Vine Mealybug Systemic Control Trial, 2008

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Test Location: Kendall Jackson, Carneros Hills Vineyard

Test Crop: Grapes: *Vitis vinifera* L. Pinot Noir clone Pommard UCD#5 grafted on Merlot clone 3 interstock in 2005; rootstock 3309C planted in 1996 at 5 ft vine X 8 ft row spacing (1089 vines per acre)

Species targeted: Vine mealybug, *Planococcus ficus*

Products Tested: Platinum® - Thiamethoxam
Venom® - Dinotefuran

Experimental Design: Three treatments were replicated four times in a randomized complete block design. Each replicate (plot) was three vines and all three vines were treated. Mealybug population data were taken from the center vine of each plot.

Summary: Platinum® and Venom® were applied by drip irrigation to Pinot Noir winegrapes infested with vine mealybugs in a randomized complete block design. Six weeks after product application, mealybug populations were reduced from 95.5 mealybugs per vine on the control plots to 18.25 mealybugs per vine on the Venom® treated plots and 4.25 mealybugs per vine on the Platinum® treated plots. Despite large population decreases on treated vines, no statistically significant differences in mealybug populations existed between the treatments. High variability between the plots reduced statistical significance.

Treatments and Rates:

Table 1. Systemic product application rates and timing for vine mealybug control

Treatment	Gallonage	Rate	Application Timing
	gal ac^{-1}	oz ac^{-1}	
Platinum®	50	5.67	June 9, 2008
Venom®	50	6.0	June 9, 2008
Control	-	-	-

Application Method:
Products were applied to the vine root zone via chemigation for systemic plant absorption. Vines were irrigated for four hours prior to and for four hours after insecticide application. Products were applied through plastic cups hung from the drip line. Pinholes in the cups allowed the insecticide to drain from the cups onto the pre-wetted area of the vine row over a period of fifteen minutes.

All plots, including the controls were sprayed with Applaud by the grower on June 2 and July 21.

Evaluation Procedures:
Vines were examined pre-treatment for mealybug presence. Plots were assigned to contiguous three vine sets in which the target pest was present on all vines. Treatments were randomly applied to the plots in a randomized complete block design.

Effectiveness of products tested was determined by evaluating mealybug population six weeks after product application. Mealybugs on the center vine of each three-vine plot were counted in three-minute timed counts on July 23, 2008. Mealybug counts were recorded by developmental stage: crawler, nymph, adult female, and adult female with eggs. For any given stage, when counts exceeded 100, a value of 100 was recorded.

Statistical Analysis:
Vine mealybug populations were calculated as the sum of counts for all developmental stages. ANOVA was used to detect treatment differences between the mealybug populations.

Results and Discussion:
Both Venom® and Platinum® reduced vine mealybug populations, however treatment differences were not statistically significant ($p=0.154$). Platinum®- and Venom®- treated vines had on average 4.25 and 18.25 mealybugs per vine respectively (Figure 1). The non-treated control vines had on average 95.5 mealybugs per vine despite the application of Applaud, an insect growth regulator, 51 days before the evaluation. A second Applaud application occurred just 2 days prior to the evaluation; however, given the short exposure time and the mode of action, a full treatment effect may not have occurred at the evaluation time.

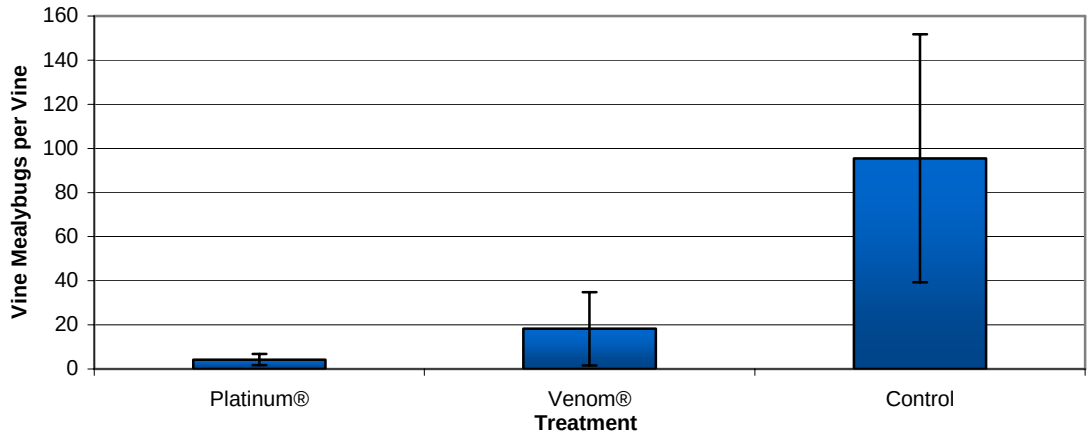

Figure 1. Average number of vine mealy bugs by treatment on July 23 2008

Although vine mealybug population reduction appeared dramatic, high variability between vines caused treatment differences to be non-significant at $\alpha=0.05$ ($p=0.154$). Grower applied Applaud® applications may have contributed to this variability and reduced the statistical significance.

Conclusion:

Platinum® and Venom® may provide adequate vine mealybug population suppression. Although treatment differences were not statistically significant, Platinum® did reduce vine mealybug populations nearly twenty-fold.

All plots were sprayed equally with Applaud®. Control vines were not truly non-treated vines and vine mealybug populations may have been suppressed by Applaud® applications. Two of the four control plots had very high vine mealybug populations and two had very low populations. This high variability reduced statistical significance.

Several control plots had crawler and nymph populations in excess of 100 individuals. These data were recorded as 100 due to time constraints in the timed counts. Data recorded by this method are artificially deflated and may have masked treatment differences.