GRASS WEED CONTROL IN ASPARAGUS — PRELIMINARY RESULTS

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SUMMARY

Alloxydim-sodium and sethoxydim gave good control of young and established summer grass (*Digitaria sanguinalis*) while diclofop-methyl and fluazifop-butyl were unsatisfactory beyond early seedling stage. Fluazifop-butyl was effective on established paspalum (*Paspalum dilatatum*); sethoxydim destroyed treated vegetation but some regrowth occurred. All four chemicals controlled smooth witchgrass (*Panicum dichotomiflorum*) and barnyard grass (*Echinochloa crus-galli*) with good asparagus (*Asparagus officinalis*) tolerance.

INTRODUCTION

Satisfactory season-long weed control is a major problem of asparagus crops, particularly in the mild, high rainfall climate of Waikato and Bay of Plenty regions. The specific problem for the growers of these regions is the rampant growth of warm-zone grasses such as paspalum, summer grass, smooth witchgrass and barnyard grass. Although there are several herbicides which can be used to control weeds in asparagus with some success (Cox 1978; Rahman *et al* 1981), their effectiveness is limited on the warm-zone grass weeds which tend to germinate in early to mid summer when much of the residual activity of the herbicides is lost. This paper gives some preliminary results of the efficacy and crop tolerance of four post-emergence grass herbicides.

MATERIALS AND METHODS

Field trials on transplanted asparagus in second season of growth (cv. Mary Washington 500W in Trial 1 and UC72 in Trial 2) were conducted on a Horotiu sandy loam soil (51% sand, 25% silt, 16% clay, 8.8% organic C and pH 5.6). Chemicals were applied in 350 litres/ha at 210 kPa between the rows, often covering the lower portion of the plants. A white emulsifiable crop oil at 4 litres/ha was mixed with alloxydim-sodium and sethoxydim and a wetting agent 0.1% v/v was added to fluazifop-butyl. Plots were 3-4.5 m wide by 5-7.5 m long and replicated four times in randomised blocks.

Glasshouse pot experiments were conducted at various times of the year using a Horotiu sandy loam soil to test tolerance of asparagus seedlings cv. Mary Washington 500W to alloxydim-sodium (1-4 kg/ha), diclofop-methyl (1.5-3.0 kg/ha) and fluazifop-butyl (1-2 kg/ha). Treatments were replicated four or five times and applied at intervals from 2-16 weeks after emergence with a glasshouse sprayer delivering 308 litres/ha at 210 kPa.

RESULTS AND DISCUSSION

The scattered plants of smooth witchgrass and barnyard grass were readily controlled (90% or more) by all four chemicals. Fluazifop-butyl and sethoxydim gave very good initial control of young summer grass and paspalum in Trial 1 but some summer grass seedlings and occasional paspalum seedlings (some regrowth in the sethoxydim treatments) had started 7 weeks after treatment (Table 1). Re-establishment of the grass weeds was slower in the fluazifop-butyl treatments with a very much lower final incidence of paspalum than the sethoxydim plots. No summer grass was observed in plots treated with alloxydim-sodium hence the high grass weed score in early January (Table 1) and the reason for abandoning the treatment was the failure to control paspalum. Diclofop-methyl had not controlled either grass, although in a separate field trial, young seedling summer grass was reduced by 52 and 66% with 1.5 and 2.25 kg/ha of diclofop-methyl respectively.

Proc. 35th N.Z. Weed and Pest Control Conf.

TABLE 1: Effects of herbicides on grass weeds (Trial 1)

Treatment (23.11.81)	Rate (kg/ha)	Grass weed scores*			Spp scores* 13.4		DM (g/m ²) 13.4	
		8.1. 1982	27.1. 1982	13.4. 1982	summer grass	paspalum	summer grass	paspalum
fluzifop-butyl	0.5	1.5b	2.5ab	4.8ab	3.8	1.0	99	2.2
fluzifop-butyl	1.0	0.5b	1.3b	3.8b	2.5	1.3	66	5.2
sethoxydim	0.5	2.0b	3.5ab	6.5ab	3.5	3.0	170	44
sethoxydim	1.0	2.0b	4.0a	6.8a	5.3	1.5	163	38
alloxydim-sodium	1.75	6.0a			treatments			
diclofop-methyl	2.25	8.5a			abandoned			
					ns	ns	ns	ns

* Score 0-10: 0 = complete weed control, 10 = no weed control

Control of established summer grass by fluzifop-butyl in Trial 2 was unsatisfactory with many new tillers being initiated at some nodes of the parent plant. Alloxydim-sodium and sethoxydim gave good control of summer grass with a very small amount of regrowth (Table 2). Paspalum plants were only partially killed by alloxydim-sodium. Both sethoxydim and fluzifop-butyl provided good initial control of paspalum but many new tillers were produced in the sethoxydim plots.

The glasshouse pot trials demonstrated high tolerance of asparagus seedlings to the three grass herbicides. Only diclofop-methyl at the highest rate of 3.0 kg/ha resulted in 21 to 28% reduction in plant growth when applied at 2 to 6 weeks after seedling emergence. Addition of crop oil at 11 litres/ha to alloxydim-sodium treatments caused some burning of the foliage and a temporary reduction in average plant height. No adverse effect of any herbicide treatment was observed on transplanted asparagus in the field trials.

The preliminary results from this work suggest that selective post-emergence control of annual and perennial grass weeds in asparagus crops is now possible with the herbicides tested. The choice will be determined by the grass weed species present and their stage of growth.

TABLE 2: Control of established summer grass and paspalum (Trial 2).

Treatment (26.1.82)	Rate (kg/ha)	Summer grass* (6.4.82)				Paspalum* (6.4.82)		
		Live plants	Live tillers	Live DM(g)	Live nodes	Live plants	Live tillers	Live DM(g)
alloxydim-sodium	2.25	2.5b	163b	4b	7.8b	10.0a	265a	168a
fluzifop-butyl	0.75	7.1a	637a	26a	45.6a	1.0c	4c	0.4c
sethoxydim	0.75	1.8b	47c	2b	4.5b	6.4b	101b	23b

* Date from 10 plants/plot; analyses were done on square root transformed data, except the data for live plants.

ACKNOWLEDGEMENTS

To C.B. Dyson for statistical analysis and J. Mortimer for technical assistance.

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