

## Onions XXV

### Onion Maggot

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Onion Maggot

#### Identification (and life cycle/seasonal history)

Onion maggot (*Delia antiqua*) is one of many flies generally known as "root maggots" (*Delia* spp.), but the only species that is restricted to onion and other *Alliums*. Adults of all are small, grayish-brown flies and are difficult to distinguish. Onion maggot is one of the largest root maggots, approximately 1/4-inch and slightly smaller than a house fly. Larvae are typical maggots - creamy colored, elongate with the head end pointed. Larvae of onion maggot can only be separated from the other species by microscopic characters.

Onion maggot winters as a pupa about one and four inches deep in soil, within a dark brown puparium. Adults are active in May and live for about 4 weeks. Females lay eggs in soil cracks at the base of plants. Larvae tunnel into roots and the basal plate of the plants. As with other root maggots, soft-rotting bacteria are carried by the maggots and introduced into the wounds, resulting in decay pockets. Probably three generations occur in the southern areas with peak larval feeding in June, late July and September. In the northern US and southern Canada only two generations may occur.

Onion maggot is sometimes introduced into fields on transplants.

#### Plant Response to Damage

Onion maggot damages onion when larvae tunnel into the base of the plants. Young plants can be killed by this injury. Wounding of older plants provide ready entry of bulb-rotting organisms.

Fortunately onion maggot is uncommon in the High Plains, preferring soils that have high organic matter content and are moist. Maggots found in onions often are other species, particularly **seedcorn maggot** or **onion bulb fly**, and are secondary pests. These other maggots only invade onions that are previously damaged and have begun to decay.

## Management Approaches

### Natural Controls

A fungus disease of the adults, *Entomophthora muscae*, is the most conspicuous disease of onion maggot and the other root maggots. The fungus infects the adult stage and cause the flies to die stuck to the tips of plants. Its effects on onion maggot populations are likely negligible.

### Cultural Control

Onion maggot is only capable of developing in onion or related *Allium* species. Rotation of field locations can be useful in reducing onion maggot populations. Adults are fair fliers but if fields are located some distance (e.g. 1/2 mile or more) from onion fields of the previous season, few adults can be expected to locate the new fields.

Onion maggots survive winter as pupae in soil of previously infested onion fields. Plowing fields will reduce survival of this stage.

Onion maggot is sometimes introduced on transplants. Inspection should be done of transplants, looking for the easiest stage to identify, the dark brown pupae. If such infested transplants are used, fields will more likely benefit from onion maggot treatment.

### Sampling

Onion maggot is readily captured on yellow sticky cards. These traps are used in some onion production areas to identify peaks of adult flight. Yellow sticky traps can be more difficult to use where many other root maggot flies may be present and also will be captured. Also, blowing soil can readily degrade sticky traps.

### Chemical Control

Onion maggot controls are most commonly directed at larvae, as planting time treatments either as seed treatment (Trigard OMC) or as in-furrow applications (Lorsban). However, such preventive applications are rarely needed in the High Plains. In addition, excessive rates of some organophosphates do have risks of suppressing germination in low organic matter soils.

Onion maggot adults can also be controlled by foliar applications. Most of the pyrethroid insecticides used for onion thrips can control adult onion maggots. Timing is important and peak flights of onion maggot are best determined by trapping.

#### *Product List for Onion Maggot on Onions:*

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| <b>Insecticide</b> | <b>Lbs Active Ingredient Per Acre (Fl. oz. or oz. product)</b> | <b>Preharvest Interval, Remarks</b> |
|--------------------|--|-------------------------------------|
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| Larval (Soil) Treatments  |                                  |  |
|---------------------------|----------------------------------|--|
| Trigard OMC               | 6.6 lbs/100 lbs onion seed       | Seed treatment. Do not use in combination with other larval treatments.  |
| Lorsban 4E                | as labeled for Colorado          | 24 hour reentry. Dry bulb only.  |
| Lorsban 15G               | as labelled for Colorado         | Planting time treatment with shallow incorporation. Organophosphate insecticide. High rates used on low organic matter soils can suppress germination. |
| Adult (Foliar) Treatments |                                  |  |
| Warrior                   | 0.02-0.03 lb (2.56-3.84 fl. oz.) | (14 days, 24 hour reentry) Maximum application of 0.25 lb AI/acre per season of 3.84 pt/acre of product per season                                     |
| Mustang, Fury             | 0.035-0.05 lb (3.0-4.3 fl. oz.)  | (7 days PHI, 12 hr reentry) Maximum 0.3 lbs ai/acre per season   |
| Pounce                    | 0.1-0.3 lb (6-12 fl. oz.)        | (1 day, 12 hrs reentry)  |
| Ambush 25W                | 0.1-0.3 lb (6.4-19.2 oz.)        | Maximum 2.0 lbs active ingredient per season.  |

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Categories: Onion Maggot, *Delia antiqua*, Insects, Onions

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