Apple Maggot CONTROL

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CONTROL STEPS

- Watch for Flies
- Time Sprays Accurately
- Spray All Trees
- Destroy Infested Drops
- Beware Neglected Orchards

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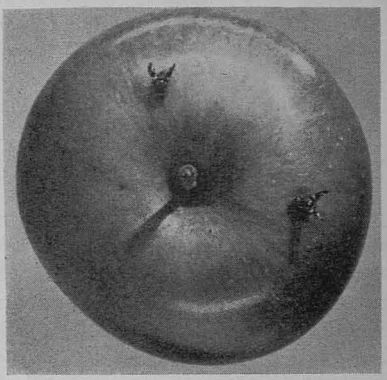
The APPLE MAGGOT Is Tricky and Destructive

THE APPLE MAGGOT, also called the "railroad worm," is one of the most troublesome and destructive pests of apples. In years when this insect is abundant, 100 per cent of the fruit in neglected or poorly sprayed orchards may be infested and made entirely unfit for sale. Even well-managed commercial orchards sometimes suffer heavy losses when the presence of maggot flies passes unnoticed and the population is allowed to build up. In Minnesota there have been periodic outbreaks of the apple maggot with several years between when no special control efforts have been necessary. During these periods of little damage, growers have lowered their guard and have followed a spray program which does not provide proper protection against the apple maggot. The result of these conditions has been unexpected outbreaks when the flies have appeared to drop out of a clear sky and have taken an entire crop with little warning.



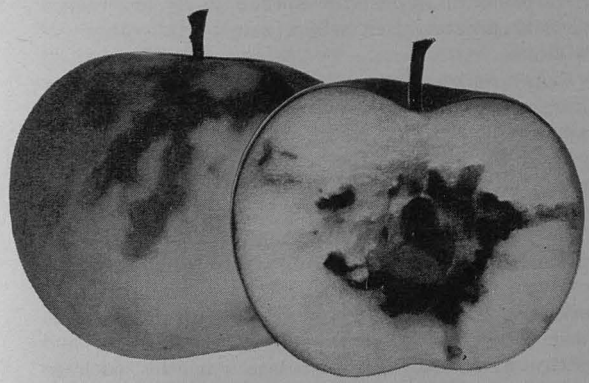
Maggot flies on mature fruit

FLY LOOKS LIKE SPIDER

The adult stage of the apple maggot is a fly a little smaller than the housefly. As shown by the picture on the front cover of this folder, the body color is black, marked with white bands on the abdomen, and there is a conspicuous white spot on the upper surface near where the wings attach. The head is reddish yellow and the wings white with black markings. When feeding or resting in a tree, the flies move their wings back and forth in a characteristic manner. Both this movement and the black design on the wings often cause the fly to be mistaken for a small spider. In moving from leaf to leaf the flies seem to hop rather than fly.

HOW FRUIT IS DAMAGED

Injury is caused by the maggots which tunnel through the flesh and eventually destroy the fruit completely. At first, infested apples can be recognized only by the presence of light-brown streaks in the flesh. In some varieties the egg punctures appear as small pits, but in the early stages of infestation it is usually necessary to examine a cut apple to be sure of its condition. Later, brown tunnels under the skin and through the flesh become evident. These conspicuous signs of damage appear when the fruit has begun to ripen, developing either after apples have fallen to the ground or after they have been picked and sent to market. Rot and internal breakdown usually develop further while apples are in storage or awaiting use by the consumer. At picking time there may be no striking external symptoms to warn the grower or the purchaser of the fruit's condition.



Brown tunnels under skin indicate internal damage

REMEMBER: By the time damage can be noticed it is too late to save the crop. Therefore, be on the alert each year to know whether to use control measures and when to start. In addition to apple maggot warnings issued by the experiment station through press and radio, keep tab on local conditions by means suggested in this folder, such as learning to recognize the fly and using bait traps.

LIFE CYCLE AND HABITS

The apple maggot spends the winter in a small yellowish or brownish capsulelike structure called the puparium. The puparia are usually found in the upper two inches of soil beneath infested trees, although some are found deeper. In Minnesota the maggot flies emerge from the puparia and escape from the ground about the middle of July. The exact date of the first emergence varies with weather conditions, particularly rainfall. Flies developing from maggots which infested early varieties the previous year tend to emerge earlier than those from late varieties. Some flies do not leave the ground the first summer; but remain in a dormant condition for as long as two or three years, especially after a dry season. This explains why a considerable number of flies may appear in an orchard the year following a completely satisfactory control program.

There is a period of about one week after the first flies appear before many eggs are deposited in the fruit. During the time between emergence and egg laying the flies move about the orchard and in neighboring trees feeding on honey dew, water, and others materials found on both foliage and fruit. Emergence may continue over a period of about two months with the peak occurring two to four weeks after the first flies appear. Abundant soil moisture allows early emergence while dry weather can cause some delay. In mixed plantings of both early and late varieties of apples the spread in fly emergence is usually greater than where one or the other occurs alone.

Eggs are inserted under the apple skin, the fly making a very small puncture, hard to see. The tiny maggots which hatch under the skin develop very slowly at first, but as the fruit approaches maturity they grow more rapidly. Infested fruit nearly always drops before any conspicuous damage can be seen on the surface. In fact, a premature drop of such varieties as Wealthy often indicates a heavy maggot infestation. Maggots leave the fruit a week or more after it has dropped and enter the soil to pass the winter. They leave such varieties as Duchess and Wealthy more quickly than late varieties such as Haralson and Northwest Greening.

Spraying Important for Control

Spraying infested orchards to kill the flies before they have laid any eggs is one of the important control measures for the apple maggot. Lead arsenate should be used at the rate of 3 pounds to 100 gallons of water (1½ tablespoons to one gallon), together with 3 pounds of spray lime to prevent arsenical injury. Wettable sulfur may be added if necessary for late-scab control.

As in other cases where spraying is used for the control of orchard pests, timing is of the greatest importance. A program which gives good control of other insects and diseases usually does not work against the apple maggot, because in most years it is completed by the first of July and too little poison remains on the trees when the maggot flies are most active, five to seven weeks later.

To get good control in a badly infested orchard a spray should be applied about one week after the first flies emerge. Usually another spray should be put on about two weeks later. If the season is dry, the second spray should follow the first heavy rain because soil moisture largely determines the peak of fly emergence. Also, a heavy rain would wash off some of the poison previously applied. Both bearing and nonbearing trees should be sprayed, also brush and trees in bordering woodlots.

These precautions should be taken because the flies must be killed before egg laying, and feeding is not confined to bearing trees. Proper timing and thoroughness of spraying are both essential for good control. It is generally advisable to use only two pounds of lead arsenate in the second maggot spray to reduce the residue of poison at harvest time.

TIMING SPRAYS—USING TRAPS

It has been said that the first spray should be timed by the appearance of flies in the orchard. One can usually find them first in trees of early varieties, and especially in several varieties of crab apples. Such trees should be watched closely after the first of July. In spite of the characteristic markings of the apple maggot flies, the discovery of the first ones to emerge in an orchard may be a matter of chance unless some method other than tree inspection is used.

Formerly, ground cages were set over areas where infested apples had been placed the previous season and the cages watched for the appearance of flies. Now bait traps make it possible to take observations over a larger area with less work. Various materials producing an odor of ammonia attract the flies. One of the cheapest and most attractive baits consists of two teaspoons of household ammonia and a pinch of granulated soap in a quart of water. This material can be suspended in a tree in a container such as a honey pail. Fill the bait up to about an inch from the lip of the container, and replace it with fresh material each week.

Bait traps to time appearance of maggot flies

Other baits which remain attractive for several weeks with only the replacement of evaporated water may be used. Of these, one of the most attractive is a mixture of 2 per cent urea and 3 per cent caustic soda. Another is a 2 per cent solution of ammonium acetate. A pinch of a soapless washing powder per quart should be added to either of these baits. When the traps are examined for flies the liquid should be poured through a sieve of window screen because the washing powder causes the flies to sink. Traps should be hung in the orchard or home planting during the first week in July to be in position to catch the first flies.

In addition to their use in spray timing, traps can serve the commercial grower in other ways. They can be used to determine fly abundance as an aid in deciding the number of sprays needed. Every year they can be used to warn the grower of the presence of flies in his orchard in time to prevent the development of outbreaks. Although bait traps are not recommended as a means of direct control of apple maggots in commercial plantings, they will help in home plantings where spraying is more difficult. Two or more traps should be used for each average-sized tree. They should be hung as high as they can be reached conveniently from the ground and located in the outside branches on the south and west sides of the tree.

CLEAN UP ALL DROPS

Spraying should always be followed with a sanitation program to prevent a carry-over of maggots to the next year. All dropped apples should be picked up and destroyed, beginning the first week in August. Early varieties should be picked up at least once each week, late varieties every two weeks, and fed to livestock, buried two feet deep or more, or burned. They can be piled at one side of the orchard and left to rot down until the following spring, provided that sometime before July 1 the pile is treated with old crankcase oil at the rate of one gallon to each 10 square feet. To be most effective, oil should be put on during the last two weeks of June. Adding 3 ounces of naphthalene flakes to each gallon of oil makes the oil treatment much more effective. The removal of drops is a very important part of the control program, particularly in farm and home orchards. It should be practiced in commercial orchards even when it seems a hopeless task, because experience has shown that spraying alone will not always clean up a bad infestation in one or two years.

Prevent Maggot-riddled Apples by: Bait Traps • Timely Sprays • Sanitation Program

Destroy infested drops

The apple maggot flies will move at least a quarter of a mile from an infested orchard and will cause some damage to nearby orchards despite the most thorough control program. For this reason it is very important that all apple tree owners in a community should clean up their orchards, particularly in urban areas where there are many small, scattered plantings. Backyard trees can become badly infested, even though sprayed thoroughly, if flies move in from other premises to lay their eggs. On the other hand, commercial control can be achieved in larger orchards in spite of neglected orchards nearby. Infested trees on the neighbor's farm do make more work for the orchardist but should not be used as an excuse for poor orchard practice at home.

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