Foliar nematodes are microscopic roundworms that live in leaf tissue and cause significant injury to many ornamental plants. This nematode is becoming more common because of the loss of systemic nematicides in the greenhouse, increased nursery production of these vegetatively propagated plants, and long distance movement of plants.

Plant species that can become infected include numerous landscape woody and herbaceous perennials; various greenhouse foliage, annual, and bedding plants; and many ferns (Table 1). The purpose of this report is to alert the reader to the occurrence of this nematode and to present several options for controlling these damaging pests.

**Symptoms**

The symptoms foliar nematodes cause are often diagnostic. The nematodes penetrate through open stomata and feed on the spongy mesophyll tissue inside the leaf. They cannot penetrate between cells that are packed tightly together and are thus restricted to areas in the leaf that are demarcated by main leaf veins. As the nematodes feed and reproduce inside leaf tissues, these areas begin to turn pale green, yellow, and eventually brown (Figure 1). In plants with parallel veins, the necrotic areas appear as long stripes. In plants with net-like veins, the necrotic areas are angular and appear as patchwork. These symptoms are easier to see when the leaf is placed in...
front of a bright light. Sometimes the dead tissue drops out of the leaf; this results in a hole that is defined by main leaf veins.

Causal agent
Foliar nematodes, *Aphelenchoides* spp., are easily extracted from infested tissue by cutting the plant material into small 5 cm squares and incubating them in water. In just a few minutes hundreds of microscopic nematodes migrate out of the tissue and start swimming in the water with rapid undulating movements. They can be seen with a dissecting microscope.

Disease cycle
The population of nematodes is usually severely reduced in the winter and gradually increases throughout the growing season, so that infected plants do not show any symptoms in the early spring. Symptoms start appearing in the early summer and increase as the season progresses. Foliar nematodes rarely kill their host, but they reduce the plant’s vigor and the symptoms are unsightly. Unfortunately, some plants may be symptomless carriers; they are infested with nematodes, but they show no visible evidence.

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<tr>
<th>PLANT TYPE</th>
<th>SPECIES NAME (COMMON NAME)</th>
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<tr>
<td>GREENHOUSE FOLIAGE, ANNUAL, AND BEDDING PLANTS</td>
<td><em>Ageratum</em> spp.; <em>Anthurium andraeanum</em>; <em>Begonia</em> spp. and hybrids; <em>Coleus</em> spp. and hybrids; <em>Cyclamen persicum</em> (Florist’s Cyclamen); <em>Ficus</em> spp. (Rubber plant); <em>Hibiscus rosa-sinensis</em>; <em>Impatiens</em> spp.; <em>Lilium</em> spp. and hybrids; <em>Pelargonium x hortorum</em> (Florist’s Geranium); <em>Peperomia</em> spp.; <em>Saintpaulia ionantha</em> (African violet) <em>Salvia</em> spp.; <em>Sinningia x</em> (Florist’s Gloxinia); <em>Vanda</em> spp. (Vanda Orchid)</td>
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<td>FERNS</td>
<td><em>Asplenium nidus</em> (Bird’s Nest Fern); <em>Athyrium goeringianum</em> (Japanese Painted Fern); <em>Blechnum</em> spp.; <em>Dryopteris</em> spp.; <em>Nephrolepis</em> spp.; <em>Polypodium</em> spp.; <em>Polsystichum</em> spp. (Shield Fern); <em>Pteris</em> spp. (Brake Fern)</td>
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Vegetatively propagated plants can be a noxious source for spreading this nematode over large distances. As some plants are symptomless carriers, and symptoms in other plants are not apparent until populations are very high, spread of this nematode is a threat whenever new plants are introduced into the landscape or garden. The nematodes are likely to spread by water splashing them from infected new transplants to other suitable plants. In the fall when the leaves drop, the nematodes dry up in the plant tissue and become dormant. They can stay inactive for months or years until favorable conditions return. However they usually become active again in the spring.

**Disease Management**
Controlling foliar nematode in the landscape can be difficult, so avoid planting infected plants in the garden. New plants may be placed in an isolated part of the garden for the first growing season to monitor for symptom development. If symptoms develop, destroy the infected plants. Systematic removal of infected plants will decrease the spread from infected to healthy plants. Do not place this material on a compost heap because these nematodes can survive and reproduce by feeding on fungi which are common in compost.

In the greenhouse or nursery, fumigate or steam soil, containers, and tools. Carefully follow the manufacturer’s directions for fumigants. Greenhouse floors, benches and storage areas should be thoroughly cleaned of plant debris. Reduce use of overhead irrigation to prevent splash dispersal of the nematodes. Avoid growing highly susceptible plant species. Consider use of heat therapy or hot water treatment of propagation plant parts.

Chemicals are not readily available for controlling foliar nematodes. Restricted-use insecticides may provide good control in the nursery, but they are not available for use in the home landscape. Home gardeners can use insecticidal soap and ZeroTol. At the present time, preventing nematode introduction and spread, as well as the use of good sanitation, are the most important tactics available for limiting damage caused by the foliar nematode.

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