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Susceptibility of Commercial Boxwood Cultivars to Boxwood Blight

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Boxwood blight is a foliar disease caused by the fungal pathogen *Calonectria pseudonaviculata* (syn *Cylindrocladium pseudonaviculatum* = *C. buxicola*). As infection progresses, foliar lesions often expand in a zonate pattern and leaves defoliate. In 2013, an experiment was conducted to evaluate the susceptibility of commercial *Buxus* cultivars to boxwood blight at the Mountain Horticultural Crops Research and Extension Center (MHCREC), Mills River, NC. Due to space limitations, thirty cultivars were evaluated in the first experiment and two additional cultivars were evaluated in the second experiment. Both experiments were conducted at the same shaded container pad with daily overhead irrigation. Six single plant replications of each cultivar were exposed to the pathogen by splash dispersal from infected 'inoculum-reservoir' plants; these inoculum reservoir plants consisted of susceptible English boxwood (*Buxus sempervirens* 'Suffruticosa') that were sprayed with a 10,000 spores per ml solution until run-off. In the first experiment, the test plants were placed in each plot four days (29 May 2013) after inoculation of the inoculum reservoir plants (24 May 2013).

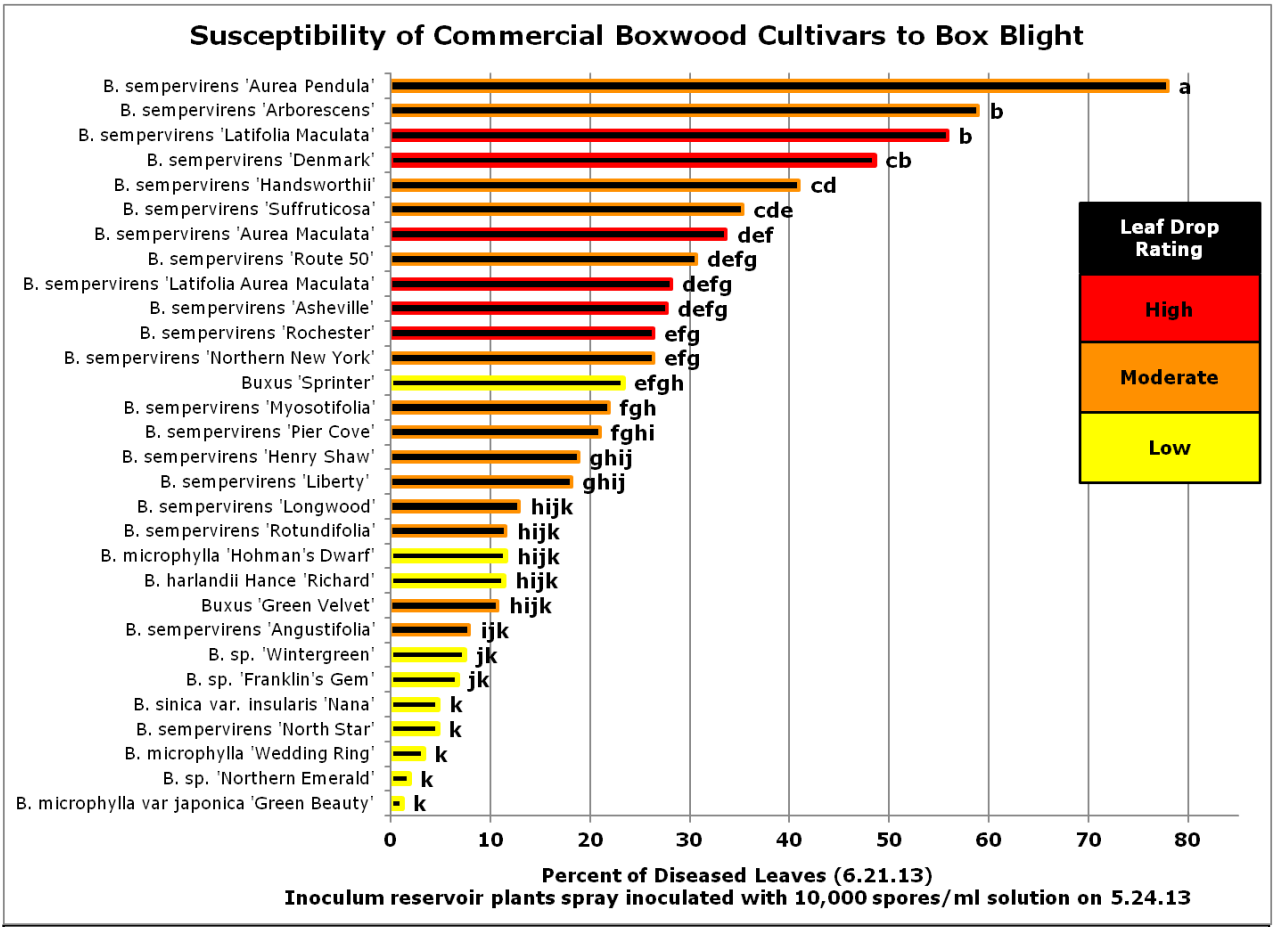

Figure 1: Disease evaluation results for experiment one. Test plants exposed to inoculum reservoir plants for 24 days. Evaluation performed by assessing percent of diseased leaves with a modified Horsfall-Barratt scale. Leaf Drop rating was performed with a qualitative scale. An ANOVA was performed and a Waller Duncan mean separation procedure was used.

After twenty-four days (21 Jun 2013) of initial exposure to the inoculum reservoir plants, the test plants with low symptom development were direct inoculated with a suspension of 10,000 spores per ml. The test plants were direct inoculated a second time with a suspension of 15,000 spores per ml eighty-two days (11 Sep 2013) after the first direct inoculation. The direct inoculations were done to provide high levels of disease pressure in order to verify cultivar resistance. The results of the first experiment are illustrated in figures 1 and 2.

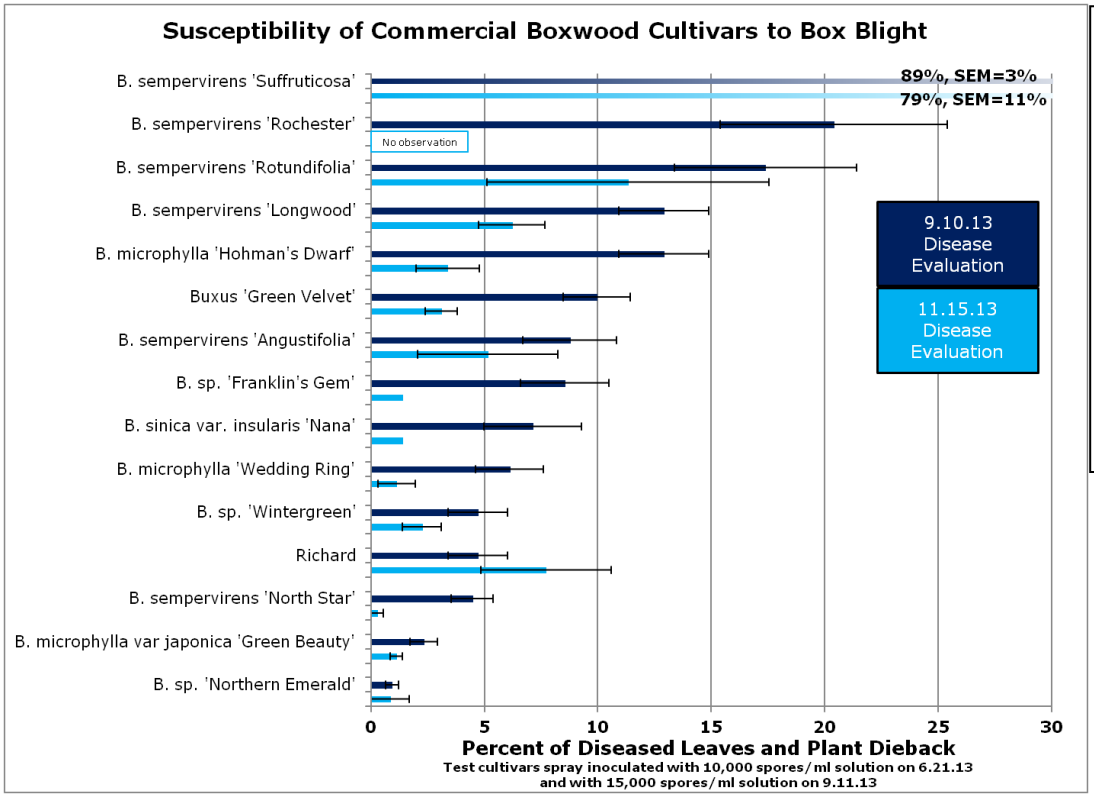

Figure 2: Disease evaluation results for experiment one after direct inoculation of test plants. Evaluation performed by assessing percent of diseased leaves and dieback with a modified Horsfall-Barratt scale. Error bars represent standard error of mean (SEM). Note that x-axis scale differs in figures 1 and 2.

The second experiment was conducted similarly; the test plants were placed in each plot three days (15 Jul 2013) after inoculation of the inoculum reservoir plants (12 Jul 2013) with a 15,000 spores per ml solution until run-off. We decided to use a higher concentration spore solution in the second experiment because warmer temperatures in the latter part of the summer are not as conducive to disease development as temperatures in the beginning of the summer. The results of the second experiment are illustrated in figure 3.

After fifty-eight days (11 Sep 2013) of initial exposure to the inoculum reservoir plants, *B. sempervirens* 'Black American' was direct inoculated with a suspension of 15,000 spores per ml. 'Black American' had 2.8% percent of diseased leaves and dieback twenty-three days (4 Oct 2013) and fifty-eight days (8 Nov 2013) after direct inoculation. In subsequent experiments (data not shown,) *B. sempervirens* 'Vardar Valley' displayed more disease development than in this second experiment trial. Even though the weather seemed to be conducive for disease development during the second experiment, the disease ratings for commercial and experimental cultivars in the second experiment were overall lower than in the first experiment.

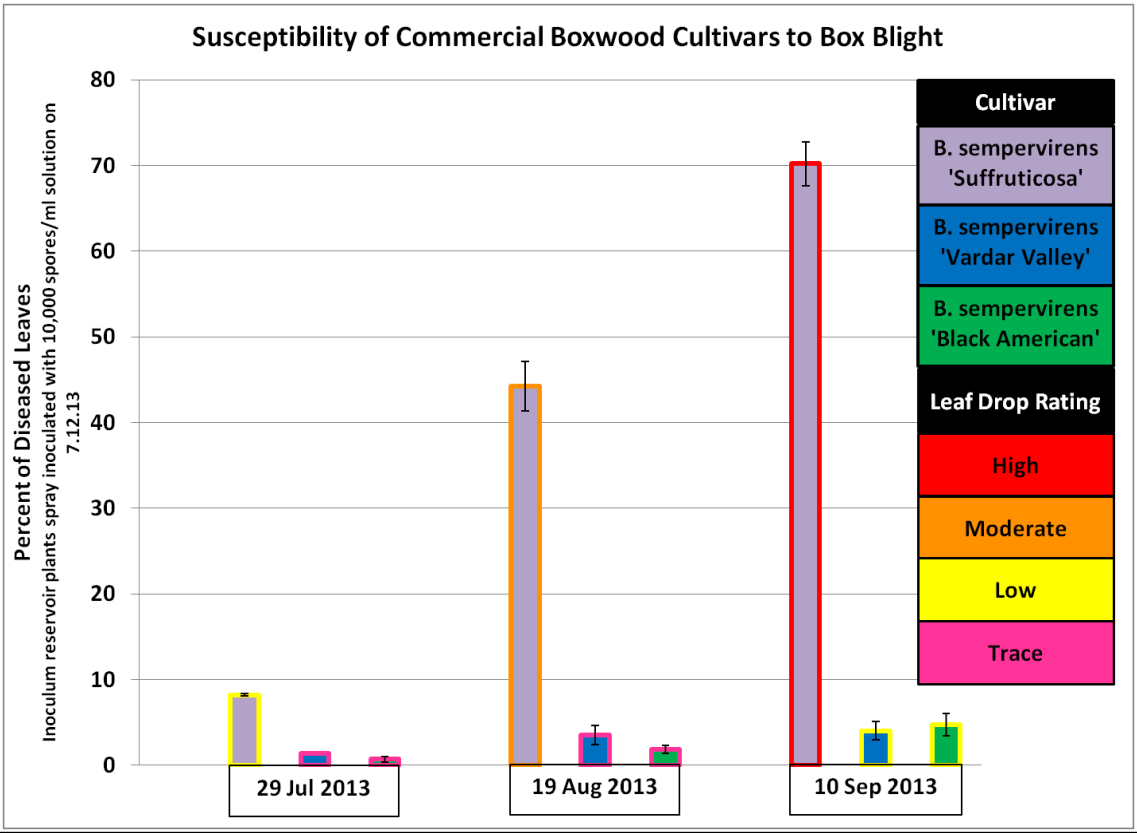

Figure 3: Disease evaluation results for the second experiment. Test plants were exposed to inoculum reservoir plants for 58 days. Evaluation was performed by assessing percent of diseased leaves with a modified Horsfall-Barratt scale. Leaf Drop rating was performed with a qualitative scale. Error bars represent standard error of the mean.

In October 2013, a selection of partially resistant cultivars identified during these trials was planted in an adjacent field at this research station to monitor long term disease development as it is important to replicate our results in additional boxwood blight susceptibility experiments. The results from these experiments can be used by growers to manage boxwood blight disease. Production guidelines should be consulted to make sure that specific cultivars can be grown in your area; USDA hardiness zones for some boxwood cultivars are listed below.

Cultivar	USDA hardiness zone	Cultivar	USDA hardiness zone
B. harlandii Hance 'Richard'	7-10	*B. sempervirens* 'Rotundifolia'	6-9
B. microphylla var japonica 'Green Beauty'	6-8	*B. sempervirens* 'Suffruticosa'	6-8
B. microphylla 'Wedding Ring'	5-9	*B. sempervirens* 'Vardar Valley'	5-8
B. sempervirens 'Angustifolia'	6-8	*B. sinica* var. insularis 'Nana'	6-8
B. sempervirens 'Asheville'	6	*B. sp.* 'Franklin's Gem'	4-9
B. sempervirens 'Handsworthii'	4-8	B. sp. 'Northern Emerald'	5-8
B. sempervirens 'Henry Shaw'	5b	*B. sp.* 'Wintergreen'	5-8
B. sempervirens 'Longwood'	6	*Buxus* 'Green Velvet'	4-8
B. sempervirens 'North Star'	5-9	*Buxus* 'Sprinter'	5-8
B. sempervirens 'Pier Cove'	5		