Wood-based compost boosts active carbon in soil, supporting larger microbial populations and more fungal colonies

Farm woodlots could provide compost feedstock to promote soil health

Effects of a Wood-based Compost on Soil Health and Fungal Populations in an Organic Loam

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INTRODUCTION

Living soils are fundamental providers of ecosystem services. Organic soil amendments can increase soil respiration -- an indicator of total microbial activity -- and suppress soil-borne plant pathogens by supporting populations of antagonistic micro-organisms. *Trichoderma* spp. have been of particular interest because of their complex symbiotic relationship with plant roots, worldwide distribution, and promising characteristics as antagonistic fungi.

The soil microbial community responds to changes in the soil environment. Microbes must acquire sufficient carbon and nitrogen from their environment to maintain a carbon:nitrogen ratio near 8:1 in their bodies. The quality and quantity of organic inputs applied to soil impact residue decomposition and subsequent availability of nutrients for crop growth. By increasing soil organic matter, wood-based composts may support a greater microbial community and improve soils' disease suppressive capability.

This study compared active carbon, soil respiration, fungal populations and lettuce growth between unamended soil and soil amended with commercial organic compost or wood-based compost.

RESULTS

Figure 1. Active carbon by treatment ± SE (*n*=10). Same letter signifies no difference ($\alpha = 0.05$).

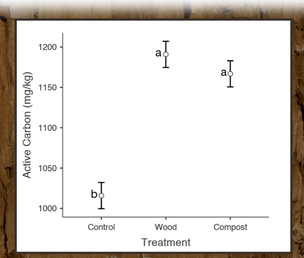


Figure 3. Fungal colony forming units by treatment ± SE (*n*=10). Same letter signifies no difference, ($\alpha = 0.05$).

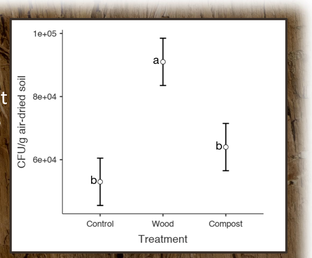


Figure 2. Soil respiration by treatment ± SE (*n*=10). Same letter signifies no difference, ($\alpha = 0.05$).

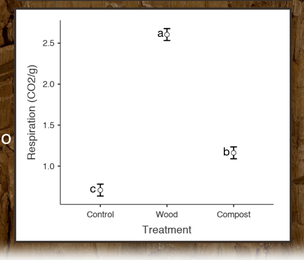
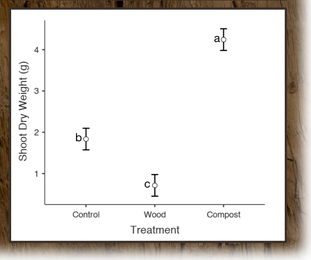


Figure 4. Shoot dry weight by treatment ± SE (*n*=10). Same letter signifies no difference, ($\alpha = 0.05$).



DISCUSSION

Through this study I aimed to increase interest in wood-based compost as a means of enhancing soil health, specifically by promoting *Trichoderma* spp. associated with disease suppressive soils. I tried to contribute to the understanding of how compost type influences factors affecting soil biology. Further research could help establish interest in wood-based composts used in combination with N-fixing cover crops or other high N inputs to overcome the N immobilization I observed. Despite positive impacts on microbial abundance, I found no evidence of compost choice influencing *Trichoderma* spp. abundance.

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