

EVALUATION OF SUBTERRANEAN CLOVER CULTIVARS AND LINES AT TAMWORTH

Ken Archer
NSW Agriculture and Fisheries
Agricultural Research Centre
Tamworth 2340

Initial studies in the Inverell area (Archer 1981) indicated that the aerial establishment of legumes such as woolly pod vetch and Haifa white clover was the most effective means of improving the production and quality of natural pastures, especially during winter. In these studies, subterranean clovers were given little emphasis because the summer rainfall and heavier textured soils in the region were not considered suitable, and earlier evaluation of subterranean clovers (Buckley 1960; Hagon 1974) was not very encouraging. However, results with the cultivar Clare (Trifolium brachycalycinum) at Inverell warranted further testing and in follow-up trials on lighter textured soils at Ashford, subterranean clovers were consistently the most productive legume species. Subsequent studies in the Tamworth/Barraba area (Archer et al. 1987), the Inverell/Ashford area (FitzGerald 1986), and in the Upper Hunter (Hill pers. comm) have fully confirmed the wide adaptation and long-term persistence of subterranean clovers in the north.

Subterranean clover is now widely recognised as the legume species most suitable for aerial sowing or direct drilling into natural pastures on the Northwest Slopes. Although current cultivars have proven to be satisfactory, each has some limitations which could be improved. The trials at Tamworth form part of the long process in evaluating new lines for possible release as improved cultivars.

THE NATIONAL SUBTERRANEAN CLOVER IMPROVEMENT PROGRAM

This is an Australia wide program designed to breed, select and release improved cultivars of subterranean clover. The program is based in Perth where all breeding and initial screening is undertaken. Seed is then sent to other States for field testing. Final selections for release of cultivars are made usually on the basis of widespread adaptation. The trials at Tamworth comprise part of this process.

DESCRIPTION OF TRIALS**1. Mid-late season T. subterraneum clover evaluation.**

Subterranean clovers are classified according to their maturity, that is, the number of days between germination and flowering. Evaluation of lines is usually done within maturity groups, and the trial at Tamworth represents the mid-late maturity group. A second trial (not at the inspection site) includes the potentially better adapted early-mid season lines.

The mid-late season trial contains nine lines which are being compared with four commercial cultivars of subterranean clover. Other species included in the trial include balansa clover (Trifolium balansae), Persian clover (Trifolium resupinatum) and murex (Medicago murex). All

plots have been fertilized annually with superphosphate, and dry matter and seed production are measured.

2. T. brachycalycinum evaluation.

There are three species of subterranean clovers, Trifolium subterraneum, T. yanninicum and T. brachycalycinum. Most cultivars belong to the first species, however it is the third of these species that has become of particular interest in this region. Clare and Rosedale are effectively the only commercially available cultivars of this species. Clare has been successful in northern areas, particularly on heavier textured soils of neutral to alkaline pH. This success has prompted the establishment of an evaluation program of introductions of T. brachycalycinum, and some potentially valuable lines have already been identified (Archer 1987). These lines are currently being evaluated in district trials, such as that at the inspection site, and also in association with the Medic Evaluation Project supervised by Bob Wetherall. Results indicate that this species has considerable potential for use in the Northwest, and at least one line could be suitable for release as a cultivar.

The trial at Tamworth contains 10 lines of T. brachycalycinum and these are being compared with Clare and five cultivars of T. subterraneum. A plot of Haifa white clover has also been included, and two plots were left unsown to measure production from the natural pasture, which contains some naturalized annual legumes in addition to the native grasses. All plots, except one of the unsown natural pasture plots, have been fertilized annually with superphosphate. Thus comparisons can be made between unfertilized natural pasture, fertilized natural pasture and sown and fertilized natural pasture. Dry matter production and seed yields are measured.

Both of the trials were established in May, 1987, by spreading inoculated, lime-pelleted seed into the existing, untreated natural pasture. Due to extremely dry conditions, about 25 mm of water was applied to aid establishment. Although this was not desirable, it had to be balanced against the possible loss of valuable seed which at this stage of testing is in very limited supply. Fortunately, establishment at other sites was also satisfactory without the application of water.

RECOMMENDATIONS

Results from these and similar trials have produced cultivar recommendations for the region which are essentially based on elevation. These recommendations, in order from low (300 m) to high (1000 m) elevations are: Dalkeith, Seaton Park, Junee, Clare, Woogenellup and Karridale. Seaton Park has proven to be the most widely adapted and reliable cultivar, especially for aerial establishment. Mixtures are also recommended e.g. Dalkeith and Seaton Park, Seaton Park and Clare.

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