

**Environmental Adaptation for Ornamental Value of Cornus florida
in a Michigan Provenance Test
R.C. Heatley, J. J. Kielbaso and G.S. Howell
Michigan State University**

The flowering dogwood is among the most popular ornamental flowering trees in North America. Seed was collected from 191 single trees, or groups of trees, by cooperators and sown in the Tree Research Center nursery in the Fall of 1972. Seeds were collected from points representing the entire range, though not a heavy sampling. There were 18 states represented, with at least 89 collections, representing 191 separate seedlots. Seedlings were ready for field planting in 1975, and 873 trees planted.

Seedlings were planted in four blocks with ten replications at the W.K. Kellogg Research Forest in Augusta, MI. During a 1979-1983 study by Heatley, trees were studied for cold hardiness and fall color. They were later rated for flowering and presence of cankers. Regarding cold hardiness T_{50} temperatures at which 50% of twigs were killed in February, Northern states of PA, MI, VA, WV, and OH averaged -34.5°C ; Central and Coastal states of MD, CT, MO, IL, NJ, and KY averaged -30.3°C ; and Southern states of GA and TN -29.5°C .

Regarding length of fall color display when 70% of leaves were red, the Northern states averaged 12.3 days, Central averaged 7.4, and Southern averaged 1.6 days. Flowering was rated in 1989, 1990 and 1991 on a scale with 5 as highest. The six highest rankings at the Michigan site are: PA - 4.3; OH - 4.0; MD - 3.8; NJ and WV - 3.7 and MI - 3.5. States in order of the least amount of cankering on stems rated, best to worst: NJ - 1.0; MI - 1.8; PA - 1.8; OH - 1.9; VA - 2.0; and MD - 2.1.

The data were combined to rank the states where one might expect to find the best dogwoods, at least for growing in South-Central Michigan. The T_{50} was screened first; seven states were -34.5°C in February 1982. Those were then ranked according to canker occurrence, from low to high. Since these separated the states quite well, we are unable to then further rank flowering and fall color. Hardiness and canker are critical to ultimate survival and usefulness and were employed for a first screening.

Based on the available data and attempting a ranking of places to look for improved dogwood seeds, the best, but with few trees in the study, is NJ; then PA followed by MI and OH; then MD and VA, and lastly WV. PA had the best flowering, followed closely by OH. VA had the best length of fall color display, followed closely by MI and NJ. Since NJ is represented by so few trees and did not flower well this year (1994), it cannot be rated highly without further sources. Best ranking, then, would be MI, PA, OH, VA, and MD.

Another interesting result relates to the widely held belief that flowering dogwood must be grown under other trees. Of the ten replications, three were under the shade of a Scotch pine study. The more hardy, Northern trees, developed significantly lower T_{50} tolerance in the open on a hilltop than in the shade. Fall color ratings were almost absent under the shade. Unfortunately, the overstory had to be removed in 1988, and the three replications with it.

It appears that we should rethink the notion that dogwood is only an understory tree, especially in light of the cold hardiness work and fall color display, which were both better in open stands, and the fact that good flowering occurs in the open.