

# Seed corn maggot

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The seed corn maggot (*Delia platura*) is a perennial pest of the seeds and seedlings of a wide variety of vegetable crops. In addition to corn, maggots will attack beans (kidney, lima, and snap), beets, cabbage, cucumbers, peas, radishes, squash, and turnips. Seed corn maggots can decimate a crop stand if left untreated. They are more of a problem when susceptible crops are planted in succession.

## Appearance

The yellowish-white larvae are typical fly maggots:  $\frac{1}{5}$ -inch long when fully grown, cream-colored, legless, and wedge-shaped. The maggot's head end is sharply pointed. Pupae are brown,  $\frac{1}{5}$ -inch long, cylindrical in shape, and rounded on both ends. Adults resemble miniature houseflies. They are dark gray,  $\frac{1}{5}$ -inch long, and their wings are held overlapped over their bodies while at rest. The flies are often mistaken for adult cabbage maggots and onion maggots, but they are smaller in size. Eggs are tiny (about  $\frac{1}{32}$ -inch long), oval, and white.

## Life cycle

Seed corn maggots overwinter as pupae in the soil. Adult flies emerge in the spring with peak emergence in early to mid-May when swarms of flies are often seen over recently tilled fields. Adults mate within 2–3 days of emergence. Females lay eggs in soils with high

organic matter or near seeds and seedlings of susceptible plants. Eggs hatch 2–4 days later. Larval feeding, development, and pupation all occur below ground and the next generation of adults appears within 3–4 weeks. This sequence of events is repeated for the three to five generations that emerge each year.

## Damage

Seed corn maggot larvae feed in the cotyledons and the below-ground hypocotyl tissue of seedlings, resulting in a variety of damage symptoms. Feeding damage in germinating seeds can kill the seedlings before they emerge. Poor germination or poor plant stands may indicate a seed corn maggot problem. To diagnose, dig up the seeds to look for damage. Plants that survive maggot damage to the seed often

have holes in the first pair of true leaves or no leaves at all (snake-head seedlings). Damage to the hypocotyls will leave the plant yellow and wilted.

## Scouting suggestions

Rescue treatments are not effective for seed corn maggots. Once damage is detected, it's too late to control the maggots. Therefore, there are no economic thresholds for this insect and any insecticides must be applied at planting as a protective measure.

Forecasting the appearance of generations can be accomplished by calculating degree-days starting when the ground thaws in the spring. Degree days are calculated each day using the formula  $[(\text{daily high} + \text{daily low}) \div 2] - 39$ . Use a maximum of 86°F for the high and a minimum of 39°F for the low.



**Seedlings damaged by seed corn maggots emerge with damaged or missing cotyledons.**

Keep a running total of degree days to anticipate when peak emergences will occur. For the first three generations, this is at 200, 600, and 1000 degree days, respectively.

The following scouting procedure can be helpful in determining the fly-free periods on a particular field. In early April, place three or four yellow plastic dishpans filled with soapy water along the edge of the field at 100-foot intervals. Every 4–6 days, remove and count the trapped flies and add fresh soapy water to the pans. Keeping a record of the number of flies trapped will indicate when fly numbers are building up or tapering off.

Currently work is being done in Minnesota to evaluate the effectiveness of a pheromone trap for predicting the presence of adult flies.

## Control

### Cultural control

Since the adult seed corn maggot is attracted to decaying organic matter, do not plant susceptible crops in fields where animal or green manure has recently been applied.

The faster the seeds germinate and grow, the less opportunity the maggots have to damage the crop. There are a few strategies to hasten germination:

- Wait until soil temperatures are at least 50°F before planting most susceptible crops. Peas and radishes may be planted when soil temperatures are above 40°F.
- Plant seeds as shallowly as feasible to speed germination.
- Soak untreated pea and bean seeds in water for 2 hours before planting to soften the seedcoat.

### Natural control

Naturally occurring fungal diseases occasionally will greatly reduce seed corn maggot numbers significantly, particularly when flies are abundant and relative humidity is high. During a fungal epidemic, dead or diseased flies can be seen clinging to the highest parts of plants along field edges.

Predaceous ground beetles eat seed corn maggot eggs, larvae, and pupae and can be important in reducing maggot numbers. Because these soil-inhabiting beetles are susceptible to insecticides, avoid using broadcast soil insecticide treatments whenever possible.

### Chemical control

If you have seed corn maggots one year, you will likely have them in succeeding years. To prevent damage, you have two options: plant treated seed or make a soil application at planting. For details on insecticide recommendations, refer to Extension publication *Commercial Vegetable Production in Wisconsin* (A3422).



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