

Best Management Practices for Boxwood Blight

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Best Management Practices for Boxwood Blight for Professionally Managed Landscapes and Public and Historic Gardens in Virginia

Boxwood blight is caused by the fungal pathogen *Calonectria pseudo-navigulata* (syn. *Cylindrocladium buxicola*). Boxwood blight was first described in the United Kingdom in the mid-1990's and by 2002 was found in several other European countries and New Zealand. In September 2011 boxwood blight was discovered in North America. Symptoms of the disease include leaf spotting (Fig. 1), elongate, dark cankers on stems (Fig. 2), defoliation, and dieback (Fig. 3). The primary means by which the disease spreads is the inadvertent introduction of infected boxwood to existing plantings. The pathogen can also spread by spores, which readily adhere to equipment and work clothes, and by microsclerotia, which survive in infested soil and plant debris. This document outlines best management practices for landscapers and property managers to reduce the risk of spreading boxwood blight to landscapes and public and historic gardens, and to manage the disease if it is introduced.

Fig. 1. Boxwood blight leaf spot symptoms. (photo by A. Bordas)



Fig. 2. Dark cankers on stems caused by the boxwood blight fungus. (photo by A. Bordas)



Fig. 3. Severe defoliation and browning of established boxwood following introduction of the disease on a new container boxwood plant. (photo by A. Bordas)

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Best Management Practices

I. Exclude the disease

- a. Purchase new planting stock from a nursery that participates in the [Boxwood Blight Cleanliness Program](#) or a retail nursery that buys its stock from production facilities in the Boxwood Blight Cleanliness Program. These facilities adhere to [specific best management practices](#) that prevent introduction and minimize the risk of spreading the disease.
- b. Boxwood not purchased from a nursery participating in the Boxwood Blight Cleanliness Program should be isolated (quarantined) as far away from existing boxwood as possible for a period of four weeks, ideally under conditions favorable for disease development, before planting in the landscape. (Favorable conditions for boxwood blight include temperatures of 60 -77°F, high humidity and periods of leaf wetness.)
 1. Do not co-mingle newly purchased boxwood with boxwood already on-site until completion of the isolation period and confirmation that boxwood is asymptomatic for boxwood blight. (Note that boxwood blight-resistant cultivars may harbor the pathogen, yet not show obvious symptoms.)
 2. Do not apply fungicides during the isolation period, since fungicides can suppress the pathogen and prevent infected boxwood from developing symptoms.
 3. Boxwood showing no boxwood blight symptoms after four weeks under optimal disease conditions pose a lower risk of introducing the disease to a site and can be planted into the landscape at the discretion of the owner or property manager.
- c. Be aware that English and American boxwood are highly susceptible to boxwood blight. Take special care when introducing new boxwood plants to established plantings of English and American boxwood by following the steps above.
- d. Boxwood greenery used for holiday decoration can also harbor the boxwood blight pathogen. To minimize risk of introducing the disease to a landscape via holiday boxwood greenery:
 1. Inspect greenery carefully for symptoms of box-

wood blight. Do not introduce symptomatic greenery to landscapes containing susceptible boxwood plants. Double-bag symptomatic plant material before removing to the landfill. Be careful to remove all plant debris, including fallen leaves.

2. Be aware that in some cases asymptomatic boxwood could also harbor the pathogen. On properties with highly valued boxwood, it may be best to avoid introducing boxwood greenery altogether.
 3. After the holidays, dispose of boxwood greenery by double-bagging it in sealed plastic bags and removing it to a landfill. Be careful to remove all plant debris, including fallen leaves.
 4. Do not compost boxwood greenery.
- e. Submit samples of symptomatic boxwood to a local Extension agent or Virginia Department of Agriculture & Consumer Services nursery inspector for diagnosis.

II. Scout for early detection of the disease

- a. Routinely inspect plant material for symptoms of boxwood blight.
- b. Submit samples of symptomatic boxwood to a local Extension agent or Virginia Department of Agriculture & Consumer Services nursery inspector for diagnosis.

III. Protect at-risk plants with fungicide applications

- a. If boxwood blight is detected in or near established plantings, initiate preventative fungicide treatment as soon as possible to any asymptomatic boxwood at the site. Once plants are infected, the disease is very difficult to control, so fungicide treatment must begin prior to infection. Fungicide treatment will not eradicate the disease and repeated applications will be necessary for the lifetime of the planting.
- b. A list of recommended fungicides can be found on the Virginia Boxwood Blight Task Force web site at: <http://www.ext.vt.edu/topics/agriculture/commercial-horticulture/boxwood-blight/index.html>.

IV. Reduce fungal inoculum for new infections

- a. Remove and destroy symptomatic branches, portions of large specimen boxwood or entire plants infected with the boxwood blight pathogen to reduce inoculum levels.
 1. Remove diseased plant material with care to avoid spreading infectious plant material. When practical, double-bag infected plants on-site before removal to limit the spread of leaf debris, twigs and soil.
 2. Burn, bury or dispose infected plant material in a landfill. (Follow local fire regulations.)
 3. Remove all residual plant debris, including fallen boxwood leaves. Methods of removal include sweeping, raking, vacuuming or flaming the ground (e.g. with an agricultural flamer, if permitted).
- b. Workers removing infected plant material should practice proper sanitation techniques (see Section VII) because the pathogen produces sticky spores that readily adhere to vehicles, equipment, tools, shoes and clothing.

V. Installation of new boxwood at infested sites

- a. If boxwood will be planted near previously infected boxwood, all infected boxwood debris at the planting site should be bagged, burned (if permitted), buried on-site, or disposed in a landfill prior to planting new boxwood. Methods of removal include sweeping, raking, vacuuming or flaming the ground (e.g. with an agricultural flamer, if permitted).
- b. Do not compost boxwood plant debris known to be infected with the boxwood blight pathogen.
- c. Workers removing infected plant material should practice proper sanitation techniques (see Section VII).
- d. Consider planting resistant boxwood cultivars or other species of woody ornamentals at sites with a known history of boxwood blight. Contact your local county Extension office for information on resistant boxwood and alternative ornamentals.

VI. Installation of new boxwood at non-infested sites

- a. Purchase plants from a nursery that participates in the [Boxwood Blight Cleanliness Program](#) or a retail nursery that buys its stock from production facilities in the Boxwood Blight Cleanliness Program and follow precautions listed in Section I above to prevent inadvertent introduction of the disease on new plant material.
- b. Consider using boxwood cultivars with a high level of resistance to boxwood blight for new plantings. Contact your local county Extension office for information on resistant boxwood.

VII. Sanitation

- a. Sanitizers
Recommendations for specific sanitizer products and instructions for their use are available on the Virginia Boxwood Blight Task Force web site (<http://www.ext.vt.edu/topics/agriculture/commercial-horticulture/boxwood-blight/index.html>). Research on sanitizer efficacy is ongoing, so check the web site for the latest updates.
- b. Clothing
 1. In landscapes and historic gardens that do not have infected boxwood, it is recommended that workers wear freshly laundered clothing each day.
 2. For landscapes and historic gardens where boxwood blight is present or nearby, disposable gloves, clothing (e.g. Tyvek®) and shoe covers should be worn when pruning, scouting or removing infected plants. If disposable clothing and shoe covers are not available, clothing should be laundered and shoes sanitized with an appropriate sanitizer each day (see Section VII a).
- c. Equipment and tools
 1. Sanitize pruners, saws, rakes, hoses and other landscape tools and equipment between boxwood plants and between work locations (see Section VII a).
 2. Be aware that vehicles can also become contaminated and potentially move the pathogen to new locations. Clean and sanitize vehicles as completely as possible between properties. Vehicles

should, at a minimum, be free of soil and plant debris before leaving a property.

d. General protocols

1. Landscape companies should develop and adhere to clearly outlined sanitary protocols aimed at reducing the risk of spreading boxwood blight. These protocols should be shared with their clients.
2. Home growers, landscape managers and owners of historic gardens should ensure that landscapers adhere to appropriate sanitation practices.
3. Workers should start the day working with uninfected boxwood, and save work on infected boxwood for last. This process reduces the chance of spreading boxwood blight during the workday and allows for more effective sanitation at the end of the day.

VIII. Recordkeeping

Keep accurate records of incoming plant material for any new plantings. Include nursery source, date purchased, date planted, variety, pesticide/fertilizer applications, etc.

IX. Training

- a. Educate and train personnel, property managers and home growers to recognize symptoms of boxwood blight. Early diagnosis allows for better disease management and helps to prevent spread.
- b. Encourage field staff and management professionals to attend regularly scheduled industry meetings where boxwood blight will be discussed. Contact your local Extension agent for a list of industry meetings or for assistance in organizing boxwood education programs.