Boxwood Dieback
Colletotrichum theobromicola Delacr.

Boxwood (Buxus sp.) is an important perennial landscape shrub in the United States. It is considered a top ornamental choice for new housing and other commercial development because of its vibrant green color and herbaceous evergreen growth. According to the 2019 USDA National Agricultural Statistics Service, the wholesale market value of boxwoods was estimated at $130 million annually in the United States.

Boxwoods are known to be infected by a number of plant diseases that include boxwood blight, Macrophoma blight, Phytophthora root rot and Volutella blight. In 2015, a new disease of boxwood called boxwood dieback was identified in Louisiana and is the first known report in the United States (Singh et al. 2015). Boxwood dieback is a foliar disease caused by a fungal pathogen, Colletotrichum theobromicola. Research suggests that an association probably exists between Colletotrichum spp. and boxwood (Crouch 2012; Farr and Rossman 2016; Holcomb 1967).

**Symptoms**

Boxwood dieback symptoms include random dieback of twigs with light tan colored foliage (Figure 1). Affected leaves do not defoliate and tend to stay attached to the branches. Root and crowns of affected plants look normal (Figure 2). These symptoms on boxwoods have been long observed in landscape plantings but were always attributed to Phytophthora root rot or Volutella blight. The infection also causes bright black discoloration of stem immediately under bark (Figure 3). This bright black discoloration extends all along the infected twigs and differs from discoloration of the crown region caused by phytophthora root rot. Other biotic and abiotic agents that may cause similar symptoms to boxwood dieback include boxwood blight, Macrophoma blight, cold injury, and herbicide injury. In addition to twig dieback, the pathogen also causes leaf spots (Figure 4) that appear white in the center surrounded by dark brown margins. Under favorable environmental conditions, black fungal fruiting bodies can be observed in the spots.

**Geographic Distribution and Host Range**

In the United States, boxwood dieback has been detected and identified in several states in the south and southeastern U.S. Complete information on the susceptibility of boxwood cultivars to C. theobromicola is not available. However, English, Japanese and Korean cultivars of boxwood have been found to be very susceptible.

**Disease Epidemiology**

Boxwood dieback is a foliar disease that has been detected from boxwood liners (Figure 5). The disease is thought to be
introduced to new locations via infected liners. The pathogen is
known to produce spores on young, infected twigs in the landscape
(Figures 6 and 7). Disease spread from plant to plant is accom-
plished by poor pruning practice, and by the dispersal of conidia via
rain or irrigation water.

Although environmental conditions affecting disease development
are not currently known, artificial inoculation of boxwood plants
maintained in a greenhouse at 28 ± 2°C and 85% relative humidity
has demonstrated that symptom development will occur after three
months of incubation.

Disease Management

Since boxwood dieback is a recently discovered disease, effective
diagnostic tools and control measures such as fungicides are
currently limited. Landscapers, nurserymen and homeowners
should follow good cultural practices and create an environment
that will hopefully decrease the spread and development of
boxwood dieback.

Since removing dead and dying twigs from plants infected by the
pathogen is not known to control this disease, all symptomatic
plants in the landscape should be removed and destroyed. Surface
disinfection of pruning and cutting tools is important to reduce its
spread. Avoiding unnecessary plant injury may also help avoid any
potential infection by the pathogen.

Nursery owners should closely monitor liners and potted boxwoods
for symptoms of boxwood dieback. Suspected plants must be imme-
diately isolated from healthy plants.

Disease management strategies practiced for managing phytoph-
thora root rot will not provide management of boxwood dieback.
Laboratory testing is required to confirm boxwood dieback because
it can easily be misdiagnosed as phytophthora root rot.

Sample Collection and Submission

To determine if plants have boxwood dieback, send plants showing
early stages of disease development to a diagnostic clinic. If practi-
cal, send the whole plant, including roots. Branches and twigs
that have been dead for several months do not generate accurate
diagnosis. Collect three to four 1-foot long symptomatic twigs with
both healthy and diseased tissue from recently infected areas. Wrap
twigs individually in dry paper towels and then pack them in plastic
ziplock bags. Include a completed sample submission with the sample and send it to your state plant diagnostic labora-
tory. Consult your state plant diagnostic lab before collecting and shipping samples.

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