The poor subterranean clover stands of dairy pastures in the Adelaide hills

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At the 1982 Agronomy Conference attention was focussed on the serious decline of both annual medics and subterranean clover in the cereal-livestock zone southern Australia (1,2). A similar decline of subterranean clover has been noted in the higher-rainfall dairy pastures of the Adelaide Hills. This lack of clover has decreased the quantity and quality of pasture available to dairy herds and has resulted in excessive amounts of expensive concentrates and other purchased feeds being used by dairy farmers. A joint research program of the Waite Institute and the S.A. Department of Agriculture began in March 1984 to get much-needed data on typical grazed dairy pastures.

Methods

Ten paddock sites were selected; sites 1 to S in the Wistow district on grey- brown podzolic soils (alt. c.300m, rainfall c.700mm) and sites 6 to 10 in the Meadows district on meadow podzolic soil (alt. c.350m, rainfall c.880mm). In March 1984, prior to the opening rains, five quadrat cages (1.5m square) were placed in position at each site and 25 soil cores (0-Scm) were taken to determine total seed reserve of subterranean clover. Data on emergence of subterranean clover, available pasture, pasture production and botanical composition, and percentage bare ground were collected through the growing season. Regular herbage harvests were at 28-day intervals.

Results and Discussion

Insufficient rain at the start of the growing season caused some loss of subterranean clover plants which contributed to the high percentage of weeds and excessive bare ground (Table 1). *Arctotheca calendula* also volunteer grasses e.g. *Bromus* spp., Hordeum spp. and *Vulpia myuros* were common in both districts. *Erodium* sp. was common in the Wistow district.

Table 1. Subterranean clover seed reserves, emergence, percentage botanical composition and bare ground in dairy pastures, Wistow and Meadows.

Site	Seed Reserve March 22 (kg/ha)	Seed Reserve March 22 (#/m^2)	Emergence April 5 (#/m^2)	Levy Point Quadrat Data July 11+ Clover (%)	Grass (%)	Weeds (%)	B/Ground (%)
1	3	57	0	2.6	7.9	89.5	38
2	249	4846	655	6.5	83.8	9.7	54
3	91	1854	204	12.7	61.9	25.4	16
4	114	2559	529	48.0	20.5	31.5	18
5	298	5528	539	28.0	66.0	6.0	30
6	382	5631	546	8.1	87.1	4.8	32
7	297	3765	490	20.0	78.7	1.3	6
8	30	546	143	trace	77.4	22.6	18
9	54	1217	168	1.3	32.0	66.7	10
10	38	683	139	9.5	32.2	58.3	8

+Botanical composition data shown as percentage overlapping cover.

This research has shown that subterranean clover seed reserves in the top 5cm of soil are a reliable indicator of emergence (r=0.855**) and potential productivity. Only at sites 2,5,6 and 7 were clover seed reserves satisfactory: a minimum seed reserve of 200 kg/ha is desirable at the time of the first autumn rains. The percentage bare ground reflects not only seed reserves and consequent pasture density but also grazing management.

1. Carter, E.D. 1982. Proc. 2nd. Aust. Agron. Conf., Wagga Wagga, p180.

2. Carter, E.D., Wolfe, E.C. and Francis, C.M. 1982. Proc. 2nd Aust. Agron. Conf., Wagga Wagga, pp 68-82.