

Potential of *trifolium subterraneum* ssp. *Brachycalycinum* for northern N.S.W.

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Subterranean clovers contribute significantly to winter pasture production and quality in Northern New South Wales, and should persist under the summer dominant rainfall conditions if adequate seed reserves are maintained (1). Clare, which is the only available cultivar of *Trifolium subterraneum* L. ssp. *brachycalycinum* is highly productive and suited to the heavier textured red and black self-mulching soils with slightly acid to neutral pH, but lacks high levels of hardseed. This study was undertaken to examine the potential of a range of ssp. *brachycalycinum* lines for use in Northern New South Wales.

Methods

Seed of twenty advanced lines of ssp. *brachycalycinum* were compared with Clare and four *T. subterraneum* cultivars (Nungarin, Dalkeith, Seaton Park and Woogenellup). Twenty five seedlings of each were planted into plots measuring 1 m x 1 m in autumn, 1983. The trial design was a randomised complete block with three replications. Dry matter yields were visually estimated in late winter and spring and seeds from each plot were recovered from soil (0.05 m² in area and 5 cm deep) in December and August over a three year period. Plots were usually grazed following yield estimations in late winter.

Results and Discussion

In the first year most lines flowered within the flowering period of Seaton Park and Clare or approximately 108-131 days after germination on May 23. Lines with the best overall growth and seed production all flowered within a few days of Clare (126 d) and Woogenellup (124 d).

Seed yields of the lines in 1983 were between 9000 and 27000 seeds/m², compared with 15000 for Clare and 22000 for the highest yielding *T. subterraneum* cultivar, Seaton Park ($P < 0.05$). In the second year, Dalkeith and Nungarin plots contained the highest seed numbers but 5 lines of ssp. *brachycalycinum* were higher than Seaton Park and most exceeded that of Clare. By year three, eight lines had higher seed yields than Seaton Park, with the best lines containing around 30000 seeds/m² compared with 18000 seeds/m² for Seaton Park ($P < 0.05$) and 11000 for Clare. Residual hardseed levels of most lines generally exceeded those of Woogenellup, Clare and Seaton Park (100- 2000 seeds/m²). Four lines had residual hardseed numbers within the range of the highest cultivars, Dalkeith and Nungarin in both years (2800-9800 seeds/ m²). The proportion of buried burrs was generally lower for the ssp. *brachycalycinum* lines with a mean of 69% compared with 88% for the *T. subterraneum* cultivars.

Dry matter yields of the ssp. *brachycalycinum* lines also compared favourably with the *T. subterraneum* cultivars. For example, during winter 1984, Clare produced significantly higher yield (2180 kg DM/ha) than Woogenellup (1310 kg DM/ha, $P < 0.05$) which was the most productive *T. subterraneum* cultivar but was only ranked 13th overall. Spring production was also high in some lines of ssp. *brachycalycinum*. In 1985 for example, the highest yielding line produced 2890 kg DM/ha compared with 2330 kg DM/ha for Clare (ranked 10th, $P < 0.05$) and 1970 kg DM/ha for Woogenellup (ranked 16th).

Some lines of *T. subterraneum* ssp. *brachycalycinum* such as 70114A, 14711B and 70056B had both high growth and seed production characteristics indicating their excellent potential for Northern New South Wales. However, further evaluations necessary, especially for oversowing into a competitive sward of native perennial grasses.

1. Hagon, M.W. 1974. Aust. J. Exp. Agric. Anim. Husb. 14 57-64.