

Title: the role of intact extraradical mycelium in managing indigenous arbuscular mycorrhiza

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Abstract

Arbuscular colonisation (AC) of the second plant in a succession starts earlier and develops faster if the extraradical mycelium of the arbuscular mycorrhiza fungi (AMF) associated with the first plant is kept intact and is the preferential propagule type. When abiotic or biotic stressors are present in the soil, the benefits conferred by the AMF are greatly enhanced. Thus, under manganese (Mn) toxicity, compared with any other type of AMF propagule, the presence of an intact ERM enhanced AC by 1.82 and 3.3 times, in wheat and subterranean clover, respectively, 21 days after planting (DAP). In consequence, the growth of both crops was more than doubled and was significantly correlated with a reduction in the Mn concentration of shoots of wheat and in the roots of subterranean clover. However, when the first plant in the succession was a member of the Fabaceae (*Ornithopus compressus* L.) shoot growth of both crops increased by 1.6 times relative to that determined if the first plant was from the Poaceae (*Lolium rigidum* L.), even though no differences were observed in AC or Mn concentration. These results seem to be associated with the AMF assemblage in the roots of the first plant that was passed to the second plant when the ERM was kept intact; whatever was the combination of plant families. The presence in the soil of an intact ERM also induced better growth of tomato plants (3.2 times at 21 DAP) after infection with *Fusarium oxysporum* (10^9 conidia/plant).