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BLUE OAT MITE (PENTHALEUS MAJOR (DUGES)) CONTROL TRIALS IN SOUTHERN QUEENSLAND

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SUMMARY

Two trials were conducted to evaluate chemicals of low persistence as possible suitable alternatives to DDT for the control of the blue oat mite *Penthaleus major* (Duges) in winter cereals.

Effective control was achieved with azinphos-ethyl at 35 g active constituent per hectare (a.c./ha), methidathion at 35 g a.c./ha and diazinon at 70 g a.c./ha.

I. INTRODUCTION

The blue oat mite *Penthaleus major* (Duges) frequently damages winter cereals in southern Queensland (Franzmann 1970). May (1954) recommended that DDT be applied for control. To reduce the possibility of chemical residues on pastures and fodder crops a suitable alternative from among the less persistent insecticides was sought.

Two trials were carried out in fields of oats on the Darling Downs during the winter of 1969. The first was a screening trial and the second tested selected insecticides from the screening trial at different dosage levels.

II. MATERIALS AND METHODS

The following materials were used in the screening trial:

DDT. A dispersible powder containing 50% w/w active constituent

Dimethoate. An emulsifiable concentrate containing 30% w/v active constituent

TABLE 1

TRIAL 1 SCREENING TRIAL
MEAN MITE NUMBERS PER 10 TILLERS

Treatment	Pre-treatment		1 day		5 day		8 day		14 day	
	Trans. Mean*	Equiv. Mean	Trans. Mean†	Equiv. Mean	Trans. Mean†	Equiv. Mean	Trans. Mean†	Equiv. Mean	Trans. Mean†	Equiv. Mean
1. DDT 280 g a.c./ha	6·8	46·3	3·1	9·0	3·8	14·4	3·0	8·7	4·6	21·1
2. Dimethoate 140 g a.c./ha ..	4·8	23·3	2·7	7·2	2·3	4·7	2·4	5·1	2·8	7·6
3. Methidathion 140 g a.c./ha ..	7·2	52·2	1·7	2·4	1·3	1·3	1·5	2·0	2·2	4·4
4. Diazinon 280 g a.c./ha ..	5·8	33·7	1·3	1·2	1·4	1·4	1·6	2·1	2·1	3·8
5. Azinphos-ethyl 70 g a.c./ha	5·9	35·3	1·8	2·8	1·2	0·9	0·9	0·2	1·9	3·1
6 Azinphos-methyl 70 g a.c./ha	6·3	39·9	2·3	4·8	1·7	2·3	1·5	1·7	3·8	14·0
7. Carbaryl 280 g a.c./ha ..	5·9	35·4	2·2	4·4	4·0	15·2	2·7	7·2	7·0	48·8
8. Parathion 140 g a.c./ha ..	6·6	44·2	1·5	1·8	1·0	0·6	1·3	1·2	2·6	6·4
9. Parathion-methyl 280 g a.c./ha	7·0	49·1	2·3	4·7	1·3	1·1	1·3	1·2	2·4	5·4
10. Untreated	5·7	32·3	5·0	24·7	3·9	15·1	4·5	19·4	6·2	40·0
Necessary differences for 5% significance	2·8		1·6		1·5		1·2		2·2	
1%	3·8		2·1		2·1		1·7		3·0	

* Transformation used — $\sqrt{x}$ † Transformation used — $\sqrt{x + \frac{1}{2}}$

Methidathion. An emulsifiable concentrate containing 20% w/v active constituent

Diazinon. An emulsifiable concentrate containing 80% w/v active constituent

Azinphos-ethyl. An emulsifiable concentrate containing 40% w/v active constituent

Azinphos-methyl. A dispersible powder containing 50% w/w active constituent

Carbaryl. A dispersible powder containing 80% w/w active constituent

Parathion. An emulsifiable concentrate containing 50% w/v active constituent

Parathion-methyl. An emulsifiable concentrate containing 50% w/v active constituent.

Azinphos-ethyl, methidathion and diazinon were selected for testing in the dosage trial.

For the screening trial, a 10 x 3 randomized block layout was used with plot size 3 m x 3 m. Sprays were applied on 18 June by knapsack sprayer using approximately 1100 litres/ha of spray. Plot infestations were assessed by counting the number of mites on 20 tillers selected at random from each plot. Mite counts were made before treatment and at 1, 5, 8 and 14 days after treatment.

For the dosage trial, a 10 x 3 randomized block layout was used with a plot size of 6·1 m x 1·5 m and a guard area 3·0 m wide between blocks. Sprays were applied by knapsack using approximately 675 litres/ha of spray on 8 July. Numbers of mites were recorded on each of 20 random tillers per plot, before treatment and at 1, 3, 7 and 14 days after treatment.

III. RESULTS

A summary of data on the effect of treatments is given for the screening trial in Table 1 and for the dosage trial in Table 2.

TABLE 2

TRIAL 2 DOSAGE TRIAL
MEAN NUMBER OF MITES PER 10 TILLERS

Treatment	Pre-treatment	1 day	3 day	7 day	14 day
1. Azinphos-ethyl 70 g a.c./ha	52·7	0·50	0·33	0·50	0·33
2. Azinphos-ethyl 35 g a.c./ha	43·7	0·83	0·17	2·33	5·83
3. Azinphos-ethyl 17 g a.c./ha	73·7	2·00	0	1·17	4·50
4. Methidathion 140 g a.c./ha	88·3	0·17	0	0	0
5. Methidathion 70 g a.c./ha	34·2	0	0·17	0·17	0
6. Methidathion 35 g a.c./ha	52·7	0	0	0·50	0·67
7. Diazinon 280 g a.c./ha	48·8	0	0·17	1·00	1·67
8. Diazinon 140 g a.c./ha	68·8	0·67	0·50	0·67	2·50
9. Diazinon 70 g a.c./ha	70·8	0·50	0·33	1·00	2·50
10. Untreated	88·3	94·67	131·17	54·50	20·50

No significant difference was established between treatments at the pre-treatment count.

IV. DISCUSSION

Although parathion and parathion-methyl gave good control in the screening trial, they were not selected for further testing because of their high mammalian toxicity. The control exercised by DDT was inadequate when compared with the more effective chemicals tested.

The data from the dosage trial indicate that all the spray treatments applied were highly effective in controlling the blue oat mite. Commercial applications of both azinphos-ethyl and methidathion at 35 g a.c./ha have demonstrated the validity of trial data.

V. ACKNOWLEDGMENTS

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