Control of root-knot nematode in the garden

While often described as a leisurely activity, gardeners know gardening can be hard work. When pests and diseases make their presence known, gardeners want to nip those issues in the bud as quickly as possible. Diseases of tomato plants caused by bacteria, viruses and nematodes can be severe, reduce tomato yield and quality, and generally are more difficult to control than those caused by fungi.

However, we all know there’s nothing that comes between a gardener and that prized, vine-ripened tomato – not even the dreaded nematode.

Nematodes are microscopic round worms that live in the soil and some species feed on plant roots and cause diseases. Root-knot is the most important nematode disease of tomato in Oklahoma.

There are four kinds of root-knot nematodes, including southern, northern, peanut and Japanese, that adversely affect tomatoes and other crop plants. It’s the northern and southern that are most common in Oklahoma. The peanut root-knot nematode has been found only in the far southwest corner of the state.

Infected plants are stunted, appear yellow or pale green and wilt easily, even when there is adequate soil moisture. Gardeners should keep in mind that a severe infestation can dramatically affect yields and eventually kill the plants.

What’s a gardener to do? Chemical fumigants are no longer available for root-knot nematodes in home gardens. However, several safer methods have been developed that produce favorable results.

- Incorporating green manure crops (small grains) to increase the organic matter content of the soil.
- Chitin applications. University research shows that the application of chitin will lower nematode numbers.
- Plant nematode-resistant varieties. Tomatoes are resistant only to the southern root-knot nematode not the northern root-knot nematode; both of which can be found in Oklahoma.
- Garden site rotation is an excellent method of control but often is not a practical option.
- Crop rotation utilizing non-host crops such as corn and onions for root-knot nematode control. The location of the crops within the garden should be moved yearly.
• Companion planting. Varieties of French Marigold (Nemagold, Petite Blanc, Vinca and Queen Sophia) have been shown to reduce nematode numbers, and that reduction occurs only in their immediate root zone.

• Sanitation is important in nematode control. The roots of infested plants should be removed from the soil soon after harvest. These infested roots should be removed from the garden site and destroyed, preferably by burning or burying in a landfill. Good sanitation practices also involve not moving nematode-infested soil to non-infested sites. Care should be taken to ensure gardening implements, hoes, shovels, rakes, etc., and gardening equipment such as rototillers are free of soil before moving from one gardening site to the next. Washing the soil from implements, tools and equipment is a good practice to follow in the effort of preventing the spread of root-knot nematode.

• Soil solarization. More information is available through Oklahoma State University Extension fact sheet F-7640, Soil Solarization for Control of Soilborne Diseases.

Unfortunately, no nematode control method will eliminate nematodes from the soil long term. The methods mentioned above will reduce the numbers for a while, but the population can rebuild if the above practices are maintained. But the taste of those vine-ripened tomatoes is worth the efforts to control these pests.

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