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Susceptibility of Crapemyrtle Cultivars to Powdery Mildew and Cercospora Leaf Spot in Alabama¹

A. K. Hagan², G. J. Keever³, C. H. Gilliam³, J. D. Williams⁴, and G. Creech⁵

Department of Plant Pathology
Auburn University, AL 36849-5624

Abstract

Reaction of 43 cultivars in three crapemyrtle taxa (*Lagerstroemia indica*, *L. indica* x *fauriei* and *L. fauriei*) to powdery mildew (*Erysiphe lagerstroemia*) and Cercospora leaf spot (*Cercospora lythracearum*) was evaluated for three years in a simulated landscape planting in Auburn, AL. Overall, the incidence of powdery mildew was lower on *L. indica* x *fauriei* and *L. fauriei* than on *L. indica*. In two of three years, Cercospora leaf spot severity was similar among all cultivars of *L. indica* and *L. indica* x *fauriei*, while the single selection of *L. fauriei* 'Fantasy' proved highly resistant to this disease. Selected cultivars in each crapemyrtle taxa were resistant to one or both diseases. Over the three-year evaluation period, hybrid cultivars 'Tuscarora', 'Tuskegee', and 'Tonto', as well as *L. fauriei* 'Fantasy' were largely free of powdery mildew and suffered little damage from Cercospora leaf spot. Cultivars suffering light injury to the foliage along with little noticeable defoliation from either disease were *L. indica* x *fauriei* 'Basham's Party Pink', 'Apalachee', 'Caddo' as well as *L. indica* 'Cherokee' and 'Glendora White'. *Lagerstroemia indica* 'Carolina Beauty', 'Wonderful White', 'Raspberry Sundae', 'Powhatan', 'Peppermint Lace', 'Majestic Beauty', and 'Orbin Adkins' were susceptible to both powdery mildew and Cercospora leaf spot. The mildew-resistant cultivars 'Acoma', 'Near East', 'Yuma', 'Souix', 'Hopi', and 'Comanche' suffered extensive spotting of the leaves, which extended well into the mid-canopy, along with heavy leaf shed due to Cercospora leaf spot. Cultivars which are susceptible to one or both diseases would be poor choices in low maintenance commercial or residential landscapes.

Index words: disease, resistance, *Erysiphe lagerstroemia*, *Cercospora lythracearum*.

Species used in study: crapemyrtle (*Lagerstroemia indica* L., *L. indica* x *fauriei*, *L. fauriei*).

Significance to the Nursery Industry

Powdery mildew and Cercospora leaf spot are common diseases of crapemyrtle. While powdery mildew was most prevalent on *Lagerstroemia indica*, the majority of cultivars in this species as well as in *L. indica* x *fauriei* were susceptible to Cercospora leaf spot. Cultivars in both taxa with partial to high resistance to both diseases were identified. The single selection of *L. fauriei* screened also possessed excellent resistance to both diseases. Selection for disease resistance not only is an effective, inexpensive, and pesticide-free means of producing quality crapemyrtles, but also can result in an attractive, low maintenance tree or shrub for commercial and residential landscapes.

Introduction

Powdery mildew (*Erysiphe lagerstroemia* E. West) and Cercospora leaf spot (*Cercospora lythracearum* Heald & F. A. Wolf) are the two most common diseases of crapemyrtle (1, 2). Although neither disease significantly threatens the health of established plants, both can greatly detract from the beauty of crapemyrtle in landscape plantings (1, 2). Powdery mildew, which usually appears in late spring or early summer, is easily recognized by the appearance of the white to buff-colored colonies of the causal fungus *E. lagerstroemia* on the leaves, tender shoots, and bud scales on the blooms. On heavily mildewed crapemyrtle, twisting of the leaves, flower bud abortion, and shoot dieback may also be seen (1).

Cercospora leaf spot, which usually becomes noticeable in August or September, is characterized by the appearance of circular to irregular brown lesions on the leaves. As lesions become more numerous, diseased leaves turn yellow to red in color and then are quickly shed. On a leaf spot-susceptible crapemyrtle selection, leaf spotting and defoliation, which begins near the base of the plant, spreads upward through the canopy until all but the youngest leaves at the shoot tips have defoliated.

Selection for disease resistance is an effective, inexpensive and pesticide-free means of producing and maintaining plantings of crapemyrtle. Over the past three decades, personnel with the U.S. National Arboretum (3, 4, 5, 6, 7, 8, 9, 10, 11, 12) along with land-grant universities and private individuals have released a number of improved cultivars in the crapemyrtle taxa *Lagerstroemia indica* L., *L. fauriei* Koehne and *L. indica* x *fauriei*. In addition to a range of desirable horticultural characteristics, many of these new releases, particularly those from the U.S. National Arboretum, were selected for tolerance or resistance to powdery mildew (3, 4, 5, 6, 7, 8, 9, 10, 11, 12). In recent studies, Knox *et al.* (14) and Windham *et al.* (15) did not observe significant colonization of the foliage of any of the cultivars of *L. indica* x *fauriei* by *E. lagerstroemia*. Holcomb (13), however, noted that several hybrid cultivars released by the U.S. National Arboretum as well as a number of cultivars of *L. indica* were susceptible to powdery mildew. Egolf (3, 4, 5, 6, 7, 8, 9, 10, 11, 12) and Knox *et al.* (14) either did not observe Cercospora leaf spot or did not recognize symptoms of this disease. Significant differences in leaf spot levels and defoliation among cultivars of crapemyrtle (*L. indica* and *L. indica* x *fauriei*) were observed by Holcomb (13). The hybrid cultivars 'Tonto', 'Tuscarora', and 'Catawba' were resistant to both powdery mildew and Cercospora leaf spot (13). The objective of this study was to determine the reaction to powdery mildew and Cercospora leaf spot of 43 cultivars of

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²Professor of Plant Pathology and Extension Specialist.

³Professor of Horticulture, Department of Horticulture.

⁴Associate Professor of Horticulture, Department of Horticulture.

⁵Research Technician, Department of Horticulture.

crapemyrtle (*Lagerstroemia indica*, *L. fauriei* and *L. indica* x *fauriei*) maintained in a simulated low-maintenance landscape planting in Alabama.

Material and Methods

Bare-root crapemyrtle liners approximately 0.6–1.0 m (24–36 in) tall were planted in March 1993 in full sun into a Marvyn loamy sand on 2.4 m (8 ft) centers in rows spaced 3.7 m (12 ft) apart on the Alabama Agricultural Experiment Station at Auburn University, AL (Zone 8b). Species and cultivars planted are listed in Tables 1, 2, and 3. Planting holes were augered to a depth of 0.6 (2 ft) to 0.8 m (2.5 ft). The experimental design was a randomized complete block with 6 two-plant replications. A trickle irrigation system with two emitters per plant was installed at the time of plant establishment and the trees were watered as needed. In March and May each year, approximately 80 g (0.2 lb) of 13N–5.6P–10.8K (13–13–13) fertilizer was uniformly distributed around the base of each tree. Directed applications of Roundup® herbicide at recommended rates were made periodically to control weeds. Escape weeds around the base of each plant were pulled by hand. Alleys between the rows were periodically mowed. In 1996, all trees were mulched with 5–7 cm (2–3 in) of aged pine bark. During the winter of 1995 and 1996, each tree was lightly pruned.

Within two years of planting, the fungi *E. lagerstroemia* and *Cercospora lythracearum* became well established on selected cultivars within this planting of crapemyrtle. Powdery mildew ratings were taken on July 28, 1995, June 4, 1996, and June 25, 1997, using a scale of 0 to 4 where 0 = no disease, 1 = 1 to 25%, 2 = 26 to 50%, 3 = 51 to 75%, and 4 = 75 to 100% of the leaves, shoots, or buds damaged or colonized by *E. lagerstroemia*. The severity of *Cercospora* leaf spot was evaluated on September 15, 1995, September 4, 1996, and August 29, 1997, using the Barratt and Horsfall Rating System where 1 = 0%, 2 = 0 to 3%, 3 = 3 to 6%, 4 = 6 to 12%, 5 = 12 to 25%, 6 = 25 to 50%, 7 = 50 to 75%, 8 = 75 to 87%, 9 = 87 to 94%, 10 = 94 to 97%, 11 = 97 to 100%, and 12 = 100% of leaves diseased or prematurely lost due to leaf spot.

Analysis of variance was performed on each year's ratings for powder mildew and *Cercospora* leaf spot across each crapemyrtle taxa and by individual cultivars. Differences in disease ratings among cultivars were tested with Fisher's protected least significant difference (LSD) test.

Results and Discussion

By mid-May each year, the characteristic cottony-white colonies of *E. lagerstroemia* were seen on the young leaves and shoots of susceptible cultivars of crapemyrtle. Generally, the incidence of powdery mildew peaked between mid-June and late July (data not shown). Signs of the causal fungus persisted on the leaves of susceptible cultivars until leaf fall. Although symptoms of *Cercospora* leaf spot first appeared on highly susceptible cultivars as early as June, typical spotting of the leaves and premature defoliation usually did not become noticeable on most cultivars until mid-August to early September (data not shown). Disease development generally continued through the fall until leaf fall began after the first hard frost in late October to early November.

As a group, the cultivars of *L. indica* proved to be significantly more susceptible to powdery mildew as compared with those of *L. indica* x *fauriei* and the single cultivar of *L. fauriei* 'Fantasy' (Table 1). Powdery mildew ratings for all hybrid cultivars and the single cultivar of *L. fauriei* were similar in all three years (Table 1). In 1995 and 1996, the intensity of *Cercospora* leaf spot across all cultivars of *L. indica* and *L. indica* x *fauriei* did not significantly differ between these two groups (Table 1). *Cercospora* leaf spot levels recorded on *L. fauriei* 'Fantasy' were significantly below those noted in all three years for the average ratings of *L. indica* and *L. indica* x *fauriei*.

Incidence of powdery mildew differed significantly among the individual cultivars of *L. indica* (Table 2). Sizable year-to-year variations in powdery mildew ratings were seen for many cultivars of *L. indica*, particularly those susceptible to this disease. In two of three years, heavy colonization of the leaves and tender shoots, as indicated by disease ratings of 2.0 or above, was seen on the cultivar 'Country Red' (Table 2). Similarly high levels of powdery mildew were recorded in one of three years for the cultivars 'Carolina Beauty', 'Raspberry Sundae', 'Wonderful White', 'Gray's Red', 'Orbin Adkins', and 'Seminole'. Moderate but noticeable mildew outbreaks, which are denoted by disease ratings between 1.0 and 2.0, were observed in at least one year on an additional 11 cultivars of *L. indica*. The cultivar 'Cherokee' remained mildew-free while low mildew ratings were recorded each year for 'Glendora White'.

Moderate to heavy spotting of the leaves along with varying levels of defoliation caused by *C. lythracearum* were

Table 1. Susceptibility of crapemyrtle (*Lagerstroemia* spp.) taxa to powdery mildew and *Cercospora* leaf spot.

Crapemyrtle taxa	Number of cultivars	Powdery mildew ^a			Cercospora leaf spot ^b		
		1995	1996	1997	1995	1996	1997
<i>L. indica</i>	20	1.5 ^a	1.8	1.1	3.6	4.9	4.5
<i>L. indica</i> x <i>fauriei</i>	22	0.3	0.1	0.5	3.6	4.3	3.2
<i>L. fauriei</i>	1	0.4	0.0	0.2	1.4	1.1	1.7
LSD (P = 0.05)		0.6	0.6	0.5	1.1	1.1	1.1

^aThe severity of powdery mildew was assessed on a scale of 0 to 4 where 0 = no disease, 1 = 1 to 25%, 2 = 26 to 50%, 3 = 51 to 75%, 4 = 76 to 100% of the leaves damaged or colonized by *E. lagerstroemia*.

^b*Cercospora* leaf spot was evaluated on using the Barratt and Horsfall System: 1 = 0%, 2 = 0 to 3%, 3 = 3 to 6%, 4 = 6 to 12%, 5 = 12 to 25%, 6 = 25 to 50%, 7 = 50 to 75%, 8 = 75 to 87%, 9 = 87 to 94%, 10 = 94 to 97%, 11 = 97 to 100%, 12 = 100% of leaves diseased or lost prematurely due to leaf spot.

^cMean separation within columns according to Fisher's protected least significance (LSD) test (P = 0.05).

Table 2. Susceptibility of cultivars of crapemyrtle (*L. indica*) to powdery mildew and *Cercospora* leaf spot.

Cultivar	Powdery mildew ^a			Cercospora leaf spot ^b		
	1995	1996	1997	1995	1996	1997
<i>L. indica</i>						
Carolina Beauty	2.3 ^x	1.6	1.2	5.8	6.3	5.8
Catawba	0.7	0.1	1.2	3.6	4.6	3.0
Centennial Spirit	1.6	0.0	0.8	2.2	4.8	5.0
Cherokee	0.0	0.0	NR ^w	2.3	4.0	NR
Country Red	2.8	2.5	0.9	4.0	4.6	5.0
Dodd #1	0.1	0.1	0.5	3.3	2.7	1.9
Dodd #2	0.4	0.2	0.9	NR	6.3	3.2
Glendora White	0.4	0.4	0.5	2.3	3.7	3.8
Gray's Red	2.2	0.8	1.0	3.5	3.9	4.3
Hardy Lavender	1.1	1.1	1.8	4.2	5.1	5.0
Majestic Beauty	1.7	1.0	1.0	3.7	5.3	5.0
Near East	0.3	0.0	1.3	5.0	5.4	4.7
Orbin Adkins	2.4	0.7	1.2	5.8	6.7	6.8
Peppermint Lace	1.7	1.0	1.6	4.0	5.6	4.9
Potomac	1.8	0.3	0.9	2.7	4.5	3.6
Powhatan	1.3	1.1	1.8	3.4	5.5	5.5
Raspberry Sundae	3.1	1.5	1.5	4.6	5.7	5.3
Regal Red	0.6	1.2	1.3	2.1	4.0	4.2
Seminole	0.8	0.3	2.2	3.3	5.6	4.5
Velma's Royal Delight	1.2	0.6	1.4	2.0	3.3	3.7
William Toovey	1.9	1.3	1.8	3.7	4.4	3.6
Wonderful White	2.4	1.5	1.3	5.0	6.8	6.8
LSD (P = 0.05)	0.7	0.5	0.6	1.1	0.9	0.6

^aThe severity of powdery mildew was assessed on a scale of 0 to 4 where 0 = no disease, 1 = 1 to 25%, 2 = 26 to 50%, 3 = 51 to 75%, 4 = 76 to 100% of the leaves damaged or colonized by *E. lagerstroemia*.

^bCercospora leaf spot was evaluated using the Barratt and Horsfall System: 1 = 0%, 2 = 0 to 3%, 3 = 3 to 6%, 4 = 6 to 12%, 5 = 12 to 25%, 6 = 25 to 50%, 7 = 50 to 75%, 8 = 75 to 87%, 9 = 87 to 94%, 10 = 94 to 97%, 11 = 97 to 100%, 12 = 100% of leaves diseased or lost prematurely due to leaf spot.

^xMean separation within columns according to Fisher's protected least significance (LSD) test (P = 0.05).

^wNR = not rated.

observed in at least one year on nearly all cultivars of *L. indica* (Table 2). By early fall, the cultivars 'Orbin Adkins' and 'Wonderful White' suffered from heavy defoliation and extensive spotting of the few remaining leaves, as indicated by Cercospora leaf spot ratings of 6.7 or above. On the cultivars 'Dodd #1', 'Glendora White', and 'Velma's Royal Delight', leaf spot levels were relatively low and defoliation, though noticeable, was limited to the lower quarter of the plant canopy.

The incidence of powdery mildew on the majority of *L. indica* x *fauriei* cultivars was generally very low (Table 3). Light to moderate mildew outbreaks, as indicated by disease ratings below 1.0, were recorded in 1995 and 1997 for 'Zuni' and in 1997 for 'Hopi' and 'Pecos'. Of all *L. indica* x *fauriei* cultivars, only 'Caddo' remained mildew-free all three years. In two of three years, colonies of *E. lagerstroemia* were not found on the leaves of 'Sarah's Favorite', 'Comanche', 'Osage', 'Acoma', 'Tonto', 'Souix', 'Lipan', or 'Natchez'. On the remaining cultivars of *L. indica* x *fauriei* as well as *L. fauriei* 'Fantasy', the occurrence of powdery mildew, as indicated by disease ratings generally below 0.5, was limited to a single to a few widely scattered colonies of *E. lagerstroemia* on the leaves, tender shoots, and flower buds.

Although the majority of *L. indica* x *fauriei* selections were resistant to powdery mildew, only a few select cultivars were also lightly damaged by Cercospora leaf spot (Table 3). Symptoms on the leaf spot-resistant cultivars 'Tonto', 'Tuskegee', 'Tuscarora', and *L. fauriei* 'Fantasy' were largely confined

to light, inconspicuous spotting of the leaves around the base of each plant. Light to moderate spotting of the foliage along with low level defoliation, as indicated by disease ratings of 2.5 to 3.8, was observed on 'Basham's Party Pink', 'Apalachee', and 'Wichita'. Conversely, the heaviest spotting of the leaves along with extensive early defoliation was recorded at least two of three years on the cultivars 'Acoma' and 'Comanche'. Disease ratings of 5.0 or higher were reported in one or more years for an additional five cultivars of *L. indica* x *fauriei*.

Resistance to powdery mildew was among the major criteria used by Egolf (5, 6, 7, 8, 9, 10, 11, 12) to select *L. indica* x *fauriei* clones for release as part of the U.S. National Arboretum *Lagerstroemia* breeding program. Beginning with the cultivars 'Natchez' and 'Muskogee', a total of 20 cultivars, all of which are named after American Indian tribes, have been introduced (5, 6, 7, 8, 9, 10, 11, 12). Among the three taxa of crapemyrtle, the resistance of *L. indica* x *fauriei* as well as *L. fauriei* 'Fantasy' to powdery mildew was indeed far superior to that demonstrated by *L. indica*. Individually, nearly all cultivars of *L. indica* x *fauriei* were highly resistant to nearly immune to powdery mildew. Similar results have also been obtained with the majority of U.S. National Arboretum releases in several other recent field studies (13, 14, 15). Not all the *L. indica* x *fauriei* releases were highly resistant to powdery mildew. Noticeable development of powdery mildew was recorded in at least one year on the cultivars 'Zuni', 'Pecos', and 'Hopi'. Windham *et al.* (15)

Table 3. Susceptibility of cultivars of crapemyrtle (*L. indica* x *fauriei* and *L. fauriei*) to powdery mildew and *Cercospora* leaf spot.

Cultivar	Powdery mildew ^z			Cercospora leaf spot ^y		
	1995	1996	1997	1995	1996	1997
<i>L. indica</i> x <i>fauriei</i>						
Acoma	0.0 ^x	0.0	0.1	5.3	6.3	6.2
Apalachee	0.2	0.0	0.2	2.7	2.8	1.3
Basham's Party Pink	0.2	0.2	0.4	2.8	2.5	1.7
Biloxi	0.4	0.3	0.8	4.4	5.3	4.0
Caddo	0.0	0.0	0.0	2.4	2.9	4.6
Choctaw	0.0	0.1	0.3	4.5	4.6	3.5
Comanche	0.0	0.0	0.4	5.6	6.6	4.9
Hopi	0.2	0.0	1.7	3.9	5.7	5.4
Lipan	0.3	0.0	0.0	2.9	5.1	2.6
Miami	0.1	0.0	0.7	3.5	4.7	3.2
Muskogee	0.2	0.0	0.6	4.7	4.8	4.2
Natchez	0.0	0.1	0.0	4.3	4.6	2.6
Osage	0.0	0.0	0.4	2.8	4.0	1.3
Pecos	0.4	0.1	1.3	2.8	5.1	2.6
Sarah's Favorite	0.0	0.0	0.1	3.5	3.8	3.3
Souix	0.1	0.0	0.0	4.3	5.2	1.3
Tonto	0.1	0.0	0.0	2.3	1.3	1.2
Tuscarora	0.5	0.0	0.4	1.7	2.4	1.8
Tuskegee	0.1	0.4	0.2	1.8	1.5	1.3
Wichita	0.3	0.0	0.8	2.8	3.6	2.6
Yuma	0.4	0.0	0.4	4.9	5.0	5.2
Zuni	1.3	0.3	1.8	4.8	4.4	3.5
<i>L. fauriei</i>						
Fantasy	0.4	0.0	0.2	1.4	1.1	1.7
LSD (P = 0.05)	0.7	0.5	0.6	1.1	0.8	0.6

^zThe severity of powdery mildew was assessed on a scale of 0 to 4 where 0 = no disease, 1 = 1 to 25%, 2 = 26 to 50%, 3 = 51 to 75%, 4 = 76 to 100% of the leaves damaged or colonized by *E. lagerstroemia*.

^yCercospora leaf spot was evaluated on using the Barratt and Horsfall System: 1 = 0%, 2 = 0 to 3%, 3 = 3 to 6%, 4 = 6 to 12%, 5 = 12 to 25%, 6 = 25 to 50%, 7 = 50 to 75%, 8 = 75 to 87%, 9 = 87 to 94%, 10 = 94 to 97%, 11 = 97 to 100%, 12 = 100% of leaves diseased or lost prematurely due to leaf spot.

^xMean separation within columns according to Fisher's protected least significance (LSD) test (P = 0.05).

also reported a light outbreak of powdery mildew on 'Hopi'. This disease was not observed by Holcomb (13) on either 'Hopi' or 'Zuni'.

Although the majority of cultivars of *L. indica* were moderately to highly susceptible to powdery mildew, several, such as 'Glendora White' and 'Cherokee', were highly resistant to nearly immune to this disease. Of the five mildew-tolerant cultivars of *L. indica* released by the U.S. National Arboretum that were included in this study, light to moderate mildew development of the foliage was seen in at least one year on 'Powhatan', 'Seminole', 'Potomac' and 'Catawba'. The remaining cultivar 'Cherokee' was mildew-free. As observed in previous trials, 'Wonderful White' (15) 'Carolina Beauty' (14) and 'Seminole' (14) were among the *L. indica* cultivars found to be susceptible to powdery mildew.

Far more cultivars of *L. indica* x *fauriei* were resistant to powdery mildew than to *Cercospora* leaf spot. Holcomb (13) also noted considerable differences in the reaction of cultivars of *L. indica* x *fauriei* to *Cercospora* leaf spot. As was previous reported (13), 'Tonto', 'Tuskegee', and 'Tuscarora' were the most leaf spot resistant among the 22 cultivars of *L. indica* x *fauriei* observed. Several cultivars of *L. indica* along with *L. fauriei* 'Fantasy' also suffered relatively light spotting of the leaves and premature defoliation. Of all cultivars, *L. fauriei* 'Fantasy' was among the most resistant to powdery mildew and *Cercospora* leaf spot.

In summary, *Cercospora* leaf spot proved to be an equally, if not a more damaging disease than powdery mildew on

two of the three crapemyrtle taxa. Cultivars resistant to powdery mildew and *Cercospora* leaf spot were identified in all three crapemyrtle taxa. Among cultivars of *L. indica*, 'Glendora White' and 'Cherokee' were the most disease resistant. Cultivars of *L. indica* x *fauriei* highly resistant to both diseases were 'Tonto', 'Tuskegee', 'Tuscarora'. Relatively light leaf spot and mildew damage was also noted on the hybrid cultivars 'Basham's Party Pink', 'Apalachee', and 'Caddo'. The single cultivar of *L. fauriei* 'Fantasy' also suffered little damage from either powdery mildew or *Cercospora* leaf spot. All the above cultivars can easily be produced in a nursery or maintained in a landscape setting without protective fungicide treatments. Those cultivars, which were heavily damaged by either powdery mildew, *Cercospora* leaf spot and in some cases both diseases, may not suffer serious damage in production nurseries but might be poor choices to establish in commercial or residential landscapes.

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Susceptibility of Cultivars of Several Dogwood Taxa to Powdery Mildew and Spot Anthracnose¹

A. K. Hagan², B. Hardin³, C. H. Gilliam⁴, G. J. Kever⁴, J. D. Williams⁵, and J. Eakes⁵

*Department of Plant Pathology
Auburn University, Alabama 36849-5624*

Abstract

Incidence of powdery mildew (*Microsphaera penicillata*) and spot anthracnose (*Elsinoe corni*) was assessed on 37 selections or cultivars of flowering dogwood (*Cornus florida*), kousa dogwood (*C. kousa*), hybrid dogwood (*C. kousa* x *florida* and *C. nuttallii* x *florida*) and giant dogwood (*C. controversa*). Across all cultivars, the flowering dogwood and *C. nuttallii* x *florida* 'Eddie's White Wonder' are more susceptible to powdery mildew and spot anthracnose than the kousa, *C. kousa* x *florida* hybrids and giant dogwood. Among the cultivars of flowering dogwood screened, 'Cherokee Brave', 'Cherokee Chief', 'Welch's Bay Beauty' and 'Weaver's White' were partially to highly resistant to both diseases. With few exceptions, the kousa dogwood and *C. kousa* x *florida* hybrids, and giant dogwood suffered very little powdery mildew or spot anthracnose-related damage.

Index words: disease, resistance, *Microsphaera penicillata*, *Elsinoe corni*, hybrid dogwood.

Species used in this study: flowering dogwood (*Cornus florida* L.); kousa dogwood (*C. kousa* Hance); hybrid dogwood (*C. kousa* x *florida* and *C. nuttallii* x *florida*); giant dogwood (*C. controversa* Hemsl.).

Significance to Nursery Industry

Spot anthracnose and powdery mildew are common and often damaging diseases of flowering dogwood during production as well as in the landscape. Cultivars of flowering dogwood with resistance to both diseases have been identified. Cultivars of kousa, *C. kousa* x *florida* hybrid and giant dogwood possess excellent resistance to both diseases, although questions concerning their winter hardiness in the

Deep South must be addressed. The production, marketing, and establishment of disease resistant dogwood taxa make good economic and environmental sense for nursery producers as well as retail outlets, landscape managers, and homeowners. Disease resistance allows the nursery producer to grow a quality and attractive container or field-grown dogwood with fewer costly pesticide and labor inputs. For consumers and landscape managers, a disease resistant dogwood is a welcome addition to the growing list of low maintenance landscape shrubs and trees. When selecting flowering dogwood for the landscape based on resistance to powdery mildew and spot anthracnose, the superior white cultivars were 'Welch's Bay Beauty' and 'Weaver White'; while the superior red cultivars were 'Cherokee Brave' and 'Cherokee Chief'. Kousa, kousa hybrids, and giant dogwoods cannot be recommended for use in this part of the south due to survival problems occurring with nearly all cultivars.

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²Professor of Plant Pathology and Extension Specialist.

³Graduate Student, Department of Horticulture.

⁴Professor of Horticulture, Department of Horticulture.

⁵Associate Professor of Horticulture, Department of Horticulture.