CORN EAR WORM CONTROL WITH PHENTHOATE

R. D. RIDLER

Gollin (N.Z.) Limited, Auckland

Summary

Trials are reported which measure the effectiveness of phenthoate in comparison with methomyl for the control of corn ear worm (*Helicoverpa armigera conferta*) in maize and sweetcorn (*Zea mays*). In five trials, phenthoate at 0.88 kg/ha was equal or superior to methomyl at 0.42 kg/ha.

INTRODUCTION

Corn ear worm (*Helicoverpa armigera conferta*) reduces the quality of sweetcorn (*Zea mays*) grown in the Gisborne-Hawkes Bay area for freezing.

Since the introduction of the parasite (*Apanteles ruficrus*) which appears to be controlling the common army caterpillar (*Pseudaletia separata*) the corn ear worm has been more noticeable in maize and in the Dargaville area this year high numbers of the pest were present. The ability of corn ear worm to reduce yields of maize and sweetcorn by desiccating silks during fertilization or by eating the kernels on the formed cob may be more potential than real, but for frozen sweetcorn cobs, corn ear worm is a threat to crop quality.

METHOD

All trials were applied to maize or sweetcorn in the milk stage, except the Dargaville trial which was in the early dent stage, by helicopter using 112 litres/ha of water, except the Gisborne trial where 89 litres/ha was used. All applications were made in calm conditions and nil rain recorded at any site during the 48 hours following treatment. Sticker spreader was not used.

Infestations noted were based upon 5 random groups of 10 cobs per group taken from each area treated. At each assessment, different cobs were assessed. The cobs were thoroughly inspected and all corn ear worm present noted. At treatment the corn ear worm were predominantly located in the silk at all sites, except at Dargaville, where the greater proportion were located between the outer leaves at the tip of the cob.

RESULTS

Phenthoate at 0.88 kg/ha gave control similar to that given by methomyl at 0.42 kg/ha and gave reasonable control through to the early dent stage (Dargaville trial) as shown in Table 1.

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TABLE 1: CORN EAR WORM CONTROL

Treatment	Rate kg/ha	Pretreatment		2/3 days after treatment		7/8 days after treatment	
		No. of larvae /100 cobs	% clean cobs	No. of larvae /100 cobs	% clean cobs	No. of larvae /100 cobs	% clean cobs
GISBORNE; SWEETCORN							
methomyl	0.42	75	—	14	88	—	96
phenthoate	0.88	74	—	6	94	—	97.5
	1.05	80	—	12	90	—	96
HAMILTON; MAIZE 610							
methomyl	0.42	100+	0	52	58	26	76
phenthoate	0.88	100+	0	46	66	18	82
	0.7	100+	0	78	42	38	64
HAMILTON; MAIZE 610							
methomyl	0.42	100+	0	50	50	26	76
phenthoate	0.88	100+	0	38	68	24	78
	0.7	100+	0	48	60	40	66
HAMILTON; MAIZE XL 45							
methomyl	0.42	100+	0	—	—	34	68
phenthoate	0.88	100+	0	—	—	8	92
	0.7	100+	0	—	—	12	90
DARGAVILLE; MAIZE XL 45							
methomyl	0.42	224	0	32	72	41	67
phenthoate	0.88	240	0	194	24	43	67
	0.7	109	0	132	20	59	55

DISCUSSION

The effectiveness of phenthoate at 0.88 kg/ha when compared with methomyl together with the lower mammalian toxicity of phenthoate (oral LD50: phenthoate 300-400, methomyl 17-24) indicate that phenthoate is an effective and safer alternative to the currently widely used methomyl, particularly when considering that in most cases control of corn ear worm in maize and sweetcorn involves aerial application. The Dargaville trial demonstrates the disadvantage of late spraying when the pest has moved into the shelter of the cob.

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SOLDIER FLY

CHAIRMAN'S SUMMARY

R. P. POTTINGER

The four papers presented are interesting and varied, ranging from conventional evaluation of insecticides, through the possible use of insecticides formulated as seed dressings against soldier fly to an ecologically based sward height adjustment experiment designed to reduce soldier fly survival.

The latter paper by Kain and Burton has opened up a considerable area of new research with promise of success in improvement of controls currently available for soldier fly. As this study has only spanned a single year and considered two flight periods (spring and autumn), with seasonally distinct plant growth and soil conditions, it is important to remember in interpretation of the results that, in order to provide spatial and seasonal replication and account for climatic variation, this experiment will need to be repeated. Possibly the authors could have correlated the area of bare ground (resulting from the treatments applied) to both oviposition and maggot survival, whilst their reference to ambient humidity presumably should read as low humidity levels.

Rowe and Mackay's paper provides an example of a full evaluation of a single insecticide formulated and applied in various ways but because of the number of treatments and interactions is not an easy paper to comprehend quickly. In other published trials, not referred to in this paper, carbofuran and paraquat applied as a combined treatment have generally been superior to carbofuran alone. Carbofuran alone has been clearly better than carbofuran and paraquat together in a number of trials presented in this paper. As the authors pointed out in the Conference discussion, the response to carbofuran and paraquat is much more marked when maggot populations are around 10,000/m² than at the relatively low level of about 3000/m², which occurred on the trial sites discussed in this paper.

Phorate has always held high potential for maize pest control and the paper by Saunders reporting success with phorate in reducing maggot populations and its analogue terbufos in effecting good trends, on all the parameters measured, must be welcome. The trials reported have confirmed that the three unregistered materials evaluated are not significantly different from carbofuran (which is registered for use against soldier fly) but they also indicate that some caution is required in the use of both phorate and chlormephos until their phytotoxic potential is clearly understood. Contrary to the conclusion given in his paper, the results presented do not support a reduction in rate of phorate applied to overcome its adverse effect on seedling emergence. The response of the crop to the insecticides applied, in relation to the various parameters measured, merited fuller discussion than given in the paper.

The preliminary study by Dixon and Parr reporting on an insectary evaluation of a range of insecticides applied as seed dressings to control soldier fly maggots is welcome. The difficulties associated with such formulations (i.e., phytotoxicity which sometimes varies with the length of treated seed storage, misuse of treated grain and its possible effects on wildlife, formulation problems, and the variable effects which could result if water soluble materials are used) are well recognised. However, the possibility of an eight fold decrease in rate of insecticide applied per hectare and a saving in use of less complex applying machinery

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