

## Differing winter production of subterranean clover cultivars

C.T. de Koning and E.D. Carter

Agronomy Department, Waite Agricultural Research Institute, The University of Adelaide, Glen Osmond, South Australia, 5064

Since the early 1950's farmers and research workers have observed that some cultivars of subterranean clover (*Trifolium subterraneum*, *T. vavilovii*, and *T. brachycalycinum*) grow more vigorously than others during the winter months (1). However, the large differences in stature of cultivars means that appearances can be deceptive: hence there has been a good deal of controversy over potential winter production of various cultivars (2,3). Many factors and reasons e.g. low temperatures and waterlogging have been proposed for the apparent differences in winter production of the various cultivars. The experiment reported here aimed to quantify the effects of temperature and waterlogging on growth of subterranean clover.

### Methods

The five cultivars Yarloop, Trikkala, Clare, Mt Barker and Larisa were grown in growth cabinets to study the effects of temperature and waterlogging. Uniform seed size was used for the experiment. In the experimental design there were 5 Cultivars x Waterlogging x 3 Replicates = 30 pots for each of three temperature regimes (24°C day/16°C night; 18°C d/ 12°C n; 12°C d/ 5°C n). Sterilized, fully fertilized, red brown earth was used in 15cm square pots. Germinated seeds were planted 1cm deep at a density of 1000 plants/m<sup>2</sup>, and grown under a 12hr. photoperiod. Harvest 1 was taken at full emergence prior to placement in the growth cabinet, harvest 2 at 10 days in the growth cabinet (? waterlogging imposed), and harvest 3 (final harvest) at 30 days in the growth cabinet.

### Results and Discussion

Irrespective of temperature or waterlogging Yarloop and Clare were consistently high yielding (Table 1).

**Table 1. Yield of subterranean clover tops (mg.D.M./plant) 30 days after emergence (mean of ? waterlogging treatments).**

	24°C d/16°C n	18°C d/ 12°C n	12°C d/5°C n
Yarloop	144	105	65
Trikkala	102	95	50
Clare	145	111	62
Mt. Barker	99	85	49
Larisa	113	86	44
Level of Sig.	***	***	***
L.S.D. (5%)	10	8	4

\*\*\*P<0.001

Cultivars differed in their ability to grow at low temperatures. Larisa had the greatest reduction in growth at the lowest temperature. Significant reductions in yield by waterlogging were found only at the lowest temperature. This research has shown clearly that some cultivars notably Clare and Yarloop, have an inherent ability to grow better than others: these studies are continuing.

1. Carter, E.D. 1954 *The Chronicle*, Adelaide. 94, #5462 Aug.26, 1954, Stud Stock Supplement pp. 22-24.

2. Rossiter, R.C. and Collins, W.J. 1980 *Aust. J. Exp. Agric. Anim. Husb.* 21: 197-201.

3. Wolfe, E.C. 1982. Annual Report 1981/82, Agric. Res. Ins., Wagga Wagga, N.S.W.