

Managing perennial summer weeds with competitive pastures

Rex Stanton¹, Hanwen Wu², Brian Dear² and Deirdre Lemerle¹

¹ EH Graham Centre, Pine Gully Road, Wagga Wagga, New South Wales 2650, Australia

² NSW Department of Primary Industries, Pine Gully Road, Wagga Wagga, New South Wales 2650, Australia
Email: rex.stanton@dpi.nsw.gov.au

Summary Prairie ground cherry (*Physalis viscosa* L.) and silverleaf nightshade (*Solanum elaeagnifolium* Cav.) were both introduced into Australia from central America in the early 20th century as contaminants of fodder and grain (Parsons and Cuthbertson 2001).

Both these species are deep rooted, summer active perennials that utilise resources over summer, therefore competing directly with pastures and indirectly with the subsequent winter crops. Herbicides are relied upon as the primary method of controlling these weeds, although few land managers have reported successfully eradicating wide-spread infestations.

Tideman (1960) reported that silverleaf nightshade did not appear to be greatly controlled by pastures containing either lucerne or phalaris. However, pastures are still worth consideration in an integrated weed management (IWM) program, as Wapshere (1988) reported that silverleaf nightshade densities declined over three years in fields returned to pasture after a cropping phase. Moerkerk and Snell (2003) have suggested that competitive perennial pastures are a control option for prairie ground cherry.

Our research aims to identify a range of summer pasture species that will suppress prairie ground cherry and silverleaf nightshade populations. Use of competitive pastures within an IWM program will have the benefits of increasing available summer pastures and decreasing reliance on herbicides for weed management.

Field sites have been selected throughout the current range of these two species in New South Wales to cover a diversity of climates, with a site at Wellington with summer rainfall and other sites near Ganmain, Narrandera and Tocumwal with winter dominant rainfall patterns.

Sub-tropical pasture grass species (Premier Digit grass, Katambora Rhodes grass, Bambatsi panic), phalaris, lucerne and chicory are being evaluated for

control in summer rainfall areas, while biserrula, lucerne, cocksfoot and phalaris are being evaluated at the southern sites. All pasture species are sown individually with sub-clover, and also as a mixture. A control treatment of sub-clover is included at all sites.

Field sites are arranged as randomised complete blocks, with individual plots 20 × 6 m. The prairie ground cherry and silverleaf nightshade populations are monitored using four fixed 1 × 1 m quadrats within each plot. Performance of the pastures (composition, biomass, percent ground cover) will be recorded seasonally using 0.25 m² quadrats randomly placed within the plots.

Keywords Silverleaf nightshade, pasture, competition.

ACKNOWLEDGMENTS

The authors thank Craig Rodham (NSW Department of Primary Industries, Wagga Wagga) for assistance sowing the trials, and David Pickering (NSW Department of Primary Industries, Orange) and Bruce Ferry (Central Murray County Council, Finley) for assistance in field site maintenance and data collection.

REFERENCES

- Moerkerk, M. and Snell, K. (2003). Integrated management of prairie ground cherry. Weed management workshop notes, Victorian DPI, Tatura.
- Parsons, W.T. and Cuthbertson, E.G. (2001). 'Noxious weeds of Australia'. (CSIRO Publishing, Melbourne).
- Tideman, A.F. (1960). Tomato weed in South Australia (*Solanum elaeagnifolium* Cav.). Proceedings of the 2nd Australian Weeds Conference, Volume 1, Paper 64. (CSIRO, Melbourne).
- Wapshere, A.J. (1988). Prospects for biological control of silverleaf nightshade, *Solanum elaeagnifolium*, in Australia. *Australian Journal of Agricultural Research* 39, 187-97.