Best Management Practices for Boxwood Blight

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Best Management Practices for Boxwood Blight for Greenery Producers

Best management practices for boxwood blight (also called "box blight") for greenery producers are practices recommended to avoid the introduction and spread of boxwood blight, caused by the fungus *Calonectria pseudonaviculata* (syn. *Cylindrocladium pseudonaviculatum*). The recommendations in this document are designed to avoid spread of boxwood blight within a planting or to new locations when pruned tips are collected, sold and/or used for holiday greenery[1]. These recommendations are relevant to anyone involved in the greenery ("tipping") industry, including small and large-scale greenery producers, home growers who sell boxwood tips, and people who tip-prune boxwood on other people's property. Care must be taken at all levels of greenery production to prevent the spread of the boxwood blight pathogen and avoid economic losses associated with this disease.

Boxwood blight symptoms

To avoid spread of boxwood blight, it is important to learn to recognize the symptoms of the disease. Typical symptoms include circular, tan leaf spots with darker borders (fig. 1) and linear, black streaks on stems (figs. 2 and 4). Whole leaves eventually turn brown and drop from the plant (fig. 3). Infected plants may show sudden and severe defoliation. Defoliated stems may produce new shoots from axillary or terminal buds later in the season (fig. 4).

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

Fig. 2. Black streaking on stems due to boxwood blight. (photo by M. A. Hansen)

Avoiding introduction of boxwood blight into a greenery-producing operation

Spores of the boxwood blight pathogen are produced in a sticky matrix and do not spread readily by wind currents. The most likely mechanism for long-distance spread of the boxwood blight pathogen is by movement of infected plants or cuttings, or on infested tools, shoes, clothing, equipment, bags, animals, or vehicles.

1. Greenery producers who maintain their own stock plants should also refer to the VCE publication "Best Management Practices for Boxwood

[1] *Because boxwood blight is a relatively new disease to the United States, some of these recommendations have not been specifically tested in a research setting, but are based on knowledge of the biology of the pathogen.*

Fig. 3. Browning and defoliation due to boxwood blight on landscape boxwood. (photo by A. Bordas)

Fig. 4. New shoots being produced on infected boxwood stem. (photo by M.A. Hansen)

Blight in Virginia Production Nurseries WITHOUT Boxwood Blight" for information on avoiding introduction of boxwood blight to a nursery.

2. Early detection is crucial. Educate workers or anyone who tip-prunes to recognize and report suspicious symptoms and to understand the importance of all the practices listed below.

3. Avoid bringing in equipment or vehicles that may have been used on sites where boxwood blight has been detected.

4. Make sure that all greenery transport vehicles entering a property have been cleaned and sanitized as completely as possible and are free of soil and plant debris (e.g. on truck beds, trailers, tires) before entry.

5. Ask visitors to the property to park their vehicles in a specified area located away from boxwood plantings.

6. Do not re-use burlap (or other) bags or bundling materials that have previously been used for boxwood plants or cuttings. (Currently there are no practical methods for disinfesting used burlap bags that may be infested with the boxwood blight pathogen.)

7. Dispose of used burlap bags in the landfill or bury them under two feet of soil. Burning bags may also be an option, depending on local fire regulations.

8. Workers entering a boxwood property where the disease has not been found should wear clean, laundered clothes and shoes that are free of soil. (Sanitizing shoes with 70 percent ethanol may also reduce the risk of spreading boxwood blight, although research results on efficacy have been inconsistent.)

9. Alternatively, workers may wear new, disposable gloves and protective shoe, arm, or leg covers while working in boxwood plantings. Change covers between sites. Place used covers in plastic bags and dispose in the landfill.

10. Workers coming from properties where boxwood blight has been found should not be allowed to enter a property with healthy boxwoods until their clothes have been laundered and shoes are free of soil and covered with disposable shoe covers.

11. Try to limit pet access to boxwood plantings because animals could carry spores from infested areas to healthy plants in non-infested areas.

Minimizing spread of the pathogen from locations where boxwood blight has been found

1. Early detection is crucial. Educate workers and anyone who tip-prunes on your property to recognize and report suspicious symptoms and to understand the importance of all of the practices listed below.

2. Never tip-prune from infected boxwood plants or from boxwoods in the same block of plants as infected boxwoods, even if the foliage appears healthy.

3. Disinfest pruning tools with a recommended sanitizer (see table) when moving between different blocks of plants and between different fields.

4. Do not work in fields when plants are wet.

5. Assemble wreaths or other holiday adornments away from existing boxwood plantings.

6. Never discard boxwood plant debris near existing boxwood plantings. Remove boxwood plant debris at the end of each day by vacuuming, bagging, and disposing in the landfill or by burying under two feet of soil.

7. Do not compost boxwood plant debris.

8. When planning your tipping (tip-pruning) schedule, start in areas least likely to have boxwood blight and move toward higher risk areas. Always work in highest risk areas LAST to minimize the risk of disease spread to healthy plants.

9. Workers entering any part of a property containing boxwood where the disease has NOT been found should wear clean, laundered clothes, disposable gloves, and shoes that are free of soil. (Sanitizing shoes with 70 percent ethanol may also reduce the risk of spreading boxwood blight, although research results on efficacy have been inconsistent.)

10. Alternatively, workers may wear new, disposable gloves and protective shoe, arm, or leg covers while working in boxwood plantings. Change covers between sites or between blocks of plants. Place used covers in plastic bags and dispose in the landfill.

11. Try to limit pet access to boxwood plantings because animals could carry spores from infested areas to healthy plants in non-infested areas.

12. Do not allow infected plant material to be sold as holiday greenery.

Where to send plant samples if boxwood blight is suspected

Accurate diagnosis is the first step in preventing the movement of boxwood blight. Growers from any Virginia county should submit suspect plant samples for diagnosis to the Virginia Tech Plant Disease Clinic through the local Virginia Cooperative Extension office (http://www.ext.vt.edu/offices/). Boxwood samples with symptoms of possible boxwood blight (stems that have leaves with spots or browning, stems with black streaks or leaf drop) should be double-bagged with each bag sealed separately for delivery to the local Extension office. If whole plants are submitted, they should be placed in garbage bags with each bag sealed separately with a twist-tie. Plant samples should be accompanied by a completed plant diagnostic form (VCE #456-097), available at the local Extension office.

Recommended sanitizers for greenery producers for disinfesting pruning tools and other equipment of the boxwood blight pathogen.[2]

Active ingredient	Brand name	Rate	Contact Time for Best Efficacy / Comments
Sodium hypochlorite (5.25%)	Clorox, other brands of household bleach	Prepare 1:9 solution of 5.25% bleach to water (or 1:14 solution of 8.25% bleach to water). Must be prepared fresh.	5 min for tools; 10-15 min for equipment surfaces
Hydrogen dioxide, peroxyacetic acid	Zerotol 2.0	Prepare 1:100 – 1:300 solution of product to water for clean, non-porous surfaces. Prepare 1:50 solution for unclean surfaces.	5-10 min Personal Protective Equipment (PPE) required
Phenolic compounds (O-benzyl-p-chlorophenol)	Lysol Brand Concentrate Disinfectant	Prepare solution of 1.25 – 2.5 oz/gal.	At least 5 min

[2] *Note that some disinfectants are corrosive. It is advisable to oil tools after treatment. Also, sanitizers will be most effective if surfaces are free of plant debris and soil prior to treatment. Information from: Douglas, S.M., "Products for Sanitizing Tools, Equipment, and Hard Surfaces for Managing Boxwood Blight." Conn. Ag. Expt. Station, 2014.*