The effects of cereal straw on productivity of annual medic pastures

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It is a common observation that high concentrations of cereal straw, especially that left in walker rows after grain harvest, inhibit the development of medic-based pasture in the wheat-sheep zone of South Australia and elsewhere. Studies on the effects of cereal residues on the germination and early development of other crop species have been undertaken (1, 2) but the effects of straw on regenerating annual pastures has received little attention. This paper reports a preliminary survey aimed at quantifying the effects of straw in field situations.

Methods

Six stubble paddocks, located on Yorke Peninsula, South Australia, were sampled in mid-spring 1983. Botanical composition, percentage bare ground and medic plant density were assessed in quadrats located on straw walker rows and on adjacent inter-row areas. Vegetation was cut to ground level and samples handsorted into straw, medic, green cereal and weed components and oven dried. The width of walker rows and spacing were measured.

Results and Discussion

At all sites medic density was significantly reduced in straw walker rows and there were concomitant reductions in medic herbage production (Table 1).

Table 1. Effect of straw walker rows on medic plant density and dry matter yield of pasture sward components.

Site		Medic density (#/m^2)	Dry matter (kg/ha) Straw	Medic	Cereal	Weed
1.	Walker row	19**	4069**	194**	379**	194**
	Between	187	786	1967	127	1967
2.	Walker row	8**	2279**	52n.s.	441**	188**
	Between	16	642	143	18	1468
3.	Walker row	13n.s.	3134**	88**	110**	276**
	Between	29	1548	624	1	1659
4.	Walker row	56**	3555**	238**	1049**	7**
	Between	969	451	5810	33	469
5.	Walker row	18*	4241**	436**	1156**	1*
	Between	102	565	4099	128	311
6.	Walker row	108**	4843**	371**	2628**	2n.s.
	Between	627	1253	2631	2	177

*, ** significantly different at 5% and 1% level, respectively.

At sites 4, 5 and 6, where there were large ranges in medic herbage production, regression analysis was used to demonstrate an exponential decline in medic dry matter as straw density increased, r^2=0.89, 0.77. 0.71 respectively. The percentage bare ground was always greater on the walker rows compared with between rows. Taking into consideration the width and spacing of the walker rows and the retardation of medic herbage in the rows it was found that walker rows reduced medic dry matter, over an entire paddock, by 15.3% (mean of five sites).

1. Kimber, R.W.L. 1967. Aust. J. Agric. Res. 18 : 361-374.

2. Lovett, J.V. and Jessop, R.S. 1982. Aust. J. Agric. Res. 33 : 909-916.