Bud Moth on Prunes

comparative effectiveness of spray and dust as controls studied in tests

— Arthur D. Borden, Harold F. Madsen and Stanley Benedict

A technical experiment is covered by the following progress report. Users of organic phosphates, such as parathion, are urged to follow carefully established precautions for handling the material.

Spray applications of Parathion and DDD gave better control of the bud moth—*Spitlonana ocellana*—attacking prunes in the Santa Clara Valley, than did dust applications in tests made during the 1949 season.

A 25-acre block of 15-year-old French prunes was divided into 10 plots—each plot 10 tree rows wide and 23 tree rows long—for a semi-commercial test of the efficiency of two of the materials found most promising in control in the 1948 experiments. All of the spray and dust applications were made by the grower with equipment in use on that orchard. The treatments were made in replicate—two plots per treatment—and included the following:

25% wettable Parathion spray at a dosage of one pound to 100 gallons of water.

50% wettable DDD spray at a dosage of three pounds to 100 gallons of water.

5% DDD dust mixture at a rate of 40 pounds an acre.

2% Parathion dust mixture at a rate of 33 pounds an acre.

Untreated plots which received no spray chemicals.

The equipment employed in the application of the spray chemicals was an air carrier type of sprayer discharging 30,000 cubic feet of air a minute, with a full peripheral discharge through 28 nozzles with .078 disc openings. The sprays were applied by the low volume method averaging 1.9 gallons a tree in the first application—April 20th—and 2.6 gallons a tree in the second application—June 14th.

A mist duster having a double fishtail discharge was employed for the application of the dust mixtures. The dust applications averaged .43 pound a tree. All applications were made in the late evening when there was no wind.

A pre-spray count made March 14th of the number of hibernaculum—protective covers for overwintering larvae—found at the base of 200 fruit spurs selected at random from each plot showed an average of 27 hibernaculum a sample and a very even distribution of the infestation in all plots.

The first application was made April 20th when the fruit was largely in the jacket period. The timing of the second application was determined by randomized counts of the number of hatched eggs of the new brood of moth as found in the untreated plots. On June 14, 69% of the eggs had hatched; 11% were in the black-spot stage ready to hatch, and 21% were not hatched. The second application was applied that evening.

A post-treatment count was made April 28th, of 200 leaves selected at random from each treatment.

Counts of Bud Moth Larvae on Leaves in Post-Spray Count of April 28

Treatment	Leaves examined	Living larvae	Dead larvae	Empty cases *	Pupae
Parathion					
spray	200	0	90	109	1
dust	200	2	67	130	1
DDD					
spray	200	12	19	165	4
dust	200	58	9	128	4
No treatment	200	83	0	13	4

*** Empty cases may indicate the larvae were destroyed and dropped out, or may have migrated to new quarters.**

After the damage to the leaves from the new brood of larvae was apparent, randomized counts of the number of injured leaves that could be seen from the ground were made on an equal number of trees in each plot.

The results of this count made July 26th showed the average number of damaged leaves per tree from each treatment to be: Parathion spray, 0.64; Parathion dust, 2.66; DDD spray, 0.64; DDD dust, 13.5 and Untreated, 32.46.

Randomized counts of mature fruit on the ground at the first picking—August 15th–16th—and at a later picking—August 28th—showed the percentages of bud moth injured fruit.

Percentage of Bud Moth Injured Fruit at Harvest

Treatment	August 15	August 28	Average for both pickings
Parathion			
spray	2.2	1.0	1.6
dust	4.4	3.0	3.7
DDD			
spray	1.3	0.4	0.8
dust	7.6	2.3	5.0
No treatment	22.1	12.5	17.3

Residue analyses were run on fresh fruit from each plot and on the dried fruit after dipping and dehydration.

Residue Analyses of Fresh and Dried Fruit Following the Control Treatments

Treatment	Parts per million on Fresh fruit	Dried fruit
Parathion		
spray	.012	.006
dust	.006	.000
DDD		
spray	.680	.710
dust	.270	.290

The spray applications gave better control than did the dusts with both of the spray chemicals tested. Although Parathion sprays and dusts show a higher initial toxicity to the larvae, the longer residual value of DDD as a spray makes this material equally effective.

Both of these materials are effective in the control of bud moth but spider mites may become a problem when DDD is used. Parathion is effective against spider mites and will also control mealy plum louse if present at the time of applying the spray.

Parathion presents no residue problem on fresh or dried fruit, while the spray residue of DDD may or may not be a problem depending upon the allowable tolerance.

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strongly retarded in comparison with lots 1 and 4, nearly twice as many buds grew on lot 3 as on lot 2.

The average temperature outdoors during the daily warm treatment of lot 3 was 9° F lower than that to which lot 2 was subjected. This difference in temperature may have caused the difference in behavior, but there is also the possibility that the strong summer sunlight may have stimulated growth of buds on lot 3. Strong radiation such as X rays in suitable dosage has been shown to break the rest of buds, and some evidence exists that ordinary light shortens the rest of certain buds. In the orchard it has been generally believed that much direct sunlight during the winter days tends to prolong the rest because it raises the temperature of twigs and buds somewhat.

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