Factors affecting seed production in Jemalong barrel medic based pastures at Roseworthy Agricultural College

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Success of annual medic species in cereal/pasture rotations in South Australia has depended on high seed yields and adequate proportions of hard seed. In recent years, Sitona weevil *(Sitona discoideus),* spotted alfalfa aphid *(Therioaphis trifolii)* and blue-green aphid *(Acyrthosiphon kondoi)* have greatly reduced medic productivity. At Roseworthy College, where soil and climate are particularly suited to Jemalong barrel medic, investigations commenced in 1980 to determine effects of stocking rate on pasture growth rates and seed production, sheep performance and the yield of following wheat crops in a 1:1 crop : pasture rotation. No control measures for the above insects have so far been adopted.

Methods

Two identical grazing trials were established: "A" in 1980 and "B" in 1981. They comprised four stocking rates (3,7,11 and 15 DSE/ha) with two replications and 4 sheep/plot. In alternate years, the area is cropped to wheat. Grazing treatments were imposed in July, but from 1982 they will be imposed year-round on pasture until cereal harvest and on cereal stubble until the autumn "break". Measurements on seed production included pod development and end-of-grazing seed yields (December 11 in 1980, January 6 in 1981-82) in the grazed paddocks, as well as in areas protected from grazing (from October 10 in 1980, October 22 in 1981).

Results and Discussion (Table 1)

Table 1 Jemalong seed yields (kg/ha) at four stocking rates in 1980 and 1981, and estimates of seed eaten by sheep

Sampling Date	Grazed until	3 DSE	7 DSE	11 DSE	15 DSE
"A"					
(a) 11.12.80	10.10.80	108	97	15	43
(b) 11.12.80	11.12.80	72	50	24	6
Reduction due to grazing (a-b)		36	47	-9	37
"B"					
(a) 30.11.81	30.11.81	25	97	66	15
(b) 6.1.82	22.10.81	24	82	64	24
(c) 6.1.82	6.1.82	33	45	25	5
Amount eaten (a-c)		-8	52	41	10

In 1980, in fully grazed areas, pod numbers in spring and seed yields in December 1980 showed a close negative, linear relationship to stocking rate ($P<0.01$). In 1981, final seed yields in the fully grazed pasture were similar to those in 1980, except that yields at 3 DSE were much lower in 1981. This effect is attributed to a denser infestation of insects at the lowest stocking rate in the spring of 1981.

Restriction of grazing from mid-late October did not increase the yield of seed to normal levels. In contrast, in a cutting trial where insects and weeds were controlled (1) seed yields around 550 kg/ha were obtained even when plants were defoliated to a height of 5 cm at early flowering (September 20, 1980).

It is concluded that insect attacks during flowering markedly reduced seed production potential and that lowering stocking rates is unlikely to remedy this. Some insect control measures seem necessary to obtain reasonable seed yields for subsequent regeneration in Jemalong medic pastures.

1. Tow, P.G. and Abdelatif, Mohammed Al-Akailah (1982). Seed Science Newsletter, in press.