2018

Dogwood Powdery Mildew

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Powdery Mildew on Dogwood

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ANR-PATH-11-2018

Powdery mildew has been one of the most important diseases of dogwoods (*Cornus* spp.) in containerized or field nurseries as well as forestry and landscape settings since 1994 (1). There are two powdery mildew species that have been reported to infect dogwoods; *Erysiphe pulchra*, which is the more prevalent species, and *Phyllactinia guttata* (2). This is one of the most destructive diseases of flowering dogwoods (*Cornus florida* L.). In Tennessee, powdery mildew is most commonly found from late May until the first frost. (3). High humidity along with dry leaves are ideal conditions for powdery mildew growth on dogwoods.

Symptoms and Signs

Powdery mildew may cause cosmetic damage with visible reddish-brown blotches that reduce growth by attacking tender shoots and leaf surfaces as well as premature defoliation. Shade culture could exacerbate powdery mildew severity. Infected leaves exhibit yellowing and marginal leaf scorch with white patches that consist of mycelia and conidia of the fungus. Powdery mildew spreads very quickly, with masses of conidia produced from each new infection.

Figure 1. Symptoms of powdery mildew on dogwood leaves

Disease management

Powdery mildew on dogwoods can be managed easily with a variety of options. Variations in powdery mildew disease susceptibility occur within *Cornus* species, hybrids and cultivars. *C. florida* (flowering dogwood) is highly susceptible to powdery mildew (with the exception of cultivars 'Jean's Appalachian Snow' 'Key's Appalachia Mist', 'Karen's Appalachian Blush,' and 'Appalachian Joy'). Some hybrids of *C. kousa* × *C. florida* such as 'Stellar Pink,' 'Stardust,' 'Galaxy,' 'Constellation,' and 'Aurora', as well as *C. kousa* (kousa dogwood), *C. sericea* (redosier dogwood), *C. mas* (corneliancherry dogwood), *C. alternifolia* (pagoda dogwood), *C. alba* (tatarian dogwood), and *C. controversa* (giant dogwood) are highly resistant to powdery mildew. Selecting resistant hybrids or varieties will allow the prevention of the disease.

Plant debris from previous seasons may serve as an inoculum source making, sanitation practices critical components of disease management. Fallen leaves and plant debris need to be collected and buried or burned offsite. Do not let the plant become heavy and overgrown with foliage. Pruning can improve air circulation but avoid over pruning as this may promote succulent new growth which can also become infected. Scouting and early diagnosis of infected plants will help prevent the spread of this disease and should be a regular part of your IPM strategy. If you would like to confirm that powdery mildew has infected your dogwoods, you may submit a sample to your local university's plant diagnostic laboratory.

To control powdery mildew on dogwoods begin making preventive fungicide applications when the weather or environmental conditions are conducive to disease development. Typically, spray applications are made on 7, 14 or 21 – day intervals depending on the level of disease pressure. Pathogen resistance to fungicides is well known and the performance of many fungicides has been affected to some degree by pathogens developing resistance. Using fungicides with different modes of action in a rotation program will lessen the risk for resistance development.

The Tennessee State University (TSU) Ornamental Pathology Program conducted a study to evaluate fungicide rotation at 14 or 21 – day spray application intervals for the control of powdery mildew of dogwood in 2017 (4). The initial fungicide application was Mural 45WG (7 oz/100 gal)(a.i. benzovindiflupyr + azoxystrobin) and made after observing the first symptoms of powdery mildew disease on the 'Cherokee Princess' flowering dogwood. Then, Palladium WDG (6 oz/100 gal)(a.i. cyprodinil + fludioxonil), Concert II 4.3SE (35 fl oz/100 gal)(a.i. chlorothalonil + propiconazole) and Palladium WDG (6 oz/100 gal)(a.i. cyprodinil + fludioxonil),) were alternated at 14 or 21 – day application intervals. Both fungicide rotation programs significantly reduced powdery mildew severity and disease progress compared to the non-treated control in flowering dogwood. The 14-day rotation program significantly reduced powdery mildew severity and disease progress compared to the 21 – day rotation program in flowering dogwood. This study also showed that the 14 – day rotation program significantly increased plant height compared to the non-treated control flowering dogwood plants.

The TSU Ornamental Pathology Program conducted another study to evaluate systemic fungicides for the control of powdery mildew of flowering dogwood (5). Treatments were Mural 45WG (5 oz/100 gal and 7 oz/100 gal)(a.i. benzovindiflupyr + azoxystrobin), Concert II 4.3SE (35 fl oz/100 gal)(a.i. chlorothalonil + propiconazole) and Pageant Intrinsic 38WG (18 oz/100 gal)(a.i. boscalid + pyraclostrobin). Treatments were applied as foliar application (on a 14 – day interval) at the first signs of powdery mildew. All fungicide treatments significantly reduced the final powdery mildew severity rating and disease progress compared to non-treated control plants. Moreover, the higher rate of Mural was the most effective in reducing powdery mildew disease progress. All treatments significantly increased plants' height compared to the non-treated control. Among fungicide-treated plants, plant height was significantly greater in plants treated with the higher rate of Mural. Our trial shows the benefit of using systemic products in the treatment program providing excellent protection for 14 days.

By incorporating products that have both translaminar and systemic activity in fungicide rotation with protectant fungicides (Table 1) nursery producers can likely extend their treatment intervals while maintaining good protection.

Table 1. Fungicides with effectiveness against powdery mildew on dogwoods

Fungicide	**Active ingredient**	**FRAC Code**	**Rate/100 gal**
Banner MAXX II EC	propiconazole	3	8 fl oz
Cleary's 3336F	thiophanate-methyl	1	24 oz
Concert II 4.3SE	propiconazole + chlorothalonil	3 + M05	35 fl oz
Daconil Ultrex	chlorothalonil	M05	1.4 lb
Eagle 20EW	myclobutanil	3	8 fl oz
MilStop	potassium bicarbonate	NC	2.5 lb
Mural 45WG	azoxystrobin + benzovindiflupyr	11 + 7	5-7 oz
Pageant Intrinsic 38WG	boscalid + pyraclostrobin	7 + 11	18 oz
Palladium WDG	cyprodinil + fludioxonil	9 + 12	6 oz
Regalia	*Reynoutria sachalinensis*	P05	1%
Rhapsody	QST 713 strain of *Bacillus subtilis*	44	3 gal
Triact 70	Neem oil	NC	2%

References

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For additional information, contact your local nursery specialist office at:

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Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

Disclaimer

This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label always takes precedence over the recommendations found in this publication. Use of trade, brand, or active ingredient names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others that may be of similar and suitable composition, nor does it guarantee or warrant the standard of the product. The author(s) and Tennessee State University assume no liability resulting from the use of these recommendations.

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