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 fall sprays for aphid control.

Aphid (mealy plum and leaf curl plum aphid) is the primary pest in dried plum production, although spider mites, scale, and peach twig borer can occasionally require control. Integrated pest management is particularly challenging in dried plum production due to the lack of inexpensive, "soft" materials for aphid control. This makes in-season aphid management challenging, as registered materials may harm beneficial mites and cause mite outbreaks or are expensive compared to disruptive materials. Dormant spray application in dried plum is very effective, but under regulatory scrutiny due to links to surface water contamination. Previous research has shown certain fall spray materials for aphid control to be effective, but little information exists on rates and timings of several new materials.

Reliance on Asana, a pyrethroid, for fall aphid control may lead to increased tolerance or resistance to this material in aphid and other pest populations. Identification of effective alternative chemistries for aphid control can contribute to a pesticide resistance management program in dried plums. 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 organophospates in fall and/or in-season sprays. Timings and rates of these materials, plus the new pyrethoids recently registered for use in dried plum (Warrior, Mustang MaxEW, and Baythroid) should be evaluated in fall applied treatments.

A fall sprays serves as an effective alternative to a dormant spray for aphid control in dried plums. However, a dormant spray can control a suite of pests including San Jose scale (SJS) and peach twig borer (PTB). Both of these pests can harm dried plum orchards, but limited information exists on affect of fall sprays on populations of these pests in fall treated orchards.

OBJECTIVES

1. Evaluate registered pesticides for aphid control at fall application timing.

2. Monitor scale and PTB populations in fall sprayed blocks.

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 previously untested but registered pesticides for effective aphid control with fall application. Seven pesticides were applied using an air-assisted, backpack mistblower this fall at two general timings – late October or early mid-November, 2008. Materials in the test represent three chemistry classes (3, 4A, and 9C) and are reported below, followed by their IARC (Insecticide Resistance Action Committee) classification:
    - Warrior (3)
    - Baythroid (3)
    - BeLeaf (9C)
    - Provado (4A)
    - Assail (4A)
    - Leverage (3 + 4A)
    - Mustang MaxEW (3)

Urea at 40#/acre was included with several of the treatments to test the effect of this foliar fertilizer on pest control. Fall foliar N fertilization may be an alternative to soil-applied fall N fertilization, and it is possible that the pesticide and urea may be tank mixed. No pest control studies have been done across a range of pesticides with urea in the tank.

Aphid populations were evaluated May, 26 2009 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. Tighly curled leaves (sign of leaf curl plum aphid activity)
    b. Honey dew and bee activity (sign of mealy plum aphid activity)

II. Determining aphid damage based on a simple 0-3 scale of damage, with 0= no damage to 3 = extensive infestation. The scale was as follows:
    a. 0 = no aphids present
    b. 0.5 = aphids present, but not visible to casual observation
    c. 1.0 = aphids present from casual observation, but not large population
    d. 2.0 = aphids readily visible, but not extreme
    e. 3.0 = extreme aphid infestation “Spray today” situation.

2. San Jose scale populations were monitored following the IPFP guidelines for dormant spur samples in six orchards in winter 2008/2009. Three of the orchards were fall sprayed in 2008, and four were treated with a standard dormant spray (oil + Asana) in late January/early February, 2009.

Peach twig borer populations were monitored by pheromone trap in six orchards, and incidence of PTB larve in 1200 fruit were checked at 400 degree days (DD) after biofix.

RESULTS AND DISCUSSION

Due to poor communication by the lead author to the grower, the plot was oversprayed by the grower in the course of his dormant spray program for the rest of the ranch. The fault for this accident lies entirely with the farm advisor. The plot was evaluated May 26, 2009, and 25% of each of the control treatments (untreated or urea only) showed significant aphid damage. Unfortunately, no conclusions can be drawn from these results as to the efficacy of the fall applied pesticides. This work will be repeated at no cost to the CDPB.

Overall, San Jose scale (SJS) and peach twig borer (PTB) populations were not significantly higher in fall treated vs. dormant sprayed blocks. There was a trend for slightly higher PTB levels in fall treated blocks, but those levels were still well below the treatment threshold. One fall treated block showed high enough levels of SJS to warrant treatment, although this pressure is right on the lower border of requiring a pesticide + oil application. Overall, pest pressures in fall treated vs. dormant sprayed blocks do not appear to be significantly different.

Table 1. Fall pesticide trial treatment materials, rates, and application timings. All urea treatments are standard graded, prilled urea applied at a rate of 40 pounds per acre. Sprays were applied at a volume equivalent to 100 gpa. Sutter County, 2008.

Trt No.	Materials & rates	Timing
1	Beleaf (2.8 oz/acre) + urea	23-Oct
2	Provado (5 oz/acre) + urea	26-Oct
3	Leverage (5 oz/acre) + urea	23-Oct
4	Assail (5.3 oz/acre) + urea	24-Oct
5	Baythroid (2.8 oz/acre) + urea	26-Oct
6	Warrior (3 oz/a)+ urea	27-Oct
7	Beleaf (2.8 oz/acre)	23-Oct
8	Provado (5 oz/acre)	24-Oct
9	Leverage (5 oz/acre)	26-Oct
10	Assail (5.3 oz/acre)	24-Oct
11	Baythroid (2.8 oz/acre)	26-Oct
12	Warrior (3 oz/a)	27-Oct
13	Mustang Max EW(0.51 oz/a)	20-Nov
14	Mustang Max EW (1.5 oz/a)	20-Nov
15	Warrior (3 oz/a)	20-Nov
16	Control	---
17	Control + urea	24-Oct

Table 2. Peach twig borer (PTB) and San Jose scale (SJS) populations in fall and dormant sprayed blocks. Scale populations were evaluated using dormant spur samples (100 spurs/orchard). Peach twig borer populations were assessed by checking 1200 fruit/orchard at 400 degree days past biofix. 2% PTB damage is the treatment threshold. The threshold for scale treatment is 10% dormant spurs with live SJS.

Orchard	Fall Sprayed	Dormant sprayed	Biofix	% larvae in fruit at 400 DD past biofix.	% San Jose scale present (100 spurs)
Orchard 1	x		April 20	0.42	0
Orchard 2		x	April 20	0.00	0
Orchard 3		x	April 17	0.25	0
Orchard 4	x		April 20	0.58	0
Orchard 5		x	April 20	0.25	0
Orchard 6		x	April 20	0.17	--
Orchard 7	X		ND	--	20