Prospects for Hudson pear biological control in Australia

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Summary Hudson pear (*Cylindropuntia rosea* (DC.) Backeb.) is an invasive cactus of Mexican origin that has naturalised in a variety of habitats in north-western NSW and continues to spread. It seriously degrades invaded land and ecosystems and has the potential to reduce the viability of agricultural enterprises and impact on the biodiversity of native fauna and flora. *Cylindropuntia rosea* has spines which can penetrate footwear and even vehicle tyres. The spines can cause serious injury to humans, livestock and working animals such as horses and dogs and may present a severe impediment to mustering operations. The presence of *C. rosea* on flood plains is particularly worrying as a major flood event could result in a significant increase in its distribution including movement into the Darling River system.

Cylindropuntia rosea was first detected in Australia in the Lightning Ridge area during the late 1960s and is believed to have spread from a cactus nursery at Grawin. The current Australian distribution of *C. rosea* is north-western NSW (primarily around the opal mining areas of Lightning Ridge, Grawin and Glengarry and at Cumborah, although infestations have also been reported from Brewarrina, near Coonamble and Goodooga), South Australia (from the Flinders Ranges south to Morgan), in Western Australia, in the Northern Territory and in Queensland. Estimates of the area of NSW infested range from 60,000 to in excess of 100,000 hectares. Climate matching of the current Australian distribution of *C. rosea* using the Match Index function in CLIMEX ® indicates large areas of inland Australia have a similar climate to the current core infestations of *C. rosea* and are therefore potentially at risk of invasion.

Control of *C. rosea* using herbicides is made more difficult by the types of terrain and vegetation in which infestations are located. *C. rosea* spreads by the movement of segments and fruit that root where they come into contact with the ground. As the plant occurs over an extremely large area it is not possible to successfully locate and destroy all potential propagules in an area. Use of herbicides over the large areas involved represents considerable costs for affected landholders and result in off-target damage to native species.

From 2003 to 2007 in excess of $750,000 was spent by NSW government agencies on *C. rosea* control in NSW alone. This does not take into account costs for control programs by private landholders. It is estimated that control works costing between $50,000 and $100,000 per annum will be required for the foreseeable future to minimise the spread of *C. rosea* in NSW.

The prospects for successful biological control of *C. rosea* are good as previous biological control programs targeting cacti have proven highly successful. *Dactylopius tomentosus* (Lamarck), a species of cochineal insect introduced into Australia in 1925 to control rope pear (*Cylindropuntia imbricata* (Haw.) F.M.Knuth), attacks *C. rosea* but is not particularly damaging. Recent research in Mexico funded by South Africa has identified a biotype of *D. tomentosus* which is specific to *C. rosea* and is likely to be more damaging. There should be few host specificity issues associated with the introduction of an additional *D. tomentosus* biotype as there are no Australian native species in the Cactaceae family.

Western Catchment Management Authority and NSW DPI have each committed $85,000 towards a future biological control program for *C. rosea*.

Keywords *Cylindropuntia rosea*, Hudson pear, biological control.

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