

AGRICULTURAL EXPERIMENT STATION
Oregon State College
Wm. A. Schoenfeld, Director
Corvallis

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THE ONION MAGGOT

by

B. G. Thompson, Associate Entomologist
John E. Davis, Assistant in Entomology

The maggot is probably the most serious insect pest of onions in Oregon. It is present everywhere in the state where onions are grown, and has caused serious losses in the larger commercial plantings. It is erratic in its activities, appearing in destructive numbers in one part of a field, while in the rest of the field no maggots can be found. Some years but little damage is done; in other years the damage may run to more than 50%.

Description

The maggots occur as dirty, white or yellowish larvae, blunt behind and tapering to a point at the head end. Full grown maggots are about 1/3 inch long.

The eggs are white, sausage-shaped and about 1/30 inch long.

The adult flies are about the size of an ordinary house fly. They are grayish-brown with a slightly hump-backed appearance. The wings are long, and when at rest extend well beyond the tip of the abdomen.

Life History

The winter is passed in the soil as pupae in small reddish-brown capsule-like puparia. The flies emerge in early spring and are present in the fields, ready to lay eggs as soon as the seedling onions appear above ground. The white eggs, conspicuous on the dark soil, are deposited about the onion plants. Volunteer onions, developing from bulbs missed in the previous harvest, are especially attractive to the flies and hundreds of eggs may be seen about such plants. The first eggs are deposited as soon as the young onion plants begin to show above ground, earlier on the volunteer onions. The eggs hatch in from 3 to 8 days and the young maggots at once seek the onions and tunnel within. The maggot stage within the onion varies from 15 days to five weeks. When full grown, the maggots usually leave the onion and pupate on the onion surface or in the adjacent soil. There are two or more broods of flies each year. There is an overlapping of broods so that all stages of flies, eggs, larvae, and pupae can be found throughout the season.

Injury

The maggots attack the onion at all stages of its development. A single maggot will kill a young seedling onion by tunneling up the interior of the stem. In the older onions a number of maggots may be found eating out the interior and causing rots and decays to develop. The early planted onions seem to be more severely damaged than do late planted onions.

Control

Until recently no very practical control was known for onion maggot.

Experiments begun by the Entomology department of the Oregon Experiment Station in 1938 and carried out on a more extensive scale in 1939, 1940, and 1941, show that mercurous chloride (calomel), when drilled in with the onion seed, gives excellent control of the onion maggot.

The calomel is thoroughly mixed with the seed at the rate of two pounds of calomel to one pound of onion seed, and planted in the usual way. Due to the extra bulk caused by the addition of the calomel, it is necessary to open the planter up one notch to give the required amount of seed. For example, if it is desired to plant three pounds of seed per acre, the planter is set at $3\frac{1}{2}$ pounds per acre. Planters equipped with metal burr agitators handled the calomel seed mixture without difficulty, while planters with brush agitators clogged badly and did not plant the seed evenly. In all cases where this treatment was used and maggots were present, more onions were obtained from the treated area than from an equal sized untreated area. In most of the plots there were at least ten times as many onions as on the corresponding untreated plots. In one case the untreated check plot had less than 3% as many onions as did the treated plot (see illustration).

In our experimental work, two types of calomel were used. One is known as Calomel USP XI, and the other as USP XI, precipitated. The precipitated calomel neither clogged the agitators nor settled to the bottom of the seed hoppers. Where calomel USP XI was used the occasional stirring of the seed and calomel mixture in the seed hoppers by means of a spoon or small paddle was found helpful.

Shallow Planting

In our experimental work better maggot control was obtained when the calomel-treated seed was shallow-planted.

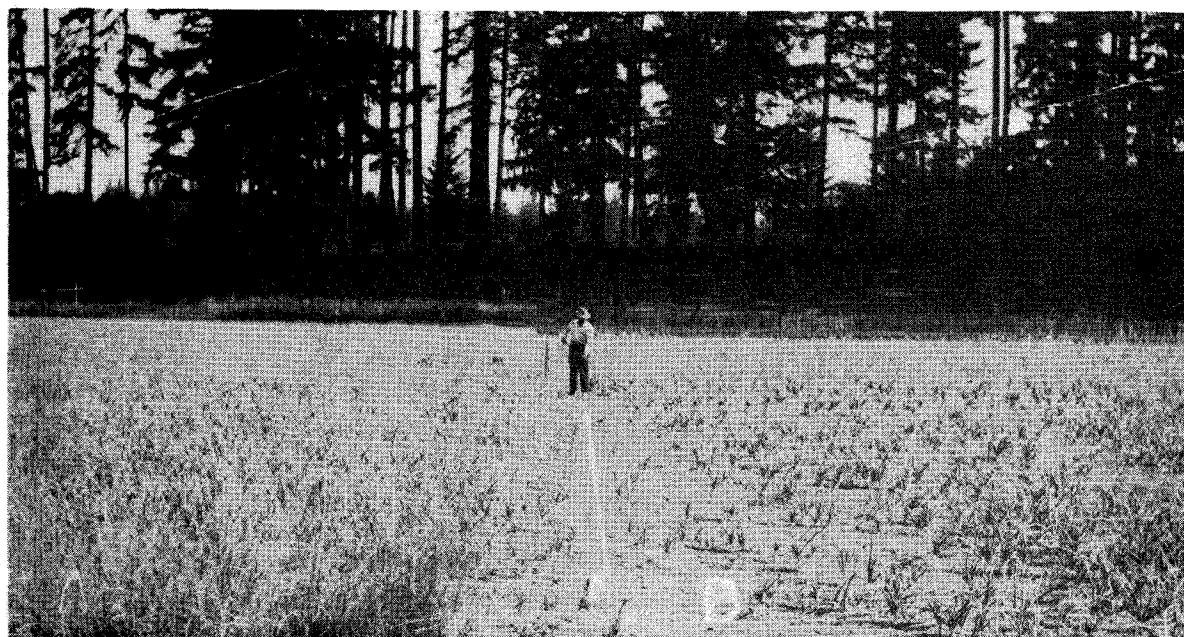
CAUTION

In some fields there was a reduction in the stand of onions when the formaldehyde treatment for smut was used with calomel-treated seed. This loss was greatest where an excessive amount of formaldehyde was used or when the seed was deep-planted.

Where necessary to use both smut and maggot control, care should be exercised to plant shallow and use only the required amount of formaldehyde.



- A. Onions produced on 1/20 acre untreated check plot.
- B. Onions produced on 1/20 acre Calomel treated plot.



- A. Calomel treated plot. Note heavy growth and good stand.
- B. Untreated check plot - unprofitable stand and growth.