

Improving lotus persistence through breeding and management

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Lotus is a summer growing perennial legume adapted to acid, low-fertility soil on the coast and tablelands of NSW. There are two types of Lotus available commercially:

- Greater lotus (*L. pedunculatus*; GL) is rhizomatous, tolerates waterlogging and high levels of Al in the soil; and
- Birdsfoot trefoil (*L. corniculatus*; BFT) has a tap-root and is drought tolerant.

Both GL and BFT contain condensed tannins which prevent bloat and allow for some protein to by-pass the rumen. However, adoption of Lotus may be limited by poor persistence under traditional grazing management (Blumenthal *et al.* 1994).

Plant breeding

There are two GL cultivars commercially available: Grasslands Maku is a late flowering tetraploid with a longer daylength requirement for flowering than the diploid cv. Sharnae. Daylength north of Taree is not long enough for a prolific amount of Maku seed to be set; Sharnae, on the other hand, is able to set large amounts of seed in northern NSW. Tannin levels in both Maku and Sharnae exceed the 3% thought optimal for provision of by-pass protein and prevention of bloat. Tannin levels in Sharnae can often exceed 10%. A new cultivar is being developed based on the diploid parents Sharnae, G4703 and G4704. Half-sib families, formed after two cycles of selection for early maturity and low tannins will be evaluated for persistence and yield at Canberra, Berry, Casino and Glen Innes.

The BFT cultivar, Grasslands Goldie, has the optimum level of tannins (3%) but has a semi-erect habit not well suited to close grazing by sheep. In preliminary studies of a range of BFT introductions,

variability in habit was identified. A more prostrate "Spanish type" has been selected and seed increased for evaluation under different grazing systems. Grazing management

Commercial experience and preliminary research indicates that both GL and BFT require lenient grazing management for maximum yield and persistence. A longer spell gives a pronounced increase in yield and rhizome development and subsequent survival in cv. Maku. Experience in New Zealand and the USA indicates that rotational grazing with a summer spell in the second or third year after sowing favours BFT yield and survival.

To examine the local effects of grazing intensity and spelling time on yield and persistence, trials are being established at four sites (Canberra, Nowra, Casino and Glen Innes) comparing three Lotus cultivars with seven different grazing treatments. In addition to these experiments graziers are involved in "co-learning" sites. At these sites traditional grazing management will be compared to strategic grazing management on a paddock scale. Trial and "co-learning" studies should enable realistic grazing strategies to be developed for the persistent use of Lotus in coastal and tableland NSW.

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References

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