

White Clover Ecotype Collection From a Summer Rainfall Environment

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The White Clover Resource Centre was established at Glen Innes in 1989 as a national germplasm facility for white clover improvement in Australia. Work of the Resource Centre includes:

- the establishment of a world-sourced white clover germplasm collection,
- conservation of the germplasm; and
- characterisation of accessions.

Characterisation data shows significant morphological diversity (Jahufer *et al.*, 1994). However, there is a need to strengthen the collection with accessions which possess persistence characteristics and adaptation to summer rainfall environments. This paper describes a white clover ecotype collection and reports preliminary characterisation results.

Methods

A plant collection of white clover genotypes was undertaken in northern New South Wales between latitudes 29°7S and 32°9S during spring 1993. Sites covered a range in altitude from 170 to 1460 m, average annual rainfall varying between 600 and 1300 mm. Collection sites were selected from old pastures aged between 12 and 30 years.

Sixty core samples of white clover were taken from each site and propagated in the glasshouse - a sample size of 30 vegetative units is considered a minimum for a cross-pollinated pasture species (Burton and Ellis Davies, 1984). *In situ* characterisation consisted of measurements of plant type, stolon density, stolon branching and white clover content in the

pasture. Local records were obtained of rainfall, fertilizer/chemical applications and grazing enterprise. Further characterisation will be done under glasshouse and field plot conditions.

Results and Discussion

Since white clover genotypes were collected as vegetative samples from grazed pastures, only plants that had survived within the pasture were collected, resulting in a population of adapted genotypes. Preliminary measurements indicate that the collected populations show substantial variation in leaf size, stolon density and stolon branching. These populations represent mainly the intermediate leaf size type with some representatives of small and large leaf types. There was little evidence of infusion of local populations with contemporary cultivars (such as cv. Haifa). Further characterisation will attempt to relate morphological differences among the genotypes with habitat of origin and investigate ecotype development within the populations. Some of these ecotypes will be used in a new breeding project aimed at developing cultivars for northern dryland environments.

References

- Burton, G.W. and W. Ellis Davies (1984). "In Crop Genetic Resources: Conservation and Evaluation". Eds. J.H.W. Holden and J.T. Williams. pp. 181-190.
- Jahufer, M.Z.Z., M. Cooper and L.A. Brien (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 region of New South Wales. *Australian Journal of Agricultural Research*, 45: 703-720.