EFFICACY OF INSECTICIDES USED FOR GLASSY-WINGED SHARPSHOOTER CONTROL IN CITRUS NURSERY STOCK

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INTRODUCTION

Citrus nurseries located in glassy-winged sharpshooter (GWSS), *Homalodisca coagulata*, infested areas must ensure that the plants that they ship to uninfested areas of California are free of GWSS. Nurserymen accomplish this by treating the citrus trees with pesticides and by careful visual inspection of leaves for signs of GWSS prior to shipment. All stages of GWSS could potentially be transported. Experiments were conducted to determine the efficacy of various pesticides against adult GWSS and their ability to deposit eggs, and against the nymphs as they attempt to emerge from egg masses.

OBJECTIVES

1. Evaluate the residuality and efficacy of various insecticides against adult GWSS.
2. Evaluate the efficacy of various insecticides against GWSS nymphs hatching from egg masses.

RESULTS AND CONCLUSIONS

Adult GWSS tests:

A combination of 66 lemon and 66 orange citrus trees (15 gallon potted plants) were treated with commercial rates of various insecticides. GWSS adults were collected from an untreated citrus orchard using sweep nets at weekly intervals and caged on the treated trees. The number of live adults after 24 hours and the number of egg masses deposited after 7 days were recorded each week for 11 weeks after treatments were applied.

Residues began to break down as evidenced by survival of adults 2 weeks after treatments were applied for the organophosphate Lorsban (chlorpyrifos), at 3 weeks for the carbamate Sevin (carbaryl), and at 3-4 weeks for the foliar neonicotinoids Assail (acetamiprid) and Marathon (imidacloprid). The systemic neonicotinoids Admire (imidacloprid) caused high mortality for 8 weeks and Platinum (thiomethoxam, unregistered) caused complete mortality of adults for 11 weeks. The pyrethroids Tame (fenpropathrin) and Talstar (bifenthrin) were highly effective, Talstar allowed only one adult to survive 24 h and Tame allowed no adults to survive over the 11 week test period.

In this same experiment, GWSS were able to deposit egg masses one week after application in the Lorsban and Marathon treatments, during week 2 in the Sevin treatment. The foliar neonicotinoids Assail and Marathon prevented egg laying for 4-5 weeks. The Tame treatment allowed 1 egg mass to be deposited during week 4. The other treatments (Admire, Platinum, and Talstar) did not allow a single egg to be deposited during the 8 weeks of the experiment.

Overhead irrigation was applied for 30 minutes 3x per week to half of the trees and significant reduction in residuality of the insecticides was observed for Sevin, Assail, Marathon and Tame.

Emergence of GWSS from egg masses:

In the second experiment, GWSS adults were collected from an unsprayed citrus orchard in Kern County and caged for one week on nursery citrus (15 gallon potted lemons and oranges). The adults were removed, and trees treated with commercial rates of various insecticides to determine if nymphs could successfully emerge from the egg cases. Successful emergence was defined as completely emerged and with fully developed wings.

Provado, Assail, and Sevin did not allow any nymphs to successfully emerge from the egg masses. Actara, Talstar, and Tame allowed 20-40% of the nymphs to successfully emerge, although all died shortly after emerging. The insect growth regulator Applaud (buprofezin) did not have any effect on nymphal emergence.

In summary, these experiments suggest that pyrethroids and the systemically applied neonicotinoids are most effective against adult GWSS and the carbamate Sevin and several of the foliar neonicotinoids are most effective against nymphs attempting to emerge from the egg masses. Based on these experiments, I would recommend that citrus nurserymen apply a systemic neonicotinoid (imidacloprid is the only one registered at this time) 2-8 weeks before shipment is expected. Immediately before shipment, a pyrethroid such as Tame or Talstar should be applied to ensure that the foliage is disinfested of nymphs and adults. In addition, Sevin, Assail, or Provado should be applied just prior to shipment to prevent nymphs from emerging from egg masses. Bethke and Redak (2001, 2002a, 2002b) and Bethke et al. (2001) demonstrated similar efficacy of systemic neonicotinoids and pyrethroids against adult GWSS and efficacy of carbaryl against emerging nymphs for ornamentals.

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