The weed control paradox: effect of management disturbance on the composition and structure of invaded communities

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Summary Disturbance has a complex role in invasive species ecology. It is thought to increase the susceptibility of a community to invasion (Hobbs and Huenneke 1992, Davis *et al.* 2000, Melbourne *et al.* 2006), and to be partly responsible for maintaining high diversity in a community by perpetuating spatial heterogeneity (Connell 1978, White and Jentsch 2001, Melbourne *et al.* 2006). Therefore the process which allows a new species to enter a community may also limit its dominance (Hobbs and Huenneke 1992, Kotanen 1995, Melbourne *et al.* 2006). Invasive species management is a disturbance of invaded plant communities. The intensity, frequency and duration of this disturbance vary greatly with management action and are therefore likely to have different impacts on community regeneration. Composition of propagule pools is also an important component of regeneration and recently developed models predict that if weed propagules are present at a disturbed site the weed will colonise the site irrespective of the presence and abundance of other species (Buckley *et al.* 2007). This field based study tests this assumption under different management actions.

The study examines regeneration after management of *Lantana camara* L. (lantana) in wet sclerophyll secondary forest. A field experiment was established in February 2007 on a private property adjacent to Richmond Range National Park, Northern NSW. Three management actions were undertaken: herbicide applied with innovative technology, mechanical removal with follow-up herbicide treatment and control where no management was undertaken. Regular measurements of temperature, humidity and leaf litter buildup are used to characterise impact of each management action on the abiotic environment. Understorey and overstorey vegetation has been monitored at large (30 m^2) and small (1 m^2) scales in order to examine both community level regeneration and immediate correlations among seed availability and establishment. Propagule availability is monitored by regular measurements of the seed bank and seed rain; comparisons among the composition of these propagule pools and vegetation are then made to address questions on mechanisms behind regeneration after weed management. Results will be presented and discussed in the conference presentation.

Understanding the impacts of invasive species management on recolonisation and regeneration of plant communities should be an important factor in management decision making. This project examines mechanisms behind regeneration after different management actions to address this issue.

Keywords Invasive species, *Lantana camara*, regeneration.

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