



New Plant Evaluations and Introductions

Michael A. Dirr
Department of Horticulture - Athens
The University of Georgia

Thought it might make sense to list/describe our breeding/testing activities under one umbrella. Many are rather simplistic with a single goal in mind; others multifaceted, complex, and futuristic.

Straight-forward Approach

We have been trying to develop a white-flowered, yellow-foliage, compact spirea. To date over 800 seedlings derived from *Spiraea chamaedryfolia* var. *ulmifolia*, *S. miyabei*, *S. japonica* 'Macrophylla', *S. j.* 'Nana', *S. j.* 'Firelight', *S. j.* 'Candlelight', and *S. j.* 'Goldflame'/'Gold Dome' flowered pink or rose with about one-half with yellow foliage. We flagged 29 for future evaluation with several beautiful dwarfs with leaf spot free, persistent yellow foliage. This work is being carried out in Athens.

In 1999, I acquired *Spiraea formosana*, a wild-collected spirea from Taiwan that is related to *S. japonica*. The large white flowers against the blue-green foliage were spectacular. My thoughts were to hybridize it with the compact yellow leaf *S. japonica* cultivars to produce the white-flowered, yellow-foliage, compact selection. 138 seedlings of *S. formosana* are growing at the Center with one compact yellow foliage form that, hopefully, will produce white flowers. If not, I will try again with *S. formosana* as the maternal parent utilizing *S. j.* 'Nyewoods Gold' and 'Queen of Golds' for the pollen parents.

The above is a rather simplistic approach with straight-forward, seemingly easily obtainable goals.

Complex Approach

The *Hydrangea* improvement is multi-faceted with the following objectives:

- I. Repeat flowering, *i.e.*, flower on new growth even if killed by low winter temperatures, early fall freezes, spring freezes, etc.
 - Compact habit.
 - Strong stems.
 - Lustrous dark green leaves.
 - Fall color.
 - Mildew-resistant foliage.
 - Colorful stems.
 - Drought tolerance.
 - Cold hardiness (stem and flower bud to at least -10 F)

The possibility of capturing all the above characteristics in a single genotype (plant) is remote. However, the project is being conducted on several fronts with multiple contributors. We continue to collect, evaluate, and study current *Hydrangea macrophylla* and *H. serrata* cultivars.

In July of this year, my former MS graduate student, Jeff Adkins, and I traveled to England to study hydrangeas. It became immediately obvious that the nursery and garden worlds do not need another poofy, blowsy, pink or blue mophead hydrangea with mediocre foliage and mildew susceptibility. One garden held 360 cultivars, another 270, and without labels they were impossible to differentiate.

Of the 80 cultivars we have evaluated in Athens only *H. m.* 'Veitchii' (a lacecap) and 'Ayesha' (mophead) showed excellent mildew resistance, with 'Veitchii' seemingly immune.

Our early work, now in fourth year, showed that the maternal parent (seed parent) exerted pronounced effects on the seedlings. The first generation of selfed 'Dooley' seedlings were all mopheads, many with beautiful flowers, but all with mildew susceptibility. All were eliminated. 'Nigra', a purple-black stemmed form, yielded mostly purple-black stemmed seedlings. 'Ayesha', with lustrous leathery foliage, produced similar seedlings. These two seedling groups have not flowered as of October 2001.

'Veitchii', almost 800 seedlings (2001), produced largely disease-free foliage and a ratio of ~3 lacecap to 1 mophead. About 60 selections were made, all propagated and will be tested in 2002 and beyond. Two early selections, 'Veitchii 2-00' and 'Veitchii 3-00', both white mopheads, offer infinitely better characteristics than the old cultivars like 'Sister Teresa' and 'Mme. Emile Moulliere'.

The reflowering characteristic is inherent in 'Endless Summer', 'Decatur Blue', 'David Ramsay', 'Oak Hill', and 'Penny-Mac'. All are genetically programmed to reflower and are being crossed with 'Veitchii' and 'Ayesha' to produce a new generation of improved foliage, habit, and flowering cultivars. The reflowering types already have a home in the marketplace. Gardeners are excited about such a plant and ask where and when it will be available. You will see the five repeat flowering types growing side-by-side at the Center. Truthfully, I see little difference among the five. Foliage and flowers are quite similar. To assess legitimacy of these clones, I am working with Dr. Jon Lindstrom, University of Arkansas, who is conducting DNA profiles ("fingerprints"). We are also assessing the place of 'Dooley', 'Nikko Blue', and others in the hierarchy. In the end, there may be one clone with five different names.

Jeff Adkins Master's research showed that 'Penny-Mac' and 'Endless Summer' develop flowers under non inductive conditions, ie long photoperiods and high night temperatures (~75 F). Unfortunately, 'Endless Summer' only developed midwinter cold hardiness to 0 F, while 'Dooley', 'Nikko Blue' and 'Generale Vicomtesse de Vibraye' were hardy to 11 F. No doubt repetitive crosses will be necessary between these cultivars to produce a perpetual flowering, stem hardy selection. See Table 1 for cold hardiness data.

In 2000 and 2001, ~4000 seedlings of 25 *Hydrangea macrophylla* and *H. serrata* parents were transplanted to 3-gal containers and are being evaluated at the Center and Dudley Nurseries. See Table 2 for a list of cultivars and numbers. From seed to flowering takes about 16 to 18 months. In the case of 'Dooley', all seedlings flowered within 18 months. About one-half the 'Veitchii' flowered within 18-months.

During the Open House, the early flowering selections from 2000 ('Veitchii' 2-00, 'Veitchii' 3-00) and the more exciting foliage selections from 2001 will be shown and discussed. Seedlings of 'Endless Summer' lacked vigor and died. However, two robust seedlings of 'Penny-Mac' will flower in 2002. Perhaps then, we will know whether the reblooming trait is passed from generation to generation.

Point of information: Bailey Nurseries, Inc., St. Paul, Minnesota are applying for a patent on 'Endless Summer'. This activity is moving forward as you read. The nonsense cultivar name will be 'Bailmer' with Endless Summer the trademark name ie Endless Summer®.

Also, under the *Hydrangea* research umbrella resides *H. paniculata* 'Brussel's Lace' and 'Pink Diamond'. Ninety-four seedlings of 'Brussel's Lace' and 397 seedlings of 'Pink Diamond' flowered in June-July-August of 2001. About 20 seedlings were selected for flower, foliage and habit improvements over 'Grandiflora' and 'Tardiva'. Three seedlings were compact, mounded growers with smaller flowers.

***Hypericum* species evaluation**

This study was an outreach of Sara Crockett, MS graduate of the Department of Botany who collected native hypericums from the southeastern United States. I asked Sara about evaluating this wild-collected material for suitability in gardens and nursery commerce. The Center provided a seed-money grant (\$1000.00). The plants are two-years-old and have demonstrated remarkable foliage, flower, bark and container-adaptability. An entire replicated collection was planted at the Horticulture Farm in Athens on December 8, 2000. The cold killed all the *H. lissophoeus*. The most cold hardy are *H. chapmanii*, *H. densiflorum*, *H. fasciculatum*, *H. galioides*, *H. nitidum* and *H. reductum*.

The various species flower from June until September, all with golden yellow flowers, usually ranging from to inch diameter. They root readily from cuttings and will fill a 3-gal container in one growing season. No insect or disease problems were noted. The branches tend to be somewhat brittle.

The following evaluation was conducted on 8-13-2001. Two individuals independently assessed appearance and overall plant quality. The higher the number, the greater the eye-appeal. A 3.0 or greater equates with *worth a trial in commerce*.

Species	Appeal Rating	Percent of foliage covered with flowers
<i>Hypericum</i> sp. 2 (H135)	3.00	1
<i>Hypericum brachyphyllum</i> (68)	3.00	30
<i>Hypericum brachyphyllum</i> (H-139)	2.50	15
<i>Hypericum brachyphyllum</i> (H-145)	2.50	35
<i>Hypericum chapmanii</i> (H-67)	3.00	15
<i>Hypericum chapmanii</i> (H-73)	3.50	4
<i>Hypericum chapmanii</i> (H-108)	3.00	3
<i>Hypericum cistifolium</i> (69B; with red seed capsules)	4.25	20
<i>Hypericum densiflorum</i> (#1)	3.25	1
<i>Hypericum densiflorum</i> (F144)	3.00	1
<i>Hypericum fasciculatum</i> (H-26)	2.25	5
<i>Hypericum fasciculatum</i> (M-1)	3.75	2
<i>Hypericum fasciculatum</i> (M-2)	3.75	10
<i>Hypericum fasciculatum</i> (M-3)	3.75	7
<i>Hypericum galioides</i> (H-138)	3.00	0
<i>Hypericum galioides</i> 'Brodie'	3.25	0
<i>Hypericum galioides-brachyphyllum</i>	3.00	1
<i>Hypericum hypericoides</i>	1.00	2
<i>Hypericum lissophoeus</i> (20-77)	1.75	5
<i>Hypericum lissophoeus</i> (Eglin)	2.25	6
<i>Hypericum lissophoeus</i> (GH)	1.75	6
<i>Hypericum lissophoeus</i> (H-125)	1.75	7
<i>Hypericum lloydii</i> (H-1)	3.00	2
<i>Hypericum microsepalum</i> (69A)	1.00	0
<i>Hypericum myrtifolium</i> (H-140)	1.00	1
<i>Hypericum nitidum</i>	3.00	2
<i>Hypericum nitidum</i> (H-27)	3.50	10
<i>Hypericum reductum</i>	3.50	2
<i>Hypericum reductum</i> (H-74)	2.00	35

***Lagerstroemia* - Dwarf Seedlings**

The goals of this improvement program are true genetic dwarf plants, superb foliage and varied flower colors. Project actually started in 1997 when the first seeds were sown. Out of 1,017 seedlings derived from 'Pocomoke', Dr. Egolf's numbered unnamed dwarf forms, as well as first generation seedling selections, 43 remain. The segregation of characteristics was phenomenal with true dwarfness (so far), lustrous dark green to red-green foliage, white, pink, fuchsia, rose, and purple flowers. Several seedlings have survived 4-years of scrutiny. The goal is 3 to 5 finalists with outstanding characteristics. The quality indices are akin to moving targets and the seedling that excels in early flower, is often overshadowed by a later seedling with outstanding foliage and reasonable flower. Visitors have flagged/tagged their favorites but the only consensus winner is the two-year-old Pocomoke #11 with lustrous dark red-purple-green foliage. It has yet to flower.

One early named introduction is 'White Chocolate' (named by Mark Griffith) that escaped our rigorous evaluation process. Originally any seedling that grew knee-high or larger in one growing season was banished to the mulch pile. A second generation seedling of compact, true pink-flowered #35 produced chocolate-purple new growth, red-budded, opening white flowers and, to date, mildew- and *Cercospora* leaf spot free foliage. Size will range from 6 to 10 feet and the name 'White Chocolate' adequately describes its features.

Other Dirr Activities

As described, our major thrusts encompass *Hydrangea*, *Hypericum*, *Lagerstroemia*, and, at Athens and the Center, *Spiraea*. The Center allows great flexibility and several minor projects also parallel the larger projects.

Aucuba japonica

Have 118 seedlings of 6 maternal parents ('Salicifolia', Golden Heart', 'Serratifolia', 'Hillieri', 'Rozannie', and 'Marmorita'). The seeds were collected during my 1999 sabbatical at the Hillier Arboretum. Looking for compactness, unusual foliage patterns, and heavy fruiting. Plants (some) flowered for the first time in 2001. Several cultivars with highly speckled gold-green foliage, 'Marmorita' (female), 'Crotonifolia' (female) and 'Golden King' (male) appear promising.

Abelia improvement

Discussed during previous open houses but worth mentioning that Dr. Carol Robacker and Ph.D. student Michele Scheiber have seedlings of open-pollinated and controlled-crosses. Michele estimated that during the Ph.D. work she has made ~10,000 crosses. To walk the seedlings at Griffin is to believe in the miracles of genetic variation.

Our early work at the Center produced ~200 seedlings and two introductions: 1)'Rose Creek' with compact habit, abundant white flowers and rose sepals; 2)'Canyon Creek' has coppery-orange new growth that fades to yellow and finally green, in fall-winter leaves become antique shades of copper and bronze, flowers are larger than typical, pink and fragrant.

Clethra alnifolia 'Ruby Spice' × 'Hummingbird'

Dr. Dennis Werner, North Carolina State University, made the initial crosses and provided seeds of the F₂ generation which should segregate into pink-flowered, dwarf growing seedlings. My initial work growing open-pollinated seedlings of selfed 'Hummingbird' yielded many compact seedlings. 'Sixteen Candles', with flowers held upright like candles on a cake and lustrous dark green foliage, was the only introduction. Seedlings of open-pollinated 'Ruby Spice' produced mostly white-flowered seedlings with a few reasonable pinks.

Dr. Werner's controlled cross might yield the elusive but coveted pink flowers on a compact shrub. Typically, *Clethra* takes three-years from seed to flower so results will not be known until 2003.

Hibiscus syriacus 'Blue Bird'

The goal is to develop a rich blue-flowered hibiscus on a strong growing shrub framework. Typical 'Blue Bird' is a weak grower but has lovely blue flowers. Seeds were sown this spring and seedlings have produced pink and blue flowers. Difficult to tell whether there is anything of worth.

Nerium oleander 'Sugarland Red'

Oleander typically is killed to the ground or injured in Zone 7 to the degree that flowering does not occur. In 2000, seeds were collected from 'Sugarland Red', a more cold hardy form that I collected in Texas. It has grown 6 to 8 feet high and flowered with abandon in 2000. Seeds germinate without any pretreatment and (315) seedlings were transplanted into 3-gal containers on June 13, 2001. A few flowered (all red) by early September, 2001. The goals are compactness, increased hardiness, and a range of flower colors.

Table 2. *Hydrangea macrophylla* and *H. serrata* cultivars and seedling numbers at the Center and Dudley Nurseries.

Plant	Number
Center	
'All Summer' Beauty'	300
'Ayesha'	34
'Forever Pink'	117
'Générale Vicomtesse de Vibraye'	1
'Goliath'	2
'Holstein'	41
'Lilacina'	267
'Mme. Emile Mouillère'	37
'Nigra'	62
'Nikko Blue'	10
'Otaksa'	265
'Penny-Mac'	2
'Tokyo Delight'	296
'Veitchii'	1,156
'Westfalen'	12
'White Wave'	222
<i>H. serrata</i> 'Grayswood'	670
<i>H. serrata</i> 'Miranda'	8
<i>H. serrata</i> 'Preziosa'	65
Dudley	
Unknown Lacecap	20
'Freudenstein'	7
'Golden Sunlight'	12
'Lanarth White'	138
'Libelle'	136
'Miranda'	73
'Nikko Blue'	10
Total	3,963