Cyclamen Mite on Strawberries

fumigation with methyl bromide shows benefits and limitations in preliminary southern California tests

J. W. Huffman and H. T. Reynolds

Damage caused by cyclamen mite—*Tarsonemus pallidus* Banks—is one of the limiting factors in California strawberry production.

Late in 1952, methyl bromide was tested on a second year planting of Lassen strawberries as a possible strawberry plant defoliant in the dormant season. When the plants in the test field started to grow in the spring of 1953 there appeared to be some reduction in cyclamen mite injury in the fumigated areas. In view of these observations, field fumigation tests for the control of the mite were conducted during the growing season.

Treatments were made on the Lassen variety of strawberry plants in a second year field which was so heavily infested with cyclamen mites that the grower intended to abandon the field. The plants were fumigated with methyl bromide in the field under a sealed tarpaulin.

A tarpaulin of durable, lightweight polyethylene plastic—its light weight does not flatten the plants and it is easy to handle—was used to confine the gas. The edges of the tarpaulin were laid in the irrigation furrows, overlapping slightly onto the adjoining plant row, and water was run down the furrows at the edge of the tarpaulin. The water level was maintained in these furrows throughout fumigation to prevent the gas from escaping. The ends of the tarpaulin were sealed by placing loose soil on them.

Warning

Methyl bromide is a highly volatile, odorless liquid, the vapors of which are poisonous to all forms of animal life. Do not breathe the vapors. Do not spill on bare skin or shoes, or on clothing in contact with the skin.

Cyclamen mite build-up following fumigation under tarpaulin at the rate of 1.5 pounds methyl bromide per 1,000 square feet of strawberry bed for two hours.

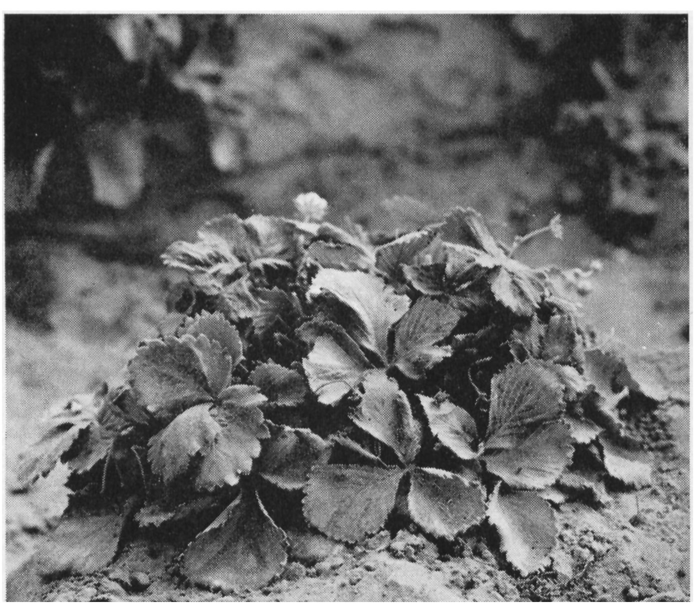
Fumigated May 31	Number mites per 40 leaf-buds[1]	
Temperature range under tarpaulin during fumigation	June 10	August 7
53 to 56° F	99	744
51 to 56° F	54	1812
54 to 74° F	5	...
63 to 78° F	1	1152
Untreated	1457	...

[1] Cyclamen mites counted on center leaflet of leaf bud only.

Rates varying from one to 2½ pounds of liquid methyl bromide per 1,000 square feet of strawberry bed were used in the tests. The methyl bromide was vaporized by passing it through a 10-foot coil of ⅜″ copper tubing immersed in a pail of hot water—about 120° F. A ⅜″ rubber hose carried the gas from the coil to the point of release under the tarpaulin. The time of exposure was two hours.

If the temperature under the tarpaulin gets too high during fumigation, the plants are severely burned—and may be killed. If the temperature gets too low relatively poor control may result. More information is needed to properly delimit temperature ranges for a given dosage, but at the present time it appears that fumigation at two pounds of methyl bromide per one thousand square feet of strawberry bed should stop if the temperatures under the tarpaulin exceed 80–85° F, or if it drops below 60° F. It may be necessary to fumigate in the evening, night, or early morning—depending upon area and prevailing weather conditions—to operate within the prescribed temperature limits.

The first signs of plant response were noticed when new leaf buds appeared



Strawberry plant prior to field fumigation with methyl bromide showing dwarf stunted plant and distorted leaves, resulting from cyclamen mite infestation.

The same strawberry plant five weeks following fumigation. Note the new canopy of bright green normal leaves developing over the old canopy of the stunted plant.

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.

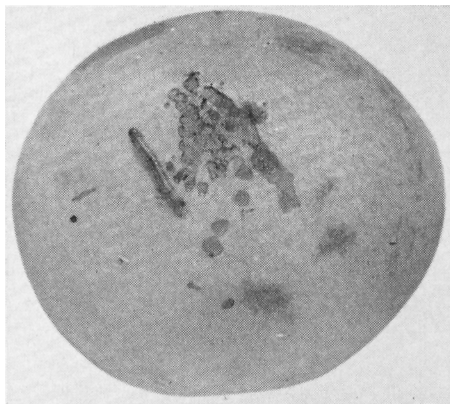
The orange tortrix has increased to major importance since 1951 when a spray program, mainly against codling moth, was established which consisted of a petal fall spray of DDD followed by a May spray of parathion timed to the flight of the codling moth.

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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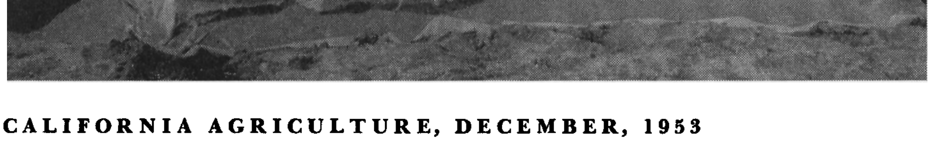
following treatment. The buds appearing in the fumigated plots had a normal shiny, bright green appearance. In contrast, the buds appearing in the untreated areas were chlorotic and misshapen. As the new leaves developed in the treated area the plants had the healthy, vigorous appearance of a first year 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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