

New Protected Woody Plant Introductions from The University of Georgia

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INTRODUCTION:

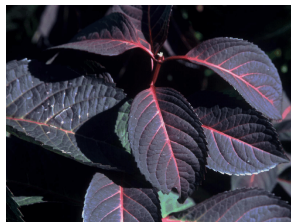
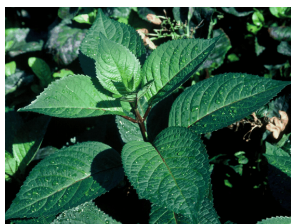
The Woody Plant Introduction Program in the Department of Horticulture continues to breed and introduce exciting woody plants that serve the Georgia nursery industry and gardeners, as well as the national horticulture scene. From the initial cross to introduction into commerce may take 5 to 10 years. The collaborative work with the Center for Applied Nursery Research, Dearing, Georgia, has allowed the program to increase seedling numbers and resultant successes. Since 1997, over 25,000 seedlings have been evaluated from a wide range of woody genera with 15 deemed worthy of patent protection.

Program funding is derived from private and public sources. All protected plants (intellectual property) belong to The University of Georgia Research Foundation (UGARF) and are licensed to nurseries for production and marketing purposes. Royalties are then given back to UGARF and used to support cultivar development programs in the College of Agricultural and Environmental Sciences. This self-funding mechanism supports 25 to 35 breeding programs each year. Most significantly, if the breeding research is based on solid science, the funding is renewed yearly until the program releases new cultivars that then start to earn royalties.

The most important aspect of the plant improvement programs at The University of Georgia is that our commodity groups are provided the BEST cultivars of ornamental, agronomic, forage, fruit and vegetable crops. These NEW cultivars are bred for yield, appearance, pest and environmental tolerances, making growers more efficient and better stewards of the environment. This symbiosis among breeder, industry and consumer translates to enhanced economic and environmental advances.

WOODY PLANTS: Includes those patented or in process.

***Hydrangea macrophylla* ‘Lady in Red’ (PP 15,715)**



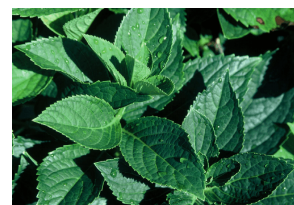
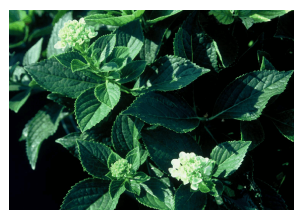
Seedling of ‘Otaksa’ (plant from which I collected seed was labeled as such but I am doubtful). Selected as Otaksa-01-01 in 2001 for red autumn color and mildew-free foliage from ~265 seedlings. Lacecap flowers in pink (no aluminum) or blue (with aluminum) maturing burgundy-red; red veins, petioles and stems contribute seasonal attributes. Utilized in our breeding program and provides red pigmentation and mildew resistance to progeny. Grew a seedling population of open-pollinated ‘Lady in Red’ to flowering and all were



lacecaps in white, pink, rose and blue. Selected only one and still assessing its worth. 'Lady in Red' is quite cold hardy and survived -3°F on Nantucket, Massachusetts. McCorkle Nurseries, Inc. are licensed by UGARF to grow and market the plant.

Hydrangea macrophylla 'Mini Penny' (PP 15,744)

Since the discovery of the remontant Endless Summer™ ('Bailmer') on September 11, 1998, our program attempted to develop other reblooming cultivars. Seeds of Endless Summer™ germinated, but seedlings lacked vigor and perished. In 2002, two seedlings of 'Penny Mac' (a rebloomer from Penny McHenry, Atlanta, Georgia) flowered with one selection (Penny Mac-01-02) proving remontant. This plant was more compact in habit, with small lustrous dark green, leathery leaves, pink/blue mophead inflorescences, and moderate mildew resistance. The two-year old plant was 16" high, 36" wide with 33 fully expressed flowers in May-June, 2002. All were removed on June 25 with 34 developed terminal flower buds and/or inflorescences on Nov. 14. Inflorescences on the original plant were ~4" across while those on heavily fertilized and watered plants may reach 6" in diameter. 'Mini Penny' has been integrated into our breeding program and crosses with 'Lanarth White' and 'Penny Mac' (a backcross) resulted in numerous compact seedlings with superior foliage. The compact (dwarf) characteristic appears in first generation seedlings which is not always the case. Licensed to McCorkle Nurseries, Inc. and will be released in 2008.



Hydrangea macrophylla 'Blushing Bride' (PPAF)

A remarkable remontant hybrid between 'Veitchii' (white lacecap) and Endless Summer™ (pink/blue, remontant mophead) with white mophead inflorescences, the sepals often semi-double. Selected in 2002 and named 'Blushing Bride' because the white flowers blush pink with maturity. In a subsequent blueing study (aluminum applied to medium), the flowers turned a robin's egg blue. The dark green, mildew and Cercospora-resistant foliage is derived from the 'Veitchii' genes. Foliage, on occasion, turns yellow to red in November in Athens. This is the first evidence of introgression of the remontant genes in progeny via





a controlled cross. Only six seedlings resulted, with five flowering in 2002, one of which became 'Blushing Bride'. Tested at Bailey Nurseries, Inc., St. Paul, MN in 2004-2005 and survived with minimal snow cover and -25°F and flowered as viewed by Dirr on July 21, 2005. Licensed to Bailey Nurseries by UGARF with distribution (200,000 plants) to independents in 2006; 2 million general release in 2007.

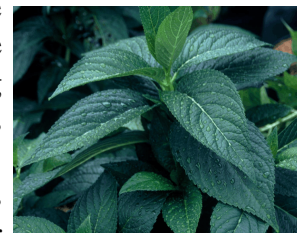
***Hydrangea macrophylla* Princess Lace™, Midnight Duchess™ and Queen of Pearls™**

The program's early work with *H. macrophylla* involved acquiring and testing as many cultivars as possible. About 200 have been assessed with ~30 utilized as maternal parents to determine the transfer of desirable flower, foliage and disease resistance traits to open-pollinated offspring. The work started in 1999 with 'Ayesha', 'Veitchii', 'Lilacina' and 'White Wave' proving superior. Most of these open-pollinated seedlings did not inspire, however, several unique phenotypes surfaced and along with 'Lady in Red' are the BEST of >20,000 hydrangea seedlings evaluated through 2005. None of these are remontant types. All will be available in commerce in 2007.

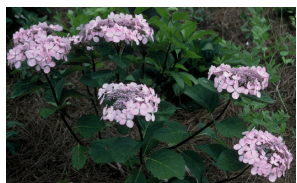
Princess Lace™ (PPAF) is a white lacecap maturing pink in non-aluminum medium or with a slight blue tinge in aluminum medium. The lustrous dark green leaves are



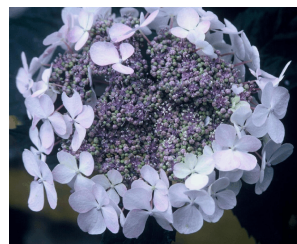
the largest on any seedling or cultivar observed. The foliage is also highly mildew resistant and, along with 'Blushing Bride', as close to immune as possible within the genetic plasticity of *H. macrophylla*. Stems are strong and hold the flowers upright. This selection displays exceptional vigor and when used as a breeding line imparts this vigor to the progeny. Licensed to McCorkle Nurseries, Inc.



Midnight Duchess™ (PPAF) - This black-purple, rigid stemmed, dark green foliated, large mauve-pink flowered lacecap seedling from 'Nigra' was completely unexpected. 'Nigra' ('Mandschurica') is a sickly blue/pink mophead with



complete mildew susceptibility and miserable cold hardiness. Flowers on 'Nigra' develop only at the terminals and if killed by cold (more often than not), simply produce foliage and black-purple stems. Nigra-02-02 produces flowers from buds along the stem (laterals) and also displays high mildew



resistance. Definitely more heat and drought resistant, for in a mixed *Hydrangea macrophylla* planting in the Dirr Chapel Hill, NC garden, Nigra-02-02 would be turgid and the leaves upright while all others were dog-eared in the 90°F and greater summer heat in 2005. Makes a great breeding line as both open-pollinated and controlled seedlings develop (~50%) the purple-black stem color, vigor, mildew resistance, and variable white to pink





lacecap and mophead inflorescences. The sepals are not affected by aluminum and dry eye-catching lime-green. My wife, Bonnie, considers Nigra-02-02 the most beautiful of all the hydrangeas discussed herein. Licensed to McCorkle Nurseries, Inc.

Queen of Pearls™ (PPAF) - This clean glistening white mophead was derived from the white lacecap, 'White Wave', a 1904 French hybrid from V. Lemoine, originally named 'Mariesii Grandiflora'. This selection also offers lustrous dark green foliage, the leaf surface somewhat bullate and rugose. Mildew and Cercospora resistances are exceedingly high. Flowers initiate green, open glistening pure white, and mature to green. The white sepals typically do not spot and age pink like 'Mme. Emile Mouillere', the most common white mophead garden hydrangea. Also, the eye



(stamens/pistil) of the sepalous cluster remains white unlike 'Mme. Emile Mouillere' that becomes pink or blue depending on absence or presence of aluminum, respectively. Licensed to McCorkle Nurseries, Inc.

***Hydrangea paniculata* - Panicle Hydrangea**

Although not as well known as *H. macrophylla* in the south, it is a major player in northern gardens with adaptability to zone 3 (-30°F to -40°F). In zone 8, plants suffer from heat and drought stress. The species flowers on new growth and is adapted to full sun. Since the early 1990s, seedlings have been evaluated with the 1999 release of 'Chantilly Lace', a seedling of 'Tardiva', with a uniform mix of sepalous and fertile flowers, the sepals turning pink, dark green leaves and strong stems. In 2000, 'Brussels Lace' and 'Pink Diamond' seed were collected at Hillier Arboretum, Hampshire, England. The ~450 seedlings resulted in 24 selections in 2001 for showy flowers, strong stems, and dark green foliage. Subsequent evaluation of these 24 in containers and for four years in-ground at the Horticulture Farm reduced the number to two spectacular selections that have been observed by *all* major nurseries in the U.S. WOW has been their way of saying they are remarkable.

Pink Diamond-01-01 (PPAF) - possible name 'White Sprite'. This selection, in the row of 24, stands out and shouts for attention. Beautiful full white panicles develop in late June-July on strong stems studded with closely spaced, leathery dark green leaves. Sepals cover the fertile flowers, initiate green, open white, and mature cream-green-parchment. Flowers are effective for two months and never appear tatty and disheveled. The compact habit, 4' by 5' 4" in four years, lends itself to smaller gardens. In containers, when flowers are removed, a second growth flush produces another flowering cycle. Approximately 50 cultivars of *H. paniculata* are known. To date, none match Pink Diamond-01-01 for the combination of desirable characteristics described above. UGARF will



license this to interested parties.

Pink Diamond-14-01 (PPAF) - possible name 'Rose Lace', 'Ruby Lace'. Like its half-sib relative, Pink Diamond-01-01, this selection is compact, 4' 3" by 5' 6" in four years. The significant variance is found in the looser inflorescence where the sepals cover 80 to 90% of the fertile flowers, the smaller individual sepals, opening white, *but* maturing rose-pink. As the sepals mature, they arch outward creating a frilly, lacy configuration. Flowers open 2 weeks later than Pink Diamond-01-01 and are showy for 2 months, especially in their rose-pink stage. Leaves are not as leathery, dark green nor are stems as strong as Pink Diamond-01-01. However, the stems are stronger than the parent 'Pink Diamond' and, as the photograph shows, amply rigid to carry the inflorescences upright. UGARF will license this to interested parties.



In 2005, seedlings of Pink Diamond-01-01 and Pink Diamond-14-01 were grown to flowering with 1 selection from the former and 12 from the latter. The variation in characteristics among the Pink Diamond-14-01 seedlings is amazing. A compact seedling with dome-shaped inflorescences like those of *H. arborescens* 'Annabelle', a double-sepaled form, and others with large white inflorescences and strong stems were in evidence. The breeding will continue in 2006 and beyond as long as significant variation occurs.

Lagerstroemia - Crapemyrtle

With 100s of cultivars of crapemyrtle, *L. indica*, including the great Indian series, primarily *L. fauriei* × *L. indica* crosses, and the recent work of Dr. Carl Whitcomb with eight patented cultivars, three of which are potent reds, Dynamite™, Red Rocket™ and Siren Red™, does the nursery/gardening world need additional? This question was posed when the Program delved into developing TRUE DWARF crapemyrtles. Where does a breeder find the genes for true dwarfness? The Chopin Series, 'New Orleans', 'Bayou Marie', 'Baton Rouge', 'Mardi Gras', etc., are marketed as 2 to 3 foot dwarf types, but grow 6 to 10 feet and more. They are susceptible to mildew and Cercospora leaf spot. Dr. Don Egolf, U.S. National Arboretum, bred for ~30 years before releasing the true genetic dwarf 'Pocomoke' in 1998. 'Chickasaw' was released in 1989 and has not been a commercial success. Dr. Egolf incorporated *L. fauriei* into these dwarf types for mildew resistance. Our thinking was to utilize this germplasm to develop improved foliage, flower colors, while maintaining the genetic dwarfness.

The work initiated in 1997 and continues as we mine the hidden genetic plasticity (variability) in Dr. Egolf's germplasm.

Over 3,000 seedlings of 'Pocomoke' and other PI or numbered National Arboretum selections have been grown to flowering. Over 100 selections were made with five now in the patent process, another nine that will be reduced to 3 or 4 in 2006 after five-years of evaluation.

Controlled crosses via bees and isolation techniques are being orchestrated. Red foliage × red foliage; red flower × red flower; white flower × white flower, etc. were consummated in 2004. In 2005, a population of seedlings from white flowers × white flowers yielded primarily dwarf,

white-flowered seedlings. White flowers on dwarf shrubs are rare occurrences with ~5 expressed from the >3,000 open-pollinated seedlings. *Red* is even rarer with one GREAT RED breakthrough from the same populations that produced the ~5 whites.

The first introductions have been evaluated from 4- to 8-years and are the best *dwarf* types available. They will be introduced in 2006 by McCorkle Nurseries, Inc. as the Razzle Dazzle™ Series. The five selections have been growing in the Dirr's Chapel Hill garden with excellent success. Cherry Dazzle™ (red) has the potential to become the BEST woody plant ever introduced through the Program.

Razzle Dazzle™ Series: (PPAF on the following five selections)

Cherry Dazzle™ ('GAMAD I') is the first true red,

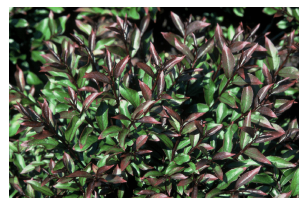


red, red compact selection. Shiny red buds open to cherry red flowers in July-August. The emerging bronze leaves turn dark green, eventually orange-



red-purple in autumn. Leaves are highly resistant to mildew and Cercospora leaf spot. Restrained compact mounded habit, 3 to 5 feet high and wide in 4 to 5 years. Selected in 2002.

Raspberry Dazzle™ ('GAMAD II') produces raspberry red flowers in summer on a dense compact upright shrub. Small lustrous dark green leaves may develop showy red fall color. Grows 4 to 5 feet high, 2 to 3 feet wide in 4 to 5 years. The foliage may develop slight mildew. Unique because of the branching pattern and foliage that reminds of *Cotoneaster apiculatus*. Flowers are not as profusely borne as those of Cherry Dazzle™. Selected in 2002.



Snow Dazzle™ ('GAMAD III') is the first white-flowered dwarf selection from our program. The youngest leaves are bronze-purple, maturing green and wavy surfaced (undulating). Pure white flowers with showy yellow stamens open in July-August. The habit is compact-mounded and will reach 2 to 3 feet high and wide in 3 years. Foliage displays



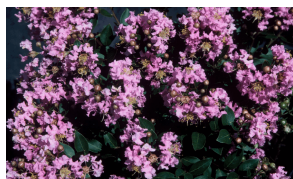
high mildew and Cercospora resistance. Occasionally will develop a fast



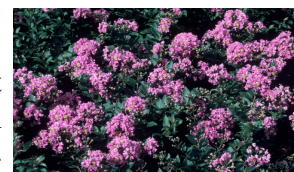
growing reversion shoot which should be removed. Selected in 2002.



Ruby Dazzle™ ('GAMAD IV') was selected in 1999 for its ruby-red-purple foliage and dense compact spreading habit - the most compact of the five selections and also the slowest growing. Superior foliage plant and considered as a possible alternative to Crimson Pygmy barberry. The pink flowers are sparsely produced in August. The compact-mounded habit, 2 to 3 feet high and wide in 4 to 5 years, coupled with the beautiful, red-purple, mildew and Cercospora resistant foliage, are the primary attributes. This selection requires no pruning as it maintains a uniform dense network of stems and foliage.



Dazzle Me Pink™ ('GAMAD V') was the first selection in 1998 and for eight years has maintained a compact, mounded habit. Copious bubble gum-pink flowers froth the foliage in late June-July. The lustrous dark green leaves serve as a great contrast to the bright flowers. Size approximates 3 to 5 feet high and wide in 5 to 7 years. Foliage is highly mildew resistant but does tend to abscise in autumn earlier than the others. This is the first to flower and is stunning in its best incarnation.



If flowers are removed when spent and before fruit set, another flush of flowers usually develops. In 2005, Cherry Dazzle™ produced flowers into early November in Durr's Chapel Hill garden. The Razzle Dazzle™ Series will make great container plants, shrub border components, groupings and masses.

Table 1. *Hydrangea macrophylla* mildew and Cercospora ratings for new introductions and standards (for comparative purposes). Fall 2005.

Introductions	Mildew	Cercospora
'Lady in Red'	0	0.5
'Mini Penny'	1.5	0
'Blushing Bride'	0	0.5
Veitchii-63-01	0.5	0.5
Nigra-02-02	1	1
White Wave-05-02	1	0.5
Standards	Mildew	Cercospora
'Penny Mac'	1 (3 plants)	1 (3 plants)
'Veitchii'	0	0
'Ayesha'	3	1
'White Wave'	2	1
'Nigra'	4	0
'Nikko Blue'	3.5 (2 plants)	0.5 (2 plants)
Endless Summer™	1 (3 plants)	2 (3 plants)
'Mme. Emile Mouillere'	2	1
'Pia' (Pink Elf™)	3	2
'Preziosa' (<i>H. macrophylla</i> × <i>H. serrata</i>)	4	4

Data taken in Athens on 10-28-05 (shade house) and 11-10-05 (shade garden). Average of 2 plants for Introductions; one plant for standards unless specified.

Mildew Rating

0 = none

1 = 1-25%

2 = 26-50%

3 = 51-75%

4 = 76-100%

Cercospora Rating

0 = none

1 = 1-25%

2 = 26-50%

3 = 51-75%

4 = 76-100%

Ratings translate to total number of leaves on a plant spotted and/or covered with mildew or Cercospora. A single spot on one leaf would constitute a rating of 1 for the plant.

Mildew and Cercospora pressures were high in 2005 and cultivars like 'Preziosa' were devastated. The 3 mildew rating on 'Ayesha' was the highest ever recorded since 2001.

A rating less than 2.0 is considered acceptable. Immunity is almost impossible within *H. macrophylla* but 'Veitchii' was perfect in 2005. It is a great breeding parent. The offspring, Veitchii-63-01 and 'Blushing Bride' reflect this.