

## EVALUATION OF PYMETROZINE TO CONTROL GREEN PEACH APHID ON STONEFRUIT

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Green peach aphid (*Myzus persicae* (Sulzer)) is a cosmopolitan pest species occurring throughout New Zealand. Infestation on peaches begins in early spring from the hatching of overwintering eggs. Hatching can occur once the buds swell, but the population does not increase rapidly until the buds have burst. Aphids emerging from overwintering eggs cause distortion of the young unfolding foliage, shrivelling of older leaves, sooty mould and stunting of lateral growth. Flowers may open early and unevenly with poor fruit set and early fall of young fruitlets. If this pest is not controlled serious dieback and loss of fruiting capacity will result. Aphid control in peaches is based on strategic applications of aphicides before blossom and over the blossom period.

Pymetrozine (coded CGA 215944) is a new insecticide representing a new class of insect control agent discovered by Ciba-Geigy. Flückiger *et al.* (1992) reported that pymetrozine is a selective compound active against Homoptera with no effect on dipteran, coleopteran or lepidopteran insects, or mites, at recommended rates. Pymetrozine has contact, translaminar and systemic activity. Its insecticidal properties arise from an inhibition of feeding probably due to effects on the nervous control of the salivary pump. Pymetrozine is ideally suited for IPM programmes as it has been demonstrated to be safe to all beneficials tested in the laboratory (Flückiger *et al.* 1992).

Two trials were carried out in 1992 in the Hawkes Bay region on Golden Queen peaches to evaluate the efficacy of pymetrozine against green peach aphid. The trials were randomised complete block designs using single tree plots and six replicates. In Trial A a single pre-shuck fall application of pymetrozine was made on 15 September 1992 in comparison with taufluvinate (Mavrick Aquaflow) and an untreated control. In Trial B a single post-shuck fall application of pymetrozine made on 30 October 1992 was compared with diazinon (Basudin 50 WP), chlorpyrifos (Lorsban 50 WP) and an untreated control. All applications were made with the addition of wetting agent (0.025%) in the equivalent of 500-750 litres water/ha using a CO<sub>2</sub> pressurised precision sprayer at 680 kPa. The percentage of laterals infested and the number of aphids/lateral were determined before spraying and at intervals afterwards on the terminal shoots of 20 laterals/plot. Lateral extension growth was assessed in both trials by measuring 10 laterals/plot on 29 December 1992. The data after either angular or square root transformation where necessary, were subjected to ANOVA analyses. Separation of means was according to Duncan's multiple range test. All results are reported as untransformed means at specified days after treatment (dat).

The results from Trial A indicated excellent efficacy from a single application of pymetrozine pre-shuck fall (Table 1). A single application of pymetrozine or taufluvinate reduced the population of green peach aphids compared with the untreated at all assessments ( $P < 0.05$ ). There was no difference between the pymetrozine or taufluvinate treatments. Predation and parasitism in the untreated plots caused the aphid populations to crash by mid-December and they did not recover to appreciable levels. Treatment with pymetrozine or taufluvinate reduced the stunting effect of green peach aphid, with significantly greater extension growth in these treatments compared with that in untreated ( $P < 0.01$ ). There was no difference in the growth between pymetrozine or taufluvinate treatments.

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**TABLE 1: Mean percentage of laterals infested with green peach aphid, mean number of aphids/lateral and mean extension lateral growth in Trial A.**

Treatment	Rate g ai/100 litres	Pre application	8 dat	35 dat	73 dat	105 dat	105 dat
		Mean % laterals infested with aphids					Growth (cm)
pymetrozine	10	6.7	0.0 bB	0.0 bB	0 bB	0 bA	44.3 bB
tafluvalinate	4.8	7.5	1.7 bB	1.7 bB	0 bB	0 bA	43.2 bB
untreated	-	12.5 NS	20 aA	23.3 aA	55 aA	5 aA	21.2 aA
		Mean no. of aphids/lateral					
pymetrozine	10	0.3	0.0 bB	0.0 bB	0.0 bB	0.0 bA	
tafluvalinate	4.8	0.4	0.02 bB	0.02 bB	0.0 bB	0.0 bA	
untreated	-	0.6 NS	1.25 aA	1.45 aA	40.7 aA	1.25 aA	

Any two means in a column followed by the same letter are not significantly different  $P < 0.05$  (lower case),  $P < 0.01$  (capitals).

In Trial B pymetrozine gave significantly lower numbers of laterals infested and fewer aphids/lateral compared with the diazinon, chlorpyrifos or untreated results at all assessments ( $P < 0.05$ ) (Table 2). The diazinon and chlorpyrifos treatments did not reduce the aphid population compared with the untreated. There was a moderate level of leaf curl (*Taphrina deformans*) infection in this trial with the aphids being present largely in the curled leaves at the tips of the laterals where they gained protection from direct insecticide contact. All treatments had a similar level of leaf curl present. The failure of diazinon or chlorpyrifos treatments to affect the aphid population may have been due to this factor. The excellent efficacy of pymetrozine in this trial demonstrated the translaminar and systemic properties. A single application of pymetrozine significantly increased extension growth compared with the untreated, diazinon, or chlorpyrifos treatments ( $P < 0.01$ ). There was no difference in lateral growth between these latter

**TABLE 2: Mean percentage of laterals infested with green peach aphid, mean number of aphids/lateral and mean extension growth in Trial B.**

Treatment	Rate g ai/100 litres	Pre-application	7 dat	21 dat	38 dat	60 dat
		Mean % laterals infested with aphids				Growth (cm)
pymetrozine	10	15.0	0.8 bA	0.0 bB	0.0 bB	40.7 aA
diazinon	50	13.3	26.7 aA	58.3 aA	36.7 aA	22.4 bB
chlorpyrifos	25	11.7	31.7 aA	46.7 aAB	31.7 aA	23.0 bB
untreated	-	11.7 NS	28.3 aA	53.3 aA	31.7 aA	23.7 bB
		Mean no. aphids/lateral				
pymetrozine	10	2.3	0.03 bB	0.0 bA	0.0 bB	
diazinon	50	2.1	1.4 aA	34.4 aA	11.5 aA	
chlorpyrifos	25	2.4	1.5 aA	37.9 aA	8.7 aAB	
untreated	-	2.2	2.4 aA	34.0 aA	9.5 aAB	

Any two means in a column followed by the same letter are not significantly different  $P < 0.05$  (lower case),  $P < 0.01$  (capitals).

three treatments. As in Trial A aphid infestation peaked in late November and then declined due to a high level of parasitism and predation.

In two trials on peaches, a single application of pymetrozine at 10 g/100 litres either pre or post-shuck fall showed excellent efficacy against green peach aphid. Pymetrozine was comparable with taufluvinate as a pre-shuck fall application, and was superior to either diazinon or chlorpyrifos treatments as a post-shuck fall application.

#### REFERENCE

Flückiger, C.R., Kristinsson, H., Senn, R., Rindlisbacher, A., Buholzer, H., and Voss, G., 1992. CGA 215944 - A novel agent to control aphids and whiteflies. *Proc. Brighton Crop Prot. Conf. - Pests and Diseases*: 43-50.