Virginia Cooperative Extension

Plant Disease Fact Sheets

2000 PUBLICATION 450-606W

Black Root Rot of Japanese Holly

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Japanese holly (*Ilex crenata*) is an important evergreen shrub grown in nurseries and landscapes in Virginia. It is widely used in foundation plantings, hedges, and in mass plantings. In 1976 the disease, black root rot, caused by the fungus *Thielaviopsis basicola*, was detected in nursery containers of Japanese holly showing severe decline. Since that time, black root rot has been detected in numerous nursery and landscape plantings in Virginia and has become the major disease problem in Japanese hollies.

Symptoms

The disease is named for the black lesions that commonly occur on infected feeder roots (Fig. 1.). Symptoms on Japanese holly include foliar chlorosis, leaf drop, and stunting. Although stems and leaves are not colonized by the fungus, plants suffer a gradual dieback as a result of root death (Fig. 2.). Young holly plants in the nursery can be killed within weeks as a result of severe root destruction by the fungus; however, mature plants decline more slowly. *Thielaviopsis basicola* produces reproductive structures, called conidia, and survival structures, called chlamydospores, on infected roots (Fig. 3.). The chlamydospores can survive in the soil for long periods of time in the absence of a host plant.

Fig. 2. Foliar dieback on Japanese holly cv. 'Helleri' due to black root rot. (Photo by R. C. Lambe)

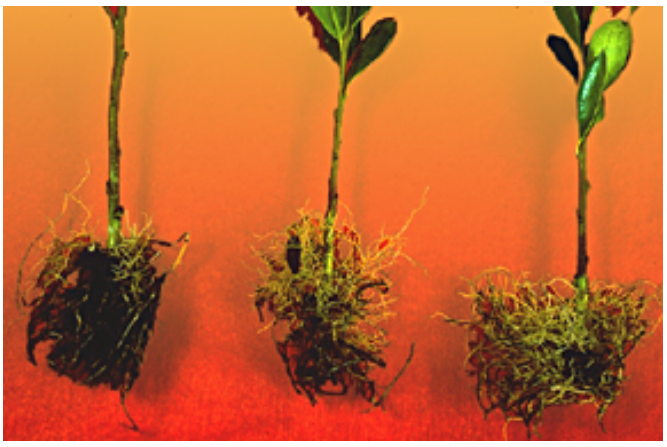

Fig. 1. Root systems of Japanese holly affected with black root rot; most severely affected plant on the left. (Photo by R. C. Lambe)

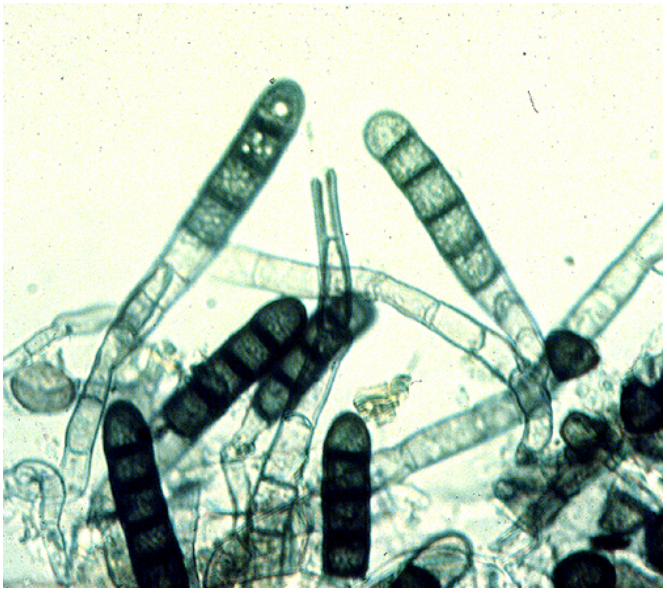

Fig. 3. Dark chlamydospores of the fungus Thielaviopsis basicola. *(Photo by R. C. Lambe)*

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Host Range

Black root rot has been reported on many herbaceous ornamentals and several important vegetable and field crops, including bean, tobacco, and peanut. *Thielaviopsis basicola* has also caused the failure of scion-rootstock grafts in several woody ornamentals. However, black root rot commonly affects only a few species of woody ornamentals grown in Virginia landscapes. These include Japanese holly, inkberry (*I. glabra*), and blue or Meserve holly (*I.* x *meserveae*). Six cultivars of Japanese holly, including 'Helleri', 'Hoogendorn', 'Nigra', 'Green Cushion', 'Mobjack', and 'Supreme', are reported to be highly susceptible. Cultivars 'Highlander', 'Compacta', and 'Convexa' are also reported to be susceptible. The 'Blue Maid' cultivar of the Meserve hollies is highly susceptible. Yaupon holly (*I. vomitoria*) and American holly (*I. opaca*) are moderately resistant to the disease, whereas English holly (*I. aquifolium*) and Chinese holly (*I. cornuta*) are highly resistant.

Control

Little is known about the environmental conditions that influence the development of black root rot. Because black root rot is ubiquitous and because little is known about cultural practices that might limit disease, preventative control with a registered fungicide is recommended for nursery plants and new landscape plantings. In established plantings, Japanese hollies that already show foliar symptoms usually have extensive root damage and should be removed. Remaining plants can be treated with a soil drench fungicide, such as thiophanate methyl (e.g. Cleary 3336) or etridiazole + thiophanate methyl (e.g. Banrot). Refer to the label or the current Virginia *Pest Management Guide for Home Grounds and Animals* (VCE Publication 456-018) or the Virginia *Pest Management Guide for Horticultural and Forest Crops* (VCE Publication 456-017), http://www.ext.vt.edu/pubs/pmg/, for details on application rates and timing. For information on the proper use of pesticides and fungicides, refer to any current VCE pest management guide.

In container production, cuttings of Japanese and other susceptible hollies should be rooted in a soilless pine bark medium in new containers or flats. Recycled containers should be thoroughly rinsed with a 10% bleach solution before reuse to prevent survival of fungal chlamydospores. In field production, care should be taken to avoid planting Japanese and other susceptible hollies in fields formerly cropped to tobacco, beans, or peanuts in which black root rot was a problem.

In landscapes with a history of the disease and where the grower would prefer not to use fungicides on a continual basis, the best option is to choose other species as replacement plants for Japanese holly. Most other woody species and many other species of holly can be planted successfully in soil infested with *Thielaviopsis basicola*. Some plants that might serve as acceptable replacement plants include one of the many compact hybrids or cultivars of boxwood or the 'William Penn' cultivar of the hybrid barberry, *Berberis x gladwynensis*. Susceptible herbaceous plants, such as pansy, Madagascar periwinkle, and foxglove, should not be planted in beds where black root rot has been a problem.

Selected References

Wills, W. H. and R.C. Lambe. 1978. Pathogenicity of *Thielaviopsis basicola* to Japanese holly (*Ilex crenata*). Plant Disease Reporter 62(10):859-863.

Wills, W. H. and R.C. Lambe. 1978. Pathogenicity of *Thielaviopsis basicola* from Japanese holly (*Ilex crenata*) to some other host plants. Plant Disease Reporter 62(12):1102-1106.