Dogwood Anthracnose

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Dogwood anthracnose (*Discula destructiva*) is often described as the most serious disease that affects dogwood species, specifically flowering (*Cornus florida)* and mountain (*C. nuttallii*) dogwood species in the United States. The disease was first noticed on the flowering dogwoods in New York and Connecticut in 1978 (1) and on mountain dogwoods in Washington in 1979 (2). Since the first reports in the late 1970's, infection of mountain dogwoods has been reported in Oregon, Idaho, British Columbia and Northern California; and reported on flowering dogwoods in Massachusetts, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Tennessee, Georgia, Kentucky, Alabama, Ohio, the District of Columbia, New Hampshire, Rhode Island, Indiana, Vermont, Michigan and Missouri (3). Dogwood anthracnose threatens forest ecosystems and causes substantial economic losses for the ornamental nursery industry.

Symptoms

Symptoms of dogwood anthracnose include necrosis of bracts, leaf spots, necrotic blotches (Figure 1), wilted and curled foliage, dieback of twigs, leaf blight and cankers on trunks (4). Initial symptoms develop on the lower leaves especially on the leaf margins and flower bracts. Tan spots on leaves with purple rims are often visible. The spots then develop into large, dead areas and as the leaves become necrotic they either dropoff or remain on the tree throughout the fall and winter seasons. Infections from the leaves spread through the

leaf petioles and produce cankers. Dogwood flower bracts are normally prone to infections and display reddish, brownish spots, or blotches. If rainy conditions occur during the flowering period , infected bracts are prevalent. Twig dieback may occur due to cankers at the leaf nodes. Succulent shoots often proliferate on the main branches and lower portions of the trunk on affected trees. Succulent branches are very susceptible to infection. If the disease spreads to the main stem of dogwood plants, cankers with swelling and splitting bark are observed. This can cause girdling of individual branches or death of the entire tree (2, 5 and 6).

Figure 1. Necrotic blotches caused by dogwood anthracnose.

Disease Cycle

Anthracnose fungus may persist in a dormant stage for extended periods in leaves, twigs, leaf debris, and branches. During spring, eruption of fruiting structures (acervuli) occurs on the lower side of the spotted leaves and large amounts of spores (conidia) are released through infected twigs. The spores are spread to newly developed leaves, flower bracts and green shoots by rain, air currents, and sometimes by birds on. Germination takes place when the spores come in contact with water on epicormic sprouts and leaves. In the infected leaves and twigs this fungus can overwinter and can resume growth in the spring to kill new shoots, twigs and buds. Cool temperatures (65°-75°F), along with moist weather are favorable conditions for infection and spread of the disease.

Disease Management

Efficient control of dogwood anthracnose is achieved with cultural and chemical control techniques. Since dogwood anthracnose can be introduced via infected plants, careful inspection should be conducted prior to and after the purchase of plant material. During dry weather conditions it is necessary to cut out all infected twigs, limbs and suckers from infected trunks or branches to reduce the inoculum level. During the fall season, fallen leaves must be removed because those leaves are a great source of overwintering type of disease inoculum. It is important to utilize proper watering and mulching during drought to ensure tree vigor. Sufficient spacing is important for air circulation which can help to

reduce infection. Excessive use of fertilizers must be avoided, because it may increase new succulent branches on plants, rendering them more susceptible to dogwood anthracnose. If this disease is a recurring problem, resistant dogwood cultivar or hybrids need to be considered for planting. See list below of resistant dogwoods (7, 8).

Anthracnose Resistant Dogwoods

C. florida cultivar 'Appalachian Spring'

C. kousa cultivars 'Big Apple', 'China Girl', 'Elizabeth Lustgarten', 'Gay Head', 'Greensleeves', 'Julian', 'Milky Way', 'Steeple' and 'Temple Jewel'

C. florida* x *C. kousa hybrids 'Aurora', 'Celestial', 'Constellation', 'Ruth Ellen', 'Star Dust', 'Stellar Pink', 'Empire', 'Red Steeple', 'Pam's Mountain' and 'Bouquet'

Fungicides can be used for dogwood anthracnose management in conjunction with other management strategies previously mentioned (Table 1). When there is a risk of dogwood anthracnose occurring, repeated applications of fungicides or biorational products may be necessary.

Table 1. Selected lists of fungicide and biorational product that can be used to prevent dogwood anthracnose.

Active Ingredient	FRAC Code	Notes
Azoxystrobin	11	Spray at 7 to 28 day intervals when conditions favor disease development.
***Bacillus subtilis* QST173**	44	Spray at 7 day intervals when conditions favor disease development.
Chlorothalonil	M5	Spray at 7 to 14 day intervals when conditions favor disease development.
Chlorothalonil + thiophanate-methyl	M5 + 1	Spray at 7 day intervals when conditions favor disease development.
Copper hydroxide	M1	Begin application at the first sign of the disease and repeat at 7 to 14 day intervals.
Copper hydroxide + mancozeb	M1 + M3	Spray at 10 to 14 day intervals.
Copper sulfate	M1	Begin application at the first sign of the disease and repeat at 7 to 10day intervals.
Fluoxastrobin	11	Under low disease pressure spray at 7 to 28day

Active Ingredient	FRAC Code	Notes
		intervals. Under high disease pressure spray at 7 to 14day intervals.
Kresoxim-methyl	11	Spray strictly as a protective treatment at 7 to 10 day intervals.
Mancozeb	M3	Begin application at bud break in early spring.
Mancozeb + myclobutanil	M3 + 3	Begin application at the first sign of the disease and repeat at 7 to 10 day intervals.
Myclobutanil	3	Spray at 7 to 14 day intervals.
Potassium bicarbonate	NC	Spray at 7 to 14 day intervals.
Propiconazole	3	Spray at 14 to 28 day intervals when conditions favor disease development.
Propiconazole + chlorothalonil	3 + M5	Spray at 21 day intervals. Application is not recommended in greenhouses and to the blooms.
Pyraclostrobin + boscalid	11 + 7	Begin application prior to the first sign of the disease and repeat at 7 to 14 day intervals.
Tebuconazole	3	Begin application with spring bud break at 14 to 28 day intervals.
Thiophanate-methyl	1	Spray at 14 to 21 day intervals when conditions favor disease development.
Thiophanate-methyl + mancozeb	1 + M3	Spray at 7 day intervals.
Trifloxystrobin	11	Begin application at the first sign of the disease and repeat at 7 to 14 day intervals.
Trifloxystrobin + triadimefon	11 + 3	Begin application at the first sign of the disease and repeat at 7 to 14 day intervals.

NOTE: Before applying ANY disease management product, be sure to: 1) read the label to be sure that the product is allowed for the crop and the disease you intend to control; 2) read and understand the safety precautions and application restrictions.

References

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8. Smith, S. and Carson, J. 2016. Anthracnose diseases of dogwood https://www.uaex.edu/publications/pdf/FSA-7564.pdf

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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