Biochar effects on mycorhizal colonization of wheat
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Introduction
Biochar may affect soil microorganisms including arbuscular mycorrhizal fungi (AMF) [1, 2]. This study investigated potential interactions between biochar and colonization of wheat roots by naturally occurring mycorrhizal fungi for (i) different types of biochar, and (ii) different rates of biochar application, in agricultural soil that was either amended or not amended with phosphate fertilizer. The glasshouse study was conducted with wheat grown for 8 weeks in soil from a site dominated by wheat cropping at Mingenew, Western Australia. Soil was amended separately with chicken manure biochar and wheat chaff biochar at rates of 0, 2.5, 5, 7.5 t/ha with or without addition of phosphate fertilizer. Mycorrhizal colonization and plant growth were measured and analyzed 8 weeks after planting.

Results and Discussion
Chicken manure biochar had little effect on mycorrhizal colonization when applied at different rates, irrespective of soil phosphorus status. For wheat chaff biochar, all rates of application increased mycorrhizal colonization of wheat grown in soil without added phosphorus (Figure 1). The highest rate of wheat chaff biochar (W7.5) application decreased mycorrhizal colonization when phosphate fertilizer was added (Figure 1). The mechanism(s) for contrasting effects of wheat chaff biochar on mycorrhizal colonization may be explained by biochar-related improvement in soil conditions for growth of mycorrhizal hyphae at lower soil phosphorus and inhibition at higher soil phosphorus [2].

Conclusion
Selection of appropriate application rates for use of some biochars in agricultural soil needs to consider possible interactions with soil P and arbuscular mycorrhizal fungi.

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