

Elvenia J. Slosson Endowment Fund

Annual Report, First year, 2004-2005

Title: Selection of Pest and Disease Tolerant Dwarf Lilacs (*Syringa*) with Low Winter-Chill Requirement and Extended Bloom Period for the Home Gardener.

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Affiliates: The Southern California Lilac Council, including Mr. Robert Ludicans, Cook's Nursery, Visalia; the Lilac Garden volunteers at Descanso Gardens, La Canada-Flintridge; commercial lilac cut-flower growers at Acton and Julian, CA; and lilac home gardeners in southern California.

Introduction: Lilacs are desirable flowering shrubs in California and the USA. Drawbacks for the home gardener in Southern California include: 1) plant size from 6 – 15 feet is too large for many small, urban gardens; 2) available cultivars may grow and flower poorly because of insufficient hours of winter chill; 3) the bloom period of a cultivar is only 3 – 4 weeks each year, from mid March through April; some cultivars are susceptible to bacterial Pierce's disease (*Xylella fastidiosa*) and leaf powdery mildew.

A previous grant funded selection of 150 open pollinated, shorter seedlings out of *S. x hyacinthiflora* 'Pocahontas' that were grown and flowered at Riverside, Sunset zone 19. The pollen parents were a selection of commercial cultivars that flower well in the UCR Botanic Gardens. Because the earlier Descanso Hybrids have pale flower colors, and were selected on nurseries at nearby Chino and Upland (zone 18), Pocahontas was chosen as the female parent to impart darker flower colors, which it did. I also knew from earlier selection work by Dr. L.C. Erickson, that plants out of Pocahontas could have short adult stature, from 2 – 4 feet in height, which would be desirable for modern home gardens. I did not know in the mid 1990's that Pocahontas is susceptible to Pierce's disease, vectored by the glassy winged sharpshooter, which is common on citrus in the Riverside area. Two plants of this cultivar, including the original female parent, have since died. Other isolated plants in Riverside and four at Irvine, appear healthy. One of the original male parents was undoubtedly *S. x hyacinthiflora* 'Excel', a sister release of Pocahontas by the F. Skinner nursery in Manitoba, Canada (Hardiness Zone 3), which also grows and flowers well at Riverside, and which is also susceptible to *Xylella*. About 25% of the original 150 short selections have died on the UCR experiment station, and about the same number of 400 open-pollinated short seedlings from different mother plants. However, most commercial cultivars in the Botanic Gardens and on the Experiment Station appear tolerant.

Goals and Objectives:

The goal of this project, and of the Southern California Lilac Council, is to popularize lilac species and hybrids in southern California and areas with similar climates. The objective is to grow replicated trials at Riverside (Sunset zone 19) and at Irvine (Sunset zone 23) of taller, commercially-available cultivars and new, shorter selections, and

exotic species and hybrids not previously grown in Southern California. By doing so we will test and select for plants that cover the defects for home gardeners in the introduction, namely: 1) shorter size, preferably with less suckering; 2) plants will grow and flower well with less hours of low winter-chill temperatures; 3) extend the bloom period of available cultivars from 3-6 weeks to 16 weeks in spring, by selecting desirable plants that bloom earlier and later in the year, and plants that will bloom in spring, summer and fall, with open cone shaped inflorescences; 4) select plants that are tolerant to Pierce's disease and to leaf powdery mildew, the main diseases in Southern California.

Discussion: 1). **Shorter plants.** It is relatively easy to select short-stature lilac plants (2-4 feet tall) from open pollinated seed collected from different mother plants of commercial cultivars. Between one quarter to one third of seedlings will fall in this range, depending on the parents. Past nurserymen must have selected for taller plants since most wild or 19th and early 20th century cultivars are tall shrubs of the under story. A good number 30 or more, of the original 150 shorter seedlings from Pocahontas, were originally select by a review team in 2001 as being of good inflorescence characteristics and worthy of further observation. This number has been further reduced by *Xylella* susceptibility, but there are still some short plants with good flower and inflorescence characteristics that remain. Cuttings of the best of these were rooted in a mist chamber in spring/summer 2005 and placed in gallon pots. Dr. Ericksen's original short selection, Ramona, was also propagated. These will be planted into the field in winter/spring 2006.

2). **Adaptation to low winter chill:** Of the 28 original, bare-root commercial cultivars planted at Irvine in winter 2003, all have established themselves. Three plants died and were replaced. Plant height measured December 16, 2005, in general showed modest gains over the mean height a year ago (Table I). A few cultivars such as *Syringa x chinensis*, 'Angel White', 'Katherine Havemeyer', and 'President Poincare' lost height, due to death of the tips of tall shoots. Lilacs grow from the center of the shrub outwards, central shoots die and are replaced by suckers that come up from the base of the plant and take over. Also the hot Santa Ana winds in fall will dry out lilac shoots if soil water is lacking. Lilac shoot tip death is common in Southern California.

Other cultivars, such as 'California Rose' and 'Alphonse Lavallee' grew 23 cm in height in 2005 Other plants may still be establishing their root system after the shock of being transplanted bare root in 2003.

Flowering was sparse at Irvine. At least 12 of the cultivars have yet to flower either in spring or fall. These include Alphonse Lavallee, Adelaide Dunbar, Belle de Nancy, Charles Joly, Congo, Ludwig Spaeth, Madam Lemoine, Michel Buchner, Monge, President Grevy, President Poincare, and Primrose. Most of the same cultivars did not flower at Riverside either. Charles Joly does flower well in the adjacent UCR Botanic Gardens, so again it may be too early for these plants to flower.

Of the remaining 16 cultivars most had reasonable spring flowering displays at Irvine, though there was a tendency for inflorescences not to expand in to large cones as at Riverside, but to be intermediate between fall globose inflorescences and fully expanded cones. This may have to do with cooler daytime temperatures at Irvine that may affect adversely the development of individual flower pedicels and peduncles in the inflorescence. I am in correspondence with a flowering physiologist in The Netherlands who has researched conditions necessary to force flowering in glasshouse grown lilacs

for the florist industry. My understanding of the original paper in Dutch is that daytime temperatures above 70 F are required for optimum pedicel growth. These temperatures may not be reached at Irvine in winter/spring, nor inland at Riverside in late fall and winter, which may account for the production of globose winter blooms. A minimum number of degree days may be required for optimum inflorescence size. What is clear from plants that have flowered in spring 2003, 2004 and 2005 is that cultivars do not flower as well at Irvine as at Riverside. This may be due at Irvine to lack of winter chilling temperatures, or due to lack of minimum temperatures necessary for optimum inflorescence development.

Some Descanso hybrid cultivars, bred at Chino and Upland (zone 18) such as Angel White and Lavender Lady did flower at Irvine, as did Esther Staley, bred at San Jose, Pocahontas and Excel, bred in Manitoba, Canada, and Anabel, bred in Iowa. All are in the Hyacinthiflora group, being hybrids of *S. oblata* from China and *S. vulgaris* from southeast Europe. Other Hyacinthiflora Descanso hybrid cultivars did not perform as well at Irvine. Moreover, Pocahontas and Excel have a tendency not to fully expand their inflorescences. With one or two exceptions, eg. Katherine Havemeyer, most *Vulgaris* group cultivars did not flower well at Irvine, and some did not grow well either.

Modified working hypothesis: A way to obtain plants for the home garden is to select among seedlings from crosses that are adapted to flower near the coast. These will probably be hybrids of *S. oblata* and *S. vulgaris* (possibly Katherine Havemeyer) or *S. oblata* with cultivars in the Hyacinthiflora group that do flower at Irvine, such as Esther Staley, Angel White or Lavender Lady. They would be backcrosses to *S. oblata*. I have not planted *S. oblata* at Irvine, but I will do spring 2006.

An important finding at Riverside in autumn 2005 was three hybrid plants that flowered with **expanded cone-shaped inflorescences**, rather than the usual unexpanded globose ones. One was an experimental seedling planted by L.C. Erickson, derived from Hyacinthiflora group parents, and the other two were seedlings of *S. vulgaris* 'Olivier de Serres' x *S. oblata* 'Cheyenne', in effect new Hyacinthiflora hybrids. As mentioned above, *S. oblata* ssp. *dilatata* flowers several times a year, even during the winter in January, when grown in full sun at Riverside. These hybrids had good lilac scent on warm days, and some are developing capsules. A working hypothesis for multiflora-type lilacs for southern California is to select among seedlings of new crosses of *S. vulgaris* x *S. oblata*, (= *S. x hyacinthiflora*), or backcrosses of *S. x hyacinthiflora* x *S. oblata*, and to grow the hybrid seedling populations at Riverside and at Irvine.. It may be easier to select desirable plants at Riverside than at Irvine. Lilac flowers are open pollinated by bees, it may be relatively easy to isolate two parents, planted in large pots, in the glasshouse or field, and let the bees do the crossing.

This pollination technique does not always work. The earliest seedling plant (tentatively called 'Libby') to flower at Riverside each year, usually in late January, whose mother parent was a Hyacinthiflora seedling grown by L.C. Erickson, and which produces dainty, intermediate sized conical inflorescences when nothing else is in bloom, with small flowers of bright pink color, has been placed next to 'Ramona' that blooms in mid February with large purple flowers. Both plants are visited by bees, but so far Libby has not produced seed and is presumed female sterile.

Syringa pubescens ssp. *microphylla-superba* is in a different section of the genus than *S. vulgaris* and *S. oblata* and has not been successfully hybridized with those two species.

The species is a multiflora type, and selection among these hybrids might produce a dainty set of cultivars for spring, summer and fall blooms, less heavy than *Vulgaris* group lilac blooms. Summer blooms in August of *S. pubescens microphylla-superba* plants were spectacular at the new Scampston Walled Garden, North Yorkshire, UK, designed by Piet Oudolf, the Dutch landscape architect.

Xylella infection was not evident at Irvine in 2005, whereas it is present at Riverside, where plants are still dieing.

Leaf powdery mildew was evident at Irvine in November and December, after early fall rains. However, leaves are senescing by this time and it was not a serious problem. It might be in the future if we ever select good fall-flowering plants.

Fall Color: Again in 2005, Anabel at Irvine had attractive yellow-rust colored fall foliage. Pocahontas, which has a purplish color to young leaves, with purple flowers, developed attractive, purple-black blotches on fall leaves.

Suckering: Is not yet a problem at Irvine, though it is increasing. Several of the *Vulgaris* group that are growing slowly, are putting energy into suckers.

Promotion: J.G. Waines was invited to talk to the Redlands Horticultural and Improvement Society in November, 2005 on the lilac breeding project at UC Riverside financed by the E.J. Slosson Fund. RHIS is a member of the Garden Clubs of California, and was surprised by the connection to founding member Mrs. Slosson.

J.G. Waines will be an invited speaker at the International Lilac Society convention at the Hilda Klager Garden at Woodland, WA in April, 2006.

Publications:

J.G. Waines. 2005. Lilacs blooming out of season. *Lilacs (J. Int.Lilac Soc.)* 34(2):49-51.

J.G. Waines. 2005. Lilacs blooming out of season. *UC Riverside Botanic Gardens Newsletter*, 25(1):1-2.

I am taking seriously the suggestion to write an article on the breeding project for Pacific Horticulture, acknowledging support from the E.J. Slosson Fund. In 2005 I took photographs of inflorescences of some of the better selections from the original short-stature plants, at least those that have survived the *Xylella* attack, and I will take more in spring 2006 and write the text. At the same time we will propagate more cuttings of desirable plants in spring 2006.

Correction: In the December 2004 report, 'Duplex' was listed, incorrectly, as in the *Vulgaris* Group. It is in the *Chinensis* group and flowers well in spring, late summer and fall in Riverside.

Table I. Cultivars Planted at Irvine South Coast Research and Extension Center in 2003.

| Name | Group | Mean Height/Range cm | |
|----------------------|-------|----------------------|---------------|
| | | Dec. 2004 | Dec. 2005 |
| Common Eastern Lilac | V | 105 (76-127) | 109 (75-130) |
| Syringa x chinensis | C | 136 (130-145) | 133 (130-142) |
| Angel White | H | 113 (105-120) | 106 (100-110) |
| California Rose | H | 99 (77-110) | 122 (110-130) |
| F. K. Smith | H | 124 (120 -144) | 136 (105-170) |
| Lavender Lady | H | 96 (86-106) | 108 (100-123) |
| Alphonse Lavallee | V | 82 (74- 90) | 107 (105-110) |
| Adelaide Dunbar | V | 54 (42-70) | 59 (35-78) |
| Anabel | H | 100 (82-124) | 113 (97-150) |
| Belle de Nancy | V | 77 (63 - 90) | 80 (69-94) |
| Charles Joly | V | 72 (55 - 85) | 74 (60-82) |
| Burgandy Queen | V | 93 (86 –101) | 96(90-108) |
| Charm | V | 86 (70 – 102) | 90(78-108) |
| Congo | V | 58 (45 – 79) | 63 (50-80) |
| Excel | H | 87 (68 – 100) | 89 (80-98) |
| Esther Staley | H | 128 (115 – 140) | 135 (125-142) |
| Katherine Havemeyer | V | 131 (117 – 145) | 108 (98-120) |
| Krasavitsa Moskv | V | 115 (109 – 120) | 126 (110-140) |
| Ludwig Spaeth | V | 86 (73 - 95) | 88 (75-95) |
| Madame Lemoine | V | 68 (61 – 75) | 70 (60-78) |
| Michel Buchner | V | 78 (70 – 90) | 80 (70-90) |
| Monge | V | 106 (100 – 112) | 114 (110-127) |
| Pocahontas | H | 108 (100-123) | 108 (100-122) |
| President Grevy | V | 82 (80-85) | 83 (70-91) |
| President Lincoln | V | 113 (112-116) | 115 (100-125) |
| President Poincare | V | 105 (90 – 125) | 98 (73-110) |
| Primrose | V | 60 (50- 70) | 60 (55-70) |
| Sensation | V | 81 (66-90) | 93 (77-115) |

C = Chinensis Group

H = Hyacinthiflora Group

V = Vulgaris Group