Towards an understanding of interactions between serrated tussock (*Nassella trichotoma*) and soil fungal communities

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Summary Serrated tussock (*Nassella trichotoma*) is a grass of South American origin that has become a weed of pastures in southeastern Australia. It has been designated a weed of national significance (Thorp and Lynch 2000), and has been the subject of considerable research. However, so far little research effort has been directed towards understanding the interactions between serrated tussock and fungal communities in the soil. This PhD project is currently in its early stages, but already the literature review has suggested a range of possibilities for exploring plant-fungus interactions for this species.

Fungal pathogens with potential as biological control agents have been identified that attack the seed (Casonato *et al.* 2004, Casonato *et al.* 2005) and roots (Hussaini *et al.* 2000) of serrated tussock, but there may also be positive mutualisms between the plant and soil fungi. For example, many grasses have beneficial mutualisms with fungal endophytes that confer attributes such as resistance to herbivory, and increased plant growth and seed production (Clay 1990, 1998). Successful invasions by exotic plant species can be affected by complex and often beneficial effects of local soil microbial communities (Callaway *et al.* 2004). Such invasions can alter the composition of fungal communities in the soil, with negative impacts on native host plants (Allen *et al.* 2003). Because serrated tussock is unpalatable, nutrients are conserved within the plant and are thereby unavailable to microorganisms in the soil. This would be expected to have consequences for other plant species, and may partially explain the ability of serrated tussock to invade temperate Australian grasslands (Badgery *et al.* 2005). From this range of issues, research questions and appropriate methodologies will be defined to increase knowledge of this critical, but so far largely neglected aspect of the ecology of serrated tussock.

Keywords Fungi, mutualisms, parasitism, endophytes.

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