

Black Root Rot

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Black root rot is the common name of a root disease caused by the fungi *Berkeleyomyces basicola* and *B. rouxiae* (formerly *Thielaviopsis basicola*) which can infect many woody and herbaceous plant species worldwide [1]. The fungi infect fine roots and cause black lesions which expand and eventually girdle and kill the roots. Advanced infections lead to decline in many hosts and mortality in highly susceptible species.

Symptoms

Symptoms of black root rot disease are very similar to other root diseases and environmental stresses, and include stunted or slow growth, chlorotic (yellow) foliage, and dieback of twigs (Figure 1). Black lesions develop on roots and often first appear mid-root, whereas infections by *Phytophthora* species, a common group of root pathogens, typically start at root tips (Figure 2). Accurate identification of the various potential root pathogens is important when choosing management options, and distinguishing the two may require a professional diagnostic lab.

Figure 1: Symptoms of yellowing and decline in Japanese holly

Photo credit: Rick Carter



Figure 2: Discolored boxwood roots infected with black root rot



Range and Hosts

Black root rot is found worldwide except on Antarctica [1]. The most common woody hosts in landscapes are hollies, particularly Japanese holly (*Ilex crenata*) and blue holly cultivars (*I. x meserveae*). English holly (*I. aquifolium*) and Chinese holly (*I. cornuta*) are considered resistant [2]. Other woody plants that are often infected include boxwood, euonymus, camellia, and citrus species [3]. Many herbaceous ornamentals and crop species are also susceptible to black root rot disease [1, 2, 3].

Management

The most important management option for this disease is sanitation [2, 3]. Inspect the root system of any host plant before planting in the landscape, and reject plants that have brown-black discoloration of root tissue. Because spores can spread in waterlogged soils, maintain adequate soil moisture but avoid saturation. Request a soil nutrient analysis and use amendments to lower the pH below 6 since the fungi are inhibited by acidic soil. Also, add soil organic matter because many studies have shown it suppresses this disease [4]. While soil-applied fungicides can be used to manage black root rot on a temporary basis, sanitation, proper soil care, and plant selection are the most sustainable management options. Please contact your Bartlett Arborist to learn more about management strategies.



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References

- [1] W.J. Nel et al., "Black root rot: a long known but little understood disease," *Plant Pathology*, vol. 68, pp. 834-842, 2019.
- [2] N. Ward et al., "Black Root Rot of Ornamentals", UK Cooperative Extension Service, PPFS-OR-W-03, 2012. Accessed on April 2, 2020 [Online]. Available: <https://plantpathology.ca.uky.edu/files/ppfs-or-w-03.pdf>
- [3] M. Walker, "Black Root Rot: *Thielaviopsis basicola*", Cornell University Plant Disease Diagnostic Clinic Factsheet, 2008. Accessed on April 2, 2020 [Online]. Available: <http://plantclinic.cornell.edu/factsheets/blackrootrot.pdf>
- [4] G. Bonanomi et al., "Suppression of Soilborne Fungal Diseases with Organic Amendments," *Journal of Plant Pathology*, vol. 89, no. 3, pp. 311-324, 2007.