Orange Tortrix on Apricots

malathion, less toxic than parathion, found effective against pest when used as a May spray for codling moth

Harold F. Madsen, Arthur D. Borden, and Robert E. Clark

The orange tortrix has been a major pest of apricots in the Santa Clara Valley—and in other coastal apricot and deciduous fruit areas—for several years.

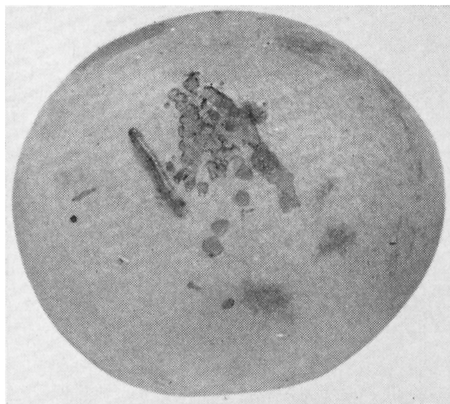
The orange tortrix has increased to major importance since 1951 when a spray program, mainly against codling moth, was established which consisted of a petal fall spray of DDD followed by a May spray of parathion timed to the flight of the codling moth.

Since 1951, codling moth has decreased to a pest of only a few orchards while the orange tortrix has increased to major importance.

During 1952, a series of plots demonstrated that the spray program developed principally for codling moth also was effective in controlling the orange tortrix.

Because of the high human toxicity of parathion, work was continued during the 1953 season in a search for substitute materials for the May spray that would be safer to use and not create a residue problem on the fruit at harvest.

A test plot was established at Berryessa in an apricot orchard that had a past history of fruit damage because of orange tortrix.



Larva of orange tortrix and damage on apricot.

Five treatments on 12-tree plots replicated twice, were used in the experiment, and treatments were applied with conventional ground equipment at 600 gallons of spray per acre. The dosages used were based on the number of pounds of material per 100 gallons of spray.

In Plot *1*, 2 pounds of 50% DDD per 100 gallons of spray were applied at petal fall and 2 pounds of 25% parathion per 100 gallons of spray, in May. This is the standard treatment used during the 1950 and 1951 seasons.

In Plot *2*, 2 pounds of DDD were applied at petal fall and 4 pounds of 25% malathion in May. Malathion—although an organic phosphate—has a much lower human toxicity rating than does parathion, and has been effective against a wide range of insect pests.

Plot *3* was treated with 2 pounds of DDD at petal fall and 2 pounds of 25% parathion in June. This plot was a timing experiment to see if a June spray would be more effective than a May spray for the orange tortrix.

In Plot *4*, 4 pounds of 25% Perthane were applied at petal fall, and repeated in May. Perthane is a new chlorinated hydrocarbon insecticide with a very low human toxicity, which could make this compound acceptable although a residue might be present at harvest.

Plot *5* was the check plot which received a grower application of 2 pounds of DDT during the pink bud stage, with no further treatment during the season.

Counts of 1,000 fruits from each treat-

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following treatment. The buds appearing in the fumigated plots had a normal shiny, bright green appearance. In contrast, the buds appearing in the untreated areas were chlorotic and misshapen. As the new leaves developed in the treated area the plants had the healthy, vigorous appearance of a first year planting. In four weeks the new leaves had grown through the canopy of old leaves and formed a new canopy well above the old one. Following a period of rapid growth the plants blossomed freely and set a heavy crop of high quality berries.

Cyclamen mite counts taken in the fumigated areas eight to 12 days after fumigation indicated excellent reduction in mite populations, although in each case some live mites were found. Counts made two months later indicated that the residual population of mites left following fumigation was able to reproduce rapidly and relatively high numbers resulted.

A polyethylene plastic tarpaulin in place during commercial field fumigation. Note: All edges are sealed by water.

Vigorous plant growth following fumigation is not entirely the result of controlling the cyclamen mite because methyl bromide fumigation of strawberry plants causes a marked plant stimulation but its entire effect on subsequent production is not known. The effect of such plant stimulation on plant longevity and on the various strawberry diseases must be studied.

To date, the effect of this type of fumigation has only been studied on the Lassen strawberry. Verbal reports from other areas indicate that different strawberry varieties differ in their susceptibility to methyl bromide injury.

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R. C. Storkan co-operated with materials and assistance in this test.

Safflower Seed Meal

oil meal proves promising as protein source for laying hens

C. R. Grau and Phyllis A. Zweigart

An economical protein source for laying hens has become available because improved methods of seed hull removal make possible the manufacture of safflower seed oil meals containing as much as 40% crude protein.

Results of preliminary feeding trials indicate that at least 15% of safflower seed oil meal can be fed in place of soybean oil meal in an all-mash ration for laying hens.

Studies of safflower protein for chicks conducted at Davis indicated that lysine and methionine are not present in amounts high enough to allow its use without combination with better sources of these amino acids. Because the hens' requirements for these amino acids are not well established, calculations of practical diets using safflower seed oil meal as the principal protein source could not be used in evaluating this new feedstuff. For these reasons, a feeding trial was devised to test the value of safflower seed oil meal in direct replacement of soybean oil meal with practical rations containing grains and fish meal.

Four groups of 15 White Leghorn hens each were selected on the basis of previous egg production. The control ration—Diet I—contained the following ingredients in amounts per 101 pounds of diet: soybean oil meal—44% protein—13.5 pounds; ground barley 30 pounds; alfalfa meal 5 pounds; fishmeal—64% protein—3 pounds; ground corn 21.5 pounds; special steamed bonemeal 2 pounds; ground limestone 1 pound; ground milo 20 pounds; dried whey 1.5 pounds; flaked oyster shell 3 pounds; salt 0.3 pound; Vitamin A—2250 I.U. per pound—and Vitamin D—300 I.C.U. per pound oil—0.2 pound; manganese sulfate 6 grams; and riboflavin 0.05 gram.

The control diet was compared with the experimental diets in which part or all of the soybean protein was replaced by safflower seed protein.

Diet II continued 9% soybean oil meal and 5% safflower seed oil meal. Diet III contained 4.5% soybean oil meal and 10% safflower seed oil meal and Diet IV contained 15% safflower seed oil meal. The safflower seed oil meal contained 41% crude protein. The total crude protein of the diet was kept constant at 15.9%—calculated—by varying the levels of corn.

The birds were maintained in individual laying cages for 11 weeks, during which time feed and water were available continuously.

Egg production data presented in the table indicate clearly that there were no discernible differences in the rates of egg production among the four groups. The drop in production among all groups toward the end can reasonably be attributed to the summer period of the experiment.

There were no appreciable differences in feed consumption among the groups, and no mortality during the experiment.

After seven weeks on the diets and at the end of the experiment, all eggs laid during one day were broken out and examined for interior quality. No abnormal yolk or albumen conditions were found. Storage trials with eggs from this experiment will not be completed for a number of months; hence nothing can be said concerning the quality of the stored eggs.

Eleven-week Trial

Protein Supplement—%	Egg production %			
	First 4 weeks	Second 4 weeks	Third 3 weeks	All 11 weeks
Soybean oil meal—13.5	73	70	64	70
Soybean oil meal—9.0 Safflower seed oil meal—5.0	72	69	46	64
Soybean oil meal—4.5 Safflower seed oil meal—10.0	75	62	58	66
Safflower seed oil meal—15	72	66	57	66

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The studies of safflower protein for chicks were conducted by F. H. Kratzer, Associate Professor of Poultry Husbandry, University of California, Davis.

TORTRIX

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ment were made in July at harvest. The results are shown in the accompanying table.

Plot	Treatment	Fruit examined	No. Tortrix	No. Twig borer	No. Codling moth	% wormy
1	DDD-Petal fall Parathion—May	1,000	0	5	0	0.5
2	DDD-Petal fall Malathion—May	1,000	0	7	0	0.7
3	DDD-Petal fall Parathion—June	1,000	1	5	0	0.6
4	Perthane-Petal fall Perthane—May	1,000	21	9	1	3.1
5	Check	1,000	54	21	1	7.6

Residues were run on the harvested fruit with the following results: Parathion in May, negative; parathion in June, 0.12 ppm—parts per million; malathion, negative; Perthane, 2.43 ppm.

These data indicate that malathion is as effective against orange tortrix as is parathion, and could be substituted for parathion in the May spray—if grower applications substantiate these results. There is apparently no residue problem with the use of malathion.

Perthane reduced the worm count below the check plot but did not measure up to either parathion or malathion.

There was no significant difference between the May and June sprays of parathion on these plots. Because the May spray is the proper timing for codling moth, it would be advantageous to retain this timing. Also, it would reduce the possibility of any residue problem.

In addition to the above plots, a few trees were sprayed in May with Diazinon, a new organic phosphate. The material showed promise in reducing the percentage of wormy fruit over the check, but because one spray was applied on only a few trees, no definite conclusions can be drawn. Further tests must be made to determine whether this material has a place in the control of orange tortrix on apricots.

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