

THE EFFECTS OF INSECTICIDE TREATMENTS ON GILL'S MEALYBUG, *FERRISIA GILLI*, IN PISTACHIOS, 2014

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Gill's mealybug: *Ferrisia gilli* Gullan

During 2014 we conducted a trial near Blackwell's Corner in Kern County to evaluate the effect of insecticides on the density of Gill's mealybug in pistachios. The trial was located in a mature commercial pistachio orchard with a history of infestation by the pest. On 2 July 2014 we surveyed approximately 120 trees to determine the average number of mealybugs per cluster within each tree. Out of these trees we chose the 36 that had the greatest mealybug density and assigned these into four groupings with group 1 being the most infested, group 2 being the next most infested, etc., until four groups of nine trees were formed. Trees within each group were assigned randomly to one of eight insecticide treatments or the untreated check in a 9 treatment by four blocks randomized complete block design. Treatments were applied on 15 July 2014 using a hand gun at 150 PSI at a water volume of 200 gpa. All treatments were made with the addition of the surfactant Dyne-amic at a rate of 4 fl oz per 100 gallons of water. Application timing coincided with crawler emergence of the second in-season generation of mealybugs.

Mealybug density was determined on 30 Jul (2 WAT), 13 Aug (4 WAT), and 27 Aug (6 WAT). On each evaluation date the number of mealybugs was counted on each of 20 clusters per tree. Data were converted into the average number of mealybugs per cluster for each tree and data were analyzed by ANOVA using transformed data (square root ($x + 0.5$)) with means separated by Fisher's Protected LSD ($P = 0.05$). The number of mealybug-days was also analyzed across all evaluation dates. This was done by multiplying the density of mealybugs on each evaluation date by 14 days and then adding those three numbers.

The effects of insecticide treatments on mealybug density are shown in figure 1. The most effective treatments were Movento, Closer, Assail, Belay and Centaur. At harvest on 27 Aug plots treated with Assail, Belay, Centaur and Movento all had less than one mealybug per cluster compared to 13.9 in the untreated check. Plots treated with Closer (3.5 mealybugs per cluster) and Bexar (5.2 per cluster) were statistically equivalent to the best treatments. Mealybug densities in plots treated with pyrifluquinazon and Sivanto were statistically equivalent to the untreated check.

Evaluation of cumulative mealybug-days revealed that Movento provided the best overall mealybug control that was statistically equivalent to the control provided by Assail, Belay, Centaur and Closer. Cumulative mealybug-days in plots treated with Bexar was statistically

higher than the best treatment but still statistically lower than the untreated check. Pyriproxyfen and Sivanto did not provide any evidence of activity against mealybugs.

Table 1. The effects of insecticide treatments on the density of *Ferrisia gilli* in pistachio, Kern County 2014.

Treatment ¹	Rate form. product/ac	Mean <i>F. gilli</i> per cluster				
		2 Jul Precounts	30 Jul 2 WAT	13 Aug 4 WAT	27 Aug 6 WAT	Cumulative Mealybug-days ²
Assail 70WP	8 oz	0.3	1.5 ab	1.0 ab	0.5 a	47.7 ab
Belay 2.13SC	6 fl oz	0.2	2.4 abc	1.0 ab	0.0 a	64.6 ab
Bexar 15SC	27 fl oz	0.2	2.7 abc	2.8 bc	5.2 ab	131.8 b
Centaur WDG	46 oz	0.2	2.3 abc	0.8 ab	0.8 a	65.5 ab
Closer 2SC	5.67 fl oz	0.3	1.0 a	0.1 a	3.5 a	45.8 ab
Movento 2SC	9 fl oz	0.2	0.7 a	0.1 a	0.4 a	18.7 a
Pyriproxyfen	6.4 fl oz	0.2	5.6 c	2.8 bc	11.0 bc	234.0 c
Sivanto	12 fl oz	0.3	5.4 bc	5.3 c	22.6 c	344.3 c
UTC	--	0.2	6.2 c	5.6 c	13.9 c	305.4 c
<i>F</i> (df = 8,24)		0.46	2.41	3.8	8.3	10.60
<i>P</i>		0.8707	0.0458	0.0050	<0.0001	<0.0001

Means in a column followed by the same letter are not significantly different ($P > 0.05$, Fisher's Protected LSD) after square root ($x + 0.5$) transformation of the data. Untransformed means are shown.

¹All treatments were made with the addition of the surfactant Dyne-amic at a rate of 4 fl oz per 100 gallons of water

²Mealybug-days is a cumulative measurement that is determined by adding the average mealybugs per cluster for each day during the six-week trial.