

festated orchard in June and early July, and as they are comparatively tame, permitting a person to approach close to them, they can easily be examined on the tree or caught and looked at more closely. They are about two-thirds the size of a house fly. The black-bodied one is a little larger than the other. Females are larger than males, as a rule, and often their sharp, sting-like ovipositor may be seen, especially at the time of egg-laying. Males have the end of the abdomen more rounded than the females. The general color of both species is black. The white-banded species has the following markings: Four white bands across the abdomen of females and three across the males, a whitish or yellowish dot about the centre of the back, a yellowish line along each side from the head to the base of the wings, beautiful golden-green eyes, yellow head and yellowish legs. The black-bodied species has almost the same markings except that, as said previously, there are no white cross bands on the abdomen. The wings of both species are conspicuous and characterized by dark markings, which are differently arranged in the one species compared with the other.

DISTRIBUTION OF THE FLIES

We have not had time to examine every district, but have found that both species of fly occurred in almost every locality in the Niagara district and at Burlington. We know that one or possibly both species also occur at Oakville and Cobourg. It is very likely that further observations will show they are present to some extent in other localities also. There are, however, many orchards quite free from them. The white-banded species is the more common one on the whole, though not in every orchard.

DIFFERENCE BETWEEN THE LARVÆ

The larvae or maggots of the Cherry Fruit Flies are, as previously stated, legless, headless, tapering towards one end, blunt at the other, nearly straight, and not more than a quarter of an inch in length. The larvae of the Plum Curculio are, when full grown, much larger, being about two-fifths of an inch in length, stout, somewhat curved, a dirty white or yellowish color, and have a distinct brown head. Moreover, the crescent-shaped scar shows where the eggs has been laid by the adult, and infested cherries regularly show a sunken darkened area on the side on which the larva is working, so that it is easy to suspect the presence of the grub within.

Both species pass the winter as pupae in the ground, the pupae being enclosed in little brown straw-colored, oval cases, looking like grains of wheat. The adults emerge from these in June and early July; those of the black-bodied species

begin to appear the first week in June, the other species about the end of the second week, so that this one is a week or more later. The majority of the adults of the first species are out by June 14th, and of the white-banded species by about June 22nd. The earliest flies of the black-banded species, therefore, begin to appear nearly a week before Early Richmonds have begun to color, and of the other species just about the time they have got the first tint of red.

The flies feed for about ten to fourteen days before they begin to lay eggs. It is very important to know this and also how they feed. The mouth parts are very like those of the house fly and may be said to consist of a long sucking tube with broad lips at the tip. The flies can be seen moving about from place to place chiefly on the leaves with their mouth parts extended and the lips feeling for any little particles of food. If a fly finds any solid, for instance a little piece of granulated sugar placed on the leaf, it holds this with the lips until it is dissolved by saliva and then sucks it in. When the cherries get ripe and are injured in any way they feed on the juice of them.

When the fly is old enough to lay eggs she selects for the purpose unripe cherries or those just beginning to color, and running restlessly around over the fruit

for a while, then at last curves her abdomen and forces the sharp, sting-like ovipositor into the fruit. In about twenty seconds the egg is laid. The exact number of eggs that a single fly can lay is very difficult to determine, but is probably two hundred or more.

The eggs hatch in about five days, and the tiny larvae or maggots at once work their way direct to the pit, where they live upon the juice, rasping the pulp with their hooks to free the juice. In two weeks or a little less on an average, the maggots are full grown. When a maggot has reached its full size it works its way out of the fruit, soon drops to the ground, and at once begins to work its way into the ground. If the surface is soft, it quickly enters; if not, it has to search for cracks to get down. Often ants capture and destroy them before they can do so. Sometimes, too, they are killed by the hot sunshine.

Soon after the ground has been entered the maggots change into pupae. The depth of the pupae is usually about one or one and a half inches below the surface. The insects remain in the pupal stage until the next June, when they change, as already stated, into flies. There is only one brood a year. It is very probable that a few of the insects pass two winters in the pupal stage before emerging as flies.

(To be continued)

Yields of Apple Trees at Different Ages

W. T. Macoun, Dominion Horticulturist, Ottawa, Ont.

EACH year there is a large number of new fruit growers in the province of Ontario, men who believe that they can make a success of the industry and who are determined to try. These men, before making their decision, estimate present and future expenses; they also endeavour to estimate probable crops and profits, but when they come to look for figures showing the yields of different varieties of apples they are disappointed. It is a remarkable fact that there has been very little reliable information published in America on the actual crops obtained from trees of different ages of the varieties of apples which are usually planted for commercial purposes. There is the general statement that Wealthy and Wagener are early bearers, that Northern Spy does not bear anything to speak of until it is twelve years of age, and that King is a very shy bearer, and that McIntosh is a rather light cropper in some places, and so on, but few actual figures are available. In fact, until a table of such yields was published in the Annual Report of the Experimental Farms for 1902 we do not think that any records of

yields had been published when trees came into bearing and afterwards. Other records have been published in the reports for 1903, 1905, 1905-6, 1909, and 1911.

Since the year 1898, or for sixteen consecutive years, records have been kept of over three thousand apple trees in the orchards at the Central Experimental Farm. Unfortunately, among these trees the winter varieties of most commercial value in western Ontario are not to be found, such varieties, for instance, as King, Greening, Baldwin and Spy, as they have not proved hardy at Ottawa, but other known sorts, such as Yellow Transparent, Duchess, Wealthy, Fameuse, and McIntosh, have been recorded with many others. The number of trees of each variety grown at Ottawa, however, is very limited, as so many sorts are under test. In the table which has been prepared only the heaviest yields are given, as it is believed that where only a few trees of each variety are grown the highest yielding tree would be fairly near the average of an orchard of several acres. These figures are not given for the main purpose of basing future profits in orcharding, but rather to give some idea of about the

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