



Charcoal effects on plant roots: implications for biochar

Adding biochar to soil for carbon sequestration can bring additional benefits to plant growth. Investigating how plant roots respond to char can help us to understand the impact of biochar on soil nutrient conditions, moisture retention and soil carbon cycling.

Methods

Wheat seedling growth conditions:

- root observation boxes (Fig. 1) (20x40x0.6 cm)
- glasshouse environment
- potting soil at 40% H₂O, pH 5.5
- 0.5-2.0mm sycamore charcoal 2% soil wt (control: no char).

At 3 weeks: roots washed free of soil and root lengths determined using root analysis software Winrhizo (v2003b). Bulk and rhizosphere soil pH measured.

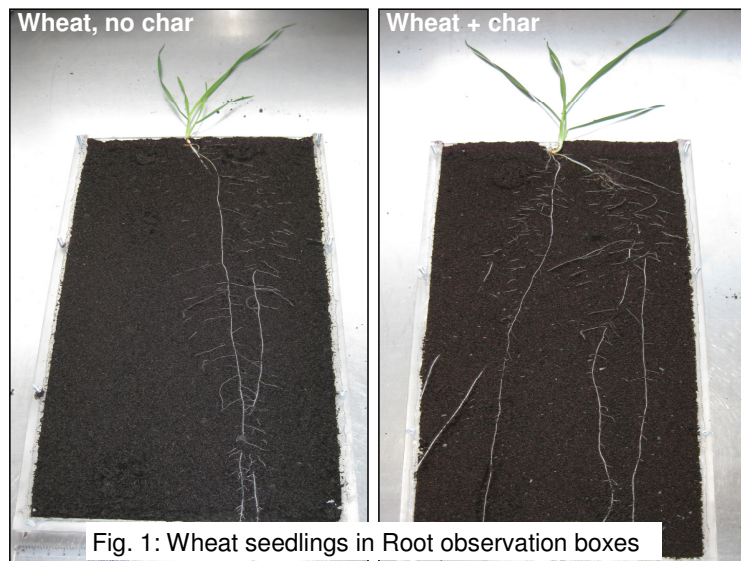
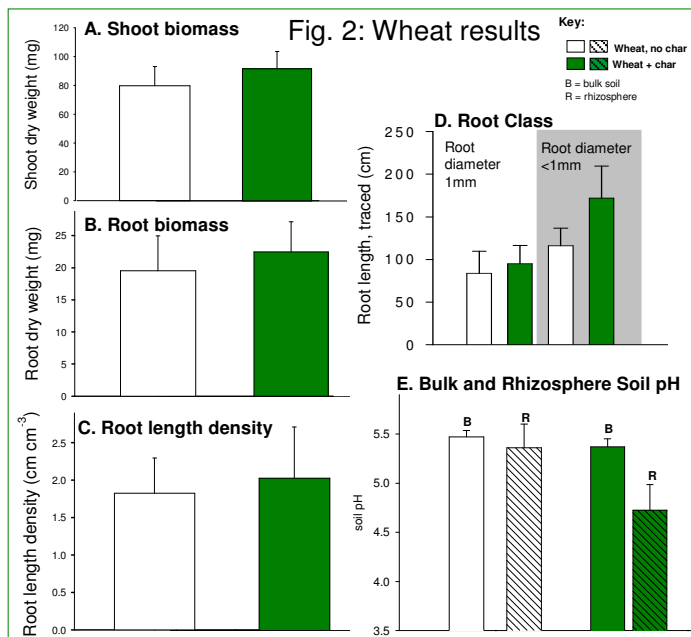


Fig. 1: Wheat seedlings in Root observation boxes



Implications for biochar

Results suggest that char addition may promote root proliferation, and lower rhizosphere pH (Fig. 2).

Most existing (bio)char studies report only root biomass measurements, but more detailed assessments are likely to reveal important differences.

Further work (glasshouse & *in situ*) will systematically assess the effects of different types of biochar in different soil:

- architecture of roots and nutrient uptake
- soil respiration
- root-microbe interactions.

