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GRAPE: *Vitis labrusca* L 'Autumn Royal'

IN-SEASON CONTROL OF VINE MEALYBUG IN 'AUTUMN ROYAL' TABLE GRAPES IN KERN COUNTY, 2009

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Vine Mealybug: *Planococcus ficus* (Signoret)

In 2009 we conducted a field trial to evaluate the effects of insecticides against vine mealybug. The trial was located in a 2.0 acre portion of a vineyard planted with 'Autumn Royal' table grapes near Arvin, Kern Co. CA. We evaluated effects of 17 treatments and an untreated check (Table 1) on mealybug density in plots that were two rows by 9 vines long and organized into a RCBD with four blocks.

Insecticide treatments were made either as a foliar spray or directly to the soil (Table 1). Foliar sprays were made by using an air blast sprayer on 26 Feb, 27 Apr, 18 May or 19 Jun. Water volume was 150 gpa for applications for Feb and Apr and 200 gpa for the May and June applications. Soil applications were made over a period of one hour by distributing half of the insecticide for each plot into cups placed under the drip emitters. The water was then turned on for 30 minutes, allowing the insecticide to pour out into the soil one drip at a time. This process was then repeated during a second 30-min interval with the other half of the insecticide. Contents of each cup were stirred at 10-min interval to help ensure consistent delivery of the insecticide to the soil. Soil treatments were applied on 29 Apr and 22 May. The trial was evaluated using cluster evaluations on 30 Jul. For each plot we evaluated 10 clusters per vine on each of the 6 vines in the center plot. Each cluster was given a rating from 0 to 3 with 0 = no mealybug, 1 = honeydew only, 2 = mealybug present, and 3 = >10 mealybugs present. Data were analyzed by ANOVA with means separation using Fisher's Protected LSD (P=0.05). Square root transformations (square root (x + 0.5)) were used for cluster evaluations except the no damage (rating = 0) cluster evaluations, which used an arcsin transformation (arcsin (square root (x))).

Movento was an effective insecticide against vine mealybug when used in April or May with damage ranging from 2.1 to 5.4% compared to the untreated check (Table 1). Applaud in April followed by May treatments of Applaud, Movento, or Admire resulted in Applaud followed by Movento as the best combination numerically, though all combinations were statistically equivalent. Plots that received foliar treatments of Clutch had 4.6% of the clusters with evidence of mealybugs compared to 8.2 to 12.1% for plots receiving soil applications of Clutch. There were no statistical differences in mealybug densities between plots treated with Lorsban 4E or Lorsban Advanced. Comparisons between soil applications of neonicotinoids in May resulted in the highest damage in plots treated with Venom, which was statistically equivalent to plots treated with Platimum or Admire. Plots treated with Clutch had the lowest damage, but that was also equivalent to damage in plots treated with Platinum or Admire.

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Table 1. Effects of insecticides treatments on the density of vine mealybug in clusters.

Treatment/ Formulation	Rate Form Prod/Acre	App. Date	Method	Surfactant[1]	Cluster Ratings[2], 30 Jul Percentage clusters per category 0[3]	1[4]	2[4]	3[4]	1+2+3[4]
Lorsban 4E	4 pt	26 Feb	Foliar	L	90.8abcd	2.5ab	6.2a	0.4ab	9.2abcd
Lorsban Advanced	4 pt	26 Feb	Foliar	L	88.8abc	5.8abc	4.2a	1.3abc	11.3abc
Movento 2SC	8 fl oz	27 April	Foliar	D	97.9a	1.7ab	0.4a	0.0a	2.1a
Movento 2SC	8 fl oz	18 May	Foliar	L	94.6abc	1.7ab	3.8a	0.0a	5.4abc
Movento 2SC	8 fl oz	18 May	Foliar	D	95.8ab	0.8a	2.9a	0.4ab	4.2ab
Movento 2SC	8 fl oz	19 June	Foliar	D	91.5abc	5.8bcd	2.7a	0.0a	8.5abc
Applaud 70DF + Applaud 70DF	12 oz + 12 oz	27 April + 18 May	Foliar + Foliar	L L	92.1abcd	3.4ab	4.2a	0.4ab	7.9abc
Applaud 70DF + Movento 2SC	12 oz + 8 fl oz	27 April + 18 May	Foliar + Foliar	L D	97.1ab	2.5ab	0.4a	0.0a	2.9ab
Clutch 2.13SC	6 fl oz	18 May	Foliar	L	95.4abc	2.9ab	1.7a	0.0a	4.6abc
Clutch 2.13SC	6 fl oz	19 June	Foliar	L	95.4abc	2.9ab	1.3a	0.4ab	4.6ab
Applaud 70DF + Admire Pro 4.65L	12 oz + 14 fl oz	27 April + 22 May	Foliar + Soil	L n/a	94.9abc	2.1ab	1.7a	1.3abc	5.1ab
Admire Pro 4.65L	14 fl oz	22 May	Soil	n/a	86.3bcd	4.6abc	7.9a	1.3abc	13.8bcd
Platinum 75SG	3.67 oz	22 May	Soil	n/a	87.1bcde	3.4ab	6.7a	2.9bc	12.9bcde
Platinum 75SG	5.67 oz	22 May	Soil	n/a	84.2cde	5.4bcd	7.1a	3.3cd	15.8cde
Clutch 2.13SC	12 fl oz	29 April	Soil	n/a	87.9bcde	4.6abc	4.6a	2.9abc	12.1bcde
Clutch 2.13SC	12 fl oz	22 May	Soil	n/a	91.8abc	4.8abc	2.6a	0.9abc	8.2abc
Venom 70SG	6 oz	22 May	Soil	n/a	75.8de	10.4cd	8.8a	5.0cd	24.2de
Untreated Check	n/a	n/a		n/a	69.3e	13.1d	8.9a	8.8d	30.7e

[1]Dyne-Amic (D) and Latron B-1956 (L) were used at a rate of 4 fl oz/100gal v/v.
[2]Cluster Ratings: 0 = no mealybug, 1 = honeydew only, 2 = mealybug present, and 3 = >10 mealybugs present
[3]Means in a column followed by the same letter are not significantly different ($P > 0.05$, Fisher's protected LSD) with arcsin square root transformation (arcsin (square root (damage percentage/100))) transformation of the data. Untransformed means are shown.
[4]Means in a column followed by the same letter are not significantly different ($P > 0.05$, Fisher's protected LSD) with square root (x + 0.5) transformation of the data. Untransformed means are shown.