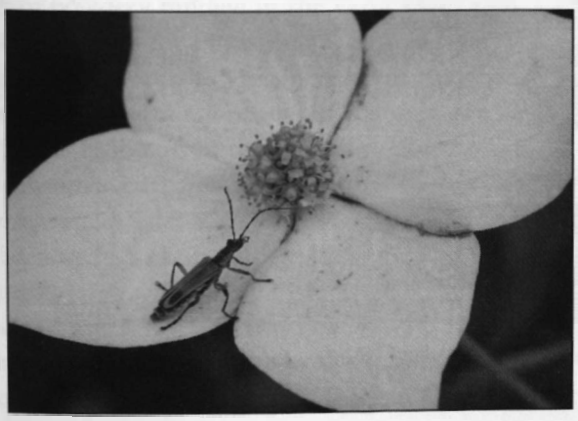
# A Future in Dogwoods

*By Brian Upchurch and Tom Ranney*

*Irene Palmer pollinating Flowering Dogwood*



*Insect pollinating Cornus kousa*

**Background:**

Flowering Dogwood (*Cornus florida*) is very much a part of the fabric of North Carolina culture. It is our state flower and one of the most recognized plants in our landscapes. For many, dogwood blossoms signify Spring itself. Dogwoods are also extremely vital to the nursery industry and economy of North Carolina. Recent estimates indicate that there are approximately 1.5 million dogwood trees sold in the US each year.

Unfortunately, Flowering Dogwoods have been besieged by two introduced diseases.

During the last 20 years, native stands of dogwoods, and to a lesser degree those in the landscape, have been assaulted by dogwood anthracnose (*Discula destructiva*). This disease is most prevalent in the mountains and foothills at elevations of 2500' and higher and in areas prone to damp, shady conditions. The disease, given time, can kill the host plant. In some areas in the Great Smokey Mountain National Park, mortality of flowering dogwoods has exceeded 95%. In other areas of the state, primarily the Piedmont, another disease is threatening our dogwoods. Powdery mildew (*Microsphaera pulchra*) is a fungal disease that infects the foliage and can make plants unsightly (read: un-saleable) and stressed. Mildew stunts the growth, and in some situations, may prove fatal to smaller plants.

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*Cornus florida 'Pygmy'*

*Fruit set on Cornus hybrid*

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This disease can be controlled with fungicides, but this is an expensive option for the grower. More times than not, the disease is not controlled in the landscape.

**The Economic Implications:**

Given that the Flowering Dogwood is so recognizable to the general public, it has historically 'sold itself'. Consumers want plants for their yards like those they have seen in our forests and along our roadways. It is important that the industry continue to offer this plant to the gardening public. But we need to offer cultivars that are an asset to the landscape rather than a liability. These diseases make growing and selling Flowering Dogwood more difficult and expensive. The cost of treating diseases in the nursery and the landscape cannot be ignored. It has been estimated that since the onset of powdery mildew in the early 1990's, production costs for Flowering Dogwood has increased 250 percent. This increase in the cost of production certainly results in reduced or lost profit. Problems in the landscape for the end consumer have and will continue to adversely affect sales and potential profit. Much has been written about controlling the disease with cultural practices and fungicides. However, this is not an economical nor long-term solution. The better solution is the introduction of cultivars that are resistant to both diseases.

There are currently a limited number of Flowering Dogwood with some disease resistance. 'Appalachian Spring' was selected from Catoctin Mountain Park, MD, and has demonstrated resistance to dogwood anthracnose. Other cultivars of Flowering Dogwood including 'Cherokee Brave' and 'Jean's Appalachian Snow' (USPP 13,009) have some resistance to powdery mildew. At this point combined resistance to both diseases is lacking in Flowering Dogwood.

## The future

The diversity found within the genus *Cornus* provides tremendous opportunities for selecting and developing new dogwood cultivars with enhanced pest resistance, adaptability, and spectacular ornamental characteristics. Led by Dr. Tom Ranney of NC State University, we have received a grant from the GoldenLeaf Foundation for the conservation, development, and commercialization of flowering dogwoods. Along with additional funding from the North Carolina Association of Nurserymen, the project will specifically address two diseases. The goal is to select and develop new dogwood cultivars with unique ornamental value that are resistant to both problems.

This project involves two primary fronts. First, we are selecting native flowering dogwoods from the wild that have resistance to dogwood anthracnose and powdery mildew.

*Dogwood trials; Cornus kousa 'Greensleeves' Cornus capitata 'Yoko'*

Second, we are utilizing these and other species and varieties in a systematic breeding program to develop a broad range of new hybrids with expanded commercial potential.

Thus far we have made substantial progress in selecting healthy trees from Mountain habitats where disease pressure from dogwood anthracnose has been severe. Promising trees have been propagated; and with the assistance of Dr. Kelly Ivors at NC State University, they are now being tested for disease resistance under controlled conditions. We have also assembled the largest and most diverse collection of dogwoods in the country with over 60 cultivars of Kousa dogwood (*C. kousa*) alone. Other accessions include Himalayan Evergreen Dogwood (*Cornus capitata*), Chinese Evergreen Dogwood (*Cornus elliptica;* formerly *c. angustata*), *C. hongkongensis*, Pacific Dogwood (*C. nuttalli*), and countless cultivars of flowering dogwood. There are many cultivars of these species, especially kousa dogwood that provide desirable traits for breeding. One exciting part of this approach is that some of these species are evergreen. Along with disease resistance, breeding may provide evergreen cultivars with greater tolerance to heat and drought. Imagine a pink-bracted form of evergreen dogwood that was mildew resistance, anthracnose resistance, and adaptable!! Small, evergreen, disease resistant, flowering trees equals a win-win for the consumer and the industry. We have greatly expanded our work on Dogwoods this year including a wide range of interspecific crosses. The project has exciting potential.

**How Can You Help?**

We need your assistance with this project This project is multi-faceted; involving two diseases affecting different parts of the state. As a member of the North Carolina green industry, you are in an ideal position to assist with the project, and ultimately benefit from it as well. We are asking those in the green industry to keep an eye out for trees that show natural disease resistance. We are particularly interested in wild trees that show resistant to powdery mildew. If you notice a wild tree that is free of powdery mildew throughout the summer and is a particularly nice specimen, let us know and we can help propagate it and test it for disease resistance compared to other selections. It may be a dogwood for the future!

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