Lucerne

WEED CONTROL IN ESTABLISHED LUCERNE WITH ISOBUMETON

S. J. RAE

Ciba-Geigy, N.Z. Ltd, Christchurch

T. M. PATTERSON

Ciba-Geigy, N.Z. Ltd, Cambridge

Summary

Isobumeton was evaluated on established lucerne in Hamilton, Rotorua, Hawke's Bay, Mid and North Canterbury and Central Otago over the period 1969 to 1973. Various rates and combinations with other chemicals were used to test lucerne tolerance and obtain optimum weed control of a wide range of species. Detailed results from a number of trials are included and these results discussed.

INTRODUCTION

Isobumeton is one of the methoxy triazines. Technical data including chemical and physical properties, toxicity, and terminology in detail, are available on request from Ciba-Geigy, N.Z. Ltd.

Initial work with isobumeton in 1969 suggested that further evaluation of this chemical was warranted to define optimum rate of use. Isobumeton/simazine combinations were included in the trial programmes based on overseas evidence suggesting these combinations may have advantages over isobumeton alone. Isobumeton/paraquat combinations were included in the 1972/73 series of trials to improve control of perennial grasses in the North Island.

EXPERIMENTAL

Results discussed are based on 55 trials consisting of the following categories.

- (1) Twenty-seven trials of 6 replications per treatment in a randomised block design, all yielded.
- (2) Sixteen trials of 3 replications per treatment in a randomised block design, for visual assessment only.
- (3) Twelve trials non-replicated using 0.25 to 0.5/ha per treatment for visual assessment.

All treatments in the randomised trials were applied as an overall spray by a Drake and Fletcher mistifier unit delivering 377 litres/ha at 220 kPa.

The treatments in the large scale non-replicated trials were applied by farmer's spraying equipment or by spraying contractors.

Lucerne yield was assessed by hand cutting four 0.25 m² quadrats per plot. A sample was removed for dry matter analysis, and a further

sample for botanical composition. All treatments were applied in June and July — during this period lucerne is semi-dormant in the North Island and dormant in the South Island.

RESULTS AND DISCUSSION

Crop Tolerance:

Comparative figures in Table 1 demonstrate the effect of isobumeton on lucerne yield. Where lucerne foliage was present at the time of chemical application the 4.5 kg/ha rate of isobumeton and the 2.25+2.25 kg/ha rate of isobumeton+simazine caused slight leaf chlorosis, at lower rates this effect was not observed. As can be seen from the table, rates of isobumeton up to 4.5 kg/ha and combinations with simazine up to 2.25 + 2.25 kg/ha do not have any detrimental effect on lucerne yield.

Weed Control:

Isobumeton 2.25 kg/ha and isobumeton 1.12+simazine 1.12 kg/ha provided acceptable control of the main annual broadleaf and grass weeds. In the South Island perennial ryegrass and poa pratensis has been adequately controlled. In the North Island perennial grasses were poorly controlled, probably because of more vigorous growing conditions experienced at the time of chemical application. The use of isobumeton 4.5 kg/ha and isobumeton 2.25+simazine 2.25 kg/ha improved perennial grass weed control in North Island situations to be adequate but barely comparable with simazine 0.8+paraquat 0.56 kg/ha.

Table 2 shows relative weed susceptibility to the treatments discussed.

In addition to the treatments listed in Table 2 15 trials were evaluated in 1972/73 to test isobumeton/paraquat mixtures at the following rates:

- isobumeton 2.25+paraquat 0.4 kg/ha
- isobumeton 1.5+paraquat 0.4 kg/ha
- isobumeton 2.25+paraquat 0.56 kg/ha
- isobumeton 1.5+paraquat 0.56 kg/ha

No results are usefully produced here for these trials as all combinations were effective in controlling poa annua, field and scrambling speedwell, seedling storksbill, shepherd's purse, poa trivialis, perennial ryegrass, cocksfoot (*Dactylis glomerata*), Yorkshire fog (*Holcus lanatus*), prairie grass (*Bromus unioloides*), barley grass, chickweed, mouse-ear chickweed, and browntop.

Dandelion increased in all areas and was not controlled by any chemical used in the trial series.

CONCLUSIONS

Isobumeton 2.25 kg/ha and isobumeton 1.12+simazine 1.12 kg/ha provided acceptable control of the main annual broadleaf and grass weeds in all areas and perennial grasses in the South Island. For the control of perennial grasses in the North Island double the above rates were required.

Isobumeton 1.5+paraquat 0.4 kg/ha effectively controlled the main annual broadleaf and annual and perennial grass weeds.

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TABLE 1: LUCERNE YIELDS (kg DM/ha)

LOCATION	isobumeton		isobumeton+simazine				atrazine + 2,2-DPA	simazine + paraquat	untreated control
kg/ha	2.25	4.5	1.12+1.12	2.25+2.25	1.57+0.67	0.95+1.8	0.84+0.56		
Hamilton	3063	3579	3042	3989	2620	2386	3892	982	
Rotorua	4122	4407	2984	3689	3080	3860	4286	1327	
Whakamaru	—	3290	3296	3120	—	—	3200	2454	
Morrinsville	1580	2386	1396	2520	—	1900	2760	1196	
Karapiro	—	2864	2860	2920	—	—	3454	1926	
Omakau	4724	5007	5098	4215	4826	4597	4462	3990	
Kyeburn	4100	3981	3680	3454	3867	3930	3926	3983	
Omakau	2856	—	2841	—	2869	2719	2987	2675	
Poolburn	1393	—	1389	—	1380	1482	1356	1205	
Lincoln	1396	—	1282	—	1299	1294	1259	1263	
Broadfields	1671	—	1630	—	1557	1632	1566	1688	

TABLE 2: WEED SUSCEPTIBILITY

	Weed Size	Treatment Rates (kg/ha) isobumeton + simazine			
		isobumeton 2.25	isobumeton 4.5	1.12 + 1.12	2.25 + 2.25
barley grass (<i>Hordeum</i> spp) (SI)	5-10 cm h	xx	xx	xx	xx
bromus mollis (<i>Bromus mollis</i>) (NI)	5-8 cm h	o	xx	x	xx
bromus mollis (<i>Bromus mollis</i>) (SI)	5-8 cm h	xx	xx	xx	xx
browntop (<i>Agrostis tenuis</i>) (NI)	5 cm h	o	x	o	x
perennial ryegrass (<i>Lolium</i> <i>perenne</i>) (NI)	8-15 cm h	o	x	o	x
perennial ryegrass (<i>Lolium</i> <i>perenne</i>) (SI)	8-15 cm h	xx	xx	xx	xx
poa annua (<i>Poa annua</i>) (NI)	2-5 cm h	o	xx	x	xx
poa annua (<i>Poa annua</i>) (SI)	2-5 cm h	xx	xx	xx	xx
poa pratensis (<i>Poa pratensis</i>) (SI)	5-10 cm h	x	xx	x	xx
chickweed (<i>Stellaria media</i>)	2-3 leaf	xx	xx	xx	xx
dandelion (<i>Taraxacum</i> <i>officinale</i>)	5-15 cm d	o	o	o	o
docks (<i>Rumex</i> spp.)	5-40 cm d	o	o	o	o
dove's foot (<i>Geranium molle</i>)	5-8 cm d	o	xx	x	xx
field speedwell (<i>Veronica</i> <i>arvensis</i>)	3-4 leaf	xx	xx	xx	xx
hawksbeard (<i>Crepis capillaris</i>)	2-10 cm d	o	xx	o	o
horehound (<i>Marrubium</i> <i>vulgare</i>)	5-15 cm d	o	o	o	o
mallow (<i>Malva</i> spp.)	3-4 leaf	o	o	o	o
mouse-ear chickweed (<i>Cerastium glomeratum</i>)	2-4 cm h	xx	xx	xx	xx
scrambling speedwell (<i>Veronica persica</i>)	3-4 leaf	xx	xx	xx	xx
shepherd's purse (<i>Capsella bursa-pastoris</i>)	4-6 leaf	xx	xx	xx	xx
spurrey (<i>Spergula arvensis</i>)	5 cm h	xx	xx	xx	xx
storksbill (<i>Erodium cicutarium</i>)	10-15 cm d	xx	xx	xx	xx
subterranean clover (<i>Trifolium subterraneum</i>)	4-6 cm h	xx	xx	xx	xx

xx = complete control

x = adequate control

o = no control

h = height

d = diameter