3-1984

Root Knot Nematode in Gardens and Commercial Vegetables

John R. Hartman  
*University of Kentucky, john.hartman@uky.edu*

William C. Nesmith  
*University of Kentucky*

[Click here to let us know how access to this document benefits you.]

Follow this and additional works at: [https://uknowledge.uky.edu/anr_reports](https://uknowledge.uky.edu/anr_reports)

Part of the [Plant Pathology Commons](https://uknowledge.uky.edu/anr_reports)

Repository Citation

[https://uknowledge.uky.edu/anr_reports/69](https://uknowledge.uky.edu/anr_reports/69)

This Report is brought to you for free and open access by the Cooperative Extension Service at UKnowledge. It has been accepted for inclusion in Agriculture and Natural Resources Publications by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.
The root knot nematode (Meloidogyne spp.) causes damage by its feeding and reproduction on plant roots. There are several pathogenic species of this nematode but the two most commonly found in Kentucky are the southern root knot nematode, *M. incognita* and the northern root knot, *M. hapla*. These nematodes can attack numerous plants including vegetables, fruits, field crops, ornamentals and common weeds. Frequently, *Meloidogyne* interacts with other plant pathogens to form a disease complex in which the resulting disease is much more severe than that caused by either component alone. These nematodes are particularly serious when high populations are allowed to build-up due to continuous replanting on the same site.

### Symptoms

Root knot nematodes are usually first detected in localized areas within a field, nursery or home garden. Gradually, the infected area increases and can eventually encompass the entire planting. Aboveground symptoms usually involve stunted and chlorotic and seem to wilt during the heat of the day. These symptoms also can result from unfavorable growing conditions, but it is the swollen and distorted roots that are most typical of root knot. Consequently, the flow of nutrients and water is inhibited and the top growth is affected. The heavier the infection and the more damage to the roots, the more severe the above ground symptoms will be.

### Life Cycle

The root knot nematode is a soil-inhabiting parasite. The female deposits eggs in a gelatinous mass at or near the root surface. A worm-shaped larva hatches, then migrates either into the soil or to a different location in the root. The larva penetrates a suitable root by repeatedly thrusting its feeding structure into cells at the surface. Within a few days, the larva becomes settled with its head embedded in the developing vascular system and begins feeding. Over time these finding sites become enlarged from the chemical reactions resulting from colonization. The nematode grows and matures, the male reverts to the worm shape and the female begins laying eggs. The rate of population increase and the length of the life cycle depend on a number of factors including soil temperature, host susceptibility and soil type. Warmer soil temperatures and a suitable host will encourage the nematode to complete its life cycle considerably faster. Sandy, organic muck and peat soils are more favorable for population buildup than are the heavier clay soils generally found in Kentucky.

### Control

**Crop rotation**—The nematode does move through the soil but its progress is slow. A simple method of dealing with the problem is to relocate the garden and sow a non-host crop in its previous location. Rotation with a nonhost crop such as marigold or tall fescue (particularly Ky. 31 fescue) for 2 to 3 years can provide excellent control of root knot nematodes. It is important to keep these crops free of weeds or volunteer plants susceptible to the nematode since they could serve as hosts nullifying the effect of rotation.

**Resistant varieties**—Certain varieties of garden beans, lima beans, sweet potatoes and tomatoes are resistant to this disease and could be incorporated in a rotation schedule. Your county agent can be contacted for specific variety recommendations. Resistant plants which can be grown for 2 or 3 year rotations include strawberry, asparagus and small grains. Marigolds and chrysanthemums are resistant as well; however, they will not protect nearby susceptible plants.

**Sanitation**—Introduction in infested transplants and potato tubers are the most common means of introduction of root knot to Ky. gardens and field. If the infested area is small with only a few plants showing symptoms, careful removal of those plants and the soil around their root zones should eliminate much of the nematode population. Clean soil can then be put in its place. In the greenhouse, infected stock should not be used for propagation. All pots, benches and tools must be thoroughly disinfected before reuse.

**Early planting**—Some vegetable crops such as radishes, lettuce and spinach can be grown when temperatures are relatively cool even though they are host of the nematode. At such temperatures the root knot nematode reproduces slowly if at all so a crop is produced before the nematode can successfully cause damage. Thus, these crops can be planted early and then harvested before suffering nematode infection.

**Soil treatment**—Disinfecting soil by heat is often practical in greenhouses or for a small quantity of potting soil in the home. It is highly effective and eliminates many other potentially dangerous soil organisms as well. Steam is most efficient but the temperature should read 180°F for 30 minutes or 160°F for 1 hour to kill all nematodes in the soil.

**Soil fumigation**—Fumigation of soil with chemicals is an effective management tool in both garden and commercial plantings. Vapam and methyl bromide are generally labeled and many other materials have commercial crop labels. These fumigants, properly used, reduce the nematode population greatly but only temporarily however, so if the site is replanted to a susceptible crop the nematode population will return to damaging levels within a season.