

may be found on the under side of the leaf, are laid singly in the months of July and August. In a few days the young caterpillars are hatched and are soon ready to begin their ravages.

The actual damage resulting from horn-worms varied in the same locality during the different seasons. It was not an uncommon occurrence to find a crop badly damaged, despite every effort put forth to combat the insect, and the crop in an adjoining field practically exempt from the horn-worm. For some reason, the former field seemed to be a favourable ground during that season, whereas in the preceding year the grower might not have experienced any damage from the horn-worm.

The general method of combatting this insect is hand-picking at the time the suckering and topping is being done. A limited number have resorted to the use of arsenical poisons—Paris green. Two problems experienced in its effective use are: 1st. The difficulty in obtaining a solution of proper strength—not too concentrated to burn the leaf, nor too weak to be effective; 2nd. The undue reliance on its insecticidal effects, ultimating in an increased damage to the crop. A few growers have used the sweetened cobalt, squirting it into the jimson flower in order to kill the adult sphinx moths of the tobacco worm. If every farmer would set out a few jimson plants in early spring in his tobacco field and use their flowers as a means by which to apply the sweetened cobalt, scores of adults would be killed. Every adult moth exterminated means about 150 to 200 fewer eggs being laid. Another very useful agent in getting rid of horn-worms is the duck; and a very surprising fact is the limited number who even think of trying this useful animal. I found that on the 230 acre plantation of the Walker Company about 600 ducks did all the 'worming.'

A valuable preventive measure in combating this insect is fall ploughing, followed by discing. By ploughing about four to five inches deep we expose the chrysalids to the action of the weather, thereby destroying scores of worms that are hibernating. By subsequent cultivation many will be broken up by coming in contact with the revolving disc of the harrow. It seems to me that were no other object aimed at than the destruction of these pupae, we would be justified in fall ploughing.

*Dates and distances of planting and dates of harvesting.*—As intimated elsewhere in my report, there is a wide difference in practice between the earliest and latest planting, even as much as six weeks lapses in some cases. It is very doubtful if even a month's delay can be afforded in producing a tobacco plant, for I believe the season is not too long for best results.

The distances of planting vary with nearly every grower. The majority plant the Burley-type tobacco at practical distances for cultivation, and with a view to obtaining maximum yields. However, scores of farmers set the cigar type tobacco at the same distances; consequently, the yield is greatly diminished and the quality is poor. There is a striking need for demonstration plots to correct this error.

Then, in regard to dates of harvesting, too many fail to take advantage of cutting at the proper stage of maturity. In nine cases out of ten the mistake lies in allowing the tobacco, especially cigar types, to become too ripe. To determine the exact dates and distances for planting, and the best dates for harvesting with a view to obtaining correct conditions for growing and curing, would be an exacting line for investigation.

*Special work in seed selection.*—A watchful study of any tobacco field in Ontario will reveal a great lack of uniformity as regards nearly all characters. This variability is noticeable particularly with regard to the difference in number, size, shape and manner of growth of leaves on individual plants, the time of ripening of the leaves on the same and on different plants. This lack of uniformity results in a decreased yield, and greatly augments the cost of grading the different types, the expense of which must be borne indirectly by the farmer. One of the leading tobacco growers of Essex made the statement recently that unless we had large, heavy