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Insecticidal control of funnel ants in turf

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Summary

Two field trials were carried out in south-eastern Queensland to evaluate three insecticides for control of funnel ants, *Aphaenogaster* spp. in turf. Chlorpyrifos, diazinon and isazophos each at 1000 g ha^{-1} active constituent gave good control when used as a mound drench.

1. INTRODUCTION

Funnel ants, *Aphaenogaster* spp. are sometimes a problem in turf of home gardens, bowling greens and golf courses. After rain their mound building activities disfigure the turf and produce an uneven surface with bare patches. Manefield and Bengston (Unpublished report, Queensland Department of Primary Industries) found that 0.25% chlordane in water at 28 mL per mound opening gave satisfactory control for 3 months on bowling greens and golf courses. For many years this and other persistent insecticides have been used for control in such situations. The trials reported here and carried out in 1977 and 1980 were designed to evaluate alternative chemicals.

2. MATERIALS AND METHODS

The following insecticides were used in field trials:

Chlorpyrifos — an emulsifiable concentrate containing 500 g L^{-1} active constituent.
Diazinon — an emulsifiable concentrate containing 800 g L^{-1} active constituent.
Isazophos — an emulsifiable concentrate containing 500 g L^{-1} active constituent.

Two trials were carried out at Nambour in south-eastern Queensland on 0.5 ha lawns containing a mixture of mat grass *Hemarthria uncinata* R. Br. and blue couch grass *Digitaria didactyla* Willdenow.

Trial 1 was a 4 × 5 completely randomized trial using plots 36 m^2. Guard areas 1 m wide separated individual plots. Chlorpyrifos, diazinon and isazophos were each applied as mound drenches using a rate equivalent to 1000 g ha^{-1} active constituent if it had been applied overall. Approximately 30 mL of 0.05% insecticide in water were applied per mound using a 1 m hand lance with a single coarse nozzle at a pressure of 400 kPa.

Trial 2 was a 5 × 4 completely randomized trial using plots 25 m^2 with 1 m wide guard areas separating individual plots. Chlorpyrifos, diazinon and isazophos were applied at 1000 g ha^{-1} active constituent and in addition chlorpyrifos was applied at 2000 g ha^{-1} active

constituent. Approximately 30 mL of 0.025% insecticide in water were applied per mound for the former treatments, and approximately 30 mL of 0.05% insecticide in water were applied per mound for the latter treatment. Application methods were as described previously.

Funnel ant populations were determined by counting the number of active mounds in each plot 1 week before treatment then 6 weeks (Trial 1) and 4 weeks (Trial 2) after treatments. To analyse the data, mound counts were adjusted to a base pre-treatment count of 200 per plot.

3. RESULTS AND DISCUSSION

Data from both trials (Table 1) show that each of the candidate insecticides significantly reduced mound building activity. In Trial 1, diazinon was not as effective as chlorpyrifos and in Trial 2 there was no significant benefit derived from applying chlorpyrifos at the double rate. Observations indicated that reinfestation of treated plots from surrounding guard areas began within 3 months of treatment.

Table 1. Mean number of active *Aphaenogaster* spp. mounds

Treatment (g ha^{-1} active constituent)	Trial 1 6 weeks post-treatment		Trial 2 4 weeks post-treatment	
	Trans.*	Equiv.	Trans.*	Equiv.
Chlorpyrifos 2000	. .	. .	1.31	19.30
Chlorpyrifos 1000	0.72	4.20	1.46	27.51
Isazophos 1000	1.16	13.38	1.50	30.99
Diazinon 1000	1.43	25.79	1.60	39.04
No treatment	2.23	167.27	2.19	154.78
s.e.	0.45		0.26	
Necessary difference for significance 5%	0.60		0.40	
Necessary difference for significance 1%	0.83		0.55	

*Transformation log (x + 1).

Because of the high mound density in the plots and the difficulty in drenching every mound, some mounds were not treated. Some recorded in the post-treatment counts on treated plots may have fallen into this category. It is therefore suggested that a second treatment is applied soon after the first to control those colonies which survive the first treatment. The efficacy of treatment is best determined 1 or 2 days after rain when new mound-building activity is prominent.

4. CONCLUSION

When efficacy, present availability and toxicity of the tested insecticides are taken into account, chlorpyrifos and diazinon are considered the best alternative insecticides for funnel ant control in home garden turf.

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