WEED CONTROL IN BLACK CURRANT CUTTINGS

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SUMMARY

Weed control in newly planted black currants (*Ribes nigrum*) was evaluated using herbicides and black polythene film. Terbumeton/terbuthylazine and oxadiazon plus simazine gave better control of annual weeds than dichlobenil and chlorthiamid and fruit yields in the next season were higher. Polythene was effective in preventing weed growth but did not increase cane or fruit production when compared with weed-free bare soil.

INTRODUCTION

Langford (1982) suggests that weed-free conditions be maintained in black currant crops, preferably with herbicides as cultivation can damage roots. Most of the recent plantings of black currants in Canterbury have relied on chemical weed control, both between and within rows. The use of black polythene film to suppress weeds in the first season has not been common, although it has been advocated for crops in Southland (Findlay 1979), where crop growth has been found to be superior using polythene compared with cultivated ground. This paper reports the results of field trials, one comparing herbicides commonly used in newly planted black currants, and the other comparing black polythene film with bare ground maintained by hand weeding.

MATERIALS AND METHODS

Two experiments were conducted at Templeton Research Station on cv. Magnus black currants planted into a cultivated Waimakariri silt loam soil of 5% soil organic matter which had previously been in pasture. Cuttings were planted at 25 cm intervals in rows 2.5 m apart in June, 1981.

Experiment 1

A split-plot design was used to compare herbicides (main plots) at four rates (sub-plots) applied directly over the rows in a 2 m wide band. Sub-plots were 5 m long and there were two replicates. Herbicides were applied in mid-July, 1981, either with a granule applicator or a modified Oxford precision sprayer which applied 200 litres/ha at 200 kPa.

On January 6, 1982, sub-plots were divided into 2.5 x 2 m sub-sub-plots. Treatments were: a) complete weed removal after weed growth had been assessed by dry matter estimation from a 1 m² quadrat centrally located over the row; b) no weed removal until June, 1982.

Terbumeton/terbuthylazine (Caragard) at 3.8 kg ai/ha in 200 litres/ha was applied with a tractor mounted boom sprayer over the entire experimental area in August, 1982. During winter, cane length within a 1 m segment of row was measured. In mid December, 1982, fruit was harvested from these plants, weighed and berries counted. The crop was spray-irrigated once in December 1981 and trickle-irrigated thereafter.

Experiment 2

A randomised block design was used to compare black polythene film with hand weeded and untreated controls. Plots were 5 m long and there were three replicates. Polythene was 0.5 m wide and laid just before cuttings were planted. Terbumeton/terbuthylazine at 3.8 kg ai/ha in 200 litres/ha was applied to inter-row areas with a knapsack sprayer, leaving a strip 0.25 m wide on either side of the cuttings. In winter 1982, dead cuttings were counted and cane length on a 2.5 m segment of row was measured. Fruit was harvested from these plants in December 1982.

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RESULTS

Excellent weed control until the end of autumn was achieved with all herbicide treatments except dichlobenil (Casoron) at all rates and chlorthiamid (Prefix) at the two lower rates (Table 1). Fathen (*Chenopodium album*), white clover (*Trifolium repens*), storksbill (*Erodium cicutarium*) and black nightshade (*Solanum nigrum*) were the main species not controlled. There were no marked differences in mean cane length, but canes per plant were considerably lower for chlorthiamid, at the lowest rate, and dichlobenil compared with other treatments. The number of berries per cane and mean berry weight were also lower for these treatments which, combined with less canes per plant, resulted in a reduced berry yield per plant. Weed removal in January had no pronounced effect on cane length or berry yield.

TABLE 1: The effect of herbicides on weed and black currant cane growth and subsequent berry yield.

Herbicide and rate (kg ai/ha)	Weed DM (kg/ha)	Mean cane length (cm)	Berry yield (g/pl)	Canes/plant	Berries/cane	Mean berry wt. (g)
dichlobenil 3.8	9200	27	3	2.0	3	0.44
dichlobenil 5.7	5650	21	28	2.2	18	0.38
dichlobenil 7.5	7710	28	7	1.7	11	0.26
dichlobenil 9.4	6640	23	19	2.3	16	0.44
terbumeton/terbuthylazine 2.5	7	28	64	3.7	31	0.56
terbumeton/terbuthylazine 3.8	3	27	86	4.7	34	0.54
terbumeton/terbuthylazine 5.0	0	36	135	3.7	68	0.55
terbumeton/terbuthylazine 6.3	0	28	81	3.3	44	0.53
chlorthiamid 3.8	10660	24	15	1.8	12	0.31
chlorthiamid 5.7	4570	35	66	3.1	33	0.50
chlorthiamid 7.5	440	34	124	3.7	58	0.58
chlorthiamid 9.4	170	34	92	3.6	48	0.54
oxadiazon 1.3 + simazine 1.3	410	33	77	4.0	36	0.54
oxadiazon 2.0 + simazine 2.0	30	31	81	4.5	38	0.54
oxadiazon 2.7 + simazine 2.7	0	28	91	4.1	40	0.53
oxadiazon 3.3 + simazine 3.3	0	31	87	3.6	45	0.51
LSD (5%): within chemicals	—*	11	51	1.2	20	0.12
: between treatments	—	12	61	2.0	26	0.15

* significantly different ($p < .05$) if ratio between weed DM treatment means exceeds 6.3(log transformation used)

TABLE 2: Comparison of polythene film with bare ground on black currant cane growth, yield and cutting survival.

	Cane length/plant (cm)	Canes/plant	Berry yield (g/pl)	% cuttings dead
Bare ground	130	4.1	140	8.3
Polythene	140	4.3	180	23.3
LSD (5%)				5.8
(1%)				9.0

Spray drift from the application of terbumeton/terbuthylazine to inter-row areas in Expt. 2 resulted in the death of weeds on the 0.5 m strip over cuttings which were to be hand weeded or untreated. Weeds which appeared later in the season were removed

by hand and both treatments were combined for statistical analysis. Polythene film gave excellent weed control but cane growth and berry yield were similar to the bare ground treatment (Table 2). The percentage of cuttings which did not establish was higher with polythene.

DISCUSSION

Large differences in the ability of herbicides to control annual weeds were apparent in Expt. 1. Dichlobenil was particularly ineffective, even at high rates, but terbumeton/terbuthylazine gave excellent control at all rates. Meeklah and Mitchell (1982) reported similar results in Southland black currants. These workers found that annual weeds were not controlled by chlorthiamid at 5 kg ai/ha and that doubling the rate did not improve weed control, which is in contrast to the results in this experiment where weed dry matter production was progressively reduced by an increasing rate of chemical (Table 1). Terbumeton/terbuthylazine and oxadiazon (Ronstar) plus simazine (Gesatop 80) appear to be more cost effective than either of the granulated herbicides for the control of annual weeds.

The removal of weeds in January, when fathen was about 100 cm tall, had no effect on black currant growth, which indicates that the crop was unable to compensate for growth lost earlier in the season. There seems to be little point, therefore, in attempting to control annual weeds which have over-grown black currant cuttings until the winter after planting, when herbicides can be used without the risk of crop damage.

The main effect of inadequate weed control was to reduce the number of canes per cutting rather than the average length of canes. However, there were also fewer berries per cane and these were smaller on average than those where good weed control had been achieved. Since all plots were kept weed free during the 1982/83 season when canes were fruiting, it seems that the productivity of canes developed under weed competition in the previous season was inhibited. The long term effects of this are not known, but yields will be monitored over subsequent seasons to determine whether cane and fruit production on these treatments continues to be inferior.

The higher number of dead cuttings under polythene in Expt. 2 has been confirmed in current work, and appears to be associated with a disc of polythene adhering to the basal end of cuttings when they are pushed into the soil. A small slit in the polythene through which the cutting is inserted would prevent this.

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