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CONTROL OF GLADIOLUS THRIPS, TAENIOTHRIPS SIMPLEX (MORISON), IN GLADIOLUS FIELDS IN SOUTH-EAST QUEENSLAND

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SUMMARY

Three field trials were carried out to compare spray and soil applications of insecticides for reduction in damage by *Taeniothrips simplex* (Morison) to gladiolus flower spikes. The most effective treatments were weekly sprays of 0·11% methamidophos or 0·06% omethoate and soil applications, below the corm at planting, of aldicarb, disulfoton or phorate each at 6·9 kg ha^{-1}.

I. INTRODUCTION

The production of gladiolus blooms is a significant industry in the Redland Shire of south-east Queensland, where virtually all the winter gladioli required for the Australian market are grown. Gladiolus thrips, *Taeniothrips simplex* (Morison), is the most important insect pest affecting flower quality. Tolerance for damage to the bloom is extremely low and insecticidal control is common. DDT at 0·1%, 0·05% dieldrin or 0·03% lindane have been applied for the purpose (Champ 1954).

In view of increasing reaction against organochlorine insecticides (Turtle 1973), several organophosphate and carbamate chemicals were evaluated for thrips control. Both cover spray and soil applications were investigated in trials carried out in the Redland Shire during the 1974–75, 1975–76 and 1976–77 summers.

II. MATERIALS AND METHODS

The following insecticides and formulations were used:

aldicarb	10% w/w	granule
dieldrin	30% w/v	emulsifiable concentrate
dimethoate	40% w/v	emulsifiable concentrate
disulfoton	5% w/w	granule
endosulfan	35% w/v	emulsifiable concentrate
maldison	50% w/v	emulsifiable concentrate
methamidophos	58% w/v	emulsifiable concentrate
methidathion	40% w/v	emulsifiable concentrate
methomyl	22·5% w/v	emulsifiable concentrate
omethoate	80% w/v	emulsifiable concentrate
oxamyl	10% w/w	granule
phorate	10% w/w	granule
phosphamidon	50% w/v	emulsifiable concentrate

Trial 1 (8 November 1974 to 30 January 1975) covered an area of 100 m^2 with an experimental layout of 5 replications of 6 treatments in a randomised block design; Trial 2 (12 September 1975 to 4 January 1976) 182 m^2 and 8 replications of 6 treatments in a completely randomised design; and Trial 3 (22 September 1976 to 5 January 1977) 230 m^2 and 10 replications of 7 treatments in a completely randomised design. Details of treatments are given in table 1.

The trials were carried out during summer as higher thrips populations were expected during this period than in the more usual production season (Anon. 1970). A uniform mixture of gladiolus cultivars Attraction, Golden Boy, Lohengrin, Oscar, Professor Gourdian, Spic and Span and White Lass were used in all trials.

Plots consisted of 20 plants in a single 0·8-m row. Rows were 0·9 m apart. Within each row a 0·3-m length planted to gladioli, and 1-m unplanted section separated plots. A perimeter of guard plants, one row deep on the sides, and 1-m long on the ends of rows, surrounded each trial area. Guard plants were unsprayed and high populations of *T. simplex* developed on these.

Insecticidal spraying was delayed until 3 weeks after plants emerged to allow pests to establish. Subsequently, sprays were applied weekly until the harvest was completed. Trials 1, 2 and 3 received 8, 11, and 10 sprays respectively, applications being made by 'Rega' knapsack spray with twin hollow cone 'Cyclone' nozzles to the point of run-off. Soil insecticides, mixed with fertilizer (N:P:K = 5:6:4), were applied by hand to either the open furrow in the pre-plant treatments at 3 to 4 cm below corm depth or as a banded side dressing beside the plants 2 weeks after emergence.

Flower spikes were harvested daily over the 2 to 4 weeks of flowering. Florets were allowed to open either in the field or indoors in water-filled containers of 45-l capacity. Quality of blooms was assessed by ratings for degree of thrips damage to the florets. The oldest ten florets of each spike were rated individually on the following scale:

grade 1 no damage
grade 2 damage visible only when floret was broken apart
grade 3 damage visible without breaking floret but covering less than 10% of petal surfaces
grade 4 damage visible without breaking floret and covering 10 to 50% of petal surfaces
grade 5 damage more severe than grade 4, floret usually malformed with severe russetting or silvering.

Subsequently, the ten ratings were averaged to give a figure for each spike. A spike was defined as unmarketable when more than 2 florets had received a rating of 4 or more, or when the average exceeded 3. At each successive harvest, data were bulked and expressed in terms of percentages of marketable blooms within each treatment.

III. RESULTS AND DISCUSSION

The results of Trials 1 to 3 are summarised in table 1. In each, flower quality was improved markedly with insecticide treatments. The results indicate that a range of materials are available to protect gladiolus flowers from *T. simplex* attack. Methamidophos at 0·11% and 0·06% as cover sprays and aldicarb, disulfoton and phorate each at 6·9 kg ha^{-1} as pre-plant dressings were the more effective treatments.

TABLE 1

PERCENTAGE OF MARKETABLE SPIKES* HARVESTED FROM GLADIOLI TREATED WITH INSECTICIDE FOR CONTROL OF *T. simplex*

Treatment	Trial 1		Trial 2		Trial 3	
	Trans† Mean	Equiv. Mean	Trans† Mean	Equiv. Mean	Trans† Mean	Equiv. Mean
omethoate 0·06% cover spray	1·37 a	96·0	1·42 a	97·6	..	..
methamidophos 0·11% cover spray	1·26 a	90·5	1·41 a	97·4	1·15 a	83·1
dieldrin 0·05% cover spray	0·81 b	52·7	0·72 c	43·8	..	..
endosulfan 0·067% cover spray	0·70 bc	42·0	..	..	..	..
phosphamidon 0·02% cover spray	0·42 bc	16·9	..	..	..	..
maldison 0·05% cover spray	0·32 c	9·8	..	..	..	..
untreated	0·0 d	0·0	0·34 d	10·9	0·54 c	26·4
diamethoate 0·03% cover spray	..	..	1·19 b	86·2	..	..
methidathion 0·05% cover spray	..	..	1·14 b	82·7	..	..
methomyl 0·025% cover spray	..	..	1·07 b	76·8	..	..
aldicarb 6·9 kg ha^{-1} pre-plant dressing	..	..	..	..	1·17 a	85·1
phorate 6·9 kg ha^{-1} pre-plant dressing	..	..	..	..	1·15 a	83·7
disulfoton 6·9 kg ha^{-1} pre-plant dressing	..	..	..	..	1·16 a	83·9
disulfoton 6·9 kg ha^{-1} side dressing	..	..	..	..	0·92 b	63·1
oxamyl 6·9 kg ha^{-1} pre-plant dressing	..	..	..	..	0·90 b	61·7

* Based on 700, 1 120 and 1 400 spikes in Trials 1 to 3 respectively.
† Inverse sine transformation.
Values followed by the same letter do not differ at the P = 0·01 level of probability within trials.
Data analysed using analysis of variance and Duncan's New Multiple Range Test.

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