

The need for change in making the best use of medics in the cereal-livestock farming systems of South Australia

E. D. Carter

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

The past role of the annual species of *Medicago* (i.e., medics) in successful cereal-pasture rotations of the integrated crop-livestock farming systems on the neutral to alkaline soils of southern Australia is undisputed. However, the recent spread of *Sitona* weevil and pasture aphids in addition to red-legged earth mite and lucerne flea has cast doubts on the efficacy of the annual medics and has caused farmer attitudes ranging from despondency to apathy. Recent studies have shown that poor stands of medics directly reflect inadequate seed reserves in the soil which may result from factors other than pasture pests, e.g. excessive grazing of pods in the summer-autumn period (1,2). The 1981 research briefly summarised here was aimed at relating pasture production and botanical composition to soil reserves of medic seed.

Methods

Thirty-five sampling sites of 25m x 25m area each comprising 25 strata of 5m x 5m were located in stubble paddocks on predominantly solonized brown soils of the Mallala district in Co. Gawler, South Australia. Soil cores were collected from each stratum in March to assess seed reserves of annual medics. Medic emergence/establishment counts (one 0.1m² quadrat/stratum) were made in May, June, July and August together with assessments of pasture availability, botanical composition and percentage bare ground. Hard seed reserves were measured in September and new seed yields in November. Thus a year-round account of medic seed gains and losses during 1981 was obtained.

Results and Discussion

Paddock sites have been classified on the basis of the March seed reserves (0-5cm soil) into six of the seven following medic status classes, viz.

1 = Extremely poor, 0-25 kg/ha; 2 = Very poor, 26-50 kg/ha; 3 = Poor, 51-100 kg/ha; 4 = Fair, 101-200 kg/ha; 5 = Good, 201-300 kg/ha; 6 = Very good, 301-400 kg/ha and 7 = Excellent, 401- kg/ha (Table 1).

Table 1. Classification of sites, and corresponding mean data on medic seed reserves, emergence, and percentage medic and bare ground, Mallala district 1981

Medic Status Class	Number of Sites	Seed Reserve (kg/ha)	Seed Reserve (#/m ²)	Cumulative Emergence + (plants/m ²)	Pasture Medic %	Survey ++ Bare ground %
1	14	9	394	35	8.5	38
2	3	33	871	80	31.6	38
3	5	71	2914	215	35.1	29
4	6	136	4745	387	53.7	13
5	3	244	9409	475	58.6	10
6	4	321	11625	985	72.3	6
7	0	-	-	-	-	-

+ Until 30 July, 1981

++ Data collected 18-24 August, 1981

This research has shown conclusively that medic seed reserves in the top 5cm of soil are a reliable indicator of potential density ($r = 0.86$) and productivity of medic pastures and core-sampling techniques are being developed to enable farmers to assess their needs for sowing additional medic seed before the

autumn rains. Farmers need to improve green pasture management to ensure better medic seed production and to regulate summer-autumn grazing more carefully to ensure adequate residues of pods, for replenishment of seed reserves through pod burial by the shallow tillage used for cereal cropping.

1. Carter, E.D. 1980. Proc. Aust. Agron. Conf., Lawes, Queensland, p. 178. Carter, E.D. 1981. Proc. XIV. Int.Grassl.Cong.Lexington,Ky., U.S.A. (in press)