

Effect of herbicides on nitrophilous weeds and the resultant establishment and development of surface-sown pasture species

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Nitrophilous weeds, (generally a mixture of thistles, other broadleaved weeds and troublesome annual grasses), which are widespread in New South Wales, reduce pasture production, injure livestock, restrict stock movement, add vegetable fault to wool and can be poisonous. No investigation into the control of these weeds on non-arable land had been made in the central tablelands of New South Wales up to 1974 when a series of experiments was started. This paper is a preliminary report on the third experiment in this series.

Eight herbicide treatments (table 1) were applied on May 13, 1976 (4 replicates), to a heavily grazed nitrophilous weed association near Orange, New South Wales (Campbell and McDonald 1979). Seed of *Medicago sativa*, *Dactylis glomerata*, *Festuca arundinacea* and *Phalaris aquatica* was broadcast on the soil surface with superphosphate 11 days later. Cattle were excluded from the area until January 1977, after which it was grazed normally.

TABLE 1. The effect of herbicides on nitrophilous weeds and resultant establishment and development of surface-sown species†.

Herbicide treatment (Kg a.i./ha)	Ground cover of weeds July 1976 (%)	Establishment of sown species† in October 1976 (plants/m ²)	Ground cover in June 1979	
			Sown species† (%)	Nitrophilous weeds (%)
Nil	82	2 d #	6 d	83
Glyphosate				
0.125	64	12 cd	6 d	78
0.25	46	28 bc	14 d	70
0.50	23	59 a	32 c	50
1.0	3	65 a	59 a	30
Amitrole + 2,2-DPA				
0.5 + 2.5	22	61 a	36 bc	49
0.75 + 2.5	16	59 a	37 bc	48
1.0 + 2.5	7	51 ab	47 ab	41

†*M. sativa* + *D. glomerata* + *F. arundinacea* + *P. aquatica*

#Means not followed by the same letter differ significantly ($P < 0.05$)

Results showed that establishment of sown species in 1976 and their percentage ground cover in 1979 was higher ($P < 0.05$) on all herbicide treatments (except the lowest rate of glyphosate in establishment and the two lowest rates of glyphosate in percentage ground cover) than on the control. Rate of glyphosate had significant effects on both establishment and ground cover of sown species but rate of amitrole had no significant effect. Establishment was achieved in 1976 as a result of herbicides killing at least some nitrophilous weeds. The sown species persisted until 1979 and replaced varying proportions of the nitrophilous weeds. Further recordings will be undertaken to trace the competition between sown species and nitrophilous weeds.

Campbell, M. H. and McDonald, W. J. (1979). *Aust. J. Exp. Agric. Anim. Husb.* 19: 448.