Tree Species Selection for Green Infrastructure **A Guide** for Specifiers

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Authors and Acknowledgements



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Henrik Sjöman is a Senior Researcher at the Swedish University of Agricultural Sciences and Scientific Curator at Gothenburg Botanical Garden. His work mainly focuses on developing knowledge of site-adapted plant use for urban environments; how species' adaptations modify tree performance and the delivery of ecosystem services. Working extensively with landscape architects and practices in the landscape industry, the prime focus of Henrik Sjöman's work has become to expand the knowledge of how to diversify the urban treescape.



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Use the various hyperlinked symbols to efficiently navigate the document and go directly to your chosen page. The aim of this guide is to enable you to select appropriate trees for your planting scheme. By doing so, you will enhance the benefits bestowed on our communities by trees, help enrich our shared landscape and create a more sustainable urban forest for future generations.

A series of chapters provide a commentary on the interpretation of this guide and tree species selection for green infrastructure. Specific information on over 280 trees is included in the *Tree Profiles* and a *Tree Selector* tool helps you identify candidate trees by a range of criteria.

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Group.

Foreword



The act of planting a tree is a huge investment. It is often celebrated as an inherently generous act as most of the benefits the tree provides will be endowed on subsequent generations, not the person who planted it. Of course, this is very true, but the gift of planting a tree is completely worthless unless the tree successfully establishes and thrives within the landscape. Our future treescapes are not determined by the number of trees planted but by those that have established, reached independence and have a bright, sustainable future for all to enjoy.

One of the great joys of trees in our parks, gardens and landscapes is their diversity and the many aesthetic attributes that they provide us with, including flowers, fruit, bark colour, and leaf shape and colour. For those with a passion for trees, this is an endless source of intrigue and fascination. It has certainly been a great source of pleasure and satisfaction for me to celebrate the diversity of trees by planting many different species in the arboretum and gardens at the Royal Botanic Gardens. Kew, as well as being the custodian of the trees planted by my predecessors. For those planning our future landscape, tree selection is one of the most important aspects of landscape design, arboriculture or horticulture; if we get it wrong we have failed in our duties. The diversity of tree species represents an opportunity to plant the right tree in the right location, giving it the best chance of a sustainable future, thereby creating resilience within the tree population to climate change and the introduction of exotic pests and pathogens. The challenge, therefore, is to understand how this diversity, expressed by trees, can lead to more appropriate tree selection decisions for our gardens, towns and cities.

In light of all this, I was extremely pleased to learn that NERC were supporting a green infrastructure Innovation Project, focussing on tree selection for our urban environment. Historically, too many selection decisions have been made on the basis of simple aesthetics or on superficial, contradictory reference information. Therefore, the approach that Andrew Hirons and Henrik Sjöman have of using science to underpin guidance represents a significant step forward in the quality of information available to those specifying trees. *Tree Species Selection for Green Infrastructure: A Guide for Specifiers* collates a wide range of information and presents it in an accessible way. I am sure that this guide will be a valuable asset to many who have the vision to plant trees.

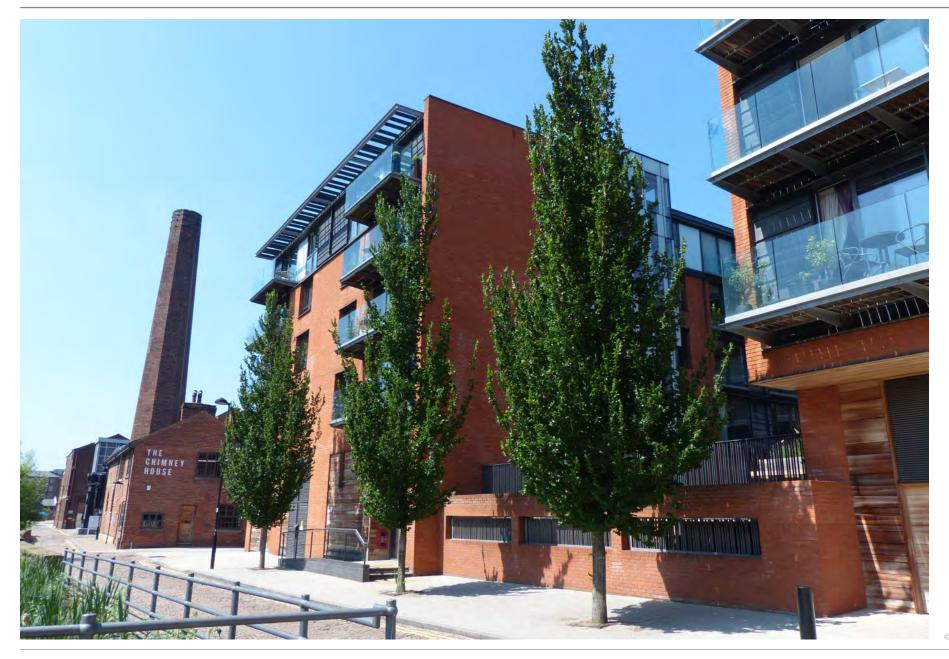
Tony Kirkham

Head of Arboretum, Gardens & Horticulture Services Royal Botanic Gardens, Kew



Exemplar species: There are a number of useful *Ulmus* cultivars that are resistant to Dutch elm disease. The upright varieties can be particularly valuable for street plantings, as shown here.





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Tree Selection for Green Infrastructure: A Guide for Specifiers complements the series of Trees and Design Action Group (TDAG) guidance focusing on the delivery of sustainable treescapes in and around our towns and cities.

It emphasises the need to acknowledge the natural heritage of a tree to ensure that the chosen species is capable of thriving on the planting site. Over 280 individual tree profiles are supported with explanatory guidance to help ensure that appropriate species are planted in our shared public spaces.

Audience

This guide is written for anyone with an interest in specifying trees for green infrastructure. This is likely to include: arboriculturists; architects; civil and structural engineers; designers; landscape architects; landscape contractors; non-profit organisations; planners and tree officers.

Aims and context

Previous TDAG guidance *Trees in the Townscape* established 12 principles of urban forestry good practice at the policy level. *Trees in Hard Landscapes* evaluated practical challenges and solutions for integrating trees into streets, civic spaces and other paved areas (such as car parks). It emphasised the requirement for collaboration between key stakeholders, identified key design choices, promoted some technical solutions and provided a framework for procuring appropriate trees.

Tree Selection for Green Infrastructure provides more extensive guidance on selecting appropriate species for a range of contrasting planting scenarios. As well as providing advice on the general approach to species selection, it includes information for over 280 species on their use-potential, size and crown characteristics, natural habitat, environmental tolerance, ornamental qualities, potential issues to be aware of, and notable varieties.

The overall aim of this guide it to provide, clear, robust information to specifiers to enable appropriate species selection and aid the diversification of the urban forest.

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Limitations

Tree Selection for Green Infrastructure: A Guide for Specifiers is, by its very nature, a guide. Its primary focus is on assisting those making tree species selection decisions for green infrastructure projects in the British Isles. It provides information on species that are available from British Isles based tree nurseries at a stock size that is suitable for planting into green infrastructure planting schemes. Typically, this means that the species are required to be available at 'standard' stock sizes¹ and above. It does not, therefore, contain the many species that might be available at much smaller sizes for the domestic market.

Since the focus is on appropriate species selection, this guidance does not attempt to be scrupulous with regards to botanical accuracy. For example, conifers are considered to 'flower' even though they have strobili rather than flowers, and 'flower clusters' is used in a general sense to describe corymbs, panicles and racemes. Of course, these are important botanical distinctions, but we felt that the document should be as accessible as possible to non-specialists. Numerous tree guides are available with this information, should it be required.

It is also important to accept that this guidance seeks to recommend species that should perform well in contrasting planting scenarios. There will always be an important role to be played by the experience, intuition and vision of individual specifiers. No single document will have all the answers.

Origins and future intentions

This guidance is the major outcome of a Natural Environment Research Council (NERC) Green Infrastructure Innovation Project (NE/N017773/1) entitled *Tree Selection for Green Infrastructure*. This project provided the opportunity to evaluate the current approach to tree species selection within the British Isles, conduct some original research on a sub-set of species and produce this guidance. In addition to the NERC sponsored research, data derived from studies funded by the Hyland R. Johns Research Grant (TREE Fund), Fund4Trees and The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (FORMAS) has been used in this guidance. A review of a wide range of published literature, indicated in the *Bibliography*, has also been used to underpin the recommendations.

Although every effort has been made to ensure the accuracy and accessibility of the content, it is anticipated that this document will initiate a conversation between a range of stakeholders using trees in green infrastructure and those tasked with providing guidance. Upon receipt of feedback, requests for additional species profiles, availability of new data or in response to a particular need, it will be possible to revise the guidance. Therefore, it is hoped that Tree Selection for Green Infrastructure will be nourished by the community that it seeks to serve, in order that collective experience and expertise can be made readily available for all.

Please engage with this document; share your experiences and ideas² so that the best contemporary knowledge on species selection can be utilised by those that share a vision for a diverse, sustainable and thriving urban forest.

Funders of research used in the development of this guidance

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FORMAS

¹A tree with a stem circumference of 8-10cm at 1m in height.

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Use potential

Planting sites within green infrastructure are highly variable. Even with a single planting scheme, individual planting sites may well differ substantially from neighbouring sites or those in close proximity. For this reason, it is necessary to develop a suite of broad recommendations based on more general characteristics of particular planting scenarios. These have formed the basis of the *Use Potential* recommendations within this guidance. The following summaries describe which species-level criteria have been employed to inform the recommendations. It should be noted that the lists formed on the basis of these criteria bundles aim to provide lists of candidate species that will perform well in the different scenarios, however, a wider range of species will be capable of surviving in each scenario.

Park



Parks have no restrictions to crown and root development imposed by built infrastructure. However, it is possible that constraints are imposed on the planting site by a range of other factors. Existing vegetation, soil conditions, exposure, species-specific environmental tolerances and proximity to the coast may all be relevant to selection decisions. Nevertheless, the 'Park' category represents the highest quality environment found within green infrastructure. Therefore, all species represented in this guide could be used within a park environment providing the environmental conditions on the site are carefully considered.

Paved



Paved scenarios often have serious constraints to the rooting environment caused by small rooting volumes, often in combination with impermeable surfaces that prevent water from infiltrating the rooting environment. Consequently, trees suitable for the *paved* environment are at least moderately tolerant to drought. Furthermore, they do not have serious issues with fruit litter that can be the cause of conflict with users of streets, courtyards and plazas. This bundle of characteristics also makes the *paved* trees useful for podium plantings. However, as no size constraints have been imposed for this category, it is important to consider the available above- and below-ground space before confirming a species choice.

A wider range of species has the potential to be used in paved environments, providing there is additional investment in the rooting environment. This will need to include the provision of an extensive volume of low bulk density (<1.4 g cm⁻³) soil, a good water supply and excellent aeration.

SuDS



The implementation of Sustainable Drainage Systems (SuDS) can involve the creation of a wide range of growing environments. Where open vegetated channels (swales) are frequently flooded, waterlogging tolerance will be a highly relevant criterion for species selection. However, SuDS schemes that incorporate specifically designed bioretention systems or tree pits have engineered soils (substrates) that are very free draining (up to 300mm per hour). This leads to rooting environments that are frequently waterlogged and rapidly dry. In natural ecosystems, highly dynamic fluctuations in soil water availability are unusual but species that are tolerant of analogous conditions can be found in upland riparian corridors closely associated with seasonal watercourses. As such, the distinctive characteristic of trees recommended for SuDS is that they are at least moderately tolerant to both waterlogging and drought. No other restrictions have been imposed on this category.



Small garden



Trees suitable for *small gardens* will have at least one notable ornamental characteristic and will typically be small or medium in size. Exceptionally, a very slow growing tree of large (potential) size may be included in this category. This allows for the fact that trees capable of reaching great proportions in their natural habitat may not reach such scales in cultivation. No environmental tolerance pre-requisites have been set for this category. However, the quality of the rooting environment and light availability will still be highly relevant to appropriate species selection.

Coastal



Trees recommended for *coastal* sites have had no size or environmental tolerance criteria imposed on them but are known to perform well in coastal regions, as they are less susceptible to saline aerosols and wind exposure. Therefore, it will be important to evaluate species' tolerance to other relevant conditions, such as shade, drought and waterlogging, before finalising species choices.

Transport corridor

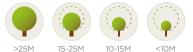


Trees suitable for *transport corridors* have had no size or environmental tolerance criteria imposed on them but are noted in the plant-use literature to have some tolerance to salt within the rooting environment. Many of these species also have some tolerance to air pollution. Unfortunately, no quantitative scales for salt and air pollution have been developed so the recommendations are necessarily based on observation.

Tree size and crown characteristics

One of the most important criteria for the selection of trees is the mature tree size and crown characteristics. The potential impact and benefits bestowed by trees are frequently related to tree size. Furthermore, future management requirements (and expense) also correspond to the relationship between tree size and the spatial constraints of the planting site. Therefore, information on mature size, crown form and crown density is displayed on each tree profile.

Mature size



Trees have been placed into one of four mature size categories: *massive* (>25m), *large* (15-25m), *medium* (10-15m) and *small* (<10m). The icons indicate the most likely maximum height of the tree growing in cultivation; this is confirmed by the associated text, which also indicates the potential tree height in natural populations. As the purpose of this guide is to disseminate information to plant users, the size categories used in the *Tree Selector* reflect the tree size most like to be achieved in cultivation, rather than ideal native environments. Importantly, the quality of the rooting environment as well a range of other environmental conditions, such as average temperature, light quality and exposure, will affect tree development. Therefore, growth environments that deviate substantially from the ideal conditions for each species often reduce mature size. Cultivar selection may also be an important factor determining final tree size.

Crown form



Tree crowns often have a characteristic form when grown in open environments. This feature can often be an important design element of a planting scheme as well as affecting how the tree crown interacts with surrounding vegetation and infrastructure.



Eight contrasting crown forms have been chosen to represent the crown diversity found within this guide. *Globular* crowns have a rounded form with vertical and horizontal dimensions being approximately equal. *Ovoid* crowns are somewhat elliptic, broader at the base than they are at the top, with the vertical axis greatly exceeding the horizontal axis. *Obovoid* crowns are also somewhat elliptic, with the vertical axis greatly exceeding the horizontal axis but are broader in the upper part of the crown. *Conical* crowns are approximately triangular in their outline and are broadest at their base. *Columnar* crowns have a vertical axis that greatly exceeds the horizontal axis but the proportions of the upper and lower crown are similar. *Irregular* crowns have an asymmetrical and uneven outline. *Weeping* crowns have strongly pendulous branches. Finally, *vase* crowns are much broader in the upper crown, which is often relatively flat rather than rounded.

Despite a tendency for a particular form, very few species rigidly conform to a particular shape. Many species are inherently variable in their morphology as a function of maturity or environment and fall somewhere between categories. The text associated with the icons endeavours to indicate this variation, where applicable. Predictable crown forms are much more readily achieved with the use of known cultivars, therefore, if consistency of form is desired from an aesthetic point of view, use a proven cultivar.

Adjacent vegetation or built infrastructure that influences the light environment and wind exposure will usually have an effect on the crown that may cause it to deviate from its expected form. Injury or failure to larger branches, via natural means or as a result of pruning, can also profoundly alter the ultimate crown form.

Crown density



Healthy crowns differ in their density as a function of leaf and branching characteristics. Together with crown size, crown density has particular implications for shading, shelter and rainfall interception. Three categories are used in this guide: *dense*, *moderate* and *open*. In some cases, it has been possible to underpin these categories with leaf area index (LAI: leaf area per unit ground area ($m^2 m^{-2}$) data. Dense crowns typically have a LAI of >6 $m^2 m^{-2}$, moderate crowns 3-6 $m^2 m^{-2}$ and open crowns <3 $m^2 m^{-2}$.

Native environment



Knowledge of the tree's native environment is critical when making robust species selection decisions. This part of the profile provides a short description of the tree's native range, principal habitats, successional status and an indication of soil preferences. In the case of artificial hybrids, a note on the parents is provided.

Environmental tolerance

In natural and managed landscapes, a suite of environmental challenges influences tree growth and performance. In natural environments, differential tolerance to environmental stress helps to determine which habitat a species competes most effectively in and, by implication, the likely performance in analogous managed landscapes. Ensuring the tree is able to cope with the likely conditions on the planting site is fundamental to the success of any planting scheme.

Each tree profile in this guide includes a tolerance scale for shade, drought and waterlogging as one or more of these environmental stresses are relevant to every planting site. A four-level qualitative scale has been developed to provide meaningful resolution across the tolerance spectrum without the risk of categorising large numbers of species in a middle rank, as is often the case with three- and five-level scales. The tolerance rating of each tree reflects a combination of plant-user experience, plant trait data and published literature. Inevitably with such a wide range of species, the quality of information is much higher for some species than it is for others. For this reason, where the tolerance characteristic for a particular stress is less certain, the phrase 'Estimated to be' has been used in the tolerance description.



Niinemets and Valladares (2006) reviewed ecological literature for 806 woody temperate species and produced a continuous five-level tolerance scale for shade, drought and waterlogging. Where there were shared species, the scale used in this guide generally interprets the Niinemets and Valladares (2006) analysis in the following way: 1 to 2 as *Sensitive*, 2 to 3 as *Moderately sensitive*, 3 to 4 as *Moderately tolerant* and 4 to 5 as *Tolerant*. Despite being a highly instructive source document, this scheme was not rigidly applied as there were numerous species where we felt that revisions were needed. To further aid the interpretation of the tolerance scales, a more detailed account of their development is presented below.

Shade tolerant



Tolerance to shade is closely associated with the particular ecological niche that a species occupies in its native habitat. For example, early successional or pioneer species are well adapted to open, high-light environments whilst late-successional species and understorev species are much better adapted to the lower light levels under the forest canopy. Existing vegetation as well as built infrastructure can substantively influence the quality and quantity of the light available to the tree. Therefore, the potential light environment is an important consideration for those selecting trees. A species is allocated its shade tolerance rating based on whether they can grow satisfactorily at a certain light availability. The four-level scale used in this guide relates approximately to the following light conditions, expressed as a percentage of full sunlight: tolerant to shade (<10% full sunlight); moderately tolerant to shade (10-25% full sunlight): partially tolerant to shade (25-50% full sunlight) and intolerant to shade (>50% full sunlight).

It should be noted that many species towards the more tolerant end of the spectrum often perform better in slightly higher light levels than their tolerance rating suggests, however, it is generally unrewarding to plant *moderately tolerant* or *tolerant* trees in fully open (high-light) environments. It should also be acknowledged that, for many larger species, shade tolerance diminishes somewhat with age. This is because a tree's need for shade tolerance is typically reduced as it becomes established within the forest canopy. Therefore, the allocated ratings are most closely related to young trees of the species and not fully mature specimens.

Drought tolerance



Many planting situations in urban environments result in water scarcity for trees. For example, small rooting (soil) volumes, compacted soil and impermeable surfaces all act to reduce soil water availability and accelerate adverse water deficits building up within the tree. The four-level scale, *tolerant to drought; moderately tolerant to drought; moderately sensitive to drought;* and *sensitive to drought,* makes use of a number of sources of information.

The Niinemets and Valladares (2006) scale integrates a range of climatic factors and the physiological potential to survive with <50% of foliage damage or dieback to create a continuous five-level scale (Table 1.1).

Table 1.1 Scale used by Niinemets and Valladares (2006) to rank 806 temperate woody species according to their drought tolerance. Trees were allocated a ranking based on their ability to survive on a site, with <50% foliage damage and dieback. P : PET is the ratio of precipitation to potential evapotranspiration.

Scale ranking	Annual precipitation (mm)	Distribution of precipitation (coefficient of variation)	P : PET ratio	Soil water potential (MPa)	Duration of dry period
1: Very intolerant	>600	Minimal	>3.0	>-0.3	A few days
2: Intolerant	500-600	<10%	1.5 : 3	-0.3 to -0.8	A few weeks
3: Moderately tolerant	400-500	10-15%	0.8-1.5	-0.8 to -1.5	Up to a month
4: Tolerant	300-400	20-25%	0.5 : 0.8	-1.5 to -3	2-3 months
5: Very tolerant	<300	>25%	<0.5	< -3	More than 3 months



In addition to the Niinemets and Valladares (2006) dataset a number of plant traits, relevant to drought tolerance, have also been used to confirm or revise the drought tolerance rating. The leaf water potential at leaf turgor loss ($\Psi_{_{\rm PO}}$) represents a quantitative plant trait that can be used to rank species, drought tolerance (Bartlett et al. 2012; Sjöman et al. 2015; 2018). Where available from our own dataset of approximately 200 species, $\Psi_{_{\rm PO}}$ was used to inform the categories: generally, $\Psi_{_{\rm PO}}$ >-2.5 MPa was classed as *sensitive*; -2.5 to -3 MPa as moderately sensitive; -3 to -3.5 MPa as moderately tolerant and <-3.5 MPa as *tolerant*. Another trait that was used to support the allocation of drought tolerance ratings was the water potential at 50% loss of hydraulic conductivity (Ψ_{50}). This trait provides excellent guidance on a species' vulnerability to drought (Choat et al. 2012). Data used to help validate our drought tolerance ratings was taken from a published meta-analysis of xylem vulnerability curves (Lens et al. 2016) and supplemented by additional data produced for this project. The resulting constellation of data was particularly valuable for determining the best allocation for species that fell close to a threshold between two tolerance levels.

Regardless of a species' drought tolerance ranking, the full expression of drought tolerance will only come about in wellestablished trees. Therefore, the selection of drought tolerant trees should never be seen as a substitute for good post-planting aftercare, such as mulching and irrigation.

Waterlogging tolerance



Waterlogging is caused by poor drainage in combination with high levels of rainfall (or irrigation). The effects of persistently saturated soils are complex, however, the most significant factor effecting trees is the deficit in oxygen within the rooting environment. This reduces the ability of roots (and many soil organisms) to aerobically respire and, as a result, they very quickly run out of metabolic energy. Consequently, unless the tree has specialist adaptations, high levels of root mortality precede a decline in the crown and, in serious cases, whole tree mortality.

Most temperate deciduous trees can cope with several weeks, waterlogging during the period of winter dormancy as metabolic activity is minimal. However, waterlogging during active growth is more serious because roots are more active and require aerobic soils. In general, the more active the growth, the more rapidly the effects of waterlogging can be seen. Factors such as the water oxygenation status and temperature will also affect how acutely waterlogging stress develops so there can be a great deal of variation around how trees experience waterlogging stress.

For this scale, *tolerant* species can survive consistent waterlogging for the duration of the growing season. *Moderately tolerant* species can survive consistent waterlogging for approximately one month during the growing season. *Moderately sensitive* species are only likely to survive if the waterlogging event is less than two weeks during the growing season and *sensitive* species are only likely to survive if the waterlogging event is less than a few days during the growing season. However, it is important to note that as this scale relates to the likely time-course to tree mortality, symptoms of waterlogging (and associated dysfunction) will be apparent within a shorter period of time.

Understanding the mechanisms and traits that confer tolerance to environmental stress is a vitally important aspect in tree selection. Those with a deeper interest in how trees respond to key environmental stresses should consult Hirons and Thomas (2018) or a plant ecology text such as Larcher (2003), Schulze *et al.*, (2005), Lambers *et al.* (2008), Keddy (2017) or Leuschner and Ellenberg (2017).

Flowering and fruiting



The phenology (timing) of flowering and fruiting are important aesthetic features of trees as well as being critical for ecological reasons. As well as a brief description of the type of flower and fruit, this section also indicates the time period which peak flowering and fruiting can be expected.



This guide uses eight periods during the year to indicate in which period peak flowering and fruiting are likely to occur (Table 1.2). Of course, after pollination, fruit begins to develop so immature fruit may be seen on the trees for much of the period between flowering and the indicative period of peak fruiting. There is also a great deal of variation in the fruiting behaviour of trees. Many hybrids are sterile so do not produce any fruit. For some genera (especially of the conifers), it can take a number of years to for fruit to fully mature. Other genera (e.g. Quercus and Fagus) exhibit a 'masting' strategy, where fruiting is very high in 'mast' years, but often rather scant in the intervening years. Where relevant, these cases are noted in the profile commentary.

As with other aspects of tree development, flowering and fruiting phenology responds to a number of environmental cues, such as day-length and temperature, as well as the general quality of the growing environment. Therefore, some variation in the timing of flowering and fruiting will occur as a function of site and unseasonal weather. It is also important to recognise that the suggested calendar period may be shifted to later in the year for the coolest parts of the British Isles.

Table 1.2 Periods used to indicate peak flowering and fruiting with the associated approximate calendar periods for larger parts of the British Isles.

Indicative seasonal period	Approximate calendar period for the British Isles			
Early spring	March through to early April			
Late spring	Late April through to the end of May			
Early summer	Early June through to early July			
Late summer	Late July through to the end of August			
Early autumn	Early September through to early October			
Late autumn	Late October through to early November			
Early winter	Late November through to the end of December			
Late winter	Early January to the end of February			

Leaf type



To help the reader visualise the tree's crown more effectively, leaves are divided into four main types: broadleaved deciduous, broadleaved evergreen, deciduous conifer and evergreen conifer. In this section, a brief description of the leaf is provided as well as an indication of significant ornamental leaf characteristics, such as autumn colour.

Single- and multi-stemmed



Trees tend to be available from the nursery as single- or multistemmed. This section indicates the likely availability of stock type, as well as providing a brief description of the bark and noting particularly attractive stem features.

Issues to be aware of



Many trees have issues that are important to consider as part of the selection process. These inevitably vary by species, but this section identifies characteristics such as: potential allergenicity, abundant fruit litter, thorns, toxicity or a propensity to produce root suckers. Importantly, features identified here may not be problematic in all planting scenarios, however, being aware of potential sources of conflict or future management challenges is fundamental to appropriate species selection.

Notable varieties

For some trees, the nursery sector only supplies the species so there are few widely available varieties or cultivars. However, in many cases, numerous varieties are available. Often these are highly desirable because of their reliable growth characteristics and ornamental features. Whilst it is challenging to list every

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potential variety, the most widely available varieties have been identified alongside a descriptive title that helps to capture its distinctive characteristic.

Tree Selector

After the individual tree profiles, lists of trees under key categories of use-potential, mature size, crown form, crown density, environmental tolerance and ornamental qualities have been collated. As with the key menus and alphabetical tree index, to aid navigation, each tree is hyperlinked to the individual tree profile. These lists also help the reader to compare trees with common characteristics.

In addition to the information in this document, a *Supplementary Database* is available to download. This Excel-based tool allows users to create a species shortlist using multiple categorical filters. Download from <u>here</u>

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Exemplar species: These oaks transform this busy public square. As well as being aesthetically appealing, they help to cool the local environment, improving the experience of diners and employees of local businesses.





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Tree selection is of strategic importance

Trees are a major component of the green infrastructure in our urban environments; as such, they are directly associated with a range of benefits or ecosystem services. As the provision of these services is dependent on healthy trees in our landscapes, the proportion of ecosystem services bestowed by trees is proportionate to their vitality. In turn, this can only be secured by good quality growing environments hosting appropriate species.

Multiple incentives for appropriate species selection should be apparent. Higher establishment success enhances the positive contribution trees make within any green infrastructure scheme. Potential disservices can also be minimised and future maintenance requirements reduced. These outcomes are all important for managers seeking to sustainably manage trees in green infrastructure and foster stewardship from the communities most directly impacted by their presence.

For understandable reasons, aesthetic criteria often dominate species selection decisions for green infrastructure projects. However, such an approach is seldom as rewarding as at first envisioned. Trees will only perform well and express their ornamental assets fully if they are appropriate for the site conditions. For example, maples (*Acer* spp.) often famed for their autumn colour rarely deliver this if they have experienced prolonged periods of drought through the growing season. Poorly selected plant material is prone to under-performance, decline and early mortality.

Therefore, the principal driver in tree selection decisions should relate to the species' ability to thrive on the chosen site, as the overwhelming majority of benefits imparted on communities by trees relies on the tree performing well in the landscape. Trees clinging on to life, barely surviving, require more intensive management, are more vulnerable to pests and pathogens and, ultimately, deliver meagre benefits. With numerous pressures on land in urban environments, the precious space allocated to trees must provide an effective contribution to the landscape and long-lasting, sustainable benefits. For these reasons, species selection is a subject that warrants strategic attention by decision makers across the green infrastructure community.

Four themes of effective tree selection

Effective tree selection relies on consideration of four factors: *Constraints, Tree ecophysiology, Ecosystem services* and *Aesthetics* (Figure 1). Of these, the primary considerations are constraints and tree ecophysiology as these factors secure the species' appropriateness for site. Once these criteria have been fully accounted for, secondary considerations that relate to desirable ecosystem services and aesthetics help to refine the best candidate species for the project.

Constraints

Constraints on the species selected are allied to the 'real world' challenges of establishing trees within and around urban environments. They are composed of a range of site, biological and practical issues for consideration. Site considerations include: the condition of the likely rooting environment; proximity of built structures; underground infrastructure; future space requirements and extant pollution. Technical and design solutions aimed at alleviating many of these site-related constraints are presented in *Trees in Hard Landscapes: A Guide for Delivery*, published by TDAG.

Biological constraints may be imposed on tree selection as a result of targets aimed at promoting species diversity, reducing risk factors associated with threats from pests and pathogens or the responsibility to protect adjacent environments from invasive species.

Practical constraints include the availability of plant material from the nurseries, budgetary restrictions, future management requirements and regulations such as those imposed by planning obligations (e.g. Section 106 agreements of the UK Town and Country Planning Act as amended) or those presented by <u>BREEAM</u> (Building Research Establishment Environmental Assessment Method) accreditation (Box 1).

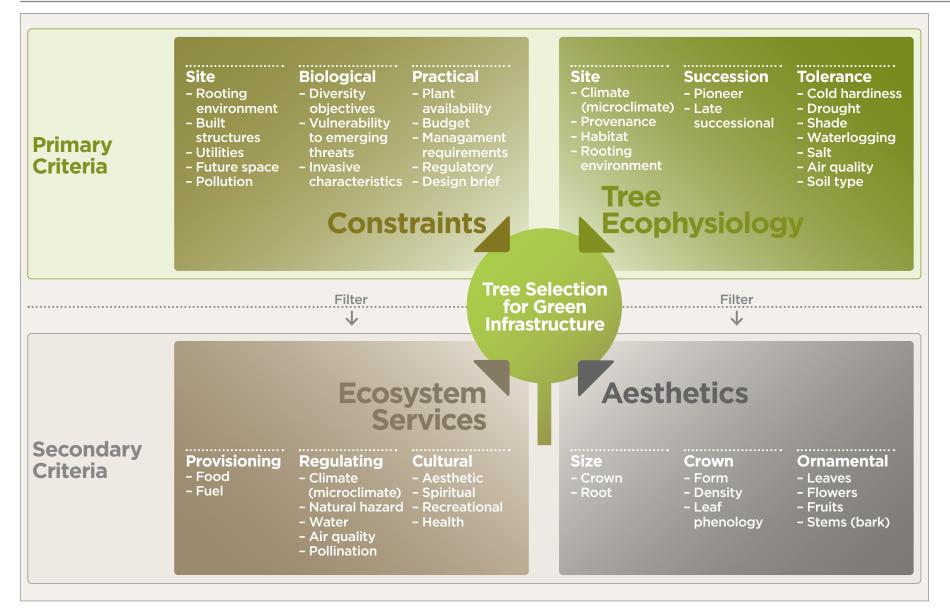


Figure 1 Factors to consider for effective tree selection.

Adapted from Johnston and Hirons (2014)

Box 1 Tree species selection and BREEAM.

BREEAM is a sustainability assessment method for masterplanning projects, infrastructure and buildings developed by the Building Research Establishment (BRE). A third party certification process aligns developments to particular standards with the aim of creating more sustainable environments, enhancing the well-being of the people who live and work in them, protecting natural resources and developing attractive property investments.

BREEAM assessment is a complex and involved process with many elements, a few of which are relevant to tree selection decisions.

Appropriate landscape design and tree selection are particularly useful for securing accreditation by supporting the following categories and aims in the <u>BREEAM Communities Technical</u> <u>Standard</u> (SD202 Issue 1.2 – August 2017):

- Social wellbeing

- (SE11) Green Infrastructure

Aim: To ensure access to high-quality space in the natural environment or urban green infrastructure for all.

- Environmental conditions
- (SE08) Microclimate

Aim: To ensure the development provides a comfortable outdoor environment through the control of climatic conditions on a micro scale.

- (SE10) Adapting to climate change
 Aim: To ensure the development is resilient to the known and predicted impacts of climate change.
- (SE13) Flood risk management

Aim: To avoid, reduce and delay the discharge of rainfall to public sewers and watercourses, thereby minimising the risk of localised flooding (on and off site), watercourse pollution and other environmental damage.

- Resources and energy

- (RE03) Water strategy

Aim: To ensure that the development is designed to minimise

water demand through efficiency and appropriate supply-side options, taking full account of current and predicted future availability of water in the area.

- Land use and Ecology
 - (LEO4) Enhancement of ecological value Aim: To ensure that the ecological value of the development is maximised through enhancement.
 - (LEO5) Landscape

Aim: To ensure that the character of the landscape is respected and, where possible, enhanced through the location of features and design appropriate to the local environment.

- Transport and movement
- (TMO2) Safe and appealing streets Aim: To create safe and appealing spaces that encourage human interaction and a positive sense of place.

Trees are one of the most fundamental components to *green infrastructure* because of their potential size, longevity and contribution to a host of ecosystem services. As the performance of trees is strongly related to appropriate selection and planting design, the 'high-quality space' sought by BREEAM should therefore reflect good practice in tree selection.

Trees influence *microclimate*, especially through shading, reducing wind-speed and increasing humidity. Therefore, careful landscape design with appropriate species can enhance thermal comfort, help improve the energy efficiency of buildings and improve the functionality of outdoor environments.

Adapting to climate change is a central theme in any sustainable development. Resilience to known and predicted impacts of climate change will need to be considered within the context of the green infrastructure. Selection of tree species that are capable of thriving in future environments will be essential. Consideration of how trees can contribute to the modification of microclimate and the species' ability to thrive in warmer, more water scarce conditions Navigation Contents page The Tree Profiles

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Box 1 Tree species selection and BREEAM. (continued)

should therefore be prominent. Drought tolerance is likely to be a particularly important species trait as this relates to the resilience of green infrastructure under future climate scenarios and will contribute to the *water strategy* by minimising the water demand of the landscape and reducing reliance on irrigation. Additionally, a diverse palette of tree species will also improve the resilience of green infrastructure to biotic threats (pests and pathogens) caused by climate change and globalisation of trade.

Numerous *flood risk management* strategies involve the use of trees within Sustainable Drainage Systems (SuDS). Trees (and their associated rooting environments) help to reduce flood risk by increasing transpiration (water loss by vegetation), rainfall interception, infiltration and storage. They may be integrated into developments in bioretention systems, detention basins, swales or as part of specially designed tree pits. These scenarios all require careful species selection, as the environmental tolerance of species will be intrinsically linked to their performance in these designed landscapes. Further guidance on appropriate tree species for SuDS can be found in the *Tree Selector* tool. At least two credits are available towards BREEAM certification if SuDS schemes are effectively integrated into a development.

A key motivation for the provision of green infrastructure is the *enhancement of ecological value* afforded by the development and its associated landscape. Species diversity will aid this goal, providing the species are suitable for the planting location. However, trees known to host a wide range of other species should be prominent. It will also be important to consider phenological diversity within the landscape so that, for example, peak flowering time is not uniform within the designed elements of green infrastructure. Other considerations relevant to maximising ecosystem services with tree species selection are discussed in Chapter 3.

To help maintain coherence of landscape character, criterion that help accumulate credits towards BREEAM certification include the

percentage area of native tree, shrub and herbaceous plantings, calculated on the basis of both new and retained plantings. A requirement of at least 60% native species contributes towards one credit and at least 80% native species contributes towards three credits under LEO5. Provision is made within the guidance for 'other ecologically appropriate species' to be included within these percentages where a suitably qualified ecologist supports their inclusion within the scheme. However, characteristics of species within this provision are obscure. On the condition that species have a minimal risk of habitat invasion, we suggest species that are more likely to thrive on the given site because of specific site conditions should be considered, especially when they offer functional diversity to the ecological attributes of the site or help support an overarching strategy that improves the resilience of green infrastructure to climate change. Indeed, the paucity of native species in the British Isles and other parts of northern Europe means that landscape-scale ecosystem services are likely to be greatly enhanced with the inclusion of appropriate exotic species (Sjöman et al. 2016).

For clarity, here is a list of species, native to the British Isles (included in this guide):

Acer campestre Alnus glutinosa Betula pendula Betula pubescens Carpinus betulus Corylus avellana Crataegus laevigata Crataegus monogyna Fagus sylvatica Ilex aquifolium Juniperus communis Malus sylvestris Pinus sylvestris Populus nigra Populus tremula Prunus avium Prunus padus Quercus petraea Quercus robur Salix caprea Salix pentandra Sorbus aria Sorbus aucuparia Sorbus torminalis Taxus baccata Tilia platyphyllos Tilia x europaea Tilia cordata Box 1 Tree species selection and BREEAM. (continued)

Where effective transport of vehicles and people is integral to developments seeking BREEAM certification, trees can play a substantial role in creating *safe and appealing streets*. This can be done by improving the aesthetics of a street with well-selected tree species and cultivars, as well as utilising trees within traffic-calming schemes. In addition to appropriate species selection, provision of high-quality, well-designed rooting environments is also essential for the long-term sustainability of street planting.

The provision of sustainable green infrastructure within developments, underpinned by good practice in species selection, should be integral to the aim of BREEAM certified schemes to provide attractive investment opportunities.

Whilst the above commentary briefly describes where tree species selection is particularly relevant to BREEAM certification, it must be noted that independent third-party experts conduct BREEAM assessments and award certification.

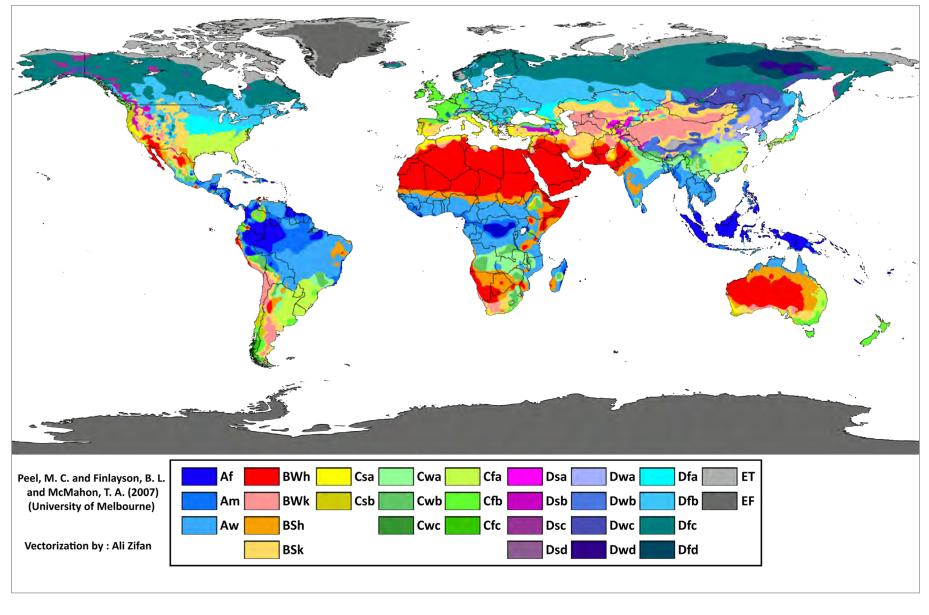
Tree Ecophysiology

Ecophysiology is the science that seeks to describe the physiological mechanisms underlying ecological observations (Lambers *et al.* 2008). It explores the traits exhibited by a species that determine its geographical distribution and habitat preferences. Ecophysiological characteristics are, therefore, highly instructive when seeking to match trees to particular planting sites.

Site characteristics are fundamental to evaluate prior to species selection. Of primary importance is the climate (and microclimate) found on the site. According to the Köppen-Geiger climate classification system (Peel et al. 2007), the British Isles is classified as a temperate oceanic climate without a pronounced dry season and with a warm summer (code Cfb, Figure 2). The mean temperature of the coldest month is greater than 0°C, there are four (or more) months with a mean temperature above 10°C and the warmest month has a mean temperature less than 22°C. In addition to the British Isles, this climate type is found in Belgium, France, Ireland, the Netherlands, most of New Zealand and the Australian states of Victoria and Tasmania. Small pockets are also found in Western Asia (Turkey and Georgia), South America (Chile and Argentina) and the Eastern Cape in South Africa. Long-term (1981-2010) rainfall records in the British Isles indicate a typical annual average rainfall of 600 to 3000mm, with the west and north-western regions being wetter than the eastern and south-eastern regions (Met Office).

Although, at a regional scale, the climate can be well characterised according to a global classification system, the conditions found in and around urban environments can deviate substantially from those presented by long-term climate data. In particular, air temperatures are often elevated and humidity levels reduced as a consequence of the Urban Heat Island effect (Orlandini *et al.* 2017). Impervious surfaces and drainage infrastructure also disrupt the infiltration of rainfall into the soil, reducing the volume of water that is available for uptake by roots and decoupling regional rainfall trends from soil water availability. Compacted soils further reduce soil infiltration and drainage increasing the likelihood of waterlogging, even after fairly minor rainfall events. Numerous microclimates also exist within the built environment as a result of shade, shelter, reflective surfaces and





Redrawn from: Peel *et al.* 2007, with permission of Creative Commons Attribution-Share Alike Unported License.

Figure 2 World map of Köppen-Geiger climate classification system. The British Isles has a temperate oceanic climate coded Cfb on this map.

wind corridors. Such variations in the growth environment between urban and adjacent rural areas can be highly relevant to tree performance (and survival) in green infrastructure.

Some tree species have a natural distribution that extends beyond the range of a single climate type. For example, silver birch (*Betula pendula*) can be found in oceanic and continental climates of Mediterranean, temperate and sub-arctic (boreal) regions. In such cases, the provenance or ecotype of the tree will be critical to its performance on any given site. Southern populations of silver birch frequently exhibit insufficient cold hardiness to be planted in more northerly locations, as they are vulnerable to late frosts. Similarly, southern ecotypes of Norway maple (*Acer platanoides*) are more prone to frost cracks than northern ones (Sjöman *et al.* 2017). Unfortunately, despite its importance, many commercially available cultivars do not have precise information on their parental lineage. Consequently, more general knowledge about species' distribution and habitats often has to suffice when selecting trees.

In natural environments, major climatic drivers and habitat preferences help to segregate species. Species suited to more open environments must be adapted to low humidity, high levels of exposure, high levels of light (radiation) and potentially nutrientpoor soils (Figure 3). Such conditions require a suite of traits that are characterised by early-successional or pioneer species. They often exhibit good growth rates in guite challenging environments but do not invest in characteristics that ensure longevity. Nevertheless, pioneer species have an important role to play in urban environments as they have an inherent capacity for growth in difficult situations. They also provide the ecological pathway for the successful establishment of *late-successional* species that prefer to develop in environments with existing vegetation or conditions that represent a later stage in forest development. Late-successional species typically mature in understorey forest environments. Whilst the low light levels of the understorey are challenging for many species, trees have less weed competition, are buffered temperature extremes. experience soil drying more gradually, enjoy greater soil fertility and more shelter. Consequently, traits that make a species competitive in an open 'pioneer' landscape make them less suited to 'late-

successional' environments and *vice versa*. In nature, competitiveness in one environment frequently results in trade-offs being made against adaptation to a contrasting environment. However, for those tasked with tree selection, this presents an opportunity to exploit knowledge of a tree's native habitat and apply it to planting recommendations. For example, a shady urban canyon or northfacing courtyard represents conditions found at a late stage of forest succession, whereas an open urban square with much higher light levels more closely represents a pioneer site. By assessing the phase of succession that a species naturally occupies, it is possible to refine species choices for urban conditions to improve the likelihood of successful tree establishment (Sjöman *et al.* 2017).



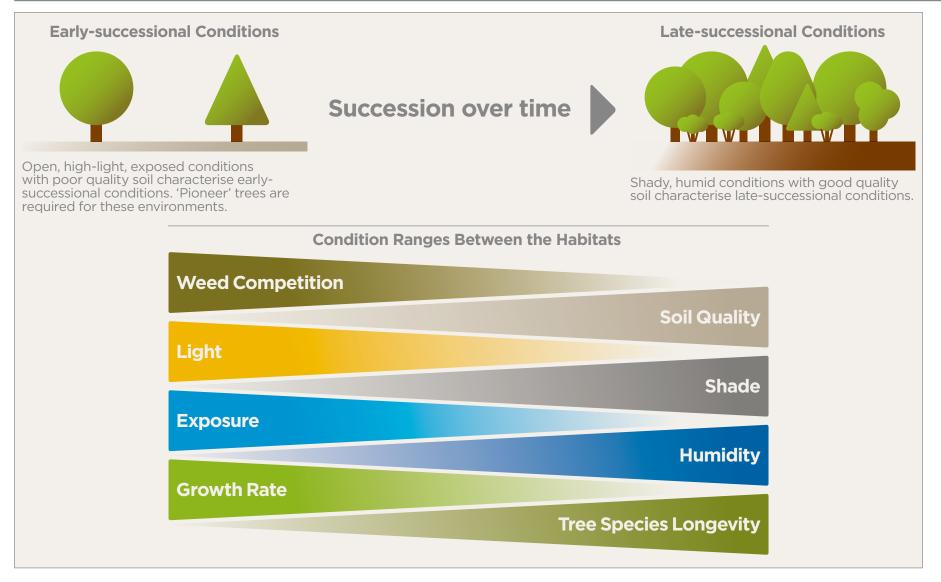


Figure 3 The successional status of a tree species is an important aspect of tree selection. Early-successional or 'pioneer' trees are typically much more capable of growing in open, high-light, low-humidity environments with poor quality soil. Pioneer trees have good growth rates but are relatively short-lived. Late-successional species require higher quality soil, higher humidity and more sheltered positions to perform well. They often take longer to establish but invest in characteristics that provides good longevity.

Table 2.1 Summary of tree species that can grow successfully in early successional pioneer growing conditions and late successional conditions.

Species for pioneer growing conditions:

Abies procera Acacia dealbata Acer campestre Acer x freemanii Acer negundo Acer rubrum Acer saccharinum Alnus cordata Alnus glutinosa Alnus incana Alnus x spaethii Betula alleghaniensis Betula ermanii Betula lenta Betula maximowicziana Betula nigra Betula papyrifera Betula pendula Betula pubescens Betula utilis Catalpa bignonioides Catalpa speciosa Celtis australis Celtis occidentalis Cercis canadensis Cercis siliquastrum Crataegus monogyna Cupressus sempervirens Elaeagnus angustifolia Fraxinus americana Fraxinus angustifolia Fraxinus ornus Fraxinus pensylvanicum Gleditsia triacanthos Juglans nigra Juniperus communis Juniperus scopulorum Juniperus virginiana Koelreuteria paniculata

Larix x marschlinsii Larix sibirica Liquidambar styraciflua Maackia amurensis Maclura pomifera Metaseguoia glyptostroboides Paulownia tomentosa Picea sitchensis Pinus heldreichii Pinus nigra Pinus pinaster Pinus sylvestris Paulownia tomentosa Populus alba Populus balsamifera Populus x berolinensis Populus x canadensis Populus laurifolia Populus nigra Populus simonii Populus tremula Populus trichocarpa Prunus avium Prunus cerasifera Prunus maackii Prunus mahaleb Prunus padus Prunus sargentii Prunus virginiana Prunus x vedoensis Pseudotsuga menziesii Pterocarva fraxinifolia Pterocarya x rehderiana Pterocarva rhoifolia Quercus acutissima Quercus cerris Quercus castaneifolia Quercus coccinea Quercus frainetto Quercus macranthera Quercus palustris

Quercus robur Quercus rubra Rhus typhina Robinia pseudoacacia Salix alba Salix caprea Salix fragilis Salix pentandra Salix x sepulcralis Sequoiadendron giganteum Sorbus aucuparia Sorbus hybrida Sorbus latifolia Styphnolobium japonicum Syringa reticulata Ulmus 'Rebona' Ulmus 'New Horizon' Zelkova serrata

Species for late successional conditions:

Abies amabilis Abies concolor Abies fraseri Abies homolepis Abies grandis Abies koreana Abies nordmanniana Abies sibirica Acer circinatum Acer griseum Acer heldreichii ssp. trautvetteri Acer pensylvanicum Acer platanoides Acer pseudoplatanus Acer rubrum Acer rufinerve Acer tataricum Acer tataricum ssp. ginnala Acer tegmentosum Acer x zoechense

Aesculus flava Aesculus hippocastanum Amelanchier lamarckii Carpinus betulus Carva ovata Cercidiphyllum japonicum Chamaecyparis lawsoniana Cornus controversa Cornus kousa Cornus mas Cryptomeria japonica Fagus grandifolia Fagus orientalis Fagus sylvatica llex aquifolium Magnolia kobus Magnolia obovata Magnolia tripetala Ostrva carpinifolia Ostrva caroliniana Picea abies Picea omorika Pinus cembra Pinus peuce Pinus x schwerinii Pinus sibirica Prunus laurocerasus Prunus padus Sciadopitys verticillata Sorbus aucuparia Sorbus torminalis Stewartia pseudocamelia Taxus baccata Thuia plicata Thuiopsis dolabrata Tilia cordata Tilia x europaea Tilia platyphyllos Tilia tomentosa Tsuga canadensis Tsuga heterophylla

Adapted from Sjöman *et al.* (2017)



Similarly, other aspects of a tree's natural habitat can inform selection decisions for green infrastructure (Figure 4). Paved urban environments, such as urban plazas, are represented in nature by warm, south-facing, mountain slopes with limited soil volume at an early phase of succession. Species such as black pine (*Pinus* nigra), sessile oak (Quercus petraea), goldenrain tree (Koelreuteria paniculata), mahaleb cherry (Prunus mahaleb) and Russian olive (Elaeagnus angustifolia) are suitable trees, as they naturally occur in similar conditions and have developed strategies for coping with these conditions (Sjöman et al. 2017). However, by improving the planting site by increasing rooting volumes with structural soils (see TDAG 2014), the site becomes more comparable to a scree slope with rooting conditions that provide good aeration and moderate retention of water and nutrients. A number of species grow well on scree slopes and exhibit good long-term development. If the urban planting site is fully exposed to the sun, pioneer species are most suitable since they can cope with the open, exposed, low-humidity sites with a high evaporative demand. Examples of such species are Italian alder (Alnus cordata), Hungarian oak (Quercus frainetto), Turkev oak (Q. cerris). Swedish whitebeam (Sorbus intermedia). Sargent's cherry (Prunus sargentii), zelkova (Zelkova serrata), field maple (Acer campestre), Japanese tree lilac (Syringa reticulata), ginkgo (Ginkgo biloba) and European hackberry (Celtis australis). Where buildings shade the planting site for part of the day, latesuccessional species that occur naturally on scree slopes may be more suitable. These include hop hornbeam (Ostrya spp.), hornbeam (Carpinus spp.), elm (Ulmus spp.) and silver lime (Tilia tomentosa), all of which can cope with the relatively poor soil conditions, shady, more humid and cooler conditions (Siöman et al. 2017).

Planting sites might be further improved with structural cells capable of hosting large volumes of high-quality soil or structural soils that increase the soil (substrate) volume available to roots (see TDAG 2014). This will provide opportunities to establish a wider range of species, especially if the site is also fairly sheltered.

Even on rich parkland sites, it is important to consider comparable habitats and the likely successional stage represented by the planting location. On open sites where it may be desirable to create

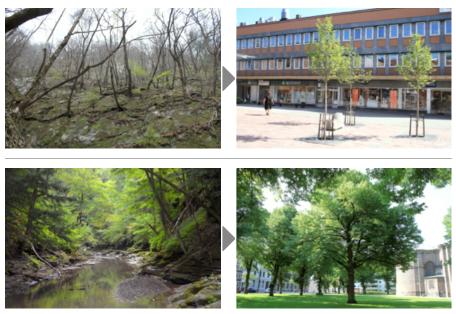


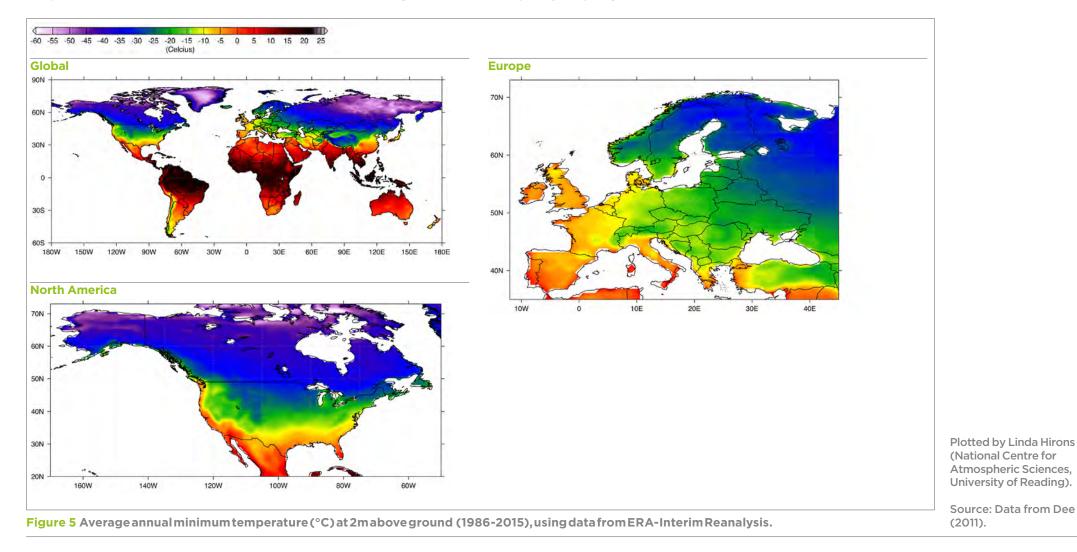
Figure 4 When analysing a tree's capacity to grow in urban environments, understanding the conditions it naturally grows in should help inform selection decisions. Trees growing on steep, south-facing mountain slopes with shallow rocky soil have developed traits that make them tolerant of these conditions. Such species often perform well in challenging urban conditions. Species that naturally grow in moist river valleys have much more in common with park environments. © Henrik Sjöman

a windbreak, pioneer species from cool, rich forests should be selected, as they possess developmental strategies that facilitate rapid establishment. Examples of such species are silver maple (*Acer saccharinum*), poplars (*Populus* spp.), many willows (*Salix* spp.), silver birch (*Betula pendula*), alder (*Alnus* spp.) and Russian olive (*Elaeagnus angustifolia*). Where established trees already exist on parkland, mature crowns modify the microenvironment, influencing light and humidity levels. These planting locations represent a later phase in forest succession and favour species such as: western hemlock (*Tsuga heterophylla*), fir (*Abies* spp.), sycamore (*Acer pseudoplatanus*), small-leaved lime (*Tilia cordata*), beech (*Fagus* spp.), yew (*Taxus* spp.) and western red cedar (*Thuja plicata*) (Sjöman *et al.* 2017).

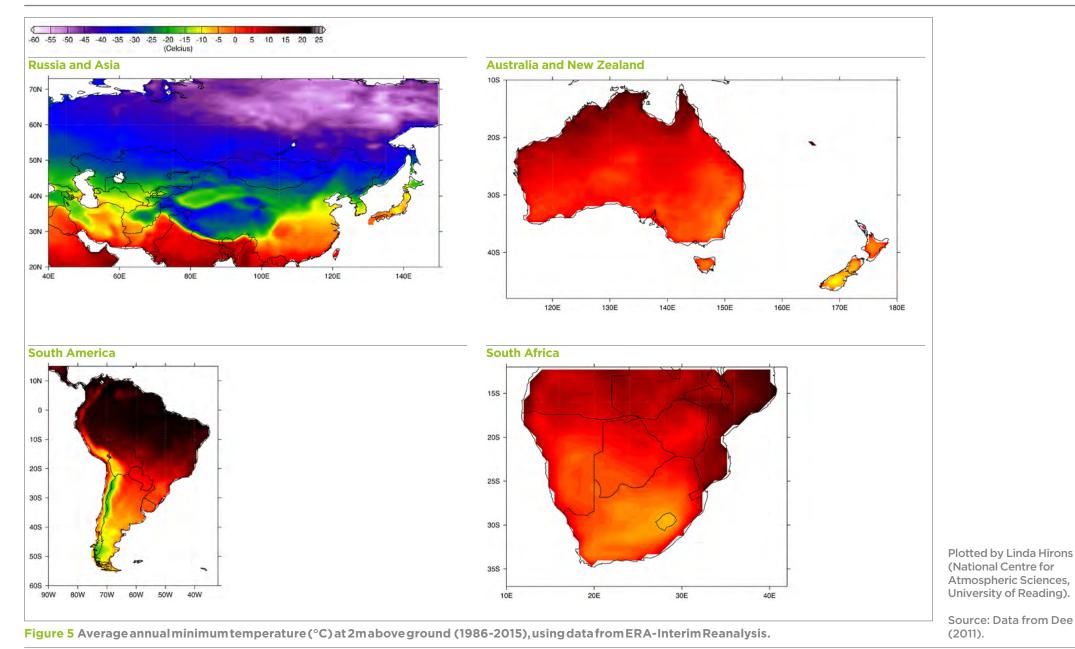
Chapter 2: The principles of tree selection for green infrastructure (continued)

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Allied to the successional status and habitat preference of a species is its tolerance to a range of individual stress factors. Although these interact, understanding particular thresholds for injury from different stress factors is crucial to selection decisions. In temperate environments, temperature thresholds for injury are a major factor in the performance and survival of trees. Resistance to damage caused by low temperatures (*cold-hardiness*) is fundamental for determining the natural distribution of species and, subsequently, is a major factor in determining where a species can be grown. Low temperatures kill trees that are not hardy enough for the area, are unable to acquire hardiness quickly enough during autumn or lose hardiness too quickly in spring (Hirons and Thomas 2018). If the tree is to be









grown outside of its natural range, it is therefore critical to match the cold-hardiness of a tree to its planting location. Consequently, cold-hardiness is a crucial factor in selecting trees for planting. Unless otherwise indicated, all species represented in this guide have sufficient cold-hardiness for all or most of the British Isles. This means that they are capable of surviving minimum winter temperatures of around -13°C (Figure 5).

Although still classed as a 'temperate climate', other regions, including large parts of the eastern US and eastern China (e.g. code Cfa, Figure 2), are distinguished from the British Isles climate by their hotter summers - where the warmest month averages greater than 22°C. This additional summer heat, combined with a tendency for a rapid transition from spring to summer, can be essential for some species to thrive. It is, therefore, the lack of suitable summer temperatures. rather than insufficient cold-hardiness that often determines which species from other temperate climates will perform well in the British Isles, For example, white oak (Quercus alba) and closely associated oak species are widespread in the eastern US, have sufficient coldhardiness for the British Isles, but tend not to perform well in the cooler summers. Similarly, native oaks from the British Isles (Quercus petraea and Q. robur) do not perform well in regions with hot summers. Consequently, climate-matching species to both winter and summer temperatures is essential when selecting species for amenity landscapes (Hirons and Thomas 2018).

Assuming the species is compatible with the site's climate in relation to temperature, it is access to water that is most likely to limit tree development: water availability influences almost every physiological process in the tree. Root loss during transplanting, small rooting (soil) volumes and impervious surfaces can all contribute to the rapid development of drought stress¹. Higher air temperatures, low atmospheric humidity, and turbulent airflow caused by wind tunnels and traffic also act to increase the tree's water requirements. Consequently, for trees in paved, street environments, good tolerance to drought² is essential. Fortunately, critical thresholds for mortality as a result of drought stress can be characterised by evaluating quantifiable traits such as the water potential at leaf turgor loss and the vulnerability of the xylem to embolism (Hirons and Thomas 2018). Such data (where available) have been used in the development of the drought-tolerance ranking of species represented in this guide. Further details of how this was done can be found in Chapter 1.

When seeking to establish future landscapes, it is vital to acknowledge that the challenge of acquiring water (and other resources) becomes more acute for the tree as its crown develops and demands more from the soil. Therefore, future requirements of the rooting environment must be considered when selecting a tree species – mature size is particularly relevant. Landscape trees are often capable of using in excess of 100 litres per day during summer. Therefore, the rooting environment must be capable of supplying sufficient water during the growing season.

Since green infrastructure in urban environments is often closely associated with the built environment, buildings as well as other vegetation can influence the quality of the light environment that trees are planted in. Tolerance to shade is closely coupled with the successional preference of a species as well as its potential to survive in a forest understorey. A shaded forest understorey may receive as little as 0.25% of the light that reaches the forest canopy (Hirons and Thomas 2018). The leaf and photosynthetic responses to light must therefore be fundamentally different across co-occurring species found at different vertical positions in the forest. While those capable of occupying a position in the canopy may well be able to acclimate to a wide range of light environments, understorey specialists are readily damaged by light intensities found in open environments. However, they are 'calibrated' to be able to effectively photosynthesise in low-light conditions. Planting understorey species in open environments or locations surrounded by reflective surfaces will rarely be rewarding, as they are unable to process all the light efficiently. Species with good shade tolerance³ are much more useful in shady courtyards, on the northern side of tall buildings and on the shady side of streets. Species with poor shade tolerance⁴ are unsuited to such sites but will perform well on more open sites with prolonged access to direct sunlight.

Strictly speaking we should refer to 'drought' as 'water deficits' because drought has a precise meteorological definition. Water deficits may arise as a result of impermeable surfaces, small rooting volumes or root damage but without the lack of precipitation needed to define a climatic drought.

- ²Species categorised as 'Drought tolerant' and 'Moderately tolerant to drought' in this guide.
- ³Species categorised as 'Shade tolerant' and 'Moderately tolerant to shade' in this guide.
- ⁴Species categorised as 'Partially tolerant to shade' and 'Intolerant to shade' in this guide.

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Most tree species, especially those found on forested mountain slopes, require excellent drainage and soil aeration if they are to thrive. This is often lacking in amenity landscapes with poorly developed soil profiles, widespread soil compaction and impermeable subsurface layers. As the predominant stress factor associated with waterlogging is soil hypoxia, tolerance to waterlogging is also a useful surrogate for tolerance to low soil oxygen. Roots and beneficial soil organisms require a good oxygen supply; the importance of sufficient soil aeration is therefore difficult to overstate. Cellular energy supplies are rapidly depleted in hypoxic conditions and unless the species is well adapted to waterlogging, roots quickly die. This is rapidly followed by a decline in the condition of the crown, visual symptoms of leaf wilting and, ultimately, crown dieback, Traits such as aerenchyma and enlarged lenticels around the base of the stem are associated with waterlogging tolerance, and help ventilate the oxygen-deprived roots and their associated rhizosphere (Hirons and Thomas, 2018). Unless effectively ameliorated, poorly aerated soil will restrict species choices to those with good tolerance to waterlogging⁵. These species are often found in riparian habitats associated with watercourses and other permanent bodies of water.

In temperate oceanic climates, tree tolerance to salt can be critical for tree survivorship. During winter, de-icing salts are frequently spread on roads and other paved areas to depress the freezing point of water and reduce the risks associated with ice. This often leads to high salt levels in adjacent soils and a marked reduction in the osmotic potential of the soil solution. As a result, water in the soil becomes harder for the tree to access, even in what appear to be moist soils. Species that are unable to tolerate this change in the condition of the soil water can experience water deficits. Consequently, growth rates decline and key physiological processes, such as photosynthesis, are disrupted. Sodium and chlorine ions may also accumulate to toxic levels inside plant tissues and, once a species-specific threshold for injury has been passed, cellular functions deteriorate. Leaf necrosis (dead patches of cells) and chlorosis (loss of green colour), particularly on the older leaves where the ions have had longer to accumulate, are indicative symptoms of damage (Costello et al. 2003).

Coastal regions are prone to salt-laden winds that are damaging to many species so careful consideration needs to be given to species selection on coastal sites. Salt-spray is also generated by traffic driving on salted roads. Therefore, trees planted in transport corridors are also required to have some tolerance to salt. Species with thick, leathery leaves tend to be more tolerant to salt-spray, particularly if they are also covered with leaf hairs. However, unlike tolerance to drought stress, quantitative traits associated with tolerance to salts held in the soil solution or air are currently unknown. For this reason, much of what we know about species' tolerance to salt is based on practitioner experience. Lists of salttolerant species are published in many standard plant-use texts and nursery catalogues. Despite the scales being somewhat arbitrary, these observations can provide critical insights into the suitability of trees for sites that are vulnerable to high levels of salinity.

Air pollution can take highly diverse forms and precise information on the thresholds of injury relating to specific pollutants is scarce, particularly for amenity species. As with salt, information relating to tree tolerance to air pollution is also primarily derived from practitioner experience. Nonetheless, such observations are vital when considering species selection in heavy industrial areas and transport corridors.

Trees are often associated with a particular soil type. Understanding this aspect of their habitat can help determine which species will perform best under analogous conditions in amenity landscapes. However, many species will be able to grow successfully in a wider range of soil types than is suggested by their population distribution in natural landscapes. For example, a tree that can perform well on dry, sandy soil, may also be able to perform perfectly well on other soil types but, in natural environments, they get out-competed by species that can perform even better. As a result, their tolerance to drought has pushed them towards more marginal sites: they grow well in more favourable conditions but, do not compete well in them. Similarly, pH has been shown to influence a wide range of soil factors, most notably nutrient availability, but providing the pH is not too extreme (<4 or >8), it seems to have a minimal effect on tree growth (Binkley and Fisher 2013). However, pH has been routinely

⁵Species categorised as 'Tolerant to waterlogging' and 'Moderately tolerant to waterlogging' in this guide.

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implicated in nutrient deficiencies for some species, *e.g. Quercus palustris*, that do require an acid soil. Therefore, in general, matching species precisely to soil-type is desirable rather than essential – this is particularly true for pioneer species that tend to be able to grow on a wide range of soils. Of far greater importance is the requirement for low soil bulk density (<1.4 g cm⁻³) and good soil aeration. Over-compacted soils and hypoxic rooting environments will be detrimental to tree roots, regardless of whether the soil-type is well matched to a species' apparent preference.

Ecosystem services

Having considered the primary criteria for tree selection – *constraints* and *tree ecophysiology* – a list of species that are likely to perform well on the planting site can be determined. This 'filtered' species list can then be evaluated according to desired *ecosystem services* and *aesthetics*.

There are various frameworks used to describe the benefits derived from ecological processes provided to humans, widely referred to as ecosystem services. Of the four categories used in the Millennium Ecosystem Assessment (2005), provisioning, regulating and cultural services are most relevant to trees in green infrastructure. *Provisioning* services provided by trees in green infrastructure can include, food and fuel supply. *Regulating* services are associated with the mitigation of unfavourable microclimates through cooling or sheltering specific spaces, a reduction in the impact of natural hazards (such as flooding), an improvement in the regulation of water flow and guality, enhancing air guality, and increased opportunities for pollinators to thrive. *Cultural* services are driven by the spiritual interaction between trees and people, recreational opportunities and the positive aesthetic impact trees have on amenity landscapes. Trees also provide habitat for other species, such as birds, bats, insects and fungi, which contribute to these cultural services as well as having a value in their own right. All these services provide benefits for human health and wellbeing as well as economic benefits, which can be reflected in avoided costs (e.g. flood damage; energy costs; healthcare costs) and the appreciation of assets (such as higher property values close to green space).

With such a diverse range of benefits bestowed by trees in green infrastructure, tree selection will need to be led by aspirations or requirements of the planting scheme. Further guidance on maximising ecosystem services through tree selection can be found in Chapter 3.

Aesthetics

Although *aesthetics* can be considered a cultural ecosystem service, its traditional prominence and on-going relevance for tree selection means that it should be considered as a distinctive criterion. Tree size, crown characteristics and ornamental qualities all contribute to the aesthetic impact trees have on our landscape. Well-selected trees can be continuous features of our daily lives, yet provide a dynamic visual narrative of time through their seasonal changes and incremental development.

Size, crown and ornamental characteristics are of greatest importance to the aesthetic contribution trees make to green infrastructure. Abundant flowers and vibrant autumn colours deliver the greatest visual impact and such selection criteria are worthy, providing the species is capable of thriving on the site. As with other aspects of tree performance, aesthetic functions are strongly related to overall site suitability as determined by the primary criteria for selection (Figure 1). A tree species stressed by challenging environmental conditions will not express its aesthetic potential and, consequently, have a diminished impact on the landscape in which it is planted.

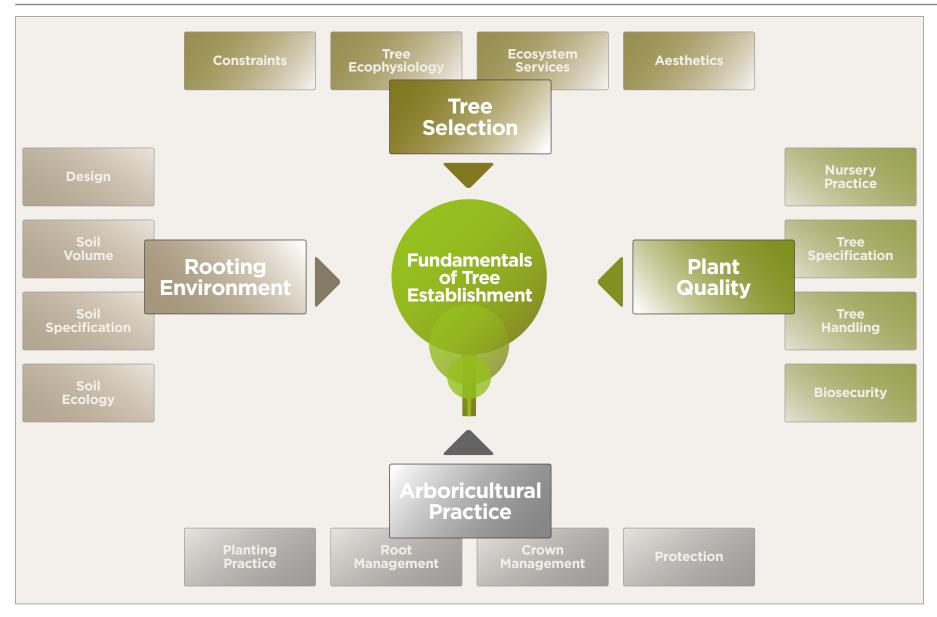
Tree selection – only one component of successful tree establishment

Whilst the emphasis of this guide is on tree selection, it is vital that appropriate species selection is not seen as the only component of successful tree establishment. Three other components – *Rooting environment, Plant quality* and *Arboricultural practice* – are also fundamental to tree establishment (Figure 6).

The rooting environment comprised of soil (or analogous substrate) provides anchorage and the medium for water and nutrient acquisition; it is, therefore, essential to the performance of the tree.

⁶See TDAG (2014) and Hirons and Thomas (2018) for further details on how this might be achieved.





Adapted from: Hirons and Percival (2012)

Figure 6 Fundamental components of tree establishment are: tree selection; the rooting environment; plant quality and; arboricultural practice.

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In many planting scenarios, trees may be planted with good success, providing soil compaction; low aeration and/or resource deficiencies do not act to suppress root growth. On sites with extensive paved surfaces, rooting environments benefit from being precisely designed to ensure that sufficient soil volumes exist to meet the current and future tree requirements⁶. To help ensure that soil is capable of providing sufficient water and nutrient resources, it is desirable to use specifications that provide guidance on expectations of soil texture, bulk density, aeration, hydraulic conductivity, electrical conductivity (salinity) and nutritional status: this may require specialist advice from an experienced arboriculturist. Furthermore, advocacy of approaches that promote good soil ecology is vital to the sustained performance of the rooting environment as a whole.

Healthy trees are derived from high-quality nursery stock. Ensuring excellent plant quality will be essential to secure tree establishment. Clearly, quality plant material is inextricably linked to excellent nursery practices. The adherence to *BS 8545 Trees: from nursery to independence in the landscape – Recommendations* (BSI 2014) will help ensure high-quality plant material. As a purchaser, precise specifications should always be used to provide clear guidance and expectations to the nursery. Wherever possible, the procurement of contract-grown stock can provide greater assurances to purchaser and nursery alike.

Care should also be taken to guarantee that poor handling between the tree nursery, any intermediary holding sites and the planting site do not compromise high-quality nursery stock. Key practices include: transportation in a covered vehicle as well as protection from temperature extremes, mechanical damage and root desiccation. Further advice on handling and storage can be found in BSI (2014).

Good biosecurity on the tree nursery is critical to ensure that threats posed by pathogens and pests are minimised. Whilst species diversity is strategically important to improve resilience within the urban forest, it is vital that innovative planting schemes do not compromise the health of established trees. Those procuring trees must make responsible decisions with regards to sourcing nursery stock. Biosecurity policies should be in place within each nursery; further guidance, for example from the <u>Arboricultural Association</u>, should also be followed.

Purposeful engagement with tree nurseries, underpinned by clear specifications, will help ensure that high-quality trees are available for your planting scheme.

Having provided a good-quality rooting environment and secured high-quality plant material, it is vital that tree establishment is not compromised by poor arboricultural practices. Poor planting practices (*e.g.* planting too deep) or insufficient protection can rapidly lead to early tree mortality. At planting, interventions to improve the quality of the root system (*e.g.* removal of root defects) and crown (*e.g.* formative pruning) will also help to reduce future maintenance requirements and promote tree longevity.

Good quality aftercare is fundamental for providing momentum to tree establishment after planting. Mulching and irrigation are paramount to help promote root development in the years following transplantation. Without these basic interventions, the prospects of successful establishment are greatly diminished. Comprehensive and extended periods of aftercare are especially important for slower growing trees, such as *Quercus robur*, *Corylus colurna* and many late-successional species (Table 2.1), however, often these species are more tolerant of environmental stress and have greater long-term potential. In all cases, good-quality planting aftercare will pay dividends in tree vitality and performance.

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Introduction

Trees make our towns and cities better places to live. They are a fundamental component of green spaces and green networks that combine to make up our green infrastructure. Evidence of the positive contribution trees make to society is extensive and expanding: trees enrich our lives.

At the most basic level, trees improve the aesthetic appeal of urban environments, help to provide a sense of place and mark the passage of time (Figure 3.1).

Trees provide economic benefits by adding value and reducing costs. For example, residential property prices have been shown to markedly increase when they are part of, or close to, landscapes with mature trees; healthy street trees can enhance the atmosphere of commercial districts, positively affecting consumer behaviour (Wolf 2005; 2017). Costs associated with storm-water management



Figure 3.1 Prunus sargentii provides spectacular autumn colour, enhancing the appeal of this paved area and helping to mark the passage of time. © Henrik Sjöman

infrastructure, health impacts of air pollution and energy usage are somewhat mitigated by trees (Roy *et al.* 2012; Mullaney *et al.* 2015).

The cultural services provided by trees have important benefits for our health and well-being (Wolf and Robbins 2015: van den Bosch 2017). The reasons for this are often complex, however, a number of studies help to provide insights into some important relationships between trees and human health. For example, higher tree cover within 250m of home was associated with better general health, partially mediated by lower levels of obesity and better neighbourhood social cohesion (Ulmer et al. 2016). Physiological studies showing reduced pulse rates and cortisol (a stress hormone) levels tangibly demonstrate the positive psychological effect exposure to trees can have on our bodies (Ochiai *et al.* 2015). Access to green infrastructure more generally has also been shown to reduce blood pressure (Grazuleviciene et al. 2015), improve mental health (Reklaitiene et al. 2014; Song et al; 2014; Bratman et al. 2015) and improve sleep patterns (Gladwell et al. 2016). Interestingly, it is likely that some species perform especially well when it comes to enhancing our well-being. For example, Ikei et al. (2015) found that the scent of oil from the Hinoki cypress (Chamaecyparis obtusa), widely used in soap and cosmetics in Japan, positively affects brain activity and induces a feeling of 'comfortableness'. Indeed, this type of effect is the basis for shinrin-voku (forest-air breathing or forest bathing), a popular form of relaxation in Japan.

Support for the value of urban trees to human health and well-being also comes from studies evaluating the consequences of their loss. Since 2002, over 100,000,000 ash (*Fraxinus* spp.) have been lost in North America as a result of an invasive beetle, emerald ash borer (*Agrilus planipennis*). This huge loss of trees has been associated with increased human mortality as a result of high levels of cardiovascular and respiratory diseases (Donovan *et al.* 2013). Furthermore, an increase in crime has also been related to the large-scale tree losses due to emerald ash borer (Kondo *et al.* 2017).

Trees can also have environmental benefits for people living in urban environments. In winter, trees can provide shelter from cold wind, improving the outdoor environment for people (Deak-Sjöman *et al.*

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2016). In summer, cooling as a result of shade and evapotranspiration can have a substantial impact on the thermal comfort. At a local level, by absorbing over 90% of the sun's radiation, a person in the shade of a tree can feel 10-15°C cooler (Armson *et al.* 2012; Orlandini *et al.* 2017). On a larger scale, the evapotranspiration of trees can mitigate the urban heat island effect by utilising the sun's radiative energy to evaporate water, reducing its ability to warm air and surfaces (Ennos *et al.* 2014).

Impervious surfaces in urban environments limit the infiltration of rainfall into the ground and substantially increase storm-water runoff, elevating the risk of flooding. Trees help to reduce local flood events by intercepting rainfall, delaying (or preventing) water from reaching the ground, removing water from the soil via transpiration and improving infiltration (Berland *et al.* 2017). Sustainable drainage systems (SuDS) that incorporate tree rooting environments are a further way trees can be used to reduce flood risk.

In addition to these benefits to human society, urban trees provide habitat and food for an array of wildlife, greatly enhancing the biodiversity of the urban realm. This, in turn, provides more opportunities for people to interact with wildlife, enhancing cultural ecosystem services such as education, recreation (e.g. bird-watching), aesthetic value and sense of place.

Without exception, species selection will have an impact on the benefits bestowed by trees to the individuals and communities that encounter them. Variation in the efficacy of a particular tree to perform well is very context dependent, but by following some basic strategies (described below), it is possible to enhance the ecosystem service provision of planting schemes.

Establish ecosystem service priorities

The term *ecosystem services* captures the vast array of benefits to human society accrued from the natural environment. For planting schemes to be most impactful, it is useful to establish ecosystem service priorities. For example, is there a need for cooling, flood mitigation, aesthetic impact or habitat for a particular species? With careful design and appropriate species selection, planting schemes can deliver multiple services. Once clarity exists on the objectives of a planting scheme, it is possible to identify species traits that enable the tree to efficiently deliver that benefit.

Trees for cooling

For cooling, the magnitude of the benefit is closely related to crown size and density. Larger crown volumes shade a greater area whilst denser crowns with a higher leaf or plant area index¹ intercept solar radiation more effectively, reducing local temperatures (Gratani and Varone 2006; Bowler *et al.* 2010; Gómez-Muñoz *et al.* 2010; Sanusi *et al.* 2017). All other factors being equal, larger trees with dense crowns are most effective at local cooling. Clearly, these criteria could be readily prioritised with judicious species selection.

Tree position is also important for shading (Figure 3.2): the service is maximized if people can access and use the space under the



Figure 3.2 The ability of trees to modify local microclimate is an important ecosystem service provided by trees. © Andrew Hirons

¹Leaf Area Index (LAI) is the leaf area per unit ground area; Plant Area Index also includes the stem material. Typically measured as m² of leaf/ plant per m² of ground (m² m⁻²).

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tree, or if the tree directly shades a building where people live or work. Health benefits may be even greater where vulnerable people benefit, *e.g.* the elderly, the sick and young children.

The potential for cooling via evapotranspiration is also closely linked to species' characteristics. Trees with larger crowns (specifically leaf area) generally require more water and, therefore, provide more evaporative cooling, although substantial variation does occur as a function of species. A major source of this variation comes from the species-specific response to soil drying (Hirons and Thomas 2018). Some species aim to avoid water deficits developing by closing their stomata and reducing water loss early in the drying cycle. Other species maintain transpiration for longer during the drving cycle and maintain physiological leaf function at lower (more negative) water potentials². Analysis has shown that drought tolerance, indicated by the leaf water potential at turgor loss, is strongly related to stomatal function with more drought-tolerant species keeping stomata open for longer during a drving event (Bartlett *et al.* 2016). Therefore, as a general rule, the larger, more drought-tolerant species ('moderately tolerant' and 'tolerant' in this guidance) will provide a greater evapotranspirational cooling service per unit of crown volume. This is an important consideration for species selection as cooling services are of greatest value in hot and dry conditions. The more drought sensitive species ('moderately sensitive' and 'sensitive' in this guidance) tend to deliver most of their cooling benefits through shading. Furthermore, a number of the more drought sensitive species (e.g. Betula spp.) will lose their leaves in response to drought, thus reducing their ability to cast shade.

Trees for flood mitigation

By intercepting rainfall, enhancing soil infiltration and removing water from the soil, trees help regulate storm-water and mitigate local flooding events. However, species' characteristics markedly influence the capacity of individual trees to regulate storm-water. Interception is governed principally by the size of the tree, leaf area, and the surface morphology of leaves and bark (Berland *et al.* 2017). Large, healthy trees with dense crowns and highly textured surfaces (leaves and bark) intercept and store water most effectively (Livesley *et al.* 2014; Van Stan *et al.* 2015; Xiao and McPherson 2011; 2016).

Leaf phenology (evergreen *vs.* deciduous) is also highly relevant as deciduous trees intercept much less rainfall during the 'leaf-off' period. Therefore, ensuring larger evergreen conifers and evergreen broadleaved species feature in planting schemes will improve year-round interception performance.

Evapotranspiration of water from the soil modulates soil water between rainfall events. As water demand is positively related to leaf area, crown size has an overwhelming influence on the ability of the tree to dry out the soil. Numerous other factors also affect the transpiration rates of trees. As a general rule, pioneer species often have higher transpiration rates, at least when water is abundant. However, as root mortality resulting from waterlogging (= oxygen deprivation) can be substantial, the rate of root recovery immediately after waterlogging will also influence the soil drying after saturating rainfall events. Larger, pioneer trees (*e.g. Alnus* spp.) that are tolerant or moderately tolerant to waterlogging are likely to perform well in this regard.

Tree pits, even for small trees, can considerably increase infiltration into soils by reducing surface run-off (Armson *et al.* 2013). Where tree pits are integrated into sustainable drainage systems (SuDS), the problems associated with high volumes of surface run-off can be reduced further. However, species that can cope with highly dynamic fluctuations in soil-water availability typified by engineered SuDS tree pits are scarce, as they are required to have some tolerance to both waterlogging and drought. To aid the overall performance of SuDS schemes, suitable species have been given the *SuDS* use potential in this guidance.

Rooting depth and morphology will also modify soil infiltration, but these characteristics are difficult to predict in the widely contrasting rooting conditions associated with urban environments. Therefore, improving soil infiltration using rooting characteristics is not a useful criterion for species selection, but simply another advantageous outcome of all trees in urban environments. ²Water potential is a measure of the water status of the plant. In simple terms, the lower (more negative) the water potential, the greater the degree of water deficit within the plant. All good plant physiology books give a more detailed explanation to the interested reader.



Trees for air quality regulation

Trees can help to remove air pollution, both by absorbing polluting gases and fine particles into their leaves, and by filtering out particles that stick to the leaves. In general, species with dense crowns and more textured leaves are most effective at filtering out pollution. Evergreen trees can provide this service all year round, whereas deciduous trees will provide little benefit during the leaf-off period. However, the impact of trees on air quality is complex and depends on local conditions. The benefits will be greatest where a dense canopy or hedge provides a barrier between the source of pollution (e.g. vehicles on a busy road) and a place used by people (e.g. a pavement, park, housing or playground). In contrast, where the canopy encloses both the source of pollution and the people. it can trap the pollution beneath it, reducing dispersion and increasing pollutant concentrations. Thus, through their influence on street ventilation, trees can play an important role in mediating local air guality. Consequently, where avenues of trees are being planted alongside busy roads, those selecting tree species must consider their canopy-forming ability and their crown density. Their ability to cope with air pollution will also be relevant.

A further way the selection of species can influence air quality is by adding texture to the surface of the land. By planting trees of different heights and dimensions, the airflow over the land's surface becomes more turbulent. This creates more mixing of air, accelerating the dispersal of pollution and reducing exposure to the pollutant.

In addition, some trees can produce allergenic pollen or biogenic volatile organic compounds (see section below on minimising disservices). Therefore, the role trees play in influencing urban air quality is complex and context dependent. More detailed information on urban air quality and its interaction with green infrastructure can be found in the *TDAG document First Steps in Urban Air Quality* (Ferranti *et al.* 2018).

Trees for carbon storage and sequestration

Trees sequester carbon dioxide from the atmosphere through the process of photosynthesis and store carbon as biomass (Nowak *et al.*

2013). As carbon is primarily stored in lignified (woody) tissues of stems and roots, larger, long-lived trees offer the greatest carbon-storage potential. For this service, size really does matter. Faster-growing species sequester carbon more rapidly than slowergrowing species, for any given tree size. However, it is tree health and longevity that secure long-term carbon storage determine which species have the greatest potential for mitigating carbon emissions. Emphasis should therefore be placed on specifying larger species capable of performing well on the planting site if these services motivate planting.

Whilst urban trees can undoubtedly contribute towards long-term goals to reduce atmospheric carbon levels, it is important to set their value in context. Greater London's 8.4 million trees are estimated to store 2.4 million tonnes of carbon and sequester about 77,200 tonnes of carbon each year (Rogers *et al.* 2015). This is approximately 3% of Greater London's annual carbon emissions, or to put it another way, enough to cover its carbon emissions for about 12 days. Therefore, in the grand scheme of things, urban forests make fairly modest contributions to the global challenge of reducing carbon emissions.

However, the provision of high-quality green infrastructure is capable of modifying carbon-intensive behaviours. For example, green networks and corridors that enable commuters to walk or cycle to work will reduce carbon (and other) emissions as well as providing health benefits for those using the infrastructure. Trees will necessarily be central to the success of such schemes and will, therefore, have a useful role to play in holistic strategies focused on mitigating a city's carbon emissions.

Trees for provisioning and cultural services

Although urban trees do not play a major role in delivering provisioning services, the wood from tree removals or pruning could be used for fuel (*e.g.* in biomass boilers). Urban trees can also provide food (fruit or nuts) on a small scale, which can have cultural benefits through the recreational or educational value of gathering 'street food' from urban trees, parks, school or hospital grounds, orchards, or community gardens.



Trees deliver significant cultural services, including aesthetic value, interaction with wildlife, sense of place, and opportunities for education and recreation. This guide provides detailed information on the aesthetic qualities of trees, and the section below describes how to maximise the wildlife value of trees. Educational opportunities can be maximised through maintaining a diverse mix of trees with good wildlife value. This is aided by the provision of interpretation boards and 'tree trails' where appropriate. Sense of place is very subjective: it could be associated with native trees (characteristic of the area) or with distinctive non-native trees, but in either case it seems likely that larger mature or veteran trees might be valued more highly.

Trees for biodiversity and pollination

Other ecosystem services that are mediated by species-specific attributes include those relating to wildlife value. A diversity of tree height within a landscape will provide the vertical structure required by many birds. Larger species that mature and reach veteran status are particularly valuable for nesting and roosting, providing they are not illuminated by artificial light. Winter-roosting birds undoubtedly benefit from evergreen trees, especially conifers that have dense, protective crowns.

Co-evolution of wildlife and trees has led to native species being particularly valuable for wildlife. Trees that host a diverse range of insects, will also indirectly support birds and bats: native *Crataegus*, *Quercus* and *Salix* have excellent credentials in this regard. However, many non-native species also have value, particularly when they flower during periods when native trees do not, or have desirable fruits. In general, 'near-native' exotic species that are more closely related to native species are preferable to those that are more phylogenetically distinct. For example, many non-native *Sorbus* or *Crataegus* have excellent wildlife credentials, whilst *Eucalyptus* tends to support fewer species.

Many native and non-native species offer valuable floral resources to bees and other pollinating insects (Somme *et al.* 2016). Pale, scented flowers are particularly good for bats because they attract insects at dusk, when bats are actively foraging. However, it is important



Figure 3.3 Conifers, such as this *Cupressus arizonica* 'glauca', provide useful habitat for winter-roosting birds. This image also shows how dense crowns can intercept precipitation. © Andrew Hirons



to note that 'double-flowered' cultivars (Figure 3.4) tend to be less valuable as their nectar and pollen supply has been diminished in favour of visual flowering qualities (Corbet *et al.* 2001), and the shape of the flower may prevent access to the pollen and nectar. Therefore, where habitat provision is an important planting objective, double-flowered cultivars should be avoided.

Many fruits (especially the more fleshy berries, drupes and pomes) are also an important food source for birds and small mammals. In fact, even non-fleshy fruits and seeds can provide good nourishment for birds. In this guidance, look out for information in the 'Notes' section relating to wildlife value.

Maximising the delivery of multiple ecosystem services

With careful design, it should be possible to design planting schemes that deliver multiple services and benefits. For example, larger trees provide greater levels of carbon storage, cooling and flood prevention (Figure 3.5). In most cases, larger trees will also have



Figure 3.4 Trees with double flowers, such as this *Prunus* 'Matsumae Hanazomei', are spectacular in spring, but they have less value for insects that rely on pollen and nectar as a food source. © Andrew Hirons



Figure 3.5 Large trees, such as these *Platanus* x *hispanica*, are essential components of green infrastructure and the delivery of a range of ecosystem services. © Andrew Hirons



greater wildlife value and a higher cultural value. Therefore, making space for and planting larger species is essential to maximise the delivery of ecosystem services from our urban forest.

In addition, ensuring functional and phenological diversity, within the constraints of the planting site, can enhance some services. Phenology relates to the timing of natural events; leaf and flower phenology are particularly important considerations for impactful planting schemes (Figure 3.6). In larger planting initiatives, a diverse species palette that targets a variety of functions can add value to the planting scheme. For example, the range of benefits provided by the planting scheme can be extended by including both evergreen



Figure 3.6 Trees that flower in summer can be used to extend the flowering season of a planting scheme and provide useful sources of pollen and nectar during a period when most tree species have finished flowering. Top images: *Stewartia sinensis* flowering in early summer. Bottom images: *Tetradium daniellii* flowering in late summer. © Andrew Hirons

and deciduous trees and a mix of species with contrasting flowering periods (especially if native or near-native species are included). In this guidance, the *Tree Selector* tool will help select a range of species with diverse attributes.

Minimise disservices

Whilst the understandable focus of many schemes is on the ecosystem services that can be accrued through successful tree establishment, it is important to acknowledge that trees are not ubiquitously beneficial (Lyytimäki 2017). Dense crowns will cool local areas in winter, potentially reducing the appeal of outdoor spaces. Litter from trees (e.g. leaves, fruit) can be a nuisance, particularly on paved sites. Some species are potentially invasive, either via vegetative or seed propagation. Poor species selection, especially in relation to mature size, can create management liabilities and conflicts with surrounding infrastructure. Where there are known problems with a particular tree species, these are noted in the '*Issues to be aware of*' section of the profile pages.

Some trees, notably wind-pollinated species, can release copious amounts of pollen. This problem can be particularly acute with male cultivars of dioecious species. In some cases, such as *Betula* spp., this pollen also carries an allergy-causing risk that should be considered in planting specifications. When planting in close proximity to vulnerable groups, such as the elderly (*e.g.* close to care homes) and young children (e.g. close to primary schools) the selection of species with a high allergy-causing potential should be avoided. In a more general sense, species diversity is crucial to reducing the dose potential of any single problematic species. Trees that are known to have high allergy-causing potential have been identified in the 'Issues to be aware of' section of the profile pages. Information on allergenicity was based on Ogren (2015) and Samson et al., (2017). More information on allergies and trees can be found on the Allergy UK website, the Society for Allergy Friendly Environmental (SAFE) Gardening website and Orgren (2015).

There are several ways in which trees can negatively influence the air quality of our towns and cities. Pollen, and occasionally leaf hairs (*e.g.* from *Plantanus* x *hispanica*), are the source of particulate matter that,

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quite apart from any allergy-causing potential, can reduce the local air quality. Many tree species also emit large amounts of biogenic volatile organic compounds (BVOCs). When combined with nitrous oxide pollutants (NO_x), BVOCs can, with the help of strong sunlight, form a further pollutant: ozone (O_3). For interest, those species that do emit high levels of BVOCs are mentioned in the 'Notes' section of the profiles³. However, whilst these species do have the potential to reduce air quality by increasing ozone, in reality, only very large-scale green infrastructure projects, dominated by high emitting species, would cause significant ozone pollution.

Survival is not enough: select trees capable of thriving in the long-term

As discussed in Chapter 2, once the constraints of a site have been fully considered, it is vital to apply ecophysiological information to the selection decision to help ensure that the tree is capable of thriving on the planting site. Trees clinging onto life do not deliver abundant ecosystem services: survival is not enough. It does not matter how profuse the flowering, how striking the autumn colour or how majestic the mature specimen promises to be, if it dies because it is poorly suited to the site, then it is only good for the saprotrophs. In itself, this is not a bad thing, but the chances are, supplementing the diet of wood decaying fungi or providing housing for specialist invertebrates is not the planting objective. Removal and replacement of dead trees is, or should be, an unnecessary management liability.

This guidance aims to bring together a broad range of information relating to species' tolerance to key environmental stressors, such as shade, drought and waterlogging. The four-level qualitative scale used for these stresses is explained in Chapter 1 and the outcomes of the species-level evaluations are collated in the *Tree Selector* tool. This information should help select trees that are capable of performing well in contrasting planting scenarios.

Strategic species diversity delivers resilience in an urban forest

There is general agreement that higher species diversity increases the resilience of ecosystems to future biotic and abiotic threats (Hooper *et al.* 2005; Smith *et al.* 2017). In the context of the urban forest, the corollary of this assumes that the greater the range of species, the more likely it is that the health of fewer trees will be compromised by any single threat. Urban forests, or sectors of the urban forest, become more vulnerable if they are comprised of only a few dominant species, as a significant climatic event, pest or pathogen outbreak may make it necessary to remove a high percentage of the trees (Sjöman *et al.* 2014). Therefore, strategic diversification of the urban tree population is critical for building resilience into the urban forest and associated green infrastructure.

The term 'strategic' is particularly relevant because simply increasing the range of species planted within our urban areas is not sufficient to build resilience within the tree population. For example, there are many species that will never be appropriate to plant in streets or paved courtyards: they do not have the traits or strategies required to cope with the conditions often associated with these locations. A diverse urban forest has little value if it leads to high mortality rates during tree establishment. Diversification should be strategic in that it should expand the range of species used from a species pool that has long-term growth potential.

Studies that include data on urban tree species diversity (*e.g. Trees in Towns II* (Britt and Johnston 2008) and i-Tree projects (*e.g.* Rogers *et al.* 2015)) can justifiably present urban forests as diverse according to widely accepted indices of biodiversity. However, these studies also indicate that whilst a broad range of species may be found in urban landscapes, a narrow range of dominant, large-crowned species provides the majority of the ecosystem services. Consequently, threats to a relatively few species disproportionately compromise the value of the urban forest as a whole. Indeed, at the local scale (*e.g.* street or park), the potential loss of a single species may remove the vast majority of tree cover in that location. Since the provision of many ecosystem services is often positively correlated with tree size, diversification should be strategic so that sites capable of supporting large specimens also support a diverse range of larger species ('Large' and 'Massive' in this guidance).

Prescriptive quotas for diversity are not always helpful as they often fail to adequately consider the scale of the planting initiative. It is the diversity at the landscape scale that is most important for building ³Species known to be high BVOC-emitters produce more than 10 μ g g⁻¹ h⁻¹ (microgram of BVOC per gram of dry weight per hour) and this information is based on Lancaster University's BVOC dataset and Samson *et al.* (2017).

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resilience in our urban forests. Consequently, it is not necessary for every planting project to have the widest variety of species possible. There are legitimate elements of urban landscape design that, for aesthetic effect, are more appropriately achieved with a narrow range of species (and/or cultivars). It may be that significant site constraints also limit the species pool from which to select. However, where design intentions or site constraints do not limit the range of species used, new planting schemes should be diverse. Indeed, the future resilience of a planting scheme is a meritorious design goal in itself. Analysis of tree diversity around a new planting scheme that reveals functional uniformity, such as dominance of spring flowering trees, could be addressed by the opportunistic introduction of new species into the local landscape. In this way it is possible to retrofit new ecosystem services into the landscape or improve the efficacy of existing services.

Vulnerabilities within the urban forest come from plantings characterised by a narrow range of species multiplied across a landscape. Diversification should be strategic so that the governance of tree populations takes place at the largest scale possible. This is often challenging to achieve in practice because no single authority has jurisdiction over tree selection criteria at a regional level. More typically, multiple stakeholders are responsible for tree selection within any one region or city; thus, coordination of species choices is difficult to realise.

Where a diverse urban forest has been identified, it is vital that complacency is not allowed to suppress the pursuit of species diversity. Those responsible for urban tree populations must be forward-looking. Whilst diversity within the tree population should be a fundamental objective in urban forest management, care should be taken to anticipate future threats. A diverse species palette often has significant value, but there are some scenarios where diverse populations of trees can still be threatened.

Seemingly diverse urban forests may be more vulnerable to an insect pest, capable of feeding on a wide range of species, than a less diverse urban forest made up of fewer susceptible species. For example, Asian longhorn beetle (*Anoplophora glabripennis*)

is a threat to many key tree genera used in urban landscapes (e.g. Acer, Aesculus, Alnus, Betula, Carpinus, Corylus, Fagus, Fraxinus, Platanus, Populus, Prunus, Salix and Ulmus), so it is possible to have a fairly diverse urban tree population that is still endangered by certain scenarios (Sjöman et al. 2014). Diversification should be strategic so that future plantings are designed to extend species diversity beyond the known hosts of significant biotic threats. Information from the <u>UK Plant Health Risk Register</u> will be essential to help plan for a strategically diverse urban forest, as it provides a risk assessment of host species' susceptibility to known pest and pathogen threats.

When selecting trees for new planting sites, it is important to remember that trees have no foresight. They cannot anticipate the likely future stresses inherent in the planting location and they cannot anticipate the potential threat from pests and pathogens. As a result, consideration of such matters must be the responsibility of those tasked with selecting trees.

Crucially, the strategic diversification of urban forests must be achieved in a sustainable way that does not compromise the biosecurity of the urban forest by irresponsibly importing trees directly to site. Those responsible for planting trees in urban environments must follow good practice with regards to the procurement of trees so that new pests and pathogens are not introduced into our urban forests as a consequence of well-intended goals for species diversity. Further guidance on the biosecurity of tree procurement can be found in Cox and Roberts (2018), available from the <u>Arboricultural Association</u>.

Conclusion

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Tree species selection can have a profound impact on the delivery of ecosystem services from the urban forest. Trees must be appropriately selected for sustained ecological well-being and not only for short-term aesthetic purposes. There must be strategic species diversification to enhance the resilience of tree populations to future biotic and abiotic threats. For efficient delivery of any singular or allied group of ecosystem services, it is vital trees are selected for specific traits, or constellations of traits, known to deliver that service.

Wherever possible, larger species should be planted as these have been shown to be of greatest benefit across a range of services. Functional and phenological diversity within any planting scheme can enhance the breadth and duration of any ecosystem services. Finally, every attempt should be made to minimise potential disservices provided by trees. If these basic rules are adhered to, then the value of your planting scheme will be enhanced.



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Exemplar species: *Davidia involucrata* has unusual white bracts during flowering. As they flutter in the spring breeze, these give the tree huge character. Here, its broad crown provides shade for a restaurant veranda.





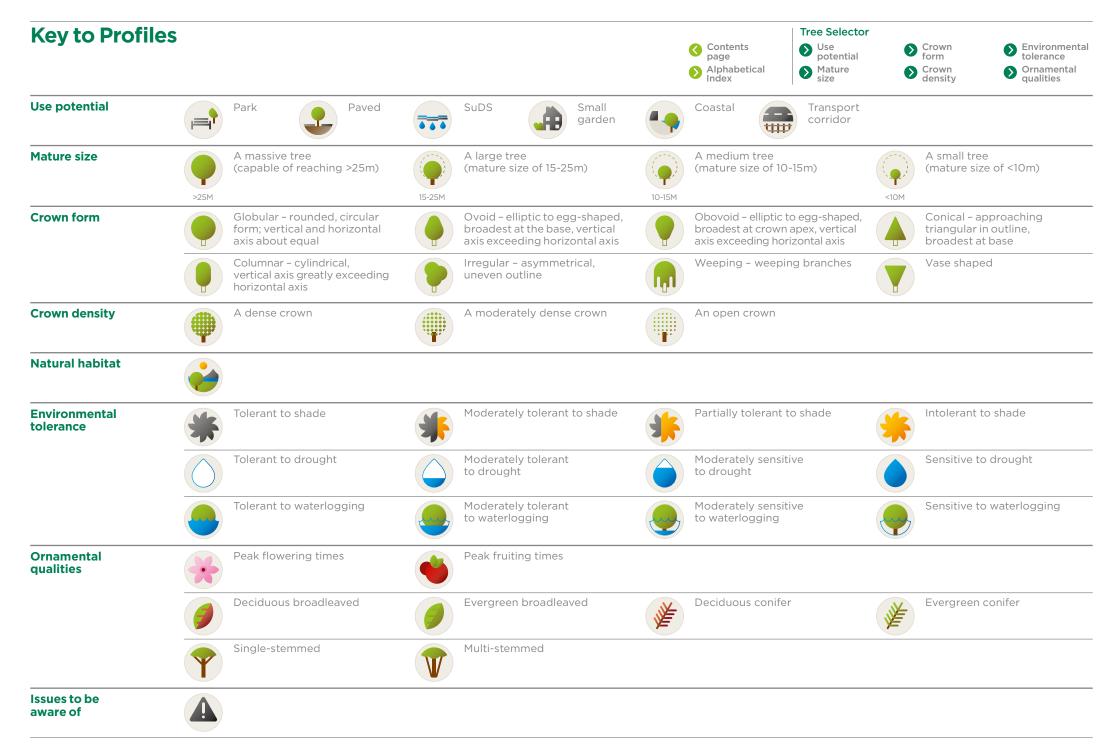
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Native species to the British Isles

Fraxinus spp. are currently under trade restrictions in the UK so have been omitted from this version of the guidance.

Α	(Shirasawa's maple)	B
Abies concolor	Acer tataricum	Betula ermanii
(White fir)	(Tatarian maple)	(Stone birch)
Abies fraseri	Acer tataricum subsp.	Betula lenta
(Fraser fir)	ginnala	(Cherry birch)
Abies grandis	(Amur maple)	Betula maximowicziana
(Grand fir)	Acer triflorum	(Monarch birch)
Abies koreana	(Three-flowered maple)	Betula nigra
(Korean fir)	Acer x zoeschense	(River birch)
Abies nordmanniana	(Zoeschen maple)	Betula papyrifera
(Nordmann fir)	Aesculus x carnea	(Paper birch)
Abies procera	(Red horse chestnut)	Betula pendula subsp.
(Noble fir)	Aesculus flava	pendula (Silver bireb)
Acacia dealbata	(Yellow buckeye)	(Silver birch)
(Silver wattle)	Aesculus hippocastanum	Betula pendula subsp.
Acer buergerianum	(Horse chostnut)	SZECHUdHICd
(Trident maple)	Aesculus indica	(Chinese white birch)
Acer campestre •		Betula pubescens •
(Field maple)	Aesculus parviflora	(Downy birch)
Acer capillipes	(Dwarf horse chestnut)	Betula utilis subsp.
(Red snake-bark maple)	Aesculus pavia	albosinensis (Chinese red birch)
Acer cappadocicum		(Chinese red birch)
(Caucasian maple)	Ailanthus altissima	Betula utilis subsp.
A I I.III		jacquemontii
(Père David's maple)	Alnus cordata	(White-barked
Acer x freemanii	(Italian alder)	Himalayan birch)
(Freeman's maple)	Alnus glutinosa •	Betula utilis subsp. utili
Acer griseum	(Common alder)	(Himalayan birch)
(Paperbark maple)	Alnus incana	Buxus sempervirens
Acer japonicum	(Grev alder)	(Box)
(Full moon maple)		
	(Creative algebra)	
(Montpellier maple)		
Acer negundo	(Alder-leaved serviceberry)	Carpinus betulus •
(Box elder)		(Hornbeam)
	(Downov conviceborny)	Carpinus japonica
(Japanese maple)		(Japanese hornbeam)
A I - I I - I	- (Canadian serviceberry)	Carya illinoinensis
(Norway maple)		(Pecan)
A	- (Serviceberry)	Carya ovata
(Svcamore)		(Shagbark hickory)
Acer rubrum	(Angelica tree)	Castanea sativa
(Red maple)		(Sweet chestnut)
V	(Monkey puzzle)	Catalpa bignonioides
Acer rufinerve (Grey-budded		(Indian bean tree)
snake-bark maple)	(Strawberry tree)	Catalpa x erubescens
Acer saccharinum		(Hybrid catalpa)
(Silver maple)		Catalpa speciosa
Acercacherum		(Northern catalpa)
Acer saccnarum (Sugar maple)	\mathbf{O}	Cedrus atlantica
(Sugai Maple)		(Atlas cedar)

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	Cedrus deodara (Himalayan cedar)	
$\mathbf{\mathbf{O}}$	Cedrus libani (Cedar of Lebanon)	\mathbf{O}
$\mathbf{\mathbf{b}}$	Celtis australis (Nettle tree)	
\bigcirc	Celtis occidentalis (Common hackberry)	
\diamond	Cercidiphyllum japonicum (Katsura tree)	
	Cercis canadensis (North American redbud)	
	Cercis siliquastrum (Judas tree)	
	Chamaecyparis lawsoniana (Lawson cypress)	
•	x Chitalpa tashkentensis Chitalpa	
	Cladrastis kentukea (Yellow wood)	
	Clerodendrum trichotomum	Ø
	(Harlequin glorybower) Cornus alternifolia (Alternate leaf dogwood)	
\mathbf{O}	Cornus controversa (Wedding cake tree)	Ø
	Cornus 'Eddie's white wonder' (Hybrid dogwood)	
	Cornus florida (Flowering dogwood)	
	Cornus kousa (Chinese dogwood)	Ø
0	Cornus mas (Cornelian cherry dogwood)	
0	Corylus avellana ● (Hazel)	
0	Corylus colurna (Turkish hazel)	
0	Corylus maxima (Filbert)	
0	Cotoneaster frigidus (Tree cotoneaster)	Ø
0	Crataegus x grignonensis (Grignon hawthorn)	Ø
	Crataegus laevigata • (Woodland hawthorn)	Ø
0	Crataegus x lavalleei (Lavallée hawthorn)	

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Use potential	form	Environr toleranc	е
Mature size	Crown density	Orname qualities	
Crataegus x media (Red thorn)	• G		
Crataegus monogyna ● (Common hawthorn)		kgo biloba idenhair tree)	
Crataegus x persimilis (Broad-leaved cockspur thorn)	(Ho	ditsia triacanthos ney locust)	
Cryptomeria japonica (Japanese cedar)		nnocladus dioica ntucky coffee tree)	
Cupressus arizonica (Arizona cypress)	• H		
<i>Cupressus macrocarpa</i> (Monterey cypress)		e sia carolina rolina silverbell)	
<i>Cupressus sempervirens</i> (Mediterranean cypress)	(Hyl	namelis x intermedi brid witch hazel)	a
x <i>Cuprocyparis leylandii</i> (Leyland cypress)	(Sev	tacodium miconioio /en-son flower)	des
Cydonia oblonga (Common quince)	(Wi	pophaë salicifolia Ilow-leaved buckthorn)	
(Chinese persimmon)	//ex (Eur	aquifolium ● ropean holly) x aquipernyi	
Diospyros kaki (Chinese persimmon)	Ilex	brid holly) aquifolium ● ropean holly)	(
E Elaeagnus angustifolia	'Dra	igon Lady' brid holly)	(
(Russian olive) Eucalyptus gunnii subsp.	- 'Che	x koehneana estnut Leaf' estnut leaved holly)	
<i>gunnii</i> (Cider gum) Eucalyptus pauciflora		'Nellie R. Stevens' brid holly)	(
group (Snow gums)			
Eucommia ulmoides (Guttapercha)		lans nigra	
<i>Euonymus europaeus</i> (Common spindle tree)	Jug	ck walnut) lans regia	
F	Jun	mmon walnut) iperus communis •	r)
Fagus orientalis (Oriental beech)	Jun	mmon juniper) iperus scopulorum cky mountain juniper	
		iperus virginiana	
Fagus sylvatica • (Common beech)		stern red cedar)	

Crown

Tree Selector

S Use

S Environmental

Alphabetical Index							Contents page		Tree Selector Use potential	Crowr	Environme tolerance	enta
IIIdex							Alphabetica Index	I	Mature size	Crown densit	o Ornamenta	al
Click an arrow to go	K		Magnolia 'Susan' (Hybrid magnolia)	Ø	<i>Picea abies</i> (Norway spruce)	$\mathbf{\mathbf{O}}$	Prunus laurocerasus (Cherry laurel)	۲	Quercus coccinea (Scarlet oak)		Sorbus x arnoldiana (Hybrid Sorbus)	(
to the Profile page. Use the arrows	<i>Koelreuteria paniculata</i> (Golden rain tree)	\mathbf{O}	Magnolia 'Yellow Bird' (Hybrid magnolia)	Ø	<i>Picea breweriana</i> (Brewer spruce)	\triangleright	Prunus lusitanica (Portugal laurel)	$\mathbf{\mathbf{b}}$	Quercus frainetto (Hungarian oak)	$\mathbf{\bullet}$	Sorbus aucuparia • (Rowan)	
top right on each profile to return.			<i>Malus baccata</i> (Siberian crabapple)	\triangleright	Picea omorika (Serbian spruce)		Prunus maackii (Manchurian cherry)		Quercus x hispanica (Spanish oak)	$\mathbf{\bullet}$	Sorbus cashmiriana (Kashmir rowan)	
	Laburnum anagyroides		Malus cultivars (Apples and crabapples)	$\mathbf{\mathbf{O}}$	<i>Picea orientalis</i> (Caucasian spruce)	$\mathbf{\mathbf{O}}$	Prunus 'Okame' (Hybrid cherry)	\triangleright	Quercus ilex (Holm oak)	\mathbf{O}	Sorbus commixta (Japanese rowan)	
Native species to the	(Common laburnum) Laburnum x watereri		Malus hupehensis (Chinese crabapple)	\diamond	Picea pungens (Colorado blue spruce)	$\mathbf{\mathbf{b}}$	Prunus padus • (Bird cherry)	$\mathbf{\mathbf{b}}$	Quercus palustris (Pin oak)	$\mathbf{\bullet}$	Sorbus discolor (Chinese rowan)	
British Isles	(Hybrid laburnum) Larix decidua		<i>Malus sylvestris</i> • (European crabapple)	\diamond	Picea sitchensis (Sitka spruce)		Prunus 'Pandora' (Hybrid cherry)	\diamond	Quercus petraea ● (Sessile oak)	$\mathbf{\Diamond}$	Sorbus intermedia (Swedish whitebeam)	
	(Common larch) Larix kaempferi	0	<i>Malus toringo</i> (Toringo crabapple)	\triangleright	Pinus nigra (Black pine)	\diamond	Prunus sargentii (Sargent's cherry)	$\mathbf{\mathbf{b}}$	Quercus phellos (Willow oak)		Sorbus 'Joseph Rock' (Hybrid Sorbus)	
	(Japanese larch) Larix x marschlinsii	0	<i>Malus trilobata</i> (Lebanese wild apple)	\diamond	Pinus pinaster (Maritime pine)	$\mathbf{\mathbf{b}}$	Prunus x schmittii (Hybrid cherry)	\triangleright	Quercus robur • (Pedunculate oak)	$\mathbf{\bullet}$	Sorbus latifolia (Broad-leaved whitebeam)	
	(Hybrid larch) <i>Ligustrum japonicum</i>	0	Malus yunnanensis (Yunnan crabapple)	\diamond	Pinus pinea (Stone pine)	$\mathbf{\mathbf{b}}$	Prunus serrula (Tibetan cherry)	$\mathbf{\mathbf{b}}$	Quercus rubra (Red oak)	\bigcirc	Sorbus pseudohupehensis (Hupeh rowan)	s (
	(Japanese tree privet) <i>Ligustrum lucidum</i>		Maytenus boaria (Chilean mayten)	\triangleright	<i>Pinus radiata</i> (Monterey pine)	$\mathbf{\mathbf{b}}$	Prunus serrulata (Japanese cherry)	$\mathbf{\mathbf{b}}$	Quercus suber (Cork oak)	$\mathbf{\bullet}$	Sorbus thibetica (Tibetan whitebeam)	
	(Chinese privet) <i>Liquidambar styraciflua</i>	0	Mespilus germanica (Medlar)	\diamond	<i>Pinus strobus</i> (Eastern white pine)	$\mathbf{\mathbf{b}}$	Prunus x subhirtella (Hybrid cherry)	$\mathbf{\mathbf{b}}$	Quercus x turneri (Turner's oak)	\bigcirc	Sorbus x thuringiaca (Hybrid Sorbus)	
	(Sweetgum) <i>Liriodendron tulipifera</i>		Metasequoia glyptostroboides	\diamond	<i>Pinus sylvestris</i> • (Scots pine)	$\mathbf{\mathbf{b}}$	Prunus 'Umineko' (Hybrid cherry)	$\mathbf{\mathbf{b}}$	D		Sorbus torminalis • (Wild service tree)	
	(Tulip tree)		(Dawn redwood) <i>Morus alba</i>	•	Pinus wallichiana (Bhutan pine)	$\mathbf{\mathbf{b}}$	Prunus x yedoensis (Yoshino cherry)	$\mathbf{\mathbf{b}}$	R Rhus typhina		Sorbus vilmorinii (Vilmorin's rowan)	
	Μ		(White mulberry) Morus nigra	0	Platanus x hispanica (London plane)	\triangleright	Pseudotsuga menziesii (Douglas fir)	\triangleright	(Staghorn sumac) Robinia pseudoacacia		Stewartia pseudocamellia (Japanese stewartia)	1
	Magnolia acuminata (Cucumber tree)		(Black mulberry)		<i>Platanus orientalis</i> (Oriental plane)	\triangleright	Pterocarya fraxinifolia (Caucasian wing-nut)	\triangleright	(False acacia)		Stewartia sinensis (Chinese stewartia)	
	Magnolia denudata (Yulan magnolia)	$\mathbf{\mathbf{b}}$	Ν		Populus alba (White poplar)	\triangleright	Pterocarya stenoptera (Chinese wing-nut)	\triangleright	S		Styphnolobium japonicum (Japanese pagoda tree)	1
	Magnolia 'Elizabeth' (Hybrid magnolia)		<i>Nothofagus antarctica</i> (Antarctic beech)		Populus x canadensis (Hybrid poplar)	\triangleright	Pyrus calleryana (Callery pear)		Salix alba (White willow)	$\mathbf{\bullet}$	Styrax japonicus (Japanese snowball tree)	
	Magnolia 'Galaxy' (Hybrid magnolia)	\diamond	Nyssa sylvatica (Black tupelo)		Populus x candicans (Ontario poplar)	$\mathbf{\mathbf{b}}$	Pyrus communis (Common pear)	$\mathbf{\mathbf{b}}$	Salix babylonica (Weeping willow)	$\mathbf{\Diamond}$	Syringa x chinensis (Chinese lilac)	
	Magnolia grandiflora (Southern magnolia)	\diamond	0		Populus nigra • (Black poplar)	$\mathbf{\mathbf{b}}$	Pyrus salicifolia (Willow-leaved pear)	$\mathbf{\mathbf{b}}$	Salix caprea ● (Goat willow)	$\mathbf{\Diamond}$	Syringa reticulata (Japanese tree lilac)	
	Magnolia 'Heaven Scent' (Hybrid magnolia)	\diamond	Olea europaea		Populus tremula • (Eurasian aspen)	$\mathbf{\mathbf{b}}$	Q		Salix daphnoides (Violet willow)	$\mathbf{\Diamond}$	Syringa vulgaris (Common lilac)	
	Magnolia kobus (Kobushi magnolia)	$\mathbf{\mathbf{b}}$	(Olive) Ostrya carpinifolia	0	Prunus 'Accolade' (Hybrid cherry)	\triangleright	Quercus acutissima		Salix pentandra ● (Bay-leaved willow)	$\mathbf{\bullet}$	т	
	Magnolia x loebneri (Loebner magnolia)	\bigcirc	(Hop hornbeam)		Prunus avium ● (Wild cherry)	\triangleright	(Sawtooth oak) Quercus bicolor		Salix x sepulcralis (Weeping willow)	$\mathbf{\Diamond}$	Tamarix gallica	
	Magnolia x soulangeana (Saucer magnolia)	$\mathbf{\mathbf{O}}$	Ρ		Prunus cerasifera (Cherry plum)	\triangleright	(Swamp white oak) Quercus x bimondorum		Sequoia sempervirens (Coastal redwood)	$\mathbf{\Diamond}$	(French tamarisk) Tamarix ramosissima	
	Magnolia 'Spectrum' (Hybrid magnolia)	\bigcirc	Parrotia persica (Persian ironwood)	\diamond	Prunus domestica (Common plum)	\triangleright	(Hybrid oak) Quercus castaneifolia		Sequoiadendron giganteum	$\mathbf{\Diamond}$	(Salt cedar) Tamarix tetrandra	
	Magnolia 'Star Wars' (Hybrid magnolia)	$\mathbf{\bullet}$	Paulownia tomentosa (Foxglove tree)	$\mathbf{\mathbf{O}}$	Prunus dulcis (Almond)	$\mathbf{\mathbf{b}}$	(Chestnut-leaved oak) Quercus cerris	0	(Giant sequoia) Sorbus aria •		(Four-stamen tamarisk) <i>Taxodium distichum</i>	
	Magnolia stellata (Star magnolia)	$\mathbf{\mathbf{b}}$	Phellodendron amurense (Amur cork tree)	\mathbf{O}	Prunus fruticosa (Steppe cherry)	$\mathbf{\mathbf{b}}$	(Turkey oak)		(Whitebeam)		(Swamp cypress)	

Alphabetical Index



Click an arrow to go to the Profile page. Use the arrows top right on each profile to return.

 Native species to the British Isles

<i>Taxus baccata</i> ● (Common yew)	\mathbf{O}
Tetradium daniellii	
(Chinese bee tree)	\triangleright
Thuja plicata	
(Western red cedar)	
Tilia americana	6
(American basswood)	
Tilia cordata 📍	\mathbf{O}
(Small-leaved lime)	
Tilia x euchlora	\mathbf{O}
(Caucasian lime)	
Tilia x europaea 📍	6
(Common lime)	
Tilia henryana	6
(Henry's lime)	
Tilia mongolica	6
(Mongolian lime)	
Tilia oliveri	6
(Chinese white lime)	
Tilia platyphyllos 📍	6
(Large-leaved lime)	
Tilia tomentosa	6
(Silver lime)	
Tsuga canadensis	6
(Eastern hemlock)	
Tsuga heterophylla	6
(Western hemlock)	
11	
U	
Ulmus - resistant cultivars	
(Elms)	

Z *Zelkova serrata* (Japanese zelkova)

 \bigcirc

	Abies concolor (White fir)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics	of growing up to 60m with lo	cal crown form wer crown getting ut 8m wide at ty.			
Natural habitat		pecies of mixed conifer forests on mountain slopes, t only to about 600m in the more northerly stands roviding they are well aerated.			
Environmental tolerance	Tolerant to shade. Moder to dro	ately tolerant ught. Sensitive to waterlogging.			
Ornamental qualities	Flowers in early summer, fairly inconspicuous.	Cylindrical cones (7-12cm) turn from green to purplish.	- Left: A young Ab © Duncan Slater		
	Evergreen conifer with needle leaves.		Right: A semi-ma © Duncan Slater	ature Abies concold	or in a park planting.
	Single-stemmed. Relatively smooth grey bark of	n younger stems, becoming deeply furrowed with age.			
Issues to be aware of	Potentially a very tall tree so requires space to a in small garden situations.	grow. Numerous dwarf forms are available for planting			
Notable varieties		Notes	- Sull and		
Numerous 'dwarf' varietie	s are available for use in small garden situations.	 Known to be more heat and drought tolerant than Abies grandis. Young trees are sensitive to weed competition (including turf), require humidity and ample soil moisture. Well established trees are less sensitive to exposure. There are many dwarf varieties that may be useful for small gardens. 	growth can be se	es of Abies concolo een as lighter green cones of Abies concel e.	1. © Duncan Slater

	Abies fraseri (Fraser fir)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics		ght, conical to nnar crown. A dense crown.			a hadi a
Natural habitat	it co-occurs with red spruce (Picea rubens). It as 36°N. Mean annual temperatures range fro	pist southern slopes of the Appalachian mountains where s naturally occurs between 1400-1800m and as far south m 2-6°C, maximum temperatures rarely exceeding 27°C adaptable in relation to soil preference and can occupy			
Environmental tolerance		erately sensitive ought. Moderately sensitive to waterlogging.			
Ornamental qualities	Flowers in early summer, fairly inconspicuous EARLY SUMMER	. Small (3-6cm) upright cones follow mature in early autumn.	© Henrik Sjöman	<i>Dies fraseri</i> showing	
	Evergreen conifer with needle leaves.		 Right: Needle lea © Ryan Charnock 	aves of <i>Abies frase</i>	ri with an apical bud.
	Single-stemmed. Grey-brown bark becomes	rough with age. Of little ornamental merit.		and Melle	
Issues to be aware of	Typically shallow rooted (20-40cm) so is vulr	erable to surface disturbance.			
Notable varieties		Notes			
Numerous 'dwarf' varietie	s are available for use in <i>small garden</i> situations.	 Young trees are sensitive to weed competition (including turf), require humidity and ample soil moisture. Well established trees are less sensitive to exposure. 	Female 'flowers' in early summer. © Duncan Slater	of Abies fraseri ter	nd to emerge

	Abies grandis (Grand fir)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A massive tree capable of exceeding 80m in favourable environments.	A dense crown.			
Natural habitat	A late-successional tree found in the mixed conifer forests of the Pacific N the temperate rainforest, but can be found from British Columbia down t Nevada mountains of northern California. Its preferred climate is humid a annual temperatures of 6-10°C. Typically found on slopes between 1400- will grow from near sea level to over 1000m farther north. Prefers mildly a	o the Coast, Cascade and Sierra nd cool to cold with average 2135m in its southern range but			
Environmental tolerance	Tolerant to shade. Moderately sensitive to drought.	Moderately sensitive to waterlogging.			
Ornamental qualities	Flowers in early summer, fairly inconspicuous. EARLY SUMMER Large (5-10 in early aut)cm) upright cones mature umn.	well amongst of	<mark>her trees</mark> . © Duncan S	
	Evergreen conifer with needle leaves.		 Right: A semi-m © Duncan Slater 	hature Abies grandis	s in an open park.
	Single-stemmed				
Issues to be aware of	Capable of becoming an extremely large tree so requires plenty of space Abies grandis can self seed and is potentially invasive.	e. In oceanic climates,			
Notable varieties	Notes				
Some 'dwarf' varieties are	(including turf), rec soil moisture.	nsitive to weed competition juire humidity and ample ned it can grow very quickly r).		ng growth contrast les from previous y	

	Abies koreana (Korean fir)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmentatolerance Ornamental qualities
Use potential	Park Small garden			The tree and it	s features	
Tree size and crown characteristics	A large tree up to 18m but more commonly 10-15m. Slow growth rate.	Conical, compact form, 3-4m wide at the base.	A dense crown.	-	*	
Natural habitat		n peninsula where it forms low forests or 00m. A late-successional species found in		-		
Environmental colerance	Tolerant to shade.		loderately sensitive o waterlogging.			
Drnamental qualities	Flowers in early summer, fairly inconsp	Cuous. Small (4-9cm) uprigh green to blue, purplis	t cones that turn from h or reddish brown.	The slow-growir garden tree. © Henrik Sjöman	ng Abies koreana m	nakes an excellent
	Evergreen conifer with needle leaves.			40		
	Single-stemmed. Smooth purplish bark	when young, becoming darker and rough	er with age.			
Issues to be aware of	No substantial issues to be aware of.					
Notable varieties		Notes			H S	2 Bank
Numerous 'dwarf' varietie	es are available for use in <i>small garden</i> situations.	 Young trees are sensitive to w (including turf), require humin soil moisture. Slow growing even when wel 	dity and ample		ome prominent in la feature of Abies ke	

	Abies nordmanniana		Tree Selector		
	(Nordmann fir)	 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A massive tree capable of exceeding 50m in favourable environments.	A dense crown.			
Natural habitat	A large range from eastern Europe, through the Anatolian peninsula to western prominent in the Caucasian mountains. A late-successional species found on d at 600-2200m.				
Environmental tolerance	Tolerant to shade. Moderately sensitive to drought.	Moderately sensitive to waterlogging.			
Ornamental qualities	Flowers in early summer, fairly inconspicuous. EARLY SUMMER EARLY	pright cones maturing	A stand of <i>Abie</i> conical growth © Henrik Sjöman	es nordmanniana dis of this species.	playing the strong
	Evergreen conifer with needle leaves.		_ © Henrik Sjoman		Last State
	Single-stemmed.				
Issues to be aware of	Capable of becoming an extremely large tree so requires plenty of space.		Weatter Too		
Notable varieties	Notes		740		
Some 'dwarf' varieties are	e available for use in <i>small garden</i> situations. (including turf), require hu soil moisture.				
			© Duncan Slater Right: The fema	aves of <i>Abies nordm</i> ale 'flowers' of <i>Abie</i> s ut fairly inconspicue	s nordmanniana

	Abies procera (Noble fir)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics	of growing up to 80m with lo	cal crown form wer crown getting ut 8m wide at ty.			
Natural habitat		cessional species of snowy mountain slopes, up to 2700m. ey are well aerated. Well suited to an oceanic climate.			
Environmental tolerance	Partially tolerant to shade. Mode	rately sensitive ught. Sensitive to waterlogging.			hard 1
Ornamental qualities	Flowers in early summer, fairly inconspicuous.	Cylindrical cones (10-20cm) turn from green to greyish-purple, with green bracts.	© Duncan Slater	ra displaying stron	
	Evergreen conifer with needle leaves.		Right: Ables proc © Duncan Slater	era has short need	lie leaves.
	Single-stemmed. Relatively smooth grey bark checked and flaky with age.	on younger stems, becoming reddish-brown, fissured,			
Issues to be aware of	Potentially a very tall tree so requires space to	grow.		ALANY A	Real Da
Notable varieties		Notes			
Bluish-green needles	'Glauca'.	 Providing it has sufficient soil depth <i>Abies procera</i> is known to be highly resistant to windthrow as it roots deeply. A fast growing <i>Abies</i> when established. 	in early summer. © Duncan Slater	flower' of Abies pr	

	<i>Acacia dealbata</i> (Silver wattle)		Contents page Alphabetical Index	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park SuDS		mucx	The tree and it		quantes
Tree size and crown characteristics		m but can	oderately dense crown.			
Natural habitat	Native to the warm-temperate climate of south-e, the tablelands and foothills of the Australian Alps, a dominant shrub in eucalypt forests. However, it small tree in clearings or on disturbed sites where environments and can cope with a wide range of	between 50-1000m. It occurs withir a pioneer species so rapidly becon t can spread into colonies. It is ofter	n forests, often forming nes dominant as a n found in riparian			
Environmental tolerance	Moderately tolerant to shade. Moderate		derately tolerant vaterlogging.	3. 1		
Ornamental qualities	Peak flowering in early spring.	Seed pods mature in lat after flowering.	e summer, 5-6 months	of Acacia dealba		
	Evergreen broadleaved species with bipinnate le			Right: Bipinnate to the crown. © D	leaves give a soft a nuncan Slater	appearance
	Single-stemmed.			ALC: N		
Issues to be aware of	Has the potential to form root suckers, especially Produces large amounts of seed.	after significant frosts (and fire in it	s native habitat).			AN
Notable varieties		Notes		Sector State	Same and	SAL 2
Smaller form	'Gaulois Astier'.	 Requires a warm microclimate to Although it is moderately toleral full sun in cooler climates, such a Good for bees and other insects 	nt to shade prefers as the British Isles.	Left: Yellow flow in early spring. ©	ers of Acacia dealb Duncan Slater	pata appear
				Right: Seedpods		are an interesting

	<i>Acer buergerianum</i> (Trident maple)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Transport corrido		The tree and i	ts features	
Tree size and crown characteristics		A dense crown.			
Natural habitat	Native to the temperate region of eastern China sea level to 1500m.	, Taiwan and Japan. Found in broadleaved forests from			
Environmental tolerance	Moderately tolerant to shade. Moderately tolerant	tely tolerant ght. Moderately sensitive to waterlogging.			
Ornamental qualities	Small, whitish flowers appearing in late spring.	Samara fruits mature in late summer.			
	Deciduous broadleaved tree with distinctive through the conditions.	ee-lobed leaves with excellent autumn colour in the			
	Single-stemmed with grey-brown bark that pee	s off in flakes on mature stems.			
Issues to be aware of	No substantial issues to be aware of.				1
Notable varieties		Notes			
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.	 Requires a warm microclimate to perform well. Good for bees and other insects. Observed to have some tolerance to salt and air pollution. 	Leaves of Acer I trident shape. © Andrew Hirons	buergerianum with	their characteristic

Tree Species Selection for Green Infrastructure: A Guide for Specifiers

		er campestro eld maple)	9			 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential		Park Paved		Transport corridor			The tree and it	s features	
Tree size and crown characteristics	10-15M	A medium tree, typically <15m but exceptionally may reach 20m.		Natural crown form is typically globular. Some cultivars provide alternative forms.		A dense crown.			1/4-
Natural habitat	e	north Africa. Can be found	as an under s, steppes (Europe (except Nordic cour storey tree, woodland edge margins) and riverbanks. It c s soils.	species as v	vell as an open grown	A STATE		
Environmental tolerance	*	Moderately tolerant to shade.		Moderately tolerant to drought.		Moderately sensitive to waterlogging.			
Ornamental qualities	LATE SPRING	Light green flowers borne in in late spring. Fairly inconsp		LATE SUMMER	a fruits mati	uring in late summer.	a golden autum		estre 'Elsrijk' showing
		Deciduous broadleaf tree. S	imple, five-	lobed leaves that turn a gold	den colour ir	n autumn.	_ © Henrik Sjöman		
V		Single-stemmed or as a mu on mature stems.	ti-stemmec	d shrub with a grey-brown co	orky bark, ve	ertically fissured			
Issues to be aware of		No substantial issues to be	aware of.						
Notable varieties				Notes					
Natural form	'Elsrijk'.					e very variable in terms easonal properties.			
Narrow crown	'Baronne	', 'Green Column', 'Arends'.		The use of kno form is require	wn cultivar i d. ave some to	s essential if a predicable lerance to salt and	© Duncan Slater	n fissured bark of A bed leaves of Acer	

	<i>Acer capillipes</i> (Red snake-bark maple)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and i		
Tree size and crown characteristics	In cultivation this tree can be viewed as a medium tree, growing up to 15m. Recorded up to 25m in native habitat.	A dense crown.			
Natural habitat	Native to the mountains of southern Japan. Four moist, fertile soils along streams. In cultivation, it free-draining soil.				
Environmental tolerance	Estimated to be partially tolerant to shade.	sensitive , moderately sensitive	STAR.	-10200	
Ornamental qualities	Flowering in late spring. Clusters of small yellowish flowers, 8-12cm long, starting upright before drooping.	Samara fruits 2-3cm long ripen in early autum	and the second second	growing in a garder	n location.
	Deciduous broadleaved tree. 3-5 lobed leaves, he green as they mature. Excellent purple autumn c	on a red petiole. Young leaves are red, turning dark ur.	100		
V	Single- or multi-stemmed. Young branches had r More mature stems become green with white str				A May
Issues to be aware of	No substantial issues to be aware of.				h d
Notable varieties		lotes	-		
The species is available, hc Consult your preferred tre	owever, no notable cultivated varieties are widely available. e nursery for options.	As an understorey tree, it requires high humidity and cannot cope with weed competition (including turf). Mulching is essential. Sensitive to warm and dry microclimates. Good for bees and other insects.	of Acer capillipe © Andrew Hirons		cure samara fruits

	Ace (Ca	e r cappadoc aucasian map	icun ole)	n		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential		Park Paved					The tree and i	ts features	
Tree size and crown characteristics	15-25M	A large tree that grows to between 20-25m.		Ovoid crown.		A moderately dense crown			
Natural habitat	e	Native to the Caucasus, Tur up to 3000m, commonly al has some tolerance to brief tolerance to shallow, dry an	ong the ba periods of	anks of streams and on mo f waterlogging. However, it	ist, shady slope	es. This suggests it			
Environmental tolerance	*	Partially tolerant to shade.		Moderately tolerant to drought.		Moderately tolerant to waterlogging.	N. Palat		E CONTRACT
Ornamental qualities	LATE SPRING	Yellow-green flower cluster with the leaves in late spring		EARLY AUTUMN	hara fruits mati	ire in early autumn.	in a parkland sit	appadocicum grow uation.	ving
		Deciduous broadleaved tre with age. In autumn leaves t		nave 5-7 lobes, they are crir	nson when you	ıng, turning dark green	_ © Andrew Hirons		673
	Y	Single- and multi-stemmed. often appear striped.	Mature st	ems have a light-grey bark	with vertical fi	ssures, young shoots			
issues to be aware of		Root suckers can cause a n	uisance in	some situations.					
Notable varieties				Notes					
Yellow leaved	'Aureum	ı'.		– Good for be	es and other ir	sects.		VA .	The second secon
Red leaved	'Rubrum	n'.					© Andrew Hirons	een flower clusters	<i>cer cappadocicum.</i> s emerge in late

	Acer davidii		Tree Selector		
	(Père David's maple)	 Contents page Alphabetical Index 	 Use potential Mature size 	Crown form Crown density	 Environmenta tolerance Ornamental qualities
Jse potential	Park Small garden		The tree and i	its features	
Free size and crown characteristics		A moderately dense crow	n.		
Natural habitat		rest understorey, up to 3000m. Noted as preferring is very scarce information on natural habitat preferences nglish language literature.			
Environmental tolerance		eated to be rately sensitive ught. Estimated to be moderately sensitive to waterlogging.			
Ornamental qualities	Yellowish flowers on pendulous clusters.	Yellow-green samara fruits mature in early autumn.	© Duncan Slater		in a garden situation
	Deciduous broadleaved tree. Leaves on young but as the tree matures entire leaves are forme	trees and young shoots typically have three lobes d. Good autumn colour.	Right: Simple le © Andrew Hirons	eaves of a mature Ad	cer davidii.
	Single- and multi-stemmed. Belonging to the 's Grey, green or reddish with white stripes.	snake-bark' maples, it has striated bark.			
Issues to be aware of	No substantial issues to be aware of.				
Notable varieties		Notes			
The species is available, he Consult your preferred tre	wever, no notable cultivated varieties are widely available. e nursery for options.	 As an understorey tree, it requires high humidity and cannot cope with weed competition (including turf). Mulching is essential. Sensitive to warm and dry microclimates. 		-bark of Acer david	ii.
				amara fruits of Acer	davidii.

	Acer x freemanii	Contents	Tree Selector Use Use potential Crown form Environment tolerance
	(Freeman's maple)	Alphabetical Index	
Use potential	Park Paved SuD	S	The tree and its features
Tree size and crown characteristics	A large hybrid tree growing to 25m.	A moderately dense crow	vn.
Natural habitat		where the ranges of the parent species, <i>Acer rubrum</i> r in floodplain and lowland deciduous forest communities lic soils.	
Environmental tolerance		erately tolerant rought. Moderately tolerant to waterlogging.	
Ornamental qualities	Red flowers appear in clusters. Separate male and female flowers occurring on the same tre or on separate trees in early spring.		Acer x freemanii makes an attractive urban tree, especially in autumn. © Henrik Sjöman
	Deciduous broadleaved tree. Simple leaves w or dry conditions.	vith five lobes. Excellent autumn colour, except incalcareous	
	Single-stemmed. Light grey bark, smooth init	ially but becoming scaly with age.	
Issues to be aware of	Slightly brittle wood (but less so that Acer sa	ccharinum) so exposed locations should be avoided.	
Notable varieties		Notes	
Hybrid-type habit	'Autumn Blaze', 'Autumn Fantasy'.	- A fast growing and readily established tree.	
Upright/Columnar hab	it 'Armstrong'.		The simple, lobed leaves of <i>Acer</i> x <i>freemanii</i> .

The simple, lobed leaves of *Acer* x *freemanii*. © Andrew Hirons

	Acer griseum			Tree Selector			
	(Paperbark maple)		Contents page Alphabetical Index	Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities 	
Use potential	Park Small garden			The tree and i	ts features		
Tree size and crown characteristics	A medium tree growing up to 12m. A globu ovoid cu		derately dense crown.	đ			
Natural habitat	Native to central China. Noted as preferring acid Information on this species' habitat is scarce in t				NP		
Environmental tolerance	Moderately tolerant to shade.	-	rately sensitive terlogging.				
Ornamental qualities	Yellow flowers emerging with new leaves in late spring.	Samara fruits mature in ea	arly autumn.	a globular crow	ed mature <i>Acer gris</i> n.	eum displaying	
	Deciduous broadleaved tree with trifoliate leave	S.		© Andrew Hirons		A (3	
V	Single- and multi-stemmed. Highly ornamental o	cinnamon coloured peeling bark.					
Issues to be aware of	No substantial issues to be aware of.						
Notable varieties		Notes				90° 96 %. "	
The species is available, ho Consult your preferred tree	vever, no notable cultivated varieties are widely available. nursery for options.	- Slow growing but worth the wait. large planting stock if immediate i					

Left: Attractive cinnamon coloured peeling bark is an ornamental feature of *Acer griseum*. © Andrew Hirons

Right: Yellow flowers emerge with the young leaves. © Andrew Hirons

	<i>Acer japonicum</i> (Full moon maple)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and i	ts features	
Tree size and crown characteristics	A medium tree that grows up to 12m. IO-15M	A dense crown.			W.
Natural habitat	Native to the northern Japan. Found on mountain slopes up to 1800m as an under deciduous forests. Information on this species' habitat is scarce in the English lang				
Environmental tolerance	moderately tolerant moderately sensitive , , , , , , , , , , , , , , , , , , ,	Estimated to be noderately sensitive o waterlogging.			
Ornamental qualities	Small red flowers held in clusters appear before the leaves. EARLY SPRING	in late summer.	in a garden situa	rn of <i>Acer japonicur</i> ation.	n growing well
	Deciduous broadleaved tree. Seven to eleven lobes. Large variety of leaves found Stunning autumn colours from creams to oranges and reds.	across the cultivars.	_ © Andrew Hirons		
V	Single- or multi-stemmed with smooth grey bark.				
Issues to be aware of	No substantial issues to be aware of.				
Notable varieties					A

The species is available, however, no notable cultivated varieties are widely available. Consult your preferred tree nursery for options.

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Left: Very attractive, simple, lobed leaves of *Acer japonicum* will display excellent autumn colours. © Andrew Hirons

Right: Young samara fruits of *Acer japonicum*. © Andrew Hirons

	Acer monspessulanum			Tree Selector		
	(Montpellier maple)		Contents page Alphabetical Index	 Use potential Mature size 	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Coasta			The tree and i	ts features	
Tree size and crown characteristics	A medium tree up to 15m, more typically 10m. Globula	r crown. A dens	e crown.			
Natural habitat	Native to the warm-temperate and Mediterrane and central Asia. Grows on sandy loam soil and Preferring neutral or calcareous soil. Found in co	dry gravelly slopes of various aspects up	o to 1700m.			
Environmental tolerance	Partially tolerant to shade.	t to drought. Sensiti	ve to waterlogging.			
Ornamental qualities	Yellow-green on pendulous inflorescences appearing in late spring.	Reddish samaras maturing	in late summer.	Acer monspess © Andrew Hirons	<i>ulanum</i> in a garden	situation.
	Deciduous broadleaved tree. Three lobed, dark		2.			
	Single- or multi-stemmed. Dark-grey bark develo	oping fissures with age.				
lssues to be aware of	No substantial issues to be aware of.					
Notable varieties		Notes				
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. e nursery for options.	- Slow growing in cooler environmen in a warm microclimate.	ts, performs best			

Left: Small, lobed leaves of *Acer monspessulanum*. © Andrew Hirons

Right: Young samara fruits of *Acer monspessulanum* mature by late summer. © Andrew Hirons

	Acer negundo (Box elder)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park SuDS		The tree and it	s features	
Tree size and crown characteristics		A moderately dense crown. form. Becoming wide.		N.	Walk.
Natural habitat	Native to North America. Enjoys humid areas a of permanent watercourses, where it acts as a	nd can often be found in riparian zones along the shores bioneer.			
Environmental tolerance	Partially tolerant to shade. Moder to dro	ately tolerant ught. Moderately tolerant to waterlogging.			
Ornamental qualities	Dioecious: male and female flowers appearing on different plants. Male flowers in dense red clusters. Female flowers in long pendulous racemes. Appearing before leaves in spring. Deciduous broadleaves tree. Pinnate leaves wit	Samara fruits held on pendant racemes of female trees. LATE SUMMER h three or five leaflets. Yellow in autumn.	A large Acer neg broad crown. © Henrik Sjöman	gundo showing a cl	naracteristically
V	Single- and multi-stemmed tree. Light grey to b	prown bark, developing fissures with age.			
Issues to be aware of	considered invasive in the British Isles. A. negun	nerica, Europe and temperate Asia. However, not generally do has brittle wood, this should be considered when placing ve high allergenicity potential during the flowering period.			
Notable varieties		Notes			
Variegated leaves	'Aureovariegatum' and 'Aureomarginatum' are standard variegated leaves. 'Flamingo' has variegated leaves with cream to light-pink margins.	 A fast growing and easy to establish species. Although partially tolerant to shade, branches that are shaded are often shed. Therefore, planting in full sun is preferable. 	© Duncan Slater	like male flowers of uits of Acer negunatisters.	

© Duncan Slater

	Acer palmatum		Tree Selector				
	(Japanese maple)	 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities 		
Use potential	Park Small garden		The tree and its features				
Tree size and crown characteristics	A medium tree growing up to 15m. Often less than 10m in cultivation.	A moderately dense crown.			1. A		
Natural habitat	Native to Japan, Taiwan, Korea and eastern China. An un Requires consistently moist soil but cannot tolerate wate						
Environmental tolerance	Tolerant to shade. Moderately sense to drought.	itive Moderately sensitive to waterlogging.					
Ornamental qualities	Small red – purple flowers held on corymbs appearing in late spring.	Small samara fruits maturing in early autumn.	A globular crov © Andrew Hirons	vn of Acer palmatur	n.		
	Deciduous broadleaved tree. Palmate leaves, five to sever variable by cultivar.	n lobed. Gives spectacular autumn colour,		Carlos an			
	Single- or multi-stemmed. Smooth, reddish on young ste	ms, turning grey-brown as stem matures.					
issues to be aware of	No substantial issues to be aware of.						
Notable varieties	Note	s	RETERN	W PARA			
		ough it can be considered tolerant to shade, ows best in partial shade.					

Acer palmatum gives a spectacular autumn display. © Andrew Hirons

	<i>Acer platanoides</i> (Norway maple)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved			The tree and it	s features	
Tree size and crown characteristics	capable of reaching 30m () form. C	o globular crown rown spread can e over 20m.	nse crown.			
Natural habitat	Native to continental Europe where it has a very It prefers nutrient rich sites of sunny slopes but species. Tends to be absent from areas of peat	is a highly adaptable and competitive				
Environmental tolerance	Tolerant to shade. Moderato drou		erately sensitive terlogging.			
Ornamental qualities	Greenish-yellow held on upright umbels appear before the leaves in early spring.	Samara fruit matures in la	te summer.	- Acer platanoides in park situations © Andrew Hirons	s can make imposir s.	ng trees
	Deciduous broadleaved tree. Leaves five-lobed do not have do not have purple/red or variegat		Iltivars that			
	Single-stemmed. Grey-brown bark, smooth whe	en young but developing vertical fissur	es with age.			
Issues to be aware of	A. platanoides release a lot of pollen so have high	h allergenicity potential during the flo	wering period.			
Notable varieties		Notes				
Species-type habit	'Emerald Queen', 'Farlakes Green', 'Summershade'.	– Seed propagated trees are very v	ariable in terms	Will Render		
Upright/columnar habit	'Cleveland', 'Columnare', 'Fairview', 'Olmsted'.	of size, growth habit and seasonal The use of known cultivar is essen				
Compact rounded	'Globosum'.	form is required.		-21		and see
Purple/Red foliage	'Crimson King', 'Crimson Kentry', 'Faassen's Black'. 'Schwedleri', 'Royal Red', 'Deborah', 'Fairview'.	- Observed to have some resistance	e to air poliution.	Left: Attractive lo © Andrew Hirons	obed leaves of Ace	er platanoides.
Yellow	'Princeton Gold'.				aved cultivars, such	
Variegated	'Drummondii'.				nson King', can pro eme. © Andrew Hirons	

	Acer pseudo (Sycamore)	oplatan	US		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park	Coastal				The tree and i	ts features	
Tree size and crown characteristics	A potentially massiv capable of reaching in favourable condit Cultivars are often much smaller.	40m	Ovoid to globular. Broad crown capable of exceeding 20m in width.	(A dense crown.			
Natural habitat	Found in deciduous cooler north facing s	woodland habita slopes. It can cop ently wet, waterlo	Europe and parts of wester t up to 1500m. In drier regic e with a wide range of soils, gged sites. Also found in co	ns of its range, i including calcar	t prefers the eous, but does			
Environmental tolerance	Tolerant to shade.	\bigcirc	Moderately sensitive to drought.		Moderately sensitive to waterlogging.			
Ornamental qualities	Yellowish green flow on pendulous racem		Sam LATE SUMMER	ara fruits maturi	ng in later summer.	globular crown	pseudoplatanus wit	h a broad,
		ved tree. Leaves	usually five lobed and dark g	green. Poor autu	mn colour.	_ © Andrew Hirons		
			mooth to finely-fissured bar reveal reddish brown layer		stems have large			
Issues to be aware of			ng seeds or seedlings may d llen so have high allergenicit					
Notable varieties			Notes					The second is
Species-type habit	'Negenia'.				ast. They cast a deep			
Upright/columnar habit	'Erectum'.				underneath them. tance to air pollution.			
Red/Purple foliage	'Spaethii', 'Autropurpureum'.					11 2 Ser	19 m	
Yellow	'Worley', 'Brilliantissimum' (sta up as a yellow/light-green).	arting with pink h	ue ending			stems in Acer p	< scales are charact seudoplatanus. © An udoplatanus 'Brilliar	ndrew Hirons
Variegated	'Leopoldii'.							pre turning light-gree

	<i>Acer rubrum</i> (Red maple)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	Crown form Crown density	Environmenta tolerance Ornamental qualities			
Use potential		ransport orridor	The tree and its f	eatures				
Tree size and crown characteristics	A massive tree capable of reaching 40m in favourable environments. 15-25M Cultivars are usually much smaller.	wn. A moderately dense crown.			SA			
Natural habitat	Native to eastern North America where it has a huge natural radeciduous woodland and floodplains, including quite poorly d be found on some upland sites as it can cope with shallow, nut calcareous soils.	rained sites. However it may also						
Environmental tolerance	Moderately tolerant to shade. Moderately tolerant to drought.	Moderately tolerant to waterlogging.						
Ornamental qualities	Red flowers appear in clusters. Separate male and female flowers occurring on the same tree or on separate trees in early spring.	amara fruits maturing in early summer.		rubrum 'October Glory garden location. © Andre				
	Deciduous broadleaved tree. Simple leaves with three to five lo colour, except in calcareous or dry conditions.	obs. Excellent red or crimson autumn	Right: Acer rubrum © Andrew Hirons	has simple, three to five	lobed leaves			
	Single-stemmed. Light grey bark, becoming scaly with age.		Cope					
Issues to be aware of	Develops a very shallow root system, particularly on poorly dra is a concern, plant a sterile cultivar such as 'Autumn Flame' or a or 'Indian Summer' to prevent spread by seeding. <i>A. rubrum</i> re allergenicity potential during the flowering period.	a male cultivar such as 'Brandywine'						
Notable varieties	Notes				7 16			
Species-type habit		bagated trees are very variable in terms	SP STA		3			
Upright/Columnar habit		owth habit and seasonal properties. f known cultivar is essential if a predicable						
Autumn colour	'Red Sunset', 'October Glory'. form is red – Observed	quired. to have some tolerance to salt and air		and a second				
No seeds	'Autumn Flame', 'Brandywine', 'Indian Summer'. pollution.	Loft: The red autumn leaves are a h						
			Right: Samara fruits These often have a	s develop shortly after f n attractive reddish hue	lowering.			

© Duncan Slater

Use potential Park Small garden The tree and its features Tree size and crown characteristics Image: Amedium tree growing up to 15m. Amedium tree growing up to 15m. Image: Amedium tree growing up to 15m. <t< th=""><th> Environmental tolerance Ornamental qualities </th><th></th><th> Crown form Crown density </th><th>Tree Selector Use potential Mature size</th><th> Contents page Alphabetical Index </th><th>ole)</th><th>ke-bark map</th><th><i>rufinerve</i> /-budded snak</th><th></th><th></th></t<>	 Environmental tolerance Ornamental qualities 		 Crown form Crown density 	Tree Selector Use potential Mature size	 Contents page Alphabetical Index 	ole)	ke-bark map	<i>rufinerve</i> /-budded snak		
characteristics Ip to 15m. Ip to 15		:S	its features	The tree and i					F	Use potential
Find the middle to upper slopes in deciduous forests. Environmental tolerance Image: Stimated to be tolerant Image: To shade. Image: To shade. Image: To shade. Image: To shade. Image: To shade. Image: To shade. Image: To shade. Image: To shade. Image: To shade. Image: To shade. Image: To shade. Ima					moderately dense crown.		crown no more than		(.)	
tolerance to shade. moderately sensitive to drought. moderately sensitive to waterlogging. Ornamental qualities Image: Sensitive to grow provide the sensitive to drought. Image: Sensitive to drought. Image: Sensitive to waterlogging. Image: Sensitive to waterlogging. Ornamental qualities Image: Sensitive to grow provide the sensitive to droup. Image: Sensitive to grow provide the sensitive to droup. Image: Sensitive to grow provide the sensiti					d on rather dry soils	00m. Usually fou				Natural habitat
qualities upright racemes but they later begin to droop. LATE SPRING Deciduous broadleaved tree. Simple leaves, three to five lobes. Excellent autumn colour, orange-red to scarlet-red. Deciduous broadleaved tree. Simple leaves, three to five lobes. Excellent autumn colour, orange-red to scarlet-red. Single- or multi-stemmed. One of the snake-bark maples: on younger stems, white axial strips form on a green background. Bark becomes grey in older stems. No substantial issues to be aware of. No substantial issues to be aware of.					noderately sensitive		moderately sensitive			
orange-red to scarlet-red. Image: construction of the snake-bark maples: on younger stems, white axial strips form on a green background. Bark becomes grey in older stems. Issues to be No substantial issues to be aware of.	location.	ell in a shady locat	growing well in a		in late summer.	nara fruits matur	n to droop.		u u	
Issues to be No substantial issues to be aware of.					colour,	Excellent autumr	e leaves, three to five lobes. E			
					e axial strips form	unger stems, whi				V
								o substantial issues to be aware of.		
Notable varieties										Notable varieties

Consult your preferred tree nursery for options.

		er saccharii	num			Contents	Tree Selector	Crown form	Environmental
	(Sil	ver maple)				Alphabetical Index	 potential Mature size 	Crown density	toleranceOrnamental qualities
Use potential		Park SuD	S				The tree and i	its features	
Tree size and crown characteristics	15-25M	A potentially massive tree growing up to 40m in favourable conditions. Typically smaller in cultivation.		Globular crown.		An open crown.			
Natural habitat	?	Native to eastern North deciduous forest up to 6		owland floodplain tree fo	und in mesic (n	ioist) temperate			
Environmental tolerance	*	Moderately tolerant to shade.		Moderately tolerant to drought.		Moderately tolerant to waterlogging.			
Ornamental qualities	EARLY	Green-yellow clusters of before leaves in early spi		EARLY SUMMER	ara fruit is matu	re by early summer.	Acer saccharing © Henrik Sjöman	um establishes read	ily and is fast growing
		Deciduous broadleaved Leaves turn yellow in aut		e lobed leaves, light gree	n above and sil	very below.			A 10-5
	Y	Single-stemmed. Light g	rey bark becom	ning scaly on older stems.					
Issues to be aware of		A vigorous shallow root	system may cau	hould not be used as a st use problems with hard su have high allergenicity p	irfaces. Invasive	in some regions.		STAN	
Notable varieties				Notes			1.11	114	
Cut leaf	'Aspleni	ifolium', 'Born's Gracious', 'l	acinatum Wier			readily establishes. establishment is preferred.	2 martin	RANGES	
Upright/Columnar habit	'Pyrami	idale'.		However, sta – The cultivar	rts to decline a	iter 50 to 75 years. hore tolerant to wind	Acer saccharing cut leaves. © Andrew Hirons	um 'Lacinatum Wier	ri' has attractive

		e r saccharum gar maple)	7			 Contents page Alphabetical Index 	 Tree Selector Use potential Mature size 	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential		Park					The tree and i	ts features	
Tree size and crown characteristics	15-25M	A potentially massive tree capable of reaching 40m in favourable conditions. Typically smaller in cultivation.		Globular to ovoid crown Crown spread is usually less than 10m.		A dense crown.			AN AN
Natural habitat	*	Native to the mesic (moist) c well-drained soils.	eciduous	forests of eastern North A	merica. Require	es, deep fertile and			
Environmental tolerance	*	Tolerant to shade.	\bigcirc	Moderately tolerant to drought.		Sensitive to waterlogging.			
Ornamental qualities	LATE SPRING	Clusters of greenish-yellow f with the leaves in late spring.		EARLY		re in early autumn.	© Andrew Hirons — Right: A young	Acer saccharum. Acer saccharum be	
		Deciduous broadleaved tree Single-stemmed. Mature ster					-	autumn colour. © Her	hrik Sjöman
Issues to be aware of		Allelopathic roots may inhibi to eastern deciduous forests			particularly if th	ney are native			
Notable varieties				Notes					
Species type habit	'Legacy	', 'Green Mountain'.				very variable in terms	All and		
Upright/Columnar habit	'Newtor	n Sentry'.			nown cultivar is	asonal properties. s essential if a predicable	© Andrew Hirons	narum leaves highlig	

	Acer shirasawanum (Shirasawa's maple)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and i	ts features	
Tree size and crown characteristics	A medium tree that can eventually reach 15m in favourable conditions. It tends to be less than 8m in cultivation.	A dense crown.	Cole Sa		- Caller
Natural habitat	Native to the low mountain deciduous forest of Japan. Found as part of the well-drained sites on mountain slopes between 700-1800m. In cultivation, I mildly acidic organic soils.				
Environmental tolerance	Estimated to be moderately tolerant to shade.	Estimated to be sensitive to waterlogging.			Ange C
Ornamental qualities	Upright clusters of flowers with creamy petals and red sepals and anther. Appearing with the leaves in later spring. SPRING	nature in early autumn.	amongst other	<i>sawanum</i> 'Aureum' vegetation.©Duncar	Slater
	Deciduous broadleaved tree. Simple nine to eleven lobed leaves. Spring col leaves turning orange or crimson red in autumn.	our yellow with	 Right: Acer shirt © Henrik Sjöman 	asawanum leaves a	nd flowers.
V	Multi-stemmed or with a very short single stem. Light brown bark axially str grey-green strips.	iated with			
lssues to be aware of	No substantial issues to be aware of.				
Notable varieties				A CONTRACT	C. P. C
Yellow leaves	'Aureum'.				
			© Duncan Slater	num leaves and sam	ara truits.

	<i>Acer tataricum</i> (Tatarian maple)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Small Garden Coastal	Transport corridor	The tree and i	ts features	
Tree size and crown characteristics	A medium tree or large shrub growing up to 12m. An obovoid tree with a broad-spreading crown.	A moderately dense crown.			
Natural habitat	Native to warm-temperate regions of eastern Europe, Central Asia and Russia in the forest steppe and steppe zones in as an understorey tree, particularly on steppes, it is found on the slopes of gullies. This tree is known to have good tole air pollution and wind.	forest margins. In the	đ		
Environmental tolerance	Moderately tolerant to shade. Tolerant to drought.	Moderately sensitive to waterlogging.		122	
Ornamental qualities	Creamy, fragrant flowers on panicles appearing in late spring. LATE SPRING	uring in early autumn. as they mature.			
	Deciduous broadleaved tree. Variable leaf shape: unlobed on mature stems, the on younger stems. Good yellow autumn colour.	ree, or five lobes		y and	
V	Multi-stemmed, occasionally single-stemmed. Grey-brown with small fissures.		1 A	DY .	N W
Issues to be aware of	No substantial issues to be aware of.			1 miles	
Notable varieties				and the second states	And the second second
The species is available, ho Consult your preferred tree	owever, no notable cultivated varieties are widely available. e nursery for options.				

Acer tataricum typically comes as a multi-stemmed tree. © Henrik Sjöman

a the second second

	<i>Acer tataricum</i> subsp. <i>g</i> (Amur maple)	innala	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small Garden Coastal	Transport corridor		The tree and it	s features	
Tree size and crown characteristics		obovoid tree, roader than it	A dense crown.		<u>No.</u>	
Natural habitat	Native to Russia, China, Korea and Japan. Found be tolerant drought, salt, air pollution and wind b habitat in the English language literature.					
Environmental tolerance	Partially tolerant to shade. Modera		Moderately sensitive to waterlogging.			
Ornamental qualities	Creamy, fragrant flowers on panicles appearing in late spring.	Samara fruits maturi	ng in early autumn.	garden tree.	ubsp. <i>ginnala</i> make	s an attractive
	Deciduous broadleaved tree. Three lobed. Excell short-lived as the leaves drop quite quickly.		this is often	_ © Henrik Sjöman		
	Multi-stemmed. Grey-brown with small fissures.					
Issues to be aware of	No substantial issues to be aware of.					
Notable varieties		Notes				Arana
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. The nursery for options.	 This sub species has better a than Acer tataricum. Often sold as Acer ginnala. Observed to have some toler and air pollution. 			es of <i>Acer tataricun</i> pre turning green.	a subsp. ginnala
					uits of Acer tataricu	ım subsp. ginnala.

	<i>Acer triflorum</i> (Three-flowered maple)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and	its features	
Tree size and crown characteristics	A medium tree capable of reaching 12m in favourable conditions.	A moderately dense crown.			
Natural habitat	Native to North east Asia (Manchuria) and the Korean peninsula.				
Environmental tolerance	Estimated to be moderately tolerant to shade.	Estimated to be moderately sensitive to waterlogging.			
Ornamental qualities	Yellow flowers in groups of three (triflorum) appear in late spring. SPRING	ture in early autumn.	© Andrew Hirons	rum makes an attra	
	Deciduous broadleaved tree. Trifoliate dark green leaves. Excellent red autumn	colour, even on shady sites.		ellent autumn colour n. © Henrik Sjöman	r is a real asset
V	Single- or multi-stemmed. Cinnamon colour exfoliating bark is a highly attract	ive feature.			
Issues to be aware of	No substantial issues to be aware of.				
Notable varieties					
The species is available, ho Consult your preferred tree	wever, no notable cultivated varieties are widely available. e nursery for options.				A Part

Left: Exfoliating bark is attractive on mature Acer triflorum trees. © Andrew Hirons Right: Trifoliate leaves turn from green to red during autumn. © Andrew Hirons

		e r x zoesche beschen map				 Contents page Alphabetical Index 	Tree SelectorUse potentialMature size	 Crown form Crown density 	 Environmentatolerance Ornamental qualities
Use potential		Park Paved	•••	SuDS			The tree and i	ts features	
Tree size and crown characteristics	15-25M	A large tree growing up to 20m.		An ovoid crown.		A moderately dense crown.			
Natural habitat	*	Not a naturally occurring h so has similar habitat requi			nd <i>A. cappad</i>	ocicum subsp. lobelii.			
Environmental tolerance	¥	Estimated to be moderately tolerant to shade.		Moderately tolerant to drought.		Estimated to be moderately sensitive to waterlogging.			
Ornamental qualities	EARLY	Yellow-green flowers held appear after the leaves in e			ara fruits matu	ire in early autumn.	A mature Acer > © Andrew Hirons	<i>zoeschense</i> displa	ying an ovoid crown
	Ø	Deciduous broadleaved tre Good autumn colour with			lossy and dar	k green in colour.	JU ANA		- Alala
	Y	Single-stemmed. Light gre	y bark, less o	corky than its parent Acer c	ampestre.		AS See		
Issues to be aware of		No substantial issues to be	aware of.						
Notable varieties				Notes					
Hybrid type habit	'Annae'.			– An underused	d maple worth	ny of greater attention.	Simple glass:		
								ypically turn orang	eaves are dark greer e to red in autumn.

	<i>Aesculus</i> x <i>carnea</i> (Red horse chestnut)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmentatolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A large tree capable of reaching 20m. A globular c can get up to				
Natural habitat	An artificially occurring hybrid: parents are <i>Aesculus</i> All <i>Aesculus</i> sp. enjoy deep, moist and well-drained s				
Environmental tolerance	Moderately tolerant to shade. Moderately to drought.	sensitive Moderately sensitive to waterlogging.			
Ornamental qualities	Red-pink flowers held on 15-20cm upright panicles appear in late spring.	Round slightly prickly husks containing one nut (conker).	Mature Aesculus © Henrik Sjöman	s x carnea flowering	g in late spring.
	Single-stemmed. Grey-green bark, smooth at first de	veloping axial fissures with age.			
Issues to be aware of	Conkers create significant 'litter' in autumn that has on high pedestrian traffic.	caused problems on streets with			
Notable varieties	N	otes			
Hybrid-type habit	'Briotii'. – (Casts a deep shade so not much will grow underneath		ea 'Briotii' has attra	ctive pink-red flowers.

	Aesculus flava	Tree Selector	Tree Selector				
		Contents page	Use potential	Crown form	Environment tolerance		
	(Yellow buckeye)	Alphabetical Index	Mature size	Crown density	Ornamental qualities		
Jse potential	Park		The tree and	its features			
Tree size and crown characteristics		A dense crown. y with a width in 15m.					
Natural habitat		e southern Appalachian mountains. Found in river c forests of low to moderate elevation (up to 1500m).					
Environmental colerance	Tolerant to shade. Modera to drou	ately sensitive ght. Moderately sensitive to waterlogging.					
Ornamental qualities	Yellow flowers held in 10-15cm upright clusters. Appearing in late spring to early summer. Highly ornamental.	Smooth, round fruits holding one or two nuts mature in early autumn. Poisonous to humans.	Right: Aesculus	flava has yellow flo	<i>us flava.</i> © Duncan Slater wers held		
	Deciduous broadleaved tree. Palmately compo	 in upright cluste © Henrik Sjöman 	ers.	- Aller A			
	Single-stemmed. Dark brown bark, starting smo	Single-stemmed. Dark brown bark, starting smooth, becoming scaly with age.					
issues to be aware of	Seeds are poisonous to humans. Conkers create on streets with high pedestrian traffic.	e significant 'litter' in autumn that could cause problems					
Notable varieties		Notes	365	TA BA	AND		
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.	- This species casts a very deep shade so not much will grow underneath it.					
				nately compound le	eaves with the		

Attractive, palmately compound leaves with th immature fruit of *Aesculus flava*. © Andrew Hirons

	Aesculus hippocastanum (Horse chestnut)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A massive tree capable of reaching 30m in favourable environments. A globular to ovoid crown that can exceed 20m in width.	A dense crown.	-		1
Natural habitat	Native to the Balkan peninsula. Found in the subalpine zone in humid, we find that the subalpine zone in humid, we find that the subalpine zone in humid, we have a subalpine zone zone in humid, we have a subalpine zone zone zone zone zone zone zone zo	warm valleys in 'ravine forests'.			
Environmental tolerance	Moderately tolerant to shade. Moderately sensitive to drought.	Moderately sensitive to waterlogging.			131
Ornamental qualities		ks containing lustrous brown nuts, conkers'. Mature in early autumn,	in a park situati	Aesculus hippocasta Dn. © Henrik Sjöman	
	Deciduous broadleaved tree. Palmately compound leaves with five to s		g leaves and flower bocastanum. © Andrev		
	Single-stemmed. Grey-brown bark, smooth at first becoming scaly with				
Issues to be aware of	Conkers create significant 'litter' in autumn that has caused problems of pedestrian traffic.	on streets with high			
Notable varieties	Notes				
Double flowered		stanum faces a wide range pests			
No conkers	'Baumannii'. – Casts a deep shad	nerefore it is not recommended. Ie so not much will grow			
Upright/Columnar	'Pyramidalis'. underneath it. - Aesculus flava and if you want a 'hors	l <i>A. indica</i> are better candidates e chestnut' look.	ornamental upr	hippocastanum has h ight flower clusters.	© Duncan Slater
			Right: The char Aesculus hippo	acteristic 'conker' fr castanum.	uit of

© Duncan Slater

	<i>Aesculus indica</i> (Indian horse chestnut)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A massive tree capable of reaching 30m in its natural habitat.	A dense crown.			
Natural habitat	Native to wooded areas of the Himalayan lowlands from Kasmir to west Nepal 900-3600m. Found in forests, shady ravines and along water-courses. Prefers humus rich soils.		1		
Environmental tolerance	Estimated to be moderately tolerant to shade.	Estimated to be moderately sensitive to waterlogging.			
Ornamental qualities	White flowers with yellow and red patches held in 20-25cm upright clusters. Appearing in early summer. Highly ornamental.	s holding one or two nuts.	A mature Aescu © Andrew Hirons	<i>Ilus indica</i> tree with a	a broad, dense crown.
	Deciduous broadleaved tree. Palmately compound leaves with seven leaflets. D	Decent autumn colour.			
	Single-stemmed with a short, thick trunk. Mature bark peels in long strips.				
Issues to be aware of	Conkers create significant 'litter' in autumn that has caused problems on street pedestrian traffic.	s with high			
Notable varieties	Notes				
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. e nursery for options.	much will grow underneath i			

Left: Upright flower clusters are a highly ornamental feature in early summer. © Kevin Martin Right: Developing fruits of *Aesculus indica*.

Right: Developing fruits of *Aesculus indica*. These will mature in early autumn. © Andrew Hirons

	<i>Aesculus parviflora</i> (Dwarf horse chestnut)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and i	ts features	
Tree size and crown characteristics	A small tree up to 4m tall. A squat globular crown form. Often much wider than it is tall: 10m wide in some cases.	A dense crown.			
Natural habitat	Native to south-eastern North America. Prefers open woodland areas with moist,	humus rich soils.			
Environmental tolerance		Estimated to be sensitive to waterlogging.	-		
Ornamental qualities	White flowers held in 20-40cm upright clusters. Highly ornamental, appearing in late summer. SUMMER SUMMER Smooth pear-shaped single nut. Often not in the British Isles.	husks containing a developed to maturity	The squat, glob © Andrew Hirons	ular crown of Aescu	Ilus pavia.
	Deciduous broadleaved tree/shrub. Palmately compound leaves with five or seve Leaves turning yellow in autumn.	n leaflets.			0.48%
	Multi-stemmed. Grey-brown smooth bark.				
Issues to be aware of	Seeds are poisonous to humans.				
Notable varieties				11-341-0	1. A. A. (1)

The species is available, however, no notable cultivated varieties are widely available. Consult your preferred tree nursery for options.

	Aesculus pavia		Tree Selector				
		Contents page	Use potential	Crown form	Environment tolerance		
•••••	(Red buckeye)	Alphabetical Index	Mature size	Crown density	Ornamental qualities		
Jse potential	Park Small garden		The tree and i	its features			
Free size and crown characteristics	A medium tree growing to 12m but generally not more than 8m. Globular to ovoid crown, up to ~8m wide.	A dense crown.					
Natural habitat	Native to south-eastern North America where it grows lowland for Found on floodplains and moist slopes to about 450m.	ests in the shade of canopy species.					
Environmental colerance	Tolerant to shade. Sensitive to drought.	Sensitive to waterlogging.					
Ornamental qualities		shaped smooth husks holding one nut. e in early autumn.	© Duncan Slater	A <i>esculus pavia</i> shov y compound leaves	ving and ovoid crow		
		Deciduous broadleaved tree. Palmately compound leaves with five lobes. Yellow in autumn.					
	Single-stemmed but branching low, or multi-stemmed. Smooth, da	ark-grey with conspicuous lenticels.					
Issues to be aware of	Seeds are poisonous to humans.			Kat N			
Notable varieties			- al		-		
Species-type habit	'Atrosanguinea'.		<i>pavia</i> 'Atrosang	red, upright flower uninea' can be seen	clusters of Aesculus in early summer.		
			© Andrew Hirons	ned fruit of Assaulu	is navia		

Right: Pear-shaped fruit of *Aesculus pavia*. © Duncan Slater

	<i>Ailanthus altissima</i> (Tree of heaven)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Paved Coastal	Transport corridor		The tree and i	ts features	
Tree size and crown characteristics	A massive tree, capable of reaching 30m in favourable conditions.	ar to ovoid A mo	derately dense crown.			Â.
Natural habitat	Native to temperate and warm-temperate region species has naturalised in similar climates across is capable of growing in a wide range of habitats, nutrient-rich loamy soils, it can succeed on nutrie and salt-tolerant.	the world. It is an early-successional , providing there is sufficient light. Al	species that hough it prefers			
Environmental tolerance	Partially tolerant to shade.	-	erately sensitive aterlogging.			
Ornamental qualities	Greenish flowers appearing in early summer held on 10-20cm terminal clusters. Dioecious: male and female flowers on separate trees.	Spirally twisted samaras placed seed maturing in EARLY AUTUMN		© Andrew Hirons	Ailanthus altissima in altissima is a robus	
	Deciduous broadleaved tree. Pinnately compoun	0	SiVe. © Henrik Sjöman			
	Typically single-stemmed. Grey bark with superfi					
Issues to be aware of	A potentially highly invasive tree, particularly in w when flowering so only plant female trees. Allelog herbaceous species. Vegetative reproduction occ of pollen so males have high allergenicity potenti	e of woody and				
Notable varieties		Notes				Part -
Red/Purple leaves	'Sangiovese'.	- Observed to have some tolerance and air pollution.	e to salt	© Andrew Hirons	compound leaves of	Ailanthus altissima.

Right: Terminal clusters of greenish-white flowers appear on *Ailanthus altissima* in early summer. © Andrew Hirons

	<i>Alnus cordata</i> (Italian alder)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved SuDS	Coastal		The tree and i	ts features	
Tree size and crown characteristics		ical form. Typically rown spread.	moderately dense crown.			~
Natural habitat	Native of Corsica, southern Italy and Greece. A elevation mountain slopes up to 900m. Capab the ability to form associations with <i>Frankia</i> that to tree roots.	le of coping with relatively unfertile	soils as it has			
Environmental tolerance	Partially tolerant to shade.	-	oderately tolerant waterlogging.			
Ornamental qualities	Male and female catkins are usually found on the same shoot appearing late winter to early spring. Deciduous broadleaved tree. Simple, glossy, da	LATE SUMMER SUMMER SUMMER SUMMER SUMMER				ective street tree, ates often provided
	Single-stemmed. Smooth grey bark on young s					
Issues to be aware of	A. cordata release a lot of pollen so have high a Has been observed to cause problems when ha					
Notable varieties		Notes			C B	A ALLAN
The species is available, h Consult your preferred tr	owever, no notable cultivated varieties are widely available. ee nursery for options.	 Grows best in a warm microcli suitable for an inner city enviro Observed to have some tolera 	onment.	Left: Alnus cord © Andrew Hirons	ata has glossy hear	t-shaped leaves.

Right: Catkins provide a subtle ornamental feature in early spring. The male catkin is shown here. © Duncan Slater

	<i>Alnus glutinosa</i> (Common alder)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Transport corridor		The tree and it	s features	
Tree size and crown characteristics	A massive tree capable of reaching 40m in ideal conditions, more typically 15-25M A conical to ovoid form. Typically <10m crown spread.	An open crown.			
Natural habitat	Native to Europe, western Asia and north Africa. A pioneer specie to 2000m. Capable of coping with relatively unfertile soils as it has <i>Frankia</i> that fix atmospheric nitrogen and make it available to tree	s the ability to form associations with			
Environmental tolerance	Partially tolerant to shade. Moderately sensitive to drought.	Tolerant to waterlogging.			
Ornamental qualities		ed cones (holding seeds) in groups ee to five are mature in late summer.	An open-grown © Henrik Sjöman	Alnus glutinosa in I	ate winter.
	Deciduous broadleaved tree. Simple dark green leaves.				and
V	Single- or multi-stemmed. Smooth purple-grey bark on young ster as the stem ages.	ms, becoming grey with fissures		De V	
Issues to be aware of	Many seeds are produced that can germinate readily in adjacent a <i>A. glutinosa</i> release a lot of pollen so have high allergenicity poten				
Notable varieties	Notes				See Distan
Cut leaf	'Laciniata', 'Imperialis' Observed to h and air polluti	nave some tolerance to salt on.	© Duncan Slater	es of Alnus glutinos	

	<i>Alnus incana</i> (Grey alder)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities 	
Use potential	Park SuDS Coastal	Transport corridor		The tree and it	s features		
Tree size and crown characteristics		to ovoid form. <8m crown	pen crown.			1	
Natural habitat	lower part of mountain slopes. Capable of coping	tive to Europe and the Caucasus. Pioneer species of riparian and floodplain woodlands and the ver part of mountain slopes. Capable of coping with relatively unfertile soils as it has the ability form associations with <i>Frankia</i> that fix atmospheric nitrogen and make it available to tree roots.					
Environmental tolerance	Partially tolerant to shade. Moderat		rately tolerant terlogging.				
Ornamental qualities	Male and female catkins are usually found on the same shoot appearing late winter to early spring.	Sessile or short-stalked co in groups of four to eight a summer.		Alnus incana gro © Andrew Hirons	ows well in a roadsid	de verge.	
	Deciduous broadleaved tree. Simple dark green			N CA			
	Single- or multi-stemmed. Smooth light-grey bar						
Issues to be aware of		Many seeds are produced that can germinate readily in adjacent areas, especially on moist bare ground. Root suckers also common. <i>A. incana</i> release a lot of pollen so have high allergenicity potential during the flowering period.					
Notable varieties		Notes		North Real			
Yellow leaved	'Aurea'.	 Only use on open slopes where yo to stablise the soil as root suckers 		A STATE	1		
Cut leaved	'Laciniata'.	 Graft cultivated varieties onto A g to minimise root sucker potential. Observed to have some tolerance and air pollution. 	lutinosa	© Andrew Hirons	res of Alnus incana. fruits (cones) of Al	Inus incana.	

	<i>Alnus x spaethii</i> (Spaeth alder)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved SuDS Coastal	Transport corridor	The tree and i	ts features	
Tree size and crown characteristics	A large tree capable of reaching 20m. A conical to ovoid form. Typically <10m crown spread.	A moderately dense crown.		1. 1. 1.	
Natural habitat	An artificial hybrid between Alnus japonica (native to north-east Asia and Japar (native to the Caucasus). Highly versatile site preferences providing there is pler an ability to withstand coastal winds. Capable of coping with relatively unfertile to form associations with <i>Frankia</i> that fix atmospheric nitrogen and make it avai	ty of light. It has soils as it has the ability			
Environmental tolerance	Estimated to be intolerant to shade. Estimated to be moderately tolerant to drought.	Estimated to be moderately tolerant to waterlogging.		Lafter tret	
Ornamental qualities		ked cones in groups aure in early autumn.	Alnus x spaethi potential in urb © Henrik Sjöman	is a robust hybrid a an areas.	alder with excellent
	Deciduous broadleaved tree. Simple dark green leaves.	MA .	80		
	Single-stemmed. Grey-brown bark smooth on young stems, becoming slightly f				
Issues to be aware of	A. x spaethii release a lot of pollen so have high allergenicity potential during the	flowering period.			
Notable varieties	Notes			100 M	
The species is available, h Consult your preferred tr	nowever, no notable cultivated varieties are widely available. ee nursery for options. - A fast growing tree that rea - Observed to have some tole and air pollution.		Left: Simple lea	ves of Alnus x space	thii.

Right: Male catkins of *Alnus* x *spaethii* are an attractive feature in late winter. © Hillier Nurseries

				• • • • • • • • • • • • • • • • • • • •			Amelanchier alnifolia					
Jse potential		aer-I	eaved		ceberry)		Contents page Alphabetic Index	Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities 		
		Park	Sm gai	all den				The tree and	l its features			
Free size and crown characteristics	<10M		r small tree n. Very rarely, 8m.		A globular crowr but quite variable		A moderately dense cr	own.		E.		
Natural habitat	;	canopy t	ree stands. It is	found on a w	ide range of sites fro		t openings or open- ist valleys to mountain to extensive thickets.					
Environmental olerance	*	shade bu	ely tolerant to ut requires goo best growth.	d	Moderately sensitive to drought.	tive	Sensitive to waterlogg	ing.		-		
Ornamental qualities	LATE		white flowers, appear in late s			edible fruits riper	e to black berry-like, i in late summer.	tree, ideal for	alnifolia is often foun compact situations.	d as a multi-stemmed		
-			us broadleaved ing yellow in au			young, dark green c	luring summer	© Henrik Sjöman				
	Y	Single- c	r multi-stemm	ed. Smooth gr	ey to reddish-browr	ı bark.			TI			
ssues to be aware of		No subst	antial issues to	be aware of.						大バ		
Notable varieties									AA	CAN CO		
Jpright/Columnar habit '	'Obelisk'.								The pass of			

Attractive creamy-white flowers cover the crown in late spring. © Henrik Sjöman

	Amelanchier arborea							Tree Selector		
		wney servi		/)		 Contents page Alphabet Index 	ical Use potentia	I Crown form Crown density	 Environmentatolerance Ornamental qualities 	
Use potential		Park Small garde		ansport rridor			The tree a	and its features		
Tree size and crown characteristics	10-15M	A large tree to 20m, but typically cultivated varieties only reach 10-12m.	Ar	n ovoid crown.	Ŷ	A moderately dense of	crown.			
Natural habitat		Native to temperate decic These are typically north f forest margins and on site but does prefer fertile, we	acing slope aspe s associated with	cts, close to strea	ms. Best growth (and flowering) is on				
Environmental tolerance	*	Tolerant to shade.		oderately sensitive drought.		Moderately tolerant to waterlogging.				
Ornamental qualities		Fragrant white flowers, he in groups of 4-10. Appeari usually before the leaves.				ening in early summer. rable - good for wildlife	Left: A you © Henrik Sjörr			
		Deciduous broadleaved tr but becoming glabrous (s		s, emerging with a				ung Amelanchier arbore lour. © Henrik Sjöman	ea 'Robin Hill' showing	
V		Single- or multi-stemmed. Smooth grey-brown bark, becoming slightly fissured with age. The fine branching pattern is also an attractive feature of this tree.							M.	
Issues to be aware of		No substantial issues to be	e aware of.						TTO O	
Notable varieties				Notes			Ven	Star March		
Species-type habit	'Robin Hi	IP.		to shade to full su – Observe		oted to be tolerant vetter in partial shade olerance to salt		Amelanchier arborea 'Ro ts in autumn.	bbin Hill' with yellow	

	Amelanchier canadensis		Tree Selector		
		Contents page	Use potential	Crown form	Environmenta tolerance
	(Canadian serviceberry)	Alphabetical Index	Mature size	Crown density	Ornamental qualities
Jse potential	Park Small garden Coastal		The tree and i	ts features	
Tree size and crown characteristics	A shrub or small tree that reaches 8m in height. Vase shaped.	moderately dense crown.			
Natural habitat	Native to temperate forests of eastern North America. Found in lowland areas, up t often on the margins of swamps and boggy areas. Often found in coastal areas. Pre margins and fairly open canopy cover.				
Environmental colerance		oderately sensitive waterlogging.			
Drnamental qualities	White flowers held in upright clusters in groups of 4-10. Appearing with the leaves in late spring. LATE SPRING		small tree. © Dun		
	Deciduous broadleaved tree. Simple leaves with good autumn colour.		 Right: Simple le © Duncan Slater 	aves of Amelanchie	r canadensis.
	Multi-stemmed. Smooth grey bark. Naturally has an upright form.				
lssues to be aware of	Forms thickets through root suckering, however, this could be an advantage in som	e circumstances.	and the second second		
Notable varieties					
Species-type habit	'Rainbow Pillar'.		Left: Upright clu are very attract	usters of small white ive in late spring. ©	e flowers Duncan Slater
				e fruit provide a goo	

for wildlife. © Duncan Slater

	<i>Amelanchier lamarckii</i> (Serviceberry)	Contents page	Tree Selector Use potential Crown Enviro tolerat		
		Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park Small garden		The tree and i	ts features	
Tree size and crown characteristics	A shrub or small tree capable of reaching 10m.	moderately dense crown.			
Natural habitat	Native to eastern North America but naturalised across temperate Europe. Found margins. Capable of growing well in a wide range of soils but preferring slightly activation drained soils.				
Environmental olerance	tolerant to shade. moderately sensitive	stimated to be noderately sensitive waterlogging.			
Ornamental qualities	White flowers held in upright clusters, appearing with the leaves in late spring. LATE SPRING		is highly ornam	lti-stemmed Amelai ental in late spring.	nchier lamarckii
	Deciduous broadleaved tree. Simple leaves, emerging copper-red and contrasting the flowers; changing to a dull green as they mature. Excellent yellow to red autum		© Barcham Trees		
V	Multi-stemmed, occasionally single-stemmed. Smooth grey bark.				
ssues to be aware of	Large quantities of fruit can cause problems on paved sites. Produces root suckers wants to form a thicket.	as it naturally			
Notable varieties					
The species is available, ho Consult your preferred tree	wever, no notable cultivated varieties are widely available. e nursery for options.				

Berry-like fruits are attractive in late summer. © Duncan Slater

	Aralia elata		Tree Selector			
	(Angelica tree)	Contents page	Use potential	Crown form	 Environmental tolerance Ornamental 	
		Alphabetical Index	Mature size	Crown density	qualities	
Jse potential	Park Small garden		The tree and i	its features		
Free size and crown characteristics	A medium tree capable of growing to about 12m but is often found as a large shrub.	A moderately dense crown.				
Natural habitat	Native to temperate deciduous forests of Japan, the Korean pen It is primarily a gap coloniser, but is also found on forest margins soils in full sun or partial shade.					
Environmental olerance	Partially tolerant to shade. Moderately sensitive to drought.	Sensitive to waterlogging.				
Ornamental qualities	appear in early autumn.	sters of small round fruit mature te autumn. Excellent for wildlife.	A young <i>Aralia</i> © Andrew Hirons	elata growing in a g	Jarden situation.	
	Deciduous broadleaved tree. Large bi-pinnate leaves are a highly prickly. Good autumn colour with leaves turning red, unusually, the prickly of the prickly.					
V	Multi-stemmed, occasionally single-stemmed. Stems are armed v	with spines.				
ssues to be aware of	Spines on stems and leaves, which may be problematic in some can cause this species to spread and form a thicket. As a result it temperate regions.				ALC C	
Notable varieties					1 al	
The species is available, he Consult your preferred tre	owever, no notable cultivated varieties are widely available. The nursery for options.				but and	

Left: Spines on the stem of *Aralia elata* are an interesting feature, but may be problematic in some circumstances. © Andrew Hirons

Right: Large clusters of small white flowers are attractive in late summer. © Andrew Hirons

	Araucaria araucana (Monkey puzzle)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Coastal		The tree and	its features	
Tree size and crown characteristics	A massive tree, capable of reaching 50m. Smaller in cultivation, but still massive.	A dense crown.			
Natural habitat	Native to the southern Andes mountains in the temperate region of Chile and Arg on mountain slopes between 600-1800m on well-drained, sandy or gravelly, acid origin. Occurring on moderately xeric (dry) sites as well as mesic (moist) sites. Nat characterised by dry summers and high precipitation (often snow) winters. Also for therefore, tolerates coastal winds and salt well.	ic soils of volcanic ive climate is often		file a	
Environmental tolerance		loderately sensitive o waterlogging.			
Ornamental qualities	Flowers not of ornamental value. Pollen from male catkins released early summer. EARLY SUMMER For the early autumn of the ear	r in spring but mature f following year.	to any open lar	aucaria araucana pr ndscape. © Andrew Hird	ons
	Evergreen conifer. Robust, thick, dark glossy green leaves spirally arranged on the They remain alive for 10-15 years.	e branches.	0	Illa-shaped crown d Cana. © Henrik Sjöman	evelops in mature
	Single-stemmed. Smooth grey-brown bark when young, maturing to a rough-text	ured bark with age.			When a
lssues to be aware of	Leaves have a spiny tip so should be avoided in some circumstances. Although fa this is a very large tree so requires space to develop.	irly slow-growing,			
Notable varieties			and a		
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.				The sec

Left: The bark of *Araucaria araucana* has a rough texture at maturity. © Andrew Hirons

- Sale

Right: Large scaly leaves with a sharp point are arranged in a spiral pattern. © Andrew Hirons

	<i>Arbutus unedo</i> (Strawberry tree)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential		nall rden		The tree and i	ts features	
Tree size and crown characteristics	A small tree capable of reaching 10m.	Ilar crown form. A dense	crown.			
Natural habitat	Native to the Mediterranean region with relic po woodlands and rocky outcrops on acidic or calc		erophyllous			
Environmental tolerance	Moderately tolerant to shade.	t to drought. Sensitive	to waterlogging.			
Ornamental qualities	Drooping clusters of small white or pinkish flowers appear in late autumn.	Strawberry-like fruit ripens in autumn of the year after flowe Edible but undesirable.		evergreen tree.		
	Evergreen broadleaved tree. Simple leathery lea	aves, dark shiny green.		Right: Simple, le © Duncan Slater	eathery leaves prov	ide all-year interest.
V	Single- or multi-stemmed. Young stems are redo	dish and mature to grey-brown rough, sca	ly bark.			
Issues to be aware of	No substantial issues to be aware of.					
Notable varieties		Notes				
The species is available, how Consult your preferred tree	wever, no notable cultivated varieties are widely available. nursery for options.	 Needs a warm microclimate to perfor Observed to have some tolerance to s 		Left: Arbutus u	pedo flowers in late	autumn.

© Duncan Slater

Right: Strawberry-like fruit ripen in late autumn, a year after flowering. © Duncan Slater

(Stone birch)	 page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Park		The tree and it	s features	
				1/4 co
east Asia, north China, the Russian Far East, Korea	a and Japan. A pioneer species capable of colonising			
Intolerant to shade. Sensitive	to drought. Sensitive to waterlogging			
Male and female catkins emerge in late spring, becoming pendulous. Attractive but not exceptional.	Pendant fruiting catkins become prominent by early autumn.	of fallen yellow le		n its carpet
Deciduous broadleaved tree with simple leaves. G		© Henrik Sjoman	H tel	
Single- and multi-stemmed. Highly attractive crea	my to orangey-pink bark that peels in thin sheets.			
Abundant pollen can cause allergies in some peop	ole.			
	Notes			
'Grayswood Hill', 'Blush'.	 A fast-growing pioneer species. Sensitive to weed competition during establishment so will perform much better with regular mulching. 	orangey-pink ba	rk to great effect. @	D Henrik Sjöman
	Image: Series of the series	Image: Second	Image: Series with the series and s	

	Betula lenta		Cartasta	Tree Selector	• C	• Facility and the
	(Cherry birch)		 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmentatolerance Ornamental qualities
Use potential	Park	Park				
Tree size and crown characteristics	A large tree up to 20m.	Globular to columnar crown.	An open crown.		Sec. We	
Natural habitat	0-1500m, but especially 300-60	s and mixed deciduous-coniferous forests DOm. A pioneer to mid-successional spec rest canopy. Also found on rocky ravine s	ies capable of colonising			
Environmental tolerance	Partially sensitive to shade.	Moderately sensitive to drought.	Sensitive to waterlogging.	1 Beau		Real A
Ornamental qualities	Male and female catkins emerge becoming pendulous. Attractive exceptional.		sistent fruiting catkins become y early autumn.	<i>Betula lenta</i> sho © Tim Baxter	owing good autumn	colour in a garden.
	Deciduous broadleaved tree wit	h simple leaves. Excellent golden yellow a	autumn colour.			
	Single-stemmed. Brown to brow Lenticels much less prominent th	n-black bark appearing dark grey to blac nan in other birches.	ck with age.			
Issues to be aware of		elems with hard surfaces, particularly whe mes. Abundant pollen can cause allergies				
Notable varieties		Notes		8/1		
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are wic e nursery for options.	so will perform much	mpetition during establishment n better with regular mulching. oirch tree in the British Isles.		Participanta is att	

Left: The bark of *Betula lenta* is attractive, particularly on younger stems. © Henrik Sjöman

Right: The leaves of *Betula lenta* display an excellent golden yellow. © Henrik Sjöman

	Betula maximowicziana (Monarch birch)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics	A massive tree that grows to 30m in its native habitat. Typically smaller in cultivation.	Om An open crown.			
Natural habitat	Native to low altitude cool-temperate forest of Japan and no Far-east and the Kuril Islands. A long-lived pioneer tree, that in a forest stand.			1	
Environmental tolerance	Intolerant to shade. Sensitive to drough	ht. Sensitive to waterlogging.			
Ornamental qualities	Male and female catkins emerge in late spring. Male catkins becoming pendulous. Attractive but not exceptional.	Fruiting catkins become prominent by early autumn.	a large tree. © He		
	Deciduous broadleaved tree with simple, heart-shaped leave when young and have rather attractive elongated teeth on t relation to other birch (<i>Betula</i>) species. Yellow autumn colou	he leaf margins. The leaves are large in	 Right: Leaves of in autumn. © Henr 	Betula maximowicz ik Sjöman	ziana turn yellow
	Single-stemmed. Grey bark, peeling in thin strips.				
Issues to be aware of	Abundant pollen can cause allergies in some people.				
Notable varieties	Notes				
The species is available, h Consult your preferred tr	ee nursery for options. establis – Sensitiv	growing species, especially when well shed. ve to weed competition during establishment perform much better with regular mulching.	Catkins of <i>Betul</i> in late spring. © Barcham Trees	a maximowicziana	are attractive

	Betula nigra (River birch)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential		nsport ridor		The tree and it	s features	
Tree size and crown characteristics	() up to 25m. Typically often c	uite irregular asionally more	open crown.			
Natural habitat	A pioneer tree of warm-temperate riparian hab of ponds, steams and rivers. Capable of growin its use of water-courses to aid seed dispersal m water within its natural range. Native to eastern and as far west as Texas and Ohio.	in drier conditions quite successfully ans that it is predominantly associat	/ but ed with			
Environmental tolerance	Intolerant to shade. Moder to drou		lerately tolerant aterlogging.			the start with
Ornamental qualities	Male and female catkins emerge in late spring. Pendulous male catkins are attractive.	EARLY SUMMER	n early summer.	and multi-stemm Right: Simple leav	a vailable as a sing ned tree. © Tim Baxter ves of <i>Betula nigra</i> .	e-stemmed
	Available as a multi-stemmed or a single-stemm in colouration in younger trees, becoming darke			© Duncan Slater		
Issues to be aware of	Shallow rooting may cause problems with hard or poorly aerated soil volumes. <i>B. nigra</i> release during the flowering period.					
Notable varieties		Notes				
Smaller form	'Heritage'.	 Seed propagated trees are highly particularly in relation to the orna of the bark. Use a cultivar with prediction of the bark of the species type so could be consed to shed leaves during dry period. Sensitive to weed competition do so will perform much better with Observed to have some salt tole 	mental quality oven properties. Itivar and smaller than dered for small gardens. nemes but is likely s. uring establishment regular mulching.	is an attractive fe	ing bark of <i>Betula r</i> eature. © Henrik Sjömar ns are an attractive late spring.	1

	Betula papyrifera (Paper birch)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics		id crown, nally becoming r.			
Natural habitat		a natural distribution from the Pacific to Atlantic coasts ginia. Colonises gaps in deciduous and coniferous forests.			
Environmental tolerance	Intolerant to shade. Sensitiv	ve to drought. Sensitive to waterloggin	ıg.		
Ornamental qualities	Male and female catkins develop in late spring.	Fruiting catkins mature in early autumn.	white bark.	la papyrifera display	ying their striking
	Deciduous broadleaved tree with simple leaves.		© Henrik Sjöman		Sal 2
	Single-stemmed. Young shoots and branches at to brown or pinkish with bark peeling in paper-li Highly attractive.	re reddish-brown. Trunks vary from very white ke sheets. Lenticels provide further bark interest.			$2/\gamma$
Issues to be aware of	Shallow rooting may cause problems with hard or poorly aerated soil volumes. <i>B. papyrifera</i> rel- potential during the flowering period.	surfaces, particularly when combined with small ease a lot of pollen so have high allergenicity			Sec.
Notable varieties		Notes			The second
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. e nursery for options.	 A fast-growing tree, especially when well establishe Sensitive to weed competition during establishment so will perform much better with regular mulching. 		yrifera has very attr	ractive white bark.

Right: In autumn, *Betula papyrifera* turn a brilliant yellow colour. © Tim Baxter

	Betula pendula subsp. p (Silver birch)	endula	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Transport corridor			The tree and i	ts features	
Tree size and crown characteristics	ideal conditions. Typically only reaching around 15m	ar, often rather r with a weeping ous) branches at r. 6-8m wide.	en crown.		R some	
Natural habitat	A pioneer tree capable of growing on a wide ran sandy, nutrient-poor, acid soils of healthland. How chalky soils. Requires high light environments an <i>pendula</i> has an expansive natural range through	wever, it is also a primary coloniser of g d will not compete well in shade. <i>B. per</i>	ravely soils and Indula subsp.			
Environmental tolerance	Intolerant to shade. Sensitiv	e to drought. Sensiti	ve to waterlogging.			
Ornamental qualities	Male and female catkins emerge in late spring, becoming pendulous. Attractive but not exceptional.	Pendant fruiting catkins be prominent by early autumn		A mature, open © Andrew Hirons	-grown Betula pend	No. of the Party o
	Deciduous broadleaved tree with simple leaves.	Good yellow autumn colour.				
V	Single- and multi-stemmed trees available. Young shreds. With age, the stem presents dark, corky p conjoin on the lower portion of the trunk, but cor	patches of bark. These are especially pro	ominent and may			
Issues to be aware of	Shallow rooting may cause problems with hard s poorly aerated soil volumes. Has the tendency to <i>B. pendula</i> release a lot of pollen so have high all	shed small diameter twigs, especially a	fter strong winds.			
Notable varieties		Notes				
Species-type habit	'Tristis', 'Zwitsers Glorie' Sensitive to weed competition during establishment so will perform much better with regular mulching. - 'Youngii' is a suitable cultivar for small gardens.					
Upright					MASIN	C Man
Cut-leaved	'Crispa', 'Dalecarlica', 'Laciniata'.'Purpurea'.			6		A BULAN
Purple				The small, simp on pendulous b	le leaves of <i>Betula p</i> ranches.	bendula hang
Small Weeping	'Youngii'.		© Andrew Hirons			

	Betula pendula subsp. s. (Chinese white birch)	zechuanica	Contents page	Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		т	he tree and its	features	
Tree size and crown characteristics		crown at 6-8m wide.	en crown.			
Natural habitat	A pioneer tree of canopy gaps in mixed deciduou and south-eastern Tibet. Also forms a sub-alpine the drier inner ranges. Requires high light environ	montane forest in south-eastern Tibe	ton			
Environmental tolerance	Intolerant to shade. Sensitive	e to drought. Sensit	ive to waterlogging.			と読み
Ornamental qualities	Male and female catkins emerge in late spring, becoming pendulous. Attractive but not exceptional.	Pendant fruiting catkins be prominent by early autumn				
	Deciduous broadleaved tree with simple leaves. G	Good yellow autumn colour.				
	Single-stemmed tree. Younger stems have a brow smooth, white, chalky bark that peels over time. R a further attractive feature of the stem.					
Issues to be aware of	Likely to display similar rooting and crown charac <i>B. pendula</i> release a lot of pollen so have high alle					
Notable varieties		Notes		1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -	1995-18- C	
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. The nursery for options.	 Sensitive to weed competition duri so will perform much better with re An underused birch in the British Is 	egular mulching.			

Betula pendula subsp. szechuanica is a attractive birch with white bark, shown here in a field-grown nursery. © Hillier Nurseries

	Betula pubescens (Downy birch)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics	A large tree to 20m in height but reduced to less than 1m in extreme habitats within its natural range.	8m (AP22
Natural habitat	A pioneer of moist woods, fens, wet mountainsides and g acid soils tolerated well. Extensive natural range from New as northern Turkey) and into central Siberia. Performs bet Betula pendula subsp. pendula.	wfoundland, through Europe (and as far south			
Environmental tolerance	Intolerant to shade. Sensitive to drou	ught. Moderately tolerant to waterlogging.			
Ornamental qualities	Male and female catkins emerge in late spring, becoming pendulous. Attractive but not exceptional.	Pendant fruiting catkins become prominent by early autumn.	Right: As a pione	rown Betula pubes er tree Betula pubes	
	Deciduous broadleaved tree with simple leaves with a vely Good yellow autumn colour.	vety texture from the leaf hairs.	 with some challe Tim Baxter 	nging conditions.	
	Single-stemmed. Young shoots are downy, particularly in have smooth, white bark, barely peeling in small shreds. W patches of bark in a similar way to <i>Betula pendula</i> subsp. p	Vith age, the stem presents dark, corky			
Issues to be aware of	<i>B. pubescens</i> release a lot of pollen so have high allergeni	icity potential during the flowering period.			
Notable varieties	Notes	;	Real Property lines		the second second
Purple leaved	so wi – Might	itive to weed competition during establishment II perform much better with regular mulching. t be worth using in SuDS schemes but is likely ed leaves during dry periods.	but not the best	Betula pubescens of the birches. ⊚ Du shoots of Betula p	uncan Slater

	<i>Betula utilis</i> subsp. <i>albo</i> (Chinese red birch)	sinensis	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Small garden			The tree and i	ts features	
Tree size and crown characteristics	to 35m in its native more ro	arown becoming bunded with age in the open.	ppen crown.			
Natural habitat	Found in north-central China in deciduous or mi forest openings and on rocky soils, such as thos					
Environmental tolerance	Estimated to be partially Modera to drou	ght. (,, mod	nated to be lerately sensitive aterlogging.	EP		2624
Ornamental qualities	Male and female catkins emerge in late spring. The female catkins are erect at flowering whilst the male catkins are pendulous.	Pendant fruiting catkins prominent by early autu		in a roadside ve	rge. © Andrew Hirons	bosinensis growing
	Deciduous broadleaved tree with simple leaves.	Deciduous broadleaved tree with simple leaves. Good golden-yellow autumn colour.		Right: Simple le © Andrew Hirons	aves of <i>Betula utilis</i>	subsp. albosinensis.
	Single- or multi-stemmed trees available. Peeling Stems also have bold lenticel flecking across the		erlain with white.	7		
Issues to be aware of	Shallow rooting may cause problems with hard a poorly aerated soil volumes. <i>B. utilis</i> release a lot the flowering period.					
Notable varieties		Notes				
Species-type habit	'Fascination'.	- Sensitive to weed competition d	0			
Pinkish bark	'China Ruby'.	so will perform much better with	regular mulching.			is has very attractive

pinkish bark. © Henrik Sjöman

Right: The fruiting catkin of *Betula utilis* subsp. *albosinensis* matures in early autumn. © Duncan Slater

	Betula utilis subsp. jacq (White-barked Himalay		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden			The tree and it	s features	
Tree size and crown characteristics	35m in its native habitat. more r	crown becoming ounded with age n in the open.	n open crown.	-		
Natural habitat	Found in the west Himalaya in the Kashmir regi forests. Often found growing close to stony rive					
Environmental tolerance	Estimated to be partially shade tolerant. Moder to drop	ught. (Leve) m	stimated to be oderately sensitive waterlogging.			
Ornamental qualities	Male and female catkins emerge in late spring. The female catkins are erect at flowering whilst the male catkins are pendulous.	Pendant fruiting catkin prominent by early au EARLY AUTUMN		growing in a gar	etula utilis subsp. ja den location. © And	rew Hirons
	Deciduous broadleaved tree with simple leaves Good golden-yellow autumn colour.	:. Young leaves particularly glossy.		0 0 0	ractive white bark is winter silhouette. «	1 3
	Single- or multi-stemmed trees available. Highly prominent lenticels flecking the stem.	y ornamental creamy-white peeling	bark with			
Issues to be aware of	Shallow rooting may cause problems with hard or poorly aerated soil volumes. <i>B. utilis</i> release during the flowering period.					
Notable varieties		Notes				
Species-type habit	'Doorenbos', 'Grayswood Ghost'.	- Sensitive to weed competition				-UD-M
Conical	'Jermyns', 'Silver Shadow'.	- so will perform much better w -	ıtn regular mülching.	Left: White bark	of <i>Betula utilis</i> sub	sp. jacquemontii

'Doorenbos'. © Henrik Sjöman

Right: Simple leaves are particularly glossy when young. ${}^{\odot}$ Andrew Hirons

	<i>Betula utilis</i> subsp. <i>utilis</i>		Tree Selector			
	(Himalayan birch)	 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmental tolerance Ornamental qualities 	
Use potential	Park Small garden		The tree and i	ts features		
Tree size and crown characteristics	A massive tree up to 35m in its native habitat. Typically much smaller in cultivation. Ovoid crown becoming more rounded with age if grown in the open.	An open crown.			Ż	
Natural habitat	Found in a broad distribution from the central Himalaya through western or mixed deciduous-coniferous forests. Often found growing close to stor on scree slopes between 2700-4500m.					
Environmental olerance	Estimated to be partially Moderately sensitive to drought.	Estimated to be moderately sensitive to waterlogging.				
Ornamental qualities		ing catkins become / early autumn.				
	Deciduous broadleaved tree with simple leaves. Good golden-yellow auto	ımn colour.				
V	Single- or multi-stemmed trees available. Peeling bark, typically brown-pi in colour with prominent lenticels flecking the stem. Highly ornamental.	nk to copper-orange				
ssues to be aware of	Shallow rooting may cause problems with hard surfaces, particularly when or poorly aerated soil volumes. <i>B. utilis</i> release a lot of pollen so have high during the flowering period.					
Notable varieties	Notes		the last	MAR ANK		
The species is available, he Consult your preferred tre		npetition during establishment better with regular mulching.				

Betula utilis subsp. utilis has attractive peeling bark. © Tim Baxter

	Buxus sempervirens			Tree Selector		
		•	Contents page	Use potential	Crown form	Environmenta tolerance
(((()))	(Box)	٢	Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park Small garden			The tree and i	ts features	
Tree size and crown characteristics	A medium tree (or shrub) capable of reaching 10m over time.	ar to irregular A dense cr	own.			- -
Natural habitat	An understorey tree (or shrub) native to the Me of soils, including on calcareous soils. Unusually	diterranean and Caucasus. It will grow on a v r, it can cope with dry shade.	wide range			
Environmental colerance	Tolerant to shade.	nt to drought. Sensitive to	o waterlogging.	-		
Ornamental qualities	Small creamy flowers appear in late spring. Separate male and female flowers are found in clusters held in leaf axils. Attractive but relatively inconspicuous.	Small, hard seed capsules are f developed in late summer.	iully	Buxus semperv with a globular © Andrew Hirons	<i>irens</i> is a slow-grow crown.	ving tree
	An evergreen-broadleaved tree with small, simp	ple leaves.				
	Single-stemmed but also sold in shrub form.			24		
Issues to be aware of	No substantial issues to be aware of.					
Notable varieties		Notes		AND ST	CONTRACT OF	
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.	 Slow growing and slow to establish. Sensitive to weed competition during establish so will perform much better with regular Excellent for dry shade. 		The small close	y, evergreen leaves	of

Tree Species Selection for Green Infrastructure: A Guide for Specifiers

© Andrew Hirons

	<i>Carpinus betulus</i> (Hornbeam)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved			The tree and it	s features	
Tree size and crown characteristics	A large tree capable of reaching 20m.	d to globular crown. A dense	e crown.			
Natural habitat	A cool-temperate deciduous tree found across fr as far north as southern Sweden. Predominantly a woodland. Requires good soil fertility but is adap	an understorey or mid-successional tree	of beech or oak			
Environmental tolerance	Moderately tolerant to shade. Moderately tolerant		e to waterlogging.			
Ornamental qualities	Separate male and female catkins are found on the same tree, appearing in late spring. Attractive but not exceptional.	Attractive, drooping fruit clu most conspicuous when the in early autumn.		A fully mature, c in a parkland sit © Henrik Sjöman	ppen-grown <i>Carpine</i> uation.	<i>us betulus</i> growing
	Broadleaved deciduous tree with simple leaves. I often remain on the tree over winter (marcescenter emerging leaves the following spring.					
	Single-stemmed. Smooth grey bark.					
Issues to be aware of	Shallow rooting may cause problems with hard s or poorly aerated soil volumes. <i>C. betulus</i> release during the flowering period.					
Notable varieties		Notes				
Upright	'Columnaris', 'Fastigiata', 'Frans Fontaine'.	- Seed propagated trees are very vari				
No fruits	'A. Beeckam', 'Frans Fontaine'.	of size, growth habit and seasonal p The use of known cultivar is essentia form is required.		Left: Simple leav © Andrew Hirons	ves and fruit of Carp	pinus betulus.
				Right: A young f leaves in summe	ruit cluster. These b er but become more in early autumn. © ,	e prominent when

	<i>Carpinus japonica</i> (Japanese hornbeam)	Contents page	Tree Selector Use potential	Crown form	Environmental tolerance
	(Sapanese normbearity	Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park Paved		The tree and i	ts features	
Tree size and crown characteristics	A medium tree capable of reaching 15m. An vase shaped to globular crown.	moderately dense crown.			
Natural habitat	A cool-temperate deciduous tree found at high elevations on mountain slopes in Jack A forest edge species rather than an understorey species.	apan.			
Environmental tolerance		stimated to be sensitive waterlogging.			
Ornamental qualities	Separate male and female catkins are found on the same tree, appearing in late spring. Attractive but not exceptional.	ruit clusters are apparent in early autumn.			
	Broadleaved deciduous tree with simple leaves slightly more elongated than <i>Carpi</i> . In autumn leaves turn yellow.	nus betulus.			
	Single-stemmed. Grey-brown bark that flakes off in small scales.			W	
Issues to be aware of	Shallow rooting may cause problems with hard surfaces, particularly when combin or poorly aerated soil volumes. <i>C. japonica</i> release a lot of pollen so have high aller during the flowering period.			S.	'W
Notable varieties			- 748		
The species is available, he Consult your preferred tre	owever, no notable cultivated varieties are widely available. e nursery for options.				and the

The leaves of *Carpinus japonica* are slightly more elongated than *C. betulus* and turn yellow in autumn. Cylindrical fruit clusters also provide interest in late summer and early autumn. © Barcham Trees

	Carya illinoinensis (Pecan)		Contents page Alphabetical Index	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park			The tree and i	ts features	
Tree size and crown characteristics	A massive tree capable of reaching 35m in its native habitat. Much smaller in cultivation.	bular in bable of ry broad	erately dense crown.		43	(
Natural habitat	Found in lowland deciduous forest communities and r Prefers deep, humic soils. Requires summer heat if it is		drainage basin.		4.12	
Environmental tolerance	Intolerant to shade. Moderately s to drought.		ately tolerant erlogging.			
Ornamental qualities	LATE SPRING Separate pendulous male catkins and upright female catkins are found on the same tree, appearing in late spring. Attractive but not exceptional.	Bunches of 3-10 elongated by late autumn. Edible.	nuts ripen	A semi-mature provided in this © Andrew Hirons	<i>Carya illinoinensis</i> e garden.	njoying the space
	Deciduous broadleaved tree with pinnate leaves.			© Andrew milons	di la	
	Single-stemmed. Light brown-grey bark with deep irre	egular furrows at maturity.		200		Mad
Issues to be aware of	A potentially very broad tree, needs space. Litter from particularly in 'masting' years.	nuts can be problematic,		R		
Notable varieties	Νο	tes			Nº Nº	A Competition
The species is available, h Consult your preferred tre		equires a warm microclimate.		NY MAY		

The pinnate leaves of *Carya illinoinensis*. © Andrew Hirons

	Carya ovata		Tree Selector		
	(Shagbark hickory)	 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A potentially massive tree capable of reaching 45m in its native habitat but typically 20-25m in cultivation. An ovoid crown, becoming globular in the open. Capable of becoming 15-20m wide at maturity.				
Natural habitat	Native to eastern US where it has a large natural range. Foun woods and occasionally in wet bottomlands. Adaptable to a and lime rich soils, providing they are well drained.				
Environmental tolerance	Moderately tolerant to shade. Moderately tolerant to drought.	t Sensitive to waterlogging.			
Ornamental qualities		Nuts borne singly or in pairs ripen by late autumn. Edible.	© Duncan Slater	ta displaying an ovo exfoliates in large s	
	Deciduous broadleaved tree with pinnate leaves. Provides a	beautiful yellow autumn colour.		eature on mature ste	
	Single-stemmed. Light brown-grey bark that exfoliates in larg	ge strips, hence 'shagbark', at maturity.			
Issues to be aware of	Potentially a very large tree so requires space.				
Notable varieties	Notes				
The species is available, h Consult your preferred tre	ee nursery for options. microclin	s summer heat to perform well so a warm mate is preferable. er slow to establish so requires a good level care.		Ilous male catkins a	
				not highly ornament Its, borne singly or i	

	Castanea sativa		Tree Selector		
	(Sweet chestnut)	Contents page	Use potential Mature	Crown form Crown	Environmenta tolerance
		Alphabetical Index	size	density	Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A massive tree capable of reaching 30m. >25M A massive tree capable of reaching 30m. Ovoid to irregular form, capable of becoming very wide (25m+) at maturity.	A dense crown.			
Natural habitat	A predominantly warm-temperate species found sporadically in mixed deciduou the Mediterranean basin, northern Turkey and the Caucasus. It has naturalised wi Europe, including in the warmer parts of the British Isles and as far north as south Prefers well-drained, warm, acid soils. Heat tolerant.	dely across			
Environmental tolerance	Moderately tolerant to shade. Moderately tolerant to drought.	Sensitive to waterlogging.			
Ornamental qualities	Separate male and female flowers are found on the same tree, prominent in late summer. Upright male flower spikes are attractive but female flowers are inconspicuous.	nuts held in a prickly n ripe.	Castanea sativa		
	A deciduous broadleaved tree, with simple leaves with characteristic pointed tee	th on its margin.	 Right: Castanea variegated leav 	e <i>sativia</i> 'Albomargir es. © Duncan Slater	hata' has
	Single-stemmed. Dark grey bark with deep helical fissures at maturity. Capable o	f very large girths.			
Issues to be aware of	Prickly fruit husks may become problematic in some situations.				
Notable varieties			-		V I (M
Glossy leaves	'Glabra'.		120.5		
Upright	'Pyramidalis'.		No.		12
Variegated	'Albomarginata'.		provide interes	nt clusters of male fl in early summer. ©	Andrew Hirons
			Right: Edible nu	its, held in prickly h	usks,

	Catalpa bignonioides		Tree Selector		
	(Indian bean tree)	Contents page	Use potential Mature	Crown form	 Environmenta tolerance Ornamental
		Alphabetical Index	size	Crown density	qualities
Use potential	Park		The tree and	its features	
Tree size and crown characteristics	A medium tree capable of reaching 15m. Fast growing. ID-15M	A moderately dense crown.			2.3
Natural habitat	Native to lowland deciduous forest (0-200m) in the eastern United States. as a pioneer in riparian environments and on the margins of floodplains. A a deep, moist loam soil.	3			
Environmental tolerance	Partially tolerant to shade. Moderately sensitive to drought.	Sensitive to waterlogging.			
Ornamental qualities		ds have developed by early Il often persist through winter.	Open grown Ca contrast in a ga © Andrew Hirons	atalpa bignonioides Irden park.	'Aurea' provides
	Deciduous broadleaved tree with fairly large simple leaves. Shed relatively	early in the British Isles.			
	Single-stemmed. Grey, shallowly fissured bark becomes platy with age.				
Issues to be aware of	Shallow rooting may cause problems with hard surfaces, particularly when or poorly aerated soil volumes. Large leaves can readily block drains. Relat				
Notable varieties	Notes				
Yellow leaved	'Aurea'. – Branches are easily sh		The CAL		
Globular	'Nana'. full sun if its natural fo	rm is to be maintained.	123	K B	
			'Aurea' are yello	simple leaves of Ca DW-green. © Andrew H	lirons
					1

Right: The long seed pods of *Catalpa bignonioides* can persist on the tree through winter. © Duncan Slater

	Catalpa x erubescens	Contents	Tree Selector	Crown form	Environmental
	(Hybrid catalpa)	pageAlphabetical Index	 potential Mature size 	 form Crown density 	toleranceOrnamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A medium tree capable of reaching 15m. Fast growing. 10-15M	noderately dense crown.			
Natural habitat	An artificial hybrid between <i>Catalpa bignonioides</i> and <i>C. ovata</i> . It has similar requirer	nents to <i>C. bignonioides</i> .			
Environmental tolerance		imated to be sensitive waterlogging.		4,05	
Ornamental qualities	Highly ornamental large orchid-like flowers in upright clusters are most abundant in late summer. LATE SUMMER		A young Catalp © Andrew Hirons	a x erubescens gro	wing in a park.
	Deciduous broadleaved tree with fairly large simple leaves. Newly developed leaves in colour and ornamental. However, they are shed relatively early in the British Isles.	are dark purple			
	Single-stemmed. Grey, shallowly fissured bark becomes platy with age.				
Issues to be aware of	Shallow rooting may cause problems with hard surfaces, particularly when combine or poorly aerated soil volumes. Large leaves can readily block drains. Relatively wea				
Notable varieties				Constant of	
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.				And The second

Attractive flowers provide interest in late summer as well as a useful food source for insects. © Andrew Hirons

	Catalpa speciosa (Northern catalpa)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics	habitat. In cultivation a more	crown es developing regular form. d 8m wide.			
Natural habitat		the eastern United States. Predominantly found in dplains. Whilst it performs best a deep, moist loam ns.			
Environmental tolerance	Partially tolerant to shade. Modera	ely sensitive ht. Sensitive to waterlogging.			
Ornamental qualities	Highly ornamental large orchid-like flowers in upright clusters are most abundant in early summer.	Long seed pods have developed by early autumn be will often persist through winter.			
	Deciduous broadleaved tree with fairly large, he	rt-shaped, simple leaves.			
	Single-stemmed. Grey, shallowly fissured bark th	t peels in long plates in on mature stems.			
Issues to be aware of	Large leaves can readily block drains.				
Notable varieties		Notes			
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.	 Known to cope well with alternate flood and drought conditions so it is probably worth trying in SuDS schemes. Wood is highly resistant to decay but rather brittle. Most easily distinguished from <i>C. bignonioides</i> by the lack of odorous leaves, when crushed. Good for bees and other pollinating insects. 	in a park situatio	a <i>lpa speciosa</i> can n n. The ovoid crowr ecies does require	n can get quite

	Cedrus atlantica	Contents page	Tree Selector	Crown form	Environmental tolerance
ŶŶ	(Atlas cedar)	Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park Paved		The tree and i	ts features	
Tree size and crown characteristics	A massive tree up to 50m in its natural habitat. Smaller in cultivation, but still massive.	A dense crown.	-		
Natural habitat	Native to the Atlas mountains in Morocco and Algeria between 1000-2000m.				
Environmental tolerance		stimated to be sensitive o waterlogging.			
Ornamental qualities	Male cones appear a few weeks before the female cones in late summer. Male and female flowers are never on the same branches. Inconspicuous.		 A Cedrus atlant in a park situatio Andrew Hirons 	ica 'Glauca' providin on.	ng colour interest
	Evergreen conifer with needle leaves forming rosettes on the short shoots. The 'g bluish-green to silvery needles.	auca' group have		10.4	76
	Single-stemmed. Smooth, light-grey bark when young: becoming fissured and pla	ty on more mature stems.	28	4	
Issues to be aware of	Capable of becoming a very large, broad tree.				
Notable varieties			-		
Bluish-green	'Glauca'.				
Upright	'Fastigiata'.				A A A A A A A A A A A A A A A A A A A

Cedrus atlantica 'Glauca' cones are an attractive feature. © Andrew Hirons

	Cedrus deodara (Himalayan cedar)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved		The tree and i	ts features	
Tree size and crown characteristics	A massive tree up to 60m in its natural habitat. Smaller in cultivation, but still massive. A massive tree up to 60m in its natural habitat. Smaller in cultivation, but still massive. Conical, becoming broader as the crown matures. Fairly horizontal branches give the tree a flat, layered crown in older trees.	dense crown.			
Natural habitat	Native to eastern Afghanistan, northern India and western Nepal from sub-tropical of the Himalayan ranges between 1200-3500m. Becomes particularly dominant or				
Environmental tolerance	Partially tolerant to shade. Tolerant to drought.	ensitive to waterlogging.			TRE
Ornamental qualities	Dioecious. Male flowers appear in early summer but only shed pollen in early autumn. Female flowers appear in late summer and mature by early autumn. Inconspicuous.	-	broadens with	age. © Henrik Sjöman	a conical crown that
	Evergreen conifer with needle leaves forming rosettes on the short shoots. Young branched slightly pendulous.			ntially massive size of become imposing t	
	Single-stemmed. Smooth, light-grey bark when young: becoming fissured and pla	ty on more mature stems			
Issues to be aware of	Capable of becoming a very large, broad tree.				
Notable varieties					A CON
Yellowish	'Aurea'.				
Pendulous	'Pendula'.				
Bluish	'Karl Fuchs'.			Ma the	
			Upright cones of inconspicuous.	certainly add interes	st but are fairly

inconspicuous. © Duncan Slater

	Cedrus libani (Cedar of Lebanon)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved		The tree and i	ts features	
Tree size and crown characteristics	A massive tree up to 40m in its natural habitat. Smaller in cultivation, but still massive. Conical when young, branches becoming horizontal with age to give a broad, stratified crown. Highly attractive.	A dense crown.	they a		
Natural habitat	Native to western Asia, especially Lebanon and Syria. The largest stands current 1300-2100m in Lebanon.	ly occur between			
Environmental tolerance	Partially tolerant to shade. Tolerant to drought.	Sensitive to waterlogging.			
Ornamental qualities		cm fully mature in the ears after fertilisation.		n of <i>Cedrus libani</i> w character to park s	
	Evergreen conifer with needle leaves forming rosettes on the short shoots.				
	Single-stemmed. Smooth, light-grey bark when young: becoming fissured and pla Highly characteristic stratified crown of layered horizontal branches makes this t				
Issues to be aware of	Capable of becoming a very large, broad tree.				
Notable varieties				The second	AN CAN

The species is available, however, no notable cultivated varieties are widely available. Consult your preferred tree nursery for options.

	<i>Celtis australis</i> (Nettle tree)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Transp corrido			The tree and it	s features	
Tree size and crown characteristics	A large tree capable of reaching 25m in its natural habitat.	ular crown.	A moderately dense crown.		F	
Natural habitat	Found in small stands in around the Mediterran Prefers open, well drained sites.	ean basin and the Balkan Peninsul	a.		T.o	
Environmental tolerance	Estimated to be moderately tolerant to shade.	ight. , r	Estimated to be noderately sensitive o waterlogging.			
Ornamental qualities	Separate male and female flowers occurring on the same tree. Unremarkable flowering event in late spring.		eld on a slender stalk. early autumn but persisting	<i>Celtis australis</i> is in paved environ © Henrik Sjöman	a robust tree that o ments.	can be used
	Deciduous broadleaved tree with simple leaves			22		
	Single-stemmed. The bark is smooth and grey becomes rough in texture.	vhen young, as it ages it develops	corky ridges and			
Issues to be aware of	No substantial issues to be aware of.			3.644		
Notable varieties		Notes		(1) 新闻		
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. e nursery for options.	 Young trees have an erratic b therefore they require extens Consider purchasing large st reduce this issue. Noted to have some tolerance 	ive formative pruning. ock sizes to help	© Henrik Sjöman	es develop on matures of <i>Celtis austra</i>	

	Celtis occidentalis (Common hackberry)	 Content page Alphabe Index 	🔮 potential	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved		The tree and	its features	
Tree size and crown characteristics		ar crown, of becoming	e crown.		
Natural habitat	Found throughout much of the eastern United St and floodplains.	ates in wooded lowland slopes, stream banks			
Environmental tolerance	Moderately tolerant to shade. Moderately tolerant	tely tolerant ght. Moderately sensitiv to waterlogging.	e e		
Ornamental qualities	Separate male and female flowers occurring on the same tree. Unremarkable flowering event in late spring.	A single drupe fruit held on a slender sta Edible. Maturing by early autumn but persisting into winter.	and the second second	rown of <i>Celtis occid</i>	<i>entalis</i> can become
	Deciduous broadleaved tree with simple leaves.				
	Single-stemmed. The bark is smooth and grey w becomes rough in texture.	nen young, as it ages it develops corky ridges and			
Issues to be aware of	No substantial issues to be aware of.				
Notable varieties		Notes		的。在自己	1000
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.	- Observed to have some tolerance to salt and air pollution.			
				of <i>Celtis occidentali</i> atures. © Henrik Sjöman	s develops corky

ridges as it matures. © Henrik Sjöman

Right: The simple leaves of *Celtis occidentalis* with immature fruit. This will ripen by early autumn and is edible (but not particularly desirable). © Andrew Hirons

	Cercidiphyllum japonicum (Katsura tree)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics	A massive tree capable of reaching 30m in its native habitat. Typically smaller in cultivation.	A moderately dense crown.			
Natural habitat	Native to Japan, China and parts of the eastern Himalaya region. Prefers sour riparian zones with gentle slopes and fertile soils of lowland alluvial forests. cold-hardy but does require summer heat from a continental climate to achie climates, such as the British Isles, it can be susceptible to late frosts as the le	he species is very ve this. In more maritime			
Environmental tolerance	Partially tolerant to shade. Sensitive to drought.	Moderately sensitive to waterlogging.			
Ornamental qualities		s have small pods clustered ups of two to five.	in a garden loca		onicum growing well
	Deciduous broadleaved tree with simple leaves. Young leaves emerge a rede throughout summer and turn a fantastic yellow-red or yellow-orange in auto		© Andrew Hirons		Contraction of the
	Single- or multi-stemmed. Fissured grey bark.		Mag.		
Issues to be aware of	Shallow rooting may cause problems with hard surfaces, particularly when caerated soil volumes.	ombined with small or poorly			
Notable varieties	Notes			A. A.	
Weeping	'Amazing Grace', 'Pendulum'. – Sensitive to salt.	known to bo a bigh omittare			
Purple leaves		known to be a high emitters anic Compounds (BVOCs).		res emerge reddish t-green in summer	

Right: *Cercidiphyllum japonicum* provides an excellent autumn display when the leaves turn yellow in autumn. © Andrew Hirons

	Cercis canadensis		Contents	Tree Selector	Crown form	Environmenta
••	(North American redbud)		Alphabetical Index	 potential Mature size 	form Crown density	 tolerance Ornamental qualities
Use potential	Park Small garden			The tree and it	s features	
Tree size and crown characteristics	A medium tree that capable of growing 12m but typically less than 10m in cultivation.	n. A mo	derately dense crown.			V
Natural habitat	Native to temperate deciduous forest of eastern North A habitat. Most frequent in forest margins but is also capak Regularly found on dry sites, including on limestone, with which is a major benefit on marginal or disturbed sites w cold-hardiness than <i>C. siliquastrum</i> .	ble of growing in the understo n good fertility. Capable of nit	rey of moist forests. rogen-fixation			
Environmental tolerance	Moderately tolerant to shade. Moderately tole to drought.	rant Sensi	tive to waterlogging.			ANA.
Ornamental qualities	Clusters of 4-8 pink flowers appear from the leaf axil in late spring shortly before the leaves emerge. Spectacular and highly ornamental.	Flat seed pods 6-10cm lon early autumn and persist	ng mature by through winter.			
	Deciduous broadleaved tree with a simple leaf.					
V	Single- or multi-stemmed. Grey bark with shallow fissured	that may flake in small plates	on mature specimens.	mange and		
lssues to be aware of	No substantial issues to be aware of.					
Notable varieties	Note	5		Same and		and a special of the
Purple leaves		ough noted to be moderately perform better in partial shade				
					e clusters of pink flo	ee for small gardens. owers provide a

	Cercis siliquastrum			Tree Selector		
		(Contents page	Use potential	Crown form	Environmenta tolerance
	(Judas tree)	3	Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park Paved Small garden	Coastal		The tree and i	ts features	
Tree size and crown characteristics	A medium tree that capable of growing 12m but typically less than 10m in cultivation.	ar crown. A moderate	ely dense crown.			
Natural habitat	Native to forest margins and the understorey of of Although cold-hardy enough for the British Isles, Therefore, warm microclimates should be favoure disturbed sites as it is aided by N-fixing bacteria.	this species does require summer heat to the dot and the species does require summer heat to the dot acting as a pioneer on marging the species of acting as a pioneer on marging the species of the spec	hrive.			
Environmental tolerance	Moderately tolerant to shade.	to drought. Sensitive to	waterlogging.			
Ornamental qualities	Clusters of pink flowers appear from the older wood in late spring shortly before the leaves emerge. Spectacular and highly ornamental.	Flat seed pods 6-10cm long mai early autumn and persist throug		Cercis siliquastr	cum flowering in a ro	padside planting bed.
	LATE SPRING	EARLY AUTUMN		© Henrik Sjöman		
	Deciduous broadleaved tree with a simple leaf.			Contraction of the second	M.	2
V	Single- or multi-stemmed. Grey bark with shallow	/ fissured on mature specimens.				
Issues to be aware of	No substantial issues to be aware of.					
Notable varieties		Notes				GR M
Larger flowers	'Bodnant'.	- Although noted to be moderately tolera				
White flowers	'Alba'.	will perform better in partial shade or fu	ili sun.			15
				Left: Clusters of	f pink flowers provid	le a very attractive

Left: Clusters of pink flowers provide a very attractive display shortly before the leaves emerge. © Andrew Hirons

Right: Flat seed pods mature in early autumn but tend to persist for several months, adding winter interest. © Andrew Hirons

	Chamaecyparis lawsoniana (Lawson cypress)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics	A massive tree capable of growing up to 70m: cultivars are much smaller.	e crown.			4
Natural habitat	Native to the mixed coniferous forest and mixed deciduous-conifer forest of north-west Found in a Mediterranean-type climate with summer fog. Mostly found on sandy and cla also found on serpentine soil (extremely nutrient poor but rich in heavy metals). Found (mostly on the lower mountain slopes, particularly alongside rocky river banks.	y-loam but			
Environmental tolerance	Moderately tolerant to shade. Moderately tolerant to drought. Sensitiv	ve to waterlogging.			
Ornamental qualities	Separate male and female flowers on the same branches. Flowering occurs in late spring but of no ornamental value.	in diameter	dense screening.		
	Evergreen conifer with scale leaves.		lawsoniana. © Hen	y conical crown of rik Sjöman	Chamaecyparis
	Single-stemmed. Thick, reddish-brown bark with long fissures.				
Issues to be aware of	Potentially an extremely large tree. <i>C. lawsoniana</i> release a lot of pollen so have high alle potential during the flowering period.	ergenicity			
Notable varieties					Bon .
Upright	'Columnaris', 'Columnaris Glauca', 'Yvonne', 'Erecta'.				1 - 7
Weeping	'Imbricata Pendula', 'Inversa'.				INE ST
Bluish	'Columnaris Glauca'.				1.6
Yellow	'Stardust'.		Left: Scale leaves © Henrik Sjöman	s of Chamaecypari	s lawsoniana.
Upright yellow	'Yvonne'.			f <i>Chamaecyparis la</i> ous and of little orr	

	x <i>Chitalpa tashkentensi</i> (Chitalpa)	S Contents page S Alphabetical Index	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Small garden		The tree and it	s features	
Tree size and crown characteristics	A small tree up to 10m. A globu crown.	lar to irregular A dense crown.			
Natural habitat	A nothogeneric hybrid between the Mexican spe both of Bignoniaceae. Prefers a fertile loam or sa position are also preferable.	ecies <i>Chilopsis linearis</i> and <i>Catalpa bignonioides</i> , andy soil. Warm microclimates and a sunny, sheltered			
Environmental tolerance		ed to be tely tolerant ght.			
Ornamental qualities	Highly ornamental trumpet-shaped, light pink flowers with a yellow centre (2.5-5cm long) held in upright clusters. Appearing in early summer.	A sterile hybrid, no fruit formed.			
	Deciduous broadleaved tree with simple leaves.				
	Single-stemmed. Bark grey-brown with shallow	ässures.	K V		
lssues to be aware of	No substantial issues to be aware of.		777		
Notable varieties		Notes			
Hybrid-type	'Summer Bells'.	 Probably worth trialling in paved environments as it is estimated to have moderate drought tolerance and it produces no fruit. 			Bells' is a small tree attractive trumpet

	Cladrastis kentukea	Contents page	Tree Selector Use potential	Crown form	Environmental tolerance
	(Yellow wood)	Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A potentially large tree up to 18m but usually less than 12m in cultivation. A globular crown, capab of becoming quite wide for a relative small tree. Often branching low.	le A dense crown.			
Natural habitat	Native to temperate deciduous forests of eastern US. Found in var fertile soils, often on limestone. Will perform best in warm microc cold-hardiness. Capable of fixing atmospheric nitrogen and, there	limates although they have good			and the second
Environmental tolerance	Moderately tolerant to shade. Moderately sensitive to waterlogging.	Sensitive to waterlogging.			
Ornamental qualities		gling flat pod, 3-8cm long, maturing arly autumn. Persisting into winter.	Cladrastis kentu © Henrik Sjöman	<i>Ikea</i> flowering in ea	irly summer.
	Deciduous broadleaved tree with pinnate leaves hosting alternate in autumn.	e leaflets. Leaves turn golden-yellow			
V	Single- or multi-stemmed. Grey bark smooth when young but be	coming shallowly fissured with age.			
Issues to be aware of	Does not flower consistently in the British Isles.				
Notable varieties	Notes				- all and a second
The species is available, hov Consult your preferred tree	,	hes are known to be brittle so extreme during handling.	1		
			Left: Drooping © Henrik Sjöman	clusters of white flo	wers are ornamental.

Right: The leaves of *Cladrastis kentukea* turn a golden-yellow in autumn. © Henrik Sjöman

Use potential Park Small garden The tree and its features Tree size and crown characteristics		<i>Clerodendrum trichotomum</i> (Harlequin glorybower)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
characteristics i i <	Use potential			The tree and i	ts features	
Intolerance Intolerant to shade. Intolerant to shade. Intolerance Image: Classes of white, fragrant flowers enveloped with a purple casing. Appearing in late summer. Highly ornamental. Image: Classes of white, fragrant flowers enveloped with a purple casing. Appearing in late summer. Highly ornamental. Image: Classes of white, fragrant flowers enveloped with a purple casing. Appearing in late summer. Highly ornamental. Image: Classes of white, fragrant flowers enveloped with a purple casing. Appearing in late summer. Highly ornamental. Image: Classes of white, fragrant flowers enveloped with a purple casing. Appearing in late summer. Highly ornamental. Image: Classes of white, fragrant flowers enveloped with a purple casing. Appearing in late summer. Highly ornamental. Image: Classes of white, fragrant flowers enveloped with a purple casing. Appearing in late summer. Highly ornamental. Image: Classes of white, fragrant flowers enveloped with a purple casing. Appearing in late summer. Highly ornamental. Image: Classes of white, fragrant flowers enveloped with a purple casing. Appearing in late summer. Highly ornamental. Image: Classes of the flowers enveloped with a purple casing. Appearing in late summer. Highly ornamental. Image: Classes of the flowers enveloped with a purple casing. Appearing in late summer. Highly ornamental. Image: Classes of the flowers enveloped with a purple casing. Appearing in late summer. Highly ornamental. Image: Classes of the flowers enveloped with a purple casing. Appearing in late summer. Image: Classes of the flowers enveloped with a purple casing. Appearing in late summer enveloped with a purple casing. Appearing in late summer enveloped with a		reaching 10m but generally less than 6m.	a moderately dense crown.			
tolerance Crnamental qualities $u \\ v \\ $	Natural habitat		n thickets			
qualities enveloped with a purple casing. Appearing in late summer. Highly ornamental. with crimson calyx from late autumn. A young Clerodendrum trichotomum in a gravitation with its bushy, globular crown. Image: Summer Algebra and the summer Algebra and th						
Andrew Hirdis Andrew H		enveloped with a purple casing. Appearing with crimson calyx from in late summer. Highly ornamental.		situation with it		
Relatively smooth, light grey bark. Issues to be Forms root suckers.			en rubbed.	© Andrew Hirons		
	V					
		Forms root suckers.				
Notable varieties	Notable varieties				A A	

Consult your preferred tree nursery for options.

	<i>Cornus alternifolia</i> (Alternate leaf dogwood)	pag	tents e	ee Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		Tł	ne tree and it	ts features	
Tree size and crown characteristics	A small tree (or shrub) growing up to 8m. An irregular often quite a small tree.	proad for	ense crown.			
Natural habitat	Native to a wide range in the temperate forests of eau understorey and on forest margins, preferring fertile margin species.					
Environmental tolerance	Tolerant of shade. Sensitive to	drought. Sensitive to wat	erlogging.			The second
Ornamental qualities	A flattened or convex cluster of creamy white flowers held just above the leaves in early summer.	Bluish-black clusters of drupes matu in early autumn. Popular with birds.	ure			
	Deciduous broadleaved tree with simple, alternate le	aves.				
V	Single-stemmed but also found as a multi-stemmed becoming fissured with age.	shrub. Reddish brown smooth bark when yo	pung,			Constant of
Issues to be aware of	No substantial issues to be aware of.				TANK	
Notable varieties	Ν	otes		355 A		C B C
The species is available, ho Consult your preferred tree		Slow growing and slow to establish, but wort	h the wait.	X		

The stratified crown of *Cornus alternifolia* growing in a forest understorey. This species has attractive convex clusters of creamy with flowers in early summer. © Henrik Sjöman

	Cornus controversa		Tree Selector		
	(Wedding cake tree)	Contents page	Use potential	Crown form	Environmental tolerance
	(Wedding Cake Liee)	Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park		The tree and	its features	
Tree size and crown characteristics	A large tree capable of reaching 20m in its native habitat, but typically less than 12m in temperate Europe.	An open crown.	à.		
Natural habitat	Native to China, Japan, Taiwan, the Korean peninsula and the Himalayas. Fo deciduous-conifer mountain forests 200-2600m.	ound in deciduous or mixed			NOT SHARE
Environmental colerance	Moderately tolerant to shade. Moderately sensitive to drought.	Moderately sensitive to waterlogging.			
Ornamental qualities	Large convex clusters of creamy white flowers, lightly scented. Held above the foliage in early summer.	all, round, dark blue fruits utumn.		re <i>rsa</i> has a beautiful when flowering.	layered crown that
	Deciduous broadleaved tree with simple alternate leaves. Good yellow autu in early autumn.	ımn colour but leaves fall			
	Single-stemmed. Green-brown bark, becoming rougher with age.				
lssues to be aware of	Shallow rooting may cause problems with hard surfaces, particularly when or poorly aerated soil volumes.	combined with small			
Notable varieties					
Species-type form	'Pagoda'.		a la la	Store State	
Variegated leaves	'Variegata'.				2 AN
				e flowersa has attrac	ctive convex clusters rons

Right: The round fruits of *Cornus controversa* ripen in early autumn. © Duncan Slater

	<i>Cornus</i> 'Eddie's white wonder' (Hybrid dogwood)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and i	ts features	
Tree size and crown characteristics	A small tree up to 10m. An ovoid crown.	A moderately dense crown			
Natural habitat	A hybrid between <i>Cornus florida</i> and <i>C. nuttalli</i> . Does not occur naturally.				
Environmental tolerance		Estimated to be sensitive o waterlogging.			
Ornamental qualities	LATE SPRING	orid.			iddie's white wonder' g and early summer.
	Deciduous broadleaved tree with simple opposite leaves. In autumn, the leaves tu	rn crimson red.	Barcham Trees		A
V	Single- or multi-stemmed. Young stems have purple hue. Bark is grey, flaking with	age.			
Issues to be aware of	Fruits are toxic to humans.				
Notable varieties					B B B

The species is available, however, no notable cultivated varieties are widely available. Consult your preferred tree nursery for options.

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Right: White floral bracts surround rather insignificant flowers in *Cornus* 'Eddie's white wonder'. © Henrik Sjöman

Left: Good autumn colour of *Cornus* 'Eddie's white wonder' extend the seasonal interest of this hybrid. © Henrik Sjöman

	<i>Cornus florida</i> (Flowering dogwood)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and it	ts features	
Tree size and crown characteristics	A medium tree up to 15m but in cultivation it rarely exceeds 8m.	wn. A moderately dense cro	wn.		
Natural habitat	Native to eastern North America from southern Canad deciduous-coniferous forest edges and forest underste acid or neutral soils.				the second
Environmental tolerance	Tolerant to shade. Moderately to to drought.	Sensitive to waterloggin	ng.		
Ornamental qualities	Insignificant flowers, accompanied by highly ornamental white bracts in late spring.			<i>s florida</i> makes an e of seasonal intere	attractive landscape est.
	Deciduous broadleaved tree with simple opposite leaver Image: Construction of the streemed tree back is grey, flaking with age.	es. In autumn the leaves turn crimson red.			
Issues to be aware of	Fruits are toxic to humans.				
Notable varieties	Not	tes	-		
Red bracts		though noted to be tolerant to shade, will perform atter in partial shade or full sun.	Left: Cornus flor	ida has attractive v significant flowers.	
			Right: Good aut	significant flowers. umn colour and rea ida autumnal intere	d-yellow drupes

	Cornus kousa			Tree Selector			
			Contents page	Use potential	Crown form	Environmenta tolerance	
	(Chinese dogwood)	٩	Alphabetical Index	Mature size	Crown density	Ornamental qualities	
Use potential	Park Small garden			The tree and i	ts features		
Tree size and crown characteristics	A small tree up to 10m but in cultivation it rarely exceeds 8m.	Dular crown. A moderat	ely dense crown.				
Natural habitat	Native to China, Japan and the Korean peninsu forest edges and forest understories, 400-220						
Environmental tolerance	Moderately tolerant to shade. Sensit	tive to drought. Sensitive t	o waterlogging.	(T)	1.0		
Ornamental qualities	Insignificant flowers, accompanied by highly ornamental white bracts in early summer. These persist through much of the summer.	Agglomerated drupes look sor to strawberries ripening by ear Edible.		The white floral ornamental in la © Andrew Hirons	bracts of <i>Cornus ko</i> ate spring.	ousa are highly	
	Deciduous broadleaved tree with simple oppo of red, orange or purple.	site leaves. In autumn the leaves turn various	shades	C Andrew Hirons			
	Multi-stemmed tree. Bark is grey, flaking with a	age to reveal a copper or olive-green colour.					
Issues to be aware of	No substantial issues to be aware of.						
Notable varieties		Notes		12			
Species-type habit	'China Girl', 'var. Chinensis', 'Milky Way'.	- Although noted to be tolerant to shade	e, will perform	ME TA	A Second		
Pink bracts	'Stella Pink'.	 better in partial shade or full sun. 		23			
				Left: White flora inconspicuous f	al bracts accompan flowers.	y rather	

© Andrew Hirons

Right: Edible fruits ripen to a red colour in early autumn. © Henrik Sjöman

	Cornus mas		Contents	Tree Selector	Crown	S Environmenta
	(Cornelian cherry dogwood		 Contents page Alphabetical Index 	Use potential Mature size	Crown Crown density	 Environmental tolerance Ornamental gualities
Use potential	Park Paved Small garden			The tree and i	-	quantes
Tree size and crown characteristics	Small tree up to 5m but in cultivation when raised as a standard it can get a little over 5m.		erately dense crown.			
Natural habitat	Native to dry deciduous forests of south-western Europe understorey and forest margins. Prefers calcareous soils Enjoys a hot climate, nevertheless, it is very cold-tolerant	but will also tolerate mildly acid				
Environmental tolerance	Moderately tolerant to shade. Moderately tole to drought.	erant Sensitiv	ve to waterlogging.			
Ornamental qualities	Small clusters of bright yellow flowers emerge before the leaves in late winter.	Red, ovoid drupe fruit riper Attractive and edible, rich i			often shrub-like, <i>Co</i> all tree. © Henrik Sjöma	
	Deciduous broadleaved tree with simple opposite leaves of red, orange or purple.		ous shades		eaves of <i>Cornus mas</i> colour. © Henrik Sjöman	s. These will provide
	Multi-stemmed tree, unless cultivated into a 'standard' sin flaking in small plates on mature stems.	ngle-stemmed tree. Bark is grey	y-brown,	12		
Issues to be aware of	Shallow rooting may cause problems with hard surfaces, or poorly aerated soil volumes. Fruits can be a problem in		ith small			
Notable varieties	Note	S		-	1	
Yellow leaved	'Aurea'. – Slow	v growing.		-		
Variegated	'Variegata'.			1		
					as has clusters of ye vide hope for spring	
				Right: Cornus n	nas yields attractive	(and edible) red

		Corylus avellana	Contents page	Tree Selector Use potential	Crown form	Environmental tolerance
Tree size and crown		(Hazel)				
characteristics	Use potential			The tree and i	ts features	
Itee of temperate deciduous forests. Environmental to shade. Image: The of temperate deciduous forests. Image: The of temperate deciduous forests. <td></td> <td>tree growing to 6m.</td> <td>A moderately dense crown.</td> <td></td> <td></td> <td></td>		tree growing to 6m.	A moderately dense crown.			
tolerance io to shade. io to drought. io	Natural habitat		derstorey shrub/multi-stemmed			
qualities are attractive, female flowers occur at the same time but are inconspicuous. image: complex com			Sensitive to waterlogging.			
Image: State Image: State		are attractive, female flowers occur at the same time but are inconspicuous.	ure by early autumn. Edible.	multi-stemmed		
V Older stems have a slightly flaky bark. Issues to be aware of Issues to be problematic on paths. Notable varieties Notable varieties		Deciduous broadleaved tree with simple leaves.			17-2	
aware of A Notable varieties			t on the younger stems.		WI SAN	
		Hazelnuts can be problematic on paths.			24	
Twisted stems 'Contorta'.	Notable varieties				112	
	Twisted stems	'Contorta'.		1.00	2/18 · ·	
Purple leaves 'Zellernus'.	Purple leaves	'Zellernus'.		-	-	the state

Hazelnuts can be harvested from *Corylus avellana* in early autumn. Here they are shown at an immature stage of development. © Duncan Slater

	Corylus colurna (Turkish hazel)		Contents page	Tree Selector Use potential	Crown form	Environmental tolerance
	(TUIKISITIAZEI)		Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park Paved Small garder	1		The tree and i	ts features	
Tree size and crown characteristics	A large tree growing to 24m. A conid	cal to ovoid crown. A mo	oderately dense crown.			
Natural habitat	Native to warm-temperate forests of south-eas in open woodland in forest margins. Grows on a they are well drained.					
Environmental tolerance	Intolerant to shade. Moder to drou		itive to waterlogging.			
Ornamental qualities	Male catkins emerge in late winter and are attractive, female flowers occur at the same time but are inconspicuous.	EARLY AUTUMN		© Henrik Sjöman	orylus colurna in a p	
	Deciduous broadleaved tree with simple leaves			Right: Male catk in late winter. © D	ins of a young <i>Coryl</i> Jouncan Slater	lus colurna emerge
	Single-stemmed tree. Grey bark becoming plat	y and flaking on mature stems.				
Issues to be aware of	Hazelnuts can be problematic on paths. C. colu potential during the flowering period.	<i>rna</i> release a lot of pollen so have high	allergenicity			
Notable varieties		Notes				and and and
Purple-red leaves	'Te-Terra Red'.	- Slow growing and slow to establi				E ANTE
Columnar	'VDB Obelisk'.	- good aftercare for 3-5 years post -	planting.	Left: Simple lea	ves of Corylus colur	rna.
				© Andrew Hirons		

© Andrew Hirons

Right: A characteristic ornamental husk surrounding the nut of *Corylus colurna*. © Duncan Slater

	Corylus maxima		Tree Selector		
	(Filbert)	 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and i	ts features	
Tree size and crown characteristics	A small multi-stemmed tree growing to 6m.	A moderately dense crown.			
Natural habitat	Native to southern Europe and Anatolian Peninsula. An understorey shrub/mul of warm-temperate deciduous forests. Occurs on a wide range of soils, includir				
Environmental tolerance	Estimated to be moderately tolerant to shade. Estimated to be moderately sensitive to drought.	Estimated to be sensitive to waterlogging.			
Ornamental qualities	Male catkins emerge in late winter and are attractive, female flowers occur at the same time but are inconspicuous. Nuts mature by each of the same time but are inconspicuous. LATE WINTER Deciduous broadleaved tree with simple leaves.	ırly autumn. Edible.		a 'Purpurea' is a use ree for small garder	
	Multi-stemmed tree or shrub. Grey-brown bark with lenticels apparent on the y Older stems have a slightly flaky bark.	ounger stems.		R.S.M.	
Issues to be aware of	Hazelnuts can be problematic on paths.				
Notable varieties			A		
Purple	'Purpurea'.			ylus maxima are enure in early autumn	closed by a smooth and are edible.

	Cotoneaster frigidus (Tree cotoneaster)	 Conterpage Alphat Index 	
Use potential	Park Small garden		The tree and its features
Tree size and crown characteristics	A small tree up to 10m in its natural habitat, smaller in cultivation.		
Natural habitat	Native to the Himalaya region.		
Environmental tolerance	Estimated to be partially tolerant to shade. Estimate moderate to droug	ely sensitive , , to waterlogging.	sensitive
Ornamental qualities	Upright clusters of 20-40 small white flowers appear in early summer.	EARLY EARLY AUTUMN Bright red clusters of pome fruits in early autumn. Highly ornamental and valuable for birds.	Cotoneaster frigidus 'Cornubia' is a useful flowering tree in early summer. © Andrew Hirons
	Deciduous broadleaved tree with simple leaves.		
	Single-stemmed small tree. Smooth grey bark bed	oming slightly platy with age.	
Issues to be aware of	Fallen fruit may cause a nuisance on footpaths.		
Notable varieties		Notes	
Compact	'Cornubia'.	- Good for bees and other pollinating insects as after many other trees have finished their flow	
			other pollinating insects in early summer. © Duncan Slater Right: Attractive clusters of red pomes make <i>Cotoneaster frigidus</i> valuable for birds. © Andrew Hirons

	Crataegus x grignonens (Grignon hawthorn)	S Contents page Alphabeti	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden Coastal	Transport corridor	The tree and	its features	
Tree size and crown characteristics	A small tree capable of growing 7m.	ar crown. A dense crown.			
Natural habitat	A hybrid of <i>Crataegus mexicana</i> and an unknown	male parent. Only found in cultivation.			
Environmental tolerance		ed to be tely tolerant ht.	tive		
Ornamental qualities	Clusters of very attractive white flowers emerge in late spring after the leaves have expanded.	Clusters reddish-brown pome fruits mature by early autumn.	small tree for a	Crataegus x grignou range of situations	. © Andrew Hirons
	Deciduous broadleaved tree with simple leaves. I	eaves remain on the tree until early winter.		eaves of <i>Crataegus</i> > ollinated flowers. © A	
V	Single-stemmed. Grey-brown bark becoming pla	ty with age.			
Issues to be aware of	Heavily thorned. Fallen fruit may cause a nuisance	e on pathways.			
Notable varieties		Notes	W.		
The species is available, hov Consult your preferred tree	vever, no notable cultivated varieties are widely available. nursery for options.	 Good for wildlife as flowers provide food for a range of insects and fruits are desirable for birds and small mammals. 			
				rs of <i>Crataegus</i> x <i>gr</i> nd are attractive to	

in late spring and are attractive to bees and other pollinating insects. © Duncan Slater

Right: The bark of *Crataegus* x *grignonensis* becomes platy and rough with age. © Andrew Hirons

	Crataegus laevigata					Tree Selector			
	(Woodland hawthorn)				Contents page	Use potential	Crown form	Environmenta tolerance	
						Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential		Park Small garden	Coasta	al Trans corric			The tree and	ts features	
Tree size and crown characteristics	<10M	A small tree capable of growing 8m, typically around 5m.	A glob	ular crown.	A de	nse crown.	a feith	SAL 0	
Natural habitat	*	Native to temperate Europe. O Found on a wide range of soils		ous forest margins a	nd clearings.				
Environmental tolerance	*	Partially tolerant to shade.	Tolera	nt to drought.	Sens	itive to waterlogging.			
Ornamental qualities	LATE SPRING	Clusters of very attractive whit emerge in late spring after the have expanded.		Cluste EARLY AUTUMN	ers red, pome fruits	in early autumn.	in late spring. ©	Duncan Slater	ata is very attractive
	I	Deciduous broadleaved tree with simple leaves.					- Right: Simple Id © Duncan Slater	bed leaves of <i>Crata</i>	aegus laevigata.
	Y	Single-stemmed in cultivation becoming platy with age.	but often multi-s	temmed in their nat	ural habitat. Grey-l	orown bark			
Issues to be aware of		Thorned.							
Notable varieties				Notes			here's		
Double flowers	'Plena'.				fireblight (<i>Erwinia a</i> ife as flowers provi		the s		and a state of the
No fruit	'Plena'.				ts and fruits are de				
								f small, predominan after the leaves hav	

© Duncan Slater Right: Clusters of small red fruits are attractive to a range of wildlife. © Duncan Slater

	Cra (La	taegus x la vallée hawt	thorn)			 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential		Park Small gard			ransport orridor		The tree and i	ts features	
Tree size and crown characteristics	<10M	A small tree capable of growing 6m.		A globular crown.	•	A dense crown.			
Natural habitat		A hybrid of <i>Crataegus me</i>	exicana and an u	unknown male parent	. Only found in cu	ltivation.			
Environmental tolerance	*	Moderately tolerant to shade.		Moderately tolerant to drought.		Sensitive to waterlogging			
Ornamental qualities	LATE SPRING	Clusters of very attractive emerge in late spring afte have expanded.			lusters of yellow-lossy pome fruits	red or orange-red, in early autumn.		<i>alleei</i> makes an exc used more widely.	ellent small tree
	I	Deciduous broadleaved t	tree with simple	leaves. Leaves persis	t to early winter.				-
V	Single-stemmed. Grey-brown bark becoming platy with age.								
lssues to be aware of		Thorned. Fallen fruit may	r cause a nuisand	ce on pathways.					
Notable varieties				Notes					
Cultivar-type habit	'Carrière	Ρ.		range of i		provide food for a are desirable for birds	Clusters of fruit in autumn. © Henrik Sjöman	s are attractive to a	range of wildlife

	Crataegus x media (Red thorn)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small Coastal	Transport corridor		The tree and it	ts features	
Tree size and crown characteristics		ar crown, around e at maturity.	ense crown.			
Natural habitat	A naturally occurring sterile hybrid between <i>Crat</i> 'Paul's Scarlet' is a particularly striking variety wi					
Environmental tolerance	Estimated to be partially tolerant to shade.		nated to be sensitive aterlogging.			
Ornamental qualities	Clusters of very attractive flowers emerge in late spring after the leaves have expanded.	Sterile hybrid, not fruit.		Crataegus x me © Duncan Slater	dia growing in road	lside planting.
	Deciduous broadleaved tree with simple leaves. R					
V	Single-stemmed in cultivation but often multi-ste Grey-brown bark becoming platy with age.	emmed in their natural habitat.				
Issues to be aware of	Thorned.			2		1000
Notable varieties		Notes			20 (C3) C	
Crimson double flowers 'Paul's Scarlet'.		- Vulnerable to fireblight (<i>Erwinia</i>		A AND	Stra.	
No fruit	'Paul's Scarlet'.	 Also sold as Crataegus laevigata but this name is now outdated. 	'Paul's Scarlet'			

Crataegus x media 'Paul's Scarlet' has spectacular double flowers in late spring. © Duncan Slater

	Crataegus monogyna (Common hawthorn)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden Coastal Transport corridor		The tree and its	s features	
Tree size and crown characteristics	A medium tree capable of growing 12m but usually less than 8m.	A dense crown.	AND	Little,	
Natural habitat	Native to temperate Europe, northern Africa, western Asia, parts of Russian a Occurs in deciduous forest margins and clearings. Found on a wide range of that are very sandy.			N.C.	
Environmental tolerance	Intolerant to shade. Tolerant to drought.	Sensitive to waterlogging.			
Ornamental qualities	Clusters of very attractive white flowers emerge in late spring after the leaves have expanded. Clusters red, por	ne fruits in early autumn.		<i>gyna</i> is a versatile s var, shown here, ha	
	Deciduous broadleaved tree with simple leaves.		© Andrew Hirons		
	Single-stemmed in cultivation but often multi-stemmed in their natural habita Grey-brown bark becoming platy with age.	t.		· 3	110
Issues to be aware of	Thorned.				
Notable varieties	Notes				2 3 8 5 X
Columnar	'Stricta' Vulnerable to fireblight (- Good for wildlife as flower range of insects and fruit and small mammals.	ers provide food for a	in late spring. © A		03
				f red pome fruits rip attractive to a range	

	Crataegus x persimilis					Tree Selector			
	(Br	oad-leaved	cock	spur thorn)	Contents page Alphabetical Index	 Use potential Mature size 	 Crown form Crown density 	 Environmentatolerance Ornamental qualities
Use potential		Park Sma gard			nsport rridor		The tree and	its features	
Tree size and crown characteristics	<10M	A small tree capable of growing 5m.		A globular crown.	•	A dense crown.			NW.
Natural habitat	e	A naturally occurring hyb US in a scattered distribu				ound in north-eastern			
Environmental tolerance		Estimated to be partially tolerant to shade.	\bigcirc	Estimated to be tolera to drought.	nt	Estimated to be sensitive to waterlogging.			
Ornamental qualities	LATE	Clusters of very attractive in late spring after the lea			sters of red por arly autumn.	ne fruit ripen	Crataegus x pe display in late s © Andrew Hirons	<i>rsimilis</i> has a specta pring.	acular flowering
	I	Deciduous broadleaved t turning yellow-red.	ree with gloss	sy simple leaves. Provides	good autumn (colour with leaves			
V	Y	Single-stemmed in cultiva becoming platy with age	ation but ofter	n multi-stemmed in their	natural habitat.	Grey-brown bark			
Issues to be aware of		Thorned.						3 tot	
Notable varieties				Notes			N200		
Hybrid-type habit	'Splende	ens'. – Also sold as <i>Crataegus</i> (x) is now considered outdate					rsimilis has clusters portly after the leaves		

	Cryptomeria japonica	Tree Selector			
	(Japanese cedar)	Contents page Alphabetical Index	 Use potential Mature size 	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A massive tree capable of reaching 50m. Smaller in cultivation, but still massive.	A dense crown.		Å .	<u>&</u>
Natural habitat	Native to Japan. Found in mountain forests, 50-1800m. It can survive on a wide but much prefers fertile, warm sites.	ange of soils			
Environmental tolerance	Moderately tolerant to shade. Moderately tolerant to drought.	Moderately sensitive to waterlogging.			
Ornamental qualities		nd cones at various stages be found on mature trees.	Left: A small gro © Andrew Hirons	Dup of Cryptomeria	
	Evergreen conifer with needle-like leaves. <i>Cryptomeria japonica</i> has distinct juve this is retained in the cultivar 'Elegans'.	nile foliage on young trees		eria japonica showir Orm. © Duncan Slater	ng a characteristically
	Single-stemmed. Attractive reddish-brown to brown-grey bark with long fibrous	ribbing.			
lssues to be aware of	Potentially a very large tree. <i>C. japonica</i> release a lot of pollen so have high allerg during the flowering period.	enicity potential			
Notable varieties					
Juvenile foliage	'Elegans'.		201		
			needle-like leav Right: The smal	al foliage of <i>Cryptol</i> es. © Henrik Sjöman I cones of <i>Cryptomo</i> fairly inconspicuou	eria japonica add

	Cupressus arizonica	Tree Selector	Tree Selector			
		Contents page	Use potential	- potential - Ionn		
	(Arizona cypress)	Alphabetic Index	cal Mature size	Crown density	Ornamental qualities	
Use potential	Park Paved Transp corrido		The tree and	The tree and its features		
Tree size and crown characteristics	A large tree capable of reaching 25m. A conic	A dense crown.				
Natural habitat	Native to southern North America on dry, rocky sheltered microclimate to perform well in the Br	r, mountain slopes, 900-2700m. Requires a warm, ritish Isles.				
Environmental tolerance	Intolerant to shade.	nt to drought. Sensitive to waterloge	ging.			
Ornamental qualities	Male and female flowers occur separately but on the same tree. Inconspicuous. Most pollinating occurs in early spring.	Round, knobbly cones (around 2cm in diameter) held on short stalks. Persistent for many years.	a columnar for		-	
	Evergreen conifer with scale-like leaves.		Cupressus arizonica erest. © Andrew Hirons	a 'Glauca' provides		
	Single-stemmed. Grey-brown to purple bark with when exposed.	A Star	test and	教教		
Issues to be aware of	<i>C. arizonica</i> release a lot of pollen so have high a	allergenicity potential during the flowering period.				
Notable varieties		Notes			N SECTIVE	
Species-type habit	'var. <i>Glabra</i> '.	- Prefers a warm microclimate.	· () () ()		a at balat	
Columnar	'Pyramidalis'.				(1)(1)(1)(1)(1)	
Blue-green foliage	'Glauca'.					
			leaves. © Andrew	Hirons	nas blue-green scale	
				e specimens, the ba n a mottled appeara		

© Andrew Hirons

	<i>Cupressus macrocarpa</i> (Monterey cypress)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Coastal		The tree and it	s features	
Tree size and crown characteristics	A massive tree capable of reaching 25m in wild, but 40m in cultivation. Some cultivars much smaller.	A dense crown.			
Natural habitat	Native to the Monterey Peninsular in California. Found on poor quality, shallow, or Prefers a warm maritime climate but will also grow further inland.	coastal soils.			
Environmental tolerance	Estimated to be intolerant to shade.	Estimated to be sensitive to waterlogging.			
Ornamental qualities	Male and female flowers occur separately but on the same tree. Inconspicuous. Round, knobbly co in diameter). Persis	nes (around 3-4cm tent for many years.	in a large garder	ocarpa providing a n.	dominant feature
	Evergreen conifer with scale-like leaves. Coloured varieties are available.		_ © Duncan Slater		
	Single-stemmed. At maturity bark has long grey fibrous ridges exposing younge in between.	er reddish-brown bark			Ale Million .
Issues to be aware of	Potentially a very large tree. <i>C. macrocarpa</i> release a lot of pollen so have high a during the flowering period.	Ilergenicity potential			
Notable varieties					
Yellow	'Goldcrest'.			bt of <i>Cupressus</i> manobbly, round coneround.	

	Cupressus sempervirens	Tree Selector				
	(Mediterranean cypress)	 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities 	
Use potential	Park Paved		The tree and	its features		
Tree size and crown characteristics	A massive tree capable of reaching 30m in wild, but many cultivars are much smaller. A massive tree capable of reaching 30m in wild, but many cultivars are much smaller.	dense crown.				
Natural habitat	Native to the Mediterranean basin and western Asia. Most frequent on steep rocky canyons, 100-1700m. <i>Cupressus sempervirens</i> can act as a pioneer on poor quality shallow rocky and clayey soils. Requires a warm, sheltered microclimate to perform	v soils, tolerating				
Environmental tolerance	Intolerant to shade. Tolerant to drought.	ensitive to waterlogging.	-			
Ornamental qualities	Male and female flowers occur separately but on the same tree. Inconspicuous.		© Duncan Slater		a very columnar form	
	Evergreen conifer with fine scale-like leaves.		ar varieties such as th ctural qualities. ⊚ Bar			
	Single-stemmed. At maturity bark has long grey fibrous ridges exposing younger r in between.	eddish-brown bark				
issues to be aware of	Potentially a very large tree, however, columnar varieties are more compact. <i>C. ser</i> a lot of pollen so have high allergenicity potential during the flowering period.	npervirens release				
Notable varieties				A AN	Star Brand Bill	
Species-type habit	'var. <i>horizontalis</i> '.		1 200	Res Con		
Columnar	'var. <i>pyramidalis</i> ', 'var. <i>stricta</i> ', 'Green Pencil'.		Eino scala lasy	es of Cupressus sem	upor viranc	

Fine scale-leaves of *Cupressus sempervirens*. © Duncan Slater

	x <i>Cuprocyparis leylandii</i> (Leyland cypress)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmentatolerance Ornamental qualities
Use potential	Park Coastal Transport corridor		The tree and it	s features	
Tree size and crown characteristics	A large tree capable of reaching 25m, but many cultivars are smaller.	A dense crown.			
Natural habitat	A hybrid between <i>Cupressus macrocarpa</i> and <i>Xanthocyparis nootkatensis</i> (syn <i>Callitropsis nootkatensis</i>). Adaptable to a wide range of soils and tolerant of sa				
Environmental tolerance	Estimated to be intolerant to shade.	Estimated to be sensitive to waterlogging.			
Ornamental qualities	Inconspicuous. Most varieties app	pear sterile.	dense columnar	aris leylandii can p crown. © Andrew Hiro	ons
	Evergreen conifer with fine scale-like leaves.	- Right: The bark of a reddish-brown	f x <i>Cuprocyparis le</i> appearance. © Andr	eylandii has rew Hirons	
	Single-stemmed. A reddish-brown bark, becoming rough at maturity.				
Issues to be aware of	Potentially a large tree, dense tree.				
Notable varieties	Notes		The second	A REAL	Have I and
Yellow	'Castlewellan'. – Fast growing and quick to	establish.	- Scale leaves of x ornamental mer © Andrew Hirons	Cuprocyparis leyla t.	andii have little

	Cydonia oblonga	Contents page	Tree Selector Use potential Crown form Environme tolerance			
	(Čommon quince)	Alphabetical Index	Mature size	Crown density	Ornamental qualities	
Use potential	Park Small garden		The tree and i	ts features		
Tree size and crown characteristics	A small tree growing up to 10m. A globular, bushy crown form.	A dense crown.				
Natural habitat	Native to western Asia, particularly the Caucasus and northern Iran. Found i woodland on rocky slopes.	in forest margins and open				
Environmental tolerance	Intolerant to shade. Moderately tolerant to drought.	Sensitive to waterlogging.				
Ornamental qualities		pear-shaped fruit around 10cm ate autumn. Edible if cooked.	The small, bush © Duncan Slater	y crown of <i>Cydonia</i>	oblonga.	
	Deciduous broadleaved tree with simple leaves: turning yellow in autumn.					
	Single-stemmed. Mature bark is slightly rough dark brown, young stems have					
Issues to be aware of	Large fruit may cause a nuisance if allowed to fall on pathways.					
Notable varieties					COLLARS.	

The species is available, however, no notable cultivated varieties are widely available. Consult your preferred tree nursery for options.

Right: This immature fruit will ripen to a golden-yellow colour in late autumn. © Duncan Slater

	<i>Davidia involucrata</i> (Pocket handkerchief tre	Contents page	Tree Selector Use potential Mature size	 Environmental tolerance Ornamental 				
Use potential	Park		Alphabetical Index	The tree and its features				
Tree size and crown characteristics	A large tree capable of reaching 20m in its native habitat, in cultivation typically less than 15m.	Ilar crown. A mode	rately dense crown.					
Natural habitat	Native to China, particularly the mixed montane west Hunan, Sichuan and north Yunnan. Require			AP -				
Environmental tolerance		ately sensitive , modera	ed to be tely sensitive logging.		他理			
Ornamental qualities	Flowers held on a small round head held on a short stalk. Fairly unremarkable in themselves but accompanied by two (rarely three) very attractive white bracts. Late spring.	Small ovoid drupe greenish with purplish bloom. Ripenir Persisting.		A mature <i>Davio</i> restaurant vera © Andrew Hirons	<i>lia involucrata</i> creato nda.	es shade for this		
	Deciduous broadleaved tree with simple leaves.							
	Single-stemmed. A grey-brown bark, becoming	slightly rough with age.						
Issues to be aware of	No substantial issues to be aware of.							
Notable varieties		Notes		and the		THE A		
Hairy leaf	subsp. <i>involucrata</i> .	- Fairly slow to establish but certainly	worth the wait.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
Smooth leaf	subsp. vilmoriniana.					The		
				2	unremarkable flowe	ers are accompanied		

by highly ornamental white floral bracts in late spring. © Henrik Sjöman

Right: Ovoid drupe fruits mature in late autumn and often persist for several months. © Andrew Hirons

	Diospyros kaki		Tree Selector		
	(Chinese persimmon)	Contents page	Use potential	Crown form	Environmenta tolerance
	(crimese persiminon)	Alphabetical Index	Mature size	Crown density	Ornamental qualities
Jse potential	Park		The tree and i	ts features	
ree size and crown haracteristics	A large tree capable of reaching 25m. In the British Isles it will be less than 10m.	A moderately dense crown			
latural habitat	Native of the Yangtze valley in China as part of the transitional mixed bordering the subtropical evergreen broadleaved forest. Prefers a c In the British Isles, it will require a warm microclimate as leaves are s	deep, fertile, slightly acidic soil.	-		New 1
invironmental olerance	Estimated to be partially tolerant to shade. Estimated to be moderately sensitive to drought.	Estimated to be moderately sensitive to waterlogging.			3
Drnamental qualities	(dioecious) both are fairly inconspicuous. (C) by late	tive, yellow-orange round fruits ripen e autumn, providing there has been n summer. Edible.	© Barcham Trees	ves and young fruit	
	Deciduous broadleaved tree with glossy simple leaves. Spectacular	r orange-red autumn colour.		le flowers of <i>Diosp</i> ot prominent. © Bard	
	Single-stemmed. Brown-grey, deeply grooved bark at maturity.		-	-	1 Com
ssues to be aware of	Fruit drop in winter may cause problems on paved areas.				
Notable varieties	Notes		1 81	1	
The species is available, ho Consult your preferred tre	wever, no notable cultivated varieties are widely available Good for bees. e nursery for options.		10	- Chill	

The edible fruit of *Diospyrus kaki* is attractive and can persist on the tree until early winter. © Barcham Trees

	<i>Elaeagnus angustifolia</i> (Russian olive)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Small Garden Coastal	Transport corridor	The tree and it	s features	
Tree size and crown characteristics	A medium tree capable of reaching 12m but usually less than 8m. 10-15M	A moderately dense crown.		5	
Natural habitat	Native to central and western Asia, naturalised across much of southern Europe dry and warm environments such as the steppe regions. Capable of growing on including on calcareous soils. Its nitrogen-fixing ability also helps it perform wel	a wide range of soils,		N/	
Environmental tolerance	Intolerant to shade. Tolerant to drought.	Sensitive to waterlogging.			
Ornamental qualities	the leaf axils of young shoots emerge in early by silvery scales. In	w-orange fruits covered warm regions they ripen ut they may never fully sles.		<i>ifolia</i> is a useful dro lvery green foliage	bught tolerant tree
	Deciduous broadleaved tree with simple leaves. Scales on the underside of the lyoung shoots give a silvery appearance.	eaves and on the			15
	Single-stemmed in cultivation, but often shrubby in its natural environment. You with silvery scales, becoming darker and more fissured with age and losing silve		0		
Issues to be aware of	Invasive in warmer climates, however, this is not a real problem in cooler climate <i>E. angustifolia</i> release a lot of pollen so have high allergenicity potential during t				
Notable varieties	Notes			2/12/3	HA CHAN
The species is available, h Consult your preferred th	owever, no notable cultivated varieties are widely available. ee nursery for options. - Good tolerance to air pollut making this species very ve - Excellent for nectar-gatheri - Buy a large tree, as they can when young.	rsatile. ng insects.	Silvery scales co yellow-orange fr © Henrik Sjöman		Fruit before revealing

	<i>Eucalyptus gunnii</i> subs	a aunnii		Tree Selector	,r		
	(Cider gum)	J. guinni	 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmental tolerance Ornamental qualities 	
Use potential	Park Transport corridor			The tree and i	ts features		
Tree size and crown characteristics	A large tree capable of reaching 25m.	d crown. An	open crown.		-S-S	20	
Natural habitat	Native to the mountains of Tasmania, 500-1200 plateaus in pure stands or with other eucalypt sp					R	
Environmental tolerance		itely sensitive (Levy) mo	imated to be derately tolerant vaterlogging.				
Ornamental qualities	Groups of 2-3 white frilly flowers emerge in late autumn in the British Isles but more typically during summer in their natural range. Attractive but not prominent.	Woody capsules knowr at least a year to ripen a for some time.			nii subsp. gunnii, sh d-tolerant eucalypt		
	Evergreen broadleaved tree with simple leaves. different from the long narrow, bluish to green a		unded and quite				
	Single-stemmed. Bark on mature trees is often r to pinky-grey within the crown (and on young tr		smooth olive			A Maria	
Issues to be aware of	Although one of the most cold-tolerant eucalyp occasionally experienced in the British Isles.	ts it is sensitive to wind-chill and sev	ere winters,				
Notable varieties		Notes			MANY	CINTURA C	
The species is available, h Consult your preferred tr	owever, no notable cultivated varieties are widely available. ee nursery for options.	– Juvenile foliage is a particular fa – Observed to have some toleran			harrow sickle-shape nii subsp. gunnii hai		

© Andrew Hirons

Right: The flowers of *Eucalyptus gunnii* subsp. *gunnii* are very attractive but rather inconspicuous. © Duncan Slater



Eucalyptus pauciflora group (Snow gums)



Use potential Ø

Tree Selector

Mature size

Crown form Crown density

Environmental tolerance Ornamental qualities

Use potential	Park	The tree and its features
Tree size and crown characteristics	The tallest representatives of this group can reach 30m. Most frequently available sub-species reach 10-18m. Most frequently available sub-species have a vase shaped crown as a result of their multi-stemmed architecture.	
Natural habitat	Native to the mountains of southeastern Australia, mostly 1000-2000m. It forms pure stands on slop and mountain plateaus. <i>E. pauciflora</i> subsp. <i>niphophila</i> is the highest altitude eucalypt and, therefore often considered the most cold-tolerant of the genus. As it is an alpine tree, it prefers cool soil.	
Environmental tolerance	Estimated to be intolerant to shade. Estimated to be moderately sensitive to drought. Estimated to be moderately sensitive to waterlogging.	
Ornamental qualities	Groups of scented white frilly flowers emerge in late spring. Attractive. LATE SPRING	ke
	Evergreen broadleaved tree with simple leaves. Juvenile leaves are distinctly smaller and more blue green that the longer more glossy green adult foliage.	
V	Most often multi-stemmed but also found as single-stemmed trees in cultivation. Smooth bark throughout trunk and crown, ivory to olive streaked with grey bands.	
Issues to be aware of	No substantial issues to be aware of.	
Notable varieties	Notes	
subsp. <i>debeuzevillei</i>	See notes <i>E. pauciflora</i> subsp. <i>debeuzevillei</i> tends to be fas	
subsp. <i>niphophila</i>	See notes. growing and taller (up to 18m) than subsp. <i>nipho</i> which only gets to about 10m.	A mature <i>Eucalyptus pauciflora</i> provides dappled

A mature *Eucalyptus pauciflora* provides dappled shade in this courtyard. The light, smooth bark is particularly attractive. © Andrew Hirons

	Eucommia ulmoides			Tree Selector			
	(Guttapercha)		Contents page	Use potential	Crown form	Environmenta tolerance	
	(Outtaperena)		Alphabetical Index	Mature size	Crown density	Ornamental qualities	
Jse potential	Park Paved Transport			The tree and i	ts features		
Free size and crown characteristics		crown, Ily spreading globular form.	oderately dense crown.	111	14		
Natural habitat	Native to China, but this species is now only found	in cultivation. No wild populations	exist.				
Environmental tolerance	Estimated to be partially tolerant to shade.	mod	nated to be erately sensitive aterlogging.				
Ornamental qualities	Male and female flowers found on separate trees. Both are inconspicuous and have little ornamental merit.	One-seeded winged fruit the female trees by early		Eucommia ulmo © Andrew Hirons	<i>bides</i> growing in a p	planting bed.	
	Deciduous broadleaved tree with simple leaves. GI is that when the leaves are broken, thin latex thread		ntifying feature				
	Single-stemmed. Light grey bark, shallowly fissured	d.					
Issues to be aware of	No substantial issues to be aware of.						
Notable varieties		Notes		And the second second		LOBA S	
The species is available, h Consult your preferred tr	e nursery for options.	 An under-utilised tree with great for green infrastructure projects. Observed to have some tolerance and air pollution. 		Left: Flowers of	Eucommia ulmoide	es emerge with the	
				Right: The gloss	airly inconspicuous. sy green leaves of <i>E</i> aroughout summer.	ucommia ulmoides	

	<i>Euonymus europaeus</i> (Common spindle tree)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small Coastal Transport corridor		The tree and it	s features	
Tree size and crown characteristics	A small tree capable of reaching 8m.	A moderately dense crown.			
Natural habitat	Native to most of Europe (including the British Isles) and western Asia. It is four forest margins but will also occur in the understorey of forest canopies with lig coastal locations as well as inland. Adaptable to a wide range of soils, including	hter shade. Found in			
Environmental tolerance	Moderately tolerant to shade. Moderately tolerant to drought.	Moderately sensitive to waterlogging.			
Ornamental qualities		ed fruit held in orangey mental, especially with n colour of leaves.	Euonymus europ © Duncan Slater	baeus has a bushy,	globular crown.
	Deciduous broadleaved tree with simple leaves. Excellent red autumn colour.				Sel 1
V	Multi-stemmed, but can be grown into a single-stemmed tree with careful prun smooth bark. Younger stems often have corky wings.	ing. Grey, relatively			Son
Issues to be aware of	Fruit is poisonous.				and the
Notable varieties					
Abundant fruit	'Red Cascade'.		They turn red in Right: Flowers c	ves of Euonymus eu autumn. © Duncan Sla f Euonymus europa d amongst the new	ater aeus are small

© Duncan Slater

	Fagus orientalis			Tree Selector				
	(Oriental beech)		 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmental tolerance Ornamental qualities 		
Use potential	Park			The tree and it	s features			
Tree size and crown characteristics	A massive tree capable of reaching 30m in its natural habitat.	form.	A dense crown.					
Natural habitat	Native to western Asia and southeastern Europ A canopy tree of warm-temperate forests, 200							
Environmental tolerance	Tolerant to shade. Model to dro	rately sensitive ught.	Sensitive to waterlogging.					
Ornamental qualities	Male and female flowers are separate but born on the same tree. Of little ornamental value.	apparent in early a	a bristly husk are most autumn. Some years eavier than other years µr).	A <i>Fagus orienta</i> trees in a park si © Andrew Hirons		well amongst other		
	Deciduous broadleaved tree with simple leaves	. Some years will see a beautiful y	yellow-golden autumn colour.	C Andrew Hirons				
	Single-stemmed. Smooth, grey bark.				RE.			
Issues to be aware of	Potentially a very large, spreading tree.							
Notable varieties		Notes						
Columnar	'Iskander'.	 Superficially very similar to which it can form hybrids. Less susceptible to woolly More heat and drought to however, still considered n to drought. Sensitive to salt spray. Fagus spp. are known to b Biogenic Volatile Organic 	aphid than <i>Fagus sylvatica.</i> erant than <i>Fagus sylvatica,</i> noderately sensitive e high emitters of	Leaves and fruit [®] Andrew Hirons	of Fagus orientalis.			

	<i>Fagus sylvatica</i> (Common beech)	Contents page	Tree Selector Use potential	Crown form	Environmental
		Alphabetica Index	Mature Size	Crown density	Ornamental qualities
Use potential	Park		The tree and	its features	
Tree size and crown characteristics		A dense crown.			2.
Natural habitat		g the British Isles). A canopy tree of mixed or pure forests de variety of soils, including calcareous, providing they ar int tree it is difficult to establish in the open.			
Environmental tolerance	Tolerant to shade. Mode to dro	rately sensitive ught.	ng.		
Ornamental qualities	Male and female flowers are separate but born on the same tree. Of little ornamental value.	Small nuts held in a bristly husk are most apparent in early autumn. Some years fruiting is much heavier than other years (masting behaviour).	A mature Fagu. © Andrew Hirons	s sylvatica in a parkl	and situation.
		. Some years will see a beautiful yellow-golden autumn col	our.		
	Single-stemmed. Smooth, grey bark.				
Issues to be aware of	Potentially a very large, spreading tree.		- 7		
Notable varieties		Notes			5-100.
Cut leaved	'Asplenifolia', 'Rohanii'.	- As a shade tolerant tree it is difficult to establish	K.C.		
Columnar	'Dawyck', 'Dawyck Gold', 'Dawyck Purple'.	 in the open. Numerous cultivars are available, most widely 			A Start
Yellow leaved	'Dawyck Gold', 'Zlatia'.	 supplied are cited here. Fagus spp. are known to be high emitters of 		1.00	And Block
Weeping	'Pendular', 'Black Swan', 'Purple Fountain'.	Biogenic Volatile Organic Compounds (BVOCs).		<i>vatica</i> 'Asplenifolia' h wn here in autumn.	
Copper/Purple	'Dawyck Purple', 'Purpurea', 'Rohanii', 'Black Swan', 'Riversii', 'Purple Fountain'.	_	Right: Small 'be	eech nuts' are held i pparent in early aut	n a bristly husk

	<i>Ficus carica</i> (Common fig)	 Contents page Alphabetical Index 		Crown Servironmental orm Ornamental crown Sornamental density
Use potential	Park Small garden		The tree and its featur	res
Tree size and crown characteristics	A medium tree capable of reaching 15m in its native range, but much smaller (less than 10m) in the British Isles.	A dense crown.		
Natural habitat		pe. Found in dry, rocky places within warm-temperate ates. Requires a warm microclimate in the British Isles. calcareous.		
Environmental tolerance		Estimated to be sensitive to waterlogging.		
Ornamental qualities	Male and female flowers are found on separate trees (dioecious). Flowers hidden so of no ornamental value.	Pear-shaped fruits about 5cm long start green and ripen brown-purple. Requires summer heat to fully ripen. Edible. Also see notes.	<i>Ficus carica</i> , growing we © Duncan Slater	II in an urban garden.
	Deciduous broadleaved tree with simple leaves but often the leaves have attractive lobes.	s. Leaf shape is variable across a crown,		
	Single-stemmed.			
Issues to be aware of	No substantial issues to be aware of.			TV TA
Notable varieties		Notes	A. C.	
Species-type habit	'Nero', 'Verdino'.	 Figs have a rather complex reproductive cycle. Ficus carica can to bear two crops of fruit a year, but only one tends to ripen in the British Isles (if any). Embryo fruits are formed in late summer of one year, overwinter, and only ripen in late summer the following year. Fruits initiated in spring tend not to ripen. Observed to have some tolerance to salt. 	Simple, lobed leaves are somewhat exotic. © Duncan Slater	very attractive and appear

	Ginkgo biloba		Tree Selector		
		Contents page	Use potential	Crown form	Environment tolerance
YYY	(Maidenhair tree)	Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park Paved Transp corrid		The tree and i	ts features	
Tree size and crown characteristics		, becoming more lar with age. A moderately dense crown.			
Natural habitat	bordering the subtropical evergreen broadleav	the transitional mixed mesophytic deciduous forest ved forest. Found in valleys 300-1100m, on acidic, has proven highly adaptable to a range of soil types.			
Environmental tolerance	Partially tolerant to shade.	nt to drought. Sensitive to waterlogging.			S.P.
Ornamental qualities	Male and female flowers are found on separate trees (dioecious). Both have little ornamental value.	Female trees produce drupe fruit, singly or in pairs which ripen by late autumn. Ripe fruits smell of rancid butter, for this reason male trees make better selections for urban environments.	and visual inter	oba provides excelle est in a public squar	re. © Andrew Hirons
	Deciduous gymnosperm (botanically, <i>Ginkgo biloba</i> is not a conifer) with simple leaves. Autumn colouration is excellent with leaves turning a golden yellow. Single-stemmed with greyish bark, becoming more deeply fissured with age.			le leaves of <i>Ginkgo</i> drew Hirons	biloba are highly
Issues to be aware of	Ripe fruits smell of rancid butter so is undesiral also cause skin irritation.	ble for most urban plantings. The juice form the fruit can			
Notable varieties		Notes			
Male clones	'Autumn Gold', 'Lakeview', 'Princeton Sentry'.	- A very robust tree that is also observed to have			
Male clones narrow	'Fastigiata', 'Fairmount'.	 some tolerance to salt and air pollution. <i>Ginkgo</i> is known to be a high emitter of Biogenic Volatile Organic Compounds (BVOCs). 			Piller 14
			Right: This drup		oba. © Duncan Slater <i>Ginkgo biloba</i> trees ason, it is best to use

	Gleditsia triacanthos			Tree Selector			
	(Honey locust)		 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmentatolerance Ornamental qualities 	
Use potential	Park Paved SuDS	Coastal	Transport corridor	The tree and i	ts features		
Tree size and crown characteristics	A potentially massive tree capable of reaching 40m in its natural habitat. Typically much smaller in cultivation.	oid to irregular	An open crown.				
Natural habitat	Native to central North America. Most frequent found in in woodland on the Gulf coast and in o to heat so will perform best in a warm microclin As a member of Fabaceae it is also capable of on poor quality soils.	open woods up to 600m within its mate but is sufficiently cold-tolera	s range. It is very tolerant ant for the British Isles.				
Environmental tolerance	Intolerant to shade.	nt to drought.	Moderately tolerant to waterlogging.	-			
Ornamental qualities	Male and female flowers are separate, found in relatively inconspicuous racemes in early summer.	pods 30-40cm long	and slightly twisted, seed mature to a lustrous brown en persisting into winter.		nthos is tolerant to c onments. © Henrik Sjör		
	Deciduous broadleaved tree with pinnate or bi-	-pinnate leaves. Excellent yellow a	autumn colour.		* C		
	Single-stemmed. Bark is dark grey with shallow	v fissures. Armed with simple or b	ranched thorns.				
Issues to be aware of	Thorns on the stem are quite formidable so it is	s often best to select a thornless c	ultivar.				
Notable varieties		Notes					
Thornless	'f. inermis', 'Moraine', 'Shademaster'.	- Observed to have some tole	erance to salt and	and the second		K BI	
Regular form	'Imperial', 'Skyline', 'Draves'.	 air pollution. Capable of performing well 	in hard surfaces.	Milling .			
Yellow leaves	'Sunburst'.						
Podless	'Moraine'.				<i>Gleditsia triacantho.</i> ipinnate. © Henrik Sjörr		
Small	'Elegantissima'.	_			er of a yellow-leave hthos 'Sunburst'.	d variety,	

© Duncan Slater

	<i>Gymnocladus dioica</i> (Kentucky coffee tree)	((Contents page Alphabetical Index	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Transport corridor			The tree and i	ts features	
Tree size and crown characteristics	capable of reaching 30m () it appea	lar crown. In winter ars to have a very silhouette.	ely dense crown.			
Natural habitat	Native to eastern US. Found in deciduous forests It enjoys damp fertile soils but as a member of Fa nitrogen, this helps it to perform well on poorer of	abaceae it is also capable of fixing atmosph				
Environmental tolerance	Partially tolerant to shade. Modera		y sensitive gging.			
Ornamental qualities	Male and female flowers are on separate trees (dioecious). Greenish white clusters borne in early summer. Attractive.	Seed pods 15-25cm long matu brown by late autumn. On fem	0	Right: A semi-m	ymnocladus dioica. nature Gymnocladu	
	Deciduous broadleaved tree with bipinnate leave Leaves emerges with a pinky-red hue and in auto		ear.	situation. © Dunca	an Slater	
	Single-stemmed. A grey-brown bark that develo	ps shallow fissures with age.				
issues to be aware of	Seeds are poisonous unless cooked by boiling or	r roasting.				46
Notable varieties		Notes				
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.	 Slow growing in the British Isles as it en summer heat, however, it is perfectly co Observed to have some tolerance to sa 	old-tolerant.			Gymnocladus dioica

Left: The large bipinnate leaves of *Gymnocladus dioica* offer interest throughout the growing season. © Henrik Sjöman

Right: *Gymnocladus dioica* has greenish-white flowers, borne in early summer. © Duncan Slater

		lesia carolina				Conte	nts	Tree Selector Use Crown Form			
	(Ca	rolina silverk	oell)			Alpha Index	betical	Mature size	Crown density	toleranceOrnamental qualities	
Use potential		Park						The tree and i	ts features		
Tree size and crown characteristics	<10M	A small tree capable of reaching 10m. See notes for larger variety.		Irregular to globular crown form.		A moderately den	se crown.	i.			
Natural habitat	•	Native to the eastern forests understorey or on the marg floodplains, swamp margins	ins of deci	duous forests, 0-1600r	n. However, it is a	lso found on elevate	d				
Environmental tolerance	*	Moderately tolerant to shade.	\bigcirc	Moderately sensitiv to drought.	e 💽	Moderately tolera to waterlogging.	int				
Ornamental qualities	LATE SPRING	White bell-shaped flowers h clusters in late spring as the Highly ornamental.				ar-shaped fruit 2-5c wings mature in earl		A flowering <i>Hall</i> © Andrew Hirons	<i>lesia carolina</i> tree in	an park situation.	
	Ø	Deciduous broadleaved tree	e with simp	le leaves.							
V	Y	Single- or multi-stemmed. B	ark brown	-grey becoming more	deeply fissured w	ith age.					
Issues to be aware of		No substantial issues to be a	aware of.								
Notable varieties				Notes						An ann	
Larger form	See note	25.		Halesia t is also so species.	<i>etraptera</i> var. <i>moi</i> Id. Considered by This group is has	n (up to 24m) of this nticola syn Halesia m / some to be the san had significant taxo his is yet to be fully	no <i>nticola</i> ne nomic	The flowers of <i>F</i> in late spring. © Andrew Hirons	Halesia carolina eme	erge with the leaves	

	Hamamelis x intermedia							Tree Selector			
		witch ha		uru		page		Use potential	Crown form	Environmental tolerance	
	(TYDIO	VVILCIIIIC				Inde	nabetical x	Mature size	Crown density	Ornamental qualities	
Use potential	Park	Small garden						The tree and i	ts features		
Tree size and crown characteristics		ree less that 4m. nrub-like.	Va	se shaped low crowi	n.	A moderately de	ense crown.	E			
Natural habitat	Could be	between <i>Hamamelis</i> e considered an unde ogous to a forest soil	erstorey shrub								
Environmental tolerance	Estimate moderat to shade	ely tolerant	me me	timated to be oderately sensitive drought.		Estimated to be moderately sens to waterlogging	sitive				
Ornamental qualities	or orang	of characteristic yell e flowers with narrov g in late winter. High	w petals.	EARLY AUTUMN	woody capsule	develops by early	autumn.	Hamamelis x int © Duncan Slater	termedia flowering i	in a woodland garden.	
	Deciduous broadleaved shrub or small tree with simple leaves. Excellent red-orange autumn colour.							K Hz			
V	Multi-stemmed by character, but occasionally cultivated as a small single-stemmed tree. Smooth brown bark.							and the			
Issues to be aware of	No subst	antial issues to be av	ware of.								
Notable varieties				Notes				ON		A Anna Ser	
Yellow flower	'Arnold Promise', 'A	Angelly', 'Pallida', 'We	esterstede'.		,	only a few of the		10 M	The Doct of L		
Copper-orange flower	'Jelena'.				y available are o warm, dry mio	represented here. croclimates.		535	a state	A CAL	
Red flower	'Diane', 'Ruby Glov	٧'.			_			Left: The flower	rs of Hamamelis x in	ntermedia appear	
								well before the	leaves in late winter	r. © Duncan Slater	

Right: Simple leaves of *Hamamelis* x *intermedia*. These will give excellent autumn colour. © Duncan Slater

	Heptacodium miconioides (Seven-son flower)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Small garden		The tree and i	its features	
Tree size and crown characteristics	A small tree up to 7m. Vase shaped to g	lobular A moderately dense crown.	and the second		Y.
Natural habitat	Native to eastern and central China. Found on cliffs, in scr Known to tolerate a wide range of soils.	ub and forests 600-1000m.			
Environmental tolerance	Estimated to be moderately tolerant to shade.	rant Estimated to be moderately sensitive to waterlogging.			
Ornamental qualities	Creamy white flowers help in upright terminal clusters in early autumn. Fragrant.	Clusters of highly attractive fruits turn from green to purple, then tan during early winter.	in a planting be - Right: The simp	Heptacodium micor d. © Andrew Hirons ble leaves of Heptaco g flower buds. © And	odium miconioides
	Single-stemmed or as a multi-stemmed shrub. Bark is yell at maturity. Attractive but not exceptional.				
Issues to be aware of	No substantial issues to be aware of.				
Notable varieties	Notes				8 8 B
The species is available, how Consult your preferred tree r	nursery for options. of its – Exce	e, but very useful small tree because late flowering and fruiting. lent for bees and other insects as it y late flowering.		of <i>Heptacodium mice</i> a very useful plant	

	<i>Hippophaë salicifolia</i> (Willow-leaved sea buc	kthorn) Contents page Alphabetica	Tree Selector Use Crown potential form Mature Crown classing Crown density Crown	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Coasta	Transport corridor	The tree and its features	
Tree size and crown characteristics	A small tree capable of reaching 10m.	gular to globular A moderately dense cro	pwn.	
Natural habitat		lley slopes. It's ability to fix atmospheric nitrogen oils, including calcareous soils. It is known to be tolerant		
Environmental tolerance		ated to be rately tolerant ught. Estimated to be moderately sensitive to waterlogging.		
Ornamental qualities	Male and female flowers found on separate trees (dioecious). Very small yellow-green flowers produced late spring. Unremarkable.	Small, round, fleshy fruits are held close to branches in clusters. Yellow when ripe in ea autumn. Persisting through much of winter	irly	
	Deciduous broadleaved tree with simple willow underneath as a result of leaf hairs.			
	Single-stemmed. Young stems covered in brow is rough with longitudinal flakes.	n hairs and scale giving a velvety feel. Mature bark		
Issues to be aware of	This tree does have some spines.			1
Notable varieties		Notes		1
No fruit	'Robert', 'Streetwise'.	- An excellent choice for challenging coastal sites		And the second second
Upright	'Streetwise'.	 and for poor quality (but well drained) soils. Observed to have some tolerance to salt and air pollution. 	Hippophaë salicifolia 'Streetwise' environment. This is an under-use	

Hippophaë salicifolia 'Streetwise' growing in a paved environment. This is an under-used species with excellent characteristics for a range of planting scenarios. © Hillier Nurseries

	<i>llex</i> x <i>altaclerensis</i> group (Hybrid holly)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities 			
Use potential	Park Small garden Coastal		The tree and it	s features				
Tree size and crown characteristics	A medium tree up to 12m. Some cultivars are much smaller.	A dense crown.			R			
Natural habitat		complex hybrid between <i>Ilex aquifolium</i> and <i>Ilex perado</i> (including various subsp. of <i>I. perado</i>). ore than 50 cultivars are available within this hybrid group. Prefers quite humic, mildly acidic (pH 6) il that is well drained.						
Environmental tolerance	Estimated to be moderately tolerant to shade. Estimated to be moderately tolerant to drought.	Estimated to be sensitive to waterlogging.						
Ornamental qualities	Male and female flowers are borne on separate trees (dioecious). LATE SPRING LATE SPRING	fruit) ripen by late autumn nroughout winter.	Right: Glossy, ev	rown <i>Ilex</i> x altaclere				
	Evergreen broadleaved trees with simple, often spiny leaves. Numerous cultivar leaves are also part of this group.	- are often spiny. @	Duncan Slater					
	Single-stemmed and multi-stemmed, dependant on the cultivar. Relatively smo	oth grey-green bark.						
Issues to be aware of	Some cultivars have quite spiny leaves that may be unsuitable for some situatio	ns.			SC			
Notable varieties	Notes		67.1					
Hybrid-type habit	'Camellifolia'. – Due to the wide range of cu		Store 1					
Variegated	'Golden King'. 'Golden King'. it is best to consult with you the most suitable cultivar for the most widely available a - <i>Ilex</i> spp. are known to be hi Volatile Organic Compound	or your needs. Two of re mentioned here. gh emitters of Biogenic		rs of <i>Ilex</i> x altaclere				
				t red drupes add in oughout autumn ar	terest to <i>Ilex</i> x ad often into winter.			

	<i>llex aquifolium</i> (European holly)	a 💊	Contents bage Alphabetical ndex	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities 		
Use potential	Park Small Garden Coastal			The tree and i	ts features			
Tree size and crown characteristics	A large tree up to 25m. Some cultivars are much smaller.	A dense crov	vn.		Act			
Natural habitat		Native to Europe, Western Asia and parts or north Africa. Forming part of the understorey in a wide range of forests across its native region. Prefers humic soil but is tolerant of both acidic and calcareous soils providing they are well drained.						
Environmental tolerance	Moderately tolerant to shade.	to drought. Sensitive to v	vaterlogging.	312				
Ornamental qualities	Male and female flowers are usually borne on separate trees (dioecious) in late spring to early summer. Inconspicuous.	late hout winter. ay have	urban park.	uifolium guarding t	he gate to an			
	Evergreen broadleaved trees with simple, often s leaves are also available.	ted	© Andrew Hirons					
V	Single-stemmed and multi-stemmed, dependant Relatively smooth grey bark.							
Issues to be aware of	Some cultivars have quite spiny leaves that may	oe unsuitable for some situations.				2 de		
Notable varieties		Notes		A ANTA				
Compact	'Alaska' (female), 'Atlas' (male).	- Due to the wide range of cultivars availab						
Variegated leaves	'Argentea Marginata', 'Aurea Marginata'.	consult with your nursery regarding the n cultivar for your needs. Most of the widely		And present		CAH		
Narrow	'Pyramidalis'.	cultivars are female so will bear the chara berry-like fruit. An exception to this would						
Yellow fruit	'Bacciflava'.	and therefore fruitless, cultivar 'Atlas'. – <i>Ilex</i> spp. are known to be high emitters of	Left: Glossy, evergreen leaves of <i>Ilex aquifolium</i> (J.C. van Tol' are mostly spineless. © Andrew Hirons					
Mostly spineless leaves	'J.C. van Tol'.	 Volatile Organic Compounds (BVOCs). Excellent for dry shade. 	Right: Red drupes of <i>llex aquifolium</i> give vibrant colour through autumn and winter. Shown here with the spiny					

Volatile Organic Compounds (BVOCs). - Excellent for dry shade.

	<i>llex</i> x <i>aquipernyi</i> 'Dragon La (Hybrid holly)	Contents page Alphabetical Index	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities 		
Use potential	Park Small Garden Coastal		The tree and i	ts features			
Tree size and crown characteristics	A small tree up to 8m. A conical crown to concommendation of the contract of t	A dense crown.					
Natural habitat	An interspecific hybrid from <i>Ilex aquifolium</i> and <i>I. pernyi</i> . Pre acidic and calcareous soils providing they are well drained.	fers humic soil but is tolerant of both			1000		
Environmental tolerance	Estimated to be moderately tolerant to shade. Estimated to be moderately tolerant to drought.	t Estimated to be sensitive to waterlogging.			1 Jan		
Ornamental qualities		Red drupes (berry-like fruit) ripen by late autumn and often persist throughout winter.					
	Evergreen broadleaved trees with simple, spiny leaves.	Evergreen broadleaved trees with simple, spiny leaves.					
V	Single-stemmed and multi-stemmed, dependant on the stoc	k type. Relatively smooth grey bark.					
Issues to be aware of	Spiny leaves may be unsuitable for some situations.						
Notable varieties	Notes				water and		
The hybrid is available, how Consult your preferred tree	nursery for options. – <i>Ilex</i> spp.	'Meschick'. are known to be high emitters of Biogenic Organic Compounds (BVOCs).					
				a <i>quipernyi</i> on the tre conical holly that ha			

A row of *llex* x *aquipernyi* on the tree nursery. This is a useful conical holly that has attractive red fruits, providing a male pollinator is nearby. © Barcham Trees

	<i>llex</i> x <i>koehneana</i> 'Chest (Chestnut leaved holly)	tnut Leaf'	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small Garden Coasta	ıl		The tree and i	ts features	
Tree size and crown characteristics	A medium tree up to 15m. A conic 10-15M A conic		dense crown.			
Natural habitat	An interspecific hybrid from <i>Ilex aquifolium</i> and acidic and calcareous soils providing they are w		tolerant of both			FE
Environmental tolerance		ately tolerant (Levy) to	stimated to be sensitive waterlogging.			
Ornamental qualities	A female cultivar with inconspicuous flowers appearing in late spring.	Red drupes (berry-lik autumn and often per	e fruit) ripen by late sist throughout winter.		P.C.S.	
	Evergreen broadleaved trees with simple, spiny					
V	Single-stemmed and multi-stemmed, dependar	nt on the stock type. Relatively smo	ooth grey bark.	Contraction of the second seco		
Issues to be aware of	Spiny leaves may be unsuitable for some situation	ons.		The		
Notable varieties		Notes				
The hybrid is available, hov Consult your preferred tree	vever, no notable cultivated varieties are widely available. a nursery for options.	 Syn Ilex castaneifolia. Ilex spp. are known to be high Volatile Organic Compounds 			stnut-like, evergreen	

Attractive, chestnut-like, evergreen leaves are characteristic of *Ilex* x *koehneana* 'Chestnut Leaf'. © Duncan Slater

			llie R. St holly)	ever	IS'		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential		Park	Small garden		Coastal			The tree and i	ts features	
Tree size and crown characteristics	<10M	A small t	rree up to 8m.		A conical crown to crown.	ovoid	A dense crown.			
Natural habitat	•				om <i>Ilex aquifolium</i> ar s soils providing they		rs humic soil but	-	Aller	
Environmental tolerance	*	Estimate moderat to shade	ely tolerant		Estimated to be moderately tolerar to drought.	nt 🔶	Estimated to be sensitive to waterlogging.			
Ornamental qualities	LATE SPRING	appearin	e cultivar with incor ng in late spring.				es (berry-like fruit) ripen nd often persist throughout	- ************************************		
		Evergreen broadleaved trees with simple, spiny leaves. Single-stemmed and multi-stemmed, dependant on the stock type. Relatively smooth grey bark.								
Issues to be aware of		Spiny lea	aves may be unsuita	able for som	e situations.				T	Trans
Notable varieties					Notes			A Contractor	A Street Street	
The hybrid is available, howe Consult your preferred tree				widely avail	- <i>llex</i> spp	l vigorous cultivar. b. are known to be l e Organic Compour	high emitters of Biogenic nds (BVOCs).			
								that has red-ora	evens' is a vigorous ange berry-like fruit tes how this cultiva	. This nursery

Tree Species Selection for Green Infrastructure: A Guide for Specifiers

© Barcham Trees

	Juglans nigra	Tree Selector				
	(Black walnut)		 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park			The tree and it	s features	
Tree size and crown characteristics		ular crown. onical when	a moderately dense crown.			
Natural habitat	Native to the eastern US. Generally not abunda especially in moist temperate forests, 0-1000m floodplains. Performs best on deep loamy well- with a range of pH values providing them are no or clay soils are not suitable.	Also occurs on calcareous upland drained, moist soils that are mildly	ds, slopes and acidic but can cope			
Environmental tolerance	Intolerant to shade. Moder to drou	ately sensitive ght.	ensitive to waterlogging.			
Ornamental qualities	Male and female flowers occur separately on the same tree. Both are relatively inconspicuous in late spring.	Rounded nut, 5-8cm in a thick green husk Ripens by early autur	that does not split.	A semi-mature a © Andrew Hirons	<i>Juglans nigra</i> in a p	ark planting.
	Deciduous broadleaved tree with pinnately con					
	Single-stemmed. Light grey-brown bark, becom			all y		
Issues to be aware of	Fruit fall may cause conflict with paved surface so have high allergenicity potential during the f					
Notable varieties		Notes				And No
The species is available, he Consult your preferred tre	owever, no notable cultivated varieties are widely available. e nursery for options.	 This species has a deep rootin requires deep (at least 1m, pro- soil depth to perform well. High value timber. Tolerant of heat. 		© Andrew Hirons	ira has large pinnat	

	<i>Juglans regia</i> (Common walnut)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmentatolerance Ornamental qualities 	
Use potential	Park			The tree and it	s features		
Tree size and crown characteristics	A massive tree capable of reaching 30m in its natural habitat.	re conical ng. Up to 15m	rately dense crown.				
Natural habitat	but occurring frequently moist temperate forests. moist soils that are mildly acidic but can cope with	Native to southeastern Europe, western Asia and western China. Generally not abundant, but occurring frequently moist temperate forests. Performs best on deep loamy well-drained, moist soils that are mildly acidic but can cope with a range of pH values providing them are not too extreme (pH <4.5 or pH >8). Very sandy soils or clay soils are not suitable.					
Environmental tolerance	Partially tolerant to shade. Moderate		e to waterlogging.			AT CA	
Ornamental qualities	Male and female flowers occur separately on the same tree. Both are relatively inconspicuous in late spring.	Rounded or ellipsoid nut, 4- held in a thick green husk th ripens in early autumn. Edib	at splits when it	It this species is u	ovides shade in an used in paved situa nents must be prov	tions, high quality	
	Deciduous broadleaved tree with pinnately compo- but not spectacular.	und leaves. Yellowish autumn colour is	s attractive	© Henrik Sjöman			
	Single-stemmed. Light grey-brown bark, becomin						
Issues to be aware of	Fruit fall may cause conflict with paved surfaces d so have high allergenicity potential during the flow		pollen				
Notable varieties		Notes					
The species is available, h Consult your preferred tro	owever, no notable cultivated varieties are widely available. The nursery for options.	- This species has a deep rooting habi requires deep (at least 1m, preferably soil depth to perform well. - High value timber. - Tolerant of heat.			s and female flower		
					istic green husks o		

	Juniperus communis	Tree Selector			
	(Common juniper)	Contents page	Use potential	Crown form	 Environmenta tolerance Ornamental
		Alphabetical Index	Size	Crown density	Ornamental qualities
Jse potential	Park Small garden Paved		The tree and	ts features	
Tree size and crown characteristics	Highly variable in height, exceptionally up to 15m but much more typically, less than 10m.	e gely			Å
Natural habitat	A vast natural range including the entire circumpolar sub-ar- further south. A pioneer species that grows on a wide range Favours open sites but will occur as part of the understorey adequate light. Requires open ground or very light shade to	of soils from sea level right up to 2400m. of some conifer forests, providing there is			
Environmental colerance	Intolerant to shade. Drought tolerant.	Moderately sensitive to waterlogging.			
Ornamental qualities	on separate trees (dioecious) and are	Small round fleshy cones, 6-9mm in diameter typically ripen in two to three years after pollination. Black with a bluish bloom.	© Henrik Sjöman	tree form of Juniper	
	Evergreen conifer with needle leaves.			i, often rather shrub- make a useful small t	
	Single-stemmed. Reddish-brown bark that often peels in lor	ng strips.			GIN AL
Issues to be aware of	No substantial issues to be aware of. Male <i>J. communis</i> relead potential during the flowering period.	se a lot of pollen so have high allergenicity			
Notable varieties	Notes				KARN
Tree form		re good for birds. the making of Gin.		dle leaves of Juniper	rus communis.
				s of <i>Juniperus comm</i> ave great merit as a	

	<i>Juniperus scopulorum</i> (Rocky mountain junipe	r)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden Paved			The tree and it	s features	
Tree size and crown characteristics	Capable of reaching 15m in favourable conditions but, more typically, gets to around 8m.		se crown.			
Natural habitat	Native to the US, particularly Rocky Mountain respecies in open woodland but is capable of bein level to around 2700m. Particularly at home on Prefers calcareous conditions, but is adaptable t	g a pioneer tree, colonising open grou steep rocky slopes, dry ridges and sand	nd from sea dy soils.	11	. 1	11
Environmental tolerance	Intolerant to shade.	t tolerant. Sensit	ive to waterlogging.		W. V	
Ornamental qualities	Male and female strobili are usually held on separate trees (dioecious) and are inconspicuous. Pollination usually occurs in late spring.	Small round fleshy cones, mature in late autumn the pollination. Black with a bl persisting on the tree for c	second year after uish bloom, often			Wish
	Evergreen conifer with scale leaves.					A AL
	Single-stemmed. Brown to grey bark that has sn	nall plates when mature.				
Issues to be aware of	No substantial issues to be aware of. Male <i>J. scop</i> allergenicity potential during the flowering period		high			
Notable varieties		Notes		A CONTRACT		
Jpright	'Blue arrow'.	- Fruits are good for birds.				
				upright conifer fo	<i>'orum</i> 'Blue arrow' i or small gardens, pa has attractive, blue ere.	arks and paved

	<i>Juniperus virginiana</i> (Eastern red cedar)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Small garden	Coastal Transport corridor	The tree and its	features	
Tree size and crown characteristics	Capable of reaching 30m in favourable conditions but much more typically gets to around 20m.	A dense crown.			
Natural habitat	Native and widespread in the eastern US and south-eastern Canada colonising open ground from sea level to around 1500m. Also occur forest stands. Frequently found on rocky ridge tops and exposed, d a wide range of soils, including calcareous, providing they are well o	rs in open, lightly shaded mixed Iry, upland sites. Adaptable to			۲
Environmental tolerance	Intolerant to shade. Drought tolerant.	Sensitive to waterlogging.	h		End
Drnamental qualities	on separate trees (dioecious) and are mature	ound fleshy cones, 3-6mm in diameter, e in late autumn. Black with a bluish Cones open the following spring.		RE	
	Evergreen conifer with scale leaves at maturity. Juvenile foliage is a the whole crown on young trees or only on younger stems on more				
	Single-stemmed. Dark-brown to grey bark that often peels in long f	ibrous strips.			
ssues to be aware of	Noted as having a shallow root system. Male <i>J. virginiana</i> release a lallergenicity potential during the flowering period.	ot of pollen so have high			
Notable varieties	Notes		- Alter State	NLA.	T-o a h
Species type	'Canaertii'. – Fruits are good - Noted as havin conditions in th	g good tolerance to saline			
			A mature <i>Juniper</i> This is one of the planting scenario: © Henrik Sjöman	best tree junipers	ring by a roadside. for a range of

	Koelreuteria paniculata	3				
		•	Contents page	Use potential	Crown form	Environment tolerance
	(Golden rain tree)		Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential		ransport orridor		The tree and i	ts features	
Tree size and crown characteristics	A large tree growing up to 18m. A glob	bular crown. A mod	derately dense crown.			
Natural habitat	Native to China where it is a gap coloniser and dry valley slopes and has few soil requirement requires a warm microclimate to perform well.	s providing it is well-drained. In the Britis				
Environmental tolerance	Partially tolerant to shade.	ant to drought. Sensi	tive to waterlogging.			
Ornamental qualities	Terminal, pyramidal clusters of yellow flowers appear in late summer. Very attractive.	LATE AUTUMN	ate autumn. They n cooler climates and	in a woodland o	Koelreuteria panicul clearing. © Andrew Hiro	ns
	Deciduous broadleaved tree with pinnate, som Excellent yellow autumn colour.	Deciduous broadleaved tree with pinnate, sometimes also having partially bipinnate, leaves. Excellent yellow autumn colour.			Koelreuteria panicu © Henrik Sjöman	lata flowering
	Single-stemmed. Grey-brown bark becomes sl	lightly fissured with age.				
Issues to be aware of	This species is invasive in warm-temperate env British Isles.	vironments, but this is not currently a pro	oblem in the			
Notable varieties		Notes		AL ?		ANA.
Orange-red leaves	'Coral Sun'.	– A worthy street tree that is under		A4 5	1 A. Me	
Upright	'Fastigiata'.	 Observed to have some tolerance to salt and air pollution. 				MAN S-A
Long flowering	'September'.	_				
		_			aves are an attractiv <i>paniculata.</i> © Andrew	
					s of Koelreuteria nai	

	<i>Laburnum anagyroides</i> (Common laburnum)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and i	ts features	
Tree size and crown characteristics	A small tree less than 10m tall. An obovoid of can reach 8m given enough Can also be of in appearance	n wide h space. quite bushy	n.		
Natural habitat	Native to central and south Europe. Found on forest r by <i>Quercus pubescens</i> . Laburnum associate with spe For this reason, they can perform well on sites with per	cialist soil bacteria to fix atmospheric nitrogen.			
Environmental tolerance	Intolerant to shade. Moderately to drought.	tolerant Sensitive to waterlogging			
Ornamental qualities	Abundant, yellow, pendant flowers cover the tree in late spring.	Pendant seedpods about 8cm long covered in silky hairs. Poisonous.	A flowering <i>Lak</i> impact to a gar	burnum anagyroide. den.	
	Deciduous broadleaved tree with pinnate leaves.		© Duncan Slater		
V	Available as a small single-stemmed tree or a small m relatively smooth.	ulti-stem tree. Green-brown bark,			
Issues to be aware of	This species is poisonous so careful consideration mu	ist be given to site selection.			
Notable varieties	Ν	otes			A NAME
The species is available, hc Consult your preferred tre	e nursery for options. - S - C t	/ery well adapted to a cool-temperate climate despite its origins. Slow growth and slow to establish. Containerised stock appear to establish more readily han rootballed (balled and burlapped) stock. Observed to have some tolerance to salt.		ant clusters of flower Duncan Slater	ers are abundant
			Right: Pendant	seedpods of <i>Labur</i> nterest in autumn b	

	Laburnum x watereri (Hybrid laburnum)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Small garden		The tree and it	s features	
Tree size and crown characteristics	A small tree less than 10m tall. An obovoid crown that can reach 8m wide given enough space. Can also be quite bushy in appearance.	A moderately dense crown.		A SH	
Natural habitat	A hybrid between <i>Laburnum anagyroides</i> and <i>Laburnum alpinum</i> . Lab bacteria to fix atmospheric nitrogen. For this reason, they can perform				
Environmental tolerance	Intolerant to shade. Moderately sensitive to drought.	Sensitive to waterlogging.		a and a second	
Ornamental qualities		seedpods about 8cm long n silky hairs. Poisonous.	A mature <i>Laburr</i> in late spring. © Henrik Sjöman	num x watereri 'Vos	ssii' flowering
	Deciduous broadleaved tree with pinnate leaves.				
	A single-stemmed tree. Green-brown bark.				
Issues to be aware of	This species is poisonous so careful consideration must be given to sit	e selection.	9-		
Notable varieties	Notes				
Hybrid-type habit	for parks and sma less drought toler – Slow growth and – Containerised sto than rootballed (b				urnum x watereri are more visual impact.

	<i>Larix decidua</i> (Common larch)	((Contents page Alphabetical Index	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park			The tree and i	ts features	
Tree size and crown characteristics		ng irregular	tely dense crown.			
Natural habitat	Native to the high mountains of central Europe, the timberline. However, it grows best on deep, on calcareous or peaty soils.					
Environmental tolerance	Intolerant to shade. Moderat to drou		o waterlogging.			
Ornamental qualities	Male and female strobili appear in late spring but are inconspicuous.	Cones (1.5-3.5cm in length) are and attractive when young. Th in late autumn to a yellowish-b	ney mature	Left: A mature I	Larix decidua. © Henr	ik Sjöman
	A deciduous conifer with needle leaves. The you are particularly attractive.	AUTUMN autumng green foliage and golden yellow autum	n colour		idua is one on the fo eedle leaves are rep	
	Single-stemmed. Bark is grey-brown, becoming	fissured and scaly with age.				
Issues to be aware of	Potentially a very large tree so needs space to d	levelop.				
Notable varieties		Notes				
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.	- All <i>Larix</i> are sensitive to air pollution.		Left: The group	prown bark of Larix	

Left: The grey-brown bark of *Larix decidua* becomes fissured with age. © Duncan Slater Right: The female flower of *Larix decidua*. © Duncan Slater

	<i>Larix kaempferi</i> (Japanese larch)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A massive tree capable of reaching 35m. A conical crown, often becoming irregular with age. To about 10m in diameter.	A moderately dense crown.			
Natural habitat	Native to the Japanese Alps, 500-2900m. A pioneer tree and forest t Predominantly found on moist (mesic) sites. Never found on peaty sit on calcareous soils.				
Environmental tolerance	Intolerant to shade. Moderately sensitive to drought.	Sensitive to waterlogging.			
Ornamental qualities	late spring but are inconspicuous.	.5-3.5cm in length) are reddish active when young. They mature Itumn to a yellowish-brown.	The attractive of © Duncan Slater	open-grown form of	f Larix kaempferi.
	A deciduous conifer with needle leaves. The young green foliage and are particularly attractive.	golden yellow autumn colour	Control of		
	Single-stemmed. Bark is grey-brown, becoming fissured and scaly wi	th age.			
Issues to be aware of	Potentially a very large tree so needs space to develop.				
Notable varieties	Notes		Rent of		
Contorted form		itive to air pollution.			A March March
Weeping	'Pendula' There are numer for small gardens	ous dwarf varieties that are useful 5.		uous male flowers o	f Larix kaometari

appear with rosettes of new needles in late spring. © Duncan Slater

Right: The green summer foliage turns golden-yellow in autumn. © Andrew Hirons

	Larix x marschlinsii			Tree Selector		
	(Hybrid larch)		Contents page Alphabetical Index	Use potential Mature size	 Crown form Crown density 	 Environmentatolerance Ornamental qualities
Use potential	Park			The tree and i	its features	
Tree size and crown characteristics	of reaching 40m. becom	ical crown, often ning irregular ge. To about n diameter.	derately dense crown.			
Natural habitat	A hybrid between <i>Larix decidua</i> and <i>L. kaempi</i>	feri.				
Environmental tolerance	Intolerant to shade. Mode to dro		itive to waterlogging.			
Ornamental qualities	Male and female strobili appear in late spring but are inconspicuous.	Cones are reddish purple when young. They mature to a yellowish-brown.		© Duncan Slater	Larix x marschlinsii.	
	A deciduous conifer with needle leaves. The year are particularly attractive.	bung green foliage and golden yellow at	utumn colour	- Right: <i>Larix</i> x m 'hybrid vigour'.	© Andrew Hirons	excellent
	Single-stemmed. Bark is grey-brown, becomin	g fissured and scaly with age.				
Issues to be aware of	Potentially a very large tree so needs space to	develop.		-		
Notable varieties		Notes				A SAPLY
The hybrid is available, hc Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.	 Syn Larix x eurolepsis. Displays excellent 'hybrid vigour' tougher and faster to establish the All Larix are sensitive to air polluti 	an either parent.			
				© Andrew Hirons	of new needles on La <i>Larix x marschlinsii</i> ature.	

	<i>Ligustrum japonicum</i> (Japanese tree privet)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Small garden		The tree and i	ts features	
Tree size and crown characteristics	A small tree to 8m. A globular to irregular crown.	dense crown.			
Natural habitat	Native to temperate forests of Japan and the Korean penninsula.				
Environmental tolerance	moderately tolerant () moderately tolerant (stimated to be noderately sensitive o waterlogging.			
Ornamental qualities	Prominent, creamy-white pyramidal flower clusters are highly attractive in late summer. LATE SUMMER	-		nicum is a useful even ites and small garde	ergreen broadleaved ens.
	Evergreen broadleaved tree with simple glossy leaves.				12 c
	Single-stemmed. Relatively smooth, light-grey bark.				0
Issues to be aware of	Clusters of fruit may cause issues with paved surfaces in some situations, but often feed on this tree, reducing this potential problem.	n the birds helpfully	J. Star		
Notable varieties					
The species is available, h	owever, no notable cultivated varieties are widely available.		11 10 10	JI MA	

Consult your preferred tree nursery for options.

Right: Clusters of small dark fruits add interest in winter. © Barcham Trees

	<i>Ligustrum lucidum</i> (Chinese privet)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Small garden		The tree and its	features	
Tree size and crown characteristics	A small tree to 10m. A globul crown.	r to irregular A dense crown.			THE P
Natural habitat	Native to temperate forests of China.				
Environmental tolerance	Moderately tolerant to shade. Moderat	Moderately sensitive to waterlogging.		Yat	ELI
Ornamental qualities	Prominent, creamy-white pyramidal flower clusters are highly attractive in late summer.	Clusters of dark blue-black oblong fruits are prominent in early winter.	Ligustrum lucidum tree for paved site © Henrik Sjöman		
	Evergreen broadleaved tree with simple glossy le		C Henrik Sjoman		A.
	Single-stemmed. Relatively smooth, light-grey ba	k.			
Issues to be aware of	Invasive in warmer climates. Clusters of fruit may but often the birds helpfully feed on this tree, red	cause issues with paved surfaces in some situations, Icing this potential problem.			
Notable varieties		Notes			
Variegated leaves	'Varigata'.	 This tree species is invasive in warm-temperate climates but generally this is not problematic in cool-temperate climates. 	Left: New glossy I © Duncan Slater Right: Clusters of interest in late sur	creamy-white flo	

	<i>Liquidambar styraciflu</i> (Sweetgum)	a	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Paved SuDS	Transport corridor		The tree and it	s features	
Tree size and crown characteristics	tree capable of reaching its life	al for much of becoming more with age.	noderately dense crown.			
Natural habitat	Native to eastern US and high elevations in pa Predominantly found in swamp margins, flood soil but is fairly adaptable to a range of soils.					23
Environmental tolerance			derately tolerant vaterlogging.			
Ornamental qualities	Fairly inconspicuous male and female flowers occur separately on the same tree in late spring. Of little ornamental value.	Spikey capsules (gum-1 flowering, are prominer and may well persist int	nt by early autumn	© Andrew Hirons	iquidambar styraci	·
	Deciduous broadleaved tree with simple palmate leaves. Spectacular autumn colour: reds, oranges and yellows.				bar styraciflua prov o a landscape. © не	
	Single-stemmed. Dark-grey bark, becoming d	Single-stemmed. Dark-grey bark, becoming deeply fissured with age. Young stems have corky wings.				
Issues to be aware of	Fruit litter can cause a problem on paved surfaction climate. <i>L. styraciflua</i> release a lot of pollen so					
Notable varieties		Notes				
Excellent autumn colour	'Lane Roberts', 'Thea', 'Worplesdon', 'Burgundy'.	- The use of known cultivar is esse	ential if a predicable		A MARINA	Alle Contraction
Columnar	'Slender Silhouette'.	 form is required. 'Worplesdon' has been selected 	l for the British climate.	A STR		
Cut leaf	'Stella', 'Stared'.	 All cultivars have good autumn An excellent, fast-growing, vers 				
Varieigated leaves	'Manon variegata', 'Aurea'.	 infrastructure. <i>Liquidambar</i> spp. are known to of Biogenic Organic Compound Observed to have some toleran air pollution. 	be high emitters Is (BVOCs).	similar to some ı Right: Spikey ca	maples. © Andrew Hirc psules of <i>Liquidam</i>	

	Liriodendron tulipifera		Tree Selector		
	(Tulip tree)	 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park	- muex	The tree and i	-	- quanties
Tree size and crown characteristics	A massive tree capable of reaching 40m in its natural habitat. Smaller but still large in cultivation.	A moderately dense crown.			
Natural habitat	Native to the eastern North America from southern Canada to the gu fertile, moist soils on slopes (0-1500m) alongside streams and on swa is good drainage.				
Environmental tolerance	Partially tolerant to shade. Moderately sensitive to drought.	Sensitive to waterlogging.			
Ornamental qualities		seeds held in a tight cone-like te that fall away from a central stalk.	Liriodendron tu	<i>lipfera</i> is a fast grov -quality rooting zor	ving tree when
	Deciduous broadleaved tree with simple leaves. Leaves turn yellow in	autumn.	© Henrik Sjöman		
	Single-stemmed. Green-brown bark, becoming deeply fissured with a	age.			265
Issues to be aware of	Potentially a very large tree.				
Notable varieties	Notes				- Li
Variegated leaves		e that readily establishes.			
Upright	'Fastigiatum'. – Good for bees. S and small mamm	eeds are also eaten by birds nals.	Left: The leaves	of Liriodendron tul	<i>ipfera</i> have

Left: The leaves of *Liriodendron tulipfera* have an interesting shape and turn yellow in autumn. © Andrew Hirons

Right: On mature trees, tulip-shaped flowers appear in early summer. © Henrik Sjöman

	Magnolia acuminata			Tree Selector			
	(Cucumber tree)		 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities 	
Use potential	Park Small garden			The tree and i	ts features		
Tree size and crown characteristics	tree capable of reaching becom	nes very broad, und 20m, with	erately dense crown.				
Natural habitat	Native to the eastern US and south-eastern Ca with deep, rich, well-drained soils. Known to co extreme (<ph 5="" or="">pH 8).</ph>						
Environmental tolerance	Moderately tolerant to shade. Sensit	tive to drought. Sensitiv	ve to waterlogging.				
Ornamental qualities	Light yellow flowers emerge in late spring just after the leaves emerge. Attractive but not the most prominent of the magnolias.	A cone-like aggregate of fo an early stage of developm small cucumbers. Maturing in early autumn.	ent resemble	situation. © Andre	Magnolia acuminata W Hirons ctive yellow flowers		
	Deciduous broadleaved tree with simple leave foliage in autumn.	Deciduous broadleaved tree with simple leaves. Capable of producing very attractive golden yellow foliage in autumn.					
	Single-stemmed. Brown, slightly fissured bark,		-				
Issues to be aware of	Unless a 'small tree' variety is used, this specie space to thrive.	s is capable of becoming a massive tree so	o requires	-b-		5	
Notable varieties		Notes		alle I		DI	
	es not have any widely available cultivars. are available – see notes.	 Magnolia acuminate is a parent of m flowered magnolia cultivars. The var subcordata group (e.g. 'Kob 'Miss Honeybee') are considerably s the species so have use potential fo Magnolia spp. are known to be high Biogenic Volatile Organic Compour 	an Dori' and maller than r small gardens. emitters of		w flowers of Magno. ppring after the leave		

	Magnolia denudata (Yulan magnolia)	Contents page Alphabetical Index	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Small garden		The tree and it	s features	
Tree size and crown characteristics	(()) crown	apable of getting m wide.			
Natural habitat	Native to moist woodlands of central China. Pre soil but will also tolerate calcareous conditions a	fers relatively deep, moist, nutrient-rich, mildly acidic s well.			
Environmental tolerance	Partially tolerant to shade. Modera	tely sensitive ght. Sensitive to waterlogging.			
Ornamental qualities	Creamy white flowers open in early spring before the leaves emerge. Highly ornamental.	Follicles held on a central spindle in a cone-like structure turn red by early autumn. Attractive.	<i>Magnolia denuda</i> site. This species	ata flowering prolif s will require a high is to thrive in pave	quality rooting
V	A multi-stemmed or single-stemmed tree. Bark	s light grey and relatively smooth.			The
lssues to be aware of	No substantial issues to be aware of.				N DY
Notable varieties		Notes		12 34	TT I
Yellow flower	'Yellow River'.	 Flowers are vulnerable to late frosts. Will also flower in light shade. Magnolia spp. are known to be high emitters of Biogenic Volatile Organic Compounds (BVOCs). 	The flowers of <i>M</i> the leaves emerg @ Andrew Hirons	agnolia denudata o ge in spring.	open before

	<i>Magnolia</i> 'Elizabeth' (Hybrid magnolia)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden			The tree and it	s features	
Tree size and crown characteristics	A medium tree up to 15m. A conical to irr crown capable about 8m wide	e of getting	oderately dense crown.			M.
Natural habitat	A hybrid between <i>Magnolia acuminata</i> and <i>M. denudat</i>	a.				
Environmental tolerance	Estimated to be partially tolerant to shade. Estimated to be not to drought.		nated to be sensitive aterlogging.		6 24	
Ornamental qualities	Pale yellow flowers open in late spring to reveal red stamens. Highly ornamental.		little			
	A multi-stemmed tree. Bark is light grey and relatively s					
Issues to be aware of	No substantial issues to be aware of.					
Notable varieties	Not	:es			STA 24	
Not applicable: a single c		agnolia spp. are known to be hig ogenic Volatile Organic Compo				pale, yellow flowers the leaves expand.

A hybrid between <i>Magnolia liliiflora</i> 'Nigra' a Adaptable to quite poor quality soils. Estimated to be partially tolerant to shade.		Contents page Alphabetical A moderately dense crown	 Use potential Mature size The tree and i	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Park Small garden A small tree up to 9m. Image: Comparison of generation of	etting about 7m wide.	A moderately dense crown	The tree and i		Ornamental qualities
A small tree up to 9m. An of g A hybrid between Magnolia liliiflora 'Nigra' a Adaptable to quite poor quality soils. An of g Estimated to be partially tolerant to shade. Estimated	etting about 7m wide.		_	its features	
A hybrid between <i>Magnolia liliiflora</i> 'Nigra' a Adaptable to quite poor quality soils. Estimated to be partially tolerant to shade.	etting about 7m wide.			t,	
Adaptable to quite poor quality soils. Estimated to be partially tolerant to shade.		'Diva'.		C)	
tolerant to shade.	mated to be				
to c	derately sensitive rought.	Estimated to be sensitive to waterlogging.			
Pink-purple flowers open in late spring. Highly ornamental.	ornamental v	rent, are of little alue.			
Deciduous broadleaved tree with simple lear					
A single-stemmed tree. Bark is light grey and	relatively smooth.				
No substantial issues to be aware of.					
	Notes			XI	La
			The pink-purple	a flowers of Magnoli	ia 'Galaxy' are
	A single-stemmed tree. Bark is light grey and No substantial issues to be aware of.	Notes - Magnolia spp. are know	Deciduous broadleaved tree with simple leaves. A single-stemmed tree. Bark is light grey and relatively smooth. No substantial issues to be aware of. Notes	Deciduous broadleaved tree with simple leaves. A single-stemmed tree. Bark is light grey and relatively smooth. No substantial issues to be aware of. Notes - Magnolia spp. are known to be high emitters of Biogenic Volatile Organic Compounds (BVOCs). The pink-purple	Deciduous broadleaved tree with simple leaves. A single-stemmed tree. Bark is light grey and relatively smooth. No substantial issues to be aware of. Notes - Magnolia spp. are known to be high emitters of Biogenic Volatile Organic Compounds (BVOCs). The pink-purple flowers of Magnoli spectacular in late spring as the leaves of the spring as

	<i>Magnolia grandiflora</i> (Southern magnolia)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics	capable of reaching 30m.	A crown that probad, n, over time.			
Natural habitat	Native to the south-eastern US. Found on coast Requires a warm microclimate with a moist soil t				
Environmental tolerance	Tolerant to shade. Modera to drou	ely sensitive Sensitive to waterlogging.			
Drnamental Jualities	Large white flowers appear in early summer. Very attractive but not profuse.	Follicles held on a central spindle in a cone-like structure turn red by early autumn. Attractive.	The evergreen, b		<i>lagnolia grandiflora</i> rge flowers in early
	Evergreen broadleaved tree with simple leaves.		© Henrik Sjöman		
	Single-stemmed. Dark grey bark, smooth at first				
lssues to be aware of	Creates a very dry shade beneath its crown. As litter throughout the year.	n evergreen broadleaved tree it does create some leaf			
Notable varieties		Notes			
Species-type	'Gallissonière'.	 'Gallissonière' has good cold-hardiness for the British Isles. Magnolia spp. are known to be high emitters of Biogenic Volatile Organic Compounds (BVOCs). 		after many other r	<i>ia grandiflora</i> appear magnolia species

	<i>Magnolia</i> 'Heaven Scent' (Hybrid magnolia)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and i	ts features	
Tree size and crown characteristics	A medium tree up to 12m. 10-15M A medium tree up to 12m. A globular crown capable of getting about 10m wide.	A moderately dense crown.			
Natural habitat	A hybrid between <i>Magnolia liliiflora</i> 'Nigra' and <i>M.</i> x <i>veitchii</i> .		1 No	P	45
Environmental colerance	Estimated to be partially tolerant to shade. Estimated to be moderately sensitive to drought.	Estimated to be sensitive to waterlogging.			
Ornamental qualities	Rose-purple flowers open in late spring. Highly ornamental. Fruits, if app ornamental	arent, are of little value.			
	Deciduous broadleaved tree with simple leaves.				
	A single-stemmed tree. Bark is light grey and relatively smooth.			JA	
Issues to be aware of	No substantial issues to be aware of.				
Notable varieties	Notes		5.10	MP-	TRANK IN
Not applicable: a single ci		own to be high emitters of Janic Compounds (BVOCs).	open in late spr	en Scent' has rose-p ing with the expand ree is useful for sma	ourple flowers that ding leaves This Il gardens and parks.

	Magnolia kobus		Tree Selector			
	(Kobushi magnolia)	 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmental tolerance Ornamental qualities 	
Use potential	Park Small garden		The tree and i	ts features		
Tree size and crown characteristics		A moderately dense crown 8m wide.				
Natural habitat	Native to temperate forests of Japan and South calcareous soils, providing they are not too dry	Norea. Adaptable to a wide range of soils including and are humus-rich.		1973 A		
Environmental tolerance	Moderately tolerant to shade. Moder	ately sensitive Moderately sensitive to waterlogging.		- In		
Ornamental qualities	White flowers emerge before the leaves in early spring.	Follicles held on a central spindle in a cone-like structure turn brown by early autumn.		: in full bloom is spe _{jõman}	ectacular in early	
	Deciduous broadleaved tree with simple leaves				I mal	
	Single-stemmed. Smooth dark grey bark.				92	
Issues to be aware of	No substantial issues to be aware of.					
Notable varieties		Notes			STA	
The species is available, h Consult your preferred tr	owever, no notable cultivated varieties are widely available. ee nursery for options.	 Flowering only really becomes profuse when plants get to 20-30 years. <i>Magnolia</i> spp. are known to be high emitters of Biogenic Volatile Organic Compounds (BVOCs). 	before the leave © Henrik Sjöman	flowers of <i>Magnolia</i> es in spring.	-	

© Henrik Sjöman

	Magnolia x loebneri		Tree Selector					
		Contents page	Use potential	Crown form	Environmenta tolerance			
((())	(Loebner magnolia)	G Alphabetic Index		Crown density	Ornamental qualities			
Jse potential	Park Small garden		The tree and	its features				
Tree size and crown characteristics		void crown that about 4-6m wide. A moderately dense cro	own.					
Natural habitat	A hybrid between <i>Magnolia kobus</i> and <i>M. stell</i> soils, providing they are well-drained.	<i>llata</i> . Adaptable to a wide range of soils, including calcared	pus Que to the second s					
Environmental colerance	Moderately tolerant to shade. Sens	itive to drought. Sensitive to waterlogg	ing.					
Ornamental qualities	White or purple-pink flowers emerge in early spring before the leaves. Fragrant.	Fruits, if apparent, are of little ornamental value.		vered <i>Magnolia</i> x <i>loe</i> Il in a shady planting				
	Deciduous broadleaved tree with simple leav	© Harry Watkins	Mr. 144					
	Single-stemmed. Grey bark, smooth when yo			25				
Issues to be aware of	No substantial issues to be aware of.		-		122			
Notable varieties		Notes	-					
Purple-pink flowers	'Leonard Messel', 'Raspberry Fun'.	- Although quite early flowering the flowers are						
White flowers	'Merrill', 'Star Bright'.	 quite frost resistant. <i>Magnolia</i> spp. are known to be high emitters of Biogenic Volatile Organic Compounds (BVOCs). 	Left: The white	e flower of Magnolia	x loebneri			
			'Star Bright'. © Right: The pink	Harry Watkins flower of <i>Magnolia</i>	x loebneri			

Right: The pink flower of *Magnolia* x *loebneri* 'Raspberry Fun'. © Harry Watkins

	Magnolia x soulangeana	3		Tree Selector			
	(Saucer magnolia)		 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environment tolerance Ornamental qualities 	
Jse potential	Park Small garden			The tree and i	ts features		
Free size and crown characteristics		d crown that out 4-6m wide.	rately dense crown.				
latural habitat	A hybrid between <i>Magnolia denudata</i> and <i>M. lilii</i> they are moist and well aerated.	<i>flora.</i> Adaptable to a wide range of soils p	providing				
Environmental :olerance	Moderately tolerant to shade.	re to drought. Sensitive	e to waterlogging.				
Drnamental qualities	Depending on the cultivar. White, pink, purple, reddish-purple flowers emerge in early spring before the leaves. Fragrant.	Fruits, if apparent, are of littl ornamental value.	e		langeana in flower is pring. A good range ower colour		
	Deciduous broadleaved tree with simple leaves.	© Henrik Sjöman		2			
V	Single-stemmed or multi-stemmed. Grey bark, s	vith age.	1				
lssues to be aware of	No substantial issues to be aware of.				12		
Notable varieties		Notes				No.	
White flowers	'Lennei Alba'.	- Flowers can be sensitive to frosts.					
Purple flowers	'Rustica Rubra'.	<i>– Magnolia</i> spp. are known to be high e Biogenic Volatile Organic Compound		YE			
Pink flowers	'Verbanica'.			14	No.		
Deep purple-red flowers	'Burgundy'.			Left: A white-flo soulangeana. ©	owered cultivar of A Henrik Sjöman	1agnolia x	
					x soulangeana flow	vers before	

© Harry Watkins

	Magnolia 'Spectrum'					_	Tree Selector			
	(Hy	/brid	magno	olia)	•		 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential		Park	Sma gard					The tree and	its features	
Tree size and crown characteristics	<10M	A small tr	ee up to 8m.		An ovoid to globular crown capable of getting about 8m wide.	Ť	A moderately dense crown	n.	alt Chile	
Natural habitat	*		between <i>Magno</i> e to quite poor		igra' and <i>M. sprengeri</i> var. <i>sp</i>	<i>rengeri</i> 'Diva				
Environmental tolerance	*	Estimated tolerant to	d to be partially o shade.	\bigcirc	Estimated to be moderately sensitive to drought.		Estimated to be sensitive to waterlogging.			
Ornamental qualities	LATE SPRING	Reddish-ı Highly orı	ourple flowers o namental.	ppen in late s		if apparent, nental value.	are of little	Many magnolia 'Spectrum' flov © Harry Watkins	a cultivars such as th ver from a young ag	is <i>Magnolia</i> ge.
	Ø	Deciduous broadleaved tree with simple leaves.								
	A single-stemmed tree. Bark is light grey and relatively smooth.									
lssues to be aware of		No substa	antial issues to k	be aware of.					E	
Notable varieties					Notes			1000		
Not applicable: a single cu	ıltivar profil	e.			- <i>Magnolia</i> spp. Biogenic Vola	are known to :ile Organic C	be high emitters of ompounds (BVOCs).	Sel.		

	Magnolia 'Star Wars'		Contents	Tree Selector	Crown	Environmental
	(Hybrid magnolia)		 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Ornamental qualities
Use potential	Park Small garden			The tree and i	ts features	
Tree size and crown characteristics	A small tree up to 5m. A globular cr capable of g about 5m wi	etting	a moderately dense crown.		A large	
Natural habitat	A hybrid between <i>Magnolia campbellii</i> and <i>M. liliiflora</i>	Э.				
Environmental tolerance	Estimated to be partially tolerant to shade. Estimated to drought.		Estimated to be sensitive o waterlogging.		C	
Ornamental qualities	Deep pink-purple flowers open in early spring before the leaves. Highly ornamental and fragrant.	Fruits, if apparent, are ornamental value.	e of little	Magnolia 'Star V before the leave © Caerhays Estate	Wars' flowering in ea	arly spring shortly
	A multi-stemmed tree. Bark is light grey and relatively	y smooth.				
Issues to be aware of	No substantial issues to be aware of.					
Notable varieties	N	otes		-		
Not applicable: a single cu		<i>Magnolia</i> spp. are known to b Biogenic Volatile Organic Cor		Flowers on Mag developing late © Caerhays Estate	anolia 'Star Wars' ma r in the year, up to e	ay also be seen early autumn.

	Magnolia stellata							Tree Selector	Tree Selector			
	(Star n						 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities 		
Use potential	Park		nall arden					The tree and i	ts features			
Tree size and crown characteristics	A sma reache	ll tree that es 7m.		An ovoid to glob crown that gets a 4-6m wide.		A mod	erately dense crown.					
Natural habitat	marsh;	y areas near lake	es and ponds, or	etween 50-600m on the hillsides ab Is soils if it is kept v	ove streams. Requ							
Environmental tolerance	Moder to share	ately tolerant de.		Sensitive to dro	ught.		ately tolerant erlogging.					
Ornamental qualities	tepals	emerge in early	ers with quite nar spring before th pink flush. Fragr	e leaves.	structure turn		pindle in a cone-like arly autumn.	Magnolia stellat wetter conditio © Harry Watkins	<i>a</i> is an excellent ma ns.	gnolia for slightly		
	Decide	uous broadleave	ed tree with simp	le leaves.					Alla			
V	Single	-stemmed or mi	ulti-stemmed. Gr	ey bark, smooth w	hen young, becon	ning rougher	with age.			Mar -		
Issues to be aware of	No sub	ostantial issues t	o be aware of.					SIP	A			
Notable varieties				Notes	5			Spart	BANN	Sec. 1		
The species is available, ho Consult your preferred tre			es are widely ava	– Magi	vers can be sensitiv nolia spp. are knov enic Volatile Orga	vn to be high						

The white flowers of *Magnolia stellata* appear delicate with their narrow tepals. © Harry Watkins

	Magnolia 'Susan' (Hybrid magnolia)	 Contents page Alphabetical Index 	Use potentialMature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Small garden		The tree and i	ts features	
Tree size and crown characteristics		A moderately dense crown of getting m wide.			
Natural habitat	A hybrid between <i>Magnolia liliiflora</i> 'Nigra' and	<i>1. stellata</i> 'Rosea'. Prefers mildly acidic soil.		Kar	
Environmental tolerance		Estimated to be sensitive to waterlogging.			
Ornamental qualities	Deep pink-purple flowers open in late spring before the leaves. Highly ornamental and fragrant.	Fruits, if apparent, are of little ornamental value.			
	Deciduous broadleaved tree with simple leaves				
	A multi-stemmed tree. Bark is light grey and re	tively smooth.			
Issues to be aware of	No substantial issues to be aware of.				
Notable varieties		Notes		S AU	
Not applicable: a single cu	ıltivar profile.	- <i>Magnolia</i> spp. are known to be high emitters of Biogenic Volatile Organic Compounds (BVOCs).	The highly orna of <i>Magnolia</i> 'Su:	mental pink-purple	flowers

	<i>Magnolia</i> 'Yellow Bird' (Hybrid magnolia)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and i	ts features	
Tree size and crown characteristics		al to irregular apable of getting m wide.	/n.		
Natural habitat	A hybrid between <i>Magnolia</i> x <i>brooklynensis</i> 'Eva	Maria' and <i>M. acuminata</i> var. <i>subcordata</i> .			
Environmental tolerance		ed to be tely sensitive ght.			
Ornamental qualities	Lemon-yellow flowers open in late spring. Highly ornamental.	Fruits, if apparent, are of little ornamental value.	A young tree of © Harry Watkins	Magnolia 'Yellow B	Bird'.
	A multi-stemmed tree. Bark is light grey and rela	tively smooth.			5.7
Issues to be aware of	No substantial issues to be aware of.				
Notable varieties		Notes	and the second second		10
Not applicable: a single cu	iltivar profile.	 Tends to bloom later than Magnolia 'Elizabeth' so helps to avoid later frost damage to flowers. Magnolia spp. are known to be high emitters of Biogenic Volatile Organic Compounds (BVOCs). 	© Harry Watkins Right: <i>Magnolia</i>		Aagnolia 'Yellow Bird'.

	<i>Malus baccata</i> (Siberian crabapple)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Small garden		The tree and it	ts features	
Tree size and crown characteristics	A medium tree capable of reaching 12m. An ovoid t crown.	egular A moderately dense crown			
Natural habitat	Native to Siberia.				
Environmental tolerance	Estimated to be partially tolerant to shade. Estimated to drough				
Ornamental qualities	White flowers emerge from a pink bud in late spring. Highly ornamental.	Glossy purple-red to brownish-purple fruits are prominent during autumn. Persisting into winter. Highly ornamental.	A young <i>Malus I</i> © Andrew Hirons	<i>baccata</i> in a garder	n planting.
	Deciduous broadleaved tree with simple leaves.				
	Single-stemmed. Dark brown relatively smooth bar				
Issues to be aware of	Fruit litter may cause an issue on some sites.				
Notable varieties		es		IKDY	
Narrow crown	'Street Parade'.	bod for bees and other pollinating insects.	After an excelle start to develop © Andrew Hirons		y, small crabapples

	Malus cultivars	Contents page	Tree Selector Use potential	Crown form	Environmental tolerance
	(Apples and crabapples	Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park Small garden		The tree and it	s features	
Tree size and crown characteristics	A small tree capable of reaching around 5m. An ovoi	d to irregular A moderately dense crown.	ablest	Here a	
Natural habitat	Hybrids and cultivars. Adaptable to a wide range not become waterlogged.	e of soils providing that they are not too dry and does			
Environmental tolerance		Estimated to be sensitive to waterlogging.			
Ornamental qualities	White, red or pink lowers emerge in late spring. Highly ornamental.	Fruits are most prominent during autumn. Persisting into winter. Highly ornamental.	© Andrew Hirons	olph' is spectacular	
	Deciduous broadleaved tree with simple leaves.			ereste' in full bloom	n in late spring.
	Single-stemmed. Dark brown relatively smooth I				
Issues to be aware of	Fruit litter may cause an issue on some sites.				
Notable varieties		Notes			1 CW
Edible	'Bramley Seedling', 'Cox's Orange Pippin', 'Egremont Russett', 'Golden Delicious', 'Howgate Wonder'.	 Numerous cultivars are available so it is best to talk to your nursery about the best variety 	R. S.		Mart
Pink flowers	'Donald Wyman', 'James Grieve', 'Rudolph'.	for your needs. - Good for bees and other pollinating insects.	F CAN		1 13
Red flowers	'Director Moerland'.			of pink-flowered cu	
White flowers	'Evereste', 'John Downie', 'Golden Hornet'.			lph' are available. @ <i>us</i> cultivars flower <i>us</i> 'Evereste'.	

	<i>Malus hupehensis</i> (Chinese crabapple)	 Content page Alphabe Index 	potential form tolerance
Use potential	Park Small garden		The tree and its features
Tree size and crown characteristics	A small tree capable of reaching 7m.	ular crown. A moderately dense	e crown.
Natural habitat	Native to China and Taiwan. Found in forest mar between 1700-1900m but up to 2900m. Adapta		
Environmental tolerance	Estimated to be partially tolerant to shade.	ely sensitive to waterlogging.	nsitive
Ornamental qualities	White flowers emerge from a pink bud in late spring. Highly ornamental.	Glossy, translucent, dark red fruits are prominent during autumn. Persisting int winter. Highly ornamental.	to A mature <i>Malus hupehensis</i> . © Andrew Hirons
	Deciduous broadleaved tree with simple leaves.		
	Single-stemmed. Dark brown relatively smooth k	ark.	
Issues to be aware of	Fruit litter may cause an issue on some sites.		
Notable varieties		Notes	
Species-type habit	'Arie Mauritz'.	- Good resistance to scab and mildew. - Good for bees and other pollinating insects.	Left: The leaves of <i>Malus hupehensis</i> have good resistance to scab and mildew.
			Right: Glossy, dark, red fruits often persist into winter. © Duncan Slater

	<i>Malus sylvestris</i> (European crabapple)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden			The tree and i	ts features	
Tree size and crown characteristics	A small tree capable of reaching 7m.	ular crown. A mo	oderately dense crown.			
Natural habitat	Native to Europe, including the British Isles. For wide range of soils providing they are nutrient-		daptable to a			
Environmental tolerance	Partially tolerant to shade. Moder to drop		itive to waterlogging.			
Ornamental qualities	White flowers emerge from a pink bud in late spring. Highly ornamental.	Greenish-yellow fruits wi are prominent during aut winter. Highly ornamenta	umn. Persisting into	A mature <i>Malus</i> © Duncan Slater	sylvestris in full flow	ver.
	Deciduous broadleaved tree with simple leaves	j.				188
	Single-stemmed. Dark brown relatively smooth	bark.				
Issues to be aware of	Fruit litter may cause an issue on paved sites.					
Notable varieties		Notes		1 . J.		7 Starting
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.	- Good for bees and other pollinati	ng insects.			20

Left: White flowers emerge from a pink bud, in late spring. © Duncan Slater

Right: *Malus sylvestris* has greenish-yellow fruits that are prominent in autumn. © Duncan Slater

	Malus toringo			Tree Selector		
	(Toringo crabapple)		Contents page	Use potential	Crown form	Environmenta tolerance
			Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park Small garden			The tree and i	ts features	
Tree size and crown characteristics	A small tree capable of reaching 5m.	A globular crown. A mod	erately dense crown.			
Natural habitat	Native to Japan. Found in forest margins they are nutrient-rich.	and on slopes. Adaptable to a wide range of s	bils providing			- And -
Environmental colerance	tolerant to shade.		ted to be sensitive erlogging.			
Ornamental qualities	Light pink or white flowers emerge from a purplish-red bud in late spring. Highly ornamental.	Yellow-orange fruits are pr during autumn. Persisting i Highly ornamental.		reddish hues.	<i>Alus toringo</i> often e	emerge with
	Deciduous broadleaved tree with simple			© Tim Baxter		
	Single-stemmed. Dark brown relatively si	mooth bark.				
ssues to be aware of	Fruit litter may cause an issue on paved s	sites.				
Notable varieties		Notes				
Species-type habit	'Brouwers Beauty'.	- Syn Malus sieboldii. Good for bees a	and other	A State		101 70)
Pink flowers	'Scarlett'.	pollinating insects.				
				Loft: M/bito flow	Vors of Malus taking	
				© Barcham Trees	ers of <i>Malus toring</i> o	

Right: The glossy red-orange fruits of *Malus toringo* add interest in autumn and winter. © Barcham Trees

	Malus trilobata		Tree Selector		
		Contents page	Use potential	Crown form	Environmental tolerance
ŶŶ	(Lebanese wild apple)	Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park Small garden Paved		The tree and i	its features	
Tree size and crown characteristics	A medium tree capable of reaching 15m.	A dense crown.			
Natural habitat		e and western Asia. Found in deciduous scrub, oak and wide range of soils providing they are nutrient-rich.			
Environmental tolerance	Partially tolerant to shade. Moderat	tely tolerant ght. Sensitive to waterlogging.	The second		-
Ornamental qualities	White flowers emerge from a white buds in early summer. Highly ornamental.	Red fruits are prominent during autumn. Persisting into winter. Highly ornamental.			
	Deciduous broadleaved tree with simple leaves. I	Excellent red autumn colour.		an sol	
	Single-stemmed. Grey-brown relatively smooth b	bark.			
Issues to be aware of	Fruit litter may cause an issue on paved sites.				S.A.
Notable varieties		Notes	1.1.1		Se to
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.	 Syns Eriolobus trilobatus and Sorbus trilobata. Excellent potential as a street tree. Good for bees and other pollinating insects. 	0		
				nerous possible nan sed tree with great p	

Tree Species Selection for Green Infrastructure: A Guide for Specifiers

© Barcham Trees

	Malus yunnanensis		Tree Selector		
		Contents page	Use potential	Crown form	Environmenta tolerance
ŶŶ	(Yunnan crabapple)	Alphabetical Index	Mature size	Crown density	Ornamental qualities
Jse potential	Park Small garden		The tree and i	ts features	
Tree size and crown characteristics	A small tree capable of reaching 10m. An ovoid crown, quite conical when young.	A moderately dense crown.			
Natural habitat	Native to China. Adaptable to a wide range of soils providing they are nu	trient-rich.			
Environmental tolerance	Estimated to be partially tolerant to shade. Estimated to be moderately tolerant to drought.	Estimated to be sensitive to waterlogging.			
Ornamental qualities		w fruits are prominent nn. Persisting into winter. nental.	well in open wo	Malus yunnanensis p oodland. © Tim Baxter	
	Deciduous broadleaved tree with simple leaves. Excellent red autumn co	lour.	- Right: Simple le © Tim Baxter	aves turn red in autu	imn.
	Single-stemmed. Grey-brown relatively smooth bark.		6	JAK	
Issues to be aware of	Fruit litter may cause an issue on paved sites.				
Notable varieties	Notes			The se	
Species-type habit	as it is much more re	ive for <i>Malus tschonoskii</i> sistant to disease. ther pollinating insects.	The fruits of Ma	alus yunnanensis are	wellow or red
			in colour. © Tim Baxter	nus yunnanensis die	yenow of red

	Maytenus boaria			Tree Selector		
	(Chilean mayten)		 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Small garden	Coastal	Transport corridor	The tree and i	ts features	
Tree size and crown characteristics	A large tree up to 25m. In cultivation, trees tend to be less than 10m.	id crown.	An open crown.			
Natural habitat	Native to Chile and north-western Argentina. Fo to wet mountain slopes and even quite saline sc					
Environmental tolerance		ted to be ately tolerant ight.	Estimated to be moderately sensitive to waterlogging.			
Ornamental qualities	Male and female flowers are separate but occur on the same tree. Inconspicuous amongst the evergreen foliage.	Red capsules riper attractive but not p		© Hillier Nurseries		sed in a urban garden.
	Evergreen broadleaved tree with simple leaves.			 Right: A mature iiiier Nurseries 	, open-grown <i>Mayte</i>	enus boaria.
	Single-stemmed in cultivation although scrubby Bark is grey and becomes platy with age.	r forms may be found in the wild	ł.			
Issues to be aware of	Spreads by root suckers so this needs to be con	sidered.				
Notable varieties		Notes			20/11	
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. e nursery for options.	- An underutilised tree. - Observed to have some tol	lerance to salt.			

The flowers of *Maytenus boaria* provide some seasonal interest but they are relatively inconspicuous amongst the evergreen foliage. © Hillier Nurseries

	Mespilus germanica (Medlar)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden			The tree and i	ts features	
Tree size and crown characteristics	A small tree capable of reaching around 8m.	gular crown form. A m	noderately dense crown.			
Natural habitat	Native to Europe, the Caucasus and western Asi Adaptable to a wide range of soils, including cal					
Environmental tolerance	Partially tolerant to shade. Modera		nsitive to waterlogging.			
Ornamental qualities	White flowers held at the end of the shoots appear in late spring.	Russet brown fruits are feature in during autum are over-ripe and have p	ın. Edible when they		<i>nica</i> can be grown a on a rather bushy a	
	Deciduous broadleaved tree with simple leaves.	Often turning an attractive golden-l	brown in autumn.		- 49- V	
	Single-stemmed, but young plants can be rather	r bushy.				
Issues to be aware of	Fruit litter may become an issue on paved surface	ces.				
Notable varieties		Notes				MAL
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.	- Slow growing and slow to estab - Good for bees and other pollina				ar after the leaves

Left: Attractive white flowers appear after the leaves in late spring. © Duncan Slater

Right: The russet-brown fruits of *Mespilus germanica* are only edible when they are over-ripe. © Henrik Sjöman

	<i>Metasequoia glyptostro</i> (Dawn redwood)	ooides	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park			The tree and it	s features	
Tree size and crown characteristics	A massive tree capable of reaching 35m.	crown. A	moderately dense crown.			
Natural habitat	Native to China.					
Environmental tolerance	Moderately tolerant to shade. Moderately tolerant		ensitive to waterlogging.			
Ornamental qualities	Male and female flowers are held separately on the same tree. Inconspicuous with little ornamental merit.	Cones ripen over abor	ut a year.	a conical crown i	a glyptostroboides nto maturity. © Dund	can Slater
	Deciduous conifer. Needles turn a bronze-orang	rown in autumn giving seasona	l interest.		e leaves are decidud colour in autumn.	
	Single-stemmed. Reddish brown bark, peeling ir	ng strips. Often becoming silve	ry-grey with age.			
Issues to be aware of	M. glyptostroboides release a lot of pollen so have	nigh allergenicity potential durir	ng the flowering period.			
Notable varieties		Notes				Son as
Yellow foliage	'Goldrush'.	- Fast growing and easy to esta		· · · · · · //		A
Narrow crown	'Sheridan Spire'.	can be somewhat sensitive to the establishment phase. - Observed to have some tolera and have some tolerance to sa - This is a deciduous conifer so to fall off in autumn.	nce to air pollution alt.	attractive, reddis	s often have fluted h-brown bark. © He ing cones mature a	nrik Sjöman

	<i>Morus alba</i> (White mulberry)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmentatol Ornamentalo qualities
Use potential	Park		The tree and its	s features	
Tree size and crown characteristics	A medium tree capable of reaching 15m, although often less than 10m. A globular crown, becoming rather b	road. A moderately dense crown.		<u> </u>	Wa.
Natural habitat	Native to hillside forests in central and north China. Widely grown on a wide range of soils. Prefers a warm microclimat				A ARE
Environmental tolerance	Partially tolerant to shade. Moderately tolera to drought.	Sensitive to waterlogging.		Arlan.	
Ornamental qualities	Male and female flowers typically held on separate trees (dioecious) and are of little ornamental value. Late spring.	Fruit cluster held on a short stalk ripening in late summer. Edible.	A broad-spreadir in a paved enviro © Henrik Sjöman		vides useful shade
	Deciduous broadleaved tree with simple leaves. Some leave enhances the visual impact of the foliage.	es have very attractive lobes which			
	Single-stemmed. Bark is light grey, acquiring shallow fissure	es with age.			
Issues to be aware of	Fruit may cause an issue on paved surfaces in some situation Male <i>M. alba</i> release a lot of pollen so have high allergenicit				
Notable varieties	Notes				6
Fruitless		ant of the silkworm so vital for the silk industry.	and and		
Cut leaf	'Lacinata' Observ	ed to have some tolerance to salt.	and a second		Provide State
Jpright	'Pyramidalis'.		and the second sec		
Large-leaved	'Macrophylla' (syn 'Platinifolia').			iture fruit of <i>Morus</i> mer and are edible	<i>alba.</i> These fruits
Weeping	'Pendula'.		© Henrik Sjöman		

	<i>Morus nigra</i> (Black mulberry)	Contents page Alphabetical Index	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A medium tree capable of reaching 15m, although often less than 10m.	moderately dense crown			
Natural habitat	Origins have been lost due to such an extensive time of cultivation (thousands of ye probably native to western Asia. Enjoys calcareous soil but will grown on a wide rar Prefers a warm microclimate.				
Environmental tolerance		timated to be sensitive waterlogging.		Carlos and	
Ornamental qualities	Male and female flowers typically held on separate trees (dioecious) and are of little ornamental value. Late spring.		The broad-spre © Henrik Sjöman	ading crown of <i>Mor</i>	rus nigra.
	Deciduous broadleaved tree with simple leaves. Rough leaves help to distinguish fr	om <i>Morus alba</i> .			
	Single-stemmed. Bark is light grey, becoming rough with age.				ACT
Issues to be aware of	Fruit may cause an issue on paved surfaces in some situations.				
Notable varieties					

The species is available, however, no notable cultivated varieties are widely available. Consult your preferred tree nursery for options.

Right: Edible fruit clusters of *Morus nigra* ripen in late summer. © Duncan Slater

	Nothofagus antarctica		Tree Selector		
	(Antarctic beech)	Contents page Alphabetical Index	Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A medium tree capable of reaching 15m. An ovoid crown.	A moderately dense crown			
Natural habitat	Native to Chile and Argentina. Found on marginal sites, of fresh lava and ash deposits. It also grows on steep slopes,				
Environmental tolerance	Estimated to be partially tolerant to shade. Estimated to be moderately sens to drought.				
Ornamental qualities	Male and female flowers (catkins) occur separately on the same plant in early summer. Inconspicuous with little ornamental merit.	Nutlets found in late summer but of little ornamental value.	in a park. © Dunc		
	Deciduous broadleaved tree with simple leaves. Good red	l autumn colour.	- Right: Nothofag in autumn. © Dur	gus antarctica devel ncan Slater	ops a red colour
	Single-stemmed. Dark grey bark, strongly and irregularly f	fissured.			
issues to be aware of	No substantial issues to be aware of.		No.		
Notable varieties	Notes				100
The species is available, h Consult your preferred tre		her bushy on unfavourable sites.			

Nothofagus antarctica is one of the few tree species from South America that we can plant in the British Isles. © Henrik Sjöman

	Nyssa sylvatica (Black tupelo)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A large tree capable of reaching 25m. A conical crown, becoming ovoid at maturity. Up to 12m wide	A moderately dense crown.			and a
Natural habitat	Native to the eastern US. Found in well-drained upland woods an Prefers deep rich mildly acidic soils.	d rich deciduous forests to about 1250m.			
Environmental tolerance	Moderately tolerant to shade. Moderately sensitive to drought.	Moderately sensitive to waterlogging.			
Ornamental qualities		h-black ovoid drupes ripen arly autumn.	© Henrik Sjöman	lyssa sylvatica tree.	olaying autumn colou
	Deciduous broadleaved tree with simple leaves. Excellent red-ora	ange autumn colour.	© Henrik Sjöman		
	Single-stemmed. Dark grey bark, becoming fissured with age.				0.2
Issues to be aware of	Few issues recorded for this species but this species has been kn	own to produce root suckers.			
Notable varieties	Notes			al o	
Species-type habit		very good for bees despite being			C
Red young leaves		t to transplant so it takes some time		8/-	A C
Weeping	'Autumn Cascades'. to establish,	but well worth being patient with.	red colour in au	of <i>Nyssa sylvatica</i> t tumn. © Andrew Hirons	5
			Right: Small dru are good for bir	ipe fruits ripen in ea ds.	ariy autumn and

© Henrik Sjöman

	Olea europaea (Olive)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Paved Small garde			The tree and it	s features	
Tree size and crown characteristics		egular to globular n form.	A dense crown.			AL D
Natural habitat	Probably native to south-eastern Europe, west in cultivation that actual origins have been obs					N/A
Environmental tolerance	Estimated to be partially tolerant to shade.	ant to drought.	Estimated to be sensitive to waterlogging.			
Ornamental qualities	Small clusters of yellow-white flowers appear in early summer. Fairly inconspicuous.) about 1-3cm long ripen lowever, fruits may not tish Isles climate.	© Duncan Slater	I form of a young C	
	Evergreen broadleaved tree with simple leaves surface is silvery-grey.	s. Upper leaf surface is grey-green	whilst the lower		<i>uropaea</i> growing in e grove in Spain. ©	
	Single-stemmed. Dark brown-grey bark becom	ning rough with age.				
Issues to be aware of	O. europaea release a lot of pollen so have high	h allergenicity potential during the	flowering period.			
Notable varieties		Notes		Tri-	1620	
The species is available, h Consult your preferred tr	nowever, no notable cultivated varieties are widely available. ee nursery for options.	 Must be in a warm microclin do well in the British Isles. Observed to have some tole 		upper side but s	st, leathery leaves ilvery underneath. olives – the lack of	© Duncan Slater

often means that olives – the lack of summer heat often means that olives never ripen in the British Isles. © Duncan Slater

	Ostrya carpinifolia (Hop hornbeam)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Coastal Transport corridor		The tree and	its features	
Tree size and crown characteristics	A large tree capable of reaching 20m. A globular, occasionally irregular or ovoid crown. Capable of becoming 12m wide.	A moderately dense crown.			
Natural habitat	Native to southern Europe and western Asia, including the Caucasus. Found as wide range of warm-temperate deciduous forests, including coastal forests on Found on a wide range of soils, including calcareous.				
Environmental tolerance	Moderately tolerant to shade. Moderately tolerant to drought.	Sensitive to waterlogging.			
Ornamental qualities	separately on the same tree. Attractive.	papery husk and held like) clusters. Turning brown by late summer.	garden. © Andrev		
	Deciduous broadleaved tree with simple leaves.			kins of <i>Ostrya carpir</i> æspring. ©Andrew Hir	
	Single-stemmed. Grey bark, smooth when young but flaking with age.		M/		
Issues to be aware of	No substantial issues to be aware of.				
Notable varieties			N Y Y	MALE 11	

The species is available, however, no notable cultivated varieties are widely available. Consult your preferred tree nursery for options.

	<i>Parrotia persica</i> (Persian ironwood)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved		The tree and i	ts features	
Tree size and crown characteristics	A large tree capable of growing up to 25m in its native range but rarely exceeding 12m in cultivation.				
Natural habitat	Native to western Asia in the temperate deciduous forest up to stands. Prefers open, dry, sunny sites and grows mainly on low-l on mildly acidic humus-rich forest soil. However, known to be to tolerant and cold-hardy throughout the British Isles.	lying plains and mountain foothills			
Environmental tolerance	Estimated to be moderately tolerant to shade. Moderately tolerant to drought.	Estimated to be moderately sensitive to waterlogging.			
Ornamental qualities		iked seed capsule fully develops by Iy autumn. Rather inconspicuous.	A tree form of F © Henrik Sjöman	Parrotia persica.	
	Deciduous broadleaved tree with simple leaves. One of the first Excellent reds, oranges and yellows from late summer and through				des.
	Single- and multi-stemmed trees available. Light grey with exfol purplish, young bark beneath. Attractive.	liating flakes revealing more coloured,			
Issues to be aware of	This species does develop root suckers, but they are rarely prob the 'tree form' cultivar is selected.	plematic. A rather shrubby tree unless			
Notable varieties	Notes				
Tree form		nakes a great street tree but other			2 300-
Weeping	'Pendula'. should be p	e too shrubby for use in streets and blanted in parks or large gardens. w-growing tree.	Left: Parrotia pe	ersica is one of the f	irst species
			to show colour	in autumn. © Henrik Sj sters of attractive fl	jöman

in late winter.

	<i>Paulownia tomentosa</i> (Foxglove tree)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved			The tree and it	s features	
Tree size and crown characteristics		lar, occasionally own form.	derately dense crown.			
Natural habitat	Native to China found as a pioneer of disturbed sheltered locations but can tolerate a wide range		Prefers sunny,			
Environmental tolerance	Partially tolerant to shade. Modera to drou		tive to waterlogging.		ЦЦ	
Ornamental qualities	Upright light-purple flower spikes cover the crown just before the leaves appear in late spring. Highly ornamental.	Ovoid woody capsules m autumn and can persist in after they have split and s	to winter on the tree,	Paulownia tomer © GreenBlue Urban	ntosa in full bloom i	n paved environment
	Deciduous broadleaved tree with large simple le	aves.				
	Single-stemmed. Grey-brown bark. Young stems	are velvety with a dense covering of	hair.			
Issues to be aware of	In warm-temperate regions this species has bee in cooler regions, such as the British Isles. Wood					
Notable varieties		Notes				
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. e nursery for options.	 Very fast to establish and fast gro Flowers are partially formed at the so are at risk of cold-injury during this can reduce the impact of pote spring flowering. Warm, sheltered therefore, preferable. 	e end of summer severe spring frosts, entially spectacular	in late spring, be © Andrew Hirons	ght flower spikes co fore the leaves app uple leaves with imm	ear.

	Phellodendron amurens (Amur cork tree)	9	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden			The tree and it	s features	
Tree size and crown characteristics		broad at the	moderately dense crown.			
Natural habitat	Native to China, Manchuria, Mongolia and the Kore exposed slopes. Adaptable to a wide range of soil		prests and open			
Environmental tolerance	Intolerant to shade. Moderate to drough	3	oderately sensitive waterlogging.			
Ornamental qualities	Male and female flowers occur on separate trees (dioecious). Yellowish-green in late spring but inconspicuous.		female trees develop < clusters of berries by iten persist into winter.	A mature <i>Phello</i> © Henrik Sjöman	dendron amurense	growing in a park.
	Deciduous broadleaved tree with pinnate leaves. New full point often short-lived as leaves fall quite early.	ery attractive foliage. Autumn c	olour is yellow	B.C.		
	Single-stemmed. Light-brown corky bark, deeply t	ssured on mature trees.				L Ca
Issues to be aware of	This species has been noted as invasive in some pair in the British Isles.	rts of the US but not currently r	noted as an issue			
Notable varieties		Notes		1 A a to		
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. e nursery for options.	 A very cold-hardy tree that callock to cold climates. Slow growing and slow estable of becoming a fantastic open Beware of the crown becomin so give plenty of space. Buy a large stock size, as sapli sensitive to frost. 	ish, but capable grown specimen. g very wide,	feature of <i>Phello</i> Right: The flowe	ured, corky bark is dendron amurense rs of Phellodendron of prominent among	. © Henrik Sjöman n <i>amurense</i> are

	<i>Picea abies</i> (Norway spruce)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics	A massive tree capable of reaching 60m.	al crown. A dense crown.			
Natural habitat	Found as a semi-pioneer and a climax species b	Iding the British Isles) as far east as the Ural mountains. Netween 400-2450m in coniferous or mixed coniferous- ed soils but can cope with a wide range of soil types			
Environmental tolerance	Tolerant to shade. Modera to drou	ately sensitive aght. Moderately sensitive to waterlogging.			
Ornamental qualities	Inconspicuous flowers (strobili) appear in late spring.	Hanging seed cones mature to reddish-brown by the winter following pollination, persisting on the tree for some time. Attractive.	Left: A mature <i>Pl</i> form. © Henrik Sjöm	an	ns a strongly conical
	Evergreen conifer tree with needle leaves.			th is an attractive der, darker foliage	
	Single-stemmed. Grey platy bark detaching in s	cales to reveal brown patches.			
Issues to be aware of	Potentially a very large tree.				
Notable varieties		Notes			
Weeping	'Inversa'.	 This species is very sensitive to weed competition as a newly planted tree. Therefore, mulching will be critical to aid establishment. In nature, it only acts as a pioneer when associated with a nurse species, such as <i>Betula pendula</i>. Sensitive to urban pollution so should be restricted to rural and park situations. 	© Duncan Slater	nes platy and roug	

	<i>Picea breweriana</i> (Brewer spruce)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmentatolerance Ornamental qualities
Jse potential	Park			The tree and it	s features	
Tree size and crown characteristics	A massive tree capable of reaching 40m. Usually smaller in cultivation but still potentially massive.	A dense	crown.		*	
Natural habitat	Native to a small regions of the Klamath and Sis It is found on mountain slopes and in ravines at mixed-species conifer forest. Capable of growin but always requires good soil aeration.	lower elevation in pure stands or as part	ofa			
Environmental tolerance	Moderately tolerant to shade. Sensitive	ve to drought. Sensitiv	e to waterlogging.			
Ornamental qualities	Inconspicuous flowers (strobili) in late spring.	Hanging seed cones are pur They mature to brown by th pollination, persisting on the time. Attractive throughout	e winter following tree for some	characteristic dr	cea breweriana dev ooping foliage. © D	uncan Slater
	Evergreen conifer tree with needle leaves. This soften known as weeping spruce.	pruce has particularly attractive pendan	foliage so is	Right: The need © Duncan Slater	e leaves of <i>Picea b</i>	rewerlana.
	Single-stemmed. Scaly bark at maturity with new later turning grey.	wly exposed bark starting a reddish-brov	n colour but			
Issues to be aware of	Potentially a very large tree.					
Notable varieties		Notes			N SAL	
The species is available, he Consult your preferred tre	owever, no notable cultivated varieties are widely available. e nursery for options.	 Sensitive to urban pollution so shoul to rural and park situations. A slow growing tree, especially whe but worth the wait. Consider a large if instant impact is required. 	n young –	Male flowers of <i>I</i> ornamental mer	Picea breweriana a	re of little

Use potential	Park A massive tree capable of reaching 30m. A massive tree capable of reaching 30m. A very narrow conical crown. Growing to about 4m wide. A massive tree capable of reaching 30m. A very narrow conical crown. Growing to about 4m wide. A massive tree capable of reaching 30m. A very narrow conical crown. Growing to about 4m wide. A massive tree capable of reaching 30m. A massive tree capable of tree capabl	dense crown.	The tree and i	ts features	
characteristics	of reaching 30m. crown. Growing to about 4m wide. Native to the Dinaric Alps on the Balkan peninsula, 300-1700m. Found on steep rom		1		
Natural habitat					
		cky slopes			MIC
Environmental tolerance	Tolerant to shade. Moderately sensitive to drought. Set	ensitive to waterlogging.			
Ornamental qualities	Inconspicuous flowers (strobili) appear in late spring. ATE NNG	ne winter following on the tree for	attractive when	ical form of <i>Picea o</i> this species is plan	
	Evergreen conifer tree with needle leaves.		_ © Henrik Sjöman		
	Single-stemmed. Grey platy bark detaching in scales to reveal brown patches.				
Issues to be aware of	Potentially a very large tree. Shallow rooting so may interfere with surface infrastruk Known to be sensitive to wind exposure.	cture.			
Notable varieties				1 1-1-1	

Consult your preferred tree nursery for options.

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Right: A female 'flower' of *Picea omorika*, pretty, but hard to spot. © Duncan Slater

	<i>Picea orientalis</i> (Caucasian spruce)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A massive tree capable of reaching 60m. A conical crown. Growing to about 5m wide.	A dense crown.	. 15	50	
Natural habitat	Native to western Asia, 1000-2000m, in mixed forests. Will grow on a wide including calcareous, providing they are well-drained.	e range of soils,			
Environmental tolerance	Estimated to be tolerant to shade. Estimated to be moderately tolerant to drought.	Estimated to be sensitive to waterlogging.			A LIA
Ornamental qualities	in late spring.	cones turn from purple to y the winter following pollination, the tree for some time. Attractive.	in the Caucasus	growing in their nat s mountains.	ive environment
	Evergreen conifer tree with needle leaves.		© Henrik Sjöman		
	Single-stemmed. Grey platy bark detaching in scales to reveal brown patch	nës.			
Issues to be aware of	Potentially a very large tree.				
Notable varieties	Notes				Mary Mary
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options Tolerant of warm micr choice for many urbar	oclimates so is a better a sites than <i>Picea abies.</i>			

Left: *Picea orientalis* can become massive trees so are best confined to park environments. © Henrik Sjöman

Right: Needle leaves of *Picea orientalis*. © Henrik Sjöman

	Picea pungens			Tree Selector		
	(Colorado blue spruce)		Contents page	Use potential	Crown form	Environmenta tolerance
			Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park			The tree and i	ts features	
Tree size and crown characteristics		Growing to about	e crown.			× A
Natural habitat	Native to the lower montane forests of the Rock Predominantly found in riparian areas. Adaptabl		areous.			
Environmental tolerance	Tolerant to shade. Modera to drout		e to waterlogging.			
Ornamental qualities	Inconspicuous flowers (strobili) appear in late spring.	Hanging seed cones turn from to yellow-grey by the winte pollination, persisting on the some time. Attractive.	r following	© Henrik Sjöman	ature Picea pungens	
	Evergreen conifer tree with needle leaves.			- Right: A young © Henrik Sjöman	Picea pungens 'Gla	
	Single-stemmed. Grey platy bark detaching in so	cales to reveal brown patches.				AN/
Issues to be aware of	Potentially a very large tree.					
Notable varieties		Notes				
Blue needles	'Hoopsii', 'Blue Diamond', 'Glauca'.	- Tolerant of warm microclimates so i for many urban sites than <i>Picea abie</i>		These make att	of blue needled cul ractive trees and ar	e always smaller
					s-type. © Duncan Slater e 'flower' of <i>Picea pu</i>	

© Duncan Slater

	Picea sitchensis (Sitka spruce)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Coastal		The tree and it	ts features	
Tree size and crown characteristics	A massive tree capable of reaching 96m. A real forest giant. Smaller in cultivation.	A dense crown.			
Natural habitat	Native to the pacific west coast of North Americ characterised by temperate rainforest. Pure star pioneer situations but it is also common in mixed		-		
Environmental tolerance	Moderately tolerant to shade. Modera	tely sensitive ght. Sensitive to waterlogging	J		And
Ornamental qualities	Inconspicuous flowers (strobili) in late spring.	Hanging seed cones are purple-green when young and mature to light brown by the winte following pollination. They persist on the tree for some time. Attractive.	Left: <i>Picea sitche</i> in open environr	ensis can make an a ments. © Duncan Slate	r
	Evergreen conifer tree with needle leaves.		- Right: Mature Priform. © Duncan Sla	<i>icea sitchensis</i> mair ^{iter}	
	Single-stemmed. Relatively smooth, grey bark, c	larkening and becoming scaly with age.			
Issues to be aware of	Potentially a very large tree. Has the potential to c	lisplay invasive characteristics in temperate oceanic climate	es.		
Notable varieties		Notes			
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.	 Sensitive to urban pollution so should be restricted to rural and park situations. Although mostly used for forestry, it can make an attractive amenity tree, providing it is given sufficient space to develop. If planted in appropriate conditions, it readily establishes and displays fast growth. 	© Duncan Slater	e 'flower' of Picea sit	

	Pinus nigra (Black pine)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Coasta	Transport corridor		The tree and it	s features	
Tree size and crown characteristics		ng much broader	nse crown.			
Natural habitat	Native to mountain forests of central and southe Adaptable to a wide range of soils, including cal Also tolerant of coastal conditions.					
Environmental tolerance	Partially tolerant to shade.	t to drought. Sens	itive to waterlogging.			
Ornamental qualities	Inconspicuous flowers (strobili) appear in late spring.	LATE AUTUMN Seed cones ripen in the a second year after pollinat the following spring about the initial flowering event	tion. They are shed ut two years after	Mature <i>Pinus nig</i> © Henrik Sjöman	<i>ura</i> lining a road. Thi	is is a versitile species
	Evergreen conifer tree with needle leaves.					
	Single-stemmed. Dark grey-brown platy bark, d	eeply fissured with age.				
Issues to be aware of	Potentially a very large tree.					
Notable varieties		Notes				
Single stem	subsp. <i>laricio</i> (Corsican pine).	- Tolerant of air pollution and salt.				CANNON CONTRACT
Broader crown	subsp. <i>nigra</i> (Austrian pine).	- An extremely robust species for u	urban conditions.			1 Mart
Narrow crown	'Pyramidalis'.				can develop into n and demonstrates	

Right: The male 'flower' of *Pinus nigra* subsp, *nigra*. © Duncan Slater

	<i>Pinus pinaster</i> (Maritime pine)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Coastal Transp corrid		The tree and it	s features	
Tree size and crown characteristics		A dense crown. A dense crown. Curity.			MAN MY
Natural habitat	Occurs up to 2000m in the mountains of north	n. A pioneer of coastal sites, particularly dry, sandy soils. A Africa. Adaptable to a wide range of soils, including nutrient content. Cold hardy to about -12°C so some			
Environmental tolerance	Intolerant to shade. Moder to dro	rately tolerant ught. Sensitive to waterlogging.			
Ornamental qualities	Inconspicuous flowers (strobili) appear in late spring.	Seed cones ripen in the autumn of their second year after pollination. They persist on the tree for several years.			
	Evergreen conifer tree with needle leaves.				716//
	Single-stemmed. Dark red-brown platy bark, d	eeply fissured with age.			
Issues to be aware of	No substantial issues to be aware of.				
Notable varieties		Notes	State of the local division of the local div		C PAR
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. e nursery for options.	- Prefers a warm microclimate. - Tolerant of air pollution.			
				f <i>Pinus pinaster.</i> Thi ith challenging con	s is a useful species ditions but it does

Needle leaves of *Pinus pinaster*. This is a useful species that can cope with challenging conditions but it does require a warm microclimate to thrive. © Barcham Trees

	Pinus pinea (Stone pine)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Coasta	Transport corridor		The tree and i	ts features	
Tree size and crown characteristics	of reaching 25m. young,	becoming vase or umbrella-like	nse crown.			
Natural habitat	Natural range is obscured as a result of extensiv peninsula. Now grows most extensively around Prefers mildly acidic, sandy soils but will grow o and clay soils. Occurs up to 1000m. Capable of	the Mediterranean and parts of weste n calcareous sites. Growth is rather lim	rn Asia.			
Environmental tolerance	Estimated to be partially tolerant to shade.		nated to be sensitive aterlogging.			
Ornamental qualities	Inconspicuous flowers (strobili) appear in late spring.	Seed cones ripen in the s third year after pollination on the tree for several years	n. They persist			This young globular -like form at maturity
	Evergreen conifer tree with needle leaves.					
	Single-stemmed. Dark red-brown platy bark, de	ep vertical fissures develop with age.			the les	
Issues to be aware of	No substantial issues to be aware of.			-		
Notable varieties		Notes		man 1 m		12 Basilians
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.	 Prefers a warm microclimate and Known to be tolerant of air pollut Cultivated for centuries for its edi 	ion.			

A young planting of *Pinus pinea* in a garden. © Duncan Slater

	<i>Pinus radiata</i> (Monterey pine)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Coastal Transpo corrido		The tree and it	ts features	
Tree size and crown characteristics	of reaching 40m. broade	al crown ning with age coming irregular.			
Natural habitat	Native to coastal forests of California, US. Adapt Can cope with soils of low nutrient content.	able to a wide range of soil textures but prefers acid soils.			
Environmental tolerance	Partially tolerant to shade. Modera	ately tolerant ght. Sensitive to waterlogging.			
Ornamental qualities	Inconspicuous flowers (strobili) appear in late spring.	Seed cones take a full two years to ripen after pollination. They persist on the tree for several years singly or in clusters of up to five.	An imposing <i>Pir</i> © Andrew Hirons	<i>hus radiata</i> in a larg	e garden.
	Evergreen conifer tree with needle leaves.				4000
	Single-stemmed. Grey to reddish-brown platy b	ark, deeply fissured with age.			
Issues to be aware of	Potentially a very large tree.				
Notable varieties		Notes	-		
The species is available, h Consult your preferred tr	owever, no notable cultivated varieties are widely available. ee nursery for options.	 Tolerant of air pollution. Naturalised in some parts of the world beyond its natural range, which is quite restricted. Very fast growing. 	cone production	1. © Andrew Hirons	owing its abundant
			Right: Different on the same bra	generations of con anch.	es can be seen

	<i>Pinus strobus</i> (Eastern white pine)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics	A massive tree capable of reaching 80m. Smaller in cultivation.	A dense crown.	-		
Natural habitat	Native to eastern North America, from the southern margins of the boreal belt in southern Appalachian mountains. Usually as part of moist (mesic) forest commu or mixed stands 0-1500m.		-		
Environmental tolerance	Moderately tolerant to shade. Moderately sensitive to drought.	Sensitive to waterlogging.			
Ornamental qualities	Inconspicuous flowers (strobili) appear in late spring. SPRING SPRING	the summer of their Illination. Cones tend to eds have been released.			
	Evergreen conifer tree with needle leaves, in bundles of five.				
	Single-stemmed. Dark grey-brown platy bark, deeply fissured with age.				
Issues to be aware of	Potentially a very large tree.				
Notable varieties	Notes				
Narrow crown	'Fastigiata' Not very tolerant of salt-lade good tolerance to air pollution		A mature <i>Pinus</i> s	strobus makes a ve	ry attractive
			open-grown tree © Henrik Sjöman		

	<i>Pinus sylvestris</i> (Scots pine)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved		The tree and it	s features	
Tree size and crown characteristics	of reaching 40m. broa	nical crown dening with age becoming irregular.		4	
Natural habitat	the Russia Far East and from northern Norwa Capable of growing on a range of marginal si	rn Asia. From Portugal and Ireland in the west to y as far south as the Sierra Nevada range in Spain. tes too challenging for other species. These include ops. Also capable of performing well on coastal sites.			
Environmental tolerance	Intolerant to shade. Tole	rant to drought. Moderately sensitive to waterlogging.			
Ornamental qualities	Inconspicuous flowers (strobili) appear in late spring.	Seed cones ripen in the autumn of their second year after pollination. Cones tend to be dropped after seeds have been released.		s an attractive national solution is a wide rate	ve conifer that is inge of environments.
	Evergreen conifer tree with needle leaves.			1AL	
	Single-stemmed. Dusky pink-orange-rusty by flakes, darky grey and fissured on the lower p	own bark on the upper portion of the stem with papery ortion of the stem. Attractive.			
Issues to be aware of	Potentially a very large tree.				
Notable varieties		Notes			
Narrow crown	'Fastigiata'.	 Much slower to establish that <i>Pinus nigra</i>, but it is more ornamental than <i>P. nigra</i> because of the attractive young bark. Tolerant of air pollution and salt-laden winds. However, <i>Pinus nigra</i> and <i>P. radiata</i> generally perform better on coastal sites. 	© Duncan Slater	ves of Pinus sylvest	

	Pinus wallichiana			Tree Selector		
	(Bhutan pine)		 Contents page Alphabetical Index 	Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park			The tree and i	ts features	
Tree size and crown characteristics		al crown ning with age.	oderately dense crown.			
Natural habitat	Native to the Himalaya region. Found in pure sta	nds and mixed forests, 1500-3500m	on steep slopes.			
Environmental tolerance	Intolerant to shade. Modera to drou		sitive to waterlogging.			
Ornamental qualities	Inconspicuous flowers (strobili) appear in late spring.	Seed cones ripen in the second year after polling be dropped after seeds	ation. Cones tend to	© Duncan Slater	ichiana is a highly or	
	Evergreen conifer tree with needle leaves. Bundle texture. Needles covered with a bluish frosting.	es of five 10-20cm long needles give	the crown a soft	- Right: Seed cor pollination. © He	nes ripen in the seco nrik Sjöman	ond year after
	Single-stemmed. Dark grey bark becoming roug	her and developing shallow fissures	with age.			
Issues to be aware of	Potentially a very large tree.					
Notable varieties		Notes		43 MARS		
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. are nursery for options.	- Tolerant of air pollution.				

The long needles in bundles of five give the crown of *Pinus wallichiana* a soft texture. © Andrew Hirons

	Platanus x hispanica (London plane)		Contents page Alphabetical Index	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Paved SuDS	Transport corridor		The tree and it	s features	
Tree size and crown characteristics	of reaching 40m. crown f	n. Capable ng very wide,	tely dense crown.			
Natural habitat	A hybrid between <i>Platanus orientalis</i> and <i>P. occi</i> but prefers mildly acidic soils. Very tolerant of h					
Environmental tolerance	Moderately tolerant to shade. Moderately tolerant	y tolerant t. Moderate to waterlo				
Ornamental qualities	Male and female flowers held separately but on the same tree. Relatively inconspicuous in late spring.	Spherical, spikey fruit about 2. diameter, held on stalks in grout to four. Prominent from late su persisting into winter.	ups of two		nica is an incredibly	
	Deciduous broadleaved tree with simple palmat	eaves.		S Duncan Slater	to a state	a and a second
	Single-stemmed. A highly attractive bark: grey w patches underneath.	n exfoliating flakes that reveal green and	cream			
Issues to be aware of	Potentially a very large tree. Hairs associated wir problems. Pollen is also allergenic. Fallen leaves for some time after they are shed.			SV K		
Notable varieties		Notes				11 984
Hybrid-type habit	'Louisa Lead', 'Malburg'.	- Very tolerant to pruning.			The sector	1 Million Barrow
Compact crown	'Alpen's Globe'.	 Platanus spp. are known to be high em Biogenic Volatile Organic Compounds 	(BVOCs).	and a state	De las dis	Color and the second
Narrower crown	'Huissen', 'Pyramidalis'.	 Observed to have some tolerance to sa air pollution. 	alt and	1.6.6	W. Pin J.	MIL IL
Strong vertical trunk	'Bloodgood', 'Mr X', 'Tremonia'.			The winter silho are very attracti	uettes of <i>Platanus ></i> ve.	k hispanica
Variegated leaves	'Suttneri'.			© Henrik Sjöman		

	<i>Platanus orientalis</i> (Oriental plane)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Paved SuDS	Transport corridor		The tree and it	s features	
Tree size and crown characteristics	of reaching 30m. crown for	m. Capable ing very wide,	a moderately dense crown.			
Natural habitat	Native to Balkan peninsula and western Asia, preconstruction of ten characterised by dry riverbeds in the summer mildly acidic soils. Very tolerant of hard surfaces a	er. Tolerant to a wide range of so				
Environmental tolerance	Moderately tolerant to shade. Moderate		loderately tolerant o waterlogging.			
Ornamental qualities	Male and female flowers held separately but on the same tree. Relatively inconspicuous in late spring.	Spherical, spikey fruit diameter, held on sta two to six. Prominent persisting into winter	lks in groups of from late summer,		<i>lis</i> is capable of dev should be planted	
	Deciduous broadleaved tree with simple palmate	leaves.				
	Single-stemmed. A highly attractive bark: grey with patches underneath.	h exfoliating flakes that reveal g	reen and cream			
Issues to be aware of	Potentially a very large tree. Hairs associated with t Pollen is also allergenic. Fallen leaves take a long t after they are shed.					
Notable varieties		Notes		1000		14 Mart
Hybrid-type habit	'Digitata'.	- Very tolerant to pruning.		-		Marka
Ornamental leaf	'Digitata'.	 Platanus spp. are known to be Biogenic Volatile Organic Cor 				STO-AB
Compact crown	'Minaret'.			attractive featur	d bark of <i>Platanus</i> e, all year round. ©	Andrew Hirons
				Right: Simple pa in bunches of tw	Ilmate leaves and s o to six.	pherical truit held

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© Andrew Hirons

	Populus alba (White poplar)	 Contents page Alphabetical Index 	Tree Selector Use Crown potential form Mature Crown size Ornamental	
Use potential		ansport rridor	The tree and its features	
Tree size and crown characteristics	A massive tree capable of reaching 40m. Typically less than 20m in the British Isles.	a ovoid crown. A moderately dense crown.		
Natural habitat		th Africa and, western and central Asia. A pioneer species parian habitats providing seasonal fluctuations in the water range of soils, including calcareous.		
Environmental tolerance		oderately sensitive drought. Sensitive to waterlogging.		
Ornamental qualities	Male and female flowers (catkins) appear on separate trees (dioecious) in early spring. Fairly inconspicuous.	Seed capsule developed from fertilised female catkins and ripens by early summer. Only on female trees.	 Populus alba provides excellent contrast against a dark background. © Duncan Slater 	
		Deciduous broadleaved tree with simple leaves. The underside of the leaf is covered with a thick mat of white hairs (indumentum) providing a very attractive leaf – particularly striking against a dark sky.		
		Single-stemmed in cultivation but may be multi-stemmed in the wild. Grey bark with very attractive diamond-shaped lenticels on the trunk, becoming rougher with age.		
Issues to be aware of	Produces abundant root suckers, which ma a lot of pollen so have high allergenicity por	ay be problematic in some landscapes. Male trees release tential during the flowering period.		
Notable varieties		Notes		
Silvery leaves	'Nivea'.	- Fast growing and easy to establish.		
Broad columnar	'Raket'.	 Tolerant of exposed, windy sites. <i>Populus</i> spp. are known to be high emitters of Biogenic Volatile Organic Compounds (BVOCs). Observed to have some tolerance to salt. 	Left: A thick mat of hairs give <i>Populus alba</i> its characteristic white leaves. © Duncan Slater	
			Right: The male catkins of <i>Populus alba</i> appear in early spring. © Duncan Slater	

	Populus x canadensis (Hybrid poplar)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmentatolerance Ornamental qualities
Use potential	Park Coastal		The tree and it	s features	
Tree size and crown characteristics	A massive tree capable of reaching 40m. An ovoid crown.	to globular A moderately dense crown			
Natural habitat	A hybrid between <i>Populus nigra</i> and <i>P. deltoides</i>		-		4
Environmental colerance	Intolerant to shade. Sensitiv	e to drought. Moderately sensitive to waterlogging.			
Ornamental qualities	Male and female flowers (catkins) appear on separate trees in early spring. Fairly inconspicuous.	Seed capsules if developed from fertilised female catkins ripen by early summer. Only on female trees of some cultivars. Often sterile.			
	Deciduous broadleaved tree with simple leaves.				
	Single-stemmed. Dark-grey bark becoming fissu	ed with age.			
Issues to be aware of	Produces root suckers, which may be problemat so have high allergenicity potential during the flo	c in some landscapes. Male trees release a lot of pollen wering period.	-		
Notable varieties		Notes			A SALA
Yellow leaves	'Serotina Aurea'.	 Fast growing and easy to establish. Tolerant of exposed, windy sites. 	Prosta Television		and and a
Coastal plantings	'Ellert', 'Koster', 'Robusta'.	 Nany cultivars are sensitive to leaf rust diseases and or cankers. <i>Populus</i> spp. are known to be high emitters of Biogenic Volatile Organic Compounds (BVOCs). Observed to have some tolerance to salt. 	<i>Populus</i> x <i>canad</i> readily establish © Henrik Sjöman	<i>lensis</i> is a fast grow es.	ving tree that

	Populus x candicans (Ontario poplar)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A large tree capable of reaching 25m. An ovoid crown.	A moderately dense crown.			1
Natural habitat	A hybrid of obscure origin. One parent is almost certain to be <i>Populus balsa</i>	mifera.			
Environmental tolerance	Estimated to be intolerant to shade. Estimated to be sensitive to drought.	Estimated to be moderately sensitive to waterlogging.			Y
Ornamental qualities	Female catkins appear in late spring. Fairly inconspicuous.	iis female clone.			in the
	Deciduous broadleaved tree with simple leaves. The variegated form is attra	active.			1 City
	Single-stemmed. Grey bark, becoming fissured with age.		101-		Mr.
Issues to be aware of	Produces root suckers which may be problematic in some landscapes. Male so have high allergenicity potential during the flowering period.	trees release a lot of pollen	A A	and the second s	
Notable varieties	Notes			mille	
Variegated leaves	'Aurora'. – Fast growing and easy – Vulnerable to a bacteria – Populus spp. are known Biogenic Volatile Organ	a canker disease.		lar <i>Populus</i> x candio cultivar 'Aurora' whice	

	Populus nigra (Black poplar)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Coastal Tran			The tree and it	s features	
Tree size and crown characteristics	A massive tree capable of reaching 40m.	d to irregular A	moderately dense crown.			the state
Natural habitat	Native to Europe (not Scandinavia), north Afr colonise floodplains, other riparian zones and including calcareous.					
Environmental tolerance	Partially tolerant to shade.	-	oderately tolerant waterlogging.			
Ornamental qualities	Male and female flowers (catkins) appear on separate trees (dioecious) in early spring. Fairly inconspicuous.	Seed capsule develop female catkins and rip Only on female trees.		shade for a path	of <i>Populus nigra</i> 'It Way. © Henrik Sjöman	
	Deciduous broadleaved tree with simple leav			© Right: Vigourous © Andrew Hirons	s young shoots of F	opulus nigra.
	Single-stemmed. Dark-grey bark becoming d	ply fissured with age.			S.	
Issues to be aware of	Produces root suckers, which may be problem so have high allergenicity potential during the		release a lot of pollen			
Notable varieties		Notes			2 Alexandre	A A
Upright	'Italica', 'Thevestina', 'Plantierensis'.	- Fast growing and easy to estal	olish.	A SAME		SI CE HA
Male	'Brandaris', 'Vereecken'.	 Tolerant of exposed, windy site Heat tolerant so useful for war 				121-14-1-
Female	'Wolterson'.	that are not too dry. - Populus spp. are known to be Biogenic Volatile Organic Com - Observed to have some tolera air pollution.	pounds (BVOCs).		re <i>Populus nigra</i> di the evening light.	splaying their

	Populus tremula (Eurasian aspen)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Coastal Transport corridor		The tree and it	s features	
Tree size and crown characteristics	A massive tree capable of reaching 40m. >25M	A moderately dense crown.	4		e see
Natural habitat	Native to Europe, Algeria and throughout much of Russia and north species found on a wide range of habitats. Performs best on well-dr the water table within 1.5m of the surface. However, will grow quite wand pH. Can tolerate extreme cold, to -30°C.	ained, loamy, calcareous soils with		ALL ALL	
Environmental tolerance	Partially tolerant to shade. Moderately sensitive to drought.	Moderately sensitive to waterlogging.			
Ornamental qualities	appear on separate trees in late winter. Fairly inconspicuous.	apsules develop from fertilised catkins and ripen by early summer. ny fluff helps to disperse seeds. n female trees.	Populus tremula to a landscape.	providing beautifu	Il autumnal colours
	Deciduous broadleaved tree with simple leaves. A flattened petiole even in light winds. Provides a golden-yellow autumn colour.	means that the leaves flutter			
	Single-stemmed in cultivation but may be multi-stemmed in the wild bark with very attractive diamond-shaped lenticels on the trunk, bed				
Issues to be aware of	Produces abundant root suckers, which may be problematic in some with seeds can cause a nuisance during periods of seed dispersal – s However, male trees release a lot of pollen so have high allergenicity	selecting male cultivars mitigates this.			
Notable varieties	Notes				194
Upright		nd easy to establish.	- with		C TU
o fruit	Biogenic Volatil	osed, windy sites. e known to be high emitters of le Organic Compounds (BVOCs). ve some tolerance to salt.	Left: The simple © Andrew Hirons	leaves flutter in the	e wind.
				catkins of <i>Populus</i>	<i>tremula</i> emerge

© Duncan Slater

	Prunus 'Accolade' (Hybrid cherry)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden			The tree and it	s features	
Tree size and crown characteristics	A small tree to 8m. An obov to 5m w		oderately dense crown.	1		
Natural habitat	Of garden origin, a hybrid between <i>Prunus sarge</i> humus rich, mildly acid soils. However, adaptable providing they are well aerated.					y.
Environmental tolerance	Estimated to be partially tolerant to shade.	ely sensitive 🛛 📈 to wa	nated to be sensitive aterlogging.			
Ornamental qualities	Pink flowers held in small clusters appear in early spring. Highly ornamental.	Small (1 cm diameter) dru ripen and turn dark red ir Generally, very few fruits	n late summer.	Prunus 'Accolad © Henrik Sjöman	e' flowering in an u	rban planting bed.
	Deciduous broadleaved tree with simple leaves.		ing yellow.	ACC.		
	Single-stemmed. Grey-brown bark, becoming ro	igher with age.				
Issues to be aware of	No substantial issues to be aware of.				A. Cr	1
Notable varieties		Notes		in the	- 112-	
Not applicable: a single cu	tivar profile.	 Extremely sensitive to poor soil a not be planted in heavy, frequent or compacted soil. Flowers are good for bees and oth Fruits are good for wildlife. Observed to have some tolerance 	ly waterlogged her pollinating insects.	Prunus 'Accolad © Henrik Sjöman	s' flowers profusely	y in early spring.

	Prunus avium (Wild cherry)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and its	s features	
Tree size and crown characteristics	grows to 25m. () ovoid cr	lar to broad own. Up to Bm wide.			
Natural habitat	Native to central Europe (including the British Isl temperate forests, up to 1900m. It can cause thic silty, nutrient-rich, mildly acidic soils but can adap	ckets via root suckers. <i>Prunus avium</i> enjoys deep, light,			
Environmental tolerance	Partially tolerant to shade. Moderat	tely sensitive ght. Sensitive to waterlogging.			
Ornamental qualities	White flowers in clusters of two to six appear in late spring with the emergence of new leaves. Highly attractive.	Dark red drupes (cherries) ripen in late summer. Edible.	in an urban plant	wers in late spring ration.	, seen here
	Deciduous broadleaved tree with simple leaves.	In autumn the leaves turn red and yellow.	_ © Henrik Sjöman		1
	Single-stemmed in cultivation, occasionally multi brownish bark with prominent lenticels, in older s develops fissures.				
Issues to be aware of	Fruit litter may cause issues on paved surfaces -	sterile cultivars mitigate this.			
Notable varieties		Notes			
Double-flowers	'Plena'.	- Extremely sensitive to poor soil aeration so should	1000	Store .	In Reality
Sterile	'Plena'.	not be planted in heavy, frequently waterlogged or compacted soil.	1000	C Lines	Sec. 1
Tasty fruits	'Kordia'.	 Flowers are good for bees and other pollinating insects Fruits are excellent for birds. Observed to have some tolerance to air pollution. Can be considered for transport corridors if planted well away from the salt-spray zone. 	the second se	nite flowers are go ting insects.	od for bees

	Prunus cerasifera (Cherry plum)		Contents page Alphabetical Index	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Small garden	Transport corridor		The tree and it	s features	
Tree size and crown characteristics		ar crown. ound 5m wide.	crown.		Constant Constant	
Natural habitat	Native to central Europe and western Asia. Foun slopes up to 2000m. It can cause thickets via roo and pH, including calcareous, providing they are	ot suckers. Can cope with a wide range of				
Environmental tolerance	Partially tolerant to shade.	to drought. Sensitive	to waterlogging.		NATU	WI
Ornamental qualities	White or pink flowers appear in early spring generally before the emergence of new leaves. Highly attractive. Deciduous broadleaved tree with simple leaves.	Dark red drupes (cherries) ripe summer but are not prolific. E			cherries to bloom in a 'Nigra', seen here	
	Single-stemmed in cultivation, occasionally mult roughening with age.	-stemmed in the wild. Dark brown bark,				
Issues to be aware of	If the true species is used, fruit litter can be a pro- less. Root suckers may be a problem in some situ		nd to fruit			
Notable varieties		Notes				
Purple-leaved	'Nigra', 'Pissardii'.	- Extremely sensitive to poor soil aeration		62		N 102 2 3
Narrow crown	'Crimson Point'.	not be planted in heavy, frequently wa or compacted soil. - Very tolerant to heat. - Flowers are good for bees and other p - Fruits are excellent for birds. - Observed to have some tolerance to s	pollinating insects.	the leaves. © Henr	urple leaves provid	

	Prunus domestica					
	(Common plum)	Conte page Conte page Alpha Index		Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden			The tree and i	ts features	
Tree size and crown characteristics		lar crown up nd 5m wide.	nse crown.			
Natural habitat	Origins obscured by cultivation, most likely south texture and pH, providing they are well drained.	hern Europe. Can cope with a wide range of soil				
Environmental tolerance	Intolerant to shade.	t to drought. Sensitive to wate	rlogging.			
Ornamental qualities	White flowers appear in early spring generally before the emergence of new leaves. Highly attractive.	Dark red drupes (plums) ripen in late summer. Edible.			mestica 'Victoria' gr rees. © Andrew Hirons	owing amongst
	Deciduous broadleaved tree with simple leaves.			Right: Simple le © Andrew Hirons	aves of Prunus dom	estica.
	Single-stemmed. Dark brown bark, roughening v	vith age.		L.		
lssues to be aware of	Fruit litter can be a problem on paved sites. Room	t suckers may be a problem in some situations.				(A)
Notable varieties		Notes				THAT OF ALL
Damson	'Hauszwetsche'.	- Extremely sensitive to poor soil aeration so sh				MAN 12
Greengage	'Reine-Claude d'Oullins'.	not be planted in heavy, frequently waterlogg or compacted soil.	ged			
Plum	'Victoria'.	 Flowers are good for bees and other pollination Fruits are excellent for wildlife, if left. 	ng insects.	This immature a	olum will ripen in lat	e summer.

This immature plum will ripen in late summer. © Andrew Hirons

	Prunus dulcis (Almond)	 Contents page Alphabetical Index 	Tree Selector Use Crown potential form Mature Crown size Crown Ornamental qualities
Use potential	Park Paved Small garden		The tree and its features
Tree size and crown characteristics		A moderately dense crown. d 5m wide.	
Natural habitat	Origins obscured by cultivation, most likely south Can cope with a wide range of soil texture provid		
Environmental tolerance	Estimated to be intolerant to shade.	to drought. Estimated to be sensitive to waterlogging.	
Ornamental qualities	White flowers, solitary or paired, appear in early spring before the emergence of new leaves. Highly attractive.	Drupes with a leathery hull protecting a woody shell, within which is an edible seed (almond). They ripen in late summer, if at all (in the British Isles).	
	Deciduous broadleaved tree with simple leaves.		
	Single-stemmed. Dark brown bark, roughening v	vith age.	
lssues to be aware of	Root suckers may be a problem in some situation	ns.	
Notable varieties		Notes	
Double flowered	'Alba Plena'.	 Extremely sensitive to poor soil aeration so should not be planted in heavy, frequently waterlogged or compacted soil. Requires a warm microclimate and is tolerant of heat. Flowers are good for bees and other pollinating insects. Numerous pests and diseases affect <i>Prunus dulcis</i> so specify with caution. 	The attractive white flower of <i>Prunus dulcis</i> appears in early spring.

	Prunus fruticosa (Steppe cherry)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Small garden			The tree and it	s features	
Tree size and crown characteristics		Iobular crown und 2.5m wide.	noderately dense crown.		Nin I	
Natural habitat	Native to eastern Europe, Caucasia and Siberia. forest-steppe zones, found on forest margins. Ca it is warm and well-drained.				dik d	
Environmental tolerance	Intolerant to shade.	to drought. Ser	nsitive to waterlogging.			
Ornamental qualities	White flowers in clusters of two to four appear in late spring. Not prolific but attractive. LATE SPRING Deciduous broadleaved tree with simple leaves.	Small, deep red-purple ripen by late summer. E SUMMER	dible but sour.		fruticosa 'Globosa nd flowers in late s	spring.
	Single-stemmed. Dark brown bark with promine	t yellow lenticels, roughening with	age.			
lssues to be aware of	Root suckers may be a problem in some situation	S.				
Notable varieties		Notes				
Lollipop	'Globosa'.	 Also known as <i>Prunus</i> x <i>eminier</i> Extremely sensitive to poor soil not be planted in heavy, frequer or compacted soil. Flowers are good for bees and of Fruits are good for wildlife. Species is planted for soil stabilit restoration. 	aeration so should htly waterlogged other pollinating insects.	restricted urban		Globosa' in a compact form of this small planting sites.

	Prunus laurocerasus		Tree Selector		
	(Cherry laurel)	Contents page Alphabetical Index	 Use potential Mature size 	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Small garden		The tree and it	s features	
Tree size and crown characteristics		lar crown, ng quite broad,			
Natural habitat	Native to forests of the Caucasus and Balkan per Adaptable to a wide range of soils, including cald	ninsula. Found as an understorey shrub or small tree. careous.			
Environmental tolerance	Tolerant to shade. Modera to droug	tely sensitive ght.	-		
Ornamental qualities	Upright flower spikes containing numerous individual flowers appear in late spring.	Clusters of small drupe (cherry) fruits turning black in early autumn when ripe. Inedible.		bby than tree-like, seful for screening	
	Multi-stemmed and single-stemmed (if buying the but roughening with age.	ne tree forms). Grey bark, relatively smooth			
Issues to be aware of	Leaves, fruits and seeds are poisonous, containing and potentially invasive. Be careful not to plant of dominate them.				
Notable varieties		Notes			
Rounded shrub form	'Rotundifolia'.	- Extremely sensitive to poor soil aeration so should			7.4
Tree form	'Novita', 'Magnoliifolia'.	not be planted in heavy, frequently waterlogged or compacted soil.			
Large leaves	'Magnoliifolia'.	 Good for bees and other insects. Very useful for screening. Will take very hard pruning. 	tree with glossy Right: The uprig appear in late sp	leaves. © Andrew Hiro nt flower spikes of a	Prunus laurocerasus ceptional, compared

	Prunus Iusitanica (Portugal laurel)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small Coast	Ι	The tree and it	s features	
Tree size and crown characteristics		Ilar to broad A dense crown.			
Natural habitat	Native to the Iberian Peninsula. Found in the u of soils, including calcareous, providing they fe	derstorey or forest margins. Adaptable to a wide range tile and well drained.			
Environmental tolerance	Partially tolerant to shade. Mode	ately tolerant Sensitive to waterlogging			
Ornamental qualities	Upright flower spikes containing numerous individual flowers appear in early summer.	Clusters of small drupe (cherry) fruits turning black in early autumn when ripe. Inedible.	A globular crow deep shade. © Duncan Slater	n of a mature <i>Prun</i>	us lusitanica provides
	Evergreen broadleaved tree with simple, gloss	leaves.			
V	Multi-stemmed and single-stemmed (if buying but roughening with age.	he tree forms). Grey bark, relatively smooth			
Issues to be aware of	This species is potentially invasive.				
Notable varieties		Notes			
Small, narrow leaves	'Angustifolia'.	 Extremely sensitive to poor soil aeration so should not be planted in heavy, frequently waterlogged or compacted soil. Good for bees and other insects. Very useful for screening. Will take very hard pruning but is susceptible to silver leaf disease (<i>Chondrostereum purpureum</i>). 		arly summer. These	boping flower spikes a are accentuated

	Prunus maackii (Manchurian cherry)	Cont page Alpha Index		 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Small garden		The tree and it	s features	
Tree size and crown characteristics	A medium tree to 12m. An ovoid	crown form. A moderately der	nse crown.	AN CONTRACT	
Natural habitat	Native to Manchuria, the Korean peninsular and e of fairly open forests on mid-elevation slopes, 50 providing they are well drained.				
Environmental tolerance	Partially tolerant to shade. Moderat	ely sensitive for wate	erlogging.		
Ornamental qualities	Small, upright clusters of flowers appear in late spring. They tend not to be abundant. Fragrant.	Small (about 5mm in diameter) drupe fruit ripen in late summer, turning bla	ack. Prunus maackii i	s an attractive medium tr est, including good autur	
V	Single- and multi-stemmed tree. Very attractive a	mber to bronze peeling bark.			
Issues to be aware of	No substantial issues to be aware of.				aniser a
Notable varieties		Notes			
Good bark	'Amber Beauty'.	 Extremely sensitive to poor soil aeration so shot be planted in heavy, frequently waterlogg or compacted soil. Seed propagated trees are very variable in te of bark colour so use of known cultivar is essed - Very cold-hardy. 	ged erms ential. Left: The amber- provides year-ro Right: Small, upr in late spring, bu	bronze, peeling bark of <i>P</i> und interest. © Henrik Sjöma right clusters of flowers ar t are often not abundant en by the new foliage. © He	ⁿ dd interest and are

	Prunus 'Okame' (Hybrid cherry)	 Contents page Alphabetical Index 	Tree Selector ↓ Use potential ↓ Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Small garden		The tree and i	ts features	
Tree size and crown characteristics	A small tree to 8m. An obc to 5m v	A moderately dense crow	wn.		
Natural habitat	Of garden origin, a hybrid between <i>Prunus cam</i> humus rich, mildly acid soils. However, adaptabl providing they are well aerated.				
Environmental tolerance		d to be ely sensitive ht.	e		
Ornamental qualities	Pink flowers held in small clusters appear in early spring. Highly ornamental.	Sterile, no fruit.	<i>Prunus</i> 'Okame © Barcham Trees	' is spectacular in e	arly spring.
		ood autumn colour with leaves turning orange-red.	200		- 11
	Single-stemmed. Grey-brown bark, becoming re	gher with age.			
Issues to be aware of	No substantial issues to be aware of.				
Notable varieties		Notes	-	La Const	ALOKY
Not applicable: a single ci	ıltivar profile.	 Extremely sensitive to poor soil aeration so should not be planted in heavy, frequently waterlogged or compacted soil. Flowers are good for bees and other pollinating inse Fruits are good for wildlife. 	The pink flower they are also ste	rs are prolific in earl erile so no fruit is pr o fruit-fall later in th	oduced, removing

	Prunus padus (Bird cherry)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and it	ts features	
Tree size and crown characteristics		d crown. ound 6m wide.			L. Aste
Natural habitat		es), and temperate Asia. Found on floodplains and DOm. Enjoys deep, nutrient-rich, mildly acidic soils			
Environmental tolerance	Moderately tolerant to shade. Modera	ght. Moderately tolerant to waterlogging.			
Ornamental qualities	White flowers in drooping spikes appear in late spring. Highly ornamental.	Black drupes (cherries) 5-7mm in diameter ripen in late summer. Inedible.	A recently estab © Henrik Sjöman	blished Prunus pade	us in full flower.
	Deciduous broadleaved tree with simple leaves.			and the second	
	Single-stemmed in cultivation, occasionally mult smooth bark.	-stemmed in the wild. Grey-brown relatively			**
Issues to be aware of	Fruit litter may cause issues on paved surfaces. F	oot suckers can often be a problem.			
Notable varieties		Notes			
Pyramidal	'Albertii'.	- The most waterlogging tolerant Prunus in this guide.			
Large flower spikes	'Watererii'.	 Flowers are good for bees and other pollinating insect Fruits are excellent for birds. 	s.	1000	1000
Compact	'Nana', 'Colorata'.		1000	11	1.00
Reddish leaves	'Colorata'.				merge in late spring er pollinating insects.

	Prunus 'Pandora' (Hybrid cherry)	 Contents page Alphabetical Index 	potential form	 Environment tolerance Ornamental qualities
Jse potential	Park Small garden		The tree and its features	
Tree size and crown characteristics	A small tree to 6m. An obo to 5m v	d crown e. A moderately dense crow	n.	
Natural habitat	Of garden origin, a hybrid between <i>Prunus pene</i> Prefers well aerated, humus rich, mildly acid soil including calcareous, providing they are well ae	lowever, adaptable to a wide range of soils,		
Environmental tolerance	Estimated to be partially tolerant to shade.	y sensitive , to waterlogging.		49.52
Ornamental qualities	Pink flowers held in small clusters appear in early spring before the emergence of leaves. Highly ornamental.	Small (1cm diameter) drupe (cherry) fruits ripen and turn red in late summer. Generally, very few fruits.	A semi-mature <i>Prunus</i> 'Pandora' in full bl situation. © Henrik Sjöman	oom in a park
	Deciduous broadleaved tree with simple leaves.	ood autumn colour with leaves turning orange-red.		
	Single-stemmed. Grey-brown bark, becoming ro	her with age.	Contra Str	
issues to be aware of	No substantial issues to be aware of.			
Notable varieties		Notes		170
Not applicable: a single cu	ltivar profile.	 Extremely sensitive to poor soil aeration so should not be planted in heavy, frequently waterlogged or compacted soil. Flowers are good for bees and other pollinating insec Fruits are good for wildlife. 	ts. Left: Light pink flowers appear in small cl in early spring. © Barcham Trees Right: <i>Prunus</i> 'Pandora' has good autumr	
57 Tree Sp	ecies Selection for Green Infrastructure: A Guide for Specifiers		with leaves turning orange-red. © Duncan Slater	Issue 1.3 /20

	Prunus sargentii (Sargent's cherry)	 Contents page Alphabetical Index 	Tree SelectorUse potentialCrown formEnvironm toleranceMature sizeCrown densityOrnamen qualities
Use potential	Park Paved Small garden		The tree and its features
Tree size and crown characteristics	A large tree to 20m in the wild, typically around 12m in cultivation. A globular to obove crown form.	A moderately dense crown.	
Natural habitat	Native to the mountains of northern Japan and the Korean p on steep, open slopes. Prefers well aerated, humus rich, mike a wide range of soils, including calcareous, providing they a	ly acid soils. However, adaptable to	
Environmental tolerance	Partially tolerant to shade. Moderately toleran to drought.	t Sensitive to waterlogging.	
Ornamental qualities	Profuse pink flowers held in small clusters appear in early spring before the emergence of leaves.	Small (about 1cm diameter) drupe (cherry) ripening to black in late summer.	Prunus sargentii is one of the few cherries that are suitable for paved environments.
	Deciduous broadleaved tree with simple leaves. Leaves eme during summer and then provide an excellent autumn displa		
V	Single- and multi-stemmed trees available. Smooth, somew	nat glossy dark brown bark.	
Issues to be aware of	No substantial issues to be aware of.		
Notable varieties	Notes		
Species-type habit		ely sensitive to poor soil aeration so should	
Narrow crown	'Rancho'. or com – Flowers – Fruits a	planted in heavy, frequently waterlogged pacted soil. s are good for bees and other pollinating insects. re excellent for birds. ed to have some tolerance to salt.	Left: Pink flowers held in small clusters appear just before the leaves in early spring. © Duncan Slater
			Right: <i>Prunus sargentii</i> is one of the few cherries that are suitable for paved environments. © Henrik Sjöman

	Prunus x schmittii (Hybrid cherry)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Small garden			The tree and it	s features	
Tree size and crown characteristics	A medium tree to 15m. 10-15M A medium tree to 15m. An obc to 4-5m		erately dense crown.		AVAN	
Natural habitat	A hybrid between <i>Prunus avium</i> and <i>P. canesce</i> However, adaptable to a wide range of soils, inc					
Environmental tolerance		ately tolerant , to wate	ted to be sensitive erlogging.			
Ornamental qualities	Pink flowers held in small clusters appear in late spring as the leaves expand. Attractive.	Sterile, no fruit.		as the flowers are	<i>ii</i> flowers in late sp e sterile, there is no	ring. However, fruit litter produced.
	Deciduous broadleaved tree with simple leaves. yellow-orange.	Good autumn colour with leaves turning	g	© Henrik Sjöman		
	Single-stemmed. Attractive glossy red-brown b	ark with prominent bands of lenticels.				
Issues to be aware of	No substantial issues to be aware of.					
Notable varieties		Notes				March 1
The hybrid is available, ho Consult your preferred tre	wever, no notable cultivated varieties are widely available. e nursery for options.	 Extremely sensitive to poor soil aeronot be planted in heavy, frequently or compacted soil. Flowers are good for bees and other solutions are good for bees and other solutions. 	waterlogged	Left: The bark, at	E least on younger to lour with bands of	trees, is an attractive lenticels.
				© Barcham Trees	Prunus x schmittii.	

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	Prunus serrula (Tibetan cherry)	 Contents page Alphabetical Index 	Tree SelectorUse potentialCrown formEnvironmental toleranceMature sizeCrown densityOrnamental qualities
Use potential	Park Small garden		The tree and its features
Tree size and crown characteristics	A medium tree to 15m in the wild but typically to around 8m in cultivation.	oular crown. A moderately dense crown.	
Natural habitat		refers well aerated, humus rich, mildly acid soils. Icluding calcareous, providing they are well aerated.	
Environmental tolerance		rately sensitive bught. Sensitive to waterlogging.	
Ornamental qualities	White flowers held in small clusters appear in late spring as the leaves expand. Not abundant but attractive.	Small (1cm diameter) drupe (cherry) fruits ripen and turn red in late summer.	A semi-mature <i>Prunus serrula</i> in a park situation. © Duncan Slater
		s. Good autumn colour with leaves turning red.	
V	Single- and multi-stemmed trees available. Str bands of lenticels.	iking copper-bronze shiny, peeling bark with prominent	
Issues to be aware of	No substantial issues to be aware of.		
Notable varieties		Notes	
Species-type habit	'Tibetica'.	- Extremely sensitive to poor soil aeration so should	
Excellent bark	'Dorothy Clive'.	 not be planted in heavy, frequently waterlogged or compacted soil. Flowers are good for bees and other pollinating insects. Fruits are excellent for birds. Quality of the bark may deteriorate as the tree matures but it is still very worthwhile. 	Left: Beautiful copper-bronze bark featuring prominent lenticels gives <i>Prunus serrula</i> year-round interest. © Barcham Trees Right: Small clusters of white flowers appear as the

	Prunus serrulata (Japanese cherry)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and its f	eatures	
Tree size and crown characteristics	to obo	lly a globular void crown form hly dependant ivar.			
Natural habitat	Of garden origin, predominantly within Japan. However, adaptable to a wide range of soils, inc They do not stand up well to hard surfaces and	Prefers well aerated, humus rich, mildly acid soils. cluding calcareous, providing they are well aerated. are sensitive to exposed, windy sites.			
Environmental tolerance	Partially tolerant to shade. Moder	ately sensitive ught. Sensitive to waterlogging.	73 A		
Ornamental qualities	White, pink or yellow flowers held in small clusters appear in late spring as the leaves expand. Highly ornamental.	Mostly sterile, seldom fruiting.	Prunus serrulata cu spectacular in late © Andrew Hirons		
	Deciduous broadleaved tree with simple leaves				
V	Single- and multi-stemmed trees available. Fair				
Issues to be aware of	No substantial issues to be aware of.				
Notable varieties		Notes			
White flowered	'Jo-nioi', 'Tai Haku', 'Sunset Boulevard' (pink edges).	- Extremely sensitive to poor soil aeration so should	Altrades		and the second
Pink flowered	'Fugenzo', 'Hokusai', 'Kanzan', 'Pink Perfection', 'Red Burgundy', 'Shogetsu'.	 not be planted in heavy, frequently waterlogged or compacted soil. Flowers are good for bees and other pollinating insects. 	acts		
Yellow flowered	'Ukon'.	 As so many cultivars of Japanese flowering cherries exist, for the fine details of form and flower, it is best 			
Upright	'Amanogawa'.	<i>Prunus serrulata</i> 'Ka in late spring.	anzan' has specta	acular pink flowers	
Gently weeping	'Shirotae' (white flowered).		© Andrew Hirons		
Red leaved	'Red Burgundy'.	-			

	Prunus x subhirtella (Hybrid cherry)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden			The tree and it	s features	
Tree size and crown characteristics	A medium tree to 15m. 10-15M A medium tree to 15m. An obov to 5m w		moderately dense crown.			
Natural habitat	A hybrid between <i>Prunus incisa</i> and <i>P. pendula</i> . However, adaptable to a wide range of soils, incl					
Environmental tolerance	Partially tolerant to shade. Modera		ensitive to waterlogging.	Street of	All she	
Ornamental qualities	Pink flowers held in small clusters appear in early spring. Some cultivars flower through winter. Attractive.	Sterile, no fruit.		Prunus x subhirt and winter flowe © Henrik Sjöman		nis hybrid has spring
	Deciduous broadleaved tree with simple leaves.	Good autumn colour with leaves t	urning red-orange.			
	Single-stemmed. Dark brown bark, unexceptiona	al.		6		
Issues to be aware of	No substantial issues to be aware of.					
Notable varieties		Notes				
Spring flowering	'Fukubana'.	- Extremely sensitive to poor so			A	
Winter flowering	'Autumnalis', 'Autumnalis Rosea'.	not be planted in heavy, frequ or compacted soil. - Flowers are good for bees and - One of the few options if you	d other pollinating insects.	during late winte © Barcham Trees		
				Right: <i>Prunus</i> x s flowers. © Barchar	s <i>ubhirtella</i> leaves er n Trees	nerge after the

	Prunus 'Umineko' (Hybrid cherry)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and i	ts features	
Tree size and crown characteristics	(() when yo	A moderately dense crow bout can bout 5m	n.	U Čeh kao	li at
Natural habitat	Of garden origin, a hybrid between <i>Prunus incisa</i> mildly acid soils. However, adaptable to a wide ra are well aerated.			67,	
Environmental tolerance	Estimated to be partially tolerant to shade.	v sensitive to waterlogging.			
Ornamental qualities	White flowers held in small clusters appear in early spring with the leaves. Highly ornamental.	Sterile, no fruit.			
	Deciduous broadleaved tree with simple leaves. reddish-purple.	od autumn colour with leaves turning			
	Single-stemmed. Grey-brown smooth bark, becc	ng slightly rougher with age.		1 Ales	
Issues to be aware of	No substantial issues to be aware of.		A State		
Notable varieties		lotes	Mar		
Not applicable: a single ci	ultivar profile.	Extremely sensitive to poor soil aeration so should not be planted in heavy, frequently waterlogged or compacted soil. Flowers are good for bees and other pollinating insec	1.00	a 'Umineko' has sma spring.	all cluster of white

	Prunus x yedoensis (Yoshino cherry)	 Contents page Alphabetical Index 	Tree SelectorUse potentialCro forrMature sizeCro den	
Use potential	Park Small garden		The tree and its features	5
Tree size and crown characteristics	A medium tree to 15m. 10-15M A medium tree to 15m. An obov to 8m w	A moderately dense crown.		
Natural habitat		n <i>Prunus x subhirtella</i> and <i>P. speciosa.</i> Prefers well aerated, e to a wide range of soils, including calcareous, providing		
Environmental tolerance	Partially tolerant to shade. Modera to droug	tely sensitive ght. Sensitive to waterlogging.		
Ornamental qualities	Bluish-white flowers held in small clusters appear in early spring. Highly ornamental.	Small (1cm diameter) drupe (cherry) fruits ripen and turn black in late summer.	The attractive form of this <i>F</i> an excellent choice for this © Barcham Trees	
	Deciduous broadleaved tree with simple leaves. Single-stemmed. Grey-brown bark, becoming row			
Issues to be aware of	No substantial issues to be aware of.			
Notable varieties		Notes		Mary at the
Broad weeping	'Ivensii', 'Shidare-yoshino'.	 Extremely sensitive to poor soil aeration so should not be planted in heavy, frequently waterlogged or compacted soil. Flowers are good for bees and other pollinating insects. Fruits are good for wildlife. 	Prunus x yedoensis flowers clusters of blueish-white flo © Barcham Trees	

Pseudotsuga menziesii (Douglas fir)



nts Use potential betical Mature size

Tree Selector

Crown form Crown density Environmental tolerance
 Ornamental qualities

		V Index	size density	qualities
Use potential	Park		The tree and its features	
Tree size and crown characteristics	A massive tree capable of reaching over 100m in favourable conditions. Usually smaller but still massive in cultivation.	A dense crown.		
Natural habitat	Native to the western North America. Predominantly occurring at lo across a range of habitats. An important component of temperate r but also found in riparian corridors in drier regions further south and tree after fire, but also found in mid- and late-successional stages. A types providing they are moist and well-drained.	ainforest in the pacific northwest d at alpine timberlines. A pioneer		
Environmental tolerance	Partially tolerant to shade. Moderately sensitive to drought.	Sensitive to waterlogging.		
Ornamental qualities		ones open in late autumn and into winter. Attractive but not highly ental.	 Left: <i>Pseudotsuga menziesii</i> is a but has the potential to become Right: The needle leaves of <i>Pseu</i> 	very large. © Duncan Slate
	Evergreen conifer with needle leaves.		© Andrew Hirons	
	Single-stemmed. Bark is brown to dark grey, becoming platy and de ridges at maturity.	eeply fissured with reddish-brown		
Issues to be aware of	Potentially a very large tree.			
Notable varieties	Notes			Cherry Li
The species is available, ho Consult your preferred tre	ee nursery for options. as an amenity ir - One of the few establishes and	nt timber tree but has potential n park environments. evergreen conifers that readily grows rapidly while young. has tree when young.	Left: The bark of <i>Pseudotsuga</i> n often becoming deeply fissured	

Right: The male 'flowers' of *Pseudotsuga menziesii* release their pollen in early spring. © Duncan Slater

	Pterocarya fraxinifolia		Tree Selector			
	(Caucasian wing-nut)	 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmentatolerance Ornamental qualities 	
Use potential	Park		The tree and i	ts features		
Tree size and crown characteristics	A massive tree capable of reaching 30m in its natural habitat. >25M	A dense crown.				
Natural habitat	Native to western Asia, particularly the Caucasus and northern Iran. Found in wo wet meadows, riparian corridors and mountain slopes, up to 1000m. Requires fe soils but can cope with a range of soil pH, providing it is not too extreme.					
Environmental tolerance		Estimated to be moderately tolerant to waterlogging.				
Ornamental qualities	Pendulous male and female catkins found separately on the same tree. Attractive but relatively inconspicuous. LATE SPRING	ries of nutlets with two become prominent	A mature <i>Ptero</i> © Andrew Hirons	<i>carya fraxinifolia</i> in	a park situation.	
	Deciduous broadleaved tree with large pinnate leaves.					
V	Generally single-stemmed in cultivation, but often appears multi-stemmed as a r suckers. Deeply fissured, rough bark at maturity.	esult of numerous root	1995			
lssues to be aware of	This species produces numerous root suckers; this may be an issue in some situal Also a potentially very large, broad-spreading tree.					
Notable varieties	Notes				and the second	
The species is available, how Consult your preferred tree	 vever, no notable cultivated varieties are widely available. nursery for options. One of the few temperate tr 		- Left: Large, pin	nate leaves of <i>Ptero</i>	carya fraxinifolia.	

© Andrew Hirons

Right: Long pendulous fruiting catkins can be seen through much of summer and make an interesting feature. © Andrew Hirons

	<i>Pterocarya stenoptera</i> (Chinese wing-nut)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics	A massive tree capable of reaching 30m in its natural habitat.	dense crown.			Y
Natural habitat	Native to China, Taiwan, Japan and the Korean peninsula. Found on in moist wood corridors and mountain slopes, up to 1500m. Requires fertile, moist, mineral soils with a range of soil pH, providing it is not too extreme.				
Environmental tolerance	tolerant to shade. moderately sensitive	stimated to be noderately tolerant o waterlogging.			
Ornamental qualities	found separately on the same tree. Attractive but relatively inconspicuous.	endulous fruiting catkins tlets with two forward- ne prominent in late nd persistent into winter.		<i>arya stenoptera</i> gr uckers are rarely a	
	Deciduous broadleaved tree with large pinnate leaves.		© Andrew Hirons		
	Single-stemmed. Deeply fissured, rough bark at maturity.				
Issues to be aware of	This species may produce root suckers when severely stressed but this is much les than with <i>P. fraxinifolia</i> .	ss of a problem			
Notable varieties	Notes				
Cut leaf	'Fern Leaf' Very fast growing once estab	lished.	- Left: Large, pinn	ate leaves of <i>Ptero</i>	carya stenoptera.
			© Andrew Hirons Right: Long pen for much of the s	dulous fruiting catk summer and are an enoptera. © Andrew H	ins can be seen attractive feature

	Pyrus calleryana (Callery pear)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Paved Small Garden Coastal	Transport corridor	The tree and it	s features	
Tree size and crown characteristics	A medium tree capable of growing to 15m. An ovoid crown, typically less than 8m in width.	A dense crown.			
Natural habitat	Native to China, Japan and Vietnam. Found on slopes, plains, forest margin Adaptable to a wide range of mineral soils, preferring calcareous soils but providing it is not too extreme.				
Environmental tolerance	Intolerant to shade. Tolerant to drought.	Sensitive to waterlogging.			
Ornamental qualities		ameter) round pome fruits autumn. Many cultivars are ng.	for paved enviro	ryana 'Chanticleer' onments. © Henrik Sjör	nan
	Deciduous broadleaved tree with simple, glossy leaves. Excellent red autur	nn colour.		wly conical form of ke it a useful urban	
	Single-stemmed. Grey-brown bark roughens and becomes slightly flaky w has some thorns on twigs and branches; these are absent in many cultivars				
Issues to be aware of	This species smells rather unpleasant at flowering. Thorns may be a proble however most are thorn-less.	m on some cultivars			
Notable varieties	Notes		- A		
Species-type habit	'Aristocrat'. – Observed to have som	ne tolerance to salt		N SA	a set
Narrow conical		ultivar 'Bradford' should			
Strongly upright	'Capital'. be avoided because it prone to biomechanic	has weak wood and is al failure.			
Excellent autumn colour	'Autumn Blaze', 'Redspire'. – A versatile but perhap	s overused tree.	Left: <i>Pyrus calle</i> that look attract	r <i>yana</i> has clusters o ive but smell unple	of white flowers easant. © Duncan Slater
			Right: Pome frui problematic.	ts of Pyrus callerya	ana are rarely

© Duncan Slater

	Pyrus communis (Common pear)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden Coastal		The tree and i	its features	
Tree size and crown characteristics	A medium tree capable of growing to 15m. An ovoid crown, typically less than 8m in width.	A dense crown.			
Natural habitat	<i>Pyrus communis</i> is of unclear origin, probably a hybrid of <i>Pyrus nivalis</i> an much of Europe, including the British Isles. Adaptable to a wide range of soils but will tolerate a range of soil pH, providing it is not too extreme.				
Environmental tolerance	Partially tolerant to shade. Moderately sensitive to drought.	Sensitive to waterlogging.			
Ornamental qualities	These are very attractive but smell unpleasant. 5cm in lengt	l pome fruits, about h, ripen by late autumn. Jenerally not that tasty.	Pyrus commun © Henrik Sjöman	<i>is</i> flowering in late s	pring.
	Deciduous broadleaved tree with simple, glossy leaves. Good autumn co and orange.	lour, with shades of red			
	Single-stemmed. Dark grey-brown bark roughens and becomes blocky v	vith age.			
Issues to be aware of	Fruit litter may be a problem on paved sites.				
Notable varieties				Kar 2X	
Narrow conical	'Beech Hill'.		Contraction of		AND NOT
Larger sub-species	subsp. <i>caucasia</i> .				
Good fruit	'Conference'.		unpleasant sme	amunis has clusters elling, flowers that a	of small, white, ppear in late spring.
			© Henrik Sjöman	6 H 6 B	·

Right: Immature fruit of *Pyrus communis*. This will mature by late autumn. © Duncan Slater

	<i>Pyrus salicifolia</i> (Willow-leaved pear)	Contents page Alphabetical Index	Tree Selector ↓ Use potential ↓ Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small Garden Coastal		The tree and it	s features	
Tree size and crown characteristics	A small tree capable of growing to 8m. A weepin typically 5m in wid	is than			New Yo
Natural habitat	Native to western Asia and Russia. Found on step preferring calcareous soils but will tolerate a rang	e margins. Adaptable to a wide range of mineral soils, of soil pH, providing it is not too extreme.			
Environmental tolerance	Estimated to be intolerant to shade. Estimate to droug	v sensitive (,,, to waterlogging.			
Ornamental qualities	Clusters of white flowers appear in late spring with the emergence of the leaves. Attractive.	Pear-shaped pome fruits, about 3cm in length, ripen by late autumn. Of little value and barely edible.	<i>Pyrus salicifolia</i> © Henrik Sjöman	is an attractive, sm	all, weeping tree.
	Deciduous broadleaved tree with simple leaves. S leaves but are lost on the upper side as the leaves				
	Single-stemmed. Dark grey-brown bark roughens	nd becomes blocky with age.			
Issues to be aware of	No substantial issues to be aware of.				
Notable varieties		lotes			
Weeping	'Pendula'.	Needs intensive training in the nursery if this species is to become a 'tree'. Usually only available as the 'Pendula' cultivar. This is only marginally different from the species-type habit, but is more strongly weeping.	Left: The willow [.] © Andrew Hirons Right: <i>Pyrus sali</i>	-like leaves of <i>Pyru</i> c <i>ifolia</i> has clusters at appear in late sp	of small,

	Quercus acutissima			Tree Selector		
			Contents page	Use potential	Crown form	Environmenta tolerance
(((()))	(Sawtooth oak)	(Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park Paved Small garden	Transport corridor		The tree and i	ts features	
Tree size and crown characteristics		d ovoid crown up to around de.	rown.	6		
Natural habitat	Native to temperate and warm-temperate parts Thailand, northern Vietnam and the Himalaya re a pioneer as well as forming a forest canopy bet	gion. An early successional oak, capable of	acting as			
Environmental tolerance	Partially tolerant to shade.	t to drought. Sensitive t	o waterlogging.		Contra la	
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	Not known to fruit substantiall Isles. In its native region, acorr early autumn of the year follow	is mature in the			E M
	Deciduous broadleaved tree with simple leaves. trees the leaves often persisting into winter.	Deciduous broadleaved tree with simple leaves. A yellow-brown autumn colour with leaves on young trees the leaves often persisting into winter.				2 de
	Single-stemmed. Brown-grey bark becomes fiss	sured and rough with age.				
Issues to be aware of	No substantial issues to be aware of.					
Notable varieties		Notes		630 h	and an all	
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. ee nursery for options.	 Well suited to street environments as it tolerance to drought and some salt tol requires space as it can become quite <i>Quercus</i> spp. are known to be high em Biogenic Volatile Organic Compounds 	erance but broad with age. itters of		es of Quercus acuti	
				promises to be environments.	useful for a range o	f situations in futur

Tree Species Selection for Green Infrastructure: A Guide for Specifiers

© Andrew Hirons

	Quercus bicolor (Swamp white oak)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved SuDS	Transport corridor		The tree and it	s features	
Tree size and crown characteristics	of growing to 38m in crown of	ovoid to globular apable of getting as it is tall.	oderately dense crown.			
Natural habitat	Native to moist temperate forests of the north-epopulations south-eastern Canada. Found in mo of swamps. Also capable of growing on moist sl to neutral soil. Can cope well with soil pans and	ist, poorly drained soils, often on the opes and uplands to 1000m. Prefers	fringes			
Environmental tolerance	Partially tolerant to shade.		lerately tolerant vaterlogging.			
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	Not known to fruit subst Isles. In its native region, late autumn.		A stand of Quero	<i>cus bicolor</i> in an urb also look great in au	
	Deciduous broadleaved tree with simple leaves. upper (green) and the lower (much paler grey-gautumn colour.					
	Single-stemmed. Dark grey bark becomes fissur	ed and shaggy with age.				and the
Issues to be aware of	No substantial issues to be aware of.			15 S		
Notable varieties		Notes			The second	
Upright hybrid	'Regal Prince' (Q. <i>bicolor</i> x Q. <i>robur</i> 'Fastigiata').	 Well suited to urban environment tolerance to drought and waterly to soil compaction and some sal Requires space as it can become 'Regal Prince' a good choice for Capable of rooting quite deeply. Quercus spp. are known to be his Biogenic Volatile Organic Comp 	ogging, good tolerance t tolerance. e quite broad with age; smaller spaces. gh emitters of		ercus bicolor. The H leaf, hence the nar	

	Quercus x bimondorum (Hybrid oak)	<pre></pre>	Contents page Alphabetical Index	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Transport			The tree and it	s features	
Tree size and crown characteristics	capable of growing to 15m. when yes	A dense cound bung, becoming roid with age. It 5m wide.	crown.			
Natural habitat	A hybrid between Quercus alba and Q. robur. Ad soils, providing they are not too heavy.	laptable to a wide range of soils, including	calcareous			
Environmental tolerance		tely tolerant (Level) to waterlo	d to be sensitive ogging.			
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	Acorns mature by late autumr	n.			
	Deciduous broadleaved tree with simple leaves. <i>Quercus alba</i> .	A good crimson autumn colour, inherited f	from			
	Single-stemmed. Light brown bark becoming fis	sured with age.				
Issues to be aware of	No substantial issues to be aware of.			an an Inderda a	Annoniques	
Notable varieties		Notes				
Hybrid type	'Crimschmidt' (Syn 'Crimson Spire').	 Observed to have some tolerance to s air pollution. <i>Quercus</i> spp. are known to be high em Biogenic Volatile Organic Compounds 	nitters of			
				potential as urba	ndorum 'Crimschmi in tree. It has a goo cellent autumn colc Son Co.	d columnar form

	<i>Quercus castaneifolia</i> (Chestnut-leaved oak)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Transport corridor		The tree and	its features	
Tree size and crown characteristics	A massive tree capable of growing to 30m. >25M A massive tree capable of growing to 30m. A globular cro parkland it is o getting almost as it is tall.	apable of			
Natural habitat	Native to western Asia, particularly the Caucasus regions slopes up to about 1500m. Found on well-drained, related Prefers a warm microclimate.				
Environmental tolerance	Estimated to be partially tolerant to shade. Estimated to moderately to drought.				
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	Acorns mature by early autumn of the year following pollination.	A mature Quer globular crown © Andrew Hirons	<i>cus castaneifolia</i> wit	th a fantastic
	Deciduous broadleaved tree with simple leaves bearing name <i>castaneifolia</i> .	a resemblance to <i>Castanea sativa</i> - hence the			
	Single-stemmed. Light brown bark becoming fissured	/ith age.			
Issues to be aware of	Capable of becoming a very large tree so this species	eeds space to grow.			
Notable varieties	Not	25		44.1	
Broad columnar to ovoi	ar - Qi	served to have some tolerance to salt I air pollution. <i>ercus</i> spp. are known to be high emitters of genic Volatile Organic Compounds (BVOCs).	The attractive of <i>Quercus castar</i> © Andrew Hirons	chestnut-like leaves beifolia.	of

	Quercus cerris (Turkey oak)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Paved Coastal	Transport corridor		The tree and i	ts features	
Tree size and crown characteristics	of growing to 35m. parkland	it is capable of Ilmost as wide	oderately dense crown.			Ne.
Natural habitat	Native to warm-temperate forests of southern Eu A pioneer oak, capable of colonising open ground up to 2000m in warm regions. Found on well-dra Prefers a warm microclimate.	d as well as forming a part of a fores	t canopy,			
Environmental tolerance	Partially tolerant to shade.	to drought. Sens	itive to waterlogging.			
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	Acorns mature by early a following pollination.	autumn of the year	A group of semi urban park. © Henrik Sjöman	-mature Quercus c	<i>erris</i> in a small
	Deciduous broadleaved tree with simple leaves. A	A yellow-brown autumn colour, but r	not spectacular.			and the second
	Single-stemmed. Dark grey bark becoming fissur	ed with age.				
Issues to be aware of	Capable of becoming a very large tree so this species needs space to grow. This is a host of the knopper gall (<i>Andricus quercuscalicis</i>) that can cause significant damage to the acorn crop of other oaks such as <i>Quercus robur</i> .					
Notable varieties		Notes				
Broad pyramidal	'Marvellous', 'Wodan'.	- Observed to have some toleranc	e to salt	P		A Station
Variegated leaf	'Argenteovariegata'.	 and air pollution. <i>Quercus</i> spp. are known to be high emitters of 		2.20		Stor Barrisk
Cut leaf	'Summer Veil'.	Biogenic Volatile Organic Compo	ounds (BVOCs).	Left: Attractive © Henrik Sjöman	autumnal leaves of	Quercus cerris.

Right: The acorn cups of *Quercus cerris* have a hairy appearance. © Duncan Slater

	÷	e rcus coccin arlet oak)	ea			 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential		Park Paved		Transport corridor			The tree and i	ts features	
Tree size and crown characteristics	15-25M	A massive tree capable of growing to 30m. Typically closer to 20m in cultivation.		A globular crown, capable of getting almost as wide as it is tall in open environments.		A moderately dense crown			
Natural habitat	*	Native to eastern United Sta acid, shallow, rocky soils. Pr		l-drained slopes, dry uplands n microclimates.	and ridges	often on low fertility,			
Environmental tolerance		Partially tolerant to shade.	\bigcirc	Tolerant to drought.		Sensitive to waterlogging.			
Ornamental qualities	LATE	Male and female flowers he the same tree, emerging in the leaves. Female flowers male catkins are attractive l	ate spring are inconsp	with vicuous, followi	mature by ng pollinatio	early autumn of the year on.		ea requires a warm e a stately tree, as s	
	Ø	Deciduous broadleaved tree with deeply lobed simple leaves. A brilliant scarlet colour that can last for 6-8 weeks. On young trees, leaves persist through winter.				© Henrik Sjöman		1 5	
	Y	Single-stemmed. Dark grey bark becoming fissured with age.				-			
Issues to be aware of		No substantial issues to be	aware of.						
Notable varieties				Notes			Sec. 1		a a
Excellent autumn colour	'Splende	ens'.		air pollution. – Drought toleral its ability to roc constrained it v to drought. – <i>Quercus</i> spp. a	nce is at lea t deeply so vill not exhil re known to	lerance to salt and st partly derived from where rooting depth is bit such good tolerance be high emitters of Compounds (BVOCs).	© Henrik Sjöman	t autumn colours of <i>Quercus coccinea</i>	

	Quercus frainetto (Hungarian oak)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Transport corridor			The tree and i	ts features	
Tree size and crown characteristics		getting almost it is tall in open	A moderately dense crown.			50/1
Natural habitat	Native to warm-temperate deciduous forests of sc Peninsula. Also found on wooded steppe margins. soils, preferring loamy textures. Enjoys warm micro natural range (such as the British Isles).	Found naturally on calcareous	and mildly acidic			
Environmental tolerance	Estimated to be moderately tolerant to shade.	(the second sec	Estimated to be moderately sensitive to waterlogging.			
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	Acorns mature by ea of pollination. Only o acorns produced on	occasional crops of	environment. ©		frainetto in a paved
	Deciduous broadleaved tree with very attractive lo	nge autumn colour.	0	active. © Henrik Sjöman		
	Single-stemmed. Grey bark becoming fissured wit	age.				
Issues to be aware of	Capable of becoming a very large tree so this spec	ies needs space to grow.				
Notable varieties		Notes		ALC: NO	1. M. 8 2	
Compact upright habit					A CARLON	
Ovoid	'Forest Green', 'Trump'.	air pollution. - Drought tolerance is at least its ability to root deeply so w constrained it will not exhibit to drought. - Quercus spp. are known to b Biogenic Volatile Organic Co	here rooting depth is such good tolerance e high emitters of	© Duncan Slater Right: The acor	red bark of <i>Quercus</i> ns of <i>Quercus fraine</i> ced on most cultiva	etto. These are

	Quercus x hispanica			Tree Selector		
			Contents page	Use Crown form		Environmenta tolerance
	(Spanish oak)		Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park Paved Transport corridor			The tree and i	ts features	
Tree size and crown characteristics	of growing to 30m. (capable	e of getting almost as it is tall in open	derately dense crown.			
Natural habitat	A hybrid between <i>Quercus cerris</i> and <i>Q. suber</i> . A are well drained and not too organic. Reported t		iding they			
Environmental tolerance	Estimated to be partially tolerant to shade.		ated to be sensitive terlogging.			
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	Acorns mature by early au year following pollination.	itumn in the	The vast, globu © Barcham Trees	lar crown of Quercu	ıs x hispanica.
	An evergreen broadleaved tree with a semi-ever old leaves fall. Leave longevity is essentially a year			and the second		
	Single-stemmed. Thick dark-grey bark, becoming deeply fissured at maturity.					
Issues to be aware of	Capable of becoming a very large tree so this sp	pecies needs space to grow.		- Charles		
Notable varieties		Notes				1. 1. A.
Hybrid-type habit	'Lucombeana', 'Fulhamensis'. - Observed to have some tolerance to salt and air pollution. 'Wageningen'. - Drought tolerance is at least partly derived from					All
More upright						N Star
Compact	'Waasland'. its ability to root deeply so where rooting depth is constrained it will not exhibit such good tolerance					
		to drought.			<i>hispanica</i> has thick, green habitat. © Bar	
		 Quercus spp. are known to be high emitters of Biogenic Volatile Organic Compounds (BVOCs). 			ers (male shown) er	nerge in late spring,

Right: The flowers (male shown) emerge in late spring, but are fairly inconspicuous. © Duncan Slater

	Quercus ilex		Tree Selector			
	(Holm oak)	 Contents page Alphabetical Index 	 Use potential Mature size Crown form Crown density 	 Environmental tolerance Ornamental qualities 		
Use potential	Park Paved Coastal Transport corridor	t	The tree and its features			
Tree size and crown characteristics	A large tree capable of growing to 25m. A globular crown, capable of getting almost as wide as it is tall in open environments.	A dense crown.		A in a		
Natural habitat	Native to the Mediterranean basin region and western Asia. Found in particularly well adapted for coastal sites. Adaptable to a wide range of providing they are well drained and not too organic.					
Environmental tolerance	Moderately tolerant to shade.	Sensitive to waterlogging.		P 4		
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	nature by early autumn the year tion.	A mature <i>Quercus ilex</i> provides its dense, globular crown. © Andrew Hirons	deep shade with		
	An evergreen broadleaved tree: older leaves are shed during early sur	nmer.				
	Single-stemmed. Thick dark-grey bark, becoming fissured and platy a	t maturity.				
Issues to be aware of	Is considered to be invasive, particularly in warm-temperate regions.					
Notable varieties	Notes					
Upright	air pollution. – Drought tolerance its ability to root of constrained it will to drought. – It is also possible – <i>Quercus</i> spp. are	e some tolerance to salt and e is at least partly derived from deeply so where rooting depth is not exhibit such good tolerance to use this species as a hedging plant. known to be high emitters of Organic Compounds (BVOCs).	Left: <i>Quercus ilex</i> has evergreer tend to be shed during early sur Right: Acorns of <i>Quercus ilex</i> m after pollination. © Duncan Slater	nmer. © Andrew Hirons		

	Quercus palustris (Pin oak)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved SuDS	Transport corridor		The tree and i	ts features	
Tree size and crown characteristics	of growing to 25m. young	y, developing a , globular crown	derately dense crown.		A	
Natural habitat	Native to the eastern United States. It acts as a margins and poorly-drained uplands, to 1000r acidic soil and will not perform well on calcare	n. Does well on a wide range of soil text				
Environmental tolerance	Partially tolerant to shade.	<u> </u>	erately tolerant aterlogging.	1 AC		
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	Acorns mature by early a following pollination.	utumn in the year		us palustris growing pyramidal crown fo	g in a park situation. or much of their
	Deciduous broadleaved tree with simple leave	s. Excellent crimson-red autumn colour.		© Andrew Hirons		1 and
	Single-stemmed. Grey-brown bark, smooth wh	nen young, developing shallow fissures v	with age.			
Issues to be aware of	With age the lower lateral branches tend to ha is necessary.	ng down so crown lifting is often requir	es where clearance			
Notable varieties		Notes				
Species-type habit	'Helmond', 'Woodside Splendor'.	- Observed to have some tolerance	e to salt and		ANKA N	
Upright	'Green Pillar'. air pollution. – Although this species is moderately tolerant to					
Dwarf	'Green Dwarf', 'Swamp Pygmy'.	flooding, it is quite sensitive to pro of flooding during the growing se	olonged periods			
Broad weeping	'Pendula'.	 <i>Quercus</i> spp. are known to be hig Biogenic Volatile Organic Compo 	h emitters of	© Duncan Slater	becomes more fissi p <i>alustris</i> leaves are	-

Right: *Quercus palustris* leaves are deeply lobed They will display excellent autumn colours. © Duncan Slater

	Quercus petraea		Tree Selector		
	(Sessile oak)	 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Coastal Transport corridor		The tree and it	s features	
Tree size and crown characteristics	A massive tree capable of growing to 35m. A globular to broad ovoid crown. Capable of becoming almost as wide as it is high.	A moderately dense crown.		i to	
Natural habitat	Native to Europe, including the British Isles, and western Asia. It has a broad distr range of cool-temperate forests. Capable of tolerating nutrient-poor, rocky soils Requires well-drained, acid to neutral soils.				
Environmental tolerance	Partially tolerant to shade. Moderately tolerant to drought.	Sensitive to waterlogging.			
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	arly autumn the year	The globular cro in a park situatio © Duncan Slater	wn of a Q <i>uercus pe</i> n.	traea
	Deciduous broadleaved tree with simple leaves.				2/24
	Single-stemmed. Grey-brown bark, becoming fissured with age.				K
Issues to be aware of	Capable of becoming a very large tree on sites that are not too exposed and ope lots of space.	n, therefore requires			
Notable varieties	Notes			MAL SO	
Entire (unlobed) leaves	'Mespilifolia' Observed to have some tole air pollution <i>Quercus</i> spp. are known to b Biogenic Volatile Organic Co	e high emitters of	Left: The leaves © Andrew Hirons	of Quercus petraea.	
				s of <i>Quercus petrae</i> r pollination.	ea mature

	Quercus phellos (Willow oak)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved SuDS Transport corridor		The tree and it	s features	
Tree size and crown characteristics	A massive tree capable of growing to 35m. Rarely above 20m in cultivation. A pyramidal crown when young, developing an ovoid to globular crown at maturity. Potentially >10m in diameter.	A dense crown.			
Natural habitat	Native to the eastern United States. Found in a range of habitats, principally in rip floodplains and lowland woods, but also found on some poorly drained upland si that have strong seasonal variability in water availability. Does well on a wide rang but requires acidic soil and will not perform well on calcareous soils.	tes (up to 400m)			
Environmental tolerance		Moderately tolerant to waterlogging.			
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	arly autumn in the year		in a park situation. sed much more wi	
	Deciduous broadleaved tree with simple, unlobed leaves. Deciduous in cool-temp in warmer regions this species is best described as semi-evergreen: immediately emergence, old leaves fall. Occasionally a good yellow autumn colour is displayed	after new leaf			
	Single-stemmed. Grey-brown bark, smooth when young, developing shallow fisse	ures with age.			
Issues to be aware of	Capable of becoming a very large tree so this species needs space to grow.				
Notable varieties	Notes				CON STATE
Species-type habit	'Hightower'. - Observed to have some toler air pollution. - <i>Quercus</i> spp. are known to b Biogenic Volatile Organic Co	e high emitters of	tend to maintain Right: The willov Depending on th	ellos make good st a compact form. « v-like leaves of Que he climate this spec or deciduous. « Bar	e <i>rcus phellos.</i> cies is either

	Quercus robur			Tree Selector		
			Contents page	Use potential	Crown form	Environmenta tolerance
(((()))	(Pedunculate oak)		Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park Transport corridor			The tree and i	ts features	
Tree size and crown characteristics	of growing to 35m. ovoid c	ular to broad crown. Capable oming almost e as it is high.	oderately dense crown.			
Natural habitat	Native to Europe, including the British Isles, and of lowland cool-temperate forests. Adaptable to nutrient-rich, not too organic and are reasonabl	o a wide range of soils, providing they		1		
Environmental tolerance	Partially tolerant to shade. Modera		erately sensitive aterlogging.			
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	Acorns mature by early a of pollination.	autumn the year	A majestic Que © Henrik Sjöman	rcus robur in a oper	n-grown situation.
	Deciduous broadleaved tree with simple leaves.					1234
	Single-stemmed. Grey-brown bark, becoming fi	issured with age.				
Issues to be aware of	Capable of becoming a very large tree on sites requires lots of space.	that are not too exposed and open, th	erefore,	12		
Notable varieties		Notes		12		
Upright	'Fastigiate Koster'.	- Observed to have some toleranc	e to salt and			
Broadly weeping	'Pendula'. air pollution. 'Pendula'. - Quercus spp. are known to be high emitters of					
Yellow leaves	'Concordia'.	Biogenic Volatile Organic Compo	ounds (BVOCs).	11		
		_			inconspicuous flow <i>Ir</i> emerge with the I	

© Duncan Slater Right: The acorns of *Quercus robur* mature the autumn after pollination. © Duncan Slater

	Quercus rubra (Red oak)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Transport corridor		The tree and it	s features	
Tree size and crown characteristics	of growing to 35m. Rarely ovoid c	lar to broad own at maturity. Illy >10m in diameter.			
Natural habitat		o 1800m. Does well on a wide range of soil textures depth and moderate to high fertility. Will not perform			
Environmental tolerance	Partially tolerant to shade. Modera	tely sensitive ght. Sensitive to waterlogging.			
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	Acorns mature by early autumn in the year following pollination.		<i>rubra</i> growing in a k great as the leave	park situation. s turn red in autumn.
		eaves. Very attractive red autumn colour occasionally		1	
	Single-stemmed. Grey-brown bark, smooth whe	n young, developing shallow fissures with age.		K-1	
Issues to be aware of	Capable of becoming a very large tree so this sp	ecies needs space to grow.			
Notable varieties		Notes		2	
Yellow leaves	'Aurea', 'Magic Fire'.	 Observed to have some tolerance to salt and air pollution. <i>Quercus</i> spp. are known to be high emitters of Biogenic Volatile Organic Compounds (BVOCs). 	The attractive lo	bed leaves of Quer	rcus rubra.

	Quercus suber (Cork oak)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Transp corrido			The tree and it	s features	
Tree size and crown characteristics	A large tree capable of growing to 18m.	A d	ense crown.			
Natural habitat	Native to the Mediterranean basin. Found in ope drained and preferably acidic but it is adaptable			SAN		NA
Environmental tolerance	Estimated to be partially tolerant to shade.		mated to be sensitive vaterlogging.			
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	Acorns mature by early of pollination.	autumn the year		<i>tus suber</i> , seen here The lower portion of or its cork.	
	Evergreen broadleaved tree with simple leaves.	Leaf longevity is generally two to thr	ee years.	© Andrew Hirons		
	Single-stemmed. Attractive, thick, corky bark is	deeply fissured at maturity.				
Issues to be aware of	Will not perform well in the colder regions of the	British Isles.				
Notable varieties		Notes				
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. e nursery for options.	 Observed to have some tolerand air pollution. Cork is traditionally harvested fr <i>Quercus</i> spp. are known to be hi Biogenic Volatile Organic Comp 	om this species. gh emitters of	© Duncan Slater	Dark of Quercus sub	

	Quercus x turneri (Turner's oak)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Paved Transpo corridor	:		The tree and it	s features	
Tree size and crown characteristics	A medium tree capable of growing to 15m. A globu	r crown. A mo	oderately dense crown.			
Natural habitat	A hybrid between <i>Quercus ilex</i> and <i>Q. robur.</i> Rec of soil textures.	ires good soil aeration but is adapta	able to a range			
Environmental tolerance	Estimated to be partially tolerant to shade.	ly tolerant (Level) to wa	nated to be sensitive aterlogging.			
Ornamental qualities	Male and female flowers held separately on the same tree, emerging in late spring with the leaves. Female flowers are inconspicuous, male catkins are attractive but not prominent.	Acorns mature by early a of pollination.	autumn the year	Quercus x turned in a park situatio © Andrew Hirons	ri displaying its glol n.	bular crown
	Evergreen broadleaved tree with simple leaves. leaf longevity is essentially a year and a leafless p Leaf longevity is generally longer on the 'Pseudo	riod is neither very apparent nor ve				
	Single-stemmed. Grey-brown bark becomes fiss	ed with age.				
Issues to be aware of	No substantial issues to be aware of.					
Notable varieties		Notes			ASTA CO	
Fully evergreen	'Pseudoturneri'.	 Observed to have some tolerance and air pollution. <i>Quercus</i> spp. are known to be hig Biogenic Volatile Organic Compo 	gh emitters of			
				Quercus x turner oak with simple, © Andrew Hirons	ri is an evergreen to lobed leaves.	o semi-evergreen

	Rhus typhina (Staghorn sumac)	 Contents page Alphabetical Index 	Tree SelectorUse potentialCrown formEnvironmenta toleranceMature sizeCrown densityOrnamental qualities
Use potential	Park Small garden Corrido		The tree and its features
Tree size and crown characteristics	A medium tree capable of growing to 15m but generally <8m in cultivation.	A moderately dense crown.	
Natural habitat		h eastern Canada. A pioneer of open ground and forest andy or rocky soils up to 1500m. Adaptable to a wide I soil.	
Environmental tolerance	Intolerant to shade. Moder to dro	Sensitive to waterlogging.	
Ornamental qualities	EARLY SUMMER Male and female flowers occur on separate trees (dioecious). Attractive upright clusters of flowers appear in early summer.	Conical, crimson, fruit clusters mature in late summer and persist well into winter. Only occurring on the female plants but highly attractive and of value to wildlife.	<i>Rhus typhina</i> growing in containers within a paved environment. The vase-shaped crowns suit this application well.
	Deciduous broadleaved tree with compound le turn to red or orange.	aves. Excellent autumn colour is provided when leaves	© Henrik Sjöman
V		out single-stemmed specimens are also available. al interest in the stems comes from the stout velvety	
lssues to be aware of	The species produces root suckers so it should	be planted where this characteristic will not be problematic.	
Notable varieties		Notes	
Cut leaves	'Dissecta', 'Laciniata'.	 Observed to have some tolerance to salt and air pollution. Individuals are quite short-lived (<50 years) but clonal colonies can live much longer. 	Left: The pinnate leaves of <i>Rhus typhina</i> are attractive, especially in autumn. © Andrew Hirons
			Right: <i>Rhus typhina</i> has upright clusters of flowers that appear in early summer. © Andrew Hirons

	Robinia pseudoacacia (False acacia)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities 	
Use potential	Park Paved Transport corridor			The tree and its features			
Tree size and crown characteristics	A large tree capable of reaching around 25m. A vase s form.	shaped crown An oper	n crown.		Ren !	and the second	
Natural habitat		Native to the Appalachian mountains in the eastern United States. A pioneer tree found in forest margins and riparian corridors up to about 1000m. Adaptable to a wide range of soils, providing the pH is not extreme and it is well drained.					
Environmental tolerance	Intolerant to shade.	t to drought. Sensitiv	e to waterlogging.				
Ornamental qualities	EARLY SUMMER Fragrant, white or creamy flowers emerge in pendulous clusters in early summer. Highly ornamental.	Seed pods mature in early a and persist into winter.	utumn		as of <i>Robinia pseudo</i> for this lawn and ver		
	Deciduous broadleaved tree with pinnately compound leaves. In some years a good yellow autumn colour can be observed.						
	Single-stemmed. Grey bark that becomes deeply fissured and rough with age. Pairs of spines are associated with the leaves.						
Issues to be aware of	Spines are found on this species but a number of cultivars lack spines so are preferable for many planting locations. Potentially invasive, particularly in warmer climates, as it produces prolific root suckers.						
Notable varieties		Notes					
Straight central trunk	'Appalachia'. – Highly variable if grown from seed, choose						
Irregular to ovoid	'Bessoniana'.		a cultivar if particular properties are desired. - In cultivation is readily establishes and grows fast.				
Upright	'Pyramidalis'.		<i>pseudoacacia</i> tends to have rather brittle xposed windy sites are best avoided.				
Compact round	'Umbraculifera'.	 - 'Bessoniana', 'Pyramidalis' and 'Umbraculifera' are scarcely thormed. - Observed to have some tolerance to salt and 		Left: The pinnat © Duncan Slater	e leaves of <i>Robinia</i> (oseudoacacia.	
Yellow leaves	'Frisia'.			Right: <i>Robinia pseudoacacia</i> has fragrant, pendulous clusters of white flowers that appear in early summer. © Andrew Hirons			
Big leaves	'Unifoliola'. air pollution.						

	Salix alba (White willow)	Conte page Alpha Index	betical Mature	S Crown	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree a	and its features	
Tree size and crown characteristics	A massive tree capable of reaching 30m.	gular crown. An open crown.			
Natural habitat		parts of north Africa. A pioneer species of riparian riverbanks. Is very adaptable to different soil types o perform well.			
Environmental tolerance	Intolerant to shade. Sensitiv	re to drought. Tolerant to water	ogging.		
Ornamental qualities	Male and female flowers (catkins) are held on separate trees (dioecious). They appear in late spring, are attractive but fairly inconspicuous.	Small capsule fruit ripens very quickly by early summer.	Left: <i>Salix a</i> © Duncan Sla		
	Deciduous broadleaved tree with simple leaves.		© Andrew Hir	narrow leaves of <i>Salix al</i>	
	Single-stemmed. Some of the cultivars have high Mature bark is grey-brown and deeply fissured.	nly ornamental coloured young stems.		1 1/2	
Issues to be aware of	Shallow rooting, especially in wet soil so conside Male trees release a lot of pollen so have high all				
Notable varieties		Notes	11		She Mar
Scarlet stems	'Chermesina'.	– Highly variable if grown from seed, choose	/	10	1500 -1
Male (no fruits)	'Belders', 'Liempde'.	 a cultivar if particular properties are desired. Easy to establish and fast to grow. Female plants are good for bees and other pollinating insects. Can be very successfully maintained as a polla this will require on-going maintenance commi Salix spp. are known to be high emitters of Bic Volatile Organic Compounds (BVOCs). 	tments. they are fa	small capsule fruit riper	ngst the new leaves.

	<i>Salix babylonica</i> (Weeping willow)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park			The tree and i	ts features	
Tree size and crown characteristics	A large tree capable of reaching 20m. A weepi	g crown. An open	crown.			
Natural habitat	Native central and north China. A key riparian sp Very widely cultivated beyond its natural range. but does require moist conditions if it is going to but suitable for southern parts of the British Isles	very adaptable to different soil types	l,			
Environmental tolerance	Intolerant to shade. Sensitiv	to drought. Moderate to waterl	ely tolerant ogging.			
Ornamental qualities	Male and female flowers (catkins) are held on separate trees (dioecious). They appear in late spring, are attractive but fairly inconspicuous.	Small capsule fruit ripens ver by early summer.	y quickly	attractive. This s		onica are especially a high quality rooting well in a payed
	Deciduous broadleaved tree with simple leaves.				IOWN). © Henrik Sjöman	
	Single-stemmed. Grey-brown bark is relatively sr irregularly fissured at maturity. The main orname			Ľ.		a - A-
Issues to be aware of	Shallow rooting, especially in wet soil so conside release a lot of pollen so have high allergenicity p		ale trees		AN	
Notable varieties		Notes				227
Twisted branches	'Tortuosa' (Syn <i>Salix matsudana</i> 'Tortuosa').	 Easy to establish and fast to grow. Female plants are good for bees and pollinating insects. Salix x sepulcralis 'Chrysocoma' is less the cold and generally makes a better in most parts of the British Isles. Tolerant of heat, providing it is in well w Salix spp. are known to be high emitter Volatile Organic Compounds (BVOCs) 	s sensitive to r 'weeping willow' vatered conditions. ers of Biogenic	and the second sec		<i>a babylonica</i> appear cuous amongst the

	Salix caprea		Tree Selector				
	(Goat willow)		 Contents page Alphabetical Index 	Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities 	
Use potential	Park			The tree and it	s features		
Tree size and crown characteristics	A medium tree capable of reaching 15m, however, typically less than 10m.		open crown.				
Natural habitat	Native to much of Europe (including the British I forest margins and meadows. Often found along adaptable with regards to soil type.	sles) and temperate Asia. A pioneer gside roads. Prefers a well-drained s	of disturbed sites, oil but is highly				
Environmental tolerance	Partially tolerant to shade. Modera		derately sensitive waterlogging.				
Ornamental qualities	Male and female flowers (catkins) are held on separate trees (dioecious). They appear in early spring before the leaves and are highly ornamental.	Small capsule fruit ripe by late spring.	ns very quickly		own <i>Salix caprea</i> . The bed sites and will re		
	Deciduous broadleaved tree with simple leaves.						
	Single-stemmed. Grey-brown bark becomes irre	gularly fissured with age.					
Issues to be aware of	Seed dispersion can cause a minor annoyance b of pollen so have high allergenicity potential dur		s release a lot				
Notable varieties		Notes					
Weeping	'Pendula'.	- Easy to establish and fast to gro					
Large female flowers	'Mas'.	 Although noted to be partially to it performs best in full sun. Female plants are good for been pollinating insects. Salix spp. are known to be high Biogenic Volatile Organic Complete the sector of t	s and other emitters of	attractive in early	atkins of <i>Salix capre</i> y spring. © Henrik Sjón sule fruit ripens in la seed.	nan	

	<i>Salix daphnoides</i> (Violet willow)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics	A medium tree capable of reaching 12m. An ovoid crown that gets to about 6m in diameter.	An open crown.			
Natural habitat	Native to Europe. Most frequently associates with upland riparian corridors on a occasionally associated with lowland rivers. Requires moist soil but is adaptable of soil types.				
Environmental colerance	Partially tolerant to shade. Sensitive to drought.	Moderately tolerant to waterlogging.			
Drnamental qualities	Male and female flowers (catkins) are held on separate trees (dioecious). They appear in early spring before the leaves and are highly ornamental.	ripens very quickly	© Duncan Slater	<i>alix daphnoides</i> in a	park environment.
	Deciduous broadleaved tree with simple leaves.		© Duncan Slater	HX	
	Single-stemmed. Young stems are a very attractive purple-violet with a white b Mature bark is grey-brown and becomes irregularly fissured with age.	loom.		the	
lssues to be aware of	Seed dispersion can cause a minor annoyance but this is fairly short-lived. Male of pollen so have high allergenicity potential during the flowering period.	trees release a lot			
Notable varieties	Notes		Ko Al	A LAND	CORP.
Male	 'Aglaia'. Easy to establish and fast t Female plants are good for pollinating insects. A good candidate for copp attractive young stems are <i>Salix</i> spp. are known to be Biogenic Volatile Organic (r bees and other bicing so that the renewed. high emitters of	The male catkins ornamental in ea © Duncan Slater	s of <i>Salix daphnoide</i> arly spring.	es are highly

	<i>Salix pentandra</i> (Bay-leaved willow)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	A large tree capable of reaching 18m. A globular crown that can get to around 10m in diameter.	An open crown.	-		
Natural habitat	Native to Europe, including the British Isles, and western Asia. Found around and swampy valleys and other areas with high water tables up to the altitudi occasionally in lowland floodplains. Requires wet soil but is adaptable to a w	nal treeline. Also found			
Environmental tolerance	Intolerant to shade. Sensitive to drought.	Tolerant to waterlogging.			
Ornamental qualities		uit ripens by late summer I on the tree into winter.			
	Deciduous broadleaved tree with simple leaves.			X	
	Single-stemmed. Young stems are a very attractive purple-violet with a white Mature bark is grey-brown and becomes irregularly fissured with age.	e bloom.			
Issues to be aware of	Not at all suitable for dry sites. Male trees release a lot of pollen so have high during the flowering period.	allergenicity potential			
Notable varieties	Notes				
The species is available, h Consult your preferred tre	 Evenusery for options. Easy to establish and fast options. Female plants are good pollinating insects. High altitude individuals Salix spp. are known to be Biogenic Volatile Organical 	for bees and other take on a shrub form. be high emitters of	The leaves of <i>So</i> for wet soils. © Henrik Sjöman	alix pentandra. This	is a useful tree

	<i>Salix x sepulcralis</i> (Weeping willow)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics	A large tree capable of reaching 20m. A weeping crown.	An open crown.		an ste	
Natural habitat	A hybrid between <i>Salix alba</i> var. <i>vitellina</i> and <i>S. babylonica</i> . Is very but does require moist conditions if it is going to perform well.	v adaptable to different soil types			
Environmental tolerance	Estimated to be intolerant to shade. Estimated to be sensitive to drought.	Estimated to be moderately tolerant to waterlogging.	-	il Ma	
Ornamental qualities		l capsule fruit ripens very quickly arly summer.		m of <i>Salix</i> x <i>sepulc</i> , noist areas, it will es	
	Deciduous broadleaved tree with simple leaves.		© Duncan Slater		la se
	Single-stemmed. The main ornamental feature of this tree is its gr	aceful weeping form.			
Issues to be aware of	Shallow rooting, especially in wet soil so consider this when select a lot of pollen so have high allergenicity potential during the flowe				
Notable varieties	Notes				Letter A
Weeping	- Female plant pollinating in: - Makes a bette British Isles th to the cold. - <i>Salix</i> spp. are	olish and fast to grow. s are good for bees and other sects. er 'weeping willow' in most parts of the nan <i>S. babylonica</i> as it is less sensitive also known to be high emitters of atile Organic Compounds (BVOCs).	© Duncan Slater Right: The flowe	nple leaves of <i>Salix</i> rs (female shown) of amongst the new	of <i>Salix</i> x sepulcralis

	Sequoia sempervirens		Tree Selector		
	(Coastal redwood)	Contents page Alphabetical Index	 Use potential Mature size 	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Coastal		The tree and i	ts features	
Tree size and crown characteristics	A massive tree capable of reaching over 100m in its natural habitat, generally less than 50m in Europe.	r in 🛛 🗱			
Natural habitat	Native to coastal sites in northern California and southerr United States. Performs best on nutrient rich, deep, alluvi type providing shallow calcareous soils are avoided.				
Environmental colerance	Tolerant to shade. Moderately toler to drought.	rant Sensitive to waterlogging.			
Ornamental qualities	Male and female reproductive parts are held separately and are of no ornamental merit.	Small (2-3cm) seed cones mature about a year after pollination. Of little ornamental merit.	Left: The conica © Henrik Sjöman	al crown of <i>Sequoia</i>	
	Evergreen conifer tree with needle leaves.		- Right: A small s © Duncan Slater	eed cone of <i>Sequoi</i>	a sempervirens.
	Single-stemmed. Mature bark is reddish-brown, thick, rou Attractive, but not highly ornamental.	ughly fibrous and relatively soft.		13 D	
Issues to be aware of	A potentially massive tree.				
Notable varieties	Notes	S			
Blue-green leaves	'Winter Blue' Once	e established this is a fast-growing tree.		A AL	
			Sequoia sempe	nvironment (shown <i>rvirens</i> can become urrently the worlds	massive. In fact,

	Sequoiadendron gigan	teum	Contents page	Tree Selector	Crown form	Environmenta tolerance
ŶŶ	(Giant sequoia)		Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park			The tree and i	ts features	
Free size and crown characteristics	reaching over 100m in its relative	cal crown, ely slender in n to its height.	se crown.			A
Natural habitat	Native to California in the United States. A pion alluvial soils but is fairly adaptable to soil type.	eer species that performs best on nutrie	ent rich, deep,			
Environmental tolerance	Partially tolerant to shade. Moder to drow		ive to waterlogging.			
Ornamental qualities	Male and female reproductive parts are held separately and are of no ornamental merit.	Small (2-3cm) seed cones about two years after polli Of little ornamental merit.	ination.	- Left: A mature S © Henrik Sjöman	Sequoiadendron gig	anteum in a forest.
	Evergreen conifer tree with needle leaves.			trees the crowns of trongly conical. © Du		
	Single-stemmed. Mature bark is reddish-brown Attractive but not highly ornamental.	n, thick, roughly fibrous and relatively sof	īt.			
Issues to be aware of	A potentially massive tree.					
Notable varieties		Notes			N N	
Blue-green leaves	'Glaucum'.	- Sensitive to salt and air pollution.		15 JUB	S- 441 -	
Broadly weeping	'Barabits Requiem'.	-				
					of Sequoiadendron g protect the tree from	

The thick bark of *Sequoiadendron giganteum* has evolved to protect the tree from forest fires. © Henrik Sjöman

	Sorbus aria (Whitebeam)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities 			
Use potential	Park Paved Small garder	1	The tree and it	s features				
Tree size and crown characteristics		id crown that gets I 6m in diameter.	THE					
Natural habitat	woodland margins, in open woodland and on m	Native to Europe, including the British Isles. Found predominantly on dry, calcareous soils around woodland margins, in open woodland and on mountain slopes to 1800m. Although it prefers calcareous soils, it is capable of growing quite well on acidic soils providing they are well drained and not dominated by clay.						
Environmental tolerance	Partially tolerant to shade.	Sensitive to waterlogging.						
Ornamental qualities	Abundant convex clusters of white flowers appear in late spring. Highly ornamental.	Clusters of red berries (pomes) ripen by late summer. Excellent for birds.	species with a ra	slow-growing, drou				
		. The underside of the leaf is covered with white hairs	_ © Henrik Sjöman					
	Single-stemmed in cultivation but often found a becoming slightly rougher with age.	as a multi-stemmed tree in the wild. Smooth grey bark,						
Issues to be aware of	Fruit litter may be a nuisance in some scenarios become problematic.	Fruit litter may be a nuisance in some scenarios but the berries usually get eaten before they become problematic.						
Notable varieties		Notes		1800 23	A REAL			
Species-type	'Magnifica', 'Majestica'.	 Extremely sensitive to poor soil aeration so should not be planted in heavy, frequently waterlogged 						
Larger leaves	'Gigantea'.	14						
Silvery-white leaves	'Lutescens'.	 Excellent for bees and other pollinating insects. The cultivar 'Lutescens' can suffer from early leaf drop 	Left: The leaves © Henrik Sjöman	of <i>Sorbus aria.</i> Justers of white flow	Iors covor			

Right: Convex clusters of white flowers cover *Sorbus aria* in late spring. © Andrew Hirons

	Sorbus x arnoldiana (Hybrid Sorbus)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and it	s features	
Tree size and crown characteristics	A medium tree capable of reaching 12m. An ovoid crown that gets around 5m in diameter.	A moderately dense crown.	7		
Natural habitat	A hybrid between <i>Sorbus aucuparia</i> and <i>S. discolor</i> . Prefers organic, acid so well on sandy soils.	ils, but also performs			
Environmental tolerance	Estimated to be partially tolerant to shade.	Estimated to be sensitive to waterlogging.	1		1
Ornamental qualities	Convex clusters of white flowers appear in late spring. Highly ornamental.	ow berries (pomes) ripen r.			
	Deciduous broadleaved tree with pinnate leaves. Generally an excellent yel autumn colour.	ow-orange-red			
	Single-stemmed. Smooth grey bark, becoming slightly rougher with age.		- AR	3000	
Issues to be aware of	Fruit litter may be a nuisance in some scenarios but the berries usually get a become problematic.	eaten before they			
Notable varieties	Notes				
Hybrid-type					
Pyramidal	'Golden Wonder'. - Excellent for bees and - Fruits are very attractive		clusters of yellov	<i>us x arnoldiana</i> has v berries in late sun vrovide good autur	nmer and autumn.

	Sorbus aucuparia (Rowan)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Small garden			The tree and it	s features	
Tree size and crown characteristics		d crown that gets 6m in diameter.	A moderately dense crown.	, A		
Natural habitat	Native to Europe, including the British Isles, and A pioneer tree found scattered in woodlands, fo around 2000m. Found on a wide range of soils, preferring light, acid soils. Requires good soil aer	rest margins, mountain slopes an from moderately acidic to calcan	nd cliffs up to the treeline reous, but generally	ALTERNIT, CONT.		
Environmental tolerance	Partially tolerant to shade. Modera		Sensitive to waterlogging.			
Ornamental qualities	Convex clusters of white flowers appear in late spring. Highly ornamental.	Clusters of red berri by late summer. Exc and small mammals	ellent for birds	interest in late su	ed fruit of <i>Sorbus au</i> ummer. It is also exe	
	Deciduous broadleaved tree with pinnate leaves autumn colour.	. Generally an excellent yellow-o	range-red	© Duncan Slater		
V	Single-stemmed in cultivation but often found as becoming slightly rougher with age.	s a multi-stemmed tree in the wil	d. Smooth grey bark,			
Issues to be aware of	Fruit litter may be a nuisance in some scenarios become problematic.	out the berries usually get eaten	before they			
Notable varieties		Notes				
Species-type	'Cardinal Royal', 'Sheerwater Seedling', 'Rossica Major'.	- Extremely sensitive to poor				W AN
Cut leaves	'Asplenifolia'.	not be planted in heavy, frec or compacted soil.	quently waterlogged	N-		A VAC
Larger leaves and fruit	'Edulis' (Syn var. <i>Edulis</i>).	m turf-grass. pollinating insects.			R Villes	
Golden fruit	'Golden Wonder' Excellent for bees and other pollinating insects.				<i>uparia</i> has highly o of white flowers in	
Upright	'Fastigiata', 'Streetwise'.			© Andrew Hirons	f red, berry-like fru	

		<i>us cashmii</i> hmir rowar				 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmentatolerance Ornamental qualities
Use potential	Pa	Small garder	1				The tree and i	ts features	
Tree size and crown characteristics		small tree capable reaching 8m.	that	regular crown gets around 4m ameter.		A moderately dense crown.			
Natural habitat	Na	ative to the Himalaya regi	on. Found in the s	ubalpine zone on mour	tain slopes.				
Environmental tolerance		stimated to be partially lerant to shade.	mod	nated to be erately sensitive ought.		Estimated to be sensitive o waterlogging.		YE	
Ornamental qualities		onvex clusters of light-pin late spring. Highly ornam		by late s		ries (pomes) ripen Ilent for birds and	Sorbus cashmiri, in late spring. © Tim Baxter	iana has clusters of	light pink flowers
		eciduous broadleaved tre	e with pinnate lea	ves. Generally, a decent	yellow-orang	ge-red autumn colour.			
V		ngle-stemmed in cultivati ecoming slightly rougher		d as a multi-stemmed ti	ee in the wild	l. Smooth grey bark,			X
lssues to be aware of		ruit litter may be a nuisand ecome problematic.	ce in some scenari	os but the berries usual	ly get eaten l	before they			
Notable varieties				Notes					
The species is available, hov Consult your preferred tree			e widely available	not be planted i or compacted s	n heavy, freque bil. es and other ttractive for l vulnerable to			e berry-like fruit are late summer and po	

	Sorbus commixta (Japanese rowan)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and its	features	
Tree size and crown characteristics		id crown that gets 4m in diameter. A moderately dense crown.	. 3		
Natural habitat	Native to China, Japan, Korea, the Kurile Islands	and Sakhalin. Found in mountain woodlands.			
Environmental tolerance	Partially tolerant to shade. Modera	ately sensitive aght. Sensitive to waterlogging.			THERE
Ornamental qualities	Convex clusters of white flowers appear in late spring. Highly ornamental.	Clusters of orange-red berries (pomes) ripen by late summer. Excellent for birds and small mammals.	and small garden s	situations. © Duncan	
	Deciduous broadleaved tree with pinnate leaves	s. An excellent yellow-orange-red autumn colour.	Right: A young <i>Sol</i> colours in autumn.		owing spectacular
	Single-stemmed in cultivation but often found a becoming slightly rougher with age.	s a multi-stemmed tree in the wild. Smooth grey bark,			
Issues to be aware of	Fruit litter may be a nuisance in some scenarios become problematic.	but the berries usually get eaten before they	X		
Notable varieties		Notes			
Species-type	'Olympic Flame' (Syn 'Dodong'), 'Jermyns'.	- Extremely sensitive to poor soil aeration so should	The ANK		- interest
Upright	'Embley'.	not be planted in heavy, frequently waterlogged or compacted soil. - Excellent for bees and other pollinating insects. - Fruits are very attractive for birds. - Easy to establish and fast growing as a young tree.	Left: The pinnate l orange in autumn.		stic yellow-red-
			Right: Clusters of a Sorbus commixta and autumn. © Dunc	useful for wildlife	like fruit make in late summer

	Sorbus discolor (Chinese rowan)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Small garden			The tree and it	s features	
Tree size and crown characteristics		crown that gets m in diameter.	A moderately dense crown.			
Natural habitat	Native to China, found in mixed deciduous fores 1500-2000m. Prefers well-aerated, slightly acidi		n-facing slopes			
Environmental tolerance	Estimated to be partially tolerant to shade.	ely sensitive	Estimated to be sensitive to waterlogging.	*		
Ornamental qualities	Pyramidal clusters of white flowers appear in late spring. Highly ornamental.	Clusters of white bei with crimson ripen b	rries (pomes) blushed by late summer.	© Andrew Hirons	orbus discolor in a	
	Deciduous broadleaved tree with pinnate leaves autumn colour.		range-red		e of a woodland ma his young <i>Sorbus c</i>	argin provides a good discolor. © Tim Baxter
	Single-stemmed. Smooth grey bark, becoming s	ghtly rougher with age.				
Issues to be aware of	Fruit litter may be a nuisance in some scenarios become problematic.	ut the berries usually get eaten	before they			
Notable varieties		Notes				
The species is available, how Consult your preferred tree r	ever, no notable cultivated varieties are widely available. hursery for options.	 Extremely sensitive to poor s not be planted in heavy, freq or compacted soil. Excellent for bees and other Syn Sorbus pekinensis and S Fruits are very attractive for 	uently waterlogged pollinating insects. . hupehensis.		berry-like fruit blu mer and are a distin	

	<i>Sorbus intermedia</i> (Swedish whitebeam)	 Contents page Alphabetical Index 	Tree SelectorUse potentialCrown formMature sizeCrown density	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Small Garden Coastal	Transport corridor	The tree and its features	
Tree size and crown characteristics	A medium tree capable of reaching 15m. An ovoid crown that gets around 6m in diameter.	A moderately dense crown.		The second second
Natural habitat	Native to the Baltic region of Europe, particularly southern Sweden. Naturalised Ireland. Found in forest margins, in open woodland and on mountain slopes to found extensively on coastal sites. Although it prefers calcareous soils, it is cap well on acidic soils providing they are well drained and not dominated by clay.	around 1000m. Also		
Environmental tolerance	Partially tolerant to shade. Moderately tolerant to drought.	Sensitive to waterlogging.		
Ornamental qualities		rries (pomes) ripen Excellent for birds.	Sorbus intermedia is suitable for a planting situations. Shown here a	
	Deciduous broadleaved tree with simple, lobed leaves. The underside of the leaves white hairs adding interest during the summer. Leaves turn yellow in autumn.	af is covered with	© Henrik Sjöman	
V	Single-stemmed in cultivation but also found as a multi-stemmed tree in the wild becoming slightly rougher with age.	ild. Smooth grey bark,		
Issues to be aware of	Fruit litter may be a nuisance in some scenarios but the berries usually get eater become problematic.	en before they		
Notable varieties	Notes			
Regular form	'Brouwers' Extremely sensitive to poor not be planted in heavy, fr or compacted soil. - Excellent for bees and oth - Fruits are very attractive for - Tolerant to salt and air pol	equently waterlogged er pollinating insects. or birds.	Left: Young leaves of <i>Sorbus inter</i> © Andrew Hirons Right: Convex clusters of white fli <i>intermedia</i> in late spring and are © Andrew Hirons	owers cover <i>Sorbus</i>

	Sorbus 'Joseph Rock'			Tree Selector		
	(Hybrid Sorbus)		 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Small garden			The tree and i	s features	
Tree size and crown characteristics		d crown that gets 4m in diameter.	noderately dense crown.			
Natural habitat	A cultivar of obscure origin, now thought to be a Adaptable to a wide range of soil.	hybrid of <i>Sorbus monbeigii</i> and <i>S.</i>	commixta.			
Environmental tolerance	Estimated to be partially tolerant to shade.		nsitive to waterlogging.			
Ornamental qualities	Convex clusters of white flowers appear in late spring. Highly ornamental.	Clusters of yellow berri to white with a pink flu They ripen by late sumr		a range of situal	Rock' is a useful me ions. It has more dr	
	Deciduous broadleaved tree with pinnate leaves	. An excellent orange-red autumn c	colour.	than many othe © Duncan Slater		
	Single-stemmed in cultivation but often found a becoming slightly rougher with age.	a multi-stemmed tree in the wild. S	Smooth grey bark,			
Issues to be aware of	Fruit litter may be a nuisance in some scenarios become problematic.	but the berries usually get eaten be	fore they			
Notable varieties		Notes				
Not applicable: a single cu	ltivar profile.	 Extremely sensitive to poor soi not be planted in heavy, freque or compacted soil. Excellent for bees and other por Fruits are very attractive for bir Reported to be very sensitive to (<i>Erwynia amylovora</i>). This is a p in southern England. 	ntly waterlogged ollinating insects. ods. o bacterial fireblight	of yellow berry- Right: Yellow be	like fruit in late sum rry-like fruits help t Rock' and are attra	e seen with clusters mer. © Barcham Trees to distinguish ctive in late summer

	<i>Sorbus latifolia</i> (Broad-leaved whitebea	nm)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Paved Coastal	Transport corridor		The tree and it	s features	
Tree size and crown characteristics		d crown that gets 6m in diameter.	noderately dense crown.		Y.	1
Natural habitat	A naturally occurring hybrid between <i>Sorbus ari</i> naturalised in the British Isles. Found in open wo					
Environmental tolerance	Estimated to be partially tolerant to shade.		imated to be sensitive vaterlogging.	-		
Ornamental qualities	Abundant convex clusters of white flowers appear in late spring. Highly ornamental.	Clusters of orangey ber by early autumn. Excell				
	Deciduous broadleaved tree with simple, shallow with white hairs adding interest during the summ	ly lobed leaves. The underside of th	e leaf is covered			
	Single-stemmed in cultivation but also found as becoming slightly rougher with age.	a multi-stemmed tree in the wild. Sn	nooth grey bark,	*		AA
Issues to be aware of	Fruit litter may be a nuisance in some scenarios become problematic.	out the berries usually get eaten bef	ore they			
Notable varieties		Notes		10 C (0 1	1.00	
Pyramidal	'Henk Vink', 'Atrovirens'.	 Extremely sensitive to poor soil not be planted in heavy, frequer or compacted soil. Excellent for bees and other point Fruits are very attractive for bird This hybrid has good tolerance 	ntly waterlogged linating insects. ds.	Sorbus latifolia h ripen in early aut © Henrik Sjöman	as clusters or orang	ge berries that

	<i>Sorbus pseudohupeher</i> (Hupeh rowan)	Sis Contents page Alphabetical Index	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and it	ts features	
Tree size and crown characteristics		d crown that gets 5m in diameter. A moderately dense crow	n.		
Natural habitat	Native to China, found dense forests, gullies, sha Prefers well-aerated, slightly acidic soils.	ded slopes and thickets 300-3800m.			ABU
Environmental tolerance		ed to be tely sensitive ght.	-		
Ornamental qualities	Pyramidal clusters of white flowers appear in late spring. Highly ornamental.	Clusters of pink berries (pomes) ripen by late summer. See notes for addition information.			
	Deciduous broadleaved tree with pinnate leaves	An excellent red autumn colour.			
	Single-stemmed, often multi-stemmed in the wi with age.	d. Smooth grey bark, becoming slightly rougher			
lssues to be aware of	Fruit litter may be a nuisance in some scenarios become problematic.	but the berries usually get eaten before they			2
Notable varieties		Notes	- 7843		
The species is available, how Consult your preferred tree i	rever, no notable cultivated varieties are widely available. nursery for options.	 Excellent for bees and other pollinating insects. Fruits are very attractive for birds. The pink-fruited tree, often sold in the nursery trade as Sorbus hupehensis, should be called Sorbus pseudohupehensis. The similar white-fruited tree should be called Sorbus glabriuscula. A similar tree with white fruits flushed with crimson is Sorbus disconting. 	the first state of the second state	upehensis is adorn	red with pink berries

	Sorbus thibetica (Tibetan whitebeam)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Small garden		The tree and it	s features	
Tree size and crown characteristics	A medium tree capable of reaching 12m. An ovoid crown that gets around 15m in diameter.	A moderately dense crown.			
Natural habitat	Native to the Himalayan region, particularly, western China, Bhutan and Myanm on slopes, stream banks and shrubby thickets; 2400-3800m. Adaptable to a w	nar. Found in forests, ride range of soils.			
Environmental tolerance	Estimated to be partially tolerant to shade. Estimated to be moderately tolerant to drought.	Estimated to be sensitive to waterlogging.			
Ornamental qualities	Abundant convex clusters of white flowers appear in late spring. Highly ornamental.	berries (pomes) ripen Excellent for birds.	A mature <i>Sorbus</i> © Andrew Hirons	s thibetica growing	in a park situation.
	Deciduous broadleaved tree with simple leaves. The underside of the leaf is cov adding interest during the summer.	vered with white hairs			Sec. 1.
	Single-stemmed in cultivation but often found as a multi-stemmed tree in the w becoming slightly rougher with age.	vild. Smooth grey bark,		NCa.	
Issues to be aware of	Fruit litter may be a nuisance in some scenarios but the berries usually get eater become problematic.	n before they			
Notable varieties	Notes				
Compact form	'John Mitchell'. - Extremely sensitive to poo not be planted in heavy, fre or compacted soil. - Excellent for bees and othe - Fruits are very attractive for	equently waterlogged er pollinating insects.		es and pollinated flor rs of scarlet berry-l	

	Sorbus x thuringiaca (Hybrid Sorbus)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Paved Small garden			The tree and it	s features	
Tree size and crown characteristics		l crown that gets 5-8m in diameter.	A moderately dense crown.			
Natural habitat	A rare but naturally occurring hybrid between So the British Isles. Found predominantly in open wo					
Environmental tolerance	Estimated to be partially tolerant to shade.	ed to be to drought.	Estimated to be sensitive to waterlogging.			
Ornamental qualities	Abundant convex clusters of white flowers appear in late spring. Highly ornamental.	Clusters of red berr by early autumn. Ex			<i>iaca</i> is a tough, attr ant red berry-like fr	active tree. Seen ruit in early autumn.
	Deciduous broadleaved tree with leaves that have pinnate. The underside of the leaf is covered with					
	Single-stemmed in cultivation but often found as becoming slightly rougher with age.	a multi-stemmed tree in the wi	ld. Smooth grey bark,			
Issues to be aware of	Fruit litter may be a nuisance in some scenarios b become problematic.	ut the berries usually get eaten	before they			
Notable varieties		Notes			ALL CONTRACT	
Upright	'Fastigiata'.	 Extremely sensitive to poor not be planted in heavy, free or compacted soil. Excellent for bees and other Fruits are very attractive for 'Fastigiata' also tends to be making it a good choice for 	quently waterlogged r pollinating insects. r birds. less than 10m,	flowers that cove © Duncan Slater	uringiaca has conve er the crown in late	

	Sorbus torminalis			Tree Selector		
	(Wild service tree)		 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Paved Coast	al		The tree and it	s features	
Tree size and crown characteristics		bid crown that gets d 15m in diameter.	A moderately dense crown.			8
Natural habitat	Native to Europe (including the British Isles), w woodland, rocky slopes, cliffs and disturbed sit of soils, including clays, providing they are reas	es, up to around 1600m. Adaptabl				
Environmental tolerance	Partially tolerant to shade.	nt to drought.	Sensitive to waterlogging.			with the
Ornamental qualities	Abundant convex clusters of white flowers appear in late spring. Highly ornamental.		-orange berries (pomes) n. Excellent for birds.	A mature Sorbus a compact, ovoid © Andrew Hirons	s <i>torminalis</i> will ofte d crown.	n maintain
	Deciduous broadleaved tree with simple, varial turning yellow to deep red.	bly lobed leaves. Good autumn col	our with leaves			
	Single-stemmed in cultivation but often found becoming slightly rougher with age.	as a multi-stemmed tree in the wild	d. Smooth grey bark,			3a
Issues to be aware of	Fruit litter may be a nuisance in some scenarios problematic. Produces root suckers and is capa		before they become			200
Notable varieties		Notes				1 Martine
The species is available, how Consult your preferred tree i	ever, no notable cultivated varieties are widely available. hursery for options.	 Extremely sensitive to poor s not be planted in heavy, freq or compacted soil. Excellent for bees and other Fruits are very attractive for l 	uently waterlogged pollinating insects.	© Henrik Sjöman	Imn leaves of <i>Sorbu</i>	
				of white flowers © Henrik Sjöman		

	Sorbus vilmorinii (Vilmorin's rowan)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden		The tree and its	features	
Tree size and crown characteristics		id crown that gets 4m in diameter.			
Natural habitat	Native to China. Found in a range of habitats, ir grasslands and bamboo thickets; 2800-4400n	cluding mountain slopes, mixed forests, riparian corridors, n.			
Environmental tolerance		ted to be ately sensitive ight. Estimated to be moderately sensitive to waterlogging.			
Ornamental qualities	Convex clusters of white flowers appear in early summer. Highly ornamental.	Clusters of crimson (pomes) that fade to white with a crimson flecks. They ripen by early autumn and persist into winter. Good for wildlife.	A mature <i>Sorbus</i> small tree for gar © Duncan Slater		an excellent
	Deciduous broadleaved tree with delicate pinn.	ate leaves. An excellent deep red autumn colour.			
	Single-stemmed in cultivation but often found a becoming slightly rougher with age.	is a multi-stemmed tree in the wild. Smooth grey bark,			ANY A
lssues to be aware of	Fruit litter may be a nuisance in some scenarios become problematic.	but the berries usually get eaten before they			None
Notable varieties		Notes			
The species is available, how Consult your preferred tree i	ever, no notable cultivated varieties are widely available. nursery for options.	 Extremely sensitive to poor soil aeration so should not be planted in heavy, frequently waterlogged or compacted soil. Excellent for bees and other pollinating insects. Fruits are very attractive for birds. Reported to be very sensitive to bacterial fireblight (<i>Erwynia amylovora</i>). This is a particular problem in southern England. 	Left: The fine, pin especially attract © Duncan Slater Right: <i>Sorbus viln</i> flowers in early su	ive when they turi <i>norinii</i> has convex	n red in autumn. clusters of white

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	<i>Stewartia pseudocame</i> (Japanese stewartia)	llia	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden			The tree and it	s features	
Tree size and crown characteristics	A large tree capable of reaching 18m. More typically less that 12m in cultivation.	id crown. A mo	oderately dense crown.	JUN		
Natural habitat	Native to Japan and the Korean peninsula. Four regions: between 175-1450m. Prefers acid soils and consistently moist.					
Environmental tolerance	Estimated to be moderately tolerant to shade.		nated to be sensitive aterlogging.			
Ornamental qualities	White flowers with yellow stamens appear in early summer. Highly ornamental.	A woody capsule develop and often persists on the		tree for parks ar	<i>seudocamellia</i> mal d small gardens. ©	Andrew Hirons
	Deciduous broadleaved tree with simple leaves and are very attractive.		r orange colour	Right: The winter is attractive. © Ar		vartia pseudocamellia
	Single-stemmed. An attractive, mottled bark. O of rusty-orange or pinkish young bark. Highly o					
Issues to be aware of	Planting sites need to be carefully selected, as t	his can be a tricky species to establish		1 AND		
Notable varieties		Notes				E CONSE
Good autumn colour	'Koreana' (syn var. <i>Koreana</i>).	 Sensitive to salt and air pollution. Excellent for bees and other inser These are quite challenging to cu so they tend to be quite expensiv 	ltivate and grow	with pinks, yello Right: The highly	f Stewartia pseudoo ws, oranges and gr y ornamental flowe appear in early sur	eys. © Andrew Hirons rs of <i>Stewartia</i>

	Stewartia sinensis	Contonto	Tree Selector	Crown	Environmental
	(Chinese stewartia)	Contents page Alphabetical Index	Use potential Mature size	 Crown form Crown density 	 Ornamental qualities
Use potential	Park Small garden		The tree and it	s features	
Tree size and crown characteristics	A medium tree capable of reaching 15m. More typically less that 10m in cultivation.	A moderately dense crown.			
Natural habitat	Native to central and eastern China. Found in m Prefers acid soils that have plenty of organic ma				
Environmental tolerance		ted to be ve to drought. Estimated to be sensitive to waterlogging.			- Ser
Ornamental qualities	Fragrant white flowers with yellow stamens appear in early summer. Highly ornamental.	A woody capsule develops by late autumn and often persists on the tree for some time.	Stewartia sinens © Andrew Hirons	is in a park situation	n.
		. In autumn they develop a deep red or orange colour			
	Single-stemmed. An attractive, dusky pink to be as a winter silhouette.	rown peeling bark. Highly ornamental, especially			
Issues to be aware of	Planting sites need to be carefully selected, as t	his can be a tricky species to establish.			
Notable varieties		Notes	AN PARA	Ast a	KA PA
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. The nursery for options.	 Sensitive to salt and air pollution. Excellent for bees and other insects. These are quite challenging to cultivate and grow so they tend to be quite expensive as a result. 		pink and brown ext nsis is very attracti	
			© Andrew Hirons Right: The white in early summer	flowers of <i>Stewart</i>	<i>ia sinensis</i> appear

in early summer. © Andrew Hirons

	<i>Styphnolobium japonicum</i> (Japanese pagoda tree)	 Contents page Alphabetical Index 	Tree SelectorUse potentialCrown formMature sizeCrown density	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Transport corridor		The tree and its features	
Tree size and crown characteristics	A large tree, capable of reaching 25m, most cultivars are notably maller, typically less than 15m.	A moderately dense crown.	- Winder	
Natural habitat	Native to central and western China and the Korean peninsula. Found woods and thickets typically on rocky mountain slopes. Adaptable to that they are not too organic (very peaty). This species is also capab (with symbiotic <i>Rhizobium</i> sp.) so does well on impoverished soils.	o a wide range of soils providing		
Environmental tolerance	Moderately tolerant to shade. Moderately tolerant to drought.	Sensitive to waterlogging.		
Ornamental qualities	appear in late summer. Highly ornamental.	ods mature by late autumn, but are een in the British Isles as they require mmer heat to develop properly.	Styphnolobium japonicum makes for paved environments.	an excellent tree
	Deciduous broadleaved tree with pinnate leaves. The leaves turn yell	ow in autumn.	© Henrik Sjöman	
	Single-stemmed. Grey bark becomes fissured with age.			
Issues to be aware of	No substantial issues to be aware of.		AN CONTRACT	
Notable varieties	Notes			
Globular	'Millstone'. – Syn Sophora jap			
Regular ovoid		d trees are very variable in terms of size, d seasonal properties. The use of known		
Straight stem	'Pegent' cultivar is essent	ial if a predicable form is required. re some tolerance to salt and air		
Weeping	'Pendula' pollution.	es and other insects.	In autumn, the leaves of <i>Styphnolo</i> turn yellow.	obium japonicum
Yellow twigs and leaves	'Golden Standard' Noted to have g - Styphnolobium	aponicum is known to be a high emitter tile Organic Compounds (BVOCs).	© Keith Sacre	

	Styrax japonicus		Tree Selector					
	(Japanese snowball tree)	 Contents page Alphabetical Index 	Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities 			
Use potential	Park Small garden		The tree and i	ts features				
Tree size and crown characteristics	A medium tree capable of reaching 12m. An irregular crown that can be wider than it is tall: to around 15m.	A moderately dense crown.						
Natural habitat	Native to Japan, China, the Korean peninsula, Myanmar, Laos, Taiwan and the well-drained lowland forests as part of the understorey or on forest margins. I soil, preferably high in organic matter.							
Environmental tolerance	Partially tolerant to shade. Moderately sensitive to drought.	Moderately sensitive to waterlogging.						
Ornamental qualities	Pendulous clusters of fragrant, bell-shaped white flowers appear in early summer. Highly ornamental. A dry, ovoid drug hairs matures by	e covered with star-shaped early autumn.	margin. © Duncar	Slater	pily on a woodland			
	Deciduous broadleaved tree with simple leaves.		- Right: Spring le darker over tim	• • •	nicus, these become			
V	Single-stemmed in cultivation, but often a multi-stemmed tree in the wild. Sm slightly fissured with age.	ooth grey bark becomes			A-			
lssues to be aware of	Fruits are poisonous.							
Notable varieties	Notes							
Narrow conical crown	'June Snow' Sensitive to salt and air p - Excellent for bees and ot			Difference of the second secon				
				e fruit of <i>Styrax jap</i> e	onicus.			

	Syringa x chinensis (Chinese lilac)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small garden			The tree and it	s features	
Tree size and crown characteristics		ng as wide as	A moderately dense crown.			Sides.
Natural habitat	A hybrid between <i>Syringa protolaciniata</i> (Syn S rich in organic matter but is adaptable to a rang					
Environmental tolerance		ately tolerant	Estimated to be sensitive to waterlogging.			
Ornamental qualities	Pink-purple flowers held in loose, upright or gentle drooping, clusters in late spring. Highly ornamental.	A capsule fruit riper but is of ittle orname		be trained to be	of <i>Syringa</i> x <i>chinel</i> come a small tree.	<i>nsis.</i> This hybrid can
	Deciduous broadleaved tree with simple leaves			© Henrik Sjöman	N.	
	Multi-stemmed. Brown-grey bark becomes roug	h with age.				10
Issues to be aware of	No substantial issues to be aware of.				1	SC.
Notable varieties		Notes		No. Sec.		
Excellent flowering	'Sangeana'.	<i>- Syringa</i> spp. are known to be Biogenic Volatile Organic Co		The side sounds		
				I he pink-purple spectacular in la © Henrik Sjöman	flowers of <i>Syringa</i> te spring.	x <i>chinensis</i> are

	<i>Syringa reticulata</i> (Japanese tree lilac)	 Contents page Alphabetical Index 	Tree SelectorUse potentialCrown formMature sizeCrown density	 Environmentatolerance Ornamental qualities
Use potential	Park Paved Small Garden Transport corridor		The tree and its features	
Tree size and crown characteristics	A small tree capable of reaching 9m. An ovoid crown form, becoming about 5m wide at maturity.	A moderately dense crown.		
Natural habitat	Native to China, Japan, the Korean Peninsula and eastern Russia. Found in mix forest margins and grassland fringes; 100-1200m. Requires well-drained soil, ri but is adaptable to a range of soil pH providing it is not too extreme.			
Environmental tolerance	Intolerant to shade. Tolerant to drought.	Moderately sensitive to waterlogging.		
Ornamental qualities	Cream-coloured flowers held in loose, upright or gentle drooping, clusters in early summer. Highly ornamental and pleasantly fragrant. A capsule fruit rip but is of little orna	ens in early autumn mental value.	<i>Syringa reticulata</i> make an exce a range of planting scenarios. T is shown here.	
	Deciduous broadleaved tree with simple leaves. Often the leaves turn a purple	colour in autumn.	© Henrik Sjöman	
V	Single-stemmed or multi-stemmed. Reddish-brown glossy bark that gentle exit Lenticels are also prominent giving the stems additional interest.	oliates on young stems.		
Issues to be aware of	No substantial issues to be aware of.			
Notable varieties	Notes			
Compact upright crown	 'Ivory Silk', 'City of Toronto'. The species is very variable require particular characters - Slow growing and slow to - This should really be referred to subsp. <i>reticulata</i>. Howevers is not widely available so to is of lesser importance. Syringa spp. are known to - Syringa spp. are known to Syringa spp. are known to	eristics, use a cultivar. establish. red to as <i>Syringa reticulata</i> , the subsp. <i>amurensis</i> he precise nomenclature	Left: The leaves of <i>Syringa retic</i> in autumn. © Henrik Sjöman Right: <i>Syringa reticulata</i> has loo	
	Biogenic Volatile Organic - Observed to have some to	Compounds (BVOCs).	flowers in early summer. © Henrik Sjöman	

	Syringa vulgaris		Tree Selector		 Privinental colerance Ornamental qualities 	
		Contents page	Use potential	Crown form		
((())	(Common lilac)	Alphabetical Index	Mature size	Crown density	S Ornamental	
Jse potential	Park Small garden		The tree and i	its features		
Tree size and crown characteristics		oid crown form, hing about 4m .urity.				
Natural habitat		e Balkan Peninsular. Found on mountain slopes (often well-drained soil, rich in organic matter but is adaptable soils.				
Environmental colerance	Partially tolerant to shade. Model to dro	rately tolerant ught. Sensitive to waterlogging.				
Ornamental qualities	Lilac-coloured flowers held in loose, upright or gentle drooping, clusters in late spring or early summer. Highly ornamental and pleasantly fragrant.	A capsule fruit ripens in early autumn but is of little ornamental value.	colours and are	<i>Syringa vulgaris</i> cor spectacular in earl	ne in many different y summer.	
	Deciduous broadleaved tree with simple leaves	S.	e Henrik Sjöman			
V	Single-stemmed or multi-stemmed. Grey rathen not spectacular.	r stringy bark, often gently spiralling, is interesting but				
Issues to be aware of	The species and some cultivars produce root s	uckers.			- N	
Notable varieties		Notes	- 103		Sold Aug	
Magenta flowers	'Ruhm von Horstenstein'.	- There are a huge number of cultivars; only a few			and the	
Purple flowers	'Ludwid Spath'.	 widely available cultivars are named here. Contact you nursery for detailed information on other cultivars. 	r A Gar		KAN AND AND	
White flowering	'Alice Harding'.	 - Syring spp. are known to be high emitters of Biogenic Volatile Organic Compounds (BVOCs). 	100	V St	A Carlow Carlo	
Double white flowers	'Madame Lemoine'.	 Flowering time is rather dependent on cultivar. Most are late spring or early summer. 	This results in a	t number of cultivar range of flower col flowers shown here ne.	ours, such as the	

Tree Species Selection for Green Infrastructure: A Guide for Specifiers

© Duncan Slater

	Tamarix gallica (French tamarisk)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small Coasta	Transport corridor		The tree and i	ts features	
Tree size and crown characteristics	of growing to 10m.	gular, rather bushy that gets almost as s it is tall.	pen crown.		N	
Natural habitat	Native of south western Europe and north Afric soils. Prefers sandy soils and requires well-drain of growing well in mild parts of the British Isles.					
Environmental tolerance	Estimated to be intolerant to shade.		nated to be sensitive aterlogging.		NY A	The start of the s
Ornamental qualities	Numerous small clusters of pink flowers create plumes of flower in late summer. Highly ornamental.	Capsules containing the s by late autumn. Of little o				NE
	Deciduous broadleaved tree with small scaly lea conifers but it is actually an angiosperm tree.	aves. This genus is superficially reminis	cent of some			
V	Naturally, most frequently seen as a multi-stemmed habit. Brown bark slightly fiss bark on younger stems and twigs.					11 - Alter
Issues to be aware of	No substantial issues to be aware of.					Arrest Contraction
Notable varieties		Notes		the states	0	and the states i
The species is available, ho Consult your preferred tree	wever, no notable cultivated varieties are widely available. nursery for options.	- Good for bees and other pollinati - Observed to have some tolerance	-			

Tamarix gallica has frothy clusters of pink flowers in late summer. This species is an excellent choice for coastal locations. © Duncan Slater

	Tamarix ramosissima (Salt cedar)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Small Garden Coastal	Transport corridor		The tree and i	ts features	
Tree size and crown characteristics		at gets about	en crown.	X	1	
Natural habitat	Native of southern Europe, western and central A on saline soils. Prefers sandy soils and requires we		sites and			4
Environmental tolerance	Intolerant to shade.	to drought. Sensit	ive to waterlogging.		Kitter .	
Ornamental qualities	Numerous small clusters of pink flowers create plumes of flower in late summer. Highly ornamental.	Capsules containing the se late autumn. Of little ornar				WE-
	Deciduous broadleaved tree with small scaly leave conifers but it is actually an angiosperm tree.	es. This genus is superficially reminisc	ent of some		WYK.	
V	Naturally, most frequently seen as a multi-stemme a single-stemmed habit.	ed tree but some nurseries prune to d	evelop			EUP
Issues to be aware of	Known to be invasive in warm climates, but this is	not currently a problem in the British	Isles.	A A A A A A A A A A A A A A A A A A A	A State	P
Notable varieties		Notes		1	A Male	
Species-type	'Pink Cascade'.	- Good for bees and other pollinatin	g insects.		MEL.	Sel
Red flowers	'Rubra'.	 Also sold as <i>Tamarix aestivalis</i>. Observed to have some tolerance 	to salt.	A young shoot	of Tamarix ramosiss	ima with small scaly

A young shoot of *Tamarix ramosissima* with small scaly leaves and flower buds. These flowers appear in late summer, when little else is flowering. © Andrew Hirons

	Tamarix tetrandra			Tree Selector	ree Selector			
	(Four-stamen tamarisk)		 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environment tolerance Ornamental qualities 		
Use potential	Park Small garden Coastal	Transport corridor		The tree and i	ts features			
Tree size and crown characteristics		ar, rather bushy t gets about as is tall.	An open crown.	æ	ster			
Natural habitat	Native of south eastern Europe. Found predomina Prefers sandy soils and requires well-drained soils.		ine soils.					
Environmental colerance	Estimated to be intolerant to shade.	d to be tolerant ht.	Estimated to be sensitive to waterlogging.					
Ornamental qualities	Numerous small clusters of pink flowers create plumes of flower in early summer. Highly ornamental.		the seed develop by le ornamental merit.					
	Deciduous broadleaved tree with small scaly leave conifers but it is actually an angiosperm tree.	s. This genus is superficially re	miniscent of some					
V	Naturally, most frequently seen as a multi-stemme single-stemmed habit. Dark grey bark slightly fissu on younger stems and twigs.							
lssues to be aware of	No substantial issues to be aware of.							
Notable varieties		Notes		1.02		The		
The species is available, how Consult your preferred tree	vever, no notable cultivated varieties are widely available. nursery for options.	 Good for bees and other po Observed to have some tole 	0					

The highly ornamental pink flowers of *Tamarix tetrandra* appear in early summer. © Duncan Slater

	Taxodium distichum (Swamp cypress)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Transport corridor			The tree and i	ts features	
Tree size and crown characteristics	of growing up to 40m gets to Becom	cal crown that around 8m wide. les more irregular mature specimens.	derately dense crown.		See.	
Natural habitat	Native to south-central and south-eastern Nort plains, primarily in riparian corridors, swamps a wet sites but will perform well on moist sites wit	nd seasonally flooded areas. Capable o	· ·			
Environmental tolerance	Partially tolerant to shade. Moderate to drout		nt to waterlogging.			
Ornamental qualities	Male and female flowers (strobili) are separate but found on the same tree. Highest level of pollination occurs in early spring. Inconspicuous.	Clusters of small (1.5-4cm cones mature about a yea Green and fleshy when yo woody at maturity.	r after pollination.	The conical form with soft spring © Andrew Hirons	n of <i>Taxodium distic</i> foliage.	chum (centre)
	Deciduous conifer with alternate needles. In aut before being shed.	tumn the needles of this conifer turn bro	onze-brown			
	Single-stemmed. Light brown-grey bark exfolia	ting in long fibrous strips at maturity.				
lssues to be aware of	Produces adaptive knee-roots, or pnematopho characteristic but may be problematic if sited n so have high allergenicity potential during the f	ear hard surfaces. T. distichum release a	-			
Notable varieties		Notes		1/ A Pa	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ALL
Species-type	'Nutans'.	- Observed to have some tolerance			10000	
Broad weeping	'Cascade Falls', 'Pendulum'.	 pollution, hence its value for transpondent This is a deciduous conifer, its need to fall off. 		In their natural e	environment, Taxod	ium distichum

In their natural environment, *Taxodium distichui* can survive long periods of waterlogging. © Henrik Sjöman

	Taxus baccata		Tree Selector					
	(Common yew)	Contents page Alphabetical Index	 Use potential Mature size 	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities 			
Use potential	Park Small garden		The tree and i	ts features				
Tree size and crown characteristics	of reaching 18m but mostly less than 15m	A dense crown. A dense crown. globular in the open up to 15m wide.	-					
Natural habitat	pure stands, but more frequently part of the u	western Asia and north Africa. Occasionally found in Inderstorey of temperate forests, particularly on steep, o a range of soil textures, but is not associated with very						
Environmental tolerance	Tolerant to shade.	Sensitive to waterlogging.						
Ornamental qualities	Male and female flowers (strobili) usually found on separate trees. Inconspicuous. Peak pollination usually occurs in early spring.	Small nut-like seeds mostly enclosed in a red, fleshy cup. Contrasting well with the dark green foliage in early autumn. Female trees only.	- <i>Taxus baccata</i> p © Andrew Hirons	performs well in the	shade of other trees			
	Evergreen conifer tree with dark green needle	e leaves.						
	Single-stemmed. Brownish-red bark, exfoliatin	ng in irregular plates. Attractive.						
Issues to be aware of	Leaves and seeds are poisonous. Male <i>T. bacc</i> potential during the flowering period.	ata release a lot of pollen so have high allergenicity						
Notable varieties		Notes						
Upright	'Fastigiata'.	– Slow growing.	- Arell					
Upright golden	'Fastigiata Aurea' (Syn 'Fastigiata Aureomarginata').	 Also used as a hedging plant. Noted to have good tolerance to air pollution. Excellent for dry shade. 						
			brownish-red a	of <i>Taxus baccata</i> is a nd exfoliates in sma <i>ccata</i> has evergreei	all plates. © Andrew Hiron			

Right: *Taxus baccata* has evergreen needle leaves. The seeds are enclosed in fleshy red cups. © Andrew Hirons

	Tetradium daniellii (Chinese bee tree)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park			The tree and it	s features	
Tree size and crown characteristics	() of reaching 20m. Quite b	ular crown. road spreading, it 10m wide.	derately dense crown.		Fatter	
Natural habitat	Native to China and the Korean Peninsula. Foun forest margins and in thickets on open slopes; u Known to perform well on calcareous and acid Avoid planting on exposed, windy sites.	p to 3200m. Tolerant of a wide range o	of climates and soils.			
Environmental tolerance		ately sensitive , mode	ated to be rately sensitive terlogging.		n n n n n n n n n n n n n n n n n n n	
Ornamental qualities	Loose, convex to pyramidal clusters of white flowers appear in late summer. Male and female flowers held on separate individuals (dioecious). Very attractive and fragrant.	EARLY AUTUMN Reddish-purple seed-pod after flowering in early aut to reveal black seed that a	umn. The split		<i>lii</i> is a useful tree fo d the flowering sea	pr park environments son.
	Deciduous broadleaved tree with dark green pin	nnate leaves.		e rienink Sjonian		
	Single-stemmed. Smooth grey bark becomes ro	ugher with age.				
Issues to be aware of	No substantial issues to be aware of.			.		
Notable varieties		Notes		1000		
Strong flowering	var. hupehensis.	 Syn Euodia daniellii, E. hupehensis. Excellent for bees and other pollin of its late flowering - hence the co One of the few temperate trees to 	ating insects because mmon name.	<i>daniellii</i> very attr © Andrew Hirons	1 0	

	Th	uja plicata				Tree Selector		
	(W	'estern red c	edar)	Contents page	Use potential Mature	Crown form Crown	Environmenta tolerance Ornamental
					Alphabetical Index	size	density	qualities
Use potential		Park				The tree and	its features	
Tree size and crown characteristics	15-25M	A massive tree capable of reaching 60m, most cultivars are considerably smaller, around 15-25m.		A conical crown that typically gets 4-5m wide. Becomes more irregular with age if grown in the open.	A dense crown.			3 May
Natural habitat	*	Native to the pacific coast Adaptable to a wide range	North America in mixed conifer fore s, including calcareous.	sts; 0-2000m.				
Environmental tolerance	*	Tolerant to shade.		Moderately tolerant to drought.	Moderately sensitive to waterlogging.		And and	
Ornamental qualities	EARLY	Male and female flowers (s separately on the same tre Peak pollination usually oc	e. Inconspi	cuous. 🛛 🚺 by late autun	ones (10-12mm) ripen nn. Fairly inconspicuous.	to saline soils s	<i>Thuja plicata.</i> This sp o should only be use t likely to be an issu	ed as a roadside
	¥.	Evergreen conifer tree with						
	Y	Single-stemmed. Brownish	-red bark, p	peeling of in stringy fibres. Attractive	e but not highly ornamental.			
lssues to be aware of		Potentially a large, dense tr during the flowering period	,	a release a lot of pollen so have hig	allergenicity potential			
Notable varieties				Notes				
Species-type habit	'Excelsa	a'.		- Also used as a hedgir				
Regular-slender habit	'Atrovir	ens'.		- Could be considered	olerance to air pollution. for a transport corridor		Constant of the second	Contraction and
Upright	'Fastigi	Fastigiata'.						and the second state

shade beneath. © Henrik Sjöman

	Tilia americana			Tree Selector		
			Contents page	Use potential	Crown form	Environmenta tolerance
	(American basswood)		Alphabetical Index	Mature size	Crown density	Ornamental qualities
Use potential	Park			The tree and i	ts features	
Tree size and crown characteristics	of reaching 40m in its that car	d ovoid crown h become at Om wide.	rately dense crown.			
Natural habitat	Native to eastern US and south eastern Canada. easterly facing slopes; 50-1500m. Prefers nutrie Tolerant of a range of soil pH, but grows poorly to perform well in the British Isles.	nt-rich, loamy soils but will also grow on	quite sandy soils.			
Environmental tolerance	Tolerant to shade. Modera to drou		e to waterlogging.	A		
Ornamental qualities	Drooping cluster of creamy-white flowers, held on a narrow leaf-like bract, emerge in early summer. Attractive, but not spectacular.	Clusters of rounded, thick-sl fruits, about 10mm in diame a narrow leaf-like bract. Ripe autumn (rarely in the British	ter, held on ening in early			
	Deciduous broadleaved tree with simple leaves.					
	Single-stemmed. Thin, smooth grey-green bark	becomes darker, rougher and fissured w	ith age.			
lssues to be aware of	Potentially a very large broad tree. Capable of p of the tree.	roducing abundant suckers around the b	pase			AL.
Notable varieties		Notes				
Species-type habit	'Moltkei'.	- Excellent for bees and other pollinat	ing insects.			
More compact crowns	'American Sentry', 'Nova', 'Redmond'.					
					s of <i>Tilia americana.</i> ecoming a massive t	

is capable of becoming a massive tree.

	<i>Tilia cordata</i> (Small-leaved lime)	 Contents page Alphabetical Index 	Tree SelectorUse potentialCrown formMature sizeCrown densityOrnamental qualities
Use potential	Park Coastal Transp corrido		The tree and its features
Tree size and crown characteristics	of reaching 30m in its crown	d ovoid to globular that can become t 15m wide.	vn.
Natural habitat	in climates where annual rainfall is typically 500	d western Asia. Found as part of lowland forest communiti D-700mm. In the warmer drier (more southerly) parts of it ties and shady, north-facing slopes. Also found on steep de range of soils.	
Environmental tolerance	Tolerant to shade. Moder to drou	ately sensitive ught. Sensitive to waterloggin	g.
Ornamental qualities	Drooping cluster of creamy-white flowers, held on a narrow leaf-like bract, emerge in early summer. Attractive, but not spectacular.	Clusters of rounded, thin-shelled, nut-like fruits, about 5mm in diameter, held on a narrow leaf-like bract. Ripening in early autumn (rarely in the British Isles).	A young <i>Tilia cordata</i> establishing in a park situation. © Andrew Hirons
	Deciduous broadleaved tree with simple leaves	i.	
	Single-stemmed. Thin, smooth grey-green bark	becomes darker, rougher and fissured with age.	
Issues to be aware of	No substantial issues to be aware of.		
Notable varieties		Notes	
Regular pyramidal grow	th 'Greenspire', 'Rancho', 'Streetwise'.	- Growth habit varies a great deal within the species,	
Orange twigs	'Winter Orange'.	 therefore, it is recommended that cultivars are used. Excellent for bees and other pollinating insects. 	
Good hybrid	<i>Tilia cordata x T. mongolica</i> 'Harvest Gold'.	 Noted to have good tolerance to air pollution and salt spray. The hybrid (<i>Tilia cordata</i> x <i>T. mongolica</i> 'Harvest Gol is worth considering if a compact form is required. Not prone to aphid infestation unless stressed. 	d') The flowers of <i>Tilia cordata</i> appear in early summer and are attractive to insects. © Andrew Hirons

	<i>Tilia x euchlora</i> (Caucasian lime)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Coastal Transp corrido			The tree and	its features	
Tree size and crown characteristics	of reaching 20m. crown t	d ovoid to globular that can become 15m wide.	A moderately dense crown.			
Natural habitat	A hybrid of somewhat obscure origin, most like range of soils.	y, Tilia cordata x T. dasystyla. Ad	aptable to a wide			
Environmental tolerance	Moderately tolerant to shade. Moderately tolerant	ately sensitive ught.	Sensitive to waterlogging.			
Ornamental qualities	EARLY SUMMER		nin-shelled, nut-like fruits, neter, held on a narrow le.	an ovoid crowr		
	Deciduous broadleaved tree with simple leaves.			0	e Tilia x euchlora with place. © Andrew Hirons	
	Single-stemmed. Thin, smooth grey-green bark	becomes darker, rougher and fis	ssured with age.			
Issues to be aware of	No substantial issues to be aware of.			TH		
Notable varieties		Notes				ALL WY L
The hybrid is available, ho Consult your preferred tre	wever, no notable cultivated varieties are widely available. e nursery for options.	– Not prone to aphid infestati	on, unless stressed.			12

Tilia x *euchlora* leaves. © Andrew Hirons

	Tilia x europaea (Common lime)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and it	s features	
Tree size and crown characteristics	of reaching 30m. crown t	d ovoid to globular that can become 15m wide.	n.		
Natural habitat	A hybrid of <i>Tilia cordata</i> x <i>T. platyphyllos</i> . Adapt	able to a wide range of soils.	-		
Environmental tolerance	Moderately tolerant to shade. Moderately to drout	ately sensitive sensitive to waterlogging			
Ornamental qualities	EARLY SUMMER	Clusters of ovoid, thin-shelled, nut-like fruits, about 8mm in diameter, held on a narrow leaf-like bract.	Tilia species, the	<i>ia x europaea</i> 'Palli y are best reserved	
	Deciduous broadleaved tree with simple leaves.	. Good yellow autumn colour.	© Andrew Hirons		
	Single-stemmed. Thin, smooth grey-green bark	becomes darker, rougher and fissured with age.			15
Issues to be aware of	Produces abundant suckers around its base. Pro 'honey dew' residues beneath the crown and su This is particularly a problem if the tree is stress	perficial sooty mould fungi on the leaves.			
Notable varieties		Notes		A Company	and the
Broad conical crown	'Pallida'.	- Tolerant to air pollution so could be considered			30
Rounded crown	'Zwart Linde'.	for a transport corridor if well away from the likely salt-spray zone.		- ALEO	
Yellow spring leaves	'Wratislaviensis'.	 Widely planted as street tree but it does not have the drought tolerance to perform well, hence the recognised problems associated with aphids. Excellent for bees and other pollinating insects. 		<i>europaea</i> . These an ticularly when the t	

	<i>Tilia henryana</i> (Henry's lime)		Contents page	Tree Selector Use potential Mature	Crown form	Environmental tolerance
			Alphabetical Index	size	Crown density	Ornamental qualities
Use potential	Park Small garden			The tree and i	its features	
Tree size and crown characteristics	of reaching 25m in its crown	ad ovoid to globular that can become d 8m wide.	A moderately dense crown.			
Natural habitat	Native to China where it has a fairly sparse dist broadleaved or tropical broad-leaved but occu that it appears colder tolerant down to about - they are not too extreme in texture or pH and a microclimate is preferable.	rs at sufficient altitude in the mour 20°C (at maturity). Adaptable to a	tains (up to 2000m) range of soils providing			
Environmental tolerance		rately sensitive t	Estimated to be sensitive o waterlogging.			
Ornamental qualities	Drooping clusters of creamy-white flowers, held on a narrow leaf-like bract, emerge in late summer. Attractive, but not spectacular.	Clusters of rounded, nut-like fruits, about held on a narrow leaf by late autumn.	6mm in diameter,	Left: A young 7 © Henrik Sjöman	-	
	Deciduous broadleaved tree with simple leaves developing bristly margins.	s. Very attractive leaves, emerging	bronze-red and	Right: Tilla henry © Andrew Hirons	yana growing well in	a woodland clearing.
	Single-stemmed. Thin, smooth grey-green bark	k becomes darker, rougher and fiss	ured with age.			6
Issues to be aware of	No substantial issues to be aware of.					
Notable varieties		Notes		1	A A	F
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. are nursery for options.	- Excellent for bees and other - The latest flowering Tilia culti	0			

One of the most attractive features of *Tilia henryana* is its bristly margined leaves. © Andrew Hirons

	Tilia mongolica (Mongolian lime)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Small garden			The tree and its	s features	
Tree size and crown characteristics		at gets to about	erately dense crown.			
Natural habitat	Native to Mongolia and China. Found on forested typically 500-600mm and mean summer tempe and on screes, however, noted to be adaptable to thickets as well as more substantial trees within a	ratures of around 20°C. Found on acid a range of soil types in cultivation. Wi	ic brown earth soils			
Environmental tolerance	Estimated to be moderately tolerant to shade.	ely tolerant to wate	ted to be sensitive erlogging.			
Ornamental qualities	Drooping cluster of creamy-white flowers, held on a narrow leaf-like bract, emerge in late summer. Attractive, but not spectacular.	Clusters of oval, thin-shelle about 5mm in diameter, he leaf-like bract. Ripening in l in the British Isles).	ld on a narrow	an ovoid crown.		
	Deciduous broadleaved tree with simple, lobed a autumn colour, particularly after a hot summer.	nd coarsely toothed leaves. Develops a	a good yellow		Tilia mongolica of lour, adding to its v	ten develops Value. © Duncan Slater
	Single-stemmed. Thin, smooth grey-green bark b	ecomes darker, rougher and fissured v	vith age.	No.		
Issues to be aware of	No substantial issues to be aware of.			S - Và		
Notable varieties		Notes			1000	14 200
Good hybrid	<i>Tilia cordata x T. mongolica</i> 'Harvest Gold'.	 Very cold-hardy. Slow growing. Excellent for bees and other pollina The hybrid (<i>Tilia cordata</i> x <i>T. mongo</i> is a useful compact hybrid. Not prone to aphid infestation. 	-	toothed margins. Right: The flower	s of Tilia mongolica	

	<i>Tilia oliveri</i> (Chinese white lime)	Contents page Alphabetical	Tree Selector Use potential Mature	Crown form	 Environmental Ornamental
		Index	size	density	qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics		void to globular t gets to about		1.	à.
Natural habitat	Native to China. Found in mixed mountain forests;	1300-2300m.			
Environmental tolerance	Estimated to be moderately tolerant to shade.	ly sensitive to waterlogging.			
Ornamental qualities	Drooping cluster of creamy-white flowers, held on a narrow leaf-like bract, emerge in early summer. Attractive, but not spectacular.	Clusters of oval, thin-shelled, nut-like fruits, about 8mm in diameter, with ribs and a warty surface. Held on a narrow leaf-like bract. Ripening in early autumn (rarely in the British Isles).	A mature <i>Tilia</i> d	<i>liveri</i> growing in a p a broad globular cro	
	Deciduous broadleaved tree with simple leaves, gro of a dense covering of leaf hairs.	een on upper surface, white beneath as a result	C Anarew Hirons	2	
	Single-stemmed. Thin, smooth grey-green bark be	comes darker, rougher and fissured with age.		The	
Issues to be aware of	No substantial issues to be aware of.				
Notable varieties		Notes		To be a first	
The species is available, he Consult your preferred tre	,	- Excellent for bees and other pollinating insects. - Not prone to aphid infestation.		Program Car	

The leaves of *Tilia oliveri* have white undersides to their leaves, making them particularly attractive as they flutter in the breeze. The flowers in early summer are very attractive to bees and other pollinating insects. © Andrew Hirons

	<i>Tilia platyphyllos</i> (Large-leaved lime)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and i	ts features	
Tree size and crown characteristics	of reaching 40m in its crown	ad ovoid to globular that can become t 20m wide.		T	
Natural habitat	hills and mountains (up to 1500m) in climates v and mean summer temperatures around 16-22	d western Asia. Found as part of forest communities on where annual rainfall is typically above 600mm per year °C. In the warmer drier (more southerly) parts of its range d shady, north-facing slopes. Found well-drained, weak to vs tolerance to mildly acidic soils.		A	
Environmental tolerance	Tolerant to shade. Moder to dro	rately sensitive ught. Sensitive to waterlogging.			
Ornamental qualities	Drooping cluster of creamy-white flowers, held on a narrow leaf-like bract, emerge in early summer. Attractive, but not spectacular.	Clusters of rounded, nut-like fruits, about 9mm in diameter, with five ribs. Held on a narrow leaf-like bract. Ripening in early autumn.	Whilst it is ofter	n planted as a street s requires high-qua	
	Deciduous broadleaved tree with simple leaves	5.	© Henrik Sjöman		1
	Single-stemmed. Thin, smooth grey-green barl	k becomes darker, rougher and fissured with age.			
Issues to be aware of	Capable of becoming a very large tree so requ	ires plenty of space.			
Notable varieties		Notes			No
Upright-pyramidal	'Delft', 'Örebro', 'Streetwise'.	- Excellent for bees and other pollinating insects.	44163		
Upright-fastigiate	'Fastigiata'.	 - Not prone to aphid infestation, unless stressed. 	- ANT		
Red twigs	'Rubra', 'Prince's Street'.	_		Contraction of the	
Yellow twigs	'Aurea'.	_		ves of <i>Tilia platyphy</i>	
Cut-leaved	'Laciniata'.	-		my flowers of <i>Tilia p</i> r and are attractive cts.	

	Tilia tomentosa (Silver lime)		 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park Paved Coasta	al Transport corridor		The tree and it	s features	
Tree size and crown characteristics	of reaching 30m in its crown	d ovoid to globular that can become t 15m wide.	derately dense crown.			T Sala
Natural habitat	Native to south-eastern Europe, particularly the communities, from the coast up to 1300m, in cl year and average daily maximum summer temp calcareous soils. However, it also shows toleran	imates where annual rainfall is typically peratures are around 26-27°C. Found v	above 600mm per			
Environmental tolerance	Moderately tolerant to shade. Moder		itive to waterlogging.			
Ornamental qualities	Drooping cluster of creamy-white flowers, held on a narrow leaf-like bract, emerge in late summer. Attractive, but not spectacular.	Clusters of oval, nut-like f in diameter, with a warty narrow leaf-like bract. Rip	surface. Held on a			his species has st other <i>Tilia</i> species
	Deciduous broadleaved tree with simple leaves giving a silvery appearance – hence the commo		vith white hairs	© Andrew Hirons	a a sha	
	Single-stemmed. Thin, smooth grey-green bark	becomes darker, rougher and fissured	l with age.			
Issues to be aware of	Capable of become a very large tree so require	s plenty of space.				
Notable varieties		Notes				S. Darly
Broadly pyramidal	'Brabant', 'Doornik', 'Sterling Silver'.	- Good for pollinating insects.		Longe C		
Shorter than species	'Sterling Silver' ('Wandell').	- Not prone to aphid infestation.		CIPE A		
Weeping	'Petiolaris'.	-		<i>a tomentosa</i> have a lere the leaves are a immer.		

Tree Species Selection for Green Infrastructure: A Guide for Specifiers

© Andrew Hirons

	Tsuga canadensis (Eastern hemlock)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmenta tolerance Ornamental qualities
Use potential	Park		The tree and it	ts features	
Tree size and crown characteristics		A dense crown.			
Natural habitat		Canada. A late-successional species native to cool moist, Dm. It will grow on various soil textures, providing that cidic soil.			
Environmental tolerance	Tolerant to shade. Sensiti	ve to drought. Sensitive to waterlogging.			
Ornamental qualities	Male and female flowers (strobili) are found separately on the same trees. Inconspicuous. Peak pollination usually occurs in early spring.	Seed cones open in early autumn and persist into winter. Attractive but relatively inconspicuous.	here growing we		storey. © Henrik Sjöman
	Evergreen conifer with needle leaves. The crow new growth contrasts against the dark green of	n is striking in late spring when the light green of the the previous years' foliage.	- Right: A young / crown. © Andrew F	<i>Fsuga canadensis</i> sh Iirons	nowing a conical
	Single-stemmed. Rough, scaly bark, even when	young. Becoming deeply fissured with age.			<u>ě</u>
Issues to be aware of	Potentially a very large tree.				
Notable varieties		Notes	- 🎊 🐔		
Weeping	'Pendula'.	 Slow growing and slow to establish. Sensitive to heat, drought, wind, salt spray, air pollution and soil compaction. This tree is strictly a tree for cool, moist parklands. Probably best suited to the north- western parts of the British Isles. 	The new growth	n of <i>Tsuga canaden</i> ne older, darker ne	

	Tsuga heterophylla (Western hemlock)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park		The tree and its	s features	
Tree size and crown characteristics		A dense crown.			
Natural habitat	Native to the north-western North America. Na elevations, 0-1830m. Capable of growing on nu However, it requires a cool, high rainfall location	trient-poor, acid soils, providing that they are well-drained.			
Environmental tolerance	Tolerant to shade. Sensiti	ve to drought. Sensitive to waterlogging.			AND ANY
Ornamental qualities	Male and female flowers (strobili) are found separately on the same trees. Inconspicuous. Peak pollination usually occurs in early spring.	Seed cones open in early autumn and persist into winter. Attractive but relatively inconspicuous.	well amongst oth	ophylla showing it ner trees. © Andrew P	lirons
	Evergreen conifer with needle leaves. The crow new growth contrasts against the dark green of	n is striking in late spring when the light green of the the previous years' foliage.		e leaves of <i>Tsuga he</i> opearance. © Andrev	
	Single-stemmed. Rough, scaly bark, even when	young. Becoming deeply fissured with age.			X
Issues to be aware of	Potentially a very large tree. This species has a to ground-surface disturbance.	very shallow root system so is particularly vulnerable			
Notable varieties		Notes	Nº S		
The species is available, h Consult your preferred tre	owever, no notable cultivated varieties are widely available. e nursery for options.	 Sensitive to heat, drought, wind, salt spray, air pollution and soil compaction. This tree is strictly a tree for cool, moist parklands. Probably best suited to the north- western parts of the British Isles. A much faster growing tree than <i>Tsuga canadensis</i>. 	© Andrew Hirons	with the older, dar	ker needles.

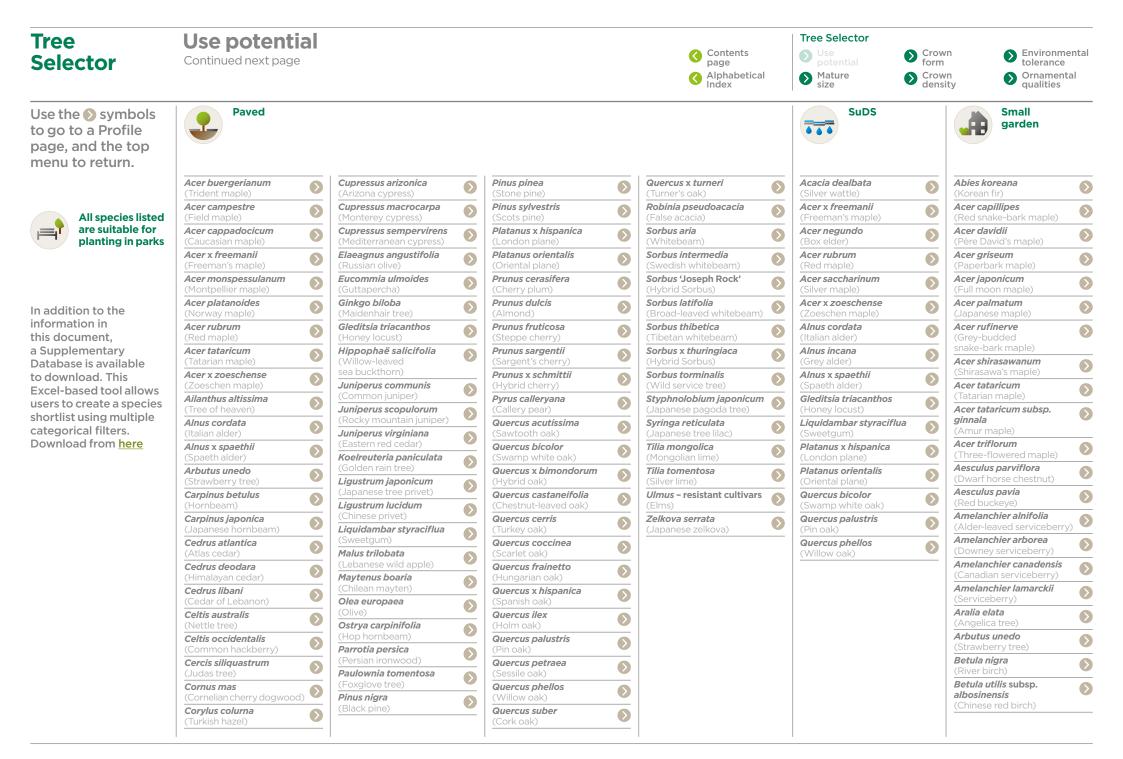
	Ulmus – resistant cultiva (Elms)	ars	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Coastal	Transport corridor		The tree and it	ts features	
Tree size and crown characteristics	to around 20m but some dependicultivars may be shorter.	ble crown form, ng on the Generally to S-8m wide.	A moderately dense crown.			
Natural habitat	The threat from Dutch Elm Disease is ongoing, the to the disease. These hybrid elms are often of co They are generally tolerant to a wide range of so	mplex parentage so are not ident	ified here.			
Environmental tolerance		tely tolerant 🛛 🗸 r	Estimated to be noderately sensitive o waterlogging.		SHE	
Ornamental qualities	Small flowers produced in dense clusters appear in early spring before the leaves emerge. Of limited ornamental merit. Deciduous broadleaved tree with simple leaves.	Clusters of flat-winge by early summer. Mo SUMMER	stly strerile.		oung Dutch elm dise vigorously in an urb	
	Single-stemmed. Smooth grey bark becomes rou on a platy appearance.					
Issues to be aware of	<i>Ulmus</i> release a lot of pollen so have high allerge	nicity potential during the flower	ing period.			
Notable varieties		Notes				
Ovoid	'Clusius'.	- Easy to establish and fast gro				
Columnar	'Lobel'.	 All have good tolerance to sa so are good for transport cor 				/ netanini
Vase-shaped	'Lutèce'.	providing they have a good s cultivars here are also toleran				
Globular	'Dodoens'.				tant <i>Ulmus</i> cultivar erforming well in a p	(probably paved environment.
Conical	'New Horizon', 'Rebona'.			© Andrew Hirons	0	
Upright	'Columnella'.					

	Zelkova serrata (Japanese zelkova)	 Contents page Alphabetical Index 	Tree Selector Use potential Mature size	 Crown form Crown density 	 Environmental tolerance Ornamental qualities
Use potential	Park Paved Transport corridor		The tree and i	ts features	
Tree size and crown characteristics	A massive tree capable of growing to 30m in its natural habitat. Typically less that 20m in cultivation.	A moderately dense crown.		27 - SA	
Natural habitat	Native to China, Japan, the Korean peninsula and Taiwan. Found in lowlan 500-2000m, usually in riparian habitats, ravines and shady slopes. It prefer but can cope with a range of soils, providing they are well-drained.				
Environmental tolerance	Partially tolerant to shade. Moderately tolerant to drought.	Sensitive to waterlogging.			
Ornamental qualities		pes about 3mm in diameter ripen mn. Of little ornamental merit.	Zelkova serrata © Andrew Hirons	growing well in a p	ark situation.
	Deciduous broadleaved tree with simple leaves with serrated margins. Of red-orange autumn colour.	en developing a good	A	- And	and the
	Single-stemmed and multi-stemmed trees available. Smooth grey bark.				KA
Issues to be aware of	Produces root suckers. <i>Z. serrata</i> release a lot of pollen so have high allerge flowering period.	enicity potential during the		X	
Notable varieties	Notes			20	
Broad-vase crown	'Green Vase', 'Village Green' Observed to have go	od salt and air pollution tolerance.	Leaves of <i>Zelko</i> orange colour in	va serrata. These de	evelop a good



- Use potential >

- Mature size >
- Crown form >
- Crown density •
- Environmental tolerance
 Ornamental qualities



Use the 🔊 symbols to go to a Profile page, and the top menu to return.



All species listed are suitable for planting in parks **Use potential**

Continued next page

							Alphabetic Index	al	Mature Size	Crowi	
	Small garden continued										Coastal
	Betula utilis subsp.		Crataegus x persimilis (Broad-leaved	\mathbf{O}	Magnolia 'Elizabeth' (Hybrid magnolia)	Ø	Prunus cerasifera (Cherry plum)		Sorbus aucuparia (Rowan)		Acer monspessulanum (Montpellier maple)
d	(White-barked Himalayan birch)		cockspur thorn)	_	Magnolia 'Galaxy' (Hybrid magnolia)	\mathbf{O}	Prunus domestica (Common plum)		Sorbus cashmiriana (Kashmir rowan)		Acer pseudoplatanus (Sycamore)
s		$\mathbf{\mathbf{S}}$	(Common quince)		(Hybrid magnolia) Magnolia 'Heaven Scent' (Hybrid magnolia)	\mathbf{O}	Prunus dulcis (Almond)	$\mathbf{\bullet}$	(Japanese rowan)		(Tatarian maple)
.5	- /	\mathbf{O}	(Russian olive)		Magnolia kobus		Prunus fruticosa	$\mathbf{\delta}$	(Sapariese rowar) Sorbus discolor (Chinese rowan)		Acer tataricum subsp.
		0	(Common spindle tree)		(Kobushi magnolia) Magnolia x loebneri		(Steppe cherry) Prunus laurocerasus	$\mathbf{\delta}$	Sorbus intermedia		(Amur maple) Ailanthus altissima
		D	(Common fig)		(Loebner magnolia) Magnolia x soulangeana		(Cherry laurel) Prunus lusitanica (Darthurgel laurel)		(Swedish whitebeam) Sorbus 'Joseph Rock'		(Tree of heaven)
		D	(Hybrid witch hazel) Heptacodium miconioides		(Saucer magnolia) <i>Magnolia</i> 'Spectrum' (Hybrid magnolia)		(Portugal laurel) Prunus maackii (Manchurian cherry)	$\mathbf{\mathbf{b}}$	(Hybrid Sorbus) Sorbus pseudohupehensis (Hupeh rowan)		(Italian alder) Alnus incana
		D	(Seven-son flower)		(Hybrid Magnolia) Magnolia 'Star Wars' (Hybrid magnolia)		(Hanchdhan cherry) Prunus 'Okame' (Hybrid cherry)	$\mathbf{\mathbf{b}}$	(Tibetan whitebeam)	$\mathbf{\bullet}$	(Grey alder) Alnus x spaethii
	(Harlequin glorybower)		(Hybrid holly)		(Star magnolia)		(Hybrid cherry) Prunus 'Pandora' (Hybrid cherry)	$\mathbf{\mathbf{b}}$	Sorbus x thuringiaca (Hybrid Sorbus)	$\mathbf{\bullet}$	(Spaeth alder) Amelanchier canadensis
	(Alternate lear dogwood)		(European holly)		(Hybrid magnolia)		Prunus sargentii (Sargent's cherry)	$\mathbf{\mathbf{b}}$	Sorbus vilmorinii (Vilmorin's rowan)	$\mathbf{\bullet}$	(Canadian serviceberry) Araucaria araucana
	wonder' (Hybrid dogwood)		'Dragon Lady' (Hybrid holly)	\mathbf{O}	(Hybrid magnolia) Magnolia 'Yellow Bird' (Hybrid magnolia)		<i>Prunus x schmittii</i> (Hybrid cherry)	$\mathbf{\mathbf{b}}$	<i>Stewartia pseudocamellia</i> (Japanese stewartia)	$\mathbf{\bullet}$	(Monkey puzzle) Cercis siliquastrum
	Cornus florida (Flowering dogwood)			Ø	(Siberian crabapple)		(Tibetan cherry)	$\mathbf{\mathbf{b}}$	Stewartia sinensis (Chinese stewartia)	\mathbf{O}	(Judas tree) Crataegus x grignonensis
	Cornus kousa (Chinese dogwood)	Ø	(Chestnut leaved holly) <i>Ilex</i> 'Nellie R. Stevens'	$\mathbf{\bullet}$	(Apples and crabapples)		(Japanese cherry)	$\mathbf{\mathbf{b}}$	(Japanese snowball tree)	\mathbf{O}	(Grignon hawthorn) Crataegus laevigata
	Cornus mas (Cornelian cherry dogwood)		(Hybrid Holly)	0	<i>Malus hupehensis</i> (Chinese crabapple)	$\mathbf{\mathbf{b}}$	<i>Prunus x subhirtella</i> (Hybrid cherry)	$\mathbf{\mathbf{b}}$	Syringa x chinensis (Chinese lilac)	\mathbf{O}	(Woodland hawthorn) Crataegus x lavalleei
	Corylus avellana (Hazel)		(Common juniper)		(European crabapple)	$\mathbf{\mathbf{b}}$	<i>Prunus</i> 'Umineko' (Hybrid cherry)	$\mathbf{\mathbf{b}}$	(Japanese tree lilac)	\mathbf{O}	(Lavallée hawthorn) Crataegus x media
	Corylus colurna (Turkish hazel)		(ROCKY MOUNTAIN JUNIPER)	0	(Toringo crabapple)	$\mathbf{\mathbf{b}}$	Prunus x yedoensis (Yoshino cherry)	$\mathbf{\mathbf{b}}$	(Common lilac)	\mathbf{O}	(Red thorn) Crataegus monogyna
	Corylus maxima (Filbert)		(Eastern red Cedar)	0	(Lebanese wild apple)	$\mathbf{\mathbf{b}}$	(Callery pear)	$\mathbf{\bullet}$	(French tamarisk)		(Common hawthorn) Crataegus x persimilis
	Cotoneaster frigidus (Tree cotoneaster)	Ø		0	(Yunnan crabapple)	$\mathbf{\mathbf{b}}$	<i>Pyrus communis</i> (Common pear)	$\mathbf{\bullet}$	Tamarix ramosissima (Salt cedar)		(Broad-leaved cockspur thorn)
	Crataegus x grignonensis (Grignon hawthorn)				(Chilean mayten)	$\mathbf{\mathbf{b}}$	(Willow-leaved pear)	$\mathbf{\mathbf{b}}$	(Four-stamen tamarisk)	\mathbf{O}	Cupressus macrocarpa (Monterey cypress)
	Crataegus laevigata (Woodland hawthorn)		(Japanese tree privet)		(Medlar)	$\mathbf{\mathbf{b}}$	<i>Quercus acutissima</i> (Sawtooth oak)	$\mathbf{\mathbf{b}}$	Taxus baccata (Common yew)	\mathbf{O}	x <i>Cuprocyparis leylandii</i> (Leyland cypress)
	Crataegus x lavalleei (Lavallée hawthorn)		(Chinese privec)		Olea europaea (Olive)	$\mathbf{\mathbf{b}}$	(Staghorn sumac)	$\mathbf{\mathbf{b}}$	(Henry's lime)	\mathbf{O}	<i>Elaeagnus angustifolia</i> (Russian olive)
	Crataegus x media (Red thorn)		(Cucumber tree)	0	<i>Phellodendron amurense</i> (Amur cork tree)	\triangleright	(Whitebeam)	$\mathbf{\mathbf{b}}$	Tilia mongolica (Mongolian lime)	\mathbf{O}	<i>Euonymus europaeus</i> (Common spindle tree)
	Crataegus monogyna (Common hawthorn)		(Yulan magnolia)		Prunus 'Accolade' (Hybrid cherry)	$\mathbf{\mathbf{O}}$	Sorbus x arnoldiana (Hybrid Sorbus)	$\mathbf{\Diamond}$			Gleditsia triacanthos (Honey locust)

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Tree Selector	Use potentia	al					 Contents page Alphabetica Index 	1	Tree Selector Use potential Mature size	Crown form Crown density)
Use the 🔊 symbols to go to a Profile page, and the top menu to return.	Coastal continued				Transport corridor							
	Hippophaë salicifolia (Willow-leaved		Pyrus communis (Common pear)		Acer buergerianum (Trident maple)	Ø	Elaeagnus angustifolia (Russian olive)	\diamond	Prunus cerasifera (Cherry plum)		Syringa reticulata (Japanese tree lilac)	•
All species listed	sea buckthorn) <i>Ilex x altaclerensis</i> group (Hybrid holly)		(willow-leaved pear)	r) (Field maple)		\bigcirc	<i>Eucalyptus gunnii</i> subsp. <i>gunnii</i> (Cider gum)	\triangleright	Pyrus calleryana (Callery pear)		Tamarix gallica (French tamarisk)	
are suitable for planting in parks	(Hybrid Holly) <i>Ilex aquifolium</i> (European holly)		Quercus cerris (Turkey oak)		(Red maple)		(Guttapercha)	$\mathbf{\bullet}$	Quercus acutissima (Sawtooth oak) Quercus bicolor		Tamarix ramosissima (Salt cedar)	
	<i>Ilex</i> x <i>aquipernyi</i> 'Dragon Lady'		(Holm oak) Image: Constant sempervires Quercus petraea Image: Constant sempervirens (Sessile oak) Image: Constant sempervires Sorbus intermedia Image: Constant sempervires (Swedish whitebeam) Image: Constant sempervires Sorbus latifolia Image: Constant sempervires (Broad-leaved whitebeam) Image: Constant sempervires Sorbus torminalis Image: Constant sempervires	Acer tataricum (Tatarian maple) Acer tataricum subsp.		(Common spindle tree)	$\mathbf{\mathbf{b}}$	(Swamp white oak)		Tamarix tetrandra (Four-stamen tamarisk) Taxodium distichum		
	(Hybrid holly) Ilex x koehneana			ak) ginnala (Amur maple) redwood) Ailanthus altissima (Tree of heaven)		Ginkgo biloba (Maidenhair tree)	\bigcirc	(Hybrid oak) Quercus castaneifolia		(Swamp cypress) Tilia cordata		
	'Chestnut Leaf' (Chestnut leaved holly)					(Hone	Gleditsia triacanthos (Honey locust)	$\mathbf{\mathbf{b}}$	(Chestnut-leaved oak) Quercus cerris		(Small-leaved lime) Tilia x euchlora	
	<i>Ilex</i> 'Nellie R. Stevens' (Hybrid holly)			_	Alnus glutinosa (Common alder)	\diamond	Gymnocladus dioica (Kentucky coffee tree)	\diamond	(Turkey oak) Quercus coccinea		(Caucasian lime) <i>Tilia tomentosa</i>	
	Juniperus virginiana (Eastern red cedar)				Alnus incana (Grey alder)	\triangleright	Hippophaë salicifolia (Willow-leaved	\triangleright	(Scarlet oak) Quercus frainetto		(Silver lime) <i>Ulmus</i> – resistant cultivar	
	Maytenus boaria (Chilean mayten) Olea europaea		Tamarix gallica		Alnus x spaethii (Spaeth alder)	\bigcirc	sea buckthorn) Juniperus virginiana (Eastern red cedar)		(Hungarian oak) Quercus x hispanica		(Elms) Zelkova serrata	
	(Olive) Ostrya carpinifolia	0	(French tamarisk) Tamarix ramosissima		Amelanchier arborea (Downey serviceberry)	$\mathbf{\mathbf{b}}$	(Golden rain tree)		(Spanish oak) Quercus ilex		(Japanese zelkova)	
	(Hop hornbeam) Picea sitchensis		(Salt cedar) Tamarix tetrandra (Four-stamen tamarisk)		Betula nigra (River birch) Betula pendula subsp.		(Sweetgum)	$\mathbf{\mathbf{b}}$	(Holm oak) Quercus palustris (Pin oak)			
	(Sitka spruce) Pinus nigra				(Silver birch)	\triangleright	(Chilean mayten)	$\mathbf{\mathbf{b}}$	(Pin Oak) Quercus petraea (Sessile oak)			
	(Black pine) Pinus pinaster		(Caucasian lime)		<i>Celtis australis</i> (Nettle tree)	\triangleright	Ostrya carpinifolia (Hop hornbeam)	\triangleright	Quercus phellos (Willow oak)			
	(Maritime pine) Pinus pinea	0	(Silver lime)		Crataegus x grignonensis (Grignon hawthorn)	$\mathbf{\mathbf{b}}$	Pinus nigra (Black pine)	$\mathbf{\mathbf{b}}$	<i>Quercus robur</i> (Pedunculate oak)	$\mathbf{\bullet}$		
	(Stone pine) Pinus radiata	0	Ulmus – resistant cultivars (Elms)		Crataegus laevigata (Woodland hawthorn)	\diamond	Pinus pinaster (Maritime pine)	\diamond	Quercus rubra (Red oak)	$\mathbf{\bullet}$		
	(Monterey pine) Populus alba				Crataegus x lavalleei (Lavallée hawthorn)	\triangleright	Pinus pinea (Stone pine)	\triangleright	Quercus suber (Cork oak)	\bigcirc		
	(White poplar) Populus x canadensis (Hybrid poplar)				Crataegus x media (Red thorn)	\bigcirc	Pinus radiata (Monterey pine)	$\mathbf{\mathbf{b}}$	Quercus x turneri (Turner's oak)	$\mathbf{\bullet}$		
	(Hybrid poplar) Populus nigra (Black poplar)				Crataegus monogyna (Common hawthorn)	$\mathbf{\mathbf{b}}$	Platanus x hispanica (London plane)	$\mathbf{\mathbf{b}}$	Rhus typhina (Staghorn sumac)			
	(Eurasian aspen)				Crataegus x persimilis (Broad-leaved cockspur thorn)	$\mathbf{\mathbf{b}}$	Platanus orientalis (Oriental plane)		Robinia pseudoacacia (False acacia)			
	(Portugal laurel)	$\mathbf{\bullet}$			Cupressus arizonica (Arizona cypress)	\triangleright	Populus alba (White poplar)		Sorbus intermedia (Swedish whitebeam)			
	(Callery pear)				x <i>Cuprocyparis leylandii</i> (Leyland cypress)		Populus nigra (Black poplar) Populus tremula		Sorbus latifolia (Broad-leaved whitebea Styphnolobium japonic			
							(Eurasian aspen)		(Japanese pagoda tree)			

Tree Selector	r		
Use potential Mature size	 Crov form Crov dens 		e ntal
Betula pubescens (Downy birch)	ens 🔊	Liquidambar styraciflua (Sweetgum)	(
Betula utilis subsp (Himalayan birch)		<i>Liriodendron tulipifera</i> (Tulip tree)	
Carpinus betulus (Hornbeam)	us 🔊	Magnolia grandiflora (Southern magnolia)	
Carya illinoinensis (Pecan)	nsis 🜔	Nyssa sylvatica (Black tupelo)	
Carya ovata (Shagbark hickory	ory)	Ostrya carpinifolia (Hop hornbeam)	
Catalpa speciosa (Northern catalpa		Paulownia tomentosa (Foxglove tree)	
Celtis australis (Nettle tree)	\mathbf{O}	Pinus pinea (Stone pine)	
Celtis occidentalis (Common hackbe		Pinus wallichiana (Bhutan pine)	
Cercidiphyllum ja (Katsura tree)	japonicum 🕥	Populus alba (White poplar)	
Corylus colurna (Turkish hazel)	a 🜔	Populus x candicans (Ontario poplar)	
Cupressus arizoni (Arizona cypress)		Prunus avium (Wild cherry)	
Cupressus sempe (Mediterranean cy		Prunus maackii (Manchurian cherry)	
X Cuprocyparis le (Leyland cypress)	s leylandii	Prunus padus (Bird cherry)	
Davidia involucration (Pocket handkerd	crata	Quercus bicolor (Swamp white oak)	
Eucalyptus gunnii gunnii	nii subsp. 🜔	Quercus coccinea (Scarlet oak)	
Cider gum)	oides	Quercus frainetto (Hungarian oak)	
(Guttapercha)		Quercus ilex (Holm oak)	
Maidenhair tree)	7	Quercus palustris (Pin oak)	
(Honey locust)		Quercus phellos	
(Kentucky coffee	ee tree)	Quercus rubra	
(European holly)	y)	Quercus suber	
ommon larch) (Caucasian wing-nut) (Silver birch) (Eastern red cedar)		Robinia pseudoacacia	
(Golden rain tree)		Salix babylonica	
	Gymnocladus of (Kentucky coffe Ilex aquifolium (European holly Juniperus virgi (Eastern red ce Koelreuteria pa	Gymnocladus dioica (Kentucky coffee tree) Ilex aquifolium (European holly) Juniperus virginiana (Eastern red cedar) Koelreuteria paniculata	Gymnocladus dioica (Kentucky coffee tree) (Willow oak) Ilex aquifolium (European holly) (Willow oak) Juniperus virginiana (Eastern red cedar) (Cork oak) Koelreuteria paniculata (False acacia)

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Salix pentandra Ahieckoreana Cladractic kontukca Brunus y schmittii Tilia measo		<10M
Salix pentandra (Bay-leaved willow)Abies koreana (Korean fir)Cladrastis kentukea (Yellow wood)Prunus x schmittii (Hybrid cherry)Tilia mongo (Mongolian)		Acer palmatum (Japanese maple)
Salix x sepulcralis (Weeping willow) Acacia dealbata (Silver wattle) O Cornus controversa (Wedding cake tree) Prunus serrulata (Japanese cherry)		Acer shirasawanum (Shirasawa's maple)
Sorbus latifolia (Broad-leaved whitebeam) Acer campestre (Field maple) Crataegus monogyna (Common hawthorn) Prunus x subhirtella (Hybrid cherry)		Acer tataricum subsp.
Sorbus torminalis (Wild service tree) Acer capillipes (Red snake-bark maple) Elaeagnus angustifolia (Russian olive) Prunus x yedoensis (Yoshino cherry)		(Amur maple) Aesculus parviflora
Tetradium daniellii (Chinese bee tree) Acer davidii (Père David's maple) Eucalyptus pauciflora group Pyrus calleryana (Callery pear)		(Dwarf horse chestnut)
Thuja plicata Acer griseum (Snow gums) Pyrus communis (Western red cedar) (Paperbark maple) Ilex x altaclerensis group (Common pear)		(Alder-leaved serviceberry)
Tilia x euchlora (Caucasian lime) Acer japonicum (Full moon maple) Image: Hyperic holity) Image: Hyperic holity)		(Canadian serviceberry)
Tilia henryana (Henry's lime) Acer monspessulanum (Montpellier maple) Image: Chesthult Lear Quercus x bimondorum (Chestnut leaved holly)		(Serviceberry)
Tilia oliveri (Chinese white lime) Acer rufinerve (Grey-budded Magnolia denudata (Yulan magnolia) Quercus x turneri (Turner's oak)		(Strawberry tree)
Ulmus - resistant cultivars snake-bark maple) Magnolia 'Elizabeth' (Hybrid magnolia) Salix daphnoides (Violet willow)		(North American redbud)
Zelkova serrata (Tatarian maple) Magnolia 'Heaven Scent' Sorbus aria (Japanese zelkova) (Tatarian maple) Magnolia 'Heaven Scent' (Multicbeam) (Japanese zelkova) (Tatarian maple) (Multicbeam) (Multicbeam)		(Judas tree)
(Three-flowered maple) Magnolia kobus Sorbus x arnoldiana Aesculus pavia (Kobushi magnolia) (Hybrid Sorbus)		Chitalpa Clerodendrum
(Red buckeye) Magnolia x soulangeana Amelanchier arborea (Saucer magnolia) (Downow convicebory) Magnolia (Saucer magnolia)		(Harlequin glorybower)
(Downey serviceberry) Aralia elata (Angelica trac) (Hybrid magnolia) Malur bacasta		Cornus alternifolia (Alternate leaf dogwood)
(Angelica tree) Malus baccata Sorbus intermedia Betula nigra (Siberian crabapple) (Swedish whitebeam) (Diver birch) Malus trilebata (Swedish whitebeam)		Cornus 'Eddie's white wonder'
(River birch)Malus trilobataSorbus 'Joseph Rock'Betula utilis subsp.(Lebanese wild apple)(Hybrid Sorbus)		(Hybrid dogwood)
albosinensisMorus alba (Chinese red birch)Sorbus pseudohupehensis (Hupeh rowan)		Cornus kousa
Betula utilis subsp. jacquemontiiMorus nigra (Black mulberry)Sorbus thibetica (Tibetan whitebeam)		Cornus mas
(White-barked Himalayan birch)Nothofagus antarctica (Antarctic beech)Sorbus x thuringiaca (Hybrid Sorbus)		(Cornelian cherry dogwood)
Buxus sempervirens Parrotia persica Stewartia pseudocamellia (Box) (Persian ironwood) (Japanese stewartia)		(Hazel)
Carpinus japonica (Japanese hornbeam)Phellodendron amurense (Amur cork tree)Styphnolobium japonicum (Japanese pagoda tree)		(Filbert)
Catalpa bignonioides (Indian bean tree)Prunus lusitanica (Portugal laurel)Styrax japonicus (Japanese snowball tree)		Crataegus x grignonensis
Catalpa x erubescens (Hybrid catalpa) Prunus sargentii (Sargent's cherry) Taxus baccata (Common yew)		(Grignon hawthorn)

Mature size



Crown form Crown density

Environmental tolerance Ornamental qualities

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A small tree continued **P** <10M

Crataegus laevigata (Woodland hawthorn)		Magnolia x loebne (Loebner magnolia
Crataegus x lavalleei		Magnolia 'Spectru
(Lavallée hawthorn)	$\mathbf{\mathbf{b}}$	(Hybrid magnolia)
Crataegus x media		Magnolia 'Star Wa
(Red thorn)	$\mathbf{\mathbf{b}}$	(Hybrid magnolia)
Crataegus x persimilis	\mathbf{O}	Magnolia stellata
(Broad-leaved		(Star magnolia)
cockspur thorn)		Magnolia 'Susan'
Cydonia oblonga	\mathbf{O}	(Hybrid magnolia)
(Common quince)		Malus cultivars
Diospyros kaki	\mathbf{O}	(Apples and craba
(Chinese persimmon)		Malus hupehensis
Euonymus europaeus	\mathbf{O}	(Chinese crabapple
(Common spindle tree)		Malus sylvestris
Ficus carica	$\mathbf{\mathbf{O}}$	(European crabap
(Common fig)		Malus toringo
Halesia carolina	\mathbf{O}	(Toringo crabapple
(Carolina silverbell)		Malus yunnanensis
Hamamelis x intermedia	\mathbf{O}	(Yunnan crabapple
(Hybrid witch hazel)		Maytenus boaria
Heptacodium miconioides	\mathbf{O}	(Chilean mayten)
(Seven-son flower)		Mespilus germanic
Hippophaë salicifolia (Willow-leaved	\mathbf{O}	(Medlar)
sea buckthorn)		Olea europaea
Ilex x aquipernyi		(Olive)
'Dragon Lady'	\mathbf{O}	Prunus 'Accolade'
(Hybrid holly)		(Hybrid cherry)
Ilex 'Nellie R. Stevens'		Prunus cerasifera
(Hybrid holly)	$\mathbf{\mathbf{O}}$	(Cherry plum)
Juniperus communis		<i>Prunus domestica</i> (Common plum)
(Common juniper)	\mathbf{O}	
Juniperus scopulorum		Prunus dulcis (Almond)
(Rocky mountain juniper)	\mathbf{O}	Prunus fruticosa
Laburnum anagyroides		(Steppe cherry)
(Common laburnum)	\mathbf{O}	Prunus lauroceras
Laburnum x watereri		(Cherry laurel)
(Hybrid laburnum)		Prunus 'Okame'
Ligustrum japonicum		(Hybrid cherry)
(Japanese tree privet)	\mathbf{O}	Prunus 'Pandora'
Ligustrum lucidum	\mathbf{O}	(Hybrid cherry)
(Chinese privet)		Prunus serrula
Magnolia 'Galaxy'	\mathbf{O}	(Tibetan cherry)
(Hybrid magnolia)	V	Prunus 'Umineko'
		(Hybrid cherry)

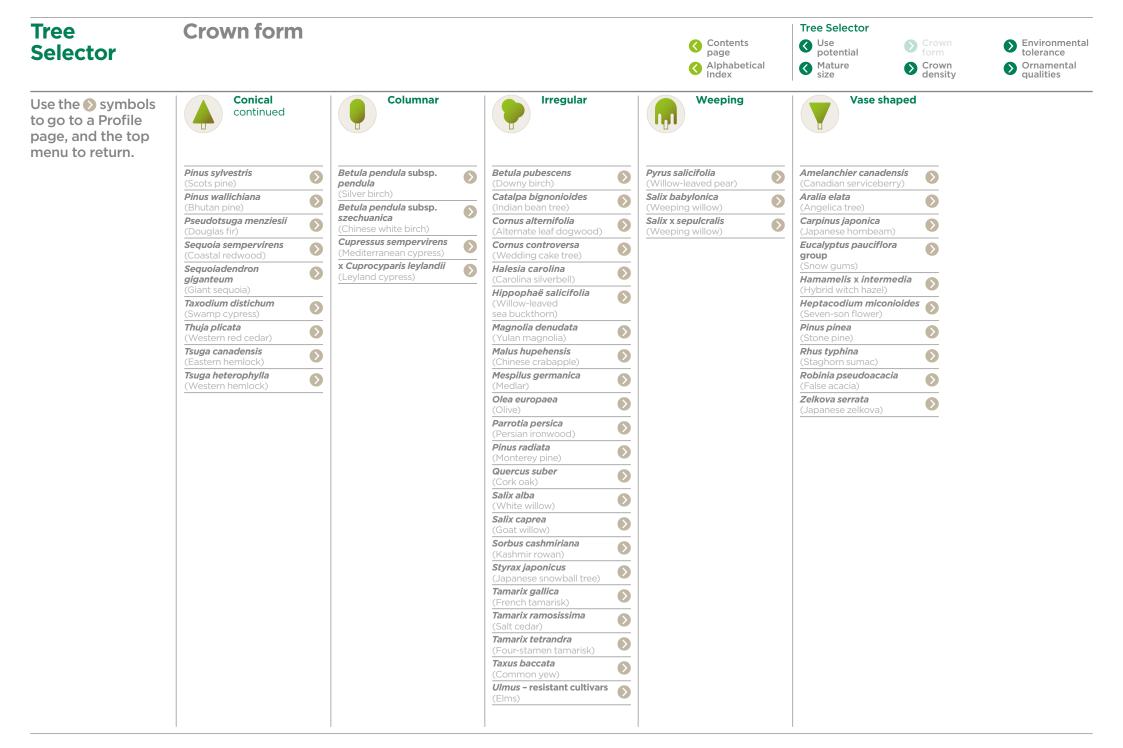
Magnolia x loebneri (Loebner magnolia)	$\mathbf{\bullet}$	Pyrus salicifolia (Willow-leaved pear)	
Magnolia 'Spectrum' (Hybrid magnolia)		Rhus typhina (Staghorn sumac)	
Magnolia 'Star Wars' (Hybrid magnolia)		Salix caprea (Goat willow)	
Magnolia stellata (Star magnolia)	NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN	Sorbus cashmiriana (Kashmir rowan)	
Magnolia 'Susan' (Hybrid magnolia)		Sorbus discolor (Chinese rowan)	
Malus cultivars (Apples and crabapples)		Sorbus vilmorinii (Vilmorin's rowan)	
Malus hupehensis (Chinese crabapple)	 <	Stewartia sinensis (Chinese stewartia)	
Malus sylvestris (European crabapple)	$\mathbf{\mathbf{O}}$	Syringa x chinensis (Chinese lilac)	
Malus toringo (Toringo crabapple)	$\mathbf{\bullet}$	Syringa reticulata (Japanese tree lilac)	
Malus yunnanensis (Yunnan crabapple)		Syringa vulgaris (Common lilac)	
<i>Maytenus boaria</i> (Chilean mayten)		Tamarix gallica (French tamarisk)	
Mespilus germanica (Medlar)	>	Tamarix ramosissima (Salt cedar)	
Olea europaea (Olive)		Tamarix tetrandra (Four-stamen tamarisk)	
Prunus 'Accolade' (Hybrid cherry)			
Prunus cerasifera (Cherry plum)			
Prunus domestica (Common plum)			
Prunus dulcis (Almond)			
Prunus fruticosa (Steppe cherry)	$\mathbf{\bullet}$		
Prunus laurocerasus (Cherry laurel)	$\mathbf{\bullet}$		
Prunus 'Okame' (Hybrid cherry)	\bigcirc		
Prunus 'Pandora' (Hybrid cherry)	Image: Constraint of the second sec		
Prunus serrula			

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continued next page						Alphabetica	al	Mature	Crowr		
						V Index		size	densit		
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Acacia dealbata (Silver wattle)	$\mathbf{\mathbf{O}}$	Celtis australis (Nettle tree)	Ø	<i>Elaeagnus angustifolia</i> (Russian olive)	$\mathbf{\mathbf{O}}$	Prunus cerasifera (Cherry plum)	$\mathbf{\bullet}$	Styphnolobium japonicum (Japanese pagoda tree)		Acer buergerianum (Trident maple)	$\mathbf{\bullet}$
<i>Acer campestre</i> (Field maple)	$\mathbf{\mathbf{O}}$	Celtis occidentalis (Common hackberry)	\diamond	Euonymus europaeus (Common spindle tree)	$\mathbf{\bullet}$	Prunus domestica (Common plum)	Ø	Syringa x chinensis (Chinese lilac)	\bullet	Acer cappadocicum (Caucasian maple)	\triangleright
Acer griseum (Paperbark maple)	$\mathbf{\bullet}$	Cercis canadensis (North American redbud)		Fagus orientalis (Oriental beech)	$\mathbf{\bullet}$	Prunus dulcis (Almond)	$\mathbf{\mathbf{b}}$	Tetradium daniellii (Chinese bee tree)		Acer x freemanii (Freeman's maple)	$\mathbf{\mathbf{b}}$
Acer japonicum (Full moon maple)	\bigcirc	Cercis siliquastrum (Judas tree)		Fagus sylvatica (Common beech)	\bigcirc	Prunus fruticosa (Steppe cherry)	\bigcirc			Acer platanoides (Norway maple)	\bigcirc
<i>Acer monspessulanum</i> (Montpellier maple)	\bigcirc	x <i>Chitalpa tashkentensis</i> Chitalpa	\bigcirc	Ficus carica (Common fig)	\mathbf{O}	Prunus laurocerasus (Cherry laurel)	\diamond			Acer pseudoplatanus (Sycamore)	\diamond
Acer negundo (Box elder)	$\mathbf{\bullet}$	Cladrastis kentukea (Yellow wood)		<i>Gymnocladus dioica</i> (Kentucky coffee tree)	$\mathbf{\bullet}$	Prunus lusitanica (Portugal laurel)	$\mathbf{\bullet}$			Acer rubrum (Red maple)	$\mathbf{\mathbf{b}}$
Acer palmatum (Japanese maple)	$\mathbf{\mathbf{b}}$	Clerodendrum trichotomum	\mathbf{O}	Juglans nigra (Black walnut)	$\mathbf{\mathbf{b}}$	Prunus sargentii (Sargent's cherry)	$\mathbf{\mathbf{b}}$			Acer x zoeschense (Zoeschen maple)	$\mathbf{\bullet}$
Acer saccharinum (Silver maple)	$\mathbf{\mathbf{b}}$	(Harlequin glorybower) Cornus florida		Juglans regia (Common walnut)	$\mathbf{\mathbf{b}}$	Prunus serrula (Tibetan cherry)	$\mathbf{\mathbf{b}}$			Aesculus flava (Yellow buckeye)	$\mathbf{\bullet}$
Acer saccharum (Sugar maple)	$\mathbf{\mathbf{b}}$	(Flowering dogwood) Cornus kousa		<i>Koelreuteria paniculata</i> (Golden rain tree)	$\mathbf{\mathbf{b}}$	Prunus serrulata (Japanese cherry)	$\mathbf{\bullet}$			Amelanchier arborea (Downey serviceberry)	$\mathbf{\bullet}$
Acer shirasawanum (Shirasawa's maple)	\mathbf{O}	(Chinese dogwood) Cornus mas		<i>Ligustrum japonicum</i> (Japanese tree privet)	$\mathbf{\bullet}$	Pterocarya fraxinifolia (Caucasian wing-nut)	$\mathbf{\mathbf{O}}$			Betula maximowicziana (Monarch birch)	\bigcirc
Acer triflorum (Three-flowered maple)	\bigcirc	(Cornelian cherry dogwood) Corylus avellana	0	<i>Ligustrum lucidum</i> (Chinese privet)	$\mathbf{\mathbf{b}}$	Pterocarya stenoptera (Chinese wing-nut)	\triangleright			Betula nigra (River birch)	
Aesculus x carnea (Red horse chestnut)		(Hazel) Corylus maxima	0	Magnolia 'Heaven Scent' (Hybrid magnolia)	$\mathbf{\mathbf{b}}$	Quercus castaneifolia (Chestnut-leaved oak)	\triangleright			Betula papyrifera (Paper birch)	\bigcirc
Aesculus hippocastanum (Horse chestnut)	$\mathbf{\mathbf{O}}$	(Filbert) Cotoneaster frigidus		Magnolia 'Star Wars' (Hybrid magnolia)	\mathbf{O}	Quercus cerris (Turkey oak)	\bigcirc			<i>Betula utilis</i> subsp. <i>albosinensis</i>	\triangleright
Aesculus indica (Indian horse chestnut)	$\mathbf{\mathbf{O}}$	(Tree cotoneaster) Crataegus x grignonensis		Magnolia 'Susan' (Hybrid magnolia)	\mathbf{O}	Quercus coccinea (Scarlet oak)	\bigcirc			(Chinese red birch) Betula utilis subsp.	
Aesculus parviflora (Dwarf horse chestnut)	\mathbf{O}	(Grignon hawthorn) Crataegus laevigata	0	Malus sylvestris (European crabapple)	\mathbf{O}	Quercus frainetto (Hungarian oak)	\diamond			jacquemontii (White-barked	
Aesculus pavia (Red buckeye)	$\mathbf{\mathbf{b}}$	(Woodland hawthorn) Crataegus x lavalleei	0	Malus toringo (Toringo crabapple)	\diamond	Quercus x hispanica (Spanish oak)				Himalayan birch) Betula utilis subsp. utilis (Himalayan birch)	$\mathbf{\bullet}$
<i>Ailanthus altissima</i> (Tree of heaven)	\bigcirc	(Lavallée hawthorn) Crataegus x media	0	Morus alba (White mulberry)	$\mathbf{\mathbf{b}}$	Quercus ilex (Holm oak)	$\mathbf{\mathbf{b}}$			(Himalayan birch) Carpinus betulus (Hornbeam)	$\mathbf{\bullet}$
Amelanchier alnifolia (Alder-leaved serviceberry)		(Red thorn) Crataegus monogyna	0	Morus nigra (Black mulberry)	\bigcirc	Quercus palustris (Pin oak)	$\mathbf{\mathbf{b}}$			(Pecan) (Pecan)	
Amelanchier lamarckii (Serviceberry)	$\mathbf{\bullet}$	(Common hawthorn) Crataegus x persimilis		Ostrya carpinifolia (Hop hornbeam)	$\mathbf{\bullet}$	Quercus petraea (Sessile oak)	$\mathbf{\mathbf{b}}$			Carya ovata	
Arbutus unedo (Strawberry tree)	\diamond	(Broad-leaved cockspur thorn)		Paulownia tomentosa (Foxglove tree)	$\mathbf{\mathbf{b}}$	Quercus robur (Pedunculate oak)	\diamond			(Shagbark hickory) Castanea sativa	
Betula ermanii (Stone birch)	\bigcirc	Cydonia oblonga (Common quince)		Platanus x hispanica (London plane)	\bigcirc	Quercus rubra (Red oak)	${}^{\bullet}$			(Sweet chestnut) Catalpa x erubescens	
Betula lenta (Cherry birch)	\diamond	Davidia involucrata (Pocket handkerchief tree)		Platanus orientalis (Oriental plane)	\bigcirc	Quercus x turneri (Turner's oak)	\diamond			(Hybrid catalpa) Catalpa speciosa	•
Buxus sempervirens (Box)	\bigcirc	Diospyros kaki (Chinese persimmon)		Prunus avium (Wild cherry)	\bigcirc	Salix pentandra (Bay-leaved willow)	$\mathbf{\mathbf{b}}$			(Northern catalpa)	

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	Cercidiphyllum japonicum (Katsura tree)		Populus x canadensis (Hybrid poplar)		Sorbus x thuringiaca (Hybrid Sorbus)		Acer capillipes (Red snake-bark maple)	\triangleright	Abies concolor (White fir)	\bigcirc	<i>llex x koehneana</i> 'Chestnut Leaf'	\diamond
	Cornus 'Eddie's white wonder'	\mathbf{O}	Populus x candicans (Ontario poplar)	Ø	Sorbus torminalis (Wild service tree)		Acer davidii (Père David's maple)		Abies fraseri (Fraser fir)	$\mathbf{\bullet}$	(Chestnut leaved holly) <i>Ilex</i> 'Nellie R. Stevens'	•
	(Hybrid dogwood) <i>Eucalyptus gunnii</i> subsp.		Populus nigra (Black poplar)		Sorbus vilmorinii (Vilmorin's rowan)	\diamond	Acer rufinerve (Grey-budded	$\mathbf{\mathbf{O}}$	Abies grandis (Grand fir)		(Hybrid holly) Juniperus communis	0
	gunnii (Cider gum) Eucommia ulmoides		Populus tremula (Eurasian aspen)		Stewartia pseudocamellia (Japanese stewartia)		snake-bark maple) Acer tataricum (Tatarica maple)	$\mathbf{\bullet}$	Abies koreana (Korean fir)	$\mathbf{\bullet}$	(Common juniper) Juniperus scopulorum	
	(Guttapercha) Ginkgo biloba		Prunus maackii (Manchurian cherry)	•	Stewartia sinensis (Chinese stewartia)	Ø	(Tatarian maple) Acer tataricum subsp. ginnala		Abies nordmanniana (Nordmann fir)		(Rocky mountain juniper) Juniperus virginiana (Eastern red cedar)	
	(Maidenhair tree) Gleditsia triacanthos		Prunus padus (Bird cherry)		Syringa reticulata (Japanese tree lilac)	\bullet	(Amur maple) Laburnum anagyroides		Abies procera (Noble fir)		(Lasternied Cedar) Larix decidua (Common larch)	0
	(Honey locust) Liriodendron tulipifera		Pyrus calleryana (Callery pear)	$\mathbf{\mathbf{b}}$	Syringa vulgaris (Common lilac)	\mathbf{O}	(Common laburnum)		Alnus cordata (Italian alder) Alnus glutinosa		(Japanese larch)	
	(Tulip tree) Magnolia acuminata		Pyrus communis (Common pear)	$\mathbf{\mathbf{b}}$	Tilia americana (American basswood)	\bigcirc	(Hybrid laburnum) Phellodendron amurense		(Common alder)		<i>Larix x marschlinsii</i> (Hybrid larch)	C
	(Cucumber tree) Magnolia 'Galaxy'		Quercus acutissima (Sawtooth oak)	Tilia cordata (Small-leaved lime)		(Amur cork tree) Prunus 'Accolade'		(Grey alder)		(Sweetgum)		
	(Hybrid magnolia)	•	Quercus bicolor (Swamp white oak)		Tilia x euchlora (Caucasian lime)		(Hybrid cherry)		Alnus x spaethii (Spaeth alder)		Magnolia 'Elizabeth'	6
	Magnolia grandiflora (Southern magnolia)		Quercus x bimondorum (Hybrid oak)	\bigcirc	Tilia x europaea (Common lime)	\bigcirc	Prunus 'Okame' (Hybrid cherry)	$\mathbf{\mathbf{b}}$	Araucaria araucana (Monkey puzzle)		(Hybrid magnolia) Magnolia 'Yellow Bird'	
	Magnolia kobus (Kobushi magnolia)		<i>Quercus phellos</i> (Willow oak)	\bigcirc	Tilia henryana (Henry's lime)	\bigcirc	Prunus 'Pandora' (Hybrid cherry)	$\mathbf{\mathbf{b}}$	Cedrus atlantica (Atlas cedar)	 Image: A start of the start of	(Hybrid magnolia) Malus trilobata	•
	Magnolia x loebneri (Loebner magnolia)		Salix daphnoides (Violet willow)	$\mathbf{\mathbf{b}}$	Tilia mongolica (Mongolian lime)		Prunus x schmittii (Hybrid cherry)	$\mathbf{\mathbf{b}}$	Cedrus deodara (Himalayan cedar)		(Lebanese wild apple) Metasequoia	6
	Magnolia x soulangeana (Saucer magnolia)		Sorbus aria (Whitebeam)	$\mathbf{\mathbf{b}}$	<i>Tilia oliveri</i> (Chinese white lime)		Prunus x subhirtella (Hybrid cherry)	$\mathbf{\mathbf{b}}$	Cedrus libani (Cedar of Lebanon)		glyptostroboides (Dawn redwood)	
	Magnolia 'Spectrum' (Hybrid magnolia)		Sorbus x arnoldiana (Hybrid Sorbus)	$\mathbf{\mathbf{b}}$	<i>Tilia platyphyllos</i> (Large-leaved lime)		Prunus 'Umineko' (Hybrid cherry)	$\mathbf{\mathbf{b}}$	Chamaecyparis lawsoniana		Picea abies (Norway spruce)	e
	Magnolia stellata (Star magnolia)		Sorbus aucuparia (Rowan)	$\mathbf{\mathbf{b}}$	Tilia tomentosa (Silver lime)		Prunus x yedoensis (Yoshino cherry)		(Lawson cypress) Corylus colurna		Picea breweriana (Brewer spruce)	
	<i>Malus baccata</i> (Siberian crabapple)		Sorbus commixta (Japanese rowan)	\bigcirc					(Turkish hazel) Cryptomeria japonica		Picea omorika (Serbian spruce)	
	Malus cultivars (Apples and crabapples)	\bigcirc	Sorbus discolor (Chinese rowan)						(Japanese cedar) Cupressus arizonica		Picea orientalis (Caucasian spruce)	
	<i>Malus yunnanensis</i> (Yunnan crabapple)		Sorbus intermedia (Swedish whitebeam)						(Arizona cypress) Cupressus macrocarpa		<i>Picea pungens</i> (Colorado blue spruce)	
	Maytenus boaria (Chilean mayten)		Sorbus 'Joseph Rock' (Hybrid Sorbus)	$\mathbf{\mathbf{b}}$					(Monterey cypress) Ilex x altaclerensis grou		Picea sitchensis (Sitka spruce)	
	Nothofagus antarctica (Antarctic beech)	Ø	Sorbus latifolia (Broad-leaved whitebeam)						(Hybrid holly) Ilex aquifolium		Pinus nigra (Black pine)	
	Nyssa sylvatica (Black tupelo) Sorbus pseudohupehensis (Hupeh rowan)	$\mathbf{\bullet}$					(European holly) <i>Ilex x aquipernyi</i>		Pinus pinaster (Maritime pine)			
	Populus alba (White poplar)		(Tibetan whitebeam)						'Dragon Lady' (Hybrid holly)		Pinus strobus (Eastern white pine)	



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						Alphabetica Index	l	Mature size	Crow densi		 Ornamenta qualities 	al
A dense crow	vn										A moderatel dense crown	-
Abies concolor (White fir)	•	Araucaria araucana (Monkey puzzle)	Ø	x <i>Cuprocyparis leylandii</i> (Leyland cypress)		Picea pungens (Colorado blue spruce)	Ø	Sequoiadendron giganteum	$\mathbf{\bullet}$	Acacia de (Silver wa		•
Abies fraseri (Fraser fir)	$\mathbf{\bullet}$	Arbutus unedo (Strawberry tree)	$\mathbf{\bullet}$	Cydonia oblonga (Common quince)	$\mathbf{\bullet}$	Picea sitchensis (Sitka spruce)	\triangleright	(Giant sequoia) Taxus baccata		Acer capp (Caucasia	n maple)	$\mathbf{\mathbf{b}}$
Abies grandis (Grand fir)		Buxus sempervirens (Box)	\bigcirc	Fagus orientalis (Oriental beech)	\bigcirc	Pinus nigra (Black pine)	$\mathbf{\mathbf{b}}$	(Common yew) Thuja plicata		Acer davi (Père Dav	i dii rid's maple)	$\mathbf{\mathbf{O}}$
Abies koreana (Korean fir)	\mathbf{O}	Carpinus betulus (Hornbeam)	$\mathbf{\bullet}$	Fagus sylvatica (Common beech)		<i>Pinus pinaster</i> (Maritime pine)	\diamond	(Western red cedar) Tsuga canadensis		Acer x fre (Freeman		$\mathbf{\mathbf{b}}$
Abies nordmanniana (Nordmann fir)	\bigcirc	Castanea sativa (Sweet chestnut)	\bigcirc	Ficus carica (Common fig)	\diamond	Pinus pinea (Stone pine)	$\mathbf{\mathbf{b}}$	(Eastern hemlock) Tsuga heterophylla		Acer grise (Paperbar		Ø
Abies procera (Noble fir)	\bigcirc	Cedrus atlantica (Atlas cedar)	$\mathbf{\mathbf{b}}$	<i>llex</i> x <i>altaclerensis</i> group (Hybrid holly)		Pinus radiata (Monterey pine)	\triangleright	(Western hemlock)		Acer negu (Box elde		\mathbf{O}
Acer buergerianum (Trident maple)	\mathbf{O}	Cedrus deodara (Himalayan cedar)	\mathbf{O}	<i>llex aquifolium</i> (European holly)	\diamond	<i>Pinus strobus</i> (Eastern white pine)	$\mathbf{\mathbf{O}}$			Acer paln (Japanese		$\mathbf{\mathbf{b}}$
Acer campestre (Field maple)	$\mathbf{\mathbf{O}}$	Cedrus libani (Cedar of Lebanon)	$\mathbf{\bullet}$	<i>llex</i> x <i>aquipernyi</i> 'Dragon Lady'		Prunus cerasifera (Cherry plum)	$\mathbf{\mathbf{b}}$			Acer rubr (Red map		$\mathbf{\mathbf{b}}$
Acer capillipes (Red snake-bark maple)		Chamaecyparis lawsoniana	\triangleright	(Hybrid holly) Ilex x koehneana		Prunus laurocerasus (Cherry laurel)	\triangleright			Acer rufin (Grey-buc	dded	\triangleright
Acer japonicum (Full moon maple)	\bigcirc	(Lawson cypress) x Chitalpa tashkentensis	$\mathbf{\bullet}$	'Chestnut Leaf' (Chestnut leaved holly)		Prunus lusitanica (Portugal laurel)	$\mathbf{\mathbf{b}}$			snake-bar Acer tatal	ricum	\mathbf{O}
Acer monspessulanum (Montpellier maple)	\bigcirc	Chitalpa Cladrastis kentukea (Yallaw waad)	•	<i>Ilex</i> 'Nellie R. Stevens' (Hybrid holly)		Pseudotsuga menziesii (Douglas fir)	$\mathbf{\bullet}$			(Tatarian I Acer triflo	orum	
Acer platanoides (Norway maple)		(Yellow wood) Cotoneaster frigidus		Juniperus communis (Common juniper)		Pterocarya fraxinifolia (Caucasian wing-nut)	$\mathbf{\mathbf{b}}$			(Three-Inc Acer x zoo (Zoeschei		•
Acer pseudoplatanus (Sycamore)	\bigcirc	(Tree cotoneaster) Crataegus x grignonensis	•	Juniperus scopulorum (Rocky mountain juniper) Juniperus virginiana		Pterocarya stenoptera (Chinese wing-nut)	$\mathbf{\mathbf{b}}$			Ailanthus	altissima	•
Acer saccharum (Sugar maple)	$\mathbf{\mathbf{b}}$	(Grignon hawthorn) Crataegus laevigata (Woodland hawthorn)		(Eastern red cedar) Ligustrum japonicum		Pyrus calleryana (Callery pear)	$\mathbf{\mathbf{b}}$			(Tree of he Alnus cor (Italian alc	data	•
Acer shirasawanum (Shirasawa's maple)		(Woodalaid Hawthom) Crataegus x lavalleei (Lavallée hawthorn)	$\mathbf{\bullet}$	(Japanese tree privet)		Pyrus communis (Common pear)	$\mathbf{\mathbf{b}}$			(Spaeth a	paethii	•
Acer tataricum subsp. ginnala (Amur maple)	\bigcirc	(Red thorn)		(Chinese privet) Magnolia grandiflora		Pyrus salicifolia (Willow-leaved pear)				Amelanch	hier alnifolia aved serviceberry	
(Red horse chestnut)	$\mathbf{\bullet}$	(Common hawthorn)	$\mathbf{\mathbf{b}}$	(Southern magnolia) Malus trilobata	0	Quercus acutissima (Sawtooth oak)				Amelanch	hier arborea serviceberry)	
Aesculus flava (Yellow buckeye)		Crataegus x persimilis (Broad-leaved		(Lebanese wild apple) Olea europaea	0	Quercus x bimondorum (Hybrid oak) Quercus castaneifolia				Amelanch	hier canadensis	$\mathbf{\mathbf{b}}$
(Horse chestnut)	$\mathbf{\mathbf{b}}$	cockspur thorn) Cryptomeria japonica		(Olive) Picea abies	0	(Chestnut-leaved oak)					hier lamarckii	$\mathbf{\mathbf{b}}$
(Indian horse chestnut)	$\mathbf{\bullet}$	(Japanese cedar) Cupressus arizonica		(Norway spruce) Picea breweriana		(Holm oak) Quercus phellos	•			Aralia ela (Angelica	ta	$\mathbf{\mathbf{b}}$
(Dwarf horse chestnut)	$\mathbf{\bullet}$	(Arizona cypress) Cupressus macrocarpa		(Brewer spruce) Picea omorika		(Willow oak) Quercus suber	•			Carpinus		$\mathbf{\mathbf{b}}$
(Red buckeye)	$\mathbf{\bullet}$	(Monterey cypress) Cupressus sempervirens		(Serbian spruce) Picea orientalis	()	(Cork oak) Sequoia sempervirens				(Pecan)		$\mathbf{\mathbf{b}}$
- 7		(Mediterranean cypress)		(Caucasian spruce)		(Coastal redwood)						

Crown density

Continued next page



Use potential Mature size

Tree Selector

Crown form Crown density

Environmental tolerance Ornamental qualities

Use the 🜔 symbols to go to a Profile page, and the top menu to return.

A moderately dense crown continued

Carya ovata	$\mathbf{\Sigma}$
(Shagbark hickory)	_
Catalpa bignonioides	6
(Indian bean tree)	
Catalpa x erubescens	\mathbf{S}
(Hybrid catalpa)	
Catalpa speciosa	
(Northern catalpa)	
Celtis australis	0
(Nettle tree)	
Celtis occidentalis	
(Common hackberry)	
Cercidiphyllum japonicum	
(Katsura tree)	
Cercis canadensis	0
(North American redbud)	$\mathbf{\sim}$
Cercis siliquastrum	
(Judas tree)	$\mathbf{\sim}$
Clerodendrum	
trichotomum	$\mathbf{\mathbf{\nabla}}$
(Harlequin glorybower)	
Cornus alternifolia	
(Alternate leaf dogwood)	
Cornus 'Eddie's white	
wonder'	
(Hybrid dogwood)	
Cornus florida	
(Flowering dogwood)	
Cornus kousa	
(Chinese dogwood)	
Cornus mas	6
(Cornelian cherry dogwood)	
Corylus avellana	6
(Hazel)	
Corylus colurna	\mathbf{S}
(Turkish hazel)	
Corylus maxima	6
(Filbert)	
Davidia involucrata	\mathbf{O}
(Pocket handkerchief tree)	
Diospyros kaki	
(Chinese persimmon)	
Elaeagnus angustifolia	
(Russian olive)	
Eucommia ulmoides	

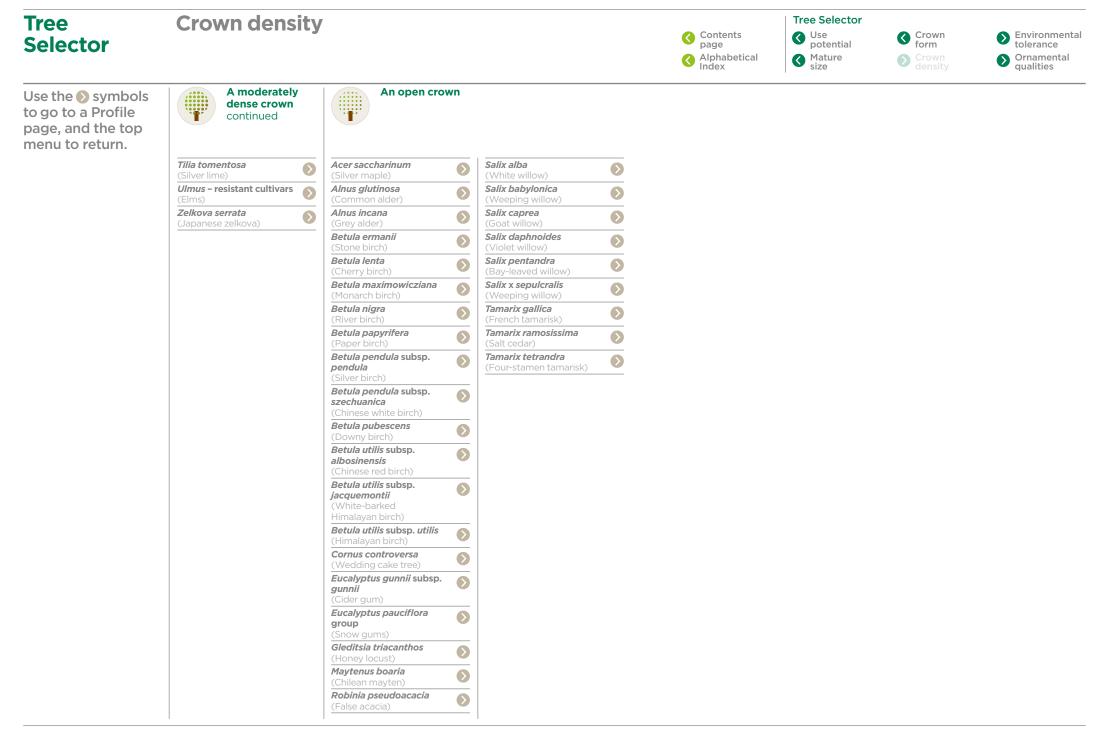
\mathbf{O}	<i>Euonymus europaeus</i> (Common spindle tree)	$\mathbf{\mathbf{O}}$
	Ginkgo biloba (Maidenhair tree)	\mathbf{O}
	<i>Gymnocladus dioica</i> (Kentucky coffee tree)	
	Halesia carolina (Carolina silverbell)	
	Hamamelis x intermedia (Hybrid witch hazel)	
	Heptacodium miconioides (Seven-son flower)	$\mathbf{\mathbf{O}}$
	Hippophaë salicifolia (Willow-leaved	
	sea buckthorn) Juglans nigra	_
	(Black walnut) Juglans regia	
\mathbf{O}	(Common walnut) Koelreuteria paniculata	
	(Golden rain tree)	
	Laburnum anagyroides (Common laburnum)	Ø
\mathbf{O}	Laburnum x watereri (Hybrid laburnum)	
	Larix decidua (Common larch)	
	<i>Larix kaempferi</i> (Japanese larch)	
0	Larix x marschlinsii (Hybrid larch)	
0	<i>Liquidambar styraciflua</i> (Sweetgum)	Ø
0	<i>Liriodendron tulipifera</i> (Tulip tree)	
	Magnolia acuminata (Cucumber tree)	•
	(Yulan magnolia)	
	(Huar Magnolia) Magnolia 'Elizabeth' (Hybrid magnolia)	
	Magnolia 'Galaxy'	0
	(Hybrid magnolia) <i>Magnolia</i> 'Heaven Scent'	0
\mathbf{O}	(Hybrid magnolia)	_

Magnolia kobus	6
(Kobushi magnolia)	
Magnolia x loebneri	6
(Loebner magnolia)	
Magnolia x soulangeana	\mathbf{O}
(Saucer magnolia)	
Magnolia 'Spectrum'	
(Hybrid magnolia)	
Magnolia 'Star Wars'	
(Hybrid magnolia)	\triangleright
Magnolia stellata	_
(Star magnolia)	$\mathbf{\mathbf{O}}$
Magnolia 'Susan'	
(Hybrid magnolia)	\mathbf{b}
Magnolia 'Yellow Bird'	\mathbf{O}
(Hybrid magnolia)	
Malus baccata	\mathbf{O}
(Siberian crabapple)	
Malus cultivars	\mathbf{O}
(Apples and crabapples)	
Malus hupehensis	
(Chinese crabapple)	
Malus sylvestris	\mathbf{O}
(European crabapple)	
Malus toringo	$\mathbf{\mathbf{b}}$
(Toringo crabapple)	
Malus yunnanensis	$\mathbf{\mathbf{b}}$
(Yunnan crabapple)	
Mespilus germanica	
(Medlar)	$\mathbf{\mathbf{b}}$
Metaseguoia	
glyptostroboides	$\mathbf{\mathbf{b}}$
(Dawn redwood)	
Morus alba	
(White mulberry)	$\mathbf{\mathbf{\nabla}}$
Morus nigra	
(Black mulberry)	\mathbf{O}
Nothofagus antarctica	\mathbf{O}
(Antarctic beech)	
Nyssa sylvatica	
(Black tupelo)	
Ostrya carpinifolia	
	$\mathbf{\mathbf{b}}$
Ostrya carpinifolia	0

		_
Paulownia tomentosa	\mathbf{O}	P
(Foxglove tree)		(
Phellodendron amurense	$\mathbf{\mathbf{O}}$	P
(Amur cork tree)		()
Pinus sylvestris	\mathbf{O}	P
(Scots pine)		()
Pinus wallichiana (Bhutan pine)	\mathbf{O}	P
Platanus x hispanica (London plane)	\mathbf{O}	G (3
Platanus orientalis	_	G
Oriental plane)	$\mathbf{\mathbf{O}}$	(
Populus alba		G
White poplar)	$\mathbf{\mathbf{b}}$	(3
Populus x canadensis		G
Hybrid poplar)	\mathbf{O}	()
Populus x candicans		G
Ontario poplar)	\mathbf{O}	(3
Populus nigra		G
Black poplar)	$\mathbf{\mathbf{O}}$	()
Populus tremula		G
Eurasian aspen)	\mathbf{O}	(
Prunus 'Accolade'		G
Hybrid cherry)		(F
Prunus avium		G
Wild cherry)		(F
Prunus domestica		G
Common plum)		(
Prunus dulcis		R
Almond)		(
Prunus fruticosa	\mathbf{O}	S
Steppe cherry)		()
Prunus maackii	\mathbf{O}	S
Manchurian cherry)		()
Prunus 'Okame'	\mathbf{O}	S
Hybrid cherry)		(
Prunus padus	$\mathbf{\mathbf{O}}$	S
Bird cherry)		()
Prunus 'Pandora'	$\mathbf{\mathbf{O}}$	S
Hybrid cherry)		(
Prunus sargentii	\mathbf{O}	S
Sargent's cherry)		((
Prunus x schmittii	$\mathbf{\mathbf{O}}$	S
Hybrid cherry)		(3
Prunus serrula	$\mathbf{\mathbf{O}}$	S
(Tibetan cherry)		()

Prunus serrulata	
Japanese cherry)	
Prunus x subhirtella Hybrid cherry)	
Prunus 'Umineko'	
Hybrid cherry)	
Prunus x yedoensis	
Yoshino cherry)	\mathbf{O}
Quercus bicolor	
Swamp white oak)	
Quercus cerris	\mathbf{O}
Turkey oak)	
Quercus coccinea	
Scarlet oak)	
Quercus frainetto	
Hungarian oak)	
Quercus x hispanica	
Spanish oak)	
Quercus palustris Pin oak)	
Quercus petraea Sessile oak)	
Quercus robur	
Pedunculate oak)	
Quercus rubra	
Red oak)	
Quercus x turneri	
Turner's oak)	
Rhus typhina	
Staghorn sumac)	$\mathbf{\mathbf{b}}$
orbus aria	$\mathbf{\bullet}$
Whitebeam)	
Sorbus x arnoldiana	
Hybrid Sorbus)	
Sorbus aucuparia	
Rowan)	
Sorbus cashmiriana	
Kashmir rowan)	
Sorbus commixta	
Japanese rowan)	
Sorbus discolor Chinese rowan)	
Sorbus intermedia	
Swedish whitebeam)	
Sorbus 'Joseph Rock'	
Hybrid Sorbus)	\mathbf{O}

Sorbus latifolia	0
(Broad-leaved whitebeam)	
Sorbus pseudohupehensis	\mathbf{S}
(Hupeh rowan)	
Sorbus thibetica	\mathbf{S}
(Tibetan whitebeam)	
Sorbus x thuringiaca	\mathbf{S}
(Hybrid Sorbus)	
Sorbus torminalis	\mathbf{S}
(Wild service tree)	
Sorbus vilmorinii	\mathbf{S}
(Vilmorin's rowan)	
Stewartia pseudocamellia	6
(Japanese stewartia)	
Stewartia sinensis	6
(Chinese stewartia)	
Styphnolobium japonicum	6
(Japanese pagoda tree)	
Styrax japonicus	
(Japanese snowball tree)	
Syringa x chinensis	
(Chinese lilac)	
Syringa reticulata	
(Japanese tree lilac)	
Syringa vulgaris	
(Common lilac)	
Taxodium distichum	
(Swamp cypress)	
Tetradium daniellii	
(Chinese bee tree)	
Tilia americana	
(American basswood)	
Tilia cordata	
(Small-leaved lime)	
Tilia x euchlora	
(Caucasian lime)	
Tilia x europaea	
(Common lime)	
Tilia henryana	
(Henry's lime)	
Tilia mongolica	
(Mongolian lime)	
Tilia oliveri	
(Chinese white lime)	
Tilia platyphyllos	
(Large-leaved lime)	



Tree Selector	Environmer Continued next page	ntal tolerance				 Contents page Alphabetical Index 		potential	Crown form Crown density	tolerance	e ntal
Use the S symbols to go to a Profile page, and the top menu to return.	Tolerant to shade			Moderately tolerant to shade							
	Abies concolor (White fir)	Picea orientalis (Caucasian spruce)	Ø	Acacia dealbata (Silver wattle)	Ø	Celtis occidentalis (Common hackberry)	•	<i>llex</i> 'Nellie R. Stevens' (Hybrid holly)		Stewartia sinensis (Chinese stewartia)	•
	Abies fraseri (Fraser fir)	Picea pungens (Colorado blue spruce)	Ø	Acer buergerianum (Trident maple)	\bigcirc	Cercis canadensis (North American redbud)		<i>Ligustrum japonicum</i> (Japanese tree privet)	$\mathbf{\bullet}$	Styphnolobium japonicui (Japanese pagoda tree)	m (
	Abies grandis (Grand fir)	Prunus laurocerasus (Cherry laurel)	$\mathbf{\bullet}$	Acer campestre (Field maple)		Cercis siliquastrum (Judas tree)		<i>Ligustrum lucidum</i> (Chinese privet)		Tilia x euchlora (Caucasian lime)	
	Abies koreana (Korean fir)	Sequoia sempervirens (Coastal redwood)	$\mathbf{\mathbf{b}}$	Acer davidii (Père David's maple)	\bullet	Chamaecyparis Iawsoniana		(Cucumber tree)	$\mathbf{\bullet}$	Tilia x europaea (Common lime)	
	Abies nordmanniana (Nordmann fir)	(Common yew)	Taxus baccata (Common yew) Thuja plicata (Western red cedar) Tilia americana (American basswood) Tilia cordata (Small-leaved lime) Tilia platyphyllos (Large-leaved lime) Tsuga canadensis (Eastern hemlock) Tsuga heterophylla (Western hemlock)	Acer x freemanii (Freeman's maple)		(Lawson cypress)	$\mathbf{\bullet}$	Magnolia kobus (Kobushi magnolia)	$\mathbf{\bullet}$	Tilia henryana (Henry's lime)	
	<i>Acer palmatum</i> (Japanese maple)				\bullet	(Yellow wood) Cornus controversa	0	(Loebner magnolia) (Loebner magnolia)		Tilia mongolica (Mongolian lime)	
	Acer platanoides (Norway maple)			Acer japonicum (Full moon maple)	$\mathbf{\bullet}$	(Wedding cake tree) Cornus kousa	0	<i>Magnolia x soulangeana</i> (Saucer magnolia)		<i>Tilia oliveri</i> (Chinese white lime)	
	Acer pseudoplatanus (Sycamore)			(Red maple)	$\mathbf{\bullet}$	(Chinese dogwood)	0	Magnolia stellata (Star magnolia)		Tilia tomentosa (Silver lime)	
	Acer rufinerve (Grey-budded				$\mathbf{\bullet}$	(Cornelian cherry dogwood) Corylus avellana	0	Metasequoia glyptostroboides			
	snake-bark maple) Acer saccharum			Acer shirasawanum (Shirasawa's maple)	$\mathbf{\bullet}$	(Hazel) Corylus maxima	0	(Dawn redwood) Nyssa sylvatica			
	(Sugar maple) Aesculus flava	Tsuga heterophylla		Acer tataricum (Tatarian maple)	$\mathbf{\bullet}$	(Filbert) Crataegus x lavalleei	0	(Black tupelo) Ostrya carpinifolia			
	(Yellow buckeye) Aesculus pavia	o		<i>Acer triflorum</i> (Three-flowered maple)		(Lavallée hawthorn) Cryptomeria japonica	0	(Hop hornbeam) Parrotia persica			
	(Red buckeye) Amelanchier arborea			Acer x zoeschense (Zoeschen maple)	$\mathbf{\bullet}$	(Japanese cedar) Davidia involucrata	0	(Persian ironwood) Picea breweriana			
	(Downey serviceberry) Buxus sempervirens			Aesculus x carnea (Red horse chestnut)	$\mathbf{\mathbf{b}}$	(Pocket handkerchief tree)		(Brewer spruce) Picea sitchensis			
	(Box) Cornus alternifolia			<i>Aesculus hippocastanum</i> (Horse chestnut)		(Common spindle tree) Halesia carolina	0	(Sitka spruce) Pinus strobus			
	(Alternate leaf dogwood) Cornus 'Eddie's white			Aesculus indica (Indian horse chestnut)		(Carolina silverbell) Hamamelis x intermedia		(Eastern white pine) Platanus x hispanica			
	wonder' (Hybrid dogwood)			<i>Aesculus parviflora</i> (Dwarf horse chestnut)		(Hybrid witch hazel) Heptacodium miconioides		(London plane) Platanus orientalis			
	Cornus florida (Flowering dogwood)	$\mathbf{\delta}$		Amelanchier alnifolia (Alder-leaved serviceberry)		(Seven-son flower) Ilex x altaclerensis group		(Oriental plane) Prunus padus			
	Fagus orientalis (Oriental beech)			Arbutus unedo (Strawberry tree)	$\mathbf{\bullet}$	(Hybrid holly) Ilex aquifolium		(Bird cherry) Quercus frainetto			
	Fagus sylvatica (Common beech)			<i>Carpinus betulus</i> (Hornbeam)	$\mathbf{\bullet}$	(European holly) Ilex x aquipernyi		(Hungarian oak) Quercus ilex			
	Magnolia grandiflora (Southern magnolia)	0		(Shagbark hickory)		'Dragon Lady' (Hybrid holly)	$\mathbf{\mathbf{b}}$	(Holm oak) Sorbus pseudohupehen	sis o		
	Picea abies (Norway spruce)	0		(Sweet chestnut)		<i>llex</i> x <i>koehneana</i> 'Chestnut Leaf'		(Hupeh rowan) Stewartia pseudocamel			
	Picea omorika (Serbian spruce)	0		<i>Celtis australis</i> (Nettle tree)	$\mathbf{\bullet}$	(Chestnut leaved holly)		(Japanese stewartia)			

Environmental tolerance

Continued next page



Use potential
 Mature size

Tree Selector

Crown form
 Crown density



Use the \bigotimes symbols to go to a Profile page, and the top menu to return.



Abies procera (Noble fir)	\mathbf{O}
Acer capillipes	6
(Red snake-bark maple)	
Acer cappadocicum	
(Caucasian maple)	
Acer monspessulanum (Montpellier maple)	
Acer negundo	
(Box elder)	$\mathbf{>}$
Acer tataricum subsp. ginnala	
(Amur maple)	
Ailanthus altissima	
(Tree of heaven)	
Alnus cordata	6
(Italian alder)	
Alnus glutinosa	
(Common alder)	
Alnus incana (Grey alder)	
Amelanchier canadensis	
(Canadian serviceberry)	\mathbf{b}
Amelanchier lamarckii	-
(Serviceberry)	\mathbf{O}
Aralia elata	
(Angelica tree)	
Araucaria araucana	6
(Monkey puzzle)	
Betula lenta	6
(Cherry birch)	
Betula utilis subsp.	
albosinensis (Chinese red birch)	
Betula utilis subsp.	
iacquemontii	$\mathbf{>}$
(White-barked	
Himalayan birch)	
Betula utilis subsp. utilis	
(Himalayan birch)	
(Himalayan birch) Carpinus japonica	6
(Himalayan birch)	$\mathbf{\mathbf{b}}$

Catalpa x erubescens

$\mathbf{\mathbf{b}}$	Catalpa speciosa (Northern catalpa)	
	Cedrus atlantica (Atlas cedar)	
$\mathbf{\mathbf{O}}$	Cedrus deodara (Himalayan cedar)	
	Cedrus libani (Cedar of Lebanon)	
•	<i>Cercidiphyllum japonicum</i> (Katsura tree)	
	x <i>Chitalpa tashkentensis</i> Chitalpa	
	Cotoneaster frigidus (Tree cotoneaster)	
	Crataegus x grignonensis	•
	(Grignon hawthorn) Crataegus laevigata	
	(Woodland hawthorn) Crataegus x media	
	(Red thorn) Crataegus x persimilis	
$\mathbf{\mathbf{b}}$	(Broad-leaved cockspur thorn)	
$\mathbf{\mathbf{b}}$	Diospyros kaki (Chinese persimmon)	\mathbf{O}
$\mathbf{\mathbf{O}}$	Eucommia ulmoides (Guttapercha)	
	Ficus carica (Common fig)	
$\mathbf{\mathbf{O}}$	<i>Ginkgo biloba</i> (Maidenhair tree)	
	<i>Gymnocladus dioica</i> (Kentucky coffee tree)	Image: Constraint of the second sec
	(Common walnut)	
D	Koelreuteria paniculata	
	(Golden rain tree) Liriodendron tulipifera	
	(Tulip tree) Magnolia denudata	Image: Constraint of the second sec
•	(Yulan magnolia) <i>Magnolia</i> 'Elizabeth'	
	(Hybrid magnolia) Magnolia 'Galaxy'	0
$\mathbf{\mathbf{b}}$	(Hybrid magnolia)	

Magnolia 'Heaven Scent' (Hybrid magnolia)	$\mathbf{\mathbf{b}}$
Magnolia 'Spectrum'	
(Hybrid magnolia)	$\mathbf{\mathbf{b}}$
Magnolia 'Star Wars'	
(Hybrid magnolia)	\mathbf{O}
Magnolia 'Susan'	
(Hybrid magnolia)	\triangleright
Magnolia 'Yellow Bird'	\mathbf{O}
(Hybrid magnolia)	
Malus baccata	$\mathbf{\mathbf{b}}$
(Siberian crabapple)	
Malus cultivars	\mathbf{O}
(Apples and crabapples)	
Malus hupehensis	\mathbf{O}
(Chinese crabapple)	
Malus sylvestris	\mathbf{O}
(European crabapple)	
Malus toringo	$\mathbf{\mathbf{O}}$
(Toringo crabapple)	
Malus trilobata	$\mathbf{\mathbf{O}}$
(Lebanese wild apple)	
<i>Malus yunnanensis</i> (Yunnan crabapple)	$\mathbf{\mathbf{b}}$
Mespilus germanica	
(Medlar)	\mathbf{O}
Morus alba	
(White mulberry)	$\mathbf{\mathbf{O}}$
Morus nigra	
(Black mulberry)	\mathbf{O}
Nothofagus antarctica	
(Antarctic beech)	
Olea europaea	\mathbf{O}
(Olive)	
Paulownia tomentosa	$\mathbf{\mathbf{b}}$
(Foxglove tree)	
Pinus nigra	\mathbf{O}
(Black pine)	
Pinus pinea	\mathbf{O}
(Stone pine)	
Pinus radiata	$\mathbf{\mathbf{b}}$
(Monterey pine)	
Populus alba	$\mathbf{\mathbf{b}}$
(White poplar)	
Populus nigra	$\mathbf{\mathbf{O}}$
(Black poplar)	

opulus tremula	\mathbf{O}	Quercus cerris
Eurasian aspen)		(Turkey oak)
Prunus 'Accolade'	$\mathbf{\mathbf{O}}$	Quercus coccinea
Hybrid cherry)		(Scarlet oak)
runus avium	$\mathbf{\mathbf{O}}$	Quercus x hispanica
Wild cherry)		(Spanish oak)
Prunus cerasifera	$\mathbf{\mathbf{b}}$	Quercus palustris
Cherry plum)		(Pin oak)
runus lusitanica	$\mathbf{\mathbf{O}}$	Quercus petraea
Portugal laurel)		(Sessile oak)
runus maackii	$\mathbf{\mathbf{b}}$	Quercus phellos
Manchurian cherry)		(Willow oak)
Prunus 'Okame'	$\mathbf{\mathbf{b}}$	Quercus robur
Hybrid cherry)		(Pedunculate oak)
Prunus 'Pandora'	$\mathbf{\mathbf{b}}$	Quercus rubra
Hybrid cherry)		(Red oak)
Prunus sargentii	$\mathbf{\mathbf{b}}$	Quercus suber
Sargent's cherry)		(Cork oak)
Prunus x schmittii Hybrid cherry)	$\mathbf{\mathbf{b}}$	Quercus x turneri (Turner's oak)
Prunus serrula Tibetan cherry)	$\mathbf{\mathbf{b}}$	Salix caprea (Goat willow)
runus serrulata		Salix daphnoides
Japanese cherry)	$\mathbf{\mathbf{b}}$	(Violet willow)
runus x subhirtella		Sequoiadendron
Hybrid cherry)	$\mathbf{\mathbf{b}}$	giganteum
Prunus 'Umineko'		(Giant sequoia)
Hybrid cherry)	\triangleright	Sorbus aria
runus x yedoensis		(Whitebeam)
Yoshino cherry)	\triangleright	Sorbus x arnoldiana
seudotsuga menziesii		(Hybrid Sorbus)
Douglas fir)	$\mathbf{\mathbf{b}}$	Sorbus aucuparia
terocarya fraxinifolia	$\mathbf{\mathbf{b}}$	(Rowan)
Caucasian wing-nut)		Sorbus cashmiriana
terocarya stenoptera	$\mathbf{\mathbf{b}}$	(Kashmir rowan)
Chinese wing-nut)		Sorbus commixta
yrus communis	$\mathbf{\mathbf{b}}$	(Japanese rowan)
Common pear)		Sorbus discolor
uercus acutissima	$\mathbf{\mathbf{b}}$	(Chinese rowan)
Sawtooth oak)		Sorbus intermedia
Quercus bicolor	\triangleright	(Swedish whitebeam)
Swamp white oak)		Sorbus 'Joseph Rock'
uercus x bimondorum	$\mathbf{\mathbf{b}}$	(Hybrid Sorbus)
Hybrid oak)		Sorbus latifolia
Quercus castaneifolia	\mathbf{O}	(Broad-leaved whitebeam)
Chestnut-leaved oak)		

\mathbf{O}	Sorbus thibetica (Tibetan whitebeam)	$\mathbf{\mathbf{b}}$
	Sorbus x thuringiaca (Hybrid Sorbus)	•
	Sorbus torminalis (Wild service tree)	0
$\mathbf{\mathbf{O}}$	Sorbus vilmorinii (Vilmorin's rowan)	0
	Styrax japonicus (Japanese snowball tree)	0
$\mathbf{\mathbf{O}}$	Syringa x chinensis (Chinese lilac)	0
$\mathbf{\mathbf{O}}$	Syringa vulgaris (Common lilac)	0
\bigcirc	Taxodium distichum (Swamp cypress)	0
\bigcirc	Tetradium daniellii (Chinese bee tree)	0
\bigcirc	Ulmus – resistant cultivars (Elms)	0
	Zelkova serrata (Japanese zelkova)	0
\mathbf{O}		

igodol b

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igodol b

igodol b

igodol b

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igodol b

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igodol b

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Environmental tolerance

Continued next page



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 $\mathbf{\mathbf{O}}$

 \mathbf{O}

 $\mathbf{\mathbf{b}}$

 \triangleright

 $\mathbf{\mathbf{O}}$

potential

Crown

0

form

Crown density

S Environmental Ornamental qualities

Use the 🔊 symbols to go to a Profile page, and the top menu to return.



Alnus x spaethii igodol bBetula ermanii lacksquareBetula maximowicziana \bigcirc (Monarch birch) Betula nigra igodot(River birch) Betula papyrifera igodol b(Paper birch) Betula pendula subsp. \mathbf{O} pendula Betula pendula subsp. lacksquareszechuanica (Chinese white birch) Betula pubescens igodol bCarya illinoinensis Ø Clerodendrum \bigcirc trichotomum (Harlequin glorybower) Corvlus colurna Ø Crataegus monogyna \bigcirc Cupressus arizonica Ø (Arizona cypress) Cupressus macrocarpa Ø (Monterey cypress) Cupressus sempervirens Ø (Mediterranean cypress) x Cuprocyparis leylandii igodot(Leyland cypress) Cydonia oblonga Ø Elaeagnus angustifolia igodol b(Russian olive) Eucalyptus gunnii subsp. \mathbf{O} gunnii (Cider gum) Eucalyptus pauciflora \mathbf{O} group Pyrus calleryana (Snow gums)

Gleditsia triacanthos

(Honey locust)

Hippophaë salicifolia	\mathbf{O}	Pyrus salicifolia
(Willow-leaved sea buckthorn)		(Willow-leaved pear)
		Rhus typhina
Juglans nigra (Black walnut)	\triangleright	(Staghorn sumac) Robinia pseudoacacia
Juniperus communis		(False acacia)
(Common juniper)	\triangleright	Salix alba
luniperus scopulorum		(White willow)
Rocky mountain juniper)	••••••••••••••••••••••••••••••••	Salix babylonica
uniperus virginiana		(Weeping willow)
astern red cedar)		Salix pentandra
burnum anagyroides		(Bay-leaved willow)
Common laburnum)		Salix x sepulcralis
aburnum x watereri		(Weeping willow)
Hybrid laburnum)		Syringa reticulata
arix decidua		(Japanese tree lilac)
Common larch)		Tamarix gallica
arix kaempferi		(French tamarisk)
lapanese larch)		Tamarix ramosissima
nrix x marschlinsii		(Salt cedar)
lybrid larch)		Tamarix tetrandra
quidambar styraciflua		(Four-stamen tamarisk)
us stoums)		
sweeigum)		
laytenus boaria		
laytenus boaria		
laytenus boaria Chilean mayten) hellodendron amurense	0	
laytenus boaria Chilean mayten) hellodendron amurense Amur cork tree)	>	
laytenus boaria Chilean mayten) hellodendron amurense Amur cork tree) inus pinaster	0 0 0	
laytenus boaria Chilean mayten) hellodendron amurense Amur cork tree) inus pinaster Maritime pine)	> > >	
laytenus boaria Chilean mayten) Ihellodendron amurense Amur cork tree) Inus pinaster Maritime pine) Inus sylvestris		
laytenus boaria Chilean mayten) Thellodendron amurense Amur cork tree) Tinus pinaster Maritime pine) Tinus sylvestris Socots pine)		
taytenus boaria Chilean mayten) Thellodendron amurense Amur cork tree) Tinus pinaster Maritime pine) Tinus sylvestris Socots pine) Tinus wallichiana		
taytenus boaria Chilean mayten) Chilean mayten) Chilean mayten) Chilean mayten Amur cork tree) Chilean spines Cots pine) Cots pine) Chilean spine) Chilean pine)		
aytenus boaria hilean mayten) hellodendron amurense mur cork tree) nus pinaster haritime pine) nus sylvestris cots pine) nus wallichiana hutan pine) opulus x canadensis		
Aytenus boaria Chilean mayten) hellodendron amurense Amur cork tree) inus pinaster Maritime pine) inus sylvestris Scots pine) inus wallichiana Bhutan pine) opulus x canadensis Hybrid poplar)		
aytenus boaria Chilean mayten) hellodendron amurense Amur cork tree) inus spinaster daritime pine) inus sylvestris Scots pine) Socts pine) Butan pine) Opulus x canadensis Hybrid poplar) Opulus x candicans		
Aaytenus boaria Chilean mayten) Phellodendron amurense Amur cork tree) Phinus pinaster Maritime pine) Phinus sylvestris Scots pine) Phinus wallichiana Bhutan pine) Populus x canadensis Hybrid poplar) Populus x candicans Ontario poplar)		
Aaytenus boaria Chilean mayten) Chellodendron amurense Amur cork tree) Chinus pinaster Maritime pine) Chinus sylvestris Scots pine) Chinus wallichiana Bhutan pine) Copulus x canadensis Hybrid poplar) Copulus x candicans Ontario poplar) Chanio poplar)		
Sweetgum) Maytenus boaria Chilean mayten) Phellodendron amurense Amur cork tree) Pinus pinaster Maritime pine) Pinus sylvestris Scots pine) Pinus wallichiana Bhutan pine) Populus x canadensis Hybrid poplar) Populus x candicans Ontario poplar) Prunus domestica Common plum)		
Aytenus boaria Chilean mayten) Chilean mayten) Chellodendron amurense Amur cork tree) Chinus pinaster Maritime pine) Chinus sylvestris Scots pine) Chinus wallichiana Bhutan pine) Copulus x canadensis Hybrid poplar) Copulus x candicans Ontario poplar) Contario poplar)		
Taytenus boaria Chilean mayten) Chilean mayten) Chellodendron amurense Amur cork tree) Chinus pinaster Maritime pine) Coscots pine) Chinus wallichiana Bhutan pine) Copulus x canadensis Hybrid poplar) Copulus x candicans Dintario poplar) Contario poplar) Contario poplar) Contario poplar) Contario poplar) Contario poplar) Contario poplar) Common plum) Common plum)		
Taytenus boaria Chilean mayten) hellodendron amurense Amur cork tree) inus pinaster Maritime pine) inus sylvestris Scots pine) inus wallichiana Bhutan pine) opulus x canadensis Hybrid poplar) opulus x candicans Dntario poplar) runus domestica Common plum) runus dulcis Almond) runus fruticosa		
Aaytenus boaria Chilean mayten) Phellodendron amurense Amur cork tree) Pinus pinaster Maritime pine) Pinus sylvestris Scots pine) Pinus wallichiana Bhutan pine) Populus x canadensis Hybrid poplar) Populus x candicans Ontario poplar) Prunus domestica		

lacksquare

(Callery pear)

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Tree Selector	Environmer Continued next page		l tolerance				 Contents page Alphabetica Index 	ıl	- potential	Crown form Crown density		
Use the 📎 symbols to go to a Profile page, and the top menu to return.	Tolerant to drought						Moderately tolerant to drought					
	<i>Acer monspessulanum</i> (Montpellier maple)	\bigcirc	Gleditsia triacanthos (Honey locust)	$\mathbf{\mathbf{O}}$	Quercus suber (Cork oak)	$\mathbf{\bullet}$	Abies concolor (White fir)		Chamaecyparis Iawsoniana		<i>Ligustrum lucidum</i> (Chinese privet)	
	Acer tataricum (Tatarian maple)	\bigcirc	<i>Ilex aquifolium</i> (European holly)		Robinia pseudoacacia (False acacia)		Acacia dealbata (Silver wattle)		(Lawson cypress) x Chitalpa tashkentensis		<i>Liquidambar styraciflua</i> (Sweetgum)	
	Ailanthus altissima (Tree of heaven)		<i>Juniperus communis</i> (Common juniper)	$\mathbf{\mathbf{b}}$	Sorbus aria (Whitebeam)	$\mathbf{\mathbf{b}}$	Acer buergerianum (Trident maple)	\bigcirc	Chitalpa Clerodendrum		<i>Malus trilobata</i> (Lebanese wild apple)	
	Alnus cordata (Italian alder)	$\mathbf{\bullet}$	Juniperus scopulorum (Rocky mountain juniper)	$\mathbf{\mathbf{b}}$	Sorbus latifolia (Broad-leaved whitebeam)		<i>Acer campestre</i> (Field maple)	$\mathbf{\bullet}$	trichotomum (Harlequin glorybower)		<i>Malus yunnanensis</i> (Yunnan crabapple)	
	Arbutus unedo (Strawberry tree)	$\mathbf{\mathbf{O}}$	Juniperus virginiana (Eastern red cedar)	$\mathbf{\mathbf{b}}$	Sorbus x thuringiaca (Hybrid Sorbus)	$\mathbf{\mathbf{b}}$	Acer cappadocicum (Caucasian maple)	$\mathbf{\bullet}$	Cornus florida (Flowering dogwood)	$\mathbf{\bullet}$	Maytenus boaria (Chilean mayten)	
	Buxus sempervirens (Box)	$\mathbf{\mathbf{O}}$	<i>Koelreuteria paniculata</i> (Golden rain tree)	$\mathbf{\mathbf{b}}$	Sorbus torminalis (Wild service tree)	$\mathbf{\mathbf{b}}$	Acer x freemanii (Freeman's maple)	$\mathbf{\bullet}$	Cornus mas (Cornelian cherry dogwoo	od) 🕥	Mespilus germanica (Medlar)	
	Cedrus atlantica (Atlas cedar)	$\mathbf{\bullet}$	Olea europaea (Olive)	$\mathbf{\mathbf{b}}$	(Japanese tree lilac)	$\mathbf{\mathbf{b}}$	Acer negundo (Box elder)	$\mathbf{\bullet}$	Corylus colurna (Turkish hazel)	$\mathbf{\bullet}$	Metasequoia glyptostroboides	
	(Himalayan cedar)		(Black pine)		Tamarix gallica (French tamarisk)		Acer platanoides (Norway maple)	$\mathbf{\bullet}$	Crataegus x grignonensi (Grignon hawthorn)		(Dawn redwood) Morus alba	
	<i>Cedrus libani</i> (Cedar of Lebanon)		(Stone pine)		(Salt cedar)		(Red maple)	$\mathbf{\bullet}$	Crataegus x lavalleei (Lavallée hawthorn)	$\mathbf{\bullet}$	(White mulberry) Morus nigra	
	<i>Celtis australis</i> (Nettle tree)		<i>Pinus sylvestris</i> (Scots pine)		(Four-stamen tamarisk)	$\mathbf{\mathbf{O}}$	(Neu maple) Acer saccharinum (Silver maple)		Cryptomeria japonica (Japanese cedar)	$\mathbf{\bullet}$	(Black mulberry) Ostrya carpinifolia	
	(Judas tree)		(Cherry plum)		(Common yew)	$\mathbf{\mathbf{O}}$	(Silver Maple) Acer saccharum (Sugar maple)	$\mathbf{\bullet}$	Cydonia oblonga (Common quince)	$\mathbf{\bullet}$	(Hop hornbeam) Parrotia persica	
	(Woodland hawthorn)	\mathbf{O}	(Common plum) Prunus domestica (Common plum)	\mathbf{O}			Acer tataricum subsp.		<i>Euonymus europaeus</i> (Common spindle tree)	$\mathbf{\bullet}$	(Persian ironwood) Paulownia tomentosa	
	Crataegus x media		Prunus dulcis				(Amur maple)		(Common fig)		(Foxglove tree)	
	(Red thorn) Crataegus monogyna		(Almond) Prunus fruticosa				Acer triflorum (Three-flowered maple)		<i>Gymnocladus dioica</i> (Kentucky coffee tree)		Phellodendron amurense (Amur cork tree)	
	(Common hawthorn) Crataegus x persimilis		(Steppe cherry) Pyrus calleryana	•			Acer x zoeschense (Zoeschen maple)		(Renacky concentee) Heptacodium miconioid (Seven-son flower)	les 🕥	Picea orientalis (Caucasian spruce)	
	(Broad-leaved cockspur thorn)		(Callery pear) Quercus acutissima				Alnus x spaethii (Spaeth alder)		<i>Hippophaë salicifolia</i> (Willow-leaved		Picea pungens (Colorado blue spruce)	
	Cupressus arizonica (Arizona cypress)	\mathbf{O}	(Sawtooth oak) Quercus bicolor	0			Araucaria araucana (Monkey puzzle)		sea buckthorn)		Pinus pinaster (Maritime pine)	
	<i>Cupressus macrocarpa</i> (Monterey cypress)	$\mathbf{\mathbf{b}}$	(Swamp white oak) Quercus cerris	0			<i>Carpinus betulus</i> (Hornbeam)	$\mathbf{\bullet}$	<i>Ilex</i> x <i>altaclerensis</i> group (Hybrid holly)		Pinus radiata (Monterey pine)	
	<i>Cupressus sempervirens</i> (Mediterranean cypress)	$\mathbf{\mathbf{b}}$	(Turkey oak) Quercus coccinea	0			<i>Carpinus japonica</i> (Japanese hornbeam)	\bigcirc	Ilex x aquipernyi 'Dragon Lady'		Platanus x hispanica (London plane)	
	x <i>Cuprocyparis leylandii</i> (Leyland cypress)	$\mathbf{\mathbf{b}}$	(Scarlet oak) Quercus frainetto	0			Carya ovata (Shagbark hickory)	$\mathbf{\bullet}$	(Hybrid holly) Ilex x koehneana		Platanus orientalis (Oriental plane)	
	<i>Elaeagnus angustifolia</i> (Russian olive)	$\mathbf{\mathbf{O}}$	(Hungarian oak) Quercus x hispanica				Castanea sativa (Sweet chestnut)		'Chestnut Leaf' (Chestnut leaved holly)		Prunus lusitanica (Portugal laurel)	
	Eucommia ulmoides (Guttapercha)	$\mathbf{\mathbf{b}}$	(Spanish oak) Quercus ilex				Celtis occidentalis (Common hackberry)	$\mathbf{\mathbf{b}}$	<i>Ilex</i> 'Nellie R. Stevens' (Hybrid holly)		Prunus sargentii (Sargent's cherry)	
	<i>Ginkgo biloba</i> (Maidenhair tree)	\bigcirc	(Holm oak) Quercus palustris				Cercis canadensis (North American redbud)	$\mathbf{\bullet}$	Laburnum anagyroides (Common laburnum)		Prunus x schmittii (Hybrid cherry)	
			(Pin oak)	$\mathbf{\mathbf{b}}$					<i>Ligustrum japonicum</i> (Japanese tree privet)	\mathbf{O}		

Environmental tolerance

Continued next page



Use potential Mature size

Tree Selector

Crown form
 Crown density

Environmental tolerance
 Ornamental gualities

Use the \bigotimes symbols to go to a Profile page, and the top menu to return.



sensitive to drought

Moderately

Quercus x bimondorum (Hybrid oak)	
Quercus castaneifolia (Chestnut-leaved oak)	\mathbf{O}
Quercus petraea	
(Sessile oak)	
Quercus phellos	
(Willow oak)	
Quercus x turneri	
(Turner's oak)	
Rhus typhina	
(Staghorn sumac)	
Sequoia sempervirens	6
(Coastal redwood)	
Sequoiadendron	6
giganteum	
(Giant sequoia)	
Sorbus intermedia	6
(Swedish whitebeam)	
Sorbus 'Joseph Rock'	6
(Hybrid Sorbus)	
Sorbus thibetica	6
(Tibetan whitebeam)	
Styphnolobium japonicum	6
(Japanese pagoda tree)	
Syringa x chinensis	6
(Chinese lilac)	
Syringa vulgaris	6
(Common lilac)	
Thuja plicata	6
(Western red cedar)	
Tilia mongolica	6
(Mongolian lime)	
Tilia tomentosa	6
(Silver lime)	
Ulmus - resistant cultivars	6
(Elms)	
Zelkova serrata	6
(Japanese zelkova)	

Abies fraseri	\mathbf{O}
(Fraser fir)	-
Abies grandis	6
(Grand fir)	
Abies koreana	\mathbf{O}
(Korean fir)	
Abies nordmanniana	\mathbf{O}
(Nordmann fir)	
Abies procera	\mathbf{O}
(Noble fir)	
Acer capillipes	\mathbf{O}
(Red snake-bark maple)	
Acer davidii	\mathbf{O}
(Père David's maple)	
Acer griseum	\mathbf{O}
(Paperbark maple)	
Acer japonicum	\mathbf{O}
(Full moon maple)	
Acer palmatum	\mathbf{O}
(Japanese maple)	
Acer pseudoplatanus	
(Sycamore)	
Acer rufinerve	
(Grey-budded	
snake-bark maple)	
Acer shirasawanum	$\mathbf{\mathbf{S}}$
(Shirasawa's maple)	_
Aesculus x carnea	$\mathbf{\mathbf{S}}$
(Red horse chestnut)	_
Aesculus flava	\mathbf{O}
(Yellow buckeye)	
Aesculus hippocastanum	\mathbf{O}
(Horse chestnut)	
Aesculus indica	\mathbf{O}
(Indian horse chestnut)	_
Alnus glutinosa	\mathbf{O}
(Common alder)	<u> </u>
Alnus incana	\mathbf{O}
(Grey alder)	
Amelanchier alnifolia	$\mathbf{\mathbf{b}}$
(Alder-leaved serviceberry)	
Amelanchier arborea	6
(Downey serviceberry)	
Amelanchier canadensis	\mathbf{O}
(Canadian serviceberry)	

Amelanchier lamarckii	\mathbf{O}
(Serviceberry)	
Aralia elata	$\mathbf{\mathbf{O}}$
(Angelica tree)	
Betula lenta	$\mathbf{\mathbf{O}}$
(Cherry birch)	
Betula nigra	$\mathbf{\mathbf{O}}$
(River birch)	
Betula utilis subsp.	$\mathbf{\Sigma}$
albosinensis (Chinese red birch)	
· · · · · · · · · · · · · · · · · · ·	
Betula utilis subsp.	
jacquemontii (White-barked	
Himalayan birch)	
Betula utilis subsp. utilis	
(Himalayan birch)	\diamond
Carya illinoinensis	
(Pecan)	$\mathbf{\mathbf{O}}$
Catalpa bignonioides	-
(Indian bean tree)	$\mathbf{\mathbf{O}}$
Catalpa x erubescens	-
(Hybrid catalpa)	$\mathbf{\mathbf{b}}$
Catalpa speciosa	_
(Northern catalpa)	\triangleright
Cladrastis kentukea	
(Yellow wood)	
Cornus controversa	
(Wedding cake tree)	
Cornus 'Eddie's white	
wonder'	
(Hybrid dogwood)	
Corylus avellana	
(Hazel)	
Corylus maxima	
(Filbert)	
Cotoneaster frigidus	
(Tree cotoneaster)	
Davidia involucrata	
(Pocket handkerchief tree)	
Diospyros kaki	
(Chinese persimmon)	
Eucalyptus gunnii subsp.	
gunnii	
(Cider gum)	

Eucalyptus pauciflora	\mathbf{O}
group	
(Snow gums)	
Fagus orientalis	\mathbf{O}
(Oriental beech)	
Fagus sylvatica	
(Common beech)	
Halesia carolina	
(Carolina silverbell)	
Hamamelis x intermedia	$\mathbf{\bullet}$
(Hybrid witch hazel)	
Juglans nigra	
(Black walnut)	•
Juglans regia	
(Common walnut)	
Laburnum x watereri	$\mathbf{\mathbf{b}}$
(Hybrid laburnum)	
Larix decidua	
(Common larch)	
Larix kaempferi	
(Japanese larch)	0
Larix x marschlinsii	
(Hybrid larch)	
Liriodendron tulipifera	
(Tulip tree)	$\mathbf{\mathbf{O}}$
Magnolia denudata	$\mathbf{\mathbf{b}}$
(Yulan magnolia)	
Magnolia 'Elizabeth'	\mathbf{O}
(Hybrid magnolia)	
Magnolia 'Galaxy'	
(Hybrid magnolia)	$\mathbf{\mathbf{O}}$
Magnolia grandiflora	
(Southern magnolia)	\mathbf{O}
Magnolia 'Heaven Scent'	
(Hybrid magnolia)	\mathbf{O}
Magnolia kobus	
(Kobushi magnolia)	$\mathbf{\mathbf{O}}$
Magnolia 'Spectrum'	
(Hybrid magnolia)	\mathbf{O}
Magnolia 'Star Wars'	
(Hybrid magnolia)	
Magnolia 'Susan'	
(Hybrid magnolia)	$\mathbf{\mathbf{b}}$
Magnolia 'Yellow Bird'	
(Hybrid magnolia)	$\mathbf{\mathbf{b}}$

Malus baccata \bigcirc (Siberian crabapple) Malus cultivars \bigcirc (Apples and crabapples) Malus hupehensis lacksquare(Chinese crabapple) Malus sylvestris \bigcirc (European crabapple) Malus toringo igodol b(Toringo crabapple) Nothofagus antarctica igodol b(Antarctic beech) Nyssa sylvatica igodol(Black tupelo) Picea abies igodolPicea omorika igodolPicea sitchensis igodol bPinus strobus igodol bPinus wallichiana igodolPopulus alba igodol(White poplar) Populus tremula igodol b(Eurasian aspen) Prunus 'Accolade' igodol b(Hybrid cherry) Prunus avium \bigcirc Prunus laurocerasus \mathbf{O} (Cherry laurel) Prunus maackii igodol b(Manchurian cherry) Prunus 'Okame' \mathbf{O} (Hybrid cherry) Prunus padus lacksquare(Bird cherry) Prunus 'Pandora' igodol b(Hybrid cherry) Prunus serrula Ø

(Tibetan cherry) Prunus serrulata

lacksquare

Prunus x subhirtella (Hybrid cherry)	
Prunus 'Umineko'	-
(Hybrid cherry)	\diamond
Prunus x yedoensis	
(Yoshino cherry)	\mathbf{C}
Pseudotsuga menziesii	
(Douglas fir)	
Pterocarya fraxinifolia	
(Caucasian wing-nut)	
Pterocarya stenoptera	
(Chinese wing-nut)	
Pyrus communis	
(Čommon pear)	
Pyrus salicifolia	
(Willow-leaved pear)	
Quercus robur	6
(Pedunculate oak)	
Quercus rubra	6
(Red oak)	
Salix caprea	6
(Goat willow)	
Sorbus x arnoldiana	6
(Hybrid Sorbus)	
Sorbus aucuparia	6
(Rowan)	
Sorbus cashmiriana	6
(Kashmir rowan)	-
Sorbus commixta	6
(Japanese rowan)	-
Sorbus discolor	6
(Chinese rowan)	-
Sorbus pseudohupehensis	
(Hupeh rowan)	-
Sorbus vilmorinii	
(Vilmorin's rowan)	-
Styrax japonicus	
(Japanese snowball tree)	
Taxodium distichum	
(Swamp cypress)	_
Tetradium daniellii	
(Chinese bee tree)	-
Tilia americana	
(American basswood)	_
Tilia cordata	\mathbf{i}
(Small-leaved lime)	

Tree	Environmenta	al tolerance				Tree Selector			
Selector	Continued next page					 Contents page Alphabetical Index 	 Use potential Mature size 	 Crown form Crown density 	 Environment tolerance Ornamental qualities
Use the 📎 symbols to go to a Profile page, and the top menu to return.	Moderately sensitive to drought continued	Sensitive to drought							
	Tilia x euchlora (Caucasian lime)	Aesculus parviflora (Dwarf horse chestnut)	Ø	Salix pentandra (Bay-leaved willow)					
	(Common lime)		Ø	Salix x sepulcralis (Weeping willow)					
	(Henry's lime)			(Japanese stewartia)					
	(Chinese white lime)			<i>Stewartia sinensis</i> (Chinese stewartia)					
	Tilia platyphyllos (Large-leaved lime)			(Eastern hemlock)					
		Betula pendula subsp. pendula (Silver birch)	Ø	Tsuga heterophylla (Western hemlock)					
		Betula pendula subsp. szechuanica (Chinese white birch)							
		Betula pubescens (Downy birch)	Ø						
		<i>Cercidiphyllum japonicun</i> (Katsura tree)	ⁿ 🜔						
		Cornus alternifolia (Alternate leaf dogwood)							
		Cornus kousa (Chinese dogwood)							
		Magnolia acuminata (Cucumber tree)	$\mathbf{\mathbf{b}}$						
		Magnolia x loebneri (Loebner magnolia)	$\mathbf{\mathbf{b}}$						
		Magnolia x soulangeana (Saucer magnolia)	\mathbf{O}						
		(Star magnolia)	$\mathbf{\mathbf{O}}$						
		(Brewer spruce)	Ø						
		(Hybrid poplar)	Ø						
		(Ontario poplar)	Ø						
		(Black poplar)							
		(White willow)	Ø						
		(Write Willow) Salix babylonica (Weeping willow)	$\mathbf{\mathbf{b}}$						
		(Weeping willow) Salix daphnoides (Violet willow)							

Tree Selector	Environmenta Continued next page	tolerance				Contents page		Tree Selector Use potential	Crown form		
						Alphabetical Index		Mature size	Crown densit	y Ornamen qualities	
Jse the ∑ symbols to go to a Profile bage, and the top menu to return.	Tolerant to waterlogging	Moderately tolerant to waterlogging	9			Moderately sensitive to waterlogging					
	Alnus glutinosa (Common alder)	Acacia dealbata (Silver wattle)	Ø	Pterocarya fraxinifolia (Caucasian wing-nut)		Abies fraseri (Fraser fir)	\mathbf{O}	Aesculus indica (Indian horse chestnut)		Heptacodium miconioida (Seven-son flower)	les
	Salix alba (White willow)	Acer cappadocicum (Caucasian maple)		Pterocarya stenoptera (Chinese wing-nut)	\bigcirc	Abies grandis (Grand fir)		Ailanthus altissima (Tree of heaven)		Hippophaë salicifolia (Willow-leaved	
	Salix pentandra (Bay-leaved willow)	Acer x freemanii (Freeman's maple)		Quercus bicolor (Swamp white oak)	\bigcirc	Abies koreana (Korean fir)	\mathbf{O}	Amelanchier canadensis (Canadian serviceberry)		sea buckthorn) Juniperus communis	
	(Swamp cypress)	Acer negundo (Box elder)		Quercus palustris (Pin oak)	\bigcirc	Abies nordmanniana (Nordmann fir)	\mathbf{O}	Amelanchier lamarckii (Serviceberry)		(Common juniper) Ligustrum japonicum	
		Acer rubrum (Red maple)	Ø	Quercus phellos (Willow oak)	$\mathbf{\mathbf{b}}$	Acer buergerianum (Trident maple)	D	Araucaria araucana (Monkey puzzle)		(Japanese tree privet) Ligustrum lucidum	
		Acer saccharinum (Silver maple)	Ø	Salix babylonica (Weeping willow)	$\mathbf{\mathbf{O}}$	<i>Acer campestre</i> (Field maple)	Ø	Betula utilis subsp. albosinensis		(Chinese privet) Magnolia kobus	
		Alnus cordata (Italian alder)	Ø	Salix daphnoides (Violet willow)	$\mathbf{\mathbf{b}}$	<i>Acer capillipes</i> (Red snake-bark maple)		(Chinese red birch) Betula utilis subsp.		(Kobushi magnolia) Maytenus boaria	
		Alnus incana (Grey alder)	Ø	<i>Salix x sepulcralis</i> (Weeping willow)	$\mathbf{\mathbf{b}}$	<i>Acer davidii</i> (Père David's maple)		jacquemontii (White-barked Himalayan birch)		(Chilean mayten) Nothofagus antarctica	
		Alnus x spaethii (Spaeth alder)	Ø			Acer griseum (Paperbark maple)	Ø	Betula utilis subsp. utilis (Himalayan birch)		(Antarctic beech) Nyssa sylvatica	
		Amelanchier arborea (Downey serviceberry)	Ø			Acer japonicum (Full moon maple)	$\mathbf{\mathbf{O}}$	(Nettle tree)		(Black tupelo) Parrotia persica	
		Betula nigra (River birch)	Ø			Acer palmatum (Japanese maple)	Ø	(Common hackberry)		(Persian ironwood) Phellodendron amurense	e
		Betula pubescens (Downy birch)	\mathbf{O}			<i>Acer platanoides</i> (Norway maple)		(Common Mackberry) Cercidiphyllum japonicur (Katsura tree)		(Amur cork tree) Picea abies	
		Carya illinoinensis (Pecan)	\mathbf{O}			<i>Acer pseudoplatanus</i> (Sycamore)		Clerodendrum		(Norway spruce) Pinus sylvestris	
		Eucalyptus gunnii subsp. gunnii	D			Acer rufinerve (Grey-budded	\triangleright	trichotomum (Harlequin glorybower)		(Scots pine) Populus x canadensis	
		(Cider gum) Gleditsia triacanthos				snake-bark maple) Acer shirasawanum	•	Cornus controversa (Wedding cake tree) Cryptomeria japonica		(Hybrid poplar) Populus x candicans	
		(Honey locust) Halesia carolina				(Shirasawa's maple) Acer tataricum	0	(Japanese cedar) Davidia involucrata		(Ontario poplar) Populus tremula	
		(Carolina silverbell) Liquidambar styraciflua				(Tatarian maple) Acer tataricum subsp.	0	(Pocket handkerchief tree Diospyros kaki		(Eurasian aspen) Quercus frainetto	
		(Sweetgum) Magnolia stellata				ginnala (Amur maple)		(Chinese persimmon) <i>Eucalyptus pauciflora</i>		(Hungarian oak) Quercus robur	
		(Star magnolia) Platanus x hispanica				Acer triflorum (Three-flowered maple)		group (Snow gums)		(Pedunculate oak) Salix caprea	
		(London plane) Platanus orientalis				Acer x zoeschense (Zoeschen maple)	\mathbf{O}	<i>Eucommia ulmoides</i> (Guttapercha)		(Goat willow) Sorbus vilmorinii	
		(Oriental plane) Populus nigra				Aesculus x carnea (Red horse chestnut)	Ø	(Common spindle tree)	$\mathbf{\bullet}$	(Vilmorin's rowan) Styrax japonicus	
		(Black poplar) Prunus padus				Aesculus flava (Yellow buckeye)	Ø	<i>Gymnocladus dioica</i> (Kentucky coffee tree)		(Japanese snowball tree) Syringa reticulata	-
		(Bird cherry)				<i>Aesculus hippocastanum</i> (Horse chestnut)	\mathbf{O}	(Hybrid witch hazel)		(Japanese tree lilac)	

Tree Selector	Environmenta Continued next page	l tolerance				Contents page Alphabetica	AI.	Tree Selector Use potential Mature	Crowr form	toleranc	
Use the S symbols to go to a Profile page, and the top menu to return.	Moderately sensitive to waterlogging continued	Sensitive to waterlogging				Index		5128		y qualities	•S
	(Chinese bee tree)	Abies concolor (White fir)	\mathbf{O}	Catalpa speciosa (Northern catalpa)	\mathbf{O}	Crataegus monogyna (Common hawthorn)	$\mathbf{\mathbf{b}}$	Koelreuteria paniculat (Golden rain tree)		<i>Malus toringo</i> (Toringo crabapple)	
	(Western red cedar)	Abies procera (Noble fir)	\triangleright	Cedrus atlantica (Atlas cedar)	\triangleright	Crataegus x persimilis (Broad-leaved	$\mathbf{\mathbf{b}}$	Laburnum anagyroide: (Common laburnum)	5	<i>Malus trilobata</i> (Lebanese wild apple)	
	Ulmus - resistant cultivars (Elms)	Acer monspessulanum (Montpellier maple)	\diamond	Cedrus deodara (Himalayan cedar)		cockspur thorn) Cupressus arizonica		<i>Laburnum x watereri</i> (Hybrid laburnum)	$\mathbf{\mathbf{O}}$	Malus yunnanensis (Yunnan crabapple)	
		Acer saccharum	\mathbf{O}	Cedrus libani	$\mathbf{\bullet}$	(Arizona cypress)		Larix decidua		Mespilus germanica	
		(Sugar maple) Aesculus parviflora	0	(Cedar of Lebanon) Cercis canadensis	0	<i>Cupressus macrocarpa</i> (Monterey cypress)	\bigcirc	(Common larch) Larix kaempferi		(Medlar) Metasequoia	
		(Dwarf horse chestnut) Aesculus pavia		(North American redbud) Cercis siliquastrum		<i>Cupressus sempervirens</i> (Mediterranean cypress)	\triangleright	(Japanese larch) Larix x marschlinsii		glyptostroboides (Dawn redwood)	
		(Red buckeye)		(Judas tree)	\mathbf{O}	x Cuprocyparis leylandii	\mathbf{O}	(Hybrid larch)		Morus alba	(
		Amelanchier alnifolia (Alder-leaved serviceberry		Chamaecyparis lawsoniana	\triangleright	(Leyland cypress) Cydonia oblonga		<i>Liriodendron tulipifera</i> (Tulip tree)	\mathbf{O}	(White mulberry) <i>Morus nigra</i>	(
		Aralia elata (Angelica tree)	\diamond	(Lawson cypress) x Chitalpa tashkentensis	_	(Common quince) Elaeagnus angustifolia		<i>Magnolia acuminata</i> (Cucumber tree)	$\mathbf{\Diamond}$	(Black mulberry) Olea europaea	
		Arbutus unedo	$\mathbf{\bullet}$	Chitalpa	$\mathbf{\mathbf{b}}$	(Russian olive)	\diamond	Magnolia denudata	$\mathbf{\bullet}$	(Olive)	
		(Strawberry tree) Betula ermanii		Cladrastis kentukea (Yellow wood)	\triangleright	<i>Fagus orientalis</i> (Oriental beech)	$\mathbf{\mathbf{b}}$	(Yulan magnolia) Magnolia 'Elizabeth'		Ostrya carpinifolia (Hop hornbeam)	
		(Stone birch)		Cornus alternifolia (Alternate leaf dogwood)	\mathbf{O}	Fagus sylvatica (Common beech)	$\mathbf{\bullet}$	(Hybrid magnolia)		Paulownia tomentosa	
		Betula lenta (Cherry birch)	\triangleright	Cornus 'Eddie's white		Ficus carica		<i>Magnolia</i> 'Galaxy' (Hybrid magnolia)	\mathbf{O}	(Foxglove tree) Picea breweriana	
		Betula maximowicziana	$\mathbf{\mathbf{b}}$	wonder' (Hybrid dogwood)		(Common fig) Ginkgo biloba		Magnolia grandiflora	$\mathbf{\bullet}$	(Brewer spruce) Picea omorika	
		(Monarch birch) Betula papyrifera		Cornus florida	\mathbf{O}	(Maidenhair tree)		(Southern magnolia) Magnolia 'Heaven Scer	nt' 🜔	(Serbian spruce)	
		(Paper birch)		(Flowering dogwood) Cornus kousa		<i>Ilex</i> x <i>altaclerensis</i> group (Hybrid holly)	$\mathbf{\mathbf{b}}$	(Hybrid magnolia)		Picea orientalis (Caucasian spruce)	
		Betula pendula subsp. pendula	\diamond	(Chinese dogwood)		llex aquifolium		<i>Magnolia x loebneri</i> (Loebner magnolia)	\mathbf{O}	Picea pungens	
		(Silver birch) Betula pendula subsp.		Cornus mas (Cornelian cherry dogwood)		(European holly) Ilex x aquipernyi		Magnolia x soulangean (Saucer magnolia)	a 🔊	(Colorado blue spruce) Picea sitchensis	
		szechuanica	\diamond	Corylus avellana	\mathbf{O}	'Dragon Lady'	$\mathbf{\mathbf{O}}$	Magnolia 'Spectrum'	$\mathbf{\bullet}$	(Sitka spruce)	
		(Chinese white birch) Buxus sempervirens		(Hazel) Corylus colurna		(Hybrid holly) Ilex x koehneana		(Hybrid magnolia) Magnolia 'Star Wars'		Pinus nigra (Black pine)	
		(Box)		(Turkish hazel)		'Chestnut Leaf' (Chestnut leaved holly)		(Hybrid magnolia)		Pinus pinaster	
		Carpinus betulus (Hornbeam)	\mathbf{O}	Corylus maxima (Filbert)		llex 'Nellie R. Stevens'		Magnolia 'Susan' (Hybrid magnolia)	\mathbf{O}	(Maritime pine) Pinus pinea	
		<i>Carpinus japonica</i> (Japanese hornbeam)		Cotoneaster frigidus (Tree cotoneaster)		(Hybrid holly) Juglans nigra		Magnolia 'Yellow Bird'	$\mathbf{\bullet}$	(Stone pine)	
		Carya ovata		Crataegus x grignonensis	6	(Black walnut)	$\mathbf{\mathbf{b}}$	(Hybrid magnolia) Malus baccata		Pinus radiata (Monterey pine)	
		(Shagbark hickory) Castanea sativa		(Grignon hawthorn) Crataegus laevigata		Juglans regia (Common walnut)	\triangleright	(Siberian crabapple)		Pinus strobus (Eastern white pine)	
		(Sweet chestnut)		(Woodland hawthorn)		Juniperus scopulorum	\mathbf{O}	Malus cultivars (Apples and crabapple	s) 🜔	Pinus wallichiana	
		<i>Catalpa bignonioides</i> (Indian bean tree)	\triangleright	Crataegus x lavalleei (Lavallée hawthorn)	$\mathbf{\mathbf{b}}$	(Rocky mountain juniper) Juniperus virginiana		Malus hupehensis		(Bhutan pine) Populus alba	
		(Hybrid catalpa)		(Red thorn)		(Eastern red cedar)		(Chinese crabapple) Malus sylvestris		(White poplar)	

Environmental tolerance



Use potential Mature size

Tree Selector

Crown form
 Crown density

Environmental tolerance
 Ornamental qualities

Use the *S* symbols to go to a Profile page, and the top menu to return.

Sensitive to waterlogging continued

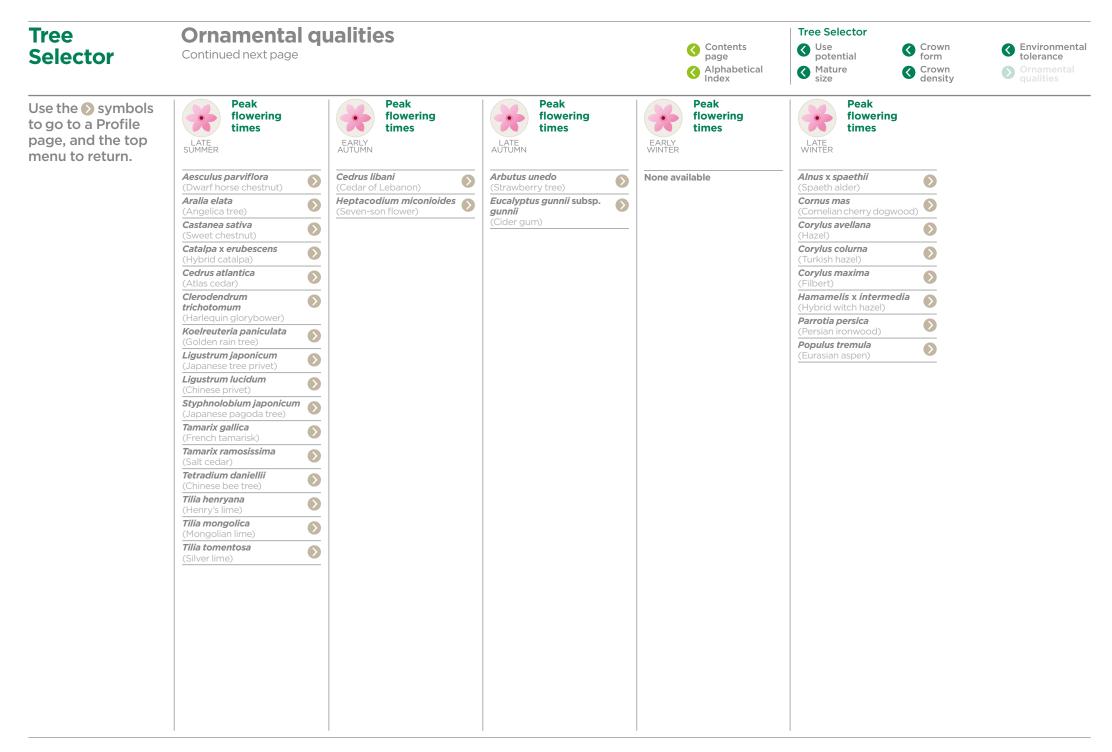
Prunus 'Accolade' (Hybrid cherry)	$\mathbf{\bullet}$	Quercus x bi (Hybrid oak)
Prunus avium (Wild cherry)	\diamond	Guercus cas (Chestnut-lea
Prunus cerasifera (Cherry plum)	\diamond	Quercus ceri (Turkey oak)
Prunus domestica (Common plum)	\triangleright	Guercus coc (Scarlet oak)
Prunus dulcis (Almond)	$\mathbf{\mathbf{b}}$	Quercus x hi (Spanish oak
Prunus fruticosa (Steppe cherry)	$\mathbf{\mathbf{b}}$	Quercus ilex (Holm oak)
Prunus laurocerasus (Cherry laurel)	$\mathbf{\mathbf{b}}$	Quercus pet (Sessile oak)
Prunus lusitanica (Portugal laurel)	$\mathbf{\mathbf{b}}$	Quercus rub (Red oak)
Prunus maackii (Manchurian cherry)	\triangleright	Quercus sub (Cork oak)
Prunus 'Okame' (Hybrid cherry)	$\mathbf{\mathbf{b}}$	Quercus x tu (Turner's oak
Prunus 'Pandora' (Hybrid cherry)	\diamond	Rhus typhina (Staghorn su
Prunus sargentii (Sargent's cherry)	\diamond	Robinia pseu (False acacia
Prunus x schmittii (Hybrid cherry)	$\mathbf{\mathbf{b}}$	Sequoia sem (Coastal redv
Prunus serrula (Tibetan cherry)	$\mathbf{\mathbf{b}}$	Sequoiadeno giganteum
Prunus serrulata (Japanese cherry)	$\mathbf{\mathbf{b}}$	(Giant sequo Sorbus aria
Prunus x subhirtella (Hybrid cherry)	$\mathbf{\mathbf{b}}$	(Whitebeam) Sorbus x arn
Prunus 'Umineko' (Hybrid cherry)	$\mathbf{\mathbf{b}}$	(Hybrid Sorb Sorbus aucu
Prunus x yedoensis (Yoshino cherry)	$\mathbf{\mathbf{b}}$	(Rowan) Sorbus cashi
Pseudotsuga menziesii (Douglas fir)	$\mathbf{\mathbf{b}}$	(Kashmir row Sorbus com
Pyrus calleryana (Callery pear)	\triangleright	(Japanese ro Sorbus disco
Pyrus communis (Common pear)	\triangleright	(Chinese row Sorbus inter
Pyrus salicifolia (Willow-leaved pear)	\triangleright	(Swedish wh Sorbus 'Jose
Quercus acutissima (Sawtooth oak)	\triangleright	(Hybrid Sorb

x <i>bimondorum</i> ak)		Sorbus latifolia (Broad-leaved whitebeam)	Ø
castaneifolia t-leaved oak)	\mathbf{O}	Sorbus pseudohupehensis (Hupeh rowan)	Ø
cerris ak)	$\mathbf{\mathbf{b}}$	Sorbus thibetica (Tibetan whitebeam)	Ø
coccinea bak)	\mathbf{O}	Sorbus x thuringiaca (Hybrid Sorbus)	Ø
x hispanica oak)		Sorbus torminalis (Wild service tree)	Ø
ilex k)	$\mathbf{\mathbf{b}}$	Stewartia pseudocamellia (Japanese stewartia)	Ø
petraea Jak)	\mathbf{O}	Stewartia sinensis (Chinese stewartia)	Ø
rubra		(Japanese pagoda tree)	••••••••••••••••••••••••••••
suber	 • •<	(Sapariese pagoda tree) Syringa x chinensis (Chinese lilac)	Ø
x turneri oak)	$\mathbf{\mathbf{b}}$	(Common lilac)	
hina n sumac)	$\mathbf{\bullet}$	(French tamarisk)	
oseudoacacia		Tamarix ramosissima	•
acia) sempervirens		(Salt cedar) Tamarix tetrandra	0
redwood) lendron	•	(Four-stamen tamarisk) Taxus baccata	0
m quoia)		(Common yew) Tilia americana	•••••••••••••••••••••••••••••
ria eam)		(American basswood) <i>Tilia cordata</i>	
arnoldiana iorbus)	$\mathbf{\mathbf{O}}$	(Small-leaved lime) <i>Tilia x euchlora</i>	0
ucuparia		(Caucasian lime) Tilia x europaea	
ashmiriana rowan)	$\mathbf{\mathbf{b}}$	(Common lime) Tilia henryana	
o mmixta e rowan)	$\mathbf{\mathbf{b}}$	(Henry's lime) Tilia mongolica	0
iscolor rowan)	Image: Constraint of the second sec	(Mongolian lime) Tilia oliveri	• •
whitebeam)	$\mathbf{\mathbf{b}}$	(Chinese white lime)	
oseph Rock'	0	Tilia platyphyllos (Large-leaved lime)	Ø
orbus)		Tilia tomentosa (Silver lime)	

Tsuga canadensis (Eastern hemlock)	
Tsuga heterophylla (Western hemlock)	
Zelkova serrata (Japanese zelkova)	

Tree Selector	Ornamenta Continued next page	-			 ✓ Contents page ✓ Alphabetica Index 	1	Tree Selector Use potential Mature	Crowr form Crowr densit	
Use the 📎 symbols to go to a Profile page, and the top menu to return.	Peak flowering times Acacia dealbata (Silver wattle)	Prunus cerasifera (Cherry plum)	Peak flowering times Acer buergerianum (Trident maple)	•	Betula lenta (Cherry birch)	•	Chamaecyparis Jawsoniana	densit	y qualities
For information relating to ornamental bark, please see individual species profiles.	Acer x freemanii (Freeman's maple) Acer japonicum (Full moon maple) Acer negundo (Box elder) Acer platanoides (Norway maple) Acer rubrum (Red maple) Acer saccharinum	 Prunus domestica (Common plum) Prunus dulcis (Almond) Prunus 'Okame' (Hybrid cherry) Prunus 'Pandora' (Hybrid cherry) Prunus sargentii (Sargent's cherry) 	Acer campestre (Field maple) Acer capillipes (Red snake-bark maple) Acer cappadocicum (Caucasian maple) Acer davidii (Père David's maple) Acer griseum (Paperbark maple) Acer monspessulanum		Betula maximowicziana (Monarch birch) Betula nigra (River birch) Betula papyrifera (Paper birch) Betula pendula subsp. pendula (Silver birch) Betula pendula subsp. szechuanica	Image: Constraint of the second sec	(Lawson cypress) Cornus 'Eddie's white wonder' (Hybrid dogwood) Cornus florida (Flowering dogwood) Crataegus x grignonen: (Grignon hawthorn) Crataegus laevigata (Woodland hawthorn) Crataegus x lavalleei		(Hybrid holly) Ilex x koehneana 'Chestnut Leaf' (Chestnut leaved holly) Ilex 'Nellie R. Stevens' (Hybrid holly) Juglans nigra (Black walnut) Juglans regia (Common walnut) Juniperus communis
	Acer saccharinum (Silver maple) Alnus cordata (Italian alder) Alnus glutinosa (Common alder) Alnus incana (Grey alder) Amelanchier arborea (Downey serviceberry) Ginkgo biloba (Maidenhair tree) Magnolia denudata (Yulan magnolia) Magnolia kobus (Kobushi magnolia) Magnolia kobus (Saucer magnolia) Magnolia kobus (Saucer magnolia) Magnolia kobus (Saucer magnolia) Magnolia kobus (Saucer magnolia) Magnolia kobus (Hybrid poplar) Populus nigra (Black poplar) Prunus (Accolade' (Hybrid cherry)	 Prunus x subhirtella (Hybrid cherry) Prunus 'Umineko' (Hybrid cherry) Prunus x yedoensis (Yoshino cherry) Pseudotsuga menziesii (Douglas fir) Salix caprea (Goat willow) Salix caphnoides (Violet willow) Taxodium distichum (Swamp cypress) Taxus baccata (Common yew) Thuja plicata (Western red cedar) Tsuga canadensis (Eastern hemlock) Ulmus - resistant cultivars (Elms) 	Acer monspessulanum (Montpellier maple) Acer palmatum (Japanese maple) Acer seudoplatanus (Sycamore) Acer rufinerve (Grey-budded snake-bark maple) Acer saccharum (Sugar maple) Acer shirasawanum (Shirasawa's maple) Acer tataricum (Tatarian maple) Acer tataricum subsp. ginnala (Amur maple) Acer triflorum (Three-flowered maple) Acer triflorum (Three-flowered maple) Acer triflorum (Three-flowered maple) Acer triflorum (Three-flowered maple) Acer triflorum (Horse chestnut) Aesculus flava (Yellow buckeye) Aesculus flava (Yellow buckeye) Amelanchier almifolia (Canadian serviceberry) Amelanchier lamarckii (Serviceberry) Betula ermanii (Stone birch)		(Chinese white birch) Betula pubescens (Downy birch) Betula utilis subsp. albosinensis (Chinese red birch) Betula utilis subsp. jacquemontii (White-barked Himalayan birch) Betula utilis subsp. utilis (Himalayan birch) Betula utilis subsp. utilis (Hornbeam) Carpinus betulus (Hornbeam) Carpinus japonica (Japanese hornbeam) Carya ovata (Shagbark hickory) Celtis occidentalis (Common hackberry) Cercidiphyllum japonicum (Katsura tree) Cercis siliquastrum (Judas tree)		(Lavallée hawthorn) Crataegus x media (Red thorn) Crataegus x persimilis (Common hawthorn) Crataegus x persimilis (Broad-leaved cockspur thorn) Cydonia oblonga (Common quince) Davidia involucrata (Pocket handkerchief tr Eucalyptus pauciflora group (Snow gums) Eucommia ulmoides (Guttapercha) Eucommon spindle tree) Fagus orientalis (Oriental beech) Fagus orientalis (Common beech) Halesia carolina (Carolina silverbell) Hippophaë salicifolia (Willow-leaved sea buckthorn) Ilex x altaclerensis grou (Hybrid holly) Ilex aquifolium (European holly)		(Common juniper) Juniperus scopulorum (Rocky mountain juniper) Juniperus virginiana (Eastern red cedar) Laburnum anagyroides (Common laburnum) Laburnum x watereri (Hybrid laburnum) Larix decidua (Common larch) Larix kaempferi (Japanese larch) Larix x marschlinsii (Hybrid larch) Liquidambar styraciflua (Sweetgum) Magnolia acuminata (Cucumber tree) Magnolia 'Elizabeth' (Hybrid magnolia) Magnolia 'Heaven Scent' (Hybrid magnolia) Magnolia 'Spectrum' (Hybrid magnolia) Magnolia 'Susan' (Hybrid magnolia) Magnolia 'Susan' (Hybrid magnolia) Magnolia 'Susan' (Hybrid magnolia) Magnolia 'Susan' (Hybrid magnolia) Magnolia 'Susan' (Hybrid magnolia) Magnolia 'Susan' (Hybrid magnolia)

Tree Selector	Ornamental Continued next page	qualities				 Contents page Alphabetical Index 		Tree Selector Use potential Mature size	 Crown form Crown densit 		2
Use the 📎 symbols to go to a Profile page, and the top menu to return.	LATE SPRING LATE							EARLY SUMMER Peak flowering times			
	<i>Malus cultivars</i> (Apples and crabapples)	Pinus pinea (Stone pine)		Quercus x bimondorum (Hybrid oak)		Sorbus discolor (Chinese rowan)		Abies concolor (White fir)	$\mathbf{\Diamond}$	Gymnocladus dioica (Kentucky coffee tree)	$\mathbf{\bullet}$
		<i>Pinus radiata</i> (Monterey pine)		<i>Quercus castaneifolia</i> (Chestnut-leaved oak)	$\mathbf{\mathbf{b}}$	Sorbus intermedia (Swedish whitebeam)		(Write fir) Abies fraseri (Fraser fir)		<i>Liriodendron tulipifera</i> (Tulip tree)	$\mathbf{\mathbf{b}}$
		Pinus strobus (Eastern white pine)	$\mathbf{\mathbf{b}}$	Quercus cerris (Turkey oak)	$\mathbf{\mathbf{b}}$	Sorbus 'Joseph Rock' (Hybrid Sorbus)	Ø	Abies grandis (Grand fir)	۲	Magnolia grandiflora (Southern magnolia)	\triangleright
	<i>Malus toringo</i> (Toringo crabapple)	Pinus sylvestris (Scots pine)	\bigcirc	Quercus coccinea (Scarlet oak)	$\mathbf{\mathbf{b}}$	Sorbus latifolia (Broad-leaved whitebeam)		Abies koreana (Korean fir)	$\mathbf{\mathbf{b}}$	Malus trilobata (Lebanese wild apple)	\mathbf{i}
	Malus yunnanensis (Yunnan crabapple)	Pinus wallichiana (Bhutan pine)	\bigcirc	Quercus frainetto (Hungarian oak)		Sorbus pseudohupehensis (Hupeh rowan)	\bigcirc	Abies nordmanniana (Nordmann fir)		Nothofagus antarctica (Antarctic beech)	$\mathbf{\mathbf{b}}$
	Maytenus boaria (Chilean mayten)	Platanus x hispanica (London plane)	$\mathbf{\mathbf{O}}$	Quercus x hispanica (Spanish oak)	$\mathbf{\mathbf{b}}$	Sorbus thibetica (Tibetan whitebeam)	\mathbf{O}	Abies procera (Noble fir)	\mathbf{O}	Olea europaea (Olive)	\mathbf{O}
	Mespilus germanica (Medlar)	Platanus orientalis (Oriental plane)	$\mathbf{\bullet}$	Quercus ilex (Holm oak)	\triangleright	Sorbus x thuringiaca (Hybrid Sorbus)		Acer x zoeschense (Zoeschen maple)		Prunus lusitanica (Portugal laurel)	Ø
	giyptostropoides	Populus x candicans (Ontario poplar)		Quercus palustris (Pin oak)	\triangleright	Sorbus torminalis (Wild service tree)		Aesculus indica (Indian horse chestnut)		Rhus typhina (Staghorn sumac)	Ø
	(Dawn redwood) Morus alba	Prunus avium (Wild cherry)	$\mathbf{\mathbf{b}}$	Quercus petraea (Sessile oak)	\diamond	Syringa x chinensis (Chinese lilac)		Aesculus pavia (Red buckeye)	$\mathbf{\bullet}$	Robinia pseudoacacia (False acacia)	\diamond
		Prunus fruticosa (Steppe cherry)		Quercus phellos (Willow oak)	$\mathbf{\mathbf{b}}$	Zelkova serrata (Japanese zelkova)		Ailanthus altissima (Tree of heaven)	$\mathbf{\bullet}$	Sorbus vilmorinii (Vilmorin's rowan)	$\mathbf{\mathbf{b}}$
	(Didek Hidiberry)	Prunus laurocerasus (Cherry laurel)	$\mathbf{\bullet}$	<i>Quercus robur</i> (Pedunculate oak)	$\mathbf{\mathbf{b}}$			Araucaria araucana (Monkey puzzle)	$\mathbf{\Diamond}$	Stewartia pseudocamellia (Japanese stewartia)	ia 🜔
		Prunus maackii (Manchurian cherry)	\diamond	Quercus rubra (Red oak)	\triangleright			Catalpa bignonioides (Indian bean tree)	\bigcirc	Stewartia sinensis (Chinese stewartia)	$\mathbf{\mathbf{O}}$
		Prunus padus (Bird cherry)	$\mathbf{\bullet}$	Quercus suber (Cork oak)				Catalpa speciosa (Northern catalpa)	$\mathbf{\mathbf{b}}$	<i>Styrax japonicus</i> (Japanese snowball tree)	$\mathbf{\mathbf{b}}$
	(Foxglove tree)	Prunus x schmittii (Hybrid cherry)	$\mathbf{\mathbf{O}}$	Quercus x turneri (Turner's oak)	$\mathbf{\mathbf{b}}$			Cedrus deodara (Himalayan cedar)		Syringa reticulata (Japanese tree lilac)	\mathbf{i}
	(Amur cork tree)	Prunus serrula	$\mathbf{\bullet}$	Salix alba (White willow)	$\mathbf{\mathbf{b}}$			x <i>Chitalpa tashkentens</i> Chitalpa	sis 🜔	Syringa vulgaris (Common lilac)	•
	(Norway spruce)	Prunus serrulata	$\mathbf{\bullet}$	Salix babylonica (Weeping willow)	$\mathbf{\mathbf{b}}$			Cladrastis kentukea (Yellow wood)	$\mathbf{\bullet}$	Tamarix tetrandra (Four-stamen tamarisk)	\mathbf{i}
	(Brewer spruce)	Pterocarya fraxinifolia	$\mathbf{\bullet}$	Salix pentandra (Bay-leaved willow)	$\mathbf{\mathbf{b}}$			Cornus alternifolia (Alternate leaf dogwoo		Tilia americana (American basswood)	\mathbf{i}
	(Serbian spruce)	Pterocarya stenoptera		Salix x sepulcralis (Weeping willow)				Cornus controversa (Wedding cake tree)		(Small-leaved lime)	$\mathbf{\mathbf{b}}$
	(Caucasian spruce)	Pyrus calleryana		Sorbus aria (Whitebeam)	$\mathbf{\mathbf{O}}$			(Chinese dogwood)		<i>Tilia x euchlora</i> (Caucasian lime)	•
	(Colorado blue spruce)	Pyrus communis	$\mathbf{\bullet}$	(Wintebean) Sorbus x arnoldiana (Hybrid Sorbus)				Cotoneaster frigidus		Tilia x europaea	•
	(Sitka spruce)	(Common pear) Pyrus salicifolia (Willowshapyod poar)		Sorbus aucuparia	•			(Tree cotoneaster) Diospyros kaki (Chipasa parsimmon)		(Common lime) Tilia oliveri (Chinasa whita lima)	•
		(Willow-leaved pear) Quercus acutissima		(Rowan) Sorbus cashmiriana				(Chinese persimmon) Elaeagnus angustifolia		(Chinese white lime) <i>Tilia platyphyllos</i>	•
	Pinus pinaster (Maritime pine)	(Sawtooth oak) Quercus bicolor (Supercus victime activity)		(Kashmir rowan) Sorbus commixta				(Russian olive) Gleditsia triacanthos		(Large-leaved lime)	
		(Swamp white oak)		(Japanese rowan)				(Honey locust)			



Tree	Ornamental	qualities			Tree Selector			
Selector	Continued next page			Contents page Alphabetical Index		Crowr form Crowr densit		ntal
Use the 📎 symbols to go to a Profile page, and the top menu to return.	EARLY SPRING	Peak fruiting times	Peak fruiting times	Peak fruiting times				
	None available	Salix caprea (Goat willow) Salix daphnoides (Violet willow)	Acer x freemanii (Freeman's maple) Acer rubrum (Red maple) Acer saccharinum (Silver maple) Amelanchier arborea (Downey serviceberry) Amelanchier lamarckii (Serviceberry) Betula nigra (River birch) Olea europaea (Olive) Pinus pinea (Stone pine) Populus radiata (Monterey pine) Populus alba (White poplar) Populus nigra (Black poplar) Populus tremula (Eurasian aspen) Salix alba (White willow) Salix x sepulcralis (Weeping willow) Ulmus – resistant cultivars (Elms)	Abies concolor (White fir) Abies koreana (Korean fir) Abies procera (Noble fir) Acacia dealbata (Silver wattle) Acer buergerianum (Trident maple) Acer japonicum (Field maple) Acer nonspessulanum (Montpellier maple) Acer pagundo (Box elder) Acer pagundo (Box elder) Acer pseudoplatanus (Sycamore) Acer segundo (Sycamore) Acer pseudoplatanus (Sycamore) Acer utfinerve (Grey-budded snake-bark maple) Alnus glutinosa (Common alder) Alnus incana (Grey alder) Amelanchier alnifolia (Alder-leaved serviceberry) Amelanchier canadensis (Canadian serviceberry)	Magnolia x loebneri (Loebner magnolia) Magnolia x soulangeana (Saucer magnolia) Magnolia 'Spectrum' (Hybrid magnolia) Magnolia 'Star Wars' (Hybrid magnolia) Magnolia 'Star Wars' (Hybrid magnolia) Magnolia 'Susan' (Hybrid magnolia) Magnolia 'Yellow Bird' (Hybrid magnolia) Magnolia 'Yellow Bird' (Hybrid magnolia) Magnolia 'Yellow Bird' (Hybrid magnolia) Morus alba (Chilean mayten) Morus alba (White mulberry) Morus nigra (Black mulberry) Morus nigra (Black mulberry) Nothofagus antarctica (Antarctic beech) Ostrya carpinifolia (Hop hornbeam) Phellodendron amurens (Amur cork tree) Pinus strobus (Eastern white pine) Platanus orientalis (Oriental plane) Platanus orientalis (Oriental plane) Prunus 'Accolade' (Hybrid cherry) Prunus avium (Wild cherry) Prunus crasifera		Prunus 'Pandora' (Hybrid cherry) Prunus sargentii (Sargent's cherry) Prunus serrula (Tibetan cherry) Prunus x yedoensis (Yoshino cherry) Pterocarya fraxinifolia (Caucasian wing-nut) Pterocarya stenoptera (Chinese wing-nut) Rhus typhina (Staghorn sumac) Salix pentandra (Bay-leaved willow) Sorbus aria (Whitebeam) Sorbus aria (Whitebeam) Sorbus aria (Whitebeam) Sorbus cashmiriana (Hybrid Sorbus) Sorbus cashmiriana (Kashmir rowan) Sorbus commixta (Japanese rowan) Sorbus Joseph Rock' (Hybrid Sorbus) Sorbus hoseph Rock' (Hybrid Sorbus) Sorbus pseudohupehens (Hupeh rowan) Syringa x chinensis (Chinese lilac)	
				Buxus sempervirens (Box) (Box) (Box) Cercidiphyllum japonicum (Magnolia 'Elizabeth' (Katsura tree) (Magnolia 'Elizabeth' Magnolia 'Galaxy' (Hybrid magnolia) Magnolia 'Heaven Scent' (Hybrid magnolia)	(Cherry plum) Prunus domestica (Common plum) Prunus dulcis (Almond) Prunus fruticosa (Steppe cherry) Prunus maackii (Manchurian cherry) Prunus padus (Bird cherry)	Image: Control of the second		

Tree Selector

Ornamental qualities Continued next page



etical Supervised Use potential Mature size

Tree Selector

 Crown form
 Crown density



Use the \bigotimes symbols to go to a Profile page, and the top menu to return.



Abies fraseri	\mathbf{O}
(Fraser fir)	
Abies grandis	\mathbf{O}
(Grand fir)	
Abies nordmanniana	\mathbf{O}
(Nordmann fir)	
Acer capillipes	$\mathbf{\mathbf{O}}$
(Red snake-bark maple)	
Acer cappadocicum	$\mathbf{\mathbf{O}}$
(Caucasian maple)	
Acer davidii	\mathbf{O}
(Père David's maple)	
Acer griseum	$\mathbf{\mathbf{O}}$
(Paperbark maple)	
Acer palmatum	$\mathbf{\mathbf{O}}$
(Japanese maple)	
Acer saccharum	$\mathbf{\mathbf{O}}$
(Sugar maple)	
Acer shirasawanum	\mathbf{O}
(Shirasawa's maple)	
Acer tataricum	$\mathbf{\mathbf{O}}$
(Tatarian maple)	
Acer tataricum subsp.	$\mathbf{\mathbf{O}}$
ginnala	
(Amur maple)	
Acer triflorum	\mathbf{O}
(Three-flowered maple)	
Acer x zoeschense	\mathbf{O}
(Zoeschen maple)	
Aesculus x carnea	\mathbf{O}
(Red horse chestnut)	
Aesculus flava	\mathbf{O}
(Yellow buckeye)	
Aesculus hippocastanum	$\mathbf{\mathbf{O}}$
(Horse chestnut)	
Aesculus indica	\mathbf{O}
(Indian horse chestnut)	
Aesculus parviflora	$\mathbf{\mathbf{O}}$
(Dwarf horse chestnut)	
Aesculus pavia	$\mathbf{\mathbf{b}}$
(Red buckeye)	
Ailanthus altissima	\mathbf{O}
(Tree of heaven)	
Alnus x spaethii	
(Spaeth alder)	

Araucaria araucana (Monkey puzzle)	\mathbf{b}
(Stone birch)	0
Betula lenta (Cherry birch)	•
Betula maximowicziana (Monarch birch)	•
Betula papyrifera (Paper birch)	\mathbf{i}
Betula pendula subsp. pendula	\mathbf{i}
(Silver birch) Betula pendula subsp. szechuanica (Chinese white birch)	•
(Downy birch)	\mathbf{i}
Betula utilis subsp. albosinensis (Chinese red birch)	>
Betula utilis subsp. jacquemontii (White-barked Himalayan birch)	•
Betula utilis subsp. utilis (Himalayan birch)	•
Carpinus betulus (Hornbeam)	•
Carpinus japonica (Japanese hornbeam)	
Catalpa bignonioides (Indian bean tree)	\mathbf{b}
Catalpa speciosa (Northern catalpa)	•
Cedrus atlantica (Atlas cedar)	0
Cedrus deodara (Himalayan cedar)	
Cedrus libani	•
(Cedar of Lebanon)	
Celtis australis (Nettle tree)	\mathbf{O}

Cercis canadensis	$\mathbf{\mathbf{S}}$
(North American redbud)	_
Cercis siliquastrum	\mathbf{S}
(Judas tree)	_
Cladrastis kentukea	\mathbf{S}
(Yellow wood)	_
Cornus alternifolia	\mathbf{S}
(Alternate leaf dogwood)	_
Cornus controversa	\mathbf{b}
(Wedding cake tree)	_
Cornus florida (Flowering dogwood)	\mathbf{O}
Cornus kousa (Chinese dogwood)	\mathbf{O}
	-
Cornus mas (Cornelian cherry dogwood)	\mathbf{S}
Corylus avellana (Hazel)	\mathbf{b}
Corvlus colurna	
(Turkish hazel)	\mathbf{O}
Corvlus maxima	_
(Filbert)	\diamond
Cotoneaster frigidus	-
(Tree cotoneaster)	\mathbf{b}
Crataegus x grignonensis	-
(Grignon hawthorn)	\diamond
Crataegus laevigata	
(Woodland hawthorn)	\diamond
Crataegus x lavalleei	
(Lavallée hawthorn)	\bigcirc
Crataegus monogyna	
(Common hawthorn)	
Crataegus x persimilis	
(Broad-leaved	
cockspur thorn)	
Elaeagnus angustifolia	
(Russian olive)	
Eucommia ulmoides	
(Guttapercha)	
Euonymus europaeus	
(Common spindle tree)	
Fagus orientalis	6
(Oriental beech)	
Fagus sylvatica	

	Halesia carolina (Carolina silverbell)	\triangleright
	Hamamelis x intermedia (Hybrid witch hazel)	\diamond
	Hippophaë salicifolia (Willow-leaved sea buckthorn)	\triangleright
	<i>Ilex x altaclerensis</i> group (Hybrid holly)	$\mathbf{\mathbf{b}}$
	Juglans nigra (Black walnut)	
-	Juglans regia (Common walnut)	\triangleright
	Juniperus communis (Common juniper)	\triangleright
-	Laburnum anagyroides (Common laburnum)	$\mathbf{\mathbf{b}}$
	Laburnum x watereri (Hybrid laburnum)	\mathbf{b}
-	Liquidambar styraciflua (Sweetgum)	\mathbf{b}
-	Liriodendron tulipifera (Tulip tree)	\diamond
	Magnolia acuminata (Cucumber tree)	Ø
	Magnolia denudata (Yulan magnolia)	\mathbf{b}
-	Magnolia grandiflora (Southern magnolia)	\triangleright
	Magnolia kobus (Kobushi magnolia)	\diamond
	Magnolia stellata (Star magnolia)	Ø
_	Malus baccata (Siberian crabapple)	Ø
	Malus cultivars (Apples and crabapples)	Ø
	Malus hupehensis (Chinese crabapple)	Ø
	Malus sylvestris (European crabapple)	Ø
	Malus toringo (Toringo crabapple)	Ø
	Malus trilobata (Lebanese wild apple)	Ø

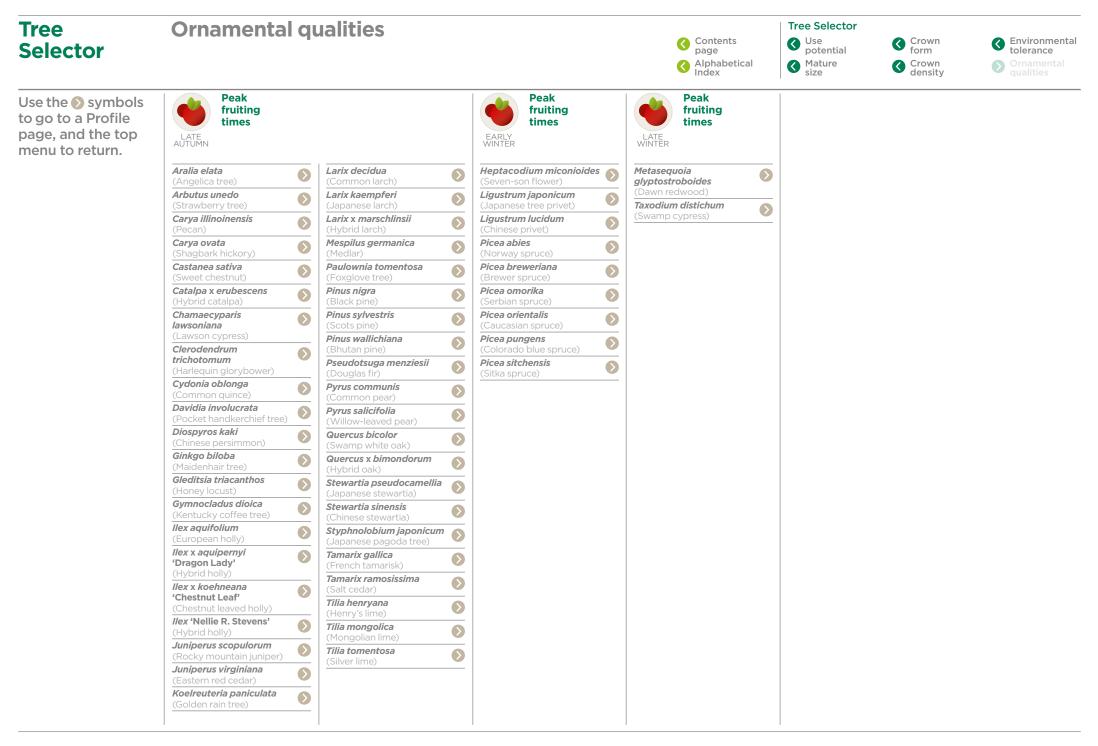
Malus yunnanensis	$\mathbf{\mathbf{O}}$
(Yunnan crabapple)	
Nyssa sylvatica	6
(Black tupelo)	
Parrotia persica	$\mathbf{\mathbf{b}}$
(Persian ironwood)	
Pinus pinaster	$\mathbf{\mathbf{b}}$
(Maritime pine)	
Prunus laurocerasus	$\mathbf{\mathbf{b}}$
(Cherry laurel)	
Prunus lusitanica	\triangleright
(Portugal laurel)	
Pyrus calleryana	0
(Callery pear)	
Quercus acutissima	0
(Sawtooth oak)	
Quercus castaneifolia	
(Chestnut-leaved oak)	
Quercus cerris (Turkey oak)	•
Quercus coccinea (Scarlet oak)	$\mathbf{\mathbf{b}}$
Quercus frainetto	
(Hungarian oak)	\triangleright
Quercus x hispanica	_
(Spanish oak)	\triangleright
Quercus ilex	
(Holm oak)	\triangleright
Quercus palustris	
(Pin oak)	\triangleright
Quercus petraea	$\mathbf{\mathbf{b}}$
(Sessile oak)	
Quercus phellos	6
(Willow oak)	Image: Control Image: Contrel
Quercus robur	
(Pedunculate oak)	
Quercus rubra	6
(Red oak)	
Quercus suber	
(Cork oak)	
Quercus x turneri	()
(Turner's oak)	
Robinia pseudoacacia	
(False acacia)	

(False acacia) Sorbus intermedia

(Swedish whitebeam)

Ø

Sorbus latifolia (Broad-leaved whitebeam)	
Sorbus thibetica (Tibetan whitebeam)	0
Sorbus x thuringiaca	6
(Hybrid Sorbus) Sorbus torminalis	
(Wild service tree) Sorbus vilmorinii	
(Vilmorin's rowan)	\mathbf{O}
Styrax japonicus (Japanese snowball tree)	
Syringa reticulata (Japanese tree lilac)	
Syringa vulgaris (Common lilac)	
(Four-stamen tamarisk)	
Taxus baccata (Common yew)	
Tetradium daniellii (Chinese bee tree)	
Thuja plicata (Western red cedar)	•
Tilia americana (American basswood)	
Tilia cordata (Small-leaved lime)	
Tilia x euchlora (Caucasian lime)	0
Tilia x europaea (Common lime)	
Tilia oliveri (Chinese white lime)	0
<i>Tilia platyphyllos</i> (Large-leaved lime)	
(Early canadensis (Eastern hemlock)	•
(Western hemlock)	
Zelkova serrata	0
(Japanese zelkova)	



Exemplar species: *Betula pendula* 'Youngii' is a weeping cultivar of a popular native species. The selection of appropriate cultivars can maximise the impact of public green spaces.





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Exemplar species: *Elaeagnus angustifolia* has silvery foliage that provides a beautiful contrast against the sky, buildings or other vegetation. It is a versatile species capable of performing well on challenging sites.





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Revisions Log



Issue 1.2 - September 2018

- i) Corrections of typographical errors.
- ii) Removal of a 'Note' on page 333, *Tilia tomentosa*, to reflect the current thinking that this species is not toxic to bees. (Thanks to Edward Baker for providing evidence for this revision).

Issue 1.3 – January 2019

- i) Minor changes to a few icons to correct inconsistencies with the associated text.
- ii) Tree Selector revised to reflect changes in (i).
- iii) Missing reference added to page 34.
- iv) Launch of the Excel based spreadsheet of supplementary data.





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