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CANR Breeding Research*

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Our plant improvement research continues to develop new cultivars for the Georgia and national nursery industries. Since 2002, 13 plants have received patents or are pending in the patent office. In 2006, we collected data for six additional patents on four crapemyrtles, a remontant lacecap *Hydrangea macrophylla* hybrid and a gardenia. Royalties to the UGA Research Foundation to support cultivar development will approach a half million dollars from our plants in 2006. The future is extremely positive with improvement work focused on a wide array of woody taxa.

Our current plant improvement activities are enumerated below.

Cephalanthus occidentalis - Buttonbush

Have fiddled with this North American native without any success. Grows in swamps. White, sputnik-shaped, fragrant flowers appear on new growth into fall. Great butterfly plant. Need larger flowers as well as pink. Must develop compact habits. The current seedling population is from a pink fruited selection. All are tall and white-flowered to date.

Distylium racemosum - Izu Tree

Unusual broadleaf evergreen member of the witch-hazel family with upright habit, lustrous dark green leaves, purple winter-spring flowers and exceptional heat tolerance. Over the years, we accessioned the above and several forms of *D. myricoides*, a smaller leaf, more horizontally spreading form. In the population of plants, was an intermediate form that appeared to be a hybrid. The seedling population from this segregated to characteristics of both species. Several plants have been selected for their habit and foliage. I believe these selections could compete with hollies and cherrylaurels in the broadleaf market. Zone 7 to 8(9) adaptability.

Gardenia augusta - Common Gardenia

Working toward cold hardy (zone 6), compact, leathery, lustrous dark green small leaves, perpetual flowering . . . have 42 selections (2005) from Shooting Star-01-03 and -05-03. Acquired as many named cultivars (40) as possible for comparison. Instituted trials at Horticulture Farm, Oconee County; Yew Dell Gardens, Louisville, KY and the Center. Louisville is true zone 6 (0 to -10°F). If any of our selections prove hardy in Louisville, this would open a new market for gardenias. We are also making controlled crosses in an attempt to incorporate new flower colors. This work is funded by a CANR grant as well as a UGARF grant.

The Shooting Star-05-03 selection will be protected. The initial plant was upright-columnar, with small glossy dark green leaves and remontant white fragrant flowers. Additionally, abundant 6-ribbed orange-red fruits mature in fall-winter.

The origin of 'Shooting Star' is wild-collected material from the northern part of the native range in China.

Hydrangea

When do we run out of magic dust? I ask the question . . . How many is too many? The refrain . . . You develop; we will market.

Hydrangea arborescens 'Annabelle' types

Working toward strong-stem, dark green foliage, smaller mophead flowers, without the bend and sway of 'Annabelle'. Still evaluating selections from 1998 without a clear-cut winner. From a large population of

H. arborescens × *H. arborescens* subsp. *radiata* (silver-back leaves), 12 sterile-flowered (mophead) selections were made in 2006. All have been propagated and will be evaluated for performance in 2007 and beyond. Still chasing a pink ‘Annabelle’ type and Rick Crowder, Hawksridge Nursery, selected a showy flowered pink seedling from our seedlings. Apparently, Dr. Tom Ranney, North Carolina State, has pink mopheads from crosses with ‘Annabelle’. I believe such a plant would prove a gigantic commercial success.

Hydrangea macrophylla

Vickie Waters, research technician, made numerous controlled crosses that yielded ~1200 seedlings in 2005.

‘Blushing Bride’ × ‘David Ramsey’ (1)
‘Blushing Bride’ × ‘Veitchii’ (1)
‘David Ramsey’ × Lilacina-16-02 (11)
‘David Ramsey’ × Midnight Duchess™ (6)
‘David Ramsey’ × Princess Lace™ (3)
‘Fuji Waterfall’ × ‘David Ramsey’ (2)
‘Fuji Waterfall’ × Lilacina-16-02 (103)
‘Fuji Waterfall’ × Midnight Duchess™ (1)
‘Fuji Waterfall’ × ‘Veitchii’ (2)
‘Jogasaki’ × ‘Blushing Bride’ (1)
‘Jogasaki’ × ‘Veitchii’ (4)
‘Lanarth White’ × ‘Mini Penny’ (172)
Lilacina-16-02 × ‘David Ramsey’ (600)
Lilacina-16-02 × Midnight Duchess™ (244)
Midnight Duchess™ × ‘David Ramsey’ (1)
Midnight Duchess™ × Lilacina-16-02 (5)
‘Penny Mac’ × ‘Mini Penny’ (3)
Princess Lace™ × ‘David Ramsey’ (11)
‘Veitchii’ selfed (11)

Plants were evaluated in 2006 and there was NOTHING better than our previous selections.

Unbelievable amount of strategizing, expense, work, care, patience, detail and perseverance for the results achieved. Such is plant breeding. In 2004, a seedling of ‘Penny Mac’ × ‘Lady in Red’ was selected for the rich neon-rose lacecap flower. It proved a remontant type with clean foliage and numbers are being bulked for continued testing. This, when released, will be the first true remontant (reblooming) lacecap via a controlled cross.

Seedlings (2006) of ‘Lady in Red’ × Preziosa-01-02 (2005 crosses) are showing considerable red pigmentation of the stems, petioles and mildew-free foliage. Preziosa-01-02 has beautiful rose-red mophead flowers that age to deep purple and hold well into September. Unfortunately, it is highly susceptible to mildew. The seedlings from the above cross have been mildew-free to date. Our hope is to bring the best traits of the two parents into the progeny.

Peering into the crystal ball, we plan to cross ‘Ami Pasquier’ (rose-red to purple-blue mophead), clean foliage, good cold hardiness × the remontants. Our goal is to increase flower color intensity with the reblooming trait. Also, we are shooting for a yellow-flowered mophead *H. macrophylla*. We have the breeding lines ready to go but are flying under the radar with the details.

Josh Kardos, Ph.D. candidate, has constituted remarkable crosses between *Dichroa febrifuga*, an evergreen, blue-fruited member of the Hydrangeaceae and seven *H. macrophylla* taxa including ‘David Ramsey’, ‘Oak Hill’, Midnight Duchess™, Queen of Pearls™, ‘Veitchii’, ‘Lady in Red’ and ‘Mini Penny’.

The above seedlings are intermediate in foliage and have been verified as true hybrids by molecular markers. The seedlings that flowered resemble *Dichroa*. Josh is backcrossing to *H. macrophylla* to produce seedlings with showy sepals and blue fruits.

He has also crossed *Hydrangea macrophylla* 'Lady in Red' and Midnight Duchess™ × *H. angustipetala*, a white lacecap with narrow, deeply serrated lustrous dark green leaves. The seedlings (almost all) resemble the paternal parent *H. angustipetala* but have the red and purple stem colors of the two maternal parents. None have flowered and 2007 should prove exciting.

Several 'Mini Penny' × 'Penny Mac' seedlings flowered (mophead) the first year and appear to be remontant types. Cuttings were rooted and this fall-winter, they will be subjected to long days via extended photoperiod and warm greenhouse temperatures to see if they are truly reblooming under non-inductive conditions.

Hydrangea paniculata - Panicle Hydrangea

So many extant cultivars (~66) that the gardening world probably does not need another. Our goals for improvement are strong stems, heat tolerant dark green foliage, showy flowers and container presence. Patents were submitted on two selections from 'Pink Diamond', PD-01-01 and PD-14-01. The first has rigid stems, large leathery dark green leaves and green to white to parchment colored sepals that cover the fertile flowers. The second has smaller white sepals that age to rose-pink and persist into September (zone 7).

From these two introductions, hundreds of seedlings are being grown with 35 selections in 2005 and 2006. The seedlings display the superb foliage and strong stems with an array of inflorescences from rounded to conical, with sepals in all shapes, sizes and colors.

Lagerstroemia - Crapemyrtle

The Razzle Dazzle™ series went to market as Dazzle Me Pink™ (pink), Ruby Dazzle™ (red-purple foliage), Snow Dazzle™ (white), Raspberry Dazzle™ (raspberry red), and Cherry Dazzle™ (red). Cherry Dazzle™ is outstanding and one of the best commercial plants to come through our program.

Continued evaluation pin-pointed three, P/WC/Chick-04-02 (fuchsia), -08-02 (coral) and -09-03 (true clear pink). All possess handsome clean foliage, mildew and *Cercospora* resistance.

In 2005/06, seedlings from controlled crosses and open-pollinated Cherry Dazzle™ produced almost universal rose to red flowered seedlings. Selections were made with CD-03-06 the BEST clear red yet. This will prove intermediate, 5 to 10 feet, in height. The foliage is clean and the flower panicles immense in relation to size of the plant. We plan to backcross this to Cherry Dazzle™ in 2007 to increase the opportunity for more true red seedlings.

In 2004, we crossed two white genotypes and have a population of compact white-flowered seedlings. White is a difficult color to consistently produce. This is also true for red. In both cases, we believe the nut has been cracked.

Lantana 'Miss Huff'

Although a stalwart in the Dirr Georgia garden for over 25-years, never have I observed significant fruit set. In 2005, plants in our Chapel Hill garden set copious quantities. A 30-day cold-moist stratification produced excellent germination with ~800 seedlings. They all flowered by July 2006 with orange to pink the predominant colors. Nine selections were made, propagated and were shifted to containers and the ground for survival testing. I was hoping for myriad flower colors and stem cold hardiness. All 800 container plants will be left uncovered at the Center to determine if any have *true* above-ground cold hardiness.

Nandina

Have been itching to develop a 'Gulf Stream' alternative and seedlings of 'Gulf Stream' and 'Moonbay' are compact with clean foliage and sparse to no fruits. The 'Gulf Stream' seedling dwarfs (6) are planted at the Horticulture Farm and in the Center garden. Five 'Moonbay' seedlings are compact and currently being evaluated. No definite timetable for release.

Viburnum

I envision a litany of NEW viburnums with superlative ornamental attributes and adaptability to the southeastern heat and drought. Currently, open-pollinated seedlings of *V. ×burkwoodii*, 'Chesapeake', 'Eskimo', and 'Mohawk' are under evaluation. Three potential introductions with clean foliage and red budded to white, fragrant flowers have been targeted.

Controlled cross of *V. ×burkwoodii* 'Park Farm Hybrid' × *V. macrocephalum* f. *keteleeri* produced remarkable variation in foliage from evergreen to deciduous. These seedlings are planted at the Horticulture Farm. Several will flower in 2007.

At the Center, a first year seedling population of *V.* NA #69852 (f. *keteleeri* × 'Eskimo') displays great segregation of traits. Several of the seedlings will be shown during the Open House.

I believe that *V. obovatum*, particularly the compact types, have great potential for the South. Plants are evergreen with white flowers, blue-black fruits and terrific heat and drought tolerance. Our collection of 12 taxa is growing at the Horticulture Farm. Cuttings are available for the taking. This is a native southeastern species with moist and dry soil tolerance. Growers need to take heed. It offers the characteristics of dwarf *Ilex crenata* and *I. vomitoria* types plus flowers (spectacular), fruits and often red-purple winter foliage color.

Completed a book on Viburnums which is now in the editing hands of Timber Press. Timber committed to including 500 photographs. Target date for publication is May, 2007, although may be later in the year.

As always, we thank you for attending the Center's Open House. We value your support and will continue to work for the greater good of not only the Georgia nursery industry, but the National as well.