

White clover germplasm development

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White clover improvement in Australia operates under the Australasian Perennial Legume Improvement Program and comprises two projects; Project 1 - "Improvement of white clover for persistence and winter growth in high rainfall/irrigated

dairy pastures" and Project 2 - "Improvement of white clover for persistence in dryland beef and sheep pastures". Project 1 is run from Hamilton in Victoria (Victorian Department of Agriculture) and Project 2 from Glen Innes in NSW (NSW Agricul-

ture). This paper highlights progress with germplasm development at Glen Innes that provides essential infrastructure for Project 2.

Methods

Methodology includes assembling a world sourced germplasm collection, germplasm conservation, characterisation and genetic analysis. The objective is to conserve white clover germplasm and to develop information on performance characteristics of each line. This provides for the timely development and release of new cultivars for the target range of dryland pasture environments.

Results and Discussion

White clover collection

The collection totals ca. 580 discrete lines including a significant representation (36%) of Mediterranean lines that are a valuable source of winter-active/summer-dry germplasm. The collection also includes Australian ecotypes (20%) and lines from northern Europe, America (North and South) and Africa.

Germplasm conservation. Overseas lines are screened for exotic viruses, seed increased in isolation and stored under cold room (working collec-

tion) and deep freeze (back-up collection) conditions. Seed multiplication is undertaken on lines that merit evaluation.

Characterisation

Some 442 lines have been characterised in the glasshouse and field (2 years data) to provide comprehensive information on important characters (eg. stolon density, stolon branching, root node frequency) and yield performance. Results show significant genotypic variation in key stolon characteristics and potential for genetic improvement (Jahufer et al 1994). Research on genetic variation and genotype x environment interaction is directed at developing more effective breeding strategies for white clover improvement.

Acknowledgment

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References

- Jahufer, M.Z.Z., Cooper, M. and Brien, L.A. (1994). Genotypic variation for stolon and other morphological attributes of white clover (*Trifolium repens* L.) populations and their influence on herbage yield in the summer rainfall regions of New South Wales. *Australian Journal of Agricultural Research*, **45**: 703-720.