



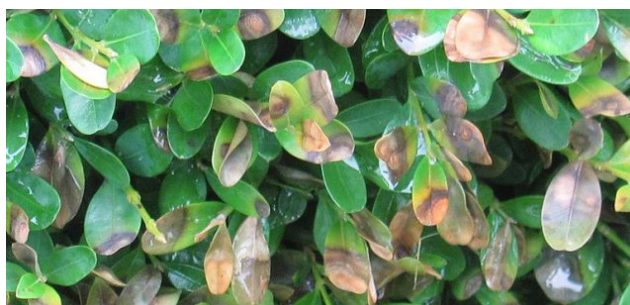
Since 1979



A Gardener's Destination

- ANNUALS
- PERENNIALS
- SHRUBS
- TREES
- POTTERY
- SUPPLIES

973-377-8703
403 Green Village Rd.
Green Village, NJ 07935



Best Management Practices for Boxwood Blight

* NOTE: THE FARM AT GREEN VILLAGE NO LONGER OFFERS A WARRANTY ON ANY BOXWOODS SOLD DUE TO THE EASE OF SPREADING OF THIS DISEASE.*

WHAT IS BOXWOOD BLIGHT?

Boxwood blight (also known as box blight), caused by the fungus *Calonectria pseudonaviculata*¹, is a serious fungal disease of boxwood that results in defoliation and decline of susceptible boxwood. Once introduced to a landscape, boxwood blight is very difficult and costly to control with fungicides. The major means of spread of this disease is by movement of contaminated plant material (e.g. container or field-grown boxwood, boxwood greenery used for holiday decoration), but boxwood blight spores can also be spread on pruning tools, clothing, equipment and anything that might have contacted infected plants. Home growers can best protect their boxwood by following the measures listed below to avoid introduction of the disease to their landscape.

SYMPTOMS OF BOXWOOD BLIGHT

The most characteristic symptoms of boxwood blight on susceptible boxwood cultivars are brown leaf spots that lead to defoliation and black streaking on boxwood stem tissue. Some cultivars of boxwood can harbor the boxwood blight pathogen, yet show no symptoms; these cultivars are considered partially resistant² (also referred to as "tolerant") cultivars

(Table 1). Fungicides can also mask symptoms of the disease on susceptible cultivars.

TABLE 1. Susceptibility of commercial boxwood cultivars to boxwood blight

(Compiled from research by Ganci, Benson and Ivors, North Carolina State University, 2012.) Refer to latest cultivar trial results at <http://plantpathology.ces.ncsu.edu/pp-ornamentals/>

HIGHLY SUSCEPTIBLE	<i>B. sempervirens</i> 'Suffruticosa' <i>B. sinica</i> var. <i>insularis</i> 'Justin Brouwers'
SUSCEPTIBLE	<i>Buxus X 'Glencoe'</i> (Chicagoland Green) <i>B. sempervirens</i> 'American'
MODERATELY SUSCEPTIBLE	<i>B. microphylla</i> 'Green Pillow' <i>Buxus X 'Green Mountain'</i>
MODERATELY RESISTANT	<i>B. microphylla</i> 'Winter Gem' <i>B. sempervirens</i> 'Dee Runk' <i>B. sempervirens</i> 'Fastigiata' <i>Buxus</i> 'Green Gem' <i>B. microphylla</i> 'John Baldwin'
MOST RESISTANT	<i>B. microphylla</i> var. <i>japonica</i> 'Green Beauty'

¹ Synonyms: *Cylindrocladium pseudonaviculatum*, *Cylindrocladium buxicola*

² Currently there are no boxwood cultivars available that are immune to boxwood blight; however, cultivars possessing various levels of resistance to the disease have been identified and research is ongoing to rank cultivars according to their level of resistance or susceptibility



OTHER PLANT HOSTS

Pachysandra terminalis (Japanese spurge), *Pachysandra procumbens* (Allegheny spurge) and *Sarcococca* species (sweetbox), which are in the same family (*Buxaceae*) as boxwood, are also susceptible to boxwood blight and infected plants of these species could introduce the disease to a landscape. Symptoms of the disease on *P. terminalis* are brown leaf spots. New host plants may be identified as researchers learn more about this disease, but hosts will likely be limited to members of the *Buxaceae* family.

AVOIDING INTRODUCTION OF BOXWOOD BLIGHT TO A LANDSCAPE

Because the boxwood blight pathogen is not well adapted to long-distance spread by long-distance air currents, the most likely entry point for the disease in a home landscape is by accidental introduction of infected plant material and/or contaminated tools, equipment or other items. Home growers who have boxwood in the landscape should carefully adhere to the following recommendations to avoid inadvertent introduction of this devastating disease to their landscape:

Prior to purchase, carefully inspect plants for symptoms of boxwood blight.

- Be aware that partially resistant cultivars of boxwood (Table 1) could act as a “Trojan horse” in a landscape because partially resistant cultivars may harbor the boxwood blight pathogen, yet not show obvious symptoms.
- Be aware that fungicide treatment can suppress symptom development.

Monitor established boxwood and newly planted boxwood on a regular basis for any symptoms of boxwood blight.

- Be aware that boxwood greenery used for holiday decoration could harbor the boxwood blight pathogen.
- To minimize risk of introducing the disease by this route, do not use boxwood greenery near landscape boxwood.
- When disposing holiday greenery, double-bag it in sealed plastic bags and dispose of it in the landfill. Do not compost boxwood greenery.

The boxwood blight fungus can be spread from one property to another via contaminated spray hoses, pruning tools, wheelbarrows, tarps, vehicles, clothing, shoes, or anything to which the sticky spores of the boxwood blight fungus might adhere.

WHAT TO DO IF BOXWOOD BLIGHT IS DIAGNOSED IN THE LANDSCAPE

Since boxwood blight cannot be effectively controlled once the infection begins, prompt removal of any diseased boxwood is recommended to help prevent spread of disease to healthy plants. Associated leaf debris should also be removed. **Be aware that removing diseased boxwood and leaf debris will not eradicate the boxwood blight pathogen from the location, since the pathogen produces long-lived survival structures that can persist in the soil for 5 to 6 years.** These survival structures can infect susceptible replacement boxwood planted in locations where the disease has been diagnosed. Therefore, replanting susceptible boxwood cultivars or members of the *Buxaceae* family in a location where infected boxwood has been removed is not advisable. Partially resistant boxwood cultivars (Table 1) could be used as replacement plants, but repeated fungicide applications will be necessary to protect any susceptible boxwood cultivars that remain in the landscape. Boxwood cultivars with a high level of resistance (termed “most resistant” in Table 1) will not require fungicide treatment.

After removal of diseased plants and debris, different management approaches should be considered, depending on the particular landscape situation. The two different scenarios outlined below illustrate two recommended, but different, management approaches:

• **SCENARIO 1**

A landscape contains highly valued boxwood that are susceptible to boxwood blight, symptoms of boxwood blight were observed in the planting, and the disease was confirmed by a plant diagnostic lab.

Immediate Actions Recommended

1. Remove diseased boxwood and leaf litter promptly. Remove leaf litter from soil surface by vacuuming, raking, or sweeping. If leaf debris has been incorporated into the soil, removing soil to a depth of 8” to 12” may help eliminate fungal inoculum of



the pathogen. Diseased boxwood, leaf debris, and soil should be bagged and removed to the landfill OR buried 2' deep in soil away from boxwood plantings. Do not compost boxwood debris or plant material.

2. Because the fungal spores can stick to tools, equipment, etc., sanitize all tools, equipment, tarps, shoes, gloves, etc., used after removing plants to prevent spread of fungal inoculum to healthy boxwood (Table 3).

3. Promptly begin a preventative fungicide spray program on any susceptible boxwood in the landscape to prevent further disease outbreaks. 4. Be aware that pets, children, and other animals can also potentially move the sticky spores of this fungus to new locations.

Long-term Actions Recommended

1. Repeat fungicide applications (7- to 14-day intervals, according to product label) to susceptible boxwood throughout the growing season for the life of the boxwood plants. If temperatures warm after the growing season has ended, additional fungicide application may be warranted. Warm temperatures plus leaf wetness are very favorable for boxwood blight infection and spread, so any time temperatures are over 60°F and rainfall is expected, a preventative fungicide spray program should be in place.

2. Monitor boxwood weekly during the growing season for symptoms of boxwood blight. Remove any symptomatic plants/debris/soil as outlined above.

3. Boxwood debris should never be composted. Bag and dispose of in the landfill OR bury 2' deep in a location away from boxwood plantings.

4. When working in boxwood plantings, minimize the chance of spreading boxwood blight inoculum that could be present on shoes, gloves, clothing, equipment and tools by sanitizing between plants/plantings (Table 3).

5. Implement the suggested cultural practices in the section below: **"Cultural Practices Recommended to Minimize Chance of Boxwood Blight."**

● SCENARIO 2

A landscape contains boxwood plants that developed symptoms of boxwood blight and the disease was confirmed by a plant diagnostic lab (e.g. Plant Disease Clinic); however, the boxwood in this landscape are

not highly valued specimens. In this situation the simplest approach would be to replace boxwood blight-susceptible boxwood with boxwood cultivars that possess a high level of resistance (termed "most resistant" in Table 1). This will allow the grower to enjoy the beauty of boxwood plantings without the significant burden of repeated fungicide sprays to susceptible boxwood over the lifetime of the planting.

1. All susceptible boxwood should be removed, including the roots. Infested plant debris should be removed by raking, sweeping, or vacuuming, then bagged and taken to the landfill. Alternatively, debris can be buried 2' deep in soil away from landscape plantings. Do not compost diseased plant material. Be aware that removing diseased boxwood and leaf debris will not eradicate the boxwood blight fungal pathogen from the location, since the pathogen produces long-lived survival structures that can persist in the soil for 5 to 6 years.

2. If boxwood leaf debris has been incorporated into the soil, removing soil to a depth of 8" to 12" may help eliminate survival structures of the pathogen. Dispose of soil and leaf litter as recommended above for diseased plant material. Do not compost.

3. Sanitize all tools, equipment, tarps, shoes, gloves, clothing, etc., used when removing plants to prevent spread of fungal inoculum that can cause infection on healthy boxwood (Table 3).

FUNGICIDE MANAGEMENT OF BOXWOOD BLIGHT IN THE HOME LANDSCAPE

Important considerations for home growers when deciding whether to implement a preventative fungicide management program for boxwood in the home landscape are:

1. Fungicides cannot eradicate the disease from infected plants.

2. Once boxwood blight is present in the landscape, it is very difficult to control. Fungicide applications that are begun after the disease is already present do not provide acceptable disease control, according to the latest research results from North Carolina State University.

3. Fungicides labeled for use by home growers are protectant fungicides and must be used preventatively.

4. An effective preventative fungicide spray program will require repeated applications (at 7- to 14-

day intervals, depending on product label and environmental conditions) of fungicides throughout the growing season.

5. Post-growing season: Warm temperatures with leaf wetness results in high boxwood blight disease pressure, so if temperatures are over 60°F and a rain event is expected, a preventative fungicide spray should be in place post-season as well.

6. Thorough fungicide coverage of boxwood foliage is difficult, yet necessary for protection from the disease.

Currently, effective fungicide options for home growers are limited; however, professional applicators in the home landscape have more product options. Future research may lead to development of effective control of boxwood blight for home growers with fewer fungicide applications. For a list of specific fungicides labeled for control of boxwood blight in the landscape for use by non-professional applicators, refer to Table 2.

TABLE 2. Products containing the active ingredient chlorothalonil have been shown to be very effective in management of the boxwood blight pathogen, if used preventatively

Note: Read and follow label directions for all products. Commercial products are named in this publication for informational purposes only. The authors do not endorse these products and do not intend discrimination against other products that also may be suitable.

ACTIVE INGREDIENT	Brand Name and Manufacturer
chlorothalonil	Broad Spectrum Landscape & Garden Fungicide (Ferti-lome)
	Vegetable, Flower, Fruit and Ornamental Fungicide (Hi-Yield)
	Fung-onil (Bonide)
	Ortho Max Garden Disease Control or Ortho Disease B Gon (Scotts)

CULTURAL PRACTICES RECOMMENDED TO MINIMIZE CHANCE OF BOXWOOD BLIGHT

Minimize leaf wetness and promote good air circulation in boxwood plantings to minimize disease pressure. Examples include:

- Choose cultivars that have a more open-growth habit (e.g. *Buxus microphylla* cultivars as opposed to *B. sempervirens* ‘Suffruticosa’).
- Avoid overhead irrigation.

- Ensure good air circulation in plantings by providing adequate spacing between plants. In general, growers may want to avoid close spacing of boxwood and, therefore, hedges.

Mulch boxwood plantings to reduce the spread of boxwood blight inoculum to foliage by splashing water.

Avoid working in boxwood plantings when the foliage is wet and fungal inoculum is more likely to be spread.

Practice good sanitation practices to avoid moving infested soil or plant material to landscape locations where boxwood are located.

- Sanitize pruning tools and other tools/equipment/clothing/tarps between boxwood plantings and also between other members of the *Buxaceae* family.
- Bag and dispose of all boxwood debris (including holiday greenery) in the landfill or bury 2’ deep in soil away from boxwood plantings.
- Be aware that allowing boxwood tippers onto your property to collect greenery may increase the risk of introduction of boxwood blight if the tippers visit multiple boxwood plantings and do not follow good sanitation practices.
- If you hire landscape professionals to spray or otherwise maintain landscape boxwood, discuss your concern about boxwood blight with them to learn about management practices they may have in place to avoid movement of boxwood blight from one client’s landscape to another. Then you can decide if their approach is acceptable to you.

TABLE 3. Sanitizers for equipment/tools

Follow label directions and precautions on all labeled products. Surfaces must be free of soil and other organic matter for sanitizers to be effective. The highest label rate is recommended. For best efficacy, at least 5-minute contact time with sanitizing agent is recommended for tools; for pots or other surfaces, at least 10 minutes. These products are corrosive, so oil tools after treatment.

ACTIVE INGREDIENT	Brand Names
o-Benzyl-p-chlorophenol (1.25 oz/gallon)	Lysol Concentrate Disinfectant
sodium hypochlorite (1 part bleach: 9 parts water)	Clorox, other brands of household bleach (must be prepared fresh)



Original Report: *Best Management Practices for Boxwood Blight*, Virginia Cooperative Extension, Virginia Department of Agriculture and Consumer Services

TO VIEW ORIGINAL SOURCE MATERIAL

Go to www.ext.vt.edu or [Click Here](#) to read the original document

