

## ENVIRONMENTALLY SOUND DRIED PLUM FARMING PRACTICES

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### PROBLEM AND SIGNIFICANCE

Balancing cost-effective pest management with minimal environmental impact is an ongoing challenge for California agriculture. This project continues previous work on alternatives to traditional timings and rates of organo-phosphate or pyrethroid pesticides for aphid control.

Aphid (mealy plum and/or leaf curl plum aphid) is the primary pest in dried plum production.. Integrated pest management has been challenging in dried plum production due to the lack of inexpensive, “soft” materials for aphid control. Until recently, materials registered for in-season aphid control could harm beneficial mites and cause mite outbreaks or were expensive compared to disruptive materials.

Recent registration of new “soft” pesticides [Actara, Provado, Assail, BeLeaf, and Movento] in dried plum production may lead to the use of these new materials as a valuable alternative to pyrethroids or organophosphates in-season. These new materials must be evaluated for efficacy.

In addition, research to identify cost-effective spray drift reduction practices that effectively control the target pest -- especially at times when limited tree canopy increases the risk of such drift – is needed.

### OBJECTIVES

1. Evaluate registered pesticides for aphid control in spring and summer.
2. Test low drift spray practices for efficacy, drift prevention, and application cost.

### PROCEDURES

1. A replicated, single tree trial was established in a Sutter County orchard with a history of high mealy plum aphid pressure to evaluate registered pesticides for effective aphid control with spring or summer application. For the entire project, five pesticides were applied tested – 3 in early March (prebloom) and 2 in late May. Application was by air-assisted, backpack mistblower following a complete randomized block design using a spray volume equivalent to 100 gallons per acre. There were six blocks with one replicate per treatment per block. Rates for the early March application were the bottom

of the label for all materials tested. Summer application rates were in the middle of the range permitted for each material. Pesticides in the test represent three chemistry classes (3, 1, and 9C) and are reported below, followed by their IARC (Insecticide Resistance Action Committee) classification:

- Lorsban at 1 quart/acre (1)
- Warrior at 2.56 oz/acre (3)
- Mustang MaxEW at 1.28 oz/acre (3)
- BeLeaf at 2.5 oz/acre (9C)
- Assail at 3 oz/acre (4A)

Aphid populations were evaluated May 19, May 27, and June 2, 2010 using two separate observations:

- I. The percent tree canopy infested with aphids was estimated by walking around the tree and looking for symptoms of aphid infestation including:
  - a. Tightly curled leaves (sign of leaf curl plum aphid activity)
  - b. Honey dew and bee activity (sign of mealy plum aphid activity)
2. A demonstration spray drift/aphid control trial was established in a 30 acre commercial orchard in Sutter Co. Two different sprayer set-ups were used.
  - Treatment 1: Standard UC recommendations for spray application:
    - 2.5 MPH ground speed
    - 100 gallons per acre spray volume, 150 psi sprayer system pressure
    - 2100 RPM on tractor tac -- 540 PTO speed
    - High gear setting on the sprayer fan
  - Treatment 2: Low drift set up:
    - 4.0 MPH ground speed
    - 100 gallons per acre spray volume/150 psi sprayer system pressure
    - 1650 RPM on tractor tac -- 420 PTO speed?
    - Low gear setting on the sprayer fan

The entire orchard was sprayed with Warrior (3 oz/acre) between November 12-18, 2010. A John Deere Model 5105ML tractor was rented and a Turbomist airblast sprayer was leased. Drift was collected on cellulose pads placed 25, 50, 100, and 200 feet from the southern edge of the orchard on November 12. This day was selected because weather forecasts called for wind from the north or northwest. Weather data were measured throughout the application by mobile weather station. Drift samples were submitted for pesticide – the Warrior active ingredient, lambda-cyhalothrin -- analysis at a commercial lab. Diesel use per spray tank delivered was measured by refilling the tractor's diesel tank after each tank was emptied. Aphid control will be evaluated in spring, 2011.

## RESULTS AND DISCUSSION

1. Early March applications of Lorsban, Warrior, or Mustang at the lowest labeled rates provided excellent aphid control in mid-May, two and a half months later (Figure 1). Applications of Beleaf or Assail provided excellent in-season control of mealy plum aphid within 2 weeks of application. Assail provided excellent control within a week of application.
2. Diesel use per 600 gallon tank decreased from 2.75 gallons to 1.37 gallons for treatments 1 and 2, respectively.

Table 1. Spring and summer pesticide trial treatment materials, rates, and application timings. Sprays were applied at a volume equivalent to 100 gpa. Sutter County, 2008.

Trt No.	Materials & rates	Timing
1	Warrior (2.56 oz/a)	March 1, 2010
2	Mustang Max EW (1.5 oz/a)	March 1, 2010
3	Lorsban (1 qt/acre)	March 1, 2010
4	Beleaf (2.5 oz/acre)	May 19, 2010
5	Assail (3 oz/acre)	May 19, 2010
6	Untreated control	--

Figure 1. Aphid infestations levels – presented as % of canopy infested with aphid – following pesticide application on March 1 (Lorsban, Warrior, or Mustang) or May 19, 2010 (Assail or Beleaf) to individual trees in a commercial orchard in Sutter County. Spray volume was equivalent to 100 gpa. Data are an average of six replicates per treatment. Bars represent +/- 1 standard error. Unless mentioned in the figure, aphid populations were evaluated on May 17, 2010. WAT = week after treatment.

