

In order to protect the orchard from reinfestation from surrounding orchards the first orchard to the east was well sprayed, and also the one to the west, the owner himself doing the latter. This left only one unsprayed orchard nearby. It was situated over a height of land about 10 rods north of the extreme north-east corner of the sprayed orchard. This orchard, because of the elevation of the land between it and the test orchard and because of the direction of the prevailing winds, was felt not to be a menace and so was used as a check. The mixture used in the spraying was 2 to 3 lbs. arsenate of lead paste to 40 gallons of water.

The result of the spraying was very gratifying, for the orchard was not only beautifully free from Scab and Codling Moth, but also had less than 3% of the fruit infested by the Apple Maggot. This estimate includes fallen apples as well as those on the trees. One tree had between 5 p.e. and 8 p.e. of infested fruit, but this was far the worst tree, most of the trees having less than 1 p.e. and several being entirely free from injury. On the Toimau, which is usually as badly attacked as any variety, only two punctured apples could be found. There is no doubt that these results were due entirely to spraying, for one of the writers visited the orchard every two or three days from the time the flies began to emerge up to the end of July, and found that numerous flies were present. Some days fifty or more could be seen on any one of many trees, thus proving that if it had not been for the spraying there would have been plenty of flies to have utterly ruined the crop. It was observed, too, that the poison must have had an effect upon the flies very soon after emerging, because of the several hundred flies seen on various occasions none were found mating nor was there any evidence of egg laying up to the date mentioned.

In the check orchard, which, according to the owner, had not been badly infested the previous year, and from which most of the fruit had been sold that year, not nearly so many flies per tree, even on the most susceptible varieties, could be found; in fact, 8 or 10 flies were all one could usually find in an hour. Some of these flies were mating and egg punctures could readily be found before the end of July. By the close of the season there were so many infested apples in it that the chief apple buyer of the county refused to purchase the fruit at any price. The same buyer, after carefully inspecting the sprayed orchard, not only stated that, in his opinion, the fruit was in first-class marketable condition, but also purchased the crop. In the check orchard we made a careful examination of Snow, Wealthy, Ben Davis and Phoenix trees and estimated that all of these had 25 p.e. and upward of the apples infested, many of the apples having so many egg punctures as to be deformed.

#### CAGE EXPERIMENTS ON THE EFFECT OF ARSENICAL POISONS UPON THE APPLE MAGGOT.

A series of experiments extending for one month was carried on in cages to see how long it took arsenate of lead and calcium arsenate respectively to kill the flies, and to test the effect of adding molasses to the former substance. A few tests were also carried on with a substance used in dusting orchards, composed of finely ground sulphur 85 p.e. and arsenate of lead powder 15 p.e.

The cages used were the ordinary Riley cages with cheesecloth on three sides and glass in front. In each of the check cages an apple branch with a few apples on it was placed in a bottle of water to keep it alive and healthy. This branch was, of course, taken from an unsprayed tree, and no poison put on it. In the cages where poison was used two small branches or twigs from this same tree were