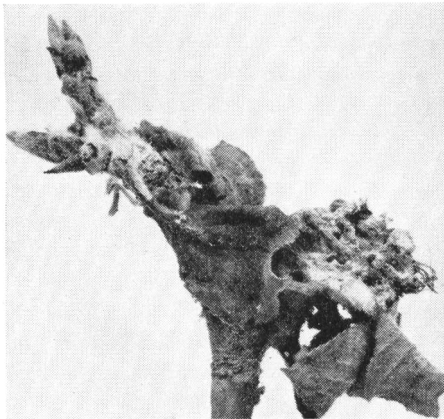


## New insecticides against

# Orange Tortrix

tested on apples near Watsonville

The orange tortrix on apples in California usually has been controlled satisfactorily by the use of TDE in the codling moth schedule of treatments. However,



Overwintering sites on apple twig.

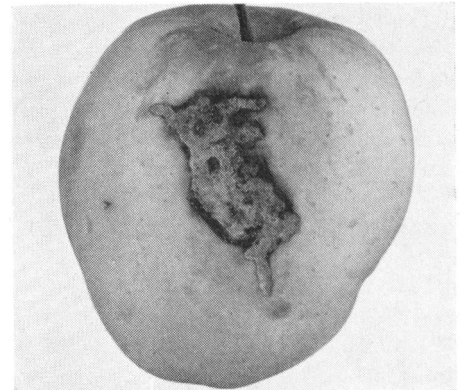
the recent increase in cases of codling moth resistance to TDE—and to DDT—has caused some growers to change to other insecticides, although little is known about the effectiveness of the substitute compounds against orange tortrix.

The orange tortrix is almost as important a pest as the codling moth. The orange tortrix is a surface feeder, but the shallow bites the pests take in the calyx, stem, or the sides of the fruit make the fruit unsuitable for fresh shipment and rejected by most processors except those engaged in producing juice.

To evaluate several new compounds against the orange tortrix, a test plot was established in a Yellow Newtown Pippin orchard near Watsonville. The Yellow Newtown Pippin is an apple variety especially susceptible to orange tortrix be-

cause of the short fruit stem and the tendency for the fruits to touch. The larvae of the orange tortrix usually spin webbing in sheltered places provided by

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Damage to apple.

in the test plots suggest some working minimums for potassium.

It appears that at early bloom—75 days—the petioles of the youngest mature leaves should have a minimum of 4.5% potassium, measured on a dry basis. Also, it appears that at 130 days the petioles should have at least 1% potassium.

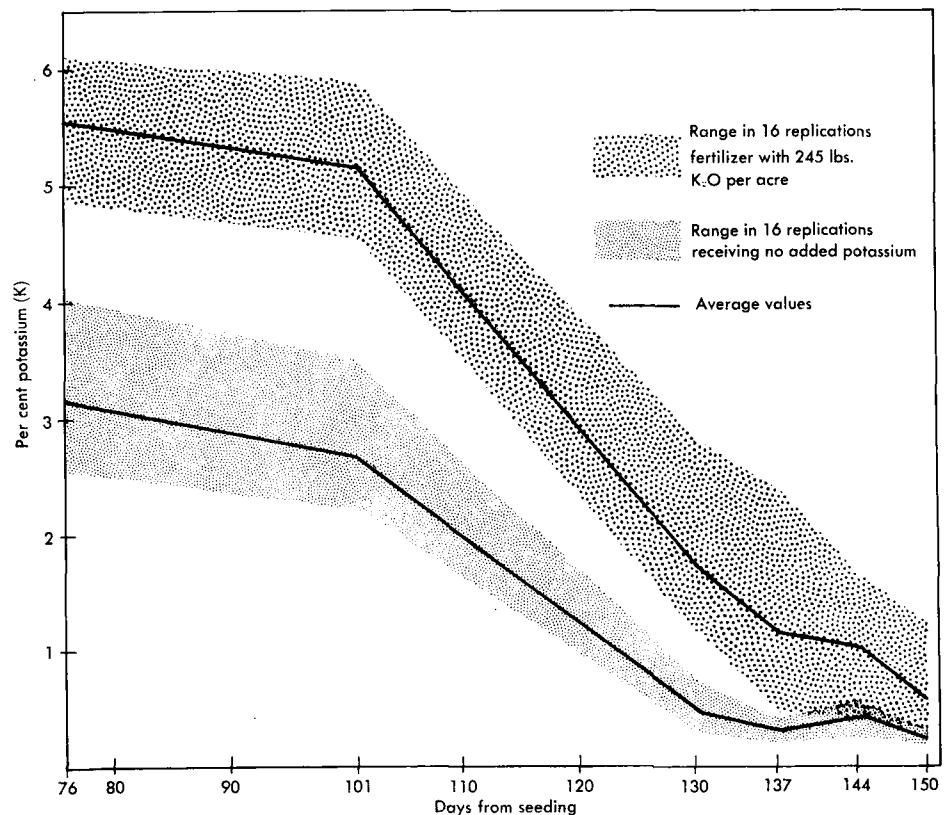
Apparently the exchangeable potassium in the soil should be present at a minimum of 60 ppm—parts per million—in the surface 12". As the studies are continued, the minimum levels may be increased.

Deficiency symptoms have been identified on a wide range of soils on the east side of the San Joaquin Valley. However, entire fields seldom show evidence of potassium deficiency. Visible plant symptoms and probable minimums of petiole and soil potassium—as determined by analyses—should indicate need of potassium fertilizer for cotton in some fields in the San Joaquin Valley cotton growing areas.

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*Forrest Fullmer of the American Potash Institute assisted in the above studies.*

Relationship of soil and petiole potassium in field fertilizer trials in 1959.



Growth of stalk cells in cultures is apparent in two or three weeks, and within six months the tissue may increase in weight up to 26,000%. Cultures of stalk tissue from lemon have been maintained for more than a year and seem to possess unlimited growth potential, if transplanted at intervals. The enlarged sac portion of the vesicle develops less readily in cultures and its growth seems to depend on the presence and growth of the stalk.

Juice vesicle cells can grow and multiply on an almost entirely inorganic

medium. This fact allows a study of the fundamental function of each chemical constituent of the nutrient medium in the development and nutrition of juice vesicle tissue.

Indoleacetic acid and gibberellic acid increase the growth of citron rind disks in culture. Either substance stimulates cell division when applied alone, and the two used together are additive in effect.

High temperature limits growth of tissues in cultures. Tissue disks grow much less at 90°F than at 77°F. The most favorable temperature conditions and the

limiting temperature range for specific tissues are being determined.

Compared with the rate of growth in complete darkness, strong fluorescent light up to 400 foot candles appears to exert a slight depressing effect on the growth of rind tissue.

Such laboratory studies on tissue cultures may help to interpret various phenomena of fruit growth in the orchard.

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*The above progress report is based on Research Project No. 1284.*

## WIND

Continued from page 3

were compared: one, with 60% perviousness, 1½" slats at 2" spacing; another, with 50% perviousness, 2" slats spaced at 2"; and the third, with 25% perviousness, had 2" slats at ¾" spacing.

The anemometer results were recorded continuously, but only periods when the wind was perpendicular or nearly perpendicular—10° off—to the fence line were used for the comparison. The average of four tests showed a close similarity of results. In all three surveys the wind velocity at the distance of 100' downwind from the fence approached 100% of the upwind velocity, and more than 90% of the upwind velocity was beyond 60' downwind from the fence. Nearer the fence the downwind velocities separated according to fence perviousness, but not a great deal.

The plotted curves of the downwind velocities should not cross on a graph because the three fences used did not represent extreme cases of perviousness. Only when a solid wall—known to protect very well immediately behind it but not at all beyond distances of ten times the wall height—is compared with a rather pervious obstacle, whose protection is mild near the fence, can the curves be expected to cross.

The rather small spread of the plotted velocities might suggest that the most pervious type of slatted fence windbreak—when lower cost and possibly less structural support because of lesser wind pressure are considered—should be the most reasonable for wind protection.

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*Wilbur O. Wilson, Professor of Poultry Hus-*

*bandry, and Lee Femling, Gerald Henderson, David van Rest, and C. R. Miller, Department of Engineering, University of California, Davis, assisted in the slatted fence windbreak experiments.*

*Funds for the tests reported were provided, in part, by Tynan and Rogers Mfg. Co., Salinas, California.*

## TORTRIX

Continued from page 5

the closeness of the fruits and feed from within this protection.

The orchard chosen for the trials suffered considerable damage from orange tortrix during 1958. In the winter of 1958-59, the larvae found feeding within mummified fruit on the trees were so numerous they indicated a potentially damaging population for the fruit season.

**Orange Tortrix Test Plots in Yellow Newtown Pippin Apples, Watsonville, 1959.**

Material	Dosage per acre*	Infested fruit %
TDE .....	10.6 lbs. 50% WP**	0.5
Sevin .....	7.6 lbs. 50% WP	1.8
Methyl Trithion .....	10.6 lbs. 25% WP	6.5
Ethion .....	10.8 lbs. 25% WP	10.3
Ethyl Guthion .....	7.7 lbs. 25% WP	11.3
DDT .....	10.4 lbs. 50% WP	15.3

\* Application dates: May 5, June 11, July 28.

\*\* WP: Wettable powder.

Materials chosen for trial—Guthion, Sevin, Ethion, and Trithion—had shown promise in previous codling moth trials. TDE was used as the standard insecticide and DDT was used as a check because it is not effective against orange tortrix. The ethyl formulation of Guthion, rather than the methyl form, and the methyl form of Trithion instead of the standard ethyl formulation were used.

Each treatment was applied to four trees with two replications in a randomized block plot design. Materials were applied with a conventional high pressure rig and orchard spray guns at an average of 500 gallons per acre per spray.

In an attempt to time the treatments, bait pans and a light-trap were used to capture adults, but so few were trapped the sprays were timed according to the local standard codling moth schedule.

At harvest, the test plots were evaluated by examining 300 fruits per replicate picked at random from the treated trees. Fruits with typical orange tortrix feeding scars were recorded as infested.

TDE gave the best control in the Watsonville experiment and Sevin was the only one of the other compounds that yielded commercial control. Ethyl Guthion, Methyl Trithion, and Ethion did not prevent damage in excess of the generally accepted economic level of 5% infested fruit.

During the experiment, the compounds were studied for their effectiveness on other pests. Ethyl Guthion and Ethion provided good control of European red mites, but it was necessary to add an acaricide to the other materials for the June 11 spray.

A light infestation of codling moth was noted on the fruit treated with Methyl Trithion and Ethion. None of the other plots showed any codling moth damage. Apple aphid and woolly apple aphid were present, but infestations remained at a low level because of extremely hot weather during June and July. The DDT and the TDE plots were the only ones to show a potentially damaging aphid population, and an aphicide was added to the June 11 treatment.

Fruit treated with Methyl Trithion showed russet spots on the skin beneath the dried spray droplets, but injury was superficial. None of the other compounds gave adverse effects.

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