Section VIII
Mites and Sap-Sucking Insects

Control of Rust Mites in Organically Grown Pears

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Abstract

Rust mites are small and difficult to control, especially in organic crops due to the limited availability of organically approved insecticides and miticides. Azadractin and Ecotrol, registered for organic agriculture, were applied to an organically grown pear orchard in July 2006 to evaluate their efficacy in controlling rust mites. While mite populations decreased over time in both treated and untreated plots, the decrease in the treated plots was greater than in the control. Further studies are needed to determine the effect of organically registered products to control rust mite populations.

Introduction

Rust mites feed on the exposed surfaces of fruit, destroying the rind cells, leading to the characteristic russeting of fruit. This damage may result in reduced grade and size, thereby drastically reducing the marketability and value of the crop.

Control of rust mites is difficult compared to other spider mites and could be more problematic in organic pear production due to the limited availability of organically registered insecticides and miticides. Therefore in this study we evaluated the efficacy of tow products for control of rust mites in an organic pear orchard.

Materials and Methods

Two applications of insecticide/miticide, approved for organic agriculture were applied to pear trees at one week intervals in Irrigon, OR. Azadractin and Ecotrol were applied at 24 fl oz/a and 4 pts/a respectively. All sprays were applied at rate of 200 gallon/a of total solution. One day before and one day after pesticide applications 20 leaves per tree were taken and the samples were transferred to a laboratory. All leaves and fruits were brushed using a mite brushing machine (Bio-Quip) and mites were counted. All mites (live/dead) were counted for the first pesticide application while for the second pesticide application one week later only live mites were counted one day before and after application.

Results and Discussion

Preliminary results indicated that Azadractin and Ecotrol, registered for organic agricultural production, may reduce rust mite populations in organic pears. When all mites were counted one day before and one day after pesticide application, no difference between mites populations was detected (Fig. 1). Perhaps due to combined (dead and alive) numbers of mites effect of the pesticides on mite control was not obvious. Therefore during the consecutive samplings only alive mites were counted. However when mite counts one day pre and one week post application were compared mite numbers were reduced significantly on both treated and non-treated pears. Reduction on non-treated pears was 6% lower as compared to treated pears (Table 1.).

When only live rust mites sampled one day before and one day after the second applications were counted, mite populations decreased for both treated and non-treated pears (Fig.2). These results are in agreement with a study of mite control in apples by Weinzierl et al (2000).They also found reduction of mite populations on untreated check plants. Further studies are needed to determine management of rust mites by pesticides registered for organic agricultural production.

Table 1. Number of rust mites one day before and one week after chemical application. Before chemical application total rust mites were counted while at one week after chemical application only live mites were counted.

Treatment	Mean number of mites 1 day pre-application	Mean number of mites 1 week post-application	MSE (1 day pre-application	MSE (1 week after application)	% mite reduction (1 week after application)
Azadractin	99.23	20.77	2145	6.41	79
Ecotrol	181.16	37.87	20.97	5.81	79
Untreated	233.20	63.50	37.91	9.23	73

Figure 1. First application of chemical control of pear rust mite in an organic pear production farm, Irrigon, OR 2006. Total number of mites before and after treatment is compared.

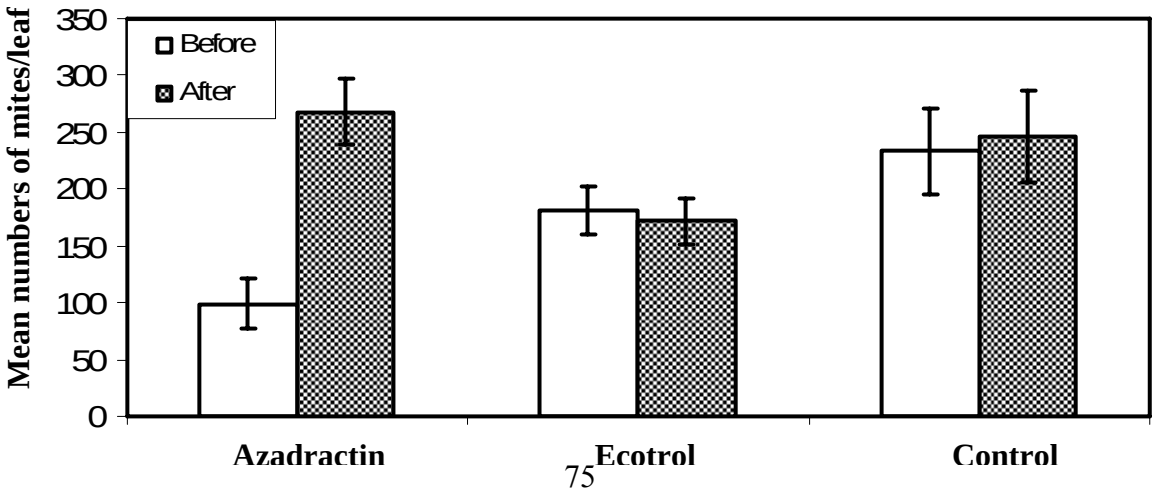

Figure 2. Second application of chemical control of pear rust mite in an organic pear production farm, Irrigon, OR 2006. Number of live mites before and after treatment is compared.