THE cover picture shows a peach into which an Oriental fruit moth has bored. When penetrating the flesh of the fruit, the borer leaves an inconspicuous scar, yet inside the fruit the destruction may be practically complete. When entering by way of the stem, there is no indication of damage even when the fruit is badly affected.
Oriental Fruit Moth Invades Illinois

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The Oriental fruit moth, a serious pest of the peach and other fruits, was first found in Illinois early in the winter of 1927-28 in Pulaski county. It apparently has become established in all the principal peach-producing sections of the state, but during the past summer (1928) it caused severe damage to peaches only in the Pulaski county section.

Since its entry into this country in about 1912 this insect has been rapidly spreading thru the eastern United States. It is to be found in all the principal peach-growing sections east of the Mississippi, including those of Michigan and southern Ontario, and it is present also in Missouri, Arkansas, and Texas. This very rapid spread from one section to another probably has been due to the shipping of infested peaches and possibly to the shipment of infested nursery stock. Locally, infection spreads by the flight of the adult moth.

Peach and Quince Most Seriously Damaged

The Oriental fruit moth prefers the quince above all other fruits, and then, in the order named, peach, apricot, plum, cherry, apple, and pear. In this country it has never become a pest of any importance on apples and pears unless they were interplanted with or growing near peach or quince.

Resembles Codling Moth in Life History

In its habits, the Oriental fruit moth resembles that longer established foreign pest of apples—the codling moth. Like the codling moth, it goes thru four stages: the egg stage; then the worm or caterpillar stage, in which all damage and all feeding is done; next the cocoon stage; and last of all, it becomes the full-grown moth, in which stage the eggs are laid.

As in the case of the codling moth, the winter is passed in the worm stage in silken cocoons spun on the bark of twigs, branches, or the trunk of the tree, on mummies on or beneath the tree, on the surface of the ground, or on objects scattered about the orchard, such as prunings, old baskets, sacks, or other accumulations of trash. In the spring the worms within the cocoons go thru the brown changing, or pupal, stage and begin to emerge as moths about the time of the full bloom of the peach. The eggs are laid on the leaves and twigs at or a little after the time of petal fall.
Four Broods to Contend With In Illinois

Investigations in environment similar to that in the peach-growing regions of Illinois lead to the belief that there will be at least four broods of this insect in southern Illinois and possibly throughout its range in this state. Studies in Ohio, where the insect has been present for several years, point to this conclusion.

First-brood worms burrow into the young, tender twigs, complete their growth there, and change within the cocoon to the pupal and then to the moth stage. The second-brood of worms likewise depends mainly on the succulent ends of the twigs for their food.

The third-brood worms hatch just before the time when the Elberta and Hale peaches are ready to pick. This brood, instead of feeding on the twigs, attacks the fruit and bores into it in about the same way as the young codling moth larvae bores into an apple. There is a distinct and very important difference, however, in the behavior of the
young Oriental fruit-moth worms as they bore their way into the fruit. This insect cuts out and throws away all the outer skin of the fruit and does not begin to feed until its head has entered the fruit. The same procedure is followed in entering the twigs. This one little difference in its behavior makes it practically impossible to poison the Oriental fruit moth by spraying the surface of the fruit with any stomach poison such as arsenate of lead, which has been found effective against the curculio and codling moth and most chewing insects. The little worms also often enter the fruit thru the stem, making such

![Figure 2: Quince Injured by the Oriental Fruit Moth](image)

The outside of the fruit showed little indication of the serious damage inside.

a small entrance hole that their presence cannot be detected, and an infested peach that may appear perfectly normal will be found, when cut open, to contain one or more worms of the Oriental fruit moth. In extreme cases 90 to 100 percent of the fruit may be infested.

The third-brood of the Oriental fruit moth completes its growth and produces a fourth brood, which comes out after the early and mid-season varieties of peaches have ripened and after most of the twigs have hardened. In orchards where early peaches alone are grown, many of these fourth-brood worms are unable to complete their growth because they cannot find a sufficient amount of favorable foods, such as green, succulent twigs or peach fruit. If apples and peaches are interplanted, many of these fourth-brood worms will go to the apples and complete their growth within the fruit, causing an injury much like that of the codling moth. Such was the case on a number of Pulaski county farms this past season where apples were grown near peaches.

In southern Ohio, at least, the worms of the fourth brood of this insect are the ones that become full-grown in the late fall and carry
the insect thru the winter. They depend for their food on the late succulent growth of twigs or, lacking these, on late peaches or apples. In the southern part of its range there are more broods. If late peaches are growing in the orchard, the fourth-brood worms attack the fruit and not only is the fruit practically ruined but an excellent means is afforded the fourth-brood larvae to mature, and thus large numbers of the larvae are ready to go thru the winter.

**Control Measures Recommended in Longer Infested States**

Since the Oriental fruit moth cannot be poisoned by the application of arsenate of lead or other poison sprays, the problem of fighting it is greatly complicated. A number of investigators in the eastern states have been working for the last eight years to develop methods of control. Where stomach poison sprays seemed useless, they have turned to trapping by lights or baits, or spraying with contact sprays. All these methods have been found to kill a number of the insects, but none have proved sufficiently effective to give commercial control in heavily infested orchards.

In Ohio and some of the eastern states the following control measures have been found helpful. They are submitted as worth trying, tho no method of control has been developed that can be relied upon.
1. Orchards are cultivated to a depth of at least 4 inches and as close to the trees as possible, early in the spring, the cultivation being completed at least by the time the peach is in bloom. This method is quite effective in destroying the cocoons on the ground or in trash about the trees. Investigations are now under way to determine the date of latest effective cultivation in southern Illinois.

2. Paradichlorobenzene is applied in the same way as for the control of the peach tree borer. This is supposed to kill most of the worms that are on or are immediately above the base of the peach tree trunk.

Peach trees should not be interplanted with apple, as in such cases the insect causes far more damage than where peaches are grown alone. Early and late peaches should be separated, and in most cases late varieties will not be profitable in areas of general infestation until some more effective method of control is developed.

No Effective Sprays Yet Known

The spraying of the trunks of the trees and the ground around the trees in the winter time to kill the overwintering larvae within the cocoons has been tried, but to date no effective spray of this sort has been found.

Sprays for use during the growing season have been developed by Dr. L. A. Stearns, working in Ohio. These consist mainly of heavy applications of lime made at frequent intervals. A good degree of protection was obtained in 1928, but Dr. Stearns is not ready to recommend these sprays until more work has been done.

The value of these control measures and their feasibility under Illinois conditions will be carefully investigated during the next few seasons. Intensive experiments for the development of control, both by spraying and by dusting, will be carried on in the most heavily infested portion of Illinois this season.

Natural Enemies Reduce Damage in Time

The history of the insect in other parts of the country indicates that it is most abundant and destructive during the first three or four years after it becomes established in a locality. From then on it declines in abundance and destructiveness until it reaches a point where only 10 to 20 percent of the peach fruit is infested. This decline in numbers after the period of first abundance is due mainly to the presence of parasites. More than forty different insects are known to prey upon the Oriental fruit moth. Certain of these insects are already present in southern Illinois, and an effort will be made this season to increase their numbers and also to bring in any other important parasites which are not found within the state.
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