Post-harvest Vine Mealybug Treatments Evaluated in Kern County Table Grapes

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During the past few years there has been a lot of debate over the value of post-harvest treatments for vine mealybug in table grapes. Some pest managers prefer to avoid post-harvest treatments because the clusters no longer need to be protected, and the late summer and early fall are when biological control organisms, particularly the parasitoid *Anagyrus pseudococci*, are at their greatest.

On the other hand, many believe that foliar insecticide treatments after harvest when mealybugs are up and exposed in the plant canopy are an excellent way to protect next year's crop by minimizing overwintering mealybug populations. Many also believe that parasitism levels, even at their best, have not provided the level of mealybug suppression of a post-harvest insecticide treatment. Additionally, table grapes have a wide range of harvest dates, meaning that post-harvest treatments could occur as early as July, or not until November depending on variety in the lower San Joaquin Valley.

In order to help determine the value of post-harvest treatments, we conducted two field trials in August 2007. The first was located in a bearing, two-year old vineyard that was grafted over to 'Summer Royal' in 2006. This Arvin vineyard contained only first- and second-year wood, and had smooth bark above the graft union. The second site was a mature 'Thompson Seedless' vineyard in Edison with thick bark with lots of cracks where mealybugs could hide.

At each site we evaluated the effects of 7 registered insecticides and an untreated check on mealybug density. Treatments included Movento 2SC at 8 oz/ac, Sevin XLR at 2 qt/ac, Lorsban 4E at 2 qt/ac, Assail 30SG at 2.5 oz/ac, Venom 70WSG at 3 oz/ac, Applaud 70DF at 12 oz/ac and Brigade WSB at 16 oz/ac. Plot size was 2 rows by 10 vines long with each insecticide replicated 4 times at each location. Plots were sprayed at 200 GPA with an air-blast sprayer on 23 or 24 August, and included the addition of Latron B-1956 at 2 fl oz per 100 gallons water as a surfactant. Multiple evaluations were made in the fall of 2007 and spring of 2008. The most important evaluations, which are summarized in this article, consisted of counting the total number of mealybugs that could be found on each of 8 vines per plot during a 3-minute period on 16 May, 2008.

Figure 1 shows the effects of August insecticide treatments on mealybug density in the Arvin trial in May 2008. All treatments, with the exception of Brigade reduced mealybug density. Movento provided a 96% reduction in mealybug density; Sevin and Lorsban provided about 80% reduction; and Assail, Venom and Applaud provided around 50 to 60% reduction. At the mature 'Thompson Seedless' site in Edison, Movento was the only insecticide to result in reduced mealybug densities (Figure 2). All other products were statistically equivalent to the untreated check. In both trials, Brigade resulted in mealybug densities numerically higher than the untreated check, which could be used as an anecdotal measurement of the value of parasitoids, which would have been removed in this plot as a side-effect of the use of this pyrethroid.

These data show that post-harvest treatments can provide significant reductions in mealybug densities the following spring. This was particularly true with Movento. Movento is a lipid biosynthesis inhibitor that was registered for use in grapes in California in July of 2008. It is used as a foliar product, but works by entering through the leaf where it moves systemically both up and down the plant. It kills primarily

sucking insects, such as vine mealybug, and is proving to be soft on a wide range of beneficial insects, including parasitoids, in ongoing research.

Movento has also performed well in in-season trials, but was not allowed in-season in table grapes in 2008, and will likely receive minimal use in 2009 because Maximum Residue Limits (MRLs) for some key export countries will not have been established. However, since residue issues do not exist for post-harvest treatments, applications of this product after harvest, but early enough in the season that leaf tissue is still active and will absorb the product, can be of benefit to pest managers looking for a new tool to improve vine mealybug IPM.

Fig. 1 Effects of 2007 postharvest treatments on vine mealybug density in May 2008 in a young 'Summer Royal' vineyard in Arvin, Kern Co.
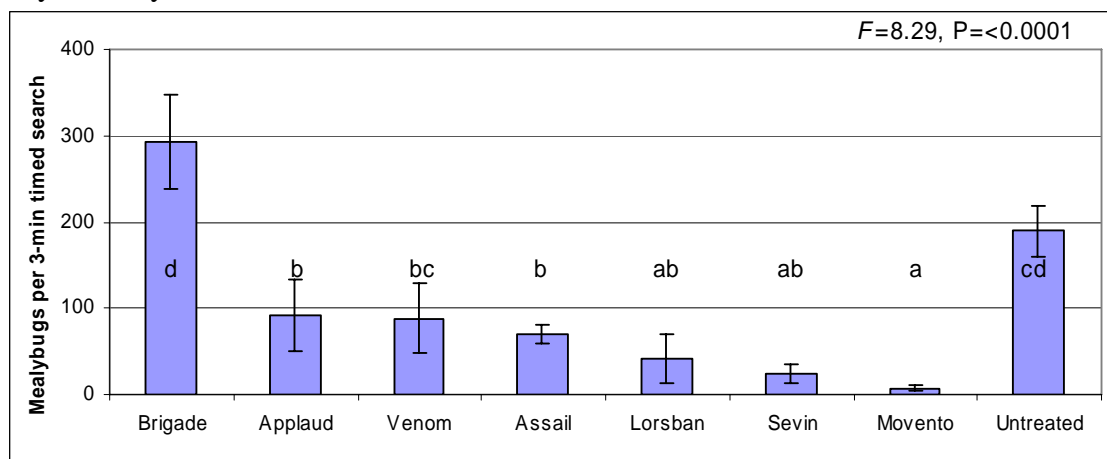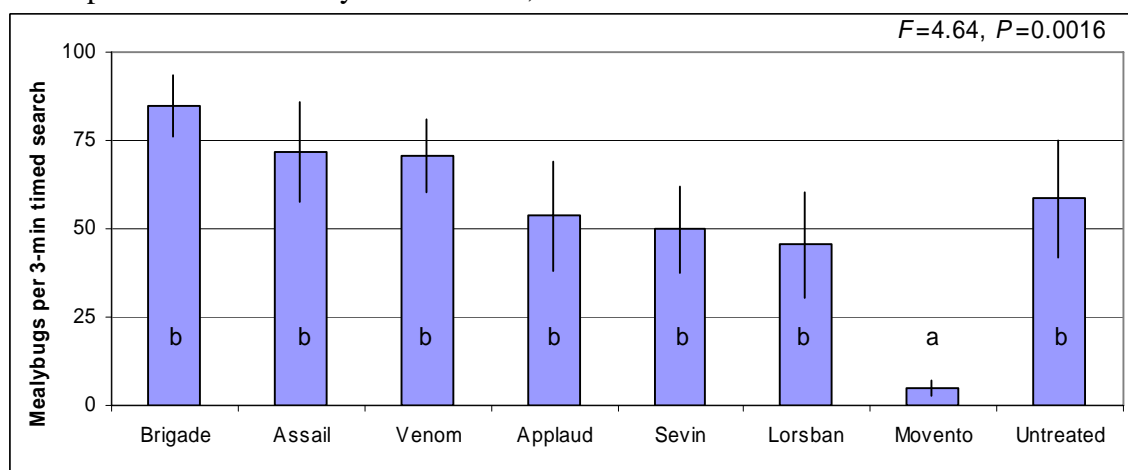

Fig. 2 Effects of 2007 postharvest treatments on vine mealybug density in May 2008 in a mature 'Thompson Seedless' vineyard in Edison, Kern Co.

Note:
Below for your reference are the actual numbers and the SEM values for the treatment averages. Data below also include the results of the 5.0 oz rate of Assail that is not currently registered and therefore wasn't include in the previous report. -David

Table 1. Effects of insecticide treatments on vine mealybug density

| Insecticide | Rate form prod/acre | Mealybugs per 3-min timed search ± SEM | |
		Arvin	Edison
Brigade WSB	16 oz	292.7 ± 54.8 d	84.9 ± 8.7 b
Applaud 70DF	12 oz	92.5 ± 41.4 b	53.6 ± 15.6 b
Venom 70WSG	3 oz	87.8 ± 40.5 bc	70.5 ± 10.4 b
Assail 30SG	2.5 oz	69.9 ± 11.1 b	71.8 ± 14.2 b
Assail	5.0 oz	132.1 ± 18.1 cd	69.3 ± 22.3 b
Lorsban 4E	2 qt	41.6 ± 29.3 ab	45.4 ± 15.1 b
Sevin XLR	2 qt	24.5 ± 11.1 ab	49.8 ± 12.4b
Movento 2SC	8 oz	7.6 ± 3.9 a	4.7 ± 2.1a
Untreated		189.3 ± 29.8 cd	58.5 ± 16.5b