

## Grape Mealybug Insecticide Trial, 2007

Principal Investigators: L. G. Varela and R. J. Smith  
Cooperative Extension  
133 Aviation Boulevard, Suite 109  
Santa Rosa, CA 95403-2894

Cooperators: Sandy Henson  
Brian Malone  
Kendall Jackson  
  
Tim Rodgers  
Rolando Sanchez  
Walsh Vineyard Management

M. Ehlhardt  
Bayer CropScience  
363 Picholine Way  
Chico, CA 95928

Test Location: Grapes – Kendall Jackson, Huichica Hills

Test Crop: Grapes: *Vitis vinifera* L. Chardonnay clone Jaeger, 110R rootstock, planted in 1990 at 5 ft vine X 8 ft row spacing (1089 vines per acre)

Species tested: Grape mealybug, *Pseudococcus maritimus*

Plot Design: Five treatments were replicated five times in a randomized block design. Each replicate (plot) was five vines and all five vines were treated. Samples were taken from the center 3 vines of each plot.

### Treatments and Rates:

Treatment Formulation	Rate/Ac	Application timing
1. Movento 2SC <sup>a</sup>	5.0 oz	June 8
2. Movento 2SC <sup>a</sup>	8.0 oz	June 8
3. Applaud	9.0 oz	April 6, 2007
4. EcoTrol EC <sup>b</sup>	0.5%	April 6, April 16 & July 8, 2007
5. Untreated	—	

<sup>a</sup> Treatments contained 0.25% by volume of Latron

<sup>b</sup> April 6 and 16 treatments were 2.0 pints in 50 GPA + 8.0 fluid ounces of Natural Wet (JH Biotech); July 8 treatment were 4.0 pints in 100 GPA + 16 fluid ounces of Natural Wet

Application Equipment: Foliar sprays were applied with a backpack pump sprayer with a volume of 50 gallons per acre on April 6 and 16 and 100 gallons per acre on June 8 and July 8.

Predominate grape mealybug stage at date of application:

April 6	crawlers of first generation; very few nymphs
April 16	crawlers of first generation; more nymphs
June 8	adult females and egg masses of second generation
July 8	egg masses and crawlers of second generation

Evaluation Procedures:

A pre-application evaluation was performed on March 28 and 30, 2007. Six spurs were inspected on all vines in the four rows where the trial was conducted. In a presence-absence sample we recorded the number of spurs per vine that were “positive” for grape mealybug crawlers. The plots were flagged after the pre-sample and any vine that had less than 3 infested spurs out of the 6 inspected was not included in any plot. Thus all vines selected for the trial had 3 to 6 infested spurs out of six inspected spurs.

Evaluations were conducted on April 19 after the application of Applaud and one application of EcoTrol EC; on May 3 after the application of Applaud and two applications of EcoTrol EC; and on July 18 and September 4 after all the treatments were applied.

On April 19, and May 3 a total of 10 basal leaves per plot were taken from the center 3 vines in each plot (3, 4 and 3 leaves from vine 2, 3 and 4 respectively). Leaves were examined under the scope and number of nymphs counted. On April 19 the mealybug stage present on the leaves were crawlers of the first generation. On May 3 the stage present were crawlers and nymphs. On July 18, 10 leaves were sampled and mealybugs counted as in the previous two dates, but the leaves selected were touching a bunch. On this date the stage present was crawlers of the second generation.

On September 4, 10 bunches each from vine 2, 3, and 4 were collected. Bunches were individually bagged and labeled, placed in coolers and taken to the lab. In the lab all bunches were cut open and all stages of mealybugs were counted. The insect stages present at the final sample date were crawlers and nymphs of the second generation.

Statistical Analysis: The four sampling dates were analyzed separately using ANOVA. On the three dates at which leaves were sampled (April 19, May 3 and July 18) Tukey’s mean separation test was used. On the bunch sample of September 4<sup>th</sup>, Bonferroni mean separation test was used due to unequal sample size since 3 vines had less than 10 bunches.

Results and Discussion:

There were no significant differences between treatments on the first two leaf samples taken on April 19 and May 3,  $P=0.9767$  and  $P=0.4866$  respectively (Table 1). For the July 18 leaf sample populations in the two Movento treatments and the Applaud treatment were significantly lower ( $P=0.00001$ ) than those of the untreated control and EcoTrol EC treatments (Figure 1). At this sampling date the mealybug population were crawlers and eggs of the second generation. Not all the eggs had hatched. Control with Applaud was targeted for the first generation crawlers. Control with Movento was targeted for the second generation. Thus, the data collected on the

July 18 sample date indicated the Movento application nearly 6 weeks prior had reduced the numbers of crawlers of the second generation that had emerged.

For the bunch sample of September 4, populations in the two Movento treatments and the Applaud treatment were significantly lower ( $P=0.00001$ ) than those of the untreated control and EcoTrol EC treatments (Figure 2a and 2b). No statistical significant difference between the Applaud treatment and the two Movento treatments was observed due to high mealybug population variability between plots.

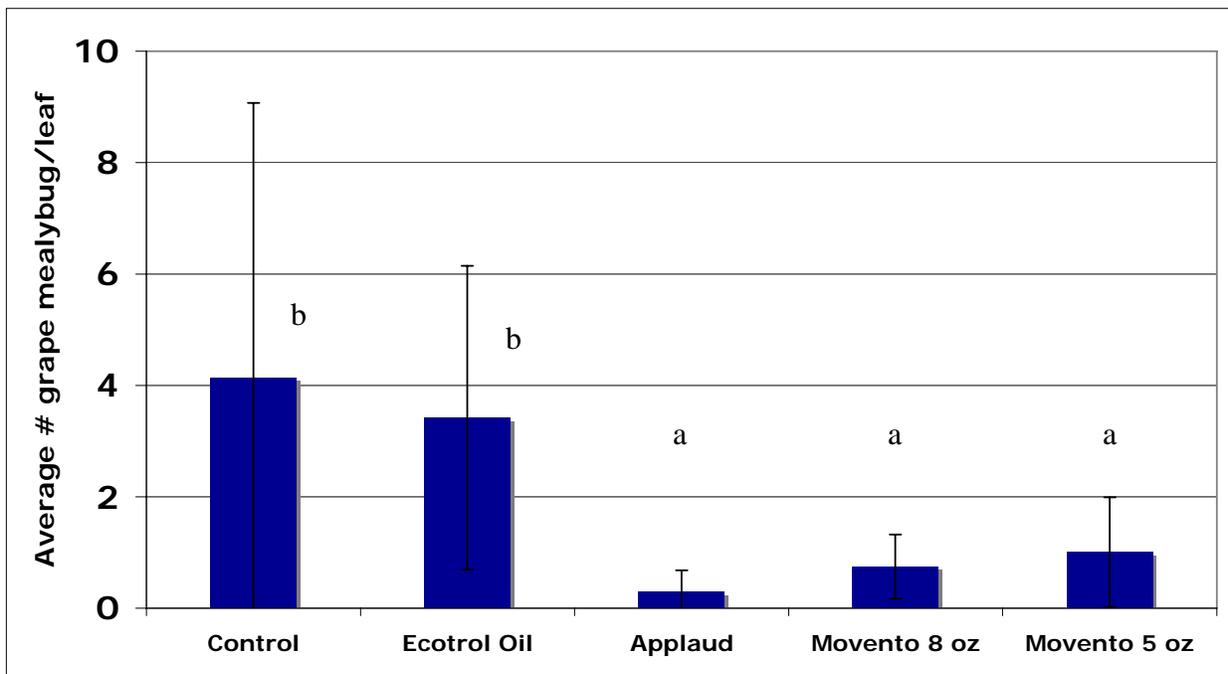
Conclusions:

Populations in both Movento treatments (5 and 8 oz) and the Applaud treatment were significantly lower than the untreated control and the EcoTrol EC treatments.

Table 1. Mean number of grape mealybugs per leaf sampled on April 19 and May 3. EcoTrol EC was applied on April 6 & 16; Applaud on April 6; and Movento was not applied prior to these evaluations.

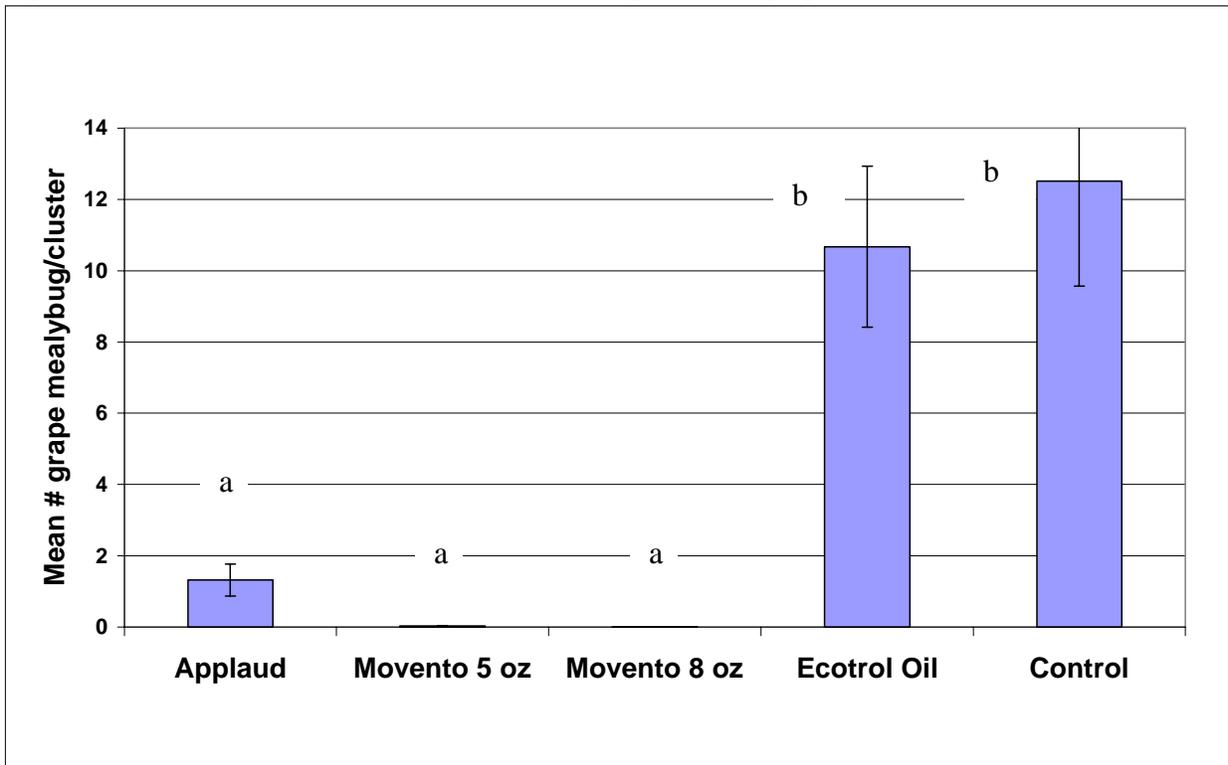
	Mean # grape mealybug/leaf				
Sampling date	Control	EcoTrol	Applaud	Movento 8 oz	Movento 5 oz
April 19	0.66	0.82	0.88	0.84	0.90
May 3	0.32	0.20	0.26	0.34	0.16

Figure 1. – Average number of grape mealybugs per leaf in five treatments evaluated on July 18.



Treatments followed by a different letter are significantly different (Tukey’s mean separation test).

Figure 2a. – Average number of grape mealybugs per cluster in five treatments evaluated on September 4<sup>th</sup>. Movento treatments results are expanded in graph 2b below.



Treatments followed by a different letter are significantly different (Bonferroni mean separation test).

Figure 2b. – Average number of grape mealybug per cluster in two treatments evaluated on September 4<sup>th</sup>.

