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# Detection and Control of Carrot Weevil

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Carrot weevil (*Listronotus oregonensis*) infestations are becoming increasingly common in carrot and celery production in Michigan. Initial damage in both carrots and celery is small circular feeding holes left by the adults on the underside of leaf petioles. Later damage will appear as wilted or dead plants in the case of celery (Fig. 1) or larval tunneling on the outer surface of the carrot root (Fig. 2). Early season damage most often occurs to plants in border rows or row ends, near field margins.

Adults of the carrot weevil are small (5/16 inch) brown or black snout beetles (Fig. 3) with a faint white band around the mid-region of the hind leg. Larvae are legless, cream-white with brown to orangish heads. Eggs are pinhead size, and cream to black in color, depending on age (Fig. 4). Pupae are cream-white with externally developing wings (Fig. 5). Because of the root-feeding habits of the larvae and the excellent camouflage of the adults, damage is often not noticed until it has become severe or until harvest.

## Life History

Adults overwinter in fields, field margins and ditch-banks in the upper 2-3" of soil. They resume activity in mid-April to late May, when temperatures rise to approximately 60°F, and begin feeding and egg-laying. Adults feed and larvae develop on a number of weed species (dock, plantain, dill, wild carrot, etc.), as well as on carrots and celery. The adults feed and lay eggs on the petioles of the celery plant or on the petioles or crown of

the carrot. Larvae usually hatch within a week and bore down to the roots. They spend 2 to 4 weeks feeding and maturing before leaving to pupate in the surrounding soil. Adults emerge from these pupae as early as mid-June and begin laying eggs in 10 days to 2 weeks. Since a female may continue to lay eggs for several months, all stages of development (eggs, larvae, pupae, and adults) may be present at any time. In mid-late August, in response to shorter days, females cease laying eggs.

## Monitoring and Detection

The carrot weevil, although causing economic problems in only a few areas of the state, occurs in weed hosts throughout Michigan. For this reason, all celery and carrot growers should monitor their fields. This is not difficult and should be done in spring and early summer, before damage has become serious. Damage data at harvest is also important.

Trapping of adult weevils is an effective method of locating fields with potential problems, before significant damage has occurred. Adult abundance and activity is also important information for timing of adult sprays. An effective trap consists of a wide-mouthed 1/2 pint jar with a "Solo" cup to funnel adults into the jar and prevent their escape (Fig. 6). Trim the cup to fit the mouth of the jar and punch hole in the bottom of the cup to allow the weevils to enter the jar. Put a few slices of carrot or 1 to 2 tablespoons of carrot baby food in the jar as bait. Locate the traps on their sides at intervals along the margins of the fields, preferably among the broadleaf weeds that are alternate hosts. Examine traps for carrot weevils and change the bait twice a week.



Fig. 1. Carrot weevil damage to celery.

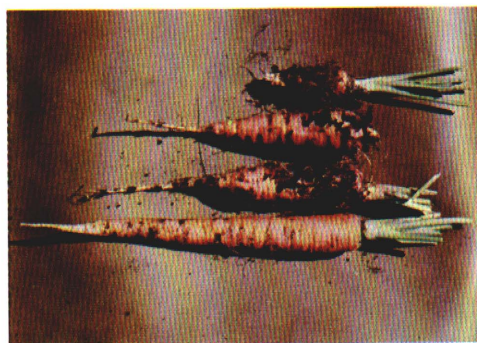


Fig. 2. Carrot weevil damage to carrots, top three damaged.



Fig. 3. Carrot weevil, adults.



Fig. 4. Carrot weevil eggs (left) and egg-laying scars on carrot petiole.

Fig. 5. Carrot weevil, (left) larvae, (right) pupa.

## Control

Current control recommendations for carrot weevil include:

- 1) rotation to non-host crops (e.g., onions or lettuce) in fields that consistently have problems;
- 2) sound cultural practices to minimize spread of infestations; and
- 3) carefully timed foliar sprays for adults or larvae, where needed.

In fields that consistently have problems, the most economical solution may be to rotate to a crop other than carrots or celery (e.g. onions, lettuce, or potatoes) and maintain good control of weed hosts for one or two years until the infestation has been reduced or eliminated. Late planting (e.g. mid-June) will also reduce damage.

To prevent spread of the infestation, properly dispose of culls and trimmings from infested fields. Also, take extra care to prevent infestation in celery plants in greenhouses or seed beds where carrot weevils may multiply and be spread throughout the fields with the transplants. Pull any dead or dying plants and examine the roots and surrounding soil for larvae or pupae. This is especially important in greenhouses and seed beds. Proper soil sterilization will greatly minimize problems in the greenhouse.

Proper timing of sprays is critical for good control while minimizing costs. Apply sprays for carrot weevil adults in the spring or early summer, as soon as adults become active. Time of expected adult activity, first adult catches

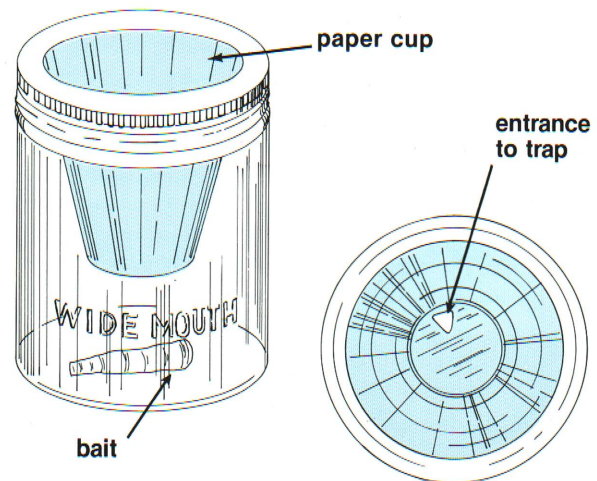


Fig. 6. Carrot weevil trap. (Place jar on side along edge of field.)

and larval damage, and recommendations for proper timing of sprays are given in "Pest Alerts," available from your county extension office. However, regional observations and warnings cannot substitute for monitoring of individual fields. Treatments for larval control should be applied when egg laying has begun.

For specific recommended materials and rates of application, see MSU Extension Bulletin E-312, Control of Insects, Diseases & Nematodes on Commercial Vegetables, \$1.10 (For Sale Only) available from your county extension office.