

APPLE-MAGGOT

(*Rhagoletis pomonella*)

By R. H. PETTIT

The apple-maggot is a footless, white maggot which, like most other maggots, has no distinct head. It attains a length of slightly more than a quarter of an inch, and tunnels in apples, preferring sweet and semi-acid fruit of the earlier varieties, although winter apples are not by any means immune. This pest is also occasionally found in plums and cherries, being common in wild crab, and is believed to have originally lived in haws. A somewhat smaller race inhabits blueberries in the East.

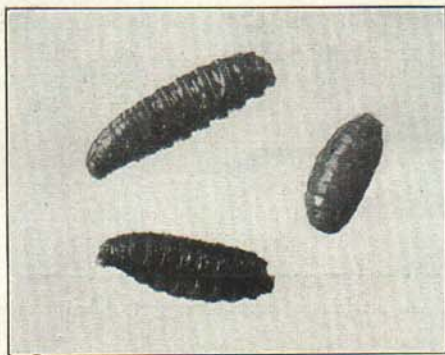


Fig. 1. Larvae or maggots, and pupa greatly enlarged.

During the colder part of the year this insect rests underground in the pupal stage, producing rather pretty two-winged flies about the first of July. These flies are shown in Fig. 2. The figure is considerably enlarged in order to show details and coloration, the insect itself being somewhat smaller than the common house-fly. The flies feed for a short period on the surfaces of apple leaves and fruits where, without puncturing the skin, they

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gather a little food from the surface by scraping and scrubbing the skin with their mouthparts.

After about a week or ten days, each female fly lays her eggs in the fruit, usually apples, being attracted most strongly to the fall and early varieties having thin skins, since these varieties are at that time larger than the standard winter sorts. Each egg is placed in a tiny slit cut into the flesh through the skin so that the maggot, when it once hatches out, is already inside of the apple and therefore completely protected from any spray which might be applied. The maggot tunnels through the flesh seemingly without any choice as to the part of the fruit utilized, finally coming to the surface when full grown.

When the surface is reached, the maggot often continues to advance until part of its body protrudes from the fruit, and if the apple falls to the ground at that time, the maggot immediately leaves the fruit and buries itself. If, however, the apple remains hanging to the tree for a time, the maggot often

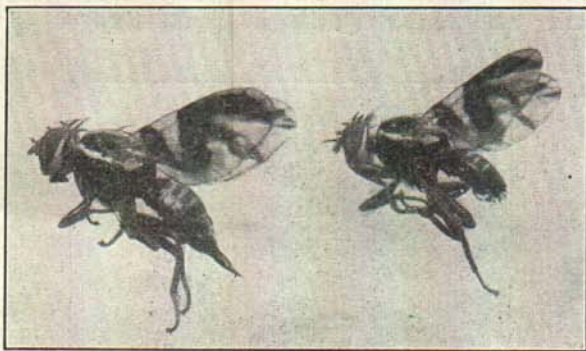


Fig. 2. Adult flies of apple-maggot, greatly enlarged.

becomes settled in place and is fastened in by the drying juice of the fruit so that when the apple finally does fall it may take several days for the dried juice to become sufficiently soft to enable the maggot to leave and bury itself. In almost no case, however, does the maggot leave the fruit until after the latter has fallen from the tree. Because of this habit, the immediate destruction of all fruit as soon as it falls would dispose of practically all of the maggots on the tree and effectively control the pest, if it were not for outside reservoirs of infestation supplied by wild crabs, haws, and other fruit of that nature. The greater proportion of the larvae that enter the ground as described remain there until the following spring, when they emerge as flies, thus completing the life cycle. A small proportion, however, emerge in the late fall, thus producing an unimportant second generation.

For a more complete discussion of the habits of this insect, together with illustrations of the effect of its work on fruits, see Michigan Experiment Station Circular Bulletin No. 87. As is well known, many of our native pests are kept within due bounds most of the time through the agency of natural enemies and natural forces inimical to the welfare of the pest. It is also well known that almost any insect from which restraining influences are removed, perhaps through the failure of parasites, may suddenly multiply

to an enormous extent, or in other words become epidemic and remain so for an indefinite period until its natural enemies once more restore the natural balance.

During the early part of the present century, the apple maggot was making itself felt quite generally and was the cause of the loss of much fruit in Michigan. However, its natural enemies, aided by efforts exerted by man, reduced its number and have kept it in subjection for so long a time that depredations have been practically forgotten by the present generation of growers. The practice of keeping in the orchard animals which feed on the freshly fallen apples has been largely discontinued. Orchards have

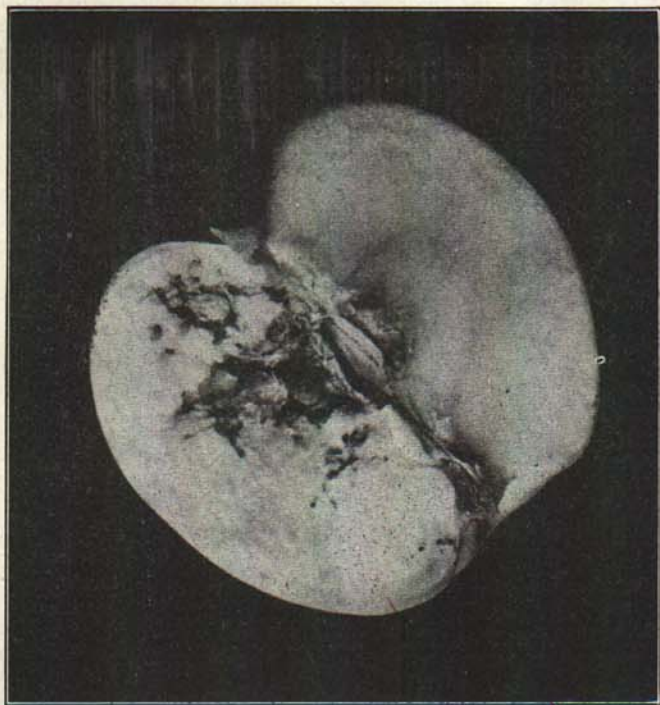


Fig. 3. Apple showing tunnels made by apple-maggot.

increased in size, and we have come to depend on spraying to the exclusion of most other methods of control for all sorts of pests. During the last two or three years, Michigan apple growers have suffered considerable losses in certain localities, through the depredations of the apple-maggot. Other states are beginning to notice similar epidemics within their own borders, and the insect is now on the increase rather than the reverse.

In view of our present information, the best that one can do is to prosecute a vigorous campaign, using our two best weapons of defense. First is the removal and destruction of fallen fruit immediately after it reaches the ground, either by the feeding of live-stock or by gathering and burying the fruit to a depth of two feet underground. Maggots buried to a lesser depth

quite frequently succeed in coming up through the soil and emerging as adults. The other method, that of spraying, demands that the application of the spray be made at just the right time. In order to be most effective, an arsenical spray of one pound of arsenate of lead to 50 gallons of water should be applied immediately after the flies appear in the orchard. This time can be easily determined by the grower by watching the orchard and perhaps sweeping the foliage with an insect net. The appearance of the adult of this pest is shown in Fig. 2. During 1928, these flies emerged about the first week of July. However, considerable variation is possible, and so the date should be set not by the calendar but as the result of a careful watch being kept for the appearance of the flies. This spray should be repeated in two weeks, and the spraying should be thoroughly done, the last named spray, at least, put on without lime-sulphur. If the pests are particularly serious, it might be worth while to add still another spray about two weeks after the one last named.