

Boxwood Blight

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Boxwood blight is a fungal disease that causes leaf spots, twig cankers, rapid defoliation, and eventual death of boxwood plants. All species and varieties of boxwood are considered susceptible. English and American boxwood are most severely affected, but there is some tolerance to boxwood blight in other species and hybrids. Pachysandra and sarcococca (sweet box), other members of the boxwood family, are also hosts of the disease. Since discovery of this disease in the United States in 2011, boxwood blight has spread rapidly across the US and can now be found in most states from coast to coast. Although boxwood blight can result in death of the host plant, it is a manageable disease.

Symptoms

Boxwood blight infects leaves and twigs causing leaf spots and twig cankers, ultimately resulting in rapid defoliation. Root rot has not been observed, and root infections do not appear to be a significant part of the disease cycle. Early symptoms consist of circular, necrotic leaf spots and dark lesions on twigs (cankers). Leaf spots can go unnoticed due to rapid defoliation occurring shortly after leaf spots are formed (Figures 1 and 2). Black twig cankers are conspicuous on defoliated twigs. As the symptoms progress, severely affected sections of the plant may fail to leaf out the following spring. The distinctive leaf spots, twig

Figure 1: Typical defoliation caused by boxwood blight



cankers, and rapid defoliation are unlike symptoms produced by other boxwood diseases and disorders.

Figure 2: Leaf spots and twig cankers caused by boxwood blight



Causal Agent

In the United States, boxwood blight is caused by the fungus *Calonectria pseudonaviculata* (synonym: *Cylindrocladium buxicola*). The fungus produces spores called conidia that are the infectious propagules. The conidia are large and sticky. Sporulation by *C. pseudonaviculata* is favored by warm temperatures (60-80° F) and high humidity. Moisture on leaves and twigs provides ideal conditions for infection by this fungus, which can enter directly through the leaf cuticle or through natural openings such as stomata. Years with high rainfall and extended

summer temperatures result in greater disease incidence and severity.

Conidia can spread over short distances by rain splash or through wind-driven rain. These sticky spores can also spread over long distances through the nursery trade, on shearing/pruning tools and animals, and by other anthropogenic means. This fungus produces overwintering (survival) spores called microsclerotia that can persist in the soil for several years in infected plant debris. These spores can germinate and serve as an inoculum source even after plants are removed.

Management

Successful boxwood blight management relies on several different tactics. Planting **resistant, non-host** species as replacements and in new landscape installments is the most sustainable option for managing this disease. Some common evergreen plants such as Japanese holly, Yaupon holly, viburnum, and *Thuja* have dwarf cultivars that are commercially-available and could be great replacements for boxwood. Planting **tolerant species or cultivars** of boxwood is also an effective management tactic. Asiatic cultivars (*Buxus microphylla*) and *B. harlandii* are generally tolerant of boxwood blight and some have forms similar to English boxwood. Cultivars such as ‘Green Beauty’, ‘Little Missy’, and ‘Golden Dream’ as well as two cultivars from the NewGen™ boxwood series, ‘Independence’ and ‘Freedom’, are considered tolerant to boxwood blight. Monitoring for early symptom development is critical to a successful management program, even for tolerant cultivars.

In addition to tolerance, **sanitation** is another very effective management tactic. Avoiding planting infected plants is the most obvious sanitation tactic. When purchasing new plants to install, inspect them for the characteristic twig cankers and leaf spots. In addition, if disease severity is moderate, pruning out infected tissues can reduce the inoculum load available to cause future infections. If possible, avoid working with healthy boxwoods after working with infected

ones. The boxwood blight pathogen can spread via pruning tools, clothing, and other equipment that may come in contact with the sticky conidia. Severely affected boxwood plants should be removed immediately, especially if they are cultivars of the extremely susceptible species, *B. sempervirens*. Lastly, sanitizing pruning tools is recommended after working with diseased plants.

Cultural practices such as planting boxwood in full sun and pruning overstory plants to allow light to penetrate through to boxwood canopies will reduce the leaf wetness period. This will ultimately reduce the disease severity by creating a less conducive environment for successful infections. Similarly, properly mulching existing plantings, especially in areas that have previously had infected plants, will reduce the likelihood of splash of the overwintering structures that may be present in fallen infected leaf debris. Finally, overhead irrigation should be avoided in boxwood plantings as the water droplets provide an efficient means of splashing the conidia to healthy tissue. Overhead irrigation will also increase the leaf wetness period, which will create a more suitable environment for the pathogen.

Lastly, **fungicide programs** can be a very effective management tactic, particularly as a preventative. Since the pathogen is most active during warm, wet periods, fungicide applications should be made monthly or biweekly in the spring, summer and into the early fall months. The summer and early fall months are the most critical times for fungicide applications. In years with wet summers where boxwood blight pressure is high, preventative applications of fungicides should be planned for healthy boxwood. While fungicides have limited therapeutic activity, fungicide programs coupled with other management tactics can successfully keep this disease under control. Fungicides are generally great management tools for boxwood blight in the United States, but they are not “silver bullets” and should always incorporate other management tactics for a successful disease management program. In Europe, there is an additional species (*Calonectria henricotiae*)

that causes boxwood blight, and this species is less sensitive to fungicides, especially triazoles and strobilurins. Monitoring for this resistant species in the U.S., and alternating active ingredients of fungicides are recommended for this disease.



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