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SUSCEPTIBILITY OF PACHYSANDRA SPECIES AND CULTIVARS TO BOXWOOD BLIGHT

Version 1.0**

**These are subject to revision based on the availability of new information (revised March 2019).

Calonectria pseudonaviculata (Crous & al.) L. Lombard & al., the pathogen that causes boxwood blight, has also been experimentally shown to cause leaf and stem disease on other genera in the *Buxaceae*, including sweet box, *Sarcococca* spp. (Henricot et al. 2008), Japanese spurge, *Pachysandra terminalis* (LaMondia et al. 2012) and Allegheny spurge, *Pachysandra procumbens* (LaMondia and Li 2013). Natural infection of *Pachysandra terminalis* in the landscape was first observed in Connecticut in 2012 (Douglas 2012) in close proximity to diseased boxwood plants. Multiple instances of diseased *Pachysandra* associated with diseased boxwood in the landscape have been recorded in Connecticut and in Virginia (Kong et al. 2016). No *Pachysandra* infection in nurseries has ever been observed.

Best management practices for boxwood blight have focused on exclusion, sanitation and fungicide application tactics. Long term management approaches will require the identification or development of resistant or partially resistant boxwood and *Pachysandra*. We conducted research in response to questions regarding potential differences in susceptibility in *Pachysandra* species and cultivars to the boxwood blight pathogen *Calonectria pseudonaviculata*. We used whole plants and detached leaf assays to evaluate differences in disease severity that occurred on five cultivars of *P. terminalis*, one cultivar of *P. axillaris*, and one selection of *P. procumbens*. The tested *Pachysandra* species and cultivars were susceptible to the pathogen and although there were differences in the numbers of lesions that developed between the plants tested; those differences were more apparent with whole plants than with the detached leaf assays. Best Management Practices to manage disease and prevent additional spread of the pathogen in nurseries, garden centers and landscapes will need to take into account that all of the *Pachysandra* species and cultivars that we evaluated may serve as inoculum reservoirs for the boxwood blight pathogen. We list here relative susceptibility of hybrids and cultivars from studies conducted at the CAES. The use of less susceptible, tolerant and ultimately resistant cultivars may become part of integrated management practices for nurseries, home gardens and landscapes. Tables are from LaMondia, 2017.

Table 1. Susceptibility of *Pachysandra* plants to *Calonectria pseudonaviculata*.

	Number of lesions per plant [a]	
Pachysandra	Expt. 1	Expt. 2
P. terminalis Common	31.7 A [b]	32.0 A
P. terminalis Crinkled Green Sheen	5.5 CD	11.1 BC
P. terminalis Green Carpet	6.5 CD	6.5 C
P. terminalis Green Sheen	15.8 B	15.8 B
P. terminalis Variegated	13.5 BC	26.5 A
P. axillaris Windcliff Fragrant	4.3 CD	13.8 BC
P =	0.0001	0.0001

[a] Ten replicate plants per cultivar. Lesions were counted 2 weeks after inoculation.
[b] Data were analyzed by the nonparametric Kruskal-Wallis one-way ANOVA on ranks, and means were separated by the Kruskal-Wallis multiple comparison Z-value test. Means within columns followed by the same letter are not significantly different ($P = 0.05$).

Table 2. Susceptibility of *Pachysandra* plants treated with fungicide or not to infection by *Calonectria pseudonaviculata*.

	Number of lesions per plant	
Pachysandra	Fungicide [a]	Non-treated
P. axillaris Windcliff Fragrant	10.1 B	143.1 B
P. terminalis Common	74.6 A [b]	340.3 A
P. terminalis Crinkled Green Sheen	10.6 B	67.9 B
P. terminalis Green Carpet	9.4 B	50.7 B
P. terminalis Green Sheen	16.7 B	98.4 B
P. terminalis Variegated	19.3 B	137.3 B

P =

Variety	0.0001
Fungicide	0.0001
Interaction	0.22

[a] Ten replicate plants per cultivar treated with Spectro 90 WDG fungicide at 0.18 kg/100 L water or not treated (water alone). Lesions were counted 2 weeks after inoculation.
[b] Data were analyzed by ANOVA after log transformation to stabilize variance and means were separated by LSD; means within columns followed by the same letter are not significantly different ($P = 0.05$).

Table 3. Percent diseased detached *Pachysandra* leaves after inoculation with *Calonectria pseudonaviculata* on the adaxial or abaxial surface.

	Percent leaves with lesions			
	Experiments 1-2 [a]		Experiments 3-5	
Pachysandra	Adaxial	Abaxial	Adaxial	Sporulation [c]
P. procumbens	62.5 A [b]	100.0 A	--	100.0 A
P. axillaris Windcliff Fragrant	55.0 AB	42.5 B	10.0 AB	4.0 B
P. terminalis Common	7.5 B	47.5 B	10.0 AB	70.0 A
P. terminalis Crinkled Green Sheen	35.0 AB	47.5 B	22.5 A	73.3 A
P. terminalis Green Carpet	30.0 AB	47.5 B	2.5 B	70.0 A
P. terminalis Green Sheen	25.0 AB	47.5 B	17.5 A	78.5 A
P. terminalis Variegated	7.5 B	40.0 B	0.0 B	70.0 A
P =	0.0001	0.001	0.0001	0.0001

[a] Five experiments were conducted, two with inoculation of a conidial suspension of 3,000 conidia in a single drop to the adaxial surface, and an additional three inoculated to either abaxial or adaxial surfaces, 24 leaves per cultivar per experiment. Leaves were evaluated 11 or 12 days after inoculation.

[b] Data were analyzed by the nonparametric Kruskal-Wallis one-way ANOVA on ranks and means were separated by the Kruskal-Wallis multiple comparison Z-value test. Means within columns followed by the same letter are not significantly different ($P = 0.05$).

[c] Percent of abaxial leaf lesions with *C. pseudonaviculata* sporulation present.

References:

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