MEALY BUG CONTROL IN GRAPES

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SUMMARY

The insecticides omethoate and prothiofos were evaluated for mid-season control of mealy-bug (*Pseudococcus calceolariae*) in grapes (*Vitis vinifera*) on a limited frequency programme. Omethoate provided superior control to prothiofos but both were more effective than comparable insecticides applied on similar programmes.

INTRODUCTION

Mealy bugs are important pests of both wine and table grapes. The most common economic effect of infestation is the down grading of fruit due to sooty mould fungi which grow on the honey dew excreted by the mealy bug (Charles 1981).

Established methods of mealy bug control have been to use either a regular programme or to spray symptomatically with insecticides. Recommendations for insecticides currently registered in New Zealand advise 4-6 spray applications throughout the season. Many grape growers, however, perceive insecticides as being highly toxic and attempt to minimize their exposure to them, regardless of actual hazard, by reducing the number of applications. This has occurred frequently often at the expense of mealy bug control. Swart and Barnes (1979) reported that a new organophosphate insecticide, prothiofos, applied twice during the season gave outstanding mealy bug control. This paper reports on the evaluation of prothiofos and omethoate for mid season mealy bug control. Omethoate is a systemic organophosphate insecticide which was first registered in New Zealand in 1968 for mite and mealy bug control in apples.

METHODS

The three replicated trials reported were carried out on commercial vineyards in Poverty Bay. Sprays were applied by hand-gun fitted with two D3-45 disc and core nozzles applying 1000 litres/ha (1500 litres/ha 2nd application Trial B) at 2100 kPa. Trials were of randomised complete block design and conducted on the variety Muller Thurgau. Additional details of individual trials are given in the Table.

Insecticides were combined with the spreader-sticker, alkyl aryl polyglycol ether, at 25 ml/100 litres. The trials were protected from diseases with regular fungicide programmes applied by the growers. Growth stages (GS) were determined according to Eichhorn and Lorenz (1977).

At harvest 25 bunches were picked at random from each plot and assessed for mealy bug infestation as follows:

0 = no infestation, 1 = 1-2, 2 = 3-6, 3 = 7-10, 4 = $\geq$ 10 live mealy bug.

The degree of infestation was then calculated according to the method of Kremer and Unterstenhofer (1967) and the control calculated after Abbott (1925).

The data were then subject to analysis of variance with untreated data excluded.

RESULTS AND DISCUSSION

In the trials reported the insecticides, methomyl (Lannate L), chlorpyrifos (Lorsban 50WP) and pirimiphos methyl (Sybol) were applied contrary to label directions with regard to application frequency but consistent with usage by many growers. Results from the three trials are presented in Table 1.

Omethoate (Folimat 50LC) at 116 g ai/100 litres was the most effective treatment in Trial A and was significantly better than all other treatments except omethoate 87 g ai/100 litres and prothiofos (Tokuthion 500EC) 62.5 g ai/100 litres in Trial B.

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TABLE 1: Percent control of mealy bug at harvest.

	Trial		
	A	B	C
Plot size (vines)	3	6	3
Replicates	4	5	4
Application dates	16.12.79 (GS 29) 8.01.80 (GS 33)	16.11.79 (GS 17) 8.01.80 (GS 33)	15.12.80 (GS 27) 16.01.81 (GS 33)
Harvest dates	7.03.80	10.03.80	13.03.81
Treatment and rate g ai/100 litres	Percent control		
untreated	0	0	0
(degree of infestation)	(98.7)	(44)	(93.25).
prothiofos 30	50.2 c	41.0 c	—
prothiofos 50	62.3 bc	70.5 b	—
prothiofos 62.5	78.7 b	93.1 ab	—
omethoate 58	—	—	95.7 a
omethoate 87	—	98.8a	96.5 a
omethoate 116	98.0 a	100.0 a	100.0 a
omethoate 116*	—	—	95.7 a
omethoate 116**	—	—	70.0 b
chlorpyrifos 50	—	—	66.8 b
pirimiphos methyl 62.5	—	—	68.9 b
methomyl 60	19.6 d	28.9 c	—
CV %	22.4	23.9	31.3

*applied only 15.12.80 (GS 27)

**applied only 16.01.81 (GS 33)

Prothiofos at the lower rates tested provided poor to mediocre control. This insecticide has recently been developed as a late dormant treatment for mealy bug control in grapes (Prince and Fisher 1982) and pipfruit (Charles and Walker 1981). In both trials, methomyl gave poor control under this limited application regime.

In Trial C the insecticide treatments can be divided into two groups, on the basis of mealy bug control. Two applications of omethoate at 58, 87 and 116 g ai/100 litres and the single early (GS 25) application at 116 g ai/100 litres gave significantly better mealy bug control than two applications of pirimiphos methyl, chlorpyrifos or a single late (GS 33) application of pirimiphos methyl, chlorpyrifos or a single late (GS 33) application of omethoate at 116 g ai/100 litres. The first group of treatments gave a very high level of mealy bug control ranging from 95.7% — 100%. The second group were considerably less effective, averaging 68.5% control.

The poor performance of omethoate 116 g ai/100 litres applied late (GS 33) relative to the single early (GS 25) treatment is attributed to poor coverage. Prevailing weather conditions delayed the bunch closure spray until berries were touching within bunches making spray penetration difficult. In the case of the single late application of omethoate this factor was critical, although the two spray programmes would also have been affected but to a lesser extent.

The poor control given by the two spray programmes of pirimiphos methyl, chlorpyrifos and methomyl highlights the need to follow a full programme as directed on their respective labels.

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