

Effects of spotted alfalfa aphids and blue-green aphids on the dry matter production of some lucerne varieties

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The spotted alfalfa aphid (SAA) and the blue-green aphid (BGA) were first recorded in Australia as pests of lucerne (*Medicago sativa*) in autumn 1977 and subsequently caused widespread damage to Hunter River, the main lucerne variety. As a consequence SAA and some BGA resistant lucerne varieties were imported from the USA, but as yet their production under Australian conditions has not been determined.

Five lucerne varieties, three from the USA resistant to the SAA, WL 451, DeKalb 167 and Condura 73 and two Australian varieties Falkiner and Hunter River were sown at Tamworth N.S.W. in plots 8 x 3m at 6.5 kg ha⁻¹ inoculated viable seed on 37 October 1977. To compare the effects of aphid infestations on dry matter production half of each plot was sprayed regularly with a systemic insecticide, demeton-s-methyl at 130 g active ingredient per ha; the other half (unsprayed) received no insecticide. Dry matter production was measured on 15 December 1977, 37 January, 5 April, 36 June, 19 September and 6 November 1978.

Heavy SAA infestations (30 per seedling) at emergence resulted in seedling mortalities of 34% and 87% respectively in unsprayed plots of Falkiner and Hunter River (Hamilton et al. 1978). The mean seedling mortality in the unsprayed plots of the SAA resistant varieties was 17.3% and not significantly different from that in the sprayed plots. The subsequent dry matter production for the first year of production of these varieties is shown in the table.

TABLE 1. Dry matter production (kg ha⁻¹) of five lucerne varieties in sprayed (s) and unsprayed (u) plots.

	15 Dec.		27 Jan.		5 April		26 June		19 Sept.		6 Nov.	
	s	u	s	u	s	u	s	u	s	u	s	u
WL 451	1530	1172	2580	2367	1232	1180	1086	1020	2261	1928	1592	1462
DeKalb 167	1475	1025	2037	2429	1126	826	1246	977	2262	1876	1974	1302
Condura 73	1601	1398	2504	2206	998	1243	1120	1077	2292	1982	1780	1367
Falkiner	1229	710	2379	2592	1212	1025	1019	886	2245	1906	1560	1395
Hunter River	820	22	2738	673	949	121	983	166	2061	477	1862	1246

Up to 30 SAA per stem were recorded in the unsprayed Hunter River plots in February and April. At all harvests the dry matter production of unsprayed Hunter River was significantly ($P < 0.05$) lower than that of the three SAA resistant varieties in the unsprayed plots. At each harvest the production of the three SAA resistant varieties was not significantly different between the insecticide treatments, except in September 1978 when a mean of 13 BGA per stem reduced their yields by 15% in the unsprayed plots. These results further confirm the susceptibility of Hunter River to both SAA and BGA attack. With the levels of aphid infestations experienced in this experiment mature plants of SAA resistant varieties did not require insecticidal control for SAA, but insecticide application would have been necessary to prevent production losses as a result of BGA attack.

Hamilton, B. A., Greenup, L. R., and Lodge, G. M. (1978). *J.Aust.Inst.Agric.Sci.* 44 : 54.