CONTROL OF WEEDS IN BLUEBERRIES

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Summary

Better control of weeds in a blueberry *(Vaccinium corymbosum)* crop was achieved with hexazinone than with dichlobenil, glyphosate, terbacil and paraquat plus simazine. Not only did hexazinone control a wider spectrum of weeds but it also gave greater residual control and was well tolerated by the blueberries.

INTRODUCTION

The initial work with blueberries has previously been reported by Staniland *et al* (1978). Those trials showed that good weed control could be achieved with high rates of dichlobenil. However, when used on peat soils, even at high rates, it was found that dichlobenil was not very persistent and this resulted in the recommendation of biannual treatments to maintain a reasonably weed free crop.

Trial work commenced in 1978 to investigate the use of a more persistent herbicide, hexazinone, with the objective of achieving adequate weed control with an annual application. Hexazinone is both soil and foliar acting and controls a wide range of vegetation including annual and perennial grasses and broadleaf weeds (Du Pont 1977). This information, combined with the results of a pilot study in which hexazinone showed a long period of activity and was well tolerated by the blueberries, made hexazinone an attractive choice for further work.

MATERIALS AND METHODS

Trial work was continued on Rukuhia peat (53% organic matter) with three trials initiated in 1978. The first trial compared hexazinone, dichlobenil, glyphosate, terbacil and paraquat plus simazine for weed control in a blueberry planting. Data recorded were crop yield and visual assessment of weed control (Table 1). Two more trials were conducted on ground adjacent to the blueberries to test the persistence of dichlobenil and hexazinone in terms of weed control. Dry matter production of weeds, including grass, from these trials was determined by mowing and drying washed samples (Table 2). A further trial was conducted in 1979/80 to test the tolerance of blueberries to hexazinone (Table 1).

Trials were of randomised block design with four replicates. The herbicides were applied either with a hand held granule applicator or with a precision sprayer applying 370 litre/ha at 200 kPa. Herbicides applied to the blueberry crop were banded (0.6 m) on either side of the row and applied about the time that crop dormancy was breaking (19.9.78 and 7.9.79) except for treatment 10 which was applied when the crop was in flower (11.10.79). The treatments testing persistence of dichlobenil and hexazinone were applied overall to a browntop *(Agrostis tenuis)*/paspalum *(Paspalum dilatatum)*/ white clover *(Trifolium repens)* sward on 19.9.78.

RESULTS AND DISCUSSION

None of the herbicides tested in 1978/79 gave a yield increase over the untreated control but glyphosate resulted in a significant yield reduction. This was mainly due to the difficulty of applying glyphosate around small bushes and it was obvious that some spray drift had reached and affected the new growth. This was unfortunate because glyphosate gave very good control of the paspalum and browntop which are normally difficult to control. In the long term, however, the lack of residual activity with

TABLE 1: Blueberry production and weed scores for 1978/79. Treatments 2 - 9 applied 19.9.78 and 7.9.79; treatment 10 applied 11.10.79.

No	Treatment	Rate (kg/ha)	Production (gm/bush) 1978/79	1979/80	Weed score* 26.2.79	31. 3.80
1	untreated		1430 a	700	0.5 c	0.5 c
2	dichlobenil	11	1190 a		1.5 c	
3	glyphosate	2	990 b		0 c	
4	paraquat + simazine	0.5 + 2.5	1340 a		0 c	
5	terbacil	4.5	1240 a	810	4.0 b	4.5 bc
6	hexazinone	2		590		7.0 ab
7	hexazinone	4	1380 a	830	9.0 a	7.0 ab
8	hexazinone	8		860		9.5 ab
9	hexazinone	16		840		10.0 a
10	hexazinone	4		820		7.5 ab
				LSD 380		
CV%			42	34	39	31

* Weed score 0 = very weedy; 10 = no weeds present

glyphosate allowed grasses, principally Yorkshire fog *(Holcus lanatus),* to come away, resulting in the low weed control score at the final assessment (Table 1). At the time of the final weed assessment only terbacil and hexazinone resulted in control scores significantly higher than the untreated control with hexazinone giving much better weed control than terbacil. The principal weed of the terbacil treated plots was paspalum.

The results of the dichlobenil and hexazinone persistence trials (Table 2) show that hexazinone was more persistent than dichlobenil, giving significant reductions in dry matter compared to untreated for a longer period of time. The first weed to appear in the dichlobenil treated plots was sweet vernal *(Anthoxanthum odoratum)* while in the hexazinone treated plots lotus major *(Lotus pedunculatus)* and catsear *(Hypochaeris radicata)* were first to appear.

TABLE 2: Persistence of dichlobenil and hexazinone applied 19.9.78

Treatment	Rate (kg/ha)	Weed DM (kg/ha) 24.1.79	24.5.79	30.11.79	7.2.80
untreated	-	5570 a	1890		
dichlobenil	5.5	4030 ab	1380		
dichlobenil	11	2840 bc	1700		
dichlobenil	22	2420 bc	1450		
dichlobenil	44	1280 c	1560		
			NS		
CV%		20	25		
untreated	-	4720 a	1120 a	1980 a	1940 a
hexazinone	2	150 b	430 b	1560 a	2100 a
hexazinone	4	400 b	390 b	1380 a	1760 a
hexazinone	8	0 b	60 c	530 b	1450 a
hexazinone	16	0 b	0 c	330 b	600 b
CV%		22	50	41	26

The high rates of hexazinone applied in 1979/80 (Table 1) had no effect on the production of blueberries, however, the bushes treated with the 16 kg/ha rate showed necrosis of the leaf edge on up to 20% of the leaves. The treatment seemed to have no other effect as the new shoot growth was apparently unaffected. The other treatments, including the late application of hexazinone, had no visible effects on blueberries and hexazinone was giving good weed control after 6 months.

CONCLUSIONS

From the trials reported here it is obvious that hexazinone is a better recommendation for weed control in blueberries than dichlobenil. Not only is it more persistent in the high organic matter peat soil, thus giving longer term weed control but it is also well tolerated by the blueberries and controls a wider spectrum of weeds. It seems that 2 kg/ha of hexazinone per annum will give adequate weed control but 4 kg/ha may sometimes be necessary if difficult to control weeds such as paspalum are present.

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