

Genotypic Variation of Stolon Attributes in White Clover Cultivars

M.Z.Z. Jahufer, L.A. Lane and J.F. Ayres

NSW Agriculture

Agricultural Research & Advisory Station, Glen Innes, NSW, 2370

Genetic improvement from plant breeding depends on the type and magnitude of genetic variation present in prospective germplasm. Characterisation of germplasm enables plant breeders to use genetic diversity more efficiently (Beuselinck and Steiner 1992). A world-sourced collection of about 700 white clover accessions comprising wild ecotypes and cultivars is maintained by NSW Agriculture at the White Clover Resource Centre, Glen Innes. This collection has been characterised for morphological attributes and seasonal herbage production relevant to agronomic performance in dryland environments (Jahufer *et al.*, 1994). This paper reports on genotypic variation in key stolon attributes and contrasts local commercial cultivars with a random sample from the national collection.

Methods

The characterisation nursery consists of 3 x 3 m plots for each accession in a randomised complete block design with two replicates. Plots are planted with 25 spaced plants. Stolon measurements (stolon density, stolon branching, internode length, stolon thickness and root node frequency) were taken from the nine central plants four months after planting. The set of commercial cultivars characterised were cvv. Clarence, El Lucero, Haifa, Huia, Irrigation, Tahora and Tamar. The random sample consisted of 60 accessions (23 cultivars and 37 ecotypes).

Results and Discussion

There was significant variation ($P < 0.05$) in all stolon attributes. In comparison with the set of commercial cultivars, the random sample had a wider range of variation for all five stolon attributes. Especially large differences were present for stolon density and stolon branching. The wide range of genotypic variation in stolon attributes in the random sample shows that the national germplasm collection has substantially broader genetic diversity for these characters than commercial cultivars. This diversity in the national collection will provide an adequate basis for genetic improvement of white clover to develop new cultivars with better persistence for dryland sheep and cattle pastures.

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References

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- 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**: 703-20.