

IFAS DISEASE ALERT: BOXWOOD BLIGHT

Causal organism: *Cylindrocladium pseudonaviculatum* or *C. buxicola*
(Synonym: *Calonectria pseudonaviculata*)



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Basics

- ❑ Boxwoods (*Buxus* spp.) are commercially important evergreen ornamental plants with an annual market value of over \$103 million in the United States.
- ❑ The first confirmed reports of Boxwood blight in the U.S were from Connecticut and North Carolina in November 2011, followed by confirmation in numerous states since then.
- ❑ In Florida, Boxwood blight was discovered in April 2015 in a commercial nursery in North Florida by the University of Florida, NFREC Plant Diagnostic Clinic and the Division of Plant Industry, FDACS. The disease was on liners of Common boxwood (*B. sempervirens*) and 'Green Velvet' (*B. sinica* var. *insularis* x *B. sempervirens* 'Suffruticosa') cultivars shipped from Oregon.
- ❑ Spread outside the Florida nursery has not been reported. No other occurrences have been detected/reported in the area as of May 18th, 2015. Shipment trace-forwards by DPI are underway. DPI and the nursery are currently implementing strategies to eradicate the pathogen from the location.
- ❑ Nursery personnel should be aware of the symptoms of boxwood blight and monitor plants in the nursery and landscape routinely.

Symptom: Leaf spot

The fungal pathogen infects leaves and branches of boxwoods, causing light or dark brown leaf spots with a dark or diffuse border.



M. Paret

UF IFAS NFREC

Symptom: Black, constricted stem and leaf blight



Infected branches develop long blackish-brown streaks on stems. The fungus does not infect roots; thus, plants may re-grow even after a severe infection. However, repeated defoliation and dieback can predispose plants to other diseases, such as **Volutella blight**, resulting in decline and eventual death.

Advanced stage of the disease on a *B. sempervirens* cultivar.

Symptom: Leaf drop



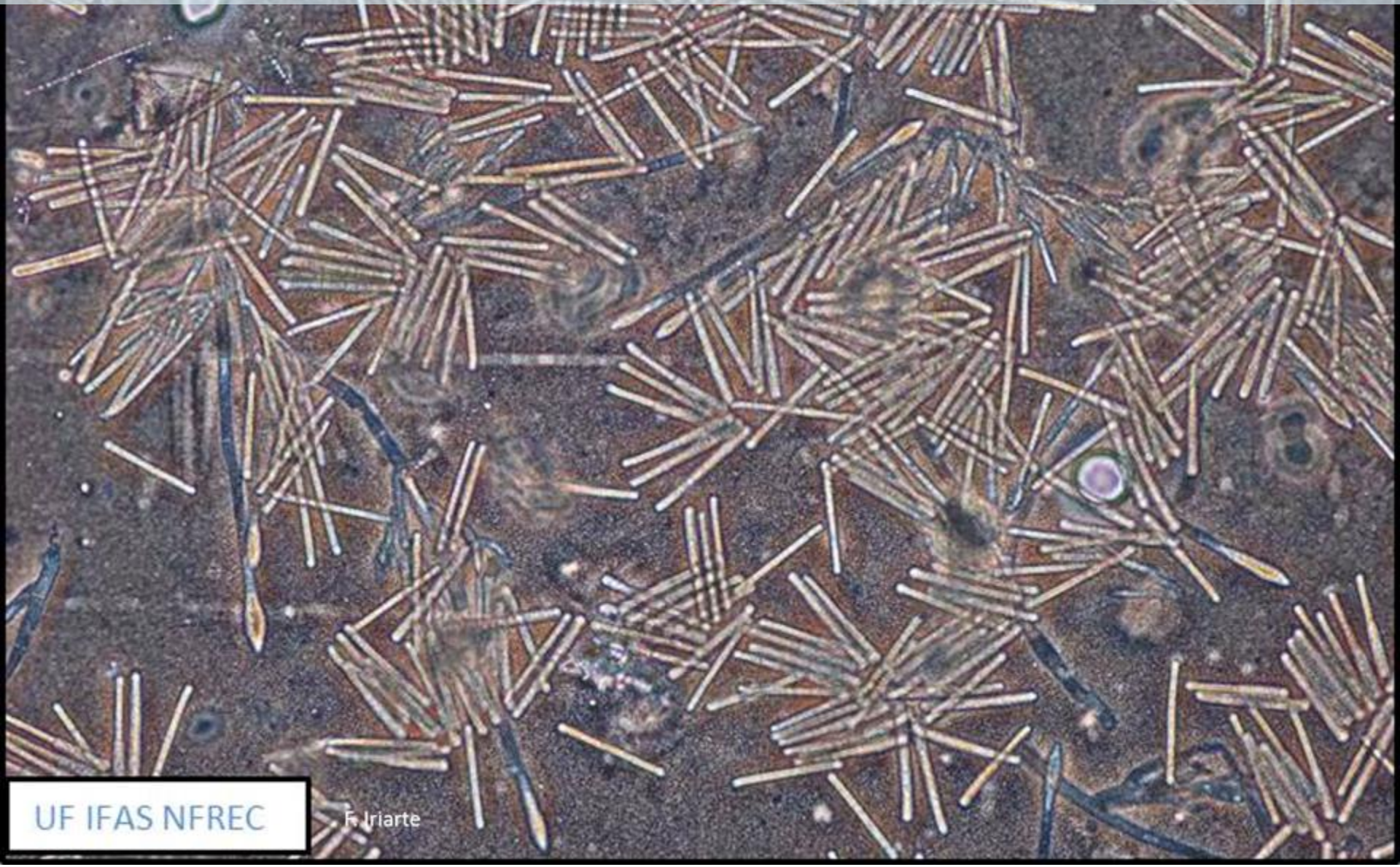
Blighted leaves that remain attached to the plant after death are NOT a symptom of Boxwood blight

Diagnostic



In warm humid conditions, the fungus produces clusters of white spores on the underside of the leaves and on infected stems.

***C. pseudonaviculatum* spores as seen under the microscope (40X). Each one of these fungal spores is capable of starting new infections if environmental conditions are favorable for disease development.**



Look-alikes

Volutella blight (*Volutella buxi*)

Opportunistic pathogen that is common on boxwood stems and foliage. *Volutella* may follow *C. pseudonaviculatum* infection. Note the salmon colored spore masses.



F. Iriarte



M. Paret

Look-alikes

Fusarium blight

(*Fusarium* spp.)

Fungal spores are easily distinguishable from those of *C. pseudonaviculatum* using a microscope



Macrophoma leaf spot and leaf blight

(*Macrophoma candollei*)

Leaf spots have distinctive black fungal structures.



Epidemiology

- ❑ The pathogen spreads by wind-driven rain or splashing water over short distances and is most infective during conditions of high humidity.
- ❑ The range of spore dispersal by wind or air currents is not known. It is believed to be short distances.
- ❑ Long-distance spread of this disease occurs via movement of infected plants, infected plant debris, soil or equipment.
- ❑ Spores also may be spread by insects.
- ❑ The pathogen has been found to survive in leaf debris placed either on the soil surface or buried in the soil for up to 5 years. (Henricot, B. 2006)
- ❑ *C. pseudonaviculatum* is primarily a foliar pathogen that causes only above-ground symptoms. However, research has shown that spores can remain viable in soil for up to 3 weeks, and microsclerotia for at least 40 weeks. (Norman L. Dart. et. al.- Virginia Department of Agriculture).

Management: Sanitation



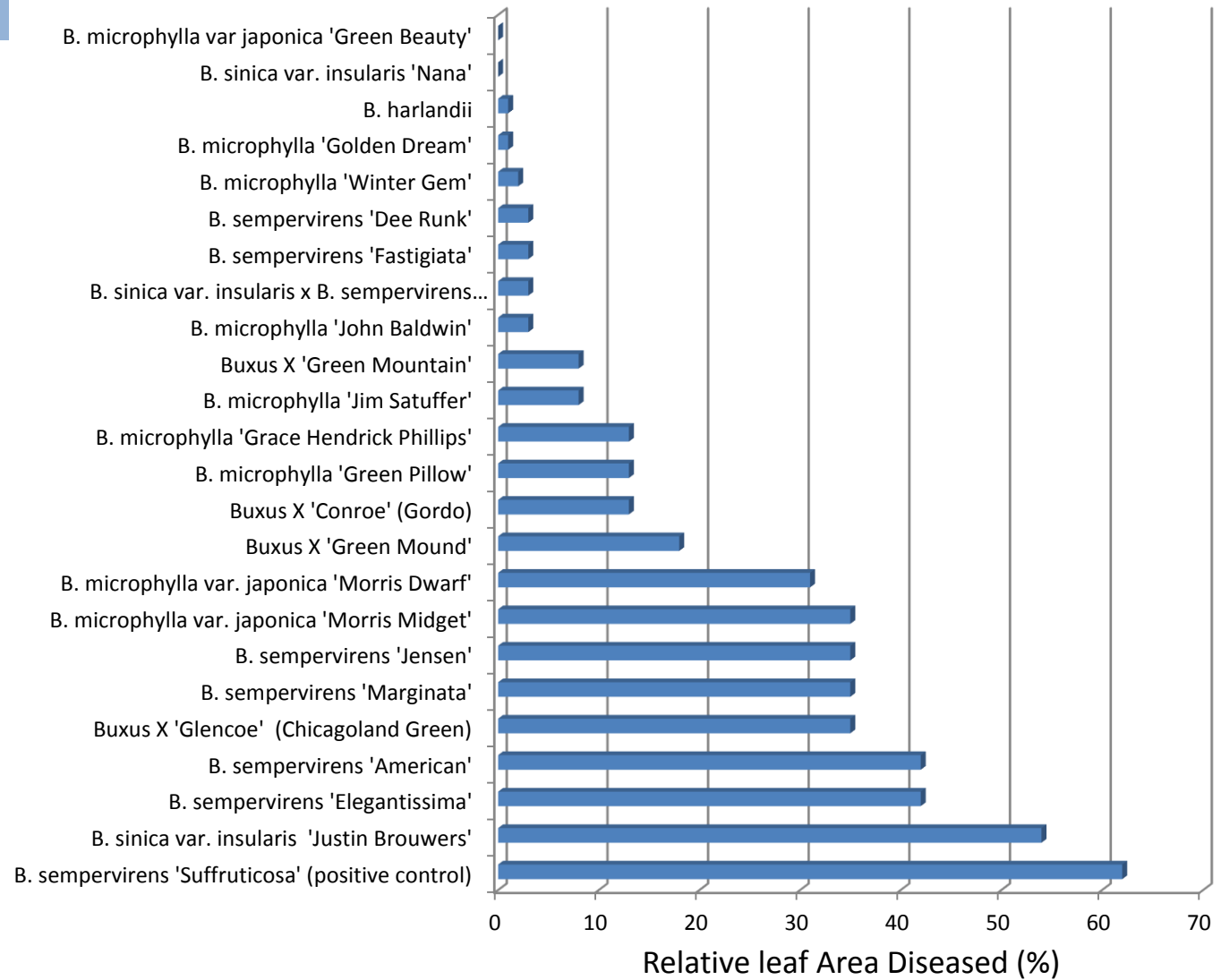
Leaf litter and flats such as these with almost 100 % infection should be bagged and either buried or disposed of in a sanitary landfill following guidelines of the Division of Plant Industry, FDACS and APHIS.

Management: Prevention

- Use only reliable sources of liners/plant material.
- Inspect plants for black leaf spots, black cankers or leaf drop before purchase.
- Disinfect pruning tools between groups of plants.
- Do not bring in cuttings, clippings or mulch that might contain diseased boxwood material.
- Consider using less-susceptible boxwood varieties and growing them in full sunlight with good ventilation.

Resistance

Susceptibility of Some commercial varieties to Boxwood Blight in North Carolina (based on final disease assessment 2012)



[Susceptibility of Commercial Boxwood Varieties to *Cylindrocladium buxicola*](#) . Miranda Ganci, D. M. Benson and K. L. Ivors. Department of Plant Pathology. [NC State University](#)

For more detailed and most recent information refer to: [NC STATE UNIVERSITY](#)

Boxwood in Florida

- ❑ Any *Buxus* species may be produced by Florida nurseries but most are sold north of Florida.
- ❑ Boxwood cultivars derived from *Buxus microphylla* may be suitable for landscape use in north and central Florida (USDA Cold Hardiness Zones 8 and 9) when planted in partial sun and if avoiding sandy soils.
- ❑ Most cultivars derived from *Buxus sempervirens* and *Buxus sinica* are not expected to thrive in Florida landscapes.
- ❑ Florida boxwood (*Schaefferia frutescens*) is not in the genus, *Buxus*, and is unaffected by Boxwood blight. It is adapted to south Florida.

Chemical control

The products listed below were the most effective chemistries for preventing boxwood blight during 2012-2013 field trials conducted at **NC State University**, MHCREC in Mills River, NC. It is provided here for reference only. **These products have not been evaluated for control of Boxwood Blight in Florida.**

Trade name	Company	Active Ingredient	FRAC ¹	SITES ²
Daconil Weatherstik	Syngenta	Chlorothalonil	M5	G, N, L
Spectro 90WDG	Nufarm	Chlorothalonil + Thiophanate methyl	M5+1	G, N, L
Concert II	Syngenta	Chlorothalonil + Propiconazole	M5+3	N, L
Torque	Nufarm	Tebuconazole	3	N, L
Tourney 50WDG	Valent	Metconazole	3	N, L
Medallion WDG	Syngenta	Fludioxanil	12	G, N, L

¹ Key to fungicide groups.

² Product labeled to use in G=greenhouse; N=nursery; L=landscape



[The Most Effective Products for Preventing Boxwood Blight, caused by *Cylindrocladium buxicola* \(= *Calonectria pseudonaviculata*\)](#). Kelly Ivors, Extension Plant Pathologist, and Miranda Ganci, Graduate Student. Dept. of Plant Pathology, **NC State University**

For more detailed and most recent information refer to: [NC STATE UNIVERSITY](#)

Management: Cultural Control

- ❑ Routinely inspect all incoming boxwood material for symptoms and closely monitor them for symptom development. Isolate new plant material for at least three weeks.
- ❑ Keep in mind that asymptomatic boxwood plants or cuttings can harbor the pathogen.
- ❑ Asymptomatic cultivars with less susceptibility can become “Trojan Horses”, introducing the pathogen to other valuable cultivars.
- ❑ If you detect symptoms of boxwood blight, immediately have your plants tested. Remove and discard (burn) infected plant material to avoid spread of the pathogen to healthy plants.
- ❑ Routinely inspect boxwood in the landscape, on the nursery grounds, and in the surrounding area for boxwood blight.

For general information see: [Boxwood Blight Update](#)

Nursery Industry Voluntary Best Management Practices

For *Cylindrocladium pseudonaviculatum* (Boxwood Blight)

To prevent the introduction of the disease and
what to do if it is detected in nursery operations

Version 1.1



Endorsements:

American Nursery & Landscape Association
Boxwood Blight Working Group
Horticultural Research Institute
National Plant Board



Testing locations

Submit samples for disease identification to:



Mathews Paret/ Fanny Iriarte
Assistant Professor, Plant Pathology/ Plant Disease Diagnostician
NFREC, University of Florida
155 Research Road, Quincy, FL 32351
850-875-7154, paret@ufl.edu
http://nfrec.ifas.ufl.edu/paret/u-scout/Lab_Profile.html



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