

Root-Knot Nematodes in the Vegetable Garden

Root-knot nematodes attack a wide variety of plants and can become serious pests in the home garden. They are microscopic roundworms that live in the soil and on plant roots. They injure plants by feeding on root cells with their needle-like mouthparts (stylets). The root system can become damaged to the point where the plant cannot properly absorb water and nutrients. Although they are widespread in South Carolina and elsewhere, they are more common in the sandy soils of the Coastal Plain and river deltas.

Symptoms

A root-knot nematode problem can be confirmed only by physically examining the roots for knots or by a laboratory test.

Symptoms on affected plants may be evident on parts of the plant both above and below the ground. Above the ground, plants may appear stunted and discolored and may die. Plants may wilt easily in hot, dry weather and appear to have nutrient deficiencies. Do not depend on plant symptoms alone when trying to determine if nematodes are damaging plants in your garden.

Beneath the ground, the roots may have knots or galls (swollen areas) on them. Both large and small roots will have round swellings on them. The entire root system may be shallow with areas that are dead or branched excessively.

Nematode sampling guidelines are available from your local county Extension office. There is a nominal charge for each sample to help defray the costs of operating this service. Samples will be analyzed to determine the types and quantities of nematodes present in the soil, so appropriate recommendations for control can be made.

Prevention & Treatment

Once nematodes are identified as a serious problem in your garden, there are several things that can be done.

Use Root-Knot Nematode-Resistant Plants: A few recommended vegetable varieties that are resistant to root-knot nematodes are listed below. These varieties will develop less disease or disease will develop slower or later than in other varieties of the same vegetable. For other resistant varieties, check your favorite seed catalogs.

Root-Knot Nematode-Resistant Plants

Vegetable	Varieties
Southern Peas	Mississippi Purple
	Mississippi Silver
	Colossus
	Hercules
	Charleston Nemagreen
	Clemson Purple
Lima Beans	Nemagreen
Hot Pepper	Charleston Hot
	Carolina Cayenne
Bell Pepper	Charleston Bell
	Carolina Wonder
Sweet Potato	Jewel
Tomato	Better Boy
	Celebrity
	Park's Whooper
	Goliath
Paste Tomato	Classica
	Viva Italia
Cherry Tomato	Small Fry
	Sweet Million

In the home landscape, some bedding plants are resistant to root-knot nematodes including zinnia,

salvia and marigold. Some damage may occur to snapdragons and pansies, especially when plants are stressed. Begonias, coleus and impatiens are most likely to be damaged in areas where root-knot nematodes are a problem.

Rotate the Garden to a New Location: This method will help to prevent nematodes and diseases from becoming established in one area. If new space is not available, rotate plants so that resistant plants are moved to an area where susceptible ones had grown previously. Usually three years of growing nonsusceptible plants (such as asparagus, corn, onions, garlic and strawberries) in a particular garden space is needed to reduce nematode populations.

Fallow Period With Summer Tilling: The population of root-knot nematodes can be reduced significantly in one season by repeated tilling (every 10 days) of the garden soil during the hot, dry summer, to bring the nematodes to the surface to be killed by the drying of the sun.

Plant Certified Disease-Free Transplants & Seed Potatoes: All plants brought to the garden should be examined carefully for signs of very tiny knots on roots. Avoid planting any plants that look suspicious. On Irish potatoes, small bumps on the surface may indicate infection by nematodes.

Remove All Plants Immediately After Harvest: Destroy plants and plant roots by pulling up immediately after harvest. Do not let stalks stand through the winter. Work the soil two to four times in winter, allowing the sun and weather to exert their killing effect.

Establish a Rotation System: Research has shown that root-knot nematode populations can be reduced

in soils that have been previously planted with French or French dwarf-type marigolds. Use French dwarf-type marigolds, such as 'Petite Gold' or 'Petite Harmony.' 'Tangerine', 'Single Gold' (sold as 'Nema-gone'), and 'Lemon Drop' are also good choices. For the first year, plant marigolds in spots where the greatest amount of nematode damage has occurred, or plant marigolds in strips several feet wide across the garden to establish a rotation scheme. Marigolds must be planted as a solid planting, no more than 7-inches apart. They must be grown for at least two months, and then turned under. Keep marigolds free of grass and weeds to prevent nematodes from feeding on roots other than marigolds. Plant vegetables sensitive to root-knot nematodes — such as tomatoes, okra, lima beans, beans and others — in the marigold area the following spring. Rotate marigolds to the same area at least every other year, as long as nematode problems exist.

Soil Amendments: The addition of any organic matter to the garden will improve soil health, and will increase microbial activity in general, which will have the benefit of improving plant health.

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