

SPRAYING WITH ARSENICALS.

A study of the structure of the mouth parts and of the feeding habits of the adults have led investigators of this insect to believe that if poisons were sprayed on the leaves and fruit these would be fed upon and cause death.

At first it was supposed that the poison must be in the form of a liquid and that it must be combined with some sweet, attractive substance, such as molasses, before the flies could or would feed upon it. Later, however, both as the result of cage experiments and of orchard observations and tests, it was seen that the poison need not be in liquid form, but that arsenate of lead could be used. The next discovery was that the molasses or any other sweetened substance was not necessary, because the flies fed upon the small particles of arsenate of lead even after all the water used in the spraying had evaporated. The fact that molasses may be omitted and that the arsenate of lead and water are sufficient is a great boon, because molasses is costly, tends to injure the foliage, and causes the mixture to wash off faster than it otherwise would.

EXPERIMENTS ON CONTROL BY SPRAYING WITH ARSENICALS.

That spraying with arsenicals will control the Apple Maggot even in the worst infested orchard has been proved by us as the result of six years' spraying experiments. At first, as will be shown, the results were inconclusive, because of defects in the methods employed, but with experience these weak points were eliminated and the last three years' tests gave most gratifying results. Cage experiments with poisoned sprays were also conducted, and not only corroborated the orchard results, but also demonstrated that the flies would feed upon the poison even where they had an opportunity of not doing so. These cage experiments will be referred to after the orchard experiments have been described.

Experiment 1. In 1913 at Bowmauville the Early Harvest and September Sweet trees in a village orchard were sprayed just as the flies began to emerge, and again four times later at intervals of a week or more, the large number of applications being due to the excessively wet weather in July and August. The mixture used was 2 lbs. arsenate of lead to 40 gals. of water containing 1 gal. of molasses. The remainder of the trees, including one Snow apple, were left unsprayed as a check. The results were inconclusive, for though there were fewer infested apples on the sprayed tree than on the Snow, yet a large number of the sprayed apples had also been attacked.

Experiment 2. In 1914 a large orchard of 25 acres or more at Mountain, in Dundas County, was sprayed twice with 2 to 3 lbs. arsenate of lead and 1 gal. of molasses to 40 gals. of water. The first spray was applied just as the flies began emerging, and the second between two and three weeks later. Suspecting that the failure to secure satisfactory results the year before was due to our having sprayed too small a portion of the orchard, it was decided that all the main bearing part should be treated, leaving as a check a block of about two acres arranged in four rows along the east side. This orchard had been badly attacked the previous year and many of the infested apples left upon the ground to rot. It contained many varieties, including several which were favorites of the Apple Maggot.

The result of the experiment as seen in September was that in the whole orchard, including the check, after much searching only ten apples with Apple Maggot egg punctures were found. This, of course, looked like a remarkable