

**EFFECT OF ALTERNATE YEAR DORMANT  
PHOSPHATE/OIL APPLICATIONS ON  
SAN JOSE SCALE AND PEACH TWIG BORER CONTROL IN  
FRENCH PRUNE**

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## INTRODUCTION

The "dormant spray", usually a phosphate insecticide combined with a spray oil, is the most important in the deciduous fruit grower's insect control program. This "clean-up" spray kills scales, peach twig borers (PTB) and aphid and mite eggs; prune growers employing a thorough dormant insecticide control program rarely have to apply in-season insecticides or acaricides.

Dormant sprays have come under increasing criticism. The sheer volume of insecticide application at this time of year presents environmental concerns; most all deciduous fruit growers apply this spray during foggy periods of winter; insecticides applied at that time often become suspended in the fog causing health hazards to both humans and animals, especially raptors.

Alternate year dormant insect control, which would reduce pesticide load, may be feasible. If one accomplishes a thorough job of insect control with a dormant spray one year, sufficient pest recovery may not occur within the next growing season to present an economic problem the following season. Such a practice, if successful, would both halve the pesticide load into the environment and grower insecticide costs. Here we report results of a third year of a six year experiment designed to test the feasibility for alternate year dormant sprays.

## METHODS

A mature, 32.4 ac Improved French prune orchard in Woodville Ca that had received annual dormant insecticide treatments was selected for the experiment. In 1992, the entire block was treated in February (dormant) with a spray of Diazinon and oil to ensure uniform, sub-economic scale and PTB levels for the onset of differential treatments the next winter. In Fall of 1992, the orchard was divided into 20, 1.62 ac plots and the following treatments replicated five times into a randomized complete block design: 1) no dormant spray; 2) annual February dormant treatment; 3) dormant treatment February 1993, 1995, 1997; and 4) dormant treatment February 1994, 1996, 1998. The first test year of treatments was applied in February 1993, the second in February 1994 and the third in February 1995. All experimental treatments were sprayed with Supracide 2E at a rate of 1 gallon product per acre in 200 gallons of water. The experiment is designed to run through the 1998 growing season.

Percentage of San Jose Scale (SJS) and Peach Twig Borer (PTB) infested fruit were determined close to harvest (8/6/93 and 8/1/94 and 8/1/95) by sampling 25 individual fruits from 10 trees within each experimental plot (i.e. 250 fruits per replicate). Dead and

live SJS status were further determined in the dormant season preceding the next experimental insecticide application (12/28/93, 2/15/94 and 2/15/95) by counting scales on 5 fruiting twigs from each of 5 trees within each replicate.

## RESULTS AND DISCUSSION

**Prune fruit infestation:** Average number of SJS and PTB infested fruit for the 1993, 1994, and 1995 season is presented in Table 1.

As of 1993, following the February treatment, significant reduction in SJS on the mature fruit occurred in treatments where the dormant spray was applied. Although resulting damage was not believed economic, PTB damage to fruit was detected, damage was light and no significant difference occurred with or without treatment (see Table 1.).

In 1994, following treatment of those plots untreated the year before or those treated annually, numerically different, but not significantly less, SJS infested fruit occurred. It is of interest that fruit from trees treated or not treated in 1993 and not 1994 had increased scale infestation from the previous season but still quite light when compared to the untreated control. As in 1993, no significant difference in PTB occurred between any treatment.

In 1995, SJS infested fruits were substantially less than in 1994. Differences between treatments were insignificant. PTB infested fruit were few with no significant difference between treated treatments but all higher than the control.

**Twig infestation:** Effect of alternate year dormant sprays on San Jose scale infested twigs for years 1993, '94, & '95 is presented in Table 2.

In December of 1993, significant reductions in average numbers of dead scale per 125 twigs from the 1993 February treatments occurred when compared to the untreated treatments. Number of live scale on twigs from annually treated trees were not significantly different from those treatments receiving no dormant treatment the previous February, although numerical differences were substantial, see Table 2.

In 1994, prior to treatment, significantly higher numbers of dead scale occurred on untreated twigs than on untreated twigs from the untreated and 1993 treated trees had significantly higher numbers of live scale (Table 2).

In 1995, again the untreated trees had significantly higher numbers of dead scale than did the treated trees regardless of year treated. Annually treated trees had significantly less live scale than either alternate year program or the untreated controls.

All plots in this experiment were examined for the presence of mealy plum aphid or leaf curl aphid; a dormant spray kills these aphids' eggs and often, in absence of such a spray, this pest develops to economic levels. No infestation from either of these pests was noted in any treatment.

## CONCLUSIONS:

This is a third year progress report of an experiment designed to run six years. Results so far indicate that alternate year dormant insecticide sprays to control SJS and PTB appear to provide control of these pests for more than one year. Aphids have not, as yet, emerged as a problem in this block following three years of no treatment and alternate year treatment.

**Table 1. EFFECT OF ALTERNATE YEAR DORMANT SPRAYS ON  
INSECT INFESTATION OF FRENCH PRUNE FRUITS**

**FRUIT DAMAGE**

**Avg. No. of San Jose Scale Infested fruit 1/**

<b>Treatment 2/</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
No Dormant Spray (Control)	58.0 a	63.0	1.4			
Annual Dormant Spray	4.0 b	10.0	1.6			
Dormant Spray '93,'95, '97	10.0 b	19.0	1.0			
Dormant Spray '94, '96, '98	54.0 a	7.0	1.0			
	P=.01	ns	ns			

**Avg. No of Peach Twig Borer Infested fruit 1/**

<b>Treatment</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
No Dormant Spray (Control)	5.0	0.0	1 b			
Annual Dormant Spray	2.0	1.0	2 ab			
Dormant Spray '93,'95, '97	10.0	1.0	1.8 ab			
Dormant Spray '94, '96, '98	3.0	0.0	3 a			
	P=.05	ns	ns			

1/ 25 Fruit/tree from 10 trees/rep = 250 fruit/rep; counted: 8/6/93, 8/1/94, 8/1/95

2/ Treatments applied in February of the year data collected

**Table 2. EFFECT OF ALTERNATE YEAR DORMANT SPRAYS ON  
SAN JOSE SCALE INFESTATION OF FRENCH PRUNE TWIGS.**

**TWIG INFESTATION (new wood) 1/**

**# No. Dead San Jose Scale per 125 twigs**

<b>Treatment</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
No Dormant Spray (Control)	16.0 a	99 a	168 a			
Annual Dormant Spray	0.0 b	11 b	25 b			
Dormant Spray '93, '95, '97	5.0 b	35 b	68 b			
Dormant Spray '94, '96, '98	52.0 a	24 b	51 b			

P = .05

**# No. Live San Jose Scale per 125 twigs (new wood)**

<b>Treatment</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
No Dormant Spray (Control)	68.0	55.0 a	87 a			
Annual Dormant Spray	0.0	15.0 b	25 c			
Dormant Spray '93, '95, '97	0.0	35.0 ab	59 ab			
Dormant Spray '94, '96, '98	72.0	22.0 b	40 bc			

P = .05

ns

1/ 5 twigs from 5 trees = 25 twigs/rep, 5 reps/treatment; Sampled 12/28/93, 2/15/95 (pre-treatment)

2/ Treatments applied in February of the year data collected