LOUISIANA PLANT PATHOLOGY
DISEASE IDENTIFICATION AND MANAGEMENT SERIES
LSU AgCenter
Research · Extension · Teaching

Boxwood Crown and Root Rot

***Phytophthora* spp.**

Boxwoods are evergreen perennial plants with vibrant green foliage and are used as stand-alone ornamentals or as hedges in home gardens and commercial landscapes. The United States wholesale market value of boxwoods is approximately $125 million (U.S. Department of Agriculture National Agricultural Statistics Service, 2014), and about 500,000 plants are sold every year in Louisiana alone (USDA NASS, 2014). In Louisiana, the most common boxwoods are the varieties of *Buxus microphylla,* Japanese, Baby Gem, Littleleaf and Wintergreen; common boxwood *(B. sempervirens)*; and Korean boxwood *(B. sinica insularis)*. Although the boxwood is considered a hardy plant and may survive adverse weather conditions, this evergreen is susceptible to several important plant diseases, including crown and root rot.

Boxwood crown and root rot is caused by *Phytophthora* spp., a funguslike microorganism commonly known as water mold. Above-ground symptoms of this disease include wilting of foliage in the beginning. As the disease progresses, wilted foliage turns light green and then tan (Figure 1). Leaves dry out and finally drop. Below-ground symptoms include root and crown rot (Figure 2). The outer layer of infected roots easily sloughs off, resulting in a rattail-like appearance and roots that lose the ability to absorb water and nutrients (Figure 3). The crown of the plant rots and turns dull brown (Figure 4). Bark of infected plants slough off at the soil line. Infected plants eventually die.

Figure 2: Nursery-grown container boxwood exhibiting typical symptoms of tan-colored foliage and rotted roots.

Figure 1: Boxwood plant showing tan-colored foliage resulting from crown and root rot caused by *Phytophthora* spp.

Figure 3: Infected boxwood roots exhibiting rot and sloughing off resulting in a rattail-like appearance.

Figure 4: Crown of an infected boxwood showing dull brown discoloration and rotted roots.

Phytophthora is a soil-borne microorganism and may survive in soils for several years in the absence of a host due to resting (survival) structures called oospores. Poor soil drainage and compaction predispose roots to Phytophthora infections. The pathogen produces motile zoospores (infection propagules), which can swim in irrigation water. The pathogen can also spread via movement of contaminated soils. In landscapes, the disease is favored by poor landscape practices, such as deep planting, overcrowding of plants, excessive mulching, overfertilization, overirrigation, planting in clay-rich soils, soil compaction and poor drainage, that create conditions conducive for disease development.

Disease management in landscapes starts with avoiding diseased plants because once Phytophthora is introduced, this plant pathogen can persist in soil for a long time. Avoid replanting in the same areas where previous plant infections have occurred. Well-drained soils with good organic matter content are recommended for new plantings. Good cultural practices, including raised beds, proper planting depth and spacing, and proper fertilization and irrigation, may help reduce infection. Roots injured during planting become highly susceptible to Phytophthora infection. In landscapes where disease is prevalent, prophylactic treatment with fungicides containing active ingredients such as aluminum tris, fosetyl-Al, mefenoxam or phosphite may help avoid infection. These fungicides do not eliminate the pathogen, and repeated applications may be required to suppress the disease. Follow fungicide labels for rates and frequency of applications.

Management of crown and root rot in container-grown boxwoods in nurseries plays a crucial role in avoiding this disease. Growers must practice good sanitation practices to avoid disease spread in their production areas. Boxwood liners or potted plants imported by nurseries must be inspected, isolated and monitored for several weeks for symptoms to develop. Scout plants regularly for early disease symptoms and isolate suspected plants at once. Remove and discard symptomatic plants by burning, if feasible. Do not discard symptomatic or dead plants in cull piles. Growers must use ground covers or gravel as a barrier to reduce contact between containers and native soils. This practice will also prevent soil particles from splashing into containers from overhead irrigation. Potting mix must be stored on paved concrete surfaces. Do not reuse potting mixes and containers that contained previously infected plants. Nurseries that use pond water for irrigation must treat it regularly to avoid spread of the pathogen. Well-drained production areas and rerouting of running irrigation water away from production blocks are essential in managing this disease. Preventative use of fungicides containing active ingredients (listed above) effective in managing Phytophthora crown and root rot may be used at recommended rates to mitigate infections and manage this disease. Because Phytophthora crown and root rot produces similar symptoms to those produced by boxwood dieback, accurate identification is required before implementing management strategies. For more information, please visit our website at www.lsuagcenter.com/plantdiagnostics.

Authors

Dr. Raj Singh, Associate Professor and Director, Plant Diagnostic Center, Department of Plant Pathology and Crop Physiology

Dr. Monique DeSouza, Research Associate, Plant Diagnostic Center, Department of Plant Pathology and Crop Physiology

Visit our website: www.LSUAgCenter.com

William B. Richardson, LSU Vice President for Agriculture
Louisiana State University Agricultural Center
Louisiana Agricultural Experiment Station
Louisiana Cooperative Extension Service
LSU College of Agriculture

PUB 3748 online 6/20