

Movement of dieback through a stand of parkinsonia – a time series study

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Summary *Parkinsonia aculeata* L. is one of Australia's top 20 weeds and control options such as application of herbicides are often limited due to environmental concerns. Although three biological control agents have been released in recent years, so far none of these have proved successful. A group of naturally occurring fungi causing dieback has been observed in stands of parkinsonia across northern Australia and these are being trailed as inoculative biological control option. Communication with landholders provided evidence that parkinsonia dieback is not a new phenomenon. Dieback has been observed for the past 50 years in areas of Queensland (T. Kendall pers. comm. 2006). Some landholders stopped activities to control parkinsonia due to the presence of parkinsonia dieback. Large infestations of parkinsonia have been killed with no external input from the landholder (T. Kendall, pers. comm. 2006). In recent studies, three fungi (*Lasiodiplodia theobromae*, *Fusicoccum dimidiatum* and *Fusarium* sp.) have been shown to cause dieback disease symptoms when adult parkinsonia trees were inoculated (Diplock *et al.* 2006, N. Diplock unpublished data 2007).

To gain an understanding of the ecology of this dieback disease, two transects (50 m × 8 m) have been set up in naturally-occurring dieback areas 25 km north of Hughenden, Queensland to monitor the movement of the disease in its natural state over time. Transects were established with the origin being situated in dieback-affected plants, moving through to apparently healthy plants. At the commencement of the study, plants were identified according to location point on the transect. Assessments were then carried out annually.

The dieback disease moved as a front into the healthy section of the transect from the north. Plants showing no signs of dieback at the beginning to the study appear to be suffering from the disease two years later. Plants showing severe signs of dieback two years ago are now dead. There has been minimal seedling recruitment following rain, with only one new seedling observed on one transect, suggesting the presence of this dieback disorder is detrimental to seedlings either before or soon after emergence. Further research in this area is needed to understand the relationship between these fungi and seedling ecology. These results so far show a steady spread of plant disease through the stand with no external input, indicating this may be a useful management tool for parkinsonia.

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