CANTERBURY GRASS GRUB TRIALS AND COMMENTS ON EXPERIENCE WITH FENSULFOTHION

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Summary

In three field trials fensulfothion gave a high initial kill of grass grub (*Costelytra zealandica*) and significant pasture response. With short-term soil residual organophosphates on small plots, results in the second year after treatment may be comparable to large-scale treatment due possibly to reinfestation. Experience indicates that, before organophosphates can be used on a field scale, application equipment and techniques need to be fully investigated.

INTRODUCTION

IN the trials listed only granular formulations were used. A handshaker was used and the granules were applied in two directions at right-angles.

TRIAL 1. CAREW 1966

Treated: April 4, 1966.

Pasture: Border dyked paddock. White clover (*Trifolium repens*), ryegrass (*Lolium perenne*), cocksfoot (*Dactylis glomerata*) sward. Height, 2 in.

Soil: Lismore stony silt loam.

Replications: 4. *Plot size:* 1/160th acre.

Assessed: Caterpillar counts — June 9, 1966, July 24, 1967. Pasture response — November 3, 1966, July 26, 1967. Assessed visually and by mowing.

RESULTS

1966 TRIAL

Pasture Production

All treatments with the exception of DDT were significantly better than control at the 1% level; there was no difference between fensulfothion 2.5% and 5% granules at the same rate. However, 2 lb (all rates in active ingredient per acre) of fensulfothion was significantly better than 1 lb at the 1% level.

Grass Grub

Once again all treatments except for DDT were significantly better than control at the 1% level. There was no difference between fensulfothion 2.5% and 5% granules at comparable dosage rates. Fensulfothion 2 lb was significantly better than 1 lb at the 5% level.

1967 TRIAL

In the second year after treatment in all the treated areas, pasture cover deteriorated with the exception of the DDT and the untreated controls.

It is quite obvious that there was little residual carry-over of fensulfothion and trichlorophon. Either natural mortality was much higher in the control and DDT plots, or there was a distinct preference by the beetles for the better grassed swards. Possibly a combination of these factors could have caused the pasture deteriorations.

TRIAL 2. TIMARU 1965-66

Treated: May 3, 1965.

Soil: Timaru silt loam.

Formulation: All granules except dry mix.

Dosage: 2 lb.

Replications: 5. *Plot size:* 1/160th acre.

Assessed: September 6-7, 1965, October 4-17, 1966. 6 samples per plot.
Pasture response assessed visually.

TABLE 1: ASSESSMENT DATA, TIMARU TRIALS

Treatment	Grass Grub				% Pasture Cover			
	1965		1966		1965		1966	
	Stat. Means	Sign. cf. Control	Stat. Means	Sign. cf. Control	Stat. Means	Sign. cf. Control	Stat. Means	Sign. of Control
fensulfothion	1.59	***	3.51	**	75.5	***	75.9	***
trichloronate	5.05	***	2.94	**	67.78	***	76.4	**
DDT dry-mix	7.49		2.14	***	63.16	***	91.1	**
Control	8.61		4.48		34.87		50.6	
Least significant differences:								
5%	1.7		1.67		12.82		17.2	
1%	2.38		2.23		25.40		23.0	
0.1%	3.36		2.92		17.97		30.1	

Fensulfothion gave an outstanding pasture response in the first year. DDT dry mix gave no significant reduction in grub numbers, but it did give a pasture response. Fensulfothion in the second year was significantly better at the 1% level than control in both pasture cover and grub numbers.

TRIAL 3. SOUTHBRIDGE 1967

Treated: March 28, 1967.

Soil: Waimakariri sandy loam.

Pasture: Predominantly ryegrass. Height 0 to ½ in.

Replications: 5. *Plot size:* 1/160th acre.

Pretreatment sampling: 32 to 58 grubs per square foot.

Assessed: September 4, 1967.

All the treated plots were significantly better at the 1% level than the control in term of pasture response and caterpillar counts. There was no statistical difference between the three rates of fensulfothion.

TABLE 2: ASSESSMENT DATA, SOUTHBRIDGE TRIAL

<i>Treatment (lb)</i>	<i>Grass</i>	<i>Grub</i>	<i>% Pasture</i>	<i>Cover</i>
	<i>Stat.</i> <i>Means</i>	<i>Sign. cf.</i> <i>Control</i>	<i>Stat.</i> <i>Means</i>	<i>Sign. cf.</i> <i>Control</i>
fensulfothion 2	1.98	**	80.8	**
fensulfothion 1½	1.83	**	78.6	**
fensulfothion 1	2.70	**	78.3	**
Control	5.92		44.2	
Least significant differences:				
5%	0.92		5.80	
1%	1.28		8.10	

CONCLUSIONS

In addition to the above trials, four field scale trials were laid down during 1966. In evaluating fensulfothion a number of valuable lessons have been learned:

- (1) Small plots (1/160th acre) are of no use in assessing the effect of a chemical on wildlife. Blocks of at least 5 to 10 acres should be used.
- (2) Where short-term residual organophosphates are used, subsequent reinfestation from surrounding plots can occur. If a large block had been treated, then it is possible that little reinfestation from outside would have occurred. Small plots therefore may give an erroneous result in the second year.
- (3) Any porina (*Wiseana* spp.) on the site should be treated.
- (4) Rank growth should not be permitted in late spring as this could encourage a porina infestation.
- (5) Small plots may demonstrate that 1 lb can give a worthwhile pasture response. However, by using a low rate under practical farm conditions and with the machinery available, there is insufficient margin of error. There is need for a built-in margin of error and with fensulfothion it is suggested that at least 1½ to 2 lb should be the rate of application under field conditions.
- (6) During comparative field-scale trials problems arose in applying the fensulfothion granules through the applicators. The farmer needs to have a foolproof applicator, and before any organophosphate is marketed for grass grub control a full evaluation of all available applicators is essential.

ACKNOWLEDGEMENTS

Thanks are due to J. M. Kelsey, P. Read, and Miss E. Stevenson, D.S.I.R., Lincoln.