POTENTIAL OF CONVENTIONAL AND BIORATIONAL INSECTICIDES FOR GLASSY-WINGED SHARPSHOOTER CONTROL

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INTRODUCTION

The glassy-winged sharpshooter (GWSS) is a primary vector of *Xylella fastidiosa* Wells et al., the causative agent of Pierce's disease (PD) in grapevines. The incidence of PD has increased with serious fruit and vine losses as GWSS numbers have increased in southern California (Blua et al. 1999). With continuing spread of GWSS, Purcell et al. (1999) suggested that diseases caused by *X. fastidiosa* are likely to become more prevalent. There is an urgent need to develop short- and long-term GWSS management that is economically, ecologically and socially acceptable. The essential cultural and biological components of developing integrated pest management (IPM) strategies for the short-term, at least, will need an efficacious GWSS chemical control component with attendant insecticide resistance management (IRM), and integrated crop management (ICM) inputs.

OBJECTIVES

The current studies were conducted to identify selective, conventional and biorational insecticides against immatures as potential components of GWSS management programs and evaluate their effectiveness for control. Previously, we studied insecticides for control of adult GWSS in grapes (Akey et al. 2001).

RESULTS AND CONCLUSIONS

We conducted a series of field trials using natural GWSS populations (eggs to nymphs to adults during a 6-mo. period in the spring/summer of 2001). Trials were conducted on small citrus, 2-m ht. orange trees. Experiments were conducted in a 3-replicate randomized complete block design at University of California, Agricultural Operations, Riverside, California. Plots were 0.114 ac in size; 25 by 22 ft, 3 trees per plot with guard rows on each side. Counts were made weekly following insecticide applications.. Mean separation tests were made following significant F values by analyses of variance.

Treatments were made with a windmill blast-type sprayer (John Bean Div., FMC) (compliant with Good Lab Practices, GLP). Spray delivery was at 180-200 psi at 300 gal/ac with 5 swivel-nozzle bodies (Tee Jet) on one side; 10 nozzles, each had a core 23, disc 6, and slotted strainer. Insecticide trade and generic names, chemistry classes, formulations, product amounts, AI/ac, and source companies are given in Table 1. An adjuvant, Silwet L 77, (Loveland Ind.) was used in all formulations. Spray penetration was estimated using water sensitive paper (Spray Systems, Inc).

Esteem showed 100% control of egg masses and may be a true ovicide for GWSS (unpublished data). This needs more investigation. Pyrethroids, neonicotinoids, and the IGR Applaud (buprofezin) were highly effective against nymphs of GWSS. Future studies should be conducted on rates of Applaud application for GWSS control. Neem products were slowly (accumulatively) effective against large nymph production (neem products had no efficacy or repellency on GWSS adults on grapes; unpublished data, summer/fall 2000).

Our previous experience, and that of many others, in pest insect crop protection using chemical control has shown that different insecticides, within the same chemical class, often have different qualities that contribute to their usefulness when applied alone or in tank mixes with another insecticide in a different or even in the same class. Analyses of the impact on the total pest and beneficial arthropod populations present in vineyards and associated ecosystems and selection of the best-fitting insecticides is a formidable challenge for implementation of ecologically oriented control programs. Such insecticide selections have been very useful in other emergency insect outbreak control efforts (Akey et al.1997, Ellsworth et al. 1997). Grower options that can accommodate management needs in different areas that may vary in climate, pest complex, and environmental and economic variables are essential, but require extensive research to develop.

Table 1. Trade names, chemistry classes, formulations and rates per acre of foliar insecticides evaluated for immature and adult glassy-winged sharpshooter control in Citrus, Riverside, CA, 2001.

Name		Chemistry		Per acre		
Trade	Generic	Class	Formulation†	Product	lb AI	Company
			Conventional Insecticides			
Capture®	bifenthrin	Pyrethroid	2 EC	6.4 fl oz	0.100	FMC
Baythroid®	cyfluthrin		2 E	3.2 fl oz 1.6 fl oz.	0.040 0.020	Bayer
Fujimite	fenpyroxi- mate	Oxime	5 EC	4.0 pt	0.200	Nichino America
Assail®	acetamiprid	Neonicotinoid	70 WP	1.2 oz	0.050	Bayer
Provado®	imidacloprid		75 WP	10.0 oz	0.460	Bayer
			Biorational Insecticides			
Trilogy, clarified extract of Neem oil (no Azadirachtin)		Neem products	70%	5.0 gal	27.3	Certis USA
Agroneem	neem extract azadirachtin		15.0% 0.15%	4.0 qt 4.0 qt	1.100 0.110	AgroLogistics
Neemix	azadirachtin		4.5%	16.0 fl oz.	0.046	Certis USA
Applaud	buprofezin	chitin inhibitor	70 WP	2.86 lb	0.200	Nichino America
Esteem	pyriproxyfen	JH analog	0.86 EC	16.0 fl oz	0.054	Valent USA

† EC-Emulsifiable Concentrate, SP-Soluble Powder, W or WP-Wettable Powder, SC-Soluble Concentrate.

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