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### Cabbage Maggot *Delia radicum*

**Injury:** The cabbage maggot can seriously injure cabbage, cauliflower, turnip, radish, and related crucifer crops. Early planted crucifers, or seedbeds of late ones, are more likely to be attacked. The young maggot begins feeding on the tender rootlets and then rasps out a channel in the main root of the plant (Fig. 1). An early indication of attack to the cabbage plant is the symptom of the plant wilting badly during the heat of the day. The plants may take on a bluish cast. The plant either dies in a few days or persists in a sickly condition for some time. In cases where the plant dies quickly, there usually are a large number of maggots that riddle the root, making way for decay organisms to get in and take over quickly. If such a plant is dug up, one should be able to see the whitish maggots, which may at first resemble a grain of rice, in the soil around the roots of the injured plants. Brown tunnels in stems or roots of older plants are also evident.

**Description:** Cabbage maggots are true flies (Diptera), closely related to the seed corn maggot. The adults are gray, long-legged flies a little smaller than the common house fly. Home gardeners seldom see them. The larvae (maggots) are white, legless, tapered toward the head, and have a pair of black mouth hooks that curve downward for rasping. The root maggot grows to 1/4 to 1/3 inch in length. The mature larvae develop into puparia, reddish or tan capsules resembling grains of wheat, in the soil near the plant.

**Life History:** The adult flies emerge from the soil where they overwintered as pupae, at about the time the first crucifer plants are set in the garden. The females either tuck the eggs down between the plant stem and the soil of transplants, or lay eggs in a recently planted field so that the young plant is attacked at emergence. Soils with high organic matter content are preferred by the flies.

Eggs hatch in 4 to 10 days, and in about 3 weeks maggots are full-grown. The pupal stage lasts 12-18 days, and the adults emerge from the puparia. In New York State, there may be four broods of cabbage maggot each year. Plant phenological indicators as well as approximate calendar dates are indicators of brood occurrence. The first occurs in late April through May when Yellow Rocket is flowering, depending on location in the state. The second brood appears in late June to mid-July when Daylily is blooming; the third in mid-August when Canada Thistle and Goldenrod flower, and the fourth, in the fall when New England Aster flowers. Generally the first brood is the most destructive in upstate New York; however, on Long Island the trouble occurs for a longer period.

**Management:** Crop rotation will help to reduce cabbage root maggot populations. Crucifer crop debris should be destroyed right after harvest. The early broods are the most important ones, because plants (transplants and direct seeded) are small, and very susceptible to attack. Older plants are more tolerant of injury. Radishes in home gardens can be grown

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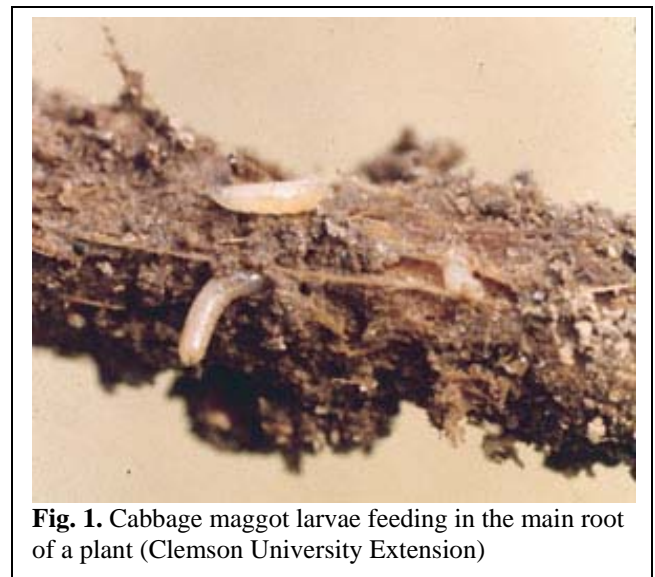
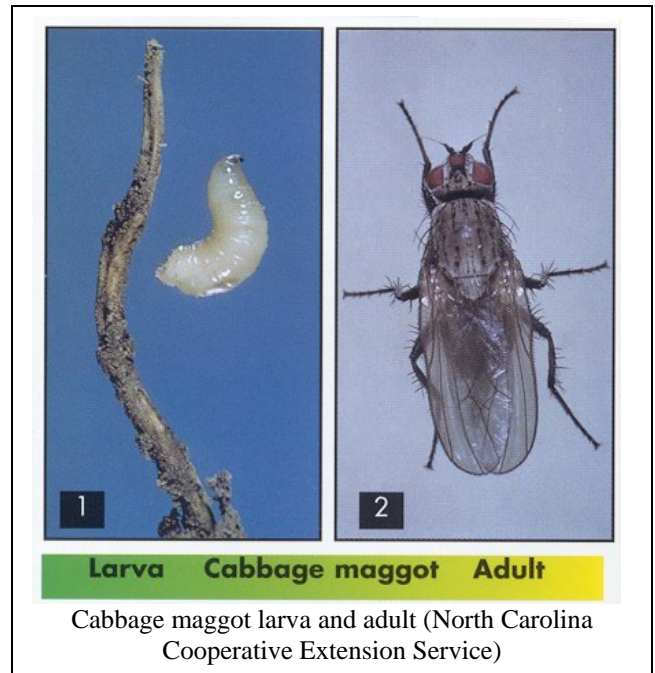


Fig. 1. Cabbage maggot larvae feeding in the main root of a plant (Clemson University Extension)

in successive plantings, seeding at weekly intervals -- in this way some will avoid damage. Infested radishes act as a trap crop and should be pulled and destroyed (not composted) as soon as noticed.

The best control is to prevent the flies from laying eggs in the first place. Barriers, spunbonded row covers, can be used. Row covers work well, but be sure to bury the edges, otherwise flies may emerge under the cover and damage the crop. Allow the cover to be loose enough so plants have room to grow. They can be effective as long as 1) there are no gaps or tears in the material; 2) the material is placed over the crop before or immediately upon crop emergence or transplanting; and 3) crops are rotated, so no hosts of the pests were grown on that site the previous year.

Shields constructed of tarpaper or old carpeting may also be used. The shield will serve as an egg-laying barrier to adult flies. The shields are cut into 6-inch squares or 10-inch circles with a small hole in the center and a slit is cut to the center. These are placed around the base of the transplant. Press them against the soil so adult flies cannot crawl underneath.

According to *Cabbage Maggot* by K. Van Wychen Bennett, E. C. Burkness and W.D. Hutchison, Department of Entomology, University of Minnesota, revised 2/12/2004 the following method can be used to monitor cabbage maggot flies in the spring. To use this procedure, correct identification of cabbage maggot adults is crucial. In late April to early May, place yellow pails filled with soapy water along the field or garden edges at intervals of 100 feet. Many insects are attracted to yellow and are trapped when they fall into the water. Empty pails every 4 to 6 days and refill with soapy water. Keep records of the captured cabbage maggot flies; these records should indicate whether populations are increasing or decreasing. Although this method is described as a monitoring tool a home gardener may want to see if they notice a reduction in cabbage maggots following the procedure.

This same publication gives the following information regarding cabbage maggot flies being attracted to organic matter. Adult cabbage maggot flies are probably attracted to rotting organic matter and freshly plowed fields. Avoid plowing fresh animal manure, weeds, green manure, or other cover crops in spring. If there is a winter cover crop, plow it at least 3-4 weeks before planting. Plowing crops in fall is better than plowing crops in spring because the cabbage maggot flies are more attracted to live, green organic matter incorporated into the soil. If cole crops are directly seeded, use a drag chain behind the planter to eliminate any moisture differences in the soil between the seed row and the adjacent soil. Moisture from newly planted seed rows can attract cabbage maggots.

No pesticides are recommended for home garden use. Entomophagous nematodes (of the type used against soil grubs) may be used according to package directions. Often by the time the injury is noticed, the plants will not recover, and discarding plants may be the best option.

June 1975, Prepared by: Carolyn Klass, Sr. Extension Associate, Dept of Entomology, Cornell University.

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Slight addition by Thomas Kowalsick, Cornell Cooperative Extension – Suffolk County, (*Information on monitoring from the University of Minnesota*)

The Pesticide Management Education Program (PMEP), in cooperation with the New York State Department of Environmental Conservation (NYSDEC), maintains a web site with a searchable database for pesticide products currently registered in New York State. Homeowners who have Internet access can locate currently registered products at <http://pmep.cce.cornell.edu/pims/current>. Several different queries are available that will produce a summary for the product(s) that the system locates. If the system fails to locate the product in question, then that product is not currently registered in New York State. The database also provides a summary of important information related to every product currently registered. Two data fields “Status” and “Expiration Date” are provided in each summary. Products with a status of “Registered - Discontinued” are currently registered but will probably be discontinued for use, sale, and distribution in New York State after the date noted in the “Expiration Date” field.

**This publication contains pesticide recommendations. Changes in pesticide regulations occur constantly and human errors are still possible. Some materials mentioned may no longer be available, and some uses may no longer be legal. All pesticides distributed, sold or applied in New York State must be registered with the New York State Department of Environmental Conservation (DEC). Questions concerning the legality and/or registration status for pesticide use in New York State should be directed to the appropriate Cornell Cooperative Extension Specialist or your regional DEC office. Read the Label before Applying Any Pesticide.**

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