Field Evaluation Of Insecticides For Managing Gill's Mealybug *(Ferrisia gilli)* In Vineyards.

Lynn R. Wunderlich[1] and Kent M. Daane[2]

[1]University of California Cooperative Extension, Placerville, CA., [2]Environmental Science Policy and Management, University of California, Berkeley, CA.

The Problem: Gill's mealybug, *Ferrisia gilli* (Gullan), native to North America, acquires grape as a new host and becomes a pest!




Gill's mealybug is the newest mealybug species attacking California's wine grape crop. The mealybug overwinters under the bark as 2nd-3rd instars and moves out onto old spurs and new shoots in spring, molting to the adult stage. Mated females bear live crawlers in late June/early July. The mealybug crawlers move out onto the leaves and because they lack wax, are the most susceptible stage to insecticide treatments. Good spray coverage is essential for adequate control, however. If left untreated, Gill's mealybug moves into grape clusters, where a second generation of crawlers is born. Mealybug presence and sticky honeydew can make grape clusters unmarketable.



Our work: We evaluated several insecticides for Gill's mealybug control in 2009 and 2010. Working with a grower collaborator, insecticides were applied in a randomized complete block of head trained Cabernet Sauvignon (2009, 6 replicates) and bilateral cordon trained Merlot (2010, 5 replicates). We calibrated the sprayer and placed water sensitive spray cards in the grapevine canopy to check for coverage. In 2009 we applied one application. In 2010 canopy growth was large and we applied two applications. We evaluated the effectiveness of our treatments in several ways: we took basal leaf counts of crawlers before and after treatment; we conducted timed whole vine ratings before and after treatment; and prior to harvest we rated clusters for mealybug damage.

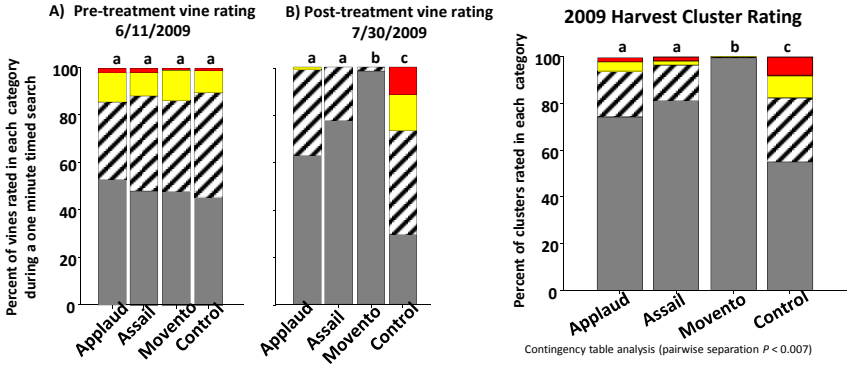
2009 treatments applied on 6/22 in approx. 103 gal/acre:

- **Applaud 70DF**, Nichino America, Inc. (buprofezin) @ 12 oz./ac .+ 0.25% R-11
- **Movento**, Bayer CropScience (spirotetramat) @ 8 oz./ac .+ 0.125% Syl-tac
- **Assail 70 WP**, Cerexagri-Nisso LLC (acetamiprid) @ 1.1 oz./ac. + 0.125% Syl-tac

Legend for Vine and Cluster Damage Ratings

- more than 15 mealybugs, unmarketable
- 6-15 mealybugs
- 1-5 mealybugs
- 0 mealybugs

Results:

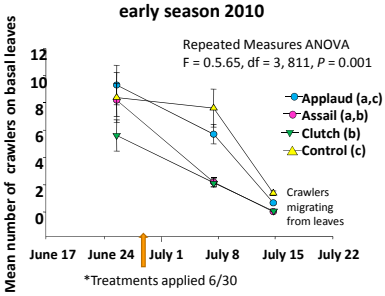


All materials provided control of Gill's mealybug in both years of study, as compared to the untreated. Movento, which was only evaluated in 2009 due to it's brief removal from the market in 2010 , provided the best control. Assail and Applaud both provided similar results and we saw better control with Applaud in 2010 when two applications were made. Clutch provided the least control of the materials we tested. Our season-long vine ratings (2010) tell a story : in our first post treatment rating, July 9, Applaud is no different than the untreated control. This is expected since it is an IGR, it takes a little longer to work. A second application helped, and by July we see good control. Prior to harvest, on Aug. 19, we begin to see Clutch break-down.

***2010 treatments applied on 6/30 in approx. 115 gal./ac; and on 7/14 in approx. 143 gal/ac.**

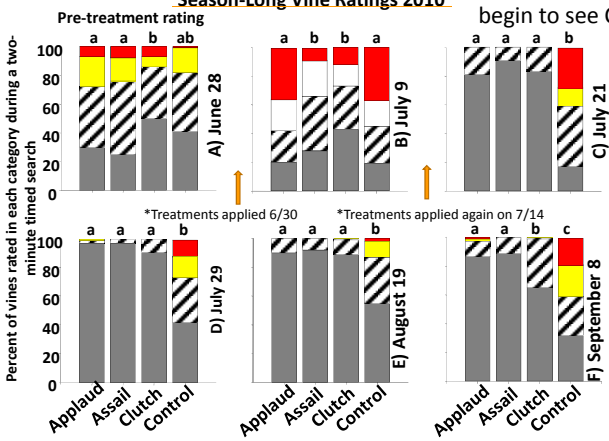
- **Applaud 70DF**, Nichino America, Inc. (buprofezin) @ 12 oz./ac .+ 0.25% R-11
- **Assail 70 WP**, UPI, (acetamiprid) @ 1.1 oz./ac. + 0.125% Syl-tac
- **Clutch 50 WDG**, Valent (clothianidin) @ 3 oz./ac. + 0.123% Syl-tac

Mean number of crawlers on basal leaves- early season 2010

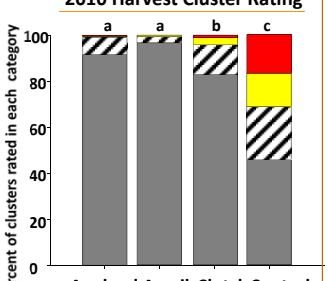


For the crawler counts, we observed treatment differences on our first post-treatment monitoring date July 8, but by July 15 crawlers were difficult to find on any leaves (included untreated), probably because they migrate out into the vine.

Season-Long Vine Ratings 2010



2010 Harvest Cluster Rating



We found all of these mealybug natural enemies during our study:

Tiny wasps (parasitoids) are the most important mealybug natural enemies, and can be harmed by some insecticides. Parasitized Gill's mealybugs form "mummies" found under trunk bark. Here, wasp exit holes are visible. *Photo credit: David R. Haviland, courtesy UC Statewide IPM Program.*

Tiny lacewing larvae prey on mealybug crawlers.

Snakefly larvae search under the bark in early spring. The adults look pre-historic!

Spiders are commonly found on grapevines and prey on many pests.

Damsel bugs appear delicate but have piercing mouthparts!

Lady-bird beetles are common in the foothills. (Larva shown here.)

Acknowledgements: We thank Viticulture Consortium West and the American Vineyard Foundation for funding this work. We also thank Valent, UPI, Bayer CropScience, and Nichino for providing product. Very special thanks to our grower collaborators for their assistance in applying treatments and welcoming us to work in their vineyards. Thanks to field assistants Charlie Tierney, Kailey Smith, Laurel Schwarzbach, and Kelly Brehm, and to Robin Cleveland for her assistance.