ALACHLOR IN VEGETABLE CROPS

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Summary

Alachlor was tested on a range of crops to assess weed control activity and selectivity. Results so far indicate that potatoes, kumaras, onions and vegetable brassicas are highly tolerant to pre-emergent treatments of 1.5 to 3.0 lb. Higher rates appear to be tolerated in areas of clay-type soils and low rainfall. This acetanilide displays exceptional activity to control annual grasses and many broadleaf weeds.

INTRODUCTION

ALACHLOR, on a world-wide basis, was found to exhibit exceptional properties as a selective pre-emergent herbicide. The compound appears selective on a wide range of crops. Although alachlor has some broadleaf weed control properties, the most promising area of use appears where grassy annual weeds have become troublesome.

This paper briefly deals with performances of the compound when used on the potato, kumara, onion and vegetable brassica crops.

EXPERIMENTAL

All treatments were applied with a back-packed knapsack on which was mounted a five-nozzle boom. The nozzle spacing of 16 in. gave an effective coverage of 5 ft. Compressed air was employed as a propellant. By using a pressure of 30 lb/sq.in., Monarch 39, fan-type nozzles, and a forward speed of 2.50 mph, an output of 30 gal/acre was achieved.

In most cases plot size was 1/200 acre with four replications per treatment. On occasions, observational strips were applied of 1/50 acre per treatment.

Weed control was visually assessed on a 0 to 10 scale as follows: 0 = nil control; 10 = 100% control. All rates are expressed in lb active ingredient per acre.

RESULTS AND DISCUSSION

POTATOES (Table 1)

Grass weeds are becoming very significant in the Pukekohe area in main crop potatoes. Species such as barnyard grass (*Echinochloa crus-galli*), smooth witchgrass (*Panicum dichotomiflorum*) and summer grass (*Digitaria sanguinalis*) have become quite dominant in certain areas. One season's work included four observational trials and one replicated trial.

KUMARAS

Barnyard grass continues to dominate this crop in the Ruawai area. Redroot (*Amaranthus retroflexus*) and black nightshade (*Solanum nigrum*) are also prevalent. Two seasons' work has been performed in the Bay of Plenty, Gisborne and Ruawai areas.

TABLE 1: WEED CONTROL IN POTATOES, PUKEKOHE

Treatment (lb)	Assessments			Yields (tons/ac Table Grade)
	Grass Weeds (5 wk)	BL Weeds (5 wk)	Grass & BL Weeds (13 wk)	
alachlor 2.0	8.0	7.2	8.8	10.6
alachlor 4.0	8.0	7.7	9.5	11.1
alachlor 2.0/linuron 1.0	10.0	9.7	9.0	8.8
Untreated control	2.0	2.0	6.0	10.9

Rainfall: 2.0 in. within one month.

BL = Broadleaf.

ONIONS (Table 2)

One season's work in the Pukekohe and Canterbury districts. Apart from the three main grasses, redroot, fathen (*Chenopodium album*), black nightshade and wild portulaca (*Portulaca oleraceae*) were the major weeds. The same weed spectrum existed in Canterbury except for redroot, summer grass and witchgrasses. Treatments were applied following crop emergence and prior to weed germination.

TABLE 2: WEED CONTROL IN ONIONS
(Crop damage 0-10 scale)

Trial 1 Pukekohe

	Assessments		Crop Damage	
	4 wk	10 wk	4 wk	10 wk
alachlor 1.5	9.00	9.00	0.0	0.0
alachlor 3.0	8.50	9.00	0.0	2.0
alachlor 5.0	10.00	9.50	4.0	6.0
propachlor 5.2	9.25	8.25	0.0	0.0
Hand-weeded control			0.0	0.0

Organic content: 5.16%. Rainfall: 4.0 in. in the first month.

Trial 2 Pukekohe

	Assessments		Crop Damage	Yield
	6 wk	10 wk	10 wk	(tons/ac)
alachlor 1.5	9.2	7.6	0.0	13.5
alachlor 3.0	9.4	8.2	2.0	14.3
alachlor 6.0	10.0	9.2	4.0	7.5
propachlor 5.2	6.6	5.8	0.0	15.5
Hand-weeded control			0.0	14.2

Rainfall: as above.

Trial 3 Canterbury

	Assessments		Yield
	6 wk	13 wk	(tons/ac)
alachlor 1.25	8.5	8.0	26.6
alachlor 2.50	9.0	9.0	26.1
alachlor 5.00	10.0	9.5	28.1
propachlor 6.00	9.5	8.0	28.5
Untreated control	4.0	0.0	24.6

Organic content: 36%. Irrigation following treatment: 0.4 in.

VEGETABLE BRASSICAS (Table 3)

The trial was performed at Nelson where once again the three main grass weeds dominated, plus redroot, fathen and black nightshade to a lesser extent.

TABLE 3: WEED CONTROL IN VEGETABLE BRASSICAS, NELSON

Treatment (lb)						Assessment at 6 wk
alachlor	1.0	....	....	....	....	6.8
alachlor	2.0	....	....	....	....	7.6
alachlor	4.0	....	....	....	....	9.9
propachlor	4.0	....	....	....	....	6.0
propachlor	6.0	....	....	....	....	7.5
propachlor	8.0	....	....	....	....	8.9
Untreated control		....	....	....	....	1.5

Irrigation following treatment: 0.5 in.

From general screening work, it appears that alachlor could prove a useful tool to control most annual grasses and some broadleaf weeds in many horticultural crops in New Zealand.

In many cropping situations, alachlor would suffice as a general herbicide. Where weeds such as wireweed (*Polygonum aviculare*), cornbind (*P. convolvulus*) and willow weed (*P. persicaria*) exist in association with grasses, a mixture would then be necessary such as alachlor/linuron (in potatoes, for example). Fumitory (*Fumaria officinalis*) is also resistant but is not considered important as it generally appears following maturation of annual grasses.

Residual life appears to be longer than at first thought. Evidence of activity at 13 weeks has been recorded following normal activation by moisture of average treatments which were then subjected to drought conditions.

Although selectivity was achieved on vegetable brassicas using alachlor (4.0 lb) in Nelson, some damage has been recorded on similar crops in Pukekohe at rates as low as 2.5 lb. The latter treatments were subjected to heavier than normal rainfall.

Similarly, some crop damage was recorded in onions at Pukekohe when subjected to high rates of alachlor and above-average rainfall during October and November.

Rates of 2.5 and 5.0 lb of alachlor gave excellent control of annual grasses and common broadleaf weeds in kumara crops at all sites. Some growers have recorded huge yield increases as the result of eliminating the weed competition at an early stage. Storage tests of the tuber are at present under way.

CONCLUSIONS

This material could prove a useful aid to crop production in areas infested with annual grass weeds in New Zealand.

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