

Insects

Nematode Control in the Home Garden

*Charles Hadden, Professor Emeritus, and Steven Bost, Professor
Entomology and Plant Pathology*

Plant-parasitic nematodes are slender, worm-like animals that usually can be seen only with the aid of a microscope. There are thousands of different kinds of nematodes, but few are pests in vegetable gardens of Tennessee. The southern root-knot nematode is the most serious pest in the home garden, although lesion and lance nematodes occasionally can cause damage.

Symptoms and Detection

Nematodes feed upon plants with a stylet, a movable, spear-like structure similar to a tiny hypodermic needle. This feeding may result in root rot, discoloration and deformities such as galls. The uptake of water and nutrients by infected plants is greatly reduced. Symptoms of nutrient deficiency, such as yellowing or stunting, may result. Plants often wilt during the day even though the soil may have an adequate supply of moisture. Plants may be killed where nematode damage is severe. The number, size and quality of fruits and vegetables are usually reduced by nematodes feeding on the plant roots.

Confirm the presence of root-knot nematodes by digging up plants at the end of the growing season and looking for galls on the roots. Soil samples may also be submitted to a lab for analysis.

Nematode injury is greatest in sandy soils. Plant stresses such as improper pH, drought and low nutrient levels also increase nematode damage.

Spread

Nematodes rarely move more than a few inches through the soil under their own power. However, humans often move them from one place to another on infected transplants or in infested soil. In the garden, nematodes are spread by soil-moving implements during cultivation. Nematodes also may be spread from one area to another in drainage water.

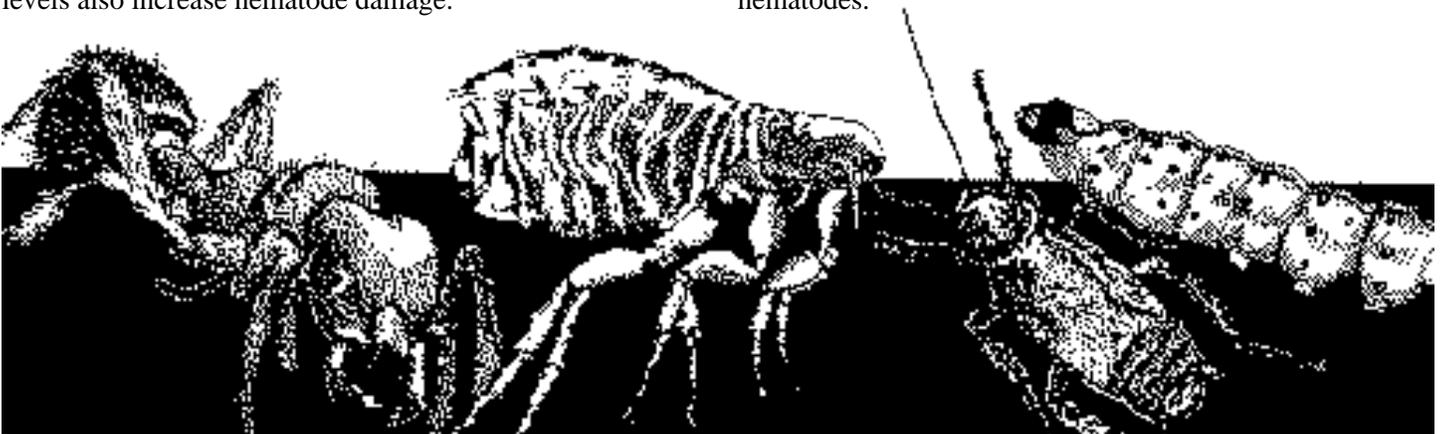
Control

Plants found to be infected with nematodes cannot be treated. All nematode control is preventive.

Cultural Practices — a garden site free of plant-parasitic nematodes, especially root-knot nematodes, should be chosen if possible. If land is available, the garden should be rotated to a new site each year, using two or more sites. Planting grass such as fescue as a rotational crop will reduce the number of nematodes in the old garden site.

Special care should be exercised in selecting or buying transplants. Only plants certified to be nematode free, or plants grown in sterilized soil, should be used. Check the roots of transplants and refuse or discard any plants whose roots have knots, galls or swellings on them.

Immediately after harvest, the roots should be dug or plowed up to expose them to the drying effects of wind and sun. This action reduces the number of overwintering nematodes.



Biological Control—This method of control involves the use of organic material or living organisms to control nematode pests.

Organic soil amendments help to suppress nematode populations as well as improve soil tilth and plant growth. Any organic material such as compost, animal manure, shredded leaves or chopped straw will serve the purpose. Organic amendments stimulate the soil's microorganisms that are natural predators of nematodes. Green manures (crops grown purposely to be tilled into the soil as fresh green organic matter) are particularly helpful.

Another possibility for control, especially if the garden is rotated, is the use of French dwarf marigolds for root-knot and lesion nematode control. The roots of French dwarf marigolds (*Tagetes patula*) exude toxic compounds which kill certain nematodes or they "trap" the nematodes in their roots. In small areas known to be affected, a bed of marigolds may be planted and maintained. However, marigolds may seed themselves and become a weed problem in the next growing season.

Resistant Varieties—The use of plants resistant to nematode attack offers the best way of avoiding these problems. Few resistant varieties are immune to nematode attack, but some will show a reduced degree of attack and provide acceptable yields. Resistant varieties are available for relatively few vegetables. Varieties resistant to the southern root-knot nematode include:

1. *Tomato*: Better Boy, Celebrity, Big Seven, Big Set, any "VFN" type variety
2. *Sweet Potato*: Jewel, Jasper, Travis

3. *Lima Bean*: Nemagreen
4. *Snap Bean (Pole)*: Alabama No. 1
5. *Southern Pea*: Mississippi Silver, Magnolia Blackeye

Note: *Root-knot nematodes vary in their ability to attack resistant plants. Resistant plants are not necessarily immune; some varieties may show sign of infection without being seriously affected. "VFN" means the tomato variety is resistant to Verticillium wilt, Fusarium wilt and root-knot nematodes.*

Solarization—Solarization is the use of heat from the sun for killing nematodes in bare soil. This technique involves placing clear plastic (1 to 1 1/2 ml thick) on moist, tilled soil and sealing the edges with soil, bricks, sand or other materials. Apply the plastic in June or July. It should remain in place for at least eight weeks (the longer, the better). The plastic may be removed in August in time to establish a fall garden, if desired. If not, remove the plastic before cold weather.

Chemical Control—Vapam, a product formerly used by home gardeners for nematode control, is no longer available for this use. Some organic products such as chitin and neem are available, but data supporting their recommendation are lacking.

Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store, or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label. Persons who do not obey the law will be subject to penalties.

Disclaimer Statement

Pesticides recommended in this publication were registered for the prescribed uses when printed. Pesticides registrations are continuously reviewed. Should registration of a recommended pesticide be canceled, it would no longer be recommended by the University of Tennessee. Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others which may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product.

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Billy G. Hicks, Dean