

Cloudburst™ Flowering Dogwood

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I once heard Dick Bir, my old friend, mentor and a former North Carolina State Nursery Extension Specialist, say, “A house isn’t your home until you plant at least one dogwood!” Agreed!

Admired worldwide, dogwoods are particularly revered here in North Carolina. As our state flower (not our state tree — that is, of course, the “pine”), *Cornus florida* is at home from the mountains to the coast and is the quintessential flowering tree by which all others are measured. Dogwoods are important commercial crops, too. The 2019 USDA Census of Horticultural Specialties (NASS, 2020) estimated U.S. wholesale sales of dogwood to be valued at \$28 million.

As beautiful as they are, Flowering Dogwoods are not without problems. They can suffer from various insects and diseases, and things got a lot worse in the late 1970s with the development/introduction of both Dogwood Anthracnose (*Discula destructiva*) and Powdery Mildew (*Erysiphe pulchra*). In North Carolina, Dogwood Anthracnose tends to be a problem at higher elevations in cool, moist, understory conditions. In one study in Great Smoky Mountains National Park, mortality of Flowering Dogwoods was as high as 94% over an approximately 20-year period, likely due to Dogwood Anthracnose (Jenkins and White, 2002). Powdery Mildew, on the other hand, is more widespread and is a persistent problem throughout the Southeastern U.S. More recently, Flowering Dogwood has also been





◀ **Figure 1. A seven-year-old flowering Cloudburst™ Dogwood** (*Cornus* 'NCCH3' PPAF).

found to be susceptible to Vascular Streak Dieback (VSD), believed to be caused by *Ceratobasidium* sp. (Liyanapathiranaige, et al., 2025), raising additional concerns.

Back in the 2000s, after Dogwood Anthracnose had been around for a few decades, we set out to take advantage of natural selection and look for potentially resistant trees surviving in the mountains of Western North Carolina, where dogwood mortality was high. This effort involved extensive scouting, generally at elevations over 3,000 feet and in remote areas where the disease was prevalent. I got completely lost more than a few times bushwhacking through steep ravines, rhododendron hells and tear-your-ear-off catbriers. We generally did this in the spring when the trees were in bloom and easily spotted from a distance, collecting data on tree health, environmental conditions and GPS coordinates (so we could go back and collect budwood in the summer for propagation). Our efforts were successful, propagating 25 promising trees. Unfortunately, we quickly learned that when we grew those trees at lower elevations, they were generally susceptible to Powdery Mildew.

So, lacking good sources of resistance to both Dogwood Anthracnose and Powdery Mildew in Flowering Dogwood (let alone VSD), we turned to breeding. In our earlier research, we found Kousa Dogwood (*Cornus kousa*) can be resistant to both diseases (Ranney et al., 1995). Knowing that Flowering Dogwoods and Kousa Dogwoods can hybridize, we began by completing F₁ hybrids between

particularly nice parents. Most of the hybrids were sterile, but one plant of *C. kousa* ‘Greensleeves’ × *C. florida* ‘World’s Fair’ (H2010-021-012) occasionally produced seeds. For a few years, we would move large Flowering Dogwoods into a cooler to delay their flowering, then haul them to the field surrounding H2010-021-012 when they were all blooming. After three years we had a grand total of three seedlings to show for our efforts. One of these seedlings was, however, particularly vigorous, with large, glossy leaves. We checked its ploidy (number of chromosome sets) using flow cytometry (Shearer and Ranney, 2013) and found it to be a triploid. In some cases, highly infertile wide hybrids between two species will occasionally form functional “unreduced” gametes that never go through normal meiosis. We speculate that this seedling resulted from an unreduced 2x gamete from H2010-021-012 crossed with a normal reduced 1x gamete from one of our Flowering Dogwoods, making it roughly 2/3 Flowering Dogwood and 1/3 Kousa Dogwood — essentially having the look and feel of a Flowering Dogwood, but with much of the disease resistance of Kousa Dogwood.

After years of field evaluations, we came to realize this was an exceptional tree and named it *Cornus* ‘NCCH3’ Cloudburst™ PPAF. Cloudburst™ has some unique features. It is extremely vigorous and can grow into a branched tree of 3-4 feet from a quart-sized rooted cutting in one growing season. We’re not sure how large it might ultimately get, but our original 8-year-old is now 19 feet tall and 14 feet wide with an upright oval habit (Fig. 1) — so maybe it will be a shade tree? The foliage



Figure 2. The large, clean, glossy foliage of Cloudburst™ Dogwood (*Cornus* ‘NCCH3’ PPAF).



Figure 3. The spectacular fall color of a 6-year-old, field-grown Cloudburst™ Dogwood (*Cornus* ‘NCCH3’ PPA).

is large and glossy and takes on a showy combination of yellows, oranges and reds in the fall (Figs. 2 and 3). Flowers (inflorescences) are large and can exceed 6 inches in diameter with white bracts, dimpled at the tips, much like Flowering Dogwood (Fig. 4). Although Flowering Dogwood is typically produced by budding, Cloudburst™ is easy to root from softwood cuttings. Cuttings taken in late May and treated with 7,000 ppm Auxin (2/3 KIBA + 1/3 KNAA, liquid quick dip) rooted ~81%. We overwinter cuttings in a heated polyhouse with a minimum winter temperature of ~40F with good survival. Rooted cuttings of Cloudburst™ often flower the following spring. Although Cloudburst™ has not gone through formal disease screening, we have not seen symptoms of either Powdery Mildew or Dogwood Anthracnose on our plants. Resistance to VSD is notoriously difficult to test for, but we have trees planted in a field nursery where VSD is prevalent and will be monitoring them going forward.

Time will tell how Cloudburst™ performs around the world, but we like what we’ve seen thus far. I even have planted three at our “home”!

Availability: Production of Cloudburst™ is ramping up, so availability may be limited at first. J. Frank Schmidt and Son



Figure 4. The large, white bracts and inflorescences of Cloudburst™ Dogwood (*Cornus* 'NCCH3' PPAF).

Co. is managing the propagation, commercialization and licensing of Cloudburst™. Contact Jeremy Montgomery at (828) 674-3295 or jmontjssales@gmail.com for availability. Anyone in North Carolina who is interested in a propagation license can contact Guy Meacham at GuyM@jfschmidt.com. Licensed propagators in North Carolina currently include Wind River Growers (www.wrgrowers.com, brian@wrgrowers.com or (828) 475-9345) and Superior Plants Nursery (jasonstevens00@hotmail.com or (919) 868-2463) — although they will not have plants available until 2026.

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Citations:

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