

Urban trees – Creating Biologically Vibrant Soil For Long Term Sustainability



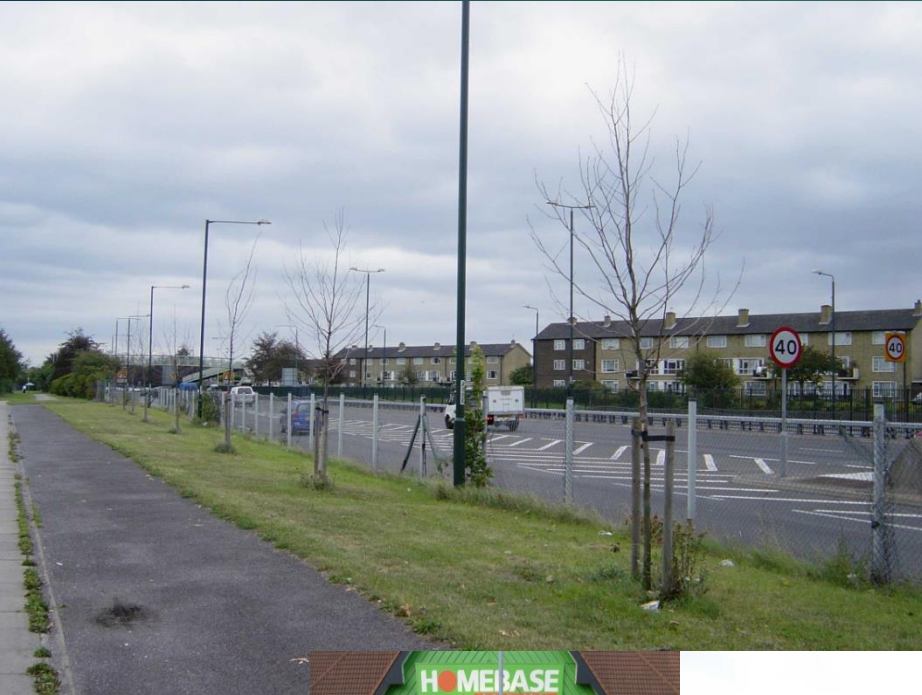
- ▶ Dr G. Percival
- ▶ Bartlett Tree Research Laboratory
- ▶ Reading University, UK

The state of urban soils within the UK

Over the past 10 years the health and soil conditions of urban trees growing throughout the UK has been assessed.



The Extent of the Problem



The Extent of the Problem



Planted Jan 2019: Assessed July 2019 (87% Death Rate)



Is this soil?





**SOIL QUALITY IS
THE KEY TO TREE
SURVIVAL AND
LONGEVITY**



Three main Problems

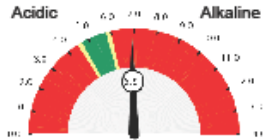
1. Soil Compaction



Soil Nutrient Analysis Report

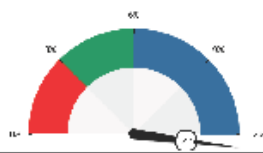
October 8, 2018

Soil pH:
6.9 Too Alkaline



Ideal pH range for this species:
4.5 to 6.0

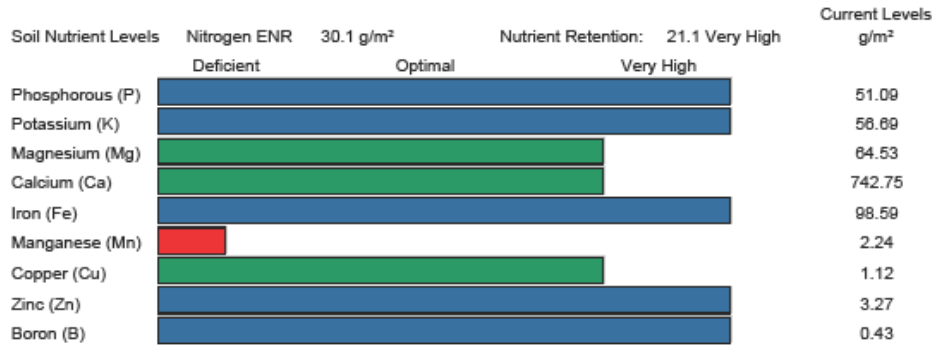
Soil Organic Matter:
12.5% High



Ideal range 3-5%

Emma Schaffert
Arborist Representative
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Plant Species: Rhododendron
Objective: Maintain Vitality
Location: Clock Tree Corner 2



Deficient Needs treatment Moderate Could be treated Optimal Within ideal range Very High Above optimal

Other elements tested: Sodium (524.00ppm Low)

Recommendations: To achieve your plant health objective for Maintenance of tree vitality, the Bartlett Tree Research Laboratories recommends soil treatments to address issues associated with Sulfur and Manganese.

Monitor or treat excesses in: Zinc, Boron as prescribed by the Bartlett Tree Research Laboratories.

Inappropriate pH

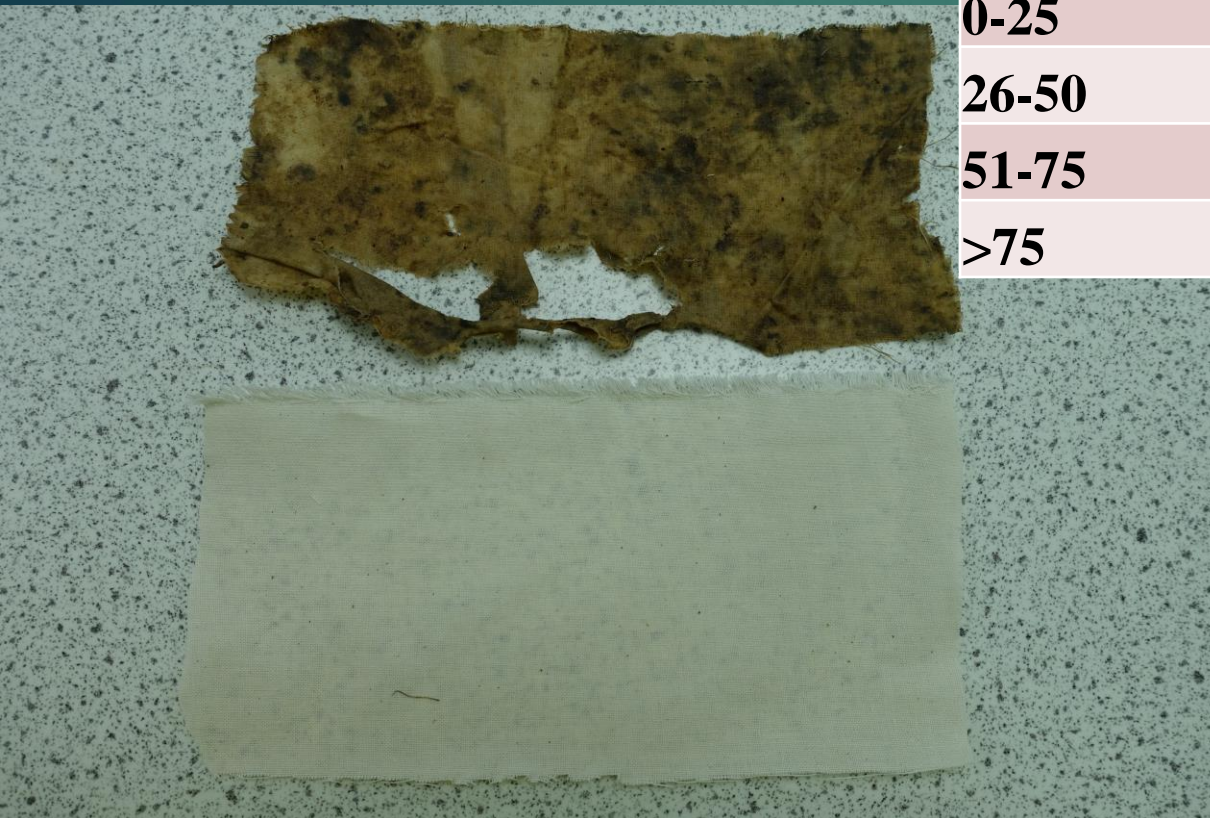


Lack of Biological Activity: Two Quick Tests.

1. A worm count: Every “spade full” of soil should have at least two worms. Worms are an excellent indicator of soil fertility/biological activity.



2. Cotton strip test. This process involves inserting a strip of unbleached calico cotton into the ground and examining it three weeks later for decay. The greater the decay, the greater the biological activity.



% Decomposition after three weeks	
0-25	Poor
26-50	Could be Improved
51-75	Good
>75	Excellent

So How Do We Create A Biologically Vibrant Soil For Long Term Sustainability

Answer: Addition of **Organic Matter**

But which one?

Biochar

Compost Tea

Biostimulants

Mycorrhiza

Seaweed extracts

Compost

Coir

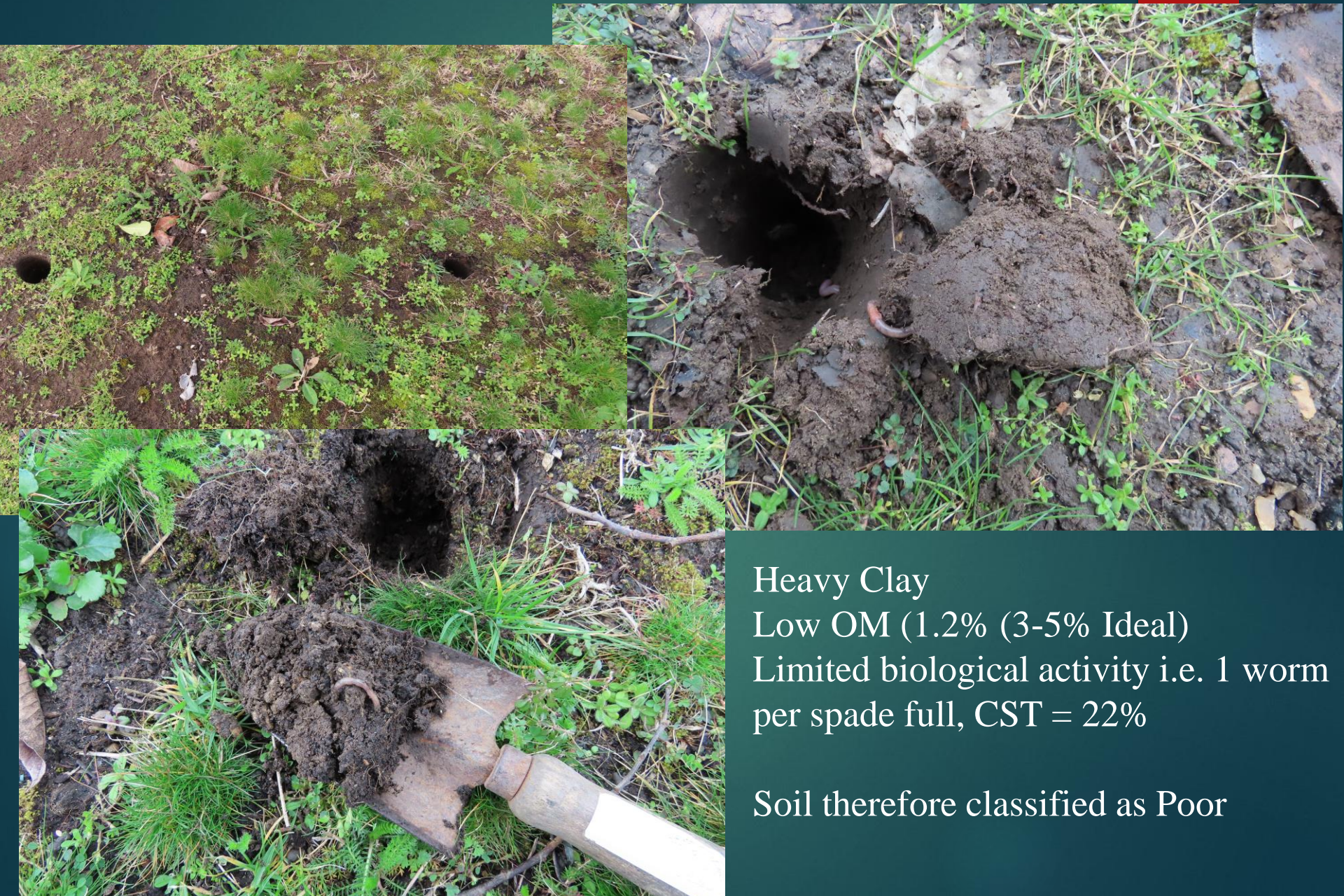
Organic fertiliser (chicken pellets or blood/fish/bone)

Combinations of the above?





What Lurks Below



Heavy Clay

Low OM (1.2% (3-5% Ideal))

Limited biological activity i.e. 1 worm per spade full, CST = 22%

Soil therefore classified as Poor

So....A Big Trial Took Place

Products Used Included

TERRACOTTAM

CHARCOAL

CONTROL

CARBON GOLD BIOCHAR

PERLITE

FOUR SEASON BIOCHAR

VERMICULITE

RICE BIOCHAR

JOHN INNES NUMBER 2

ORGANIC FERTILISER (8-7-7)

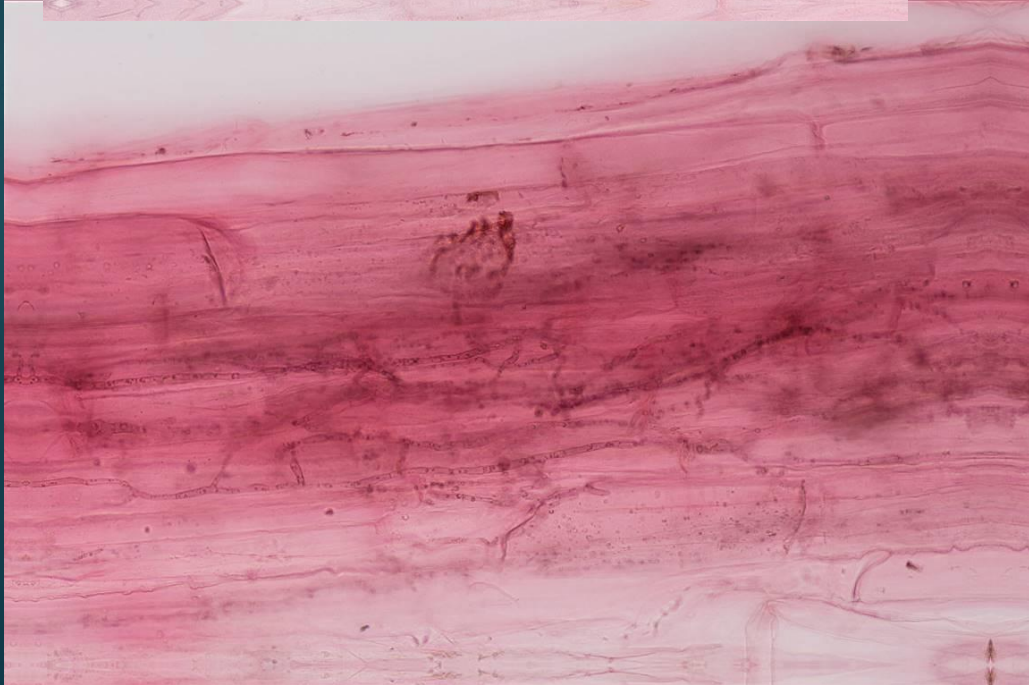
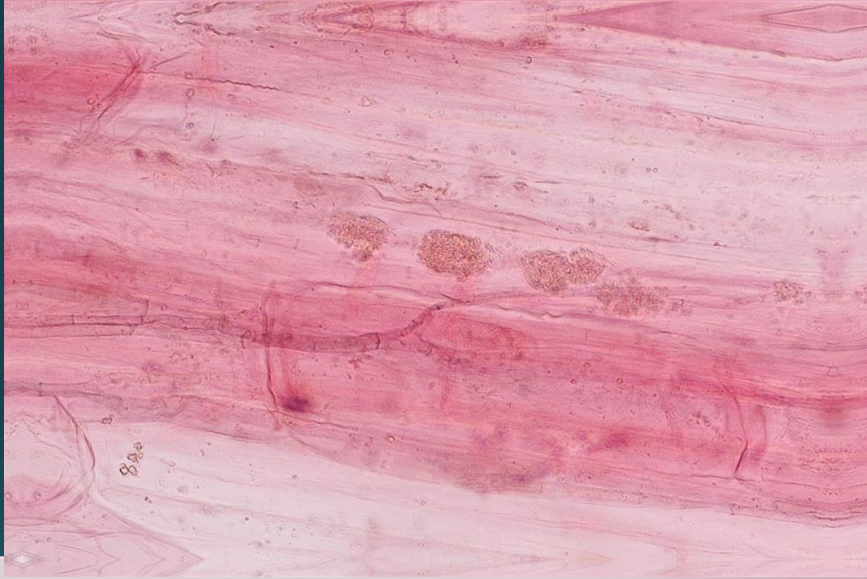
WITH AND WITHOUT WOODCHIP MULCH



ROOT DRY WEIGHT AND MYCORRHIZAL ASSOCIATIONS



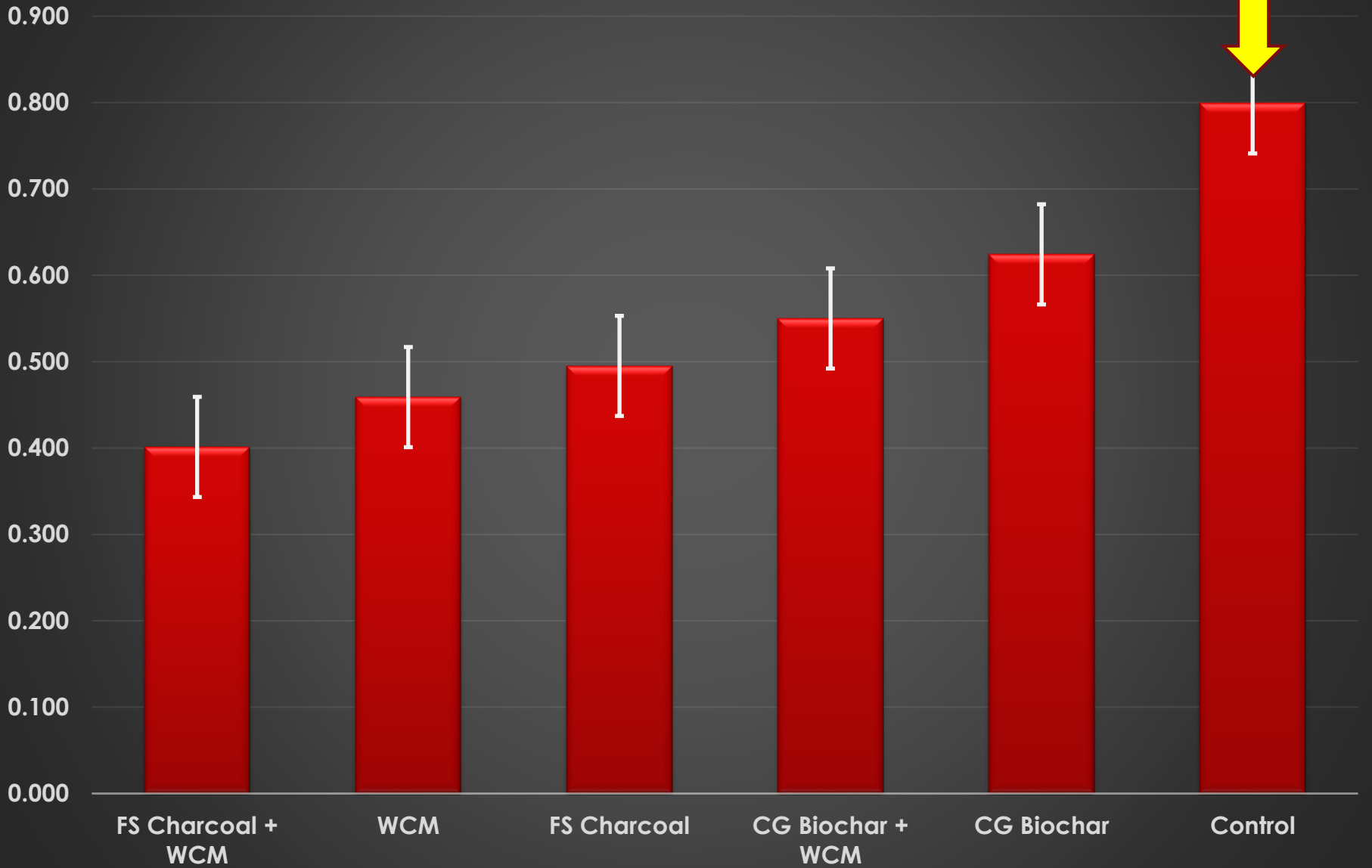
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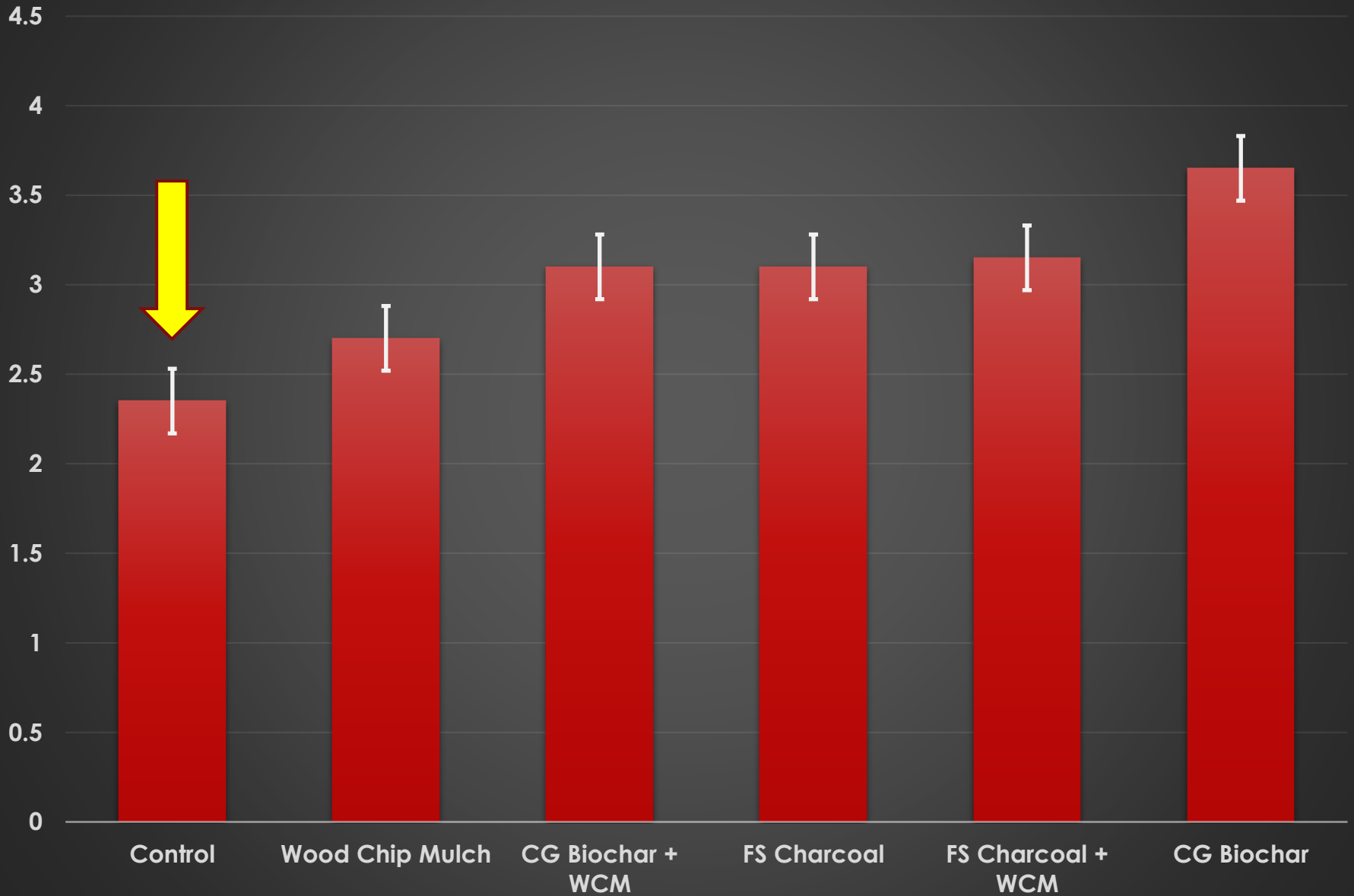




Root Dry Weight



Mycorrhizal Colonisation



So How Do We Create A Biologically Vibrant Soil For Long Term Sustainability

Lessons learnt So Far:

1. Alleviate Soil Compaction
2. Make sure the soil pH is suitable for the species
3. Add biochar + compost + organic fertiliser (chicken pellets) + native soil*
4. *Biosecurity





END