CHLORMEPHOS AND QUINALPHOS FOR GRASS GRUB CONTROL

B. N. MacDIARMID

Ivon Watkins-Dow Ltd, New Plymouth

Summary

Two new organophosphate insecticides, chlormephos and quinalphos were evaluated as granule formulations for grass grub control in field trials in South Taranaki. Only in late applications under high soil moisture conditions were grub numbers reduced significantly below those in the untreated plots. In only one out of seven treatments with the two chemicals was a significant pasture yield response recorded. Neither chemical appeared suitable as a new grass grub insecticide.

INTRODUCTION

Chlormephos is a contact, non-systemic soil insecticide (oral toxicity — 7 to 12 mg/kg) for controlling wire worms, root fly larvae and other soil Diptera larvae. Quinalphos is a moderately toxic (oral — 62 to 137 mg/kg) organophosphate developed primarily for the control of chewing pests and fly larvae in rice paddy fields.

Preliminary investigations with these two new organophosphates indicated they may satisfy some of the criteria for new grass grub insecticides. In laboratory screening tests, 2 ppm of chlormephos was sufficient to achieve 78-100% mortality compared with 46% with diazinon; while in field tests chlormephos sprayed at 2 kg/ha in the rain resulted in a 90% grub mortality and a 50% pasture response (Woon, pers. comm.) Trials with quinalphos on black beetle (*Heteronychus arator*) by Esson (1973) indicated good activity against the larvae and a residual activity of up to two months against adult beetles (Esson, pers. comm.).

These chemicals were therefore included in the trials at Matapu and Ngaere, also reported at this Conference. Chlormephos was applied on a 20% absorbed clay LVM 16/28 granule, while quinalphos was applied as a 5% pumice 16/30 granule.

RESULTS

Table 1 compares the grub counts and pasture yields obtained with the two chemicals, with those obtained with a 20% diazinon absorbed clay LVM 16/28 granule and the untreated plots.

TABLE 1: GRUB COUNTS/0.1m² AND PASTURE DM YIELDS

Chemical (2 kg ai/ha)	Trial Appln.	064 — 1.2.73	Matapu 5.3.73	068 — 29.3.73	Ngaere March-April 1973
diazinon 20G		11.8 a	7.2 b	7.2 b	6.9 c
chlormephos 20G		12.4 a	7.4 b	9.6 ab	12.4 b
quinalphos 5G		—	12.7 ab	9.1 b	11.6 b
untreated		17.3 a	15.7 a	17.6 a	19.4 a
Pasture DM Yield kg/ha					
diazinon 20G		1930 a	2320 a	2240 a	1370 a
chlormephos 20G		1980 a	1760 b	1760 a	870 b
quinalphos 5G		—	1540 b	1870 a	1120 ab
untreated		1490 b	1390 b	1600 a	860 b

Neither chlormephos nor quinalphos were particularly effective in reducing the grub numbers — only with the late, autumn applications were the grub counts significantly different from the untreated. A significant pasture response was obtained with the February application of chlormephos.

DISCUSSION

Chlormephos

The high toxicity of chlormephos precludes its use as a spray for grass grub control and the results obtained in these trials do not appear to warrant its further investigation for this market as a granule formulation.

Quinalphos

It appears from the above results quinalphos is unsuitable for grass grub control. However, its relatively long soil life and chemical stability, as well as its activity against adult black beetles (Esson 1973) probably warrant its further investigation as a protectant against the feeding adults of this species on crops such as maize.

REFERENCES

- Esson, M. J., 1973. Chemical control trials. *Proc. 26th N.Z. Weed and Pest Control Conf.*: 230.

Proc. 27th N.Z. Weed and Pest Control Conf.