

**THE EVALUATION AND PROPAGATION OF NEW CULTIVARS
DEVELOPED AT THE U.S. NATIONAL ARBORETUM**

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The U. S. National Arboretum, Washington, D.C., has become a major center for the development, evaluation, and distribution of woody ornamental cultivars. A new cultivar may arise as a selection from a seedling population derived from introduced seed, a naturally occurring or induced mutant, or a hybrid resultant from controlled pollination. The early hybridization work of B. Y. Morrison, who produced the vast array of Glenn Dale azaleas (18); and of O. M. Freeman, who produced *Magnolia* x 'Freeman' and 'Maryland' (11, 17), has been expanded in the last 15 years to encompass a major shrub breeding project and more recently a tree breeding project. From these research programs some 40 cultivars have been introduced and numerous seedling selections made which will yield superior shrub and tree cultivars in the future.

The development of a new cultivar by hybridization requires not only a minimum of 8-10 years for a shrub and many more years for a tree, but also a great expenditure of funds. Briefly, the current procedure of cultivar introduction into the nursery trade, and subsequently to the consumer, is as follows:

1) Hybridization, seedling production, and initial seedling selection research is conducted at the U. S. National Arboretum.

2) The seedling is propagated and sent to cooperators in other geographic regions for evaluation under a Standard Memorandum of Understanding for Evaluation of Potential New Cultivars of Ornamental Shrubs and Trees.

3) Propagation stock of the seedling selection to be introduced is distributed by the National Arboretum under number or cultivar name to cooperating wholesale propagation nurseries for volume stock increase under a Standard Memorandum of Understanding for Increasing the Planting Stock of Vegetatively Propagated Stock.

4) The selected plant is given a cultivar name that is registered and published, and official release made by the Plant Science Research Division of the Agricultural Research Service, U. S. Department of Agriculture

5) After stock increase, publicity in the form of brief, factual information is released by the National Arboretum to the trade journals.

6a) The cultivar is released for distribution by cooperating wholesale propagation nurseries to other wholesale and retail nurseries.

6b) The cultivar is distributed by the National Arboretum to cooperating arboreta, botanic gardens, and research institutions.

7) When a cultivar is listed in at least three retail nursery catalogs, the A.R.S. Information Div., U.S. Department of Agriculture, distributes press releases to publicize the merits and the availability of the cultivar to the consumer.

PROPAGATION OF NEW CULTIVARS

With few exceptions, the cultivars released to date by the National Arboretum are readily propagated utilizing softwood or semi-hardwood cuttings under mist as would be standard propagation practice for the species. However, a few comments would be in order for several of the cultivars.

The crape-myrtle cultivars are easily propagated by softwood, hardwood, or root cuttings. Softwood cuttings will root under mist in 3 weeks. Hardwood cuttings can either be rooted in the usual manner in cold frames in late fall and early winter, or placed horizontally on the propagation media in a warm greenhouse in mid-winter to vegetate. When the young shoots that form abundantly along the hardwood cutting are several inches long, they are removed and handled as softwood cuttings. The same hardwood cutting will produce a sequence of shoots that can be periodically removed and rooted.

Hibiscus rosa-sinensis 'Vulcan' and *H. syriacus* 'Diana' can be readily propagated by cuttings or grafting, but if grafted on stock of the same species, a salable plant will be produced more quickly. Mature wood will root, but will take much longer and will not produce as vigorous a plant as softwood cuttings.

The magnolia cultivars are best propagated by softwood cuttings, but success is dependent upon the condition of the cutting. *Magnolia* x 'Freeman' is more readily propagated from cuttings taken from immature plants. The deciduous magnolia cultivar cuttings are best taken very soft before the terminal bud has set. The softwood cuttings under interrupted mist will root in 6-8 weeks.

Pyracantha x 'Mohave' and 'Shawnee' both root readily and can be propagated by softwood, semi-hardwood, or hardwood cuttings. 'Mohave', in particular, is easily propagated and rapidly produces vigorous plants.

In general, the viburnum cultivars are best propagated as softwood cuttings under mist in early summer. If the cuttings are rooted early and kept under long days of at least 18 hours from mid-July until a second flush of growth has been produced, they will have a well established root system and sufficient growth to over-winter in cold frames. Late season propagations result in plants that will not have growth hardened to withstand freezing and must be over-wintered in a

cool greenhouse. *Viburnum* 'Mohawk' and 'Cayuga' can be readily propagated only when growth is very soft and before the terminal flower buds have been initiated. These two cultivars can be satisfactorily over-wintered if given long days to maintain the rooted cutting in vegetative growth until the second flush of growth.

DESCRIPTIVE COMMENTS OF NEW CULTIVARS

A brief description of each of the cultivars released by the U.S. National Arboretum follows. The N.A. number refers to the National Arboretum accession number, and the P.I. number refers to the plant introduction number assigned by the New Crops Research Division of the Agricultural Research Service. The hardiness zone of each, as indicated after the P.I. number, is based on the Plant Hardiness Zone Map, U.S.D.A. Misc. Publ. No. 814. All color designations are according to the Royal Horticultural Society Colour Chart, 1942 and 1966. Additional descriptive botanical details may be located in the original reference citation indicated after each cultivar name. (The following cultivars were illustrated with Kodachrome slides):

1.) *Hibiscus syriacus* L. 'Diana' (Egolf) *Baileya* 17(2):75-78. 1970. N A 32224. P.I. 347257. Zone 5.

'Diana' is a triploid from a cross of a tetraploid seedling with white petals and red eye spot and a heavily ruffled diploid white seedling selection made in 1963. It is being introduced because of its waxy, heavy textured, wide spreading, up to 6-inch diameter, ruffled, pure white flowers that remain open for more than one day; heavy, dark green leaves, dense branching; and compact, upright growth habit. Since 'Diana' is a triploid, there is little or no seed production. The majority of the flowers drop immediately after withering with the result that flower bud initiation is never inhibited, and the plant continues to flower freely until autumn. 'Diana' in 8 years has developed into a dense, upright shrub that is now 8 feet high and 6 feet wide.

2.) *Hibiscus rosa-sinensis* L. 'Vulcan' (Egolf) *Baileya* 14(2):47-49. 1966. N A 28178. P I. 315886. Zone 9b.

'Vulcan' resulted from a cross of *H. r-s* 'Fire Chief' x *H. r-s* 'Mason Red' made in 1963. It is a subtropical shrub of medium upright growth, with thick, leathery leaves. Flowers are 5-7 inches in diameter, blood red (Blood Red 820/1, Blood Red 820), with yellow (Yellow'Ochre 07/1 to Chrome Yellow 605/1) reverse that does not fade; of excellent form and substance; and persistent for more than a day except in extreme heat. It has grown well in sun or shade. Plants grown outdoors produce flowers and leaves somewhat smaller than when grown in the greenhouse. 'Vulcan' is a semi-tropical plant which can be grown only in areas similar to Florida and Southern California where *H. rosa-sinensis* is hardy.

3) *Ilex crenata* Thunb 'High Light' (Kosar). *Proc. 37th Mtg., Holly Soc. Amer.* P 5 1964 N A. 16473. P I. 316588 Zone 6.

'High Light' is a male selection from a branch mutation of *I. c.* 'Microphylla' made in 1956 by W. F. Kosar. The cultivar may be distinguished by its broadly pyramidal growth habit, boxwood-like textured foliage; dark green leaves, 1 inch long and $\frac{3}{8}$ inch wide, and twiggy branching that gives the mature plant a billowy appearance. The plant is as hardy as *I. c.* 'Microphylla'. During the past 15 years at the National Arboretum the cultivar has grown to 13 feet in height and 11 feet in width. The plant with the aspect of boxwood is best used as a specimen in the landscape.

4) *Ilex* x 'John T Morris' (Skinner). *Proc. 31st Mtg., Holly Soc Amer.* P. 11 1961 N A 12201 P I 267825 Zone 7a

'John T Morris' is a male selection from a cross of *I. cornuta* Lindl. 'Burfordii' x *I. pernyi* Franch. made in 1948 by H. T. Skinner at the Morris Arboretum, Philadelphia. The rich, glossy, dark green, leathery leaves, which are $1\frac{1}{4}$ - $1\frac{3}{4}$ inches long and 1 to $1\frac{1}{2}$ inches wide, have 5-7 deep lobes ending in stiff spines. The original plant, now 15 feet high and 12 feet wide, has a symmetrical, conical growth habit. It is suitable for the small residential garden and hedges.

5) *Ilex* x 'Lydia Morris' (Skinner). *Proc. 31st Mtg., Holly Soc. Amer.* P 11 1961 N A. 12202 P I. 267824 Zone 7a.

'Lydia Morris' is a female selection from the same cross as 'John T Morris'. The cultivar has abundant $\frac{3}{8}$ inch diameter, cardinal red (Orange Red 34A to 33A) berries that ripen in November and persist until mid-winter and are spectacular against the glossy, dark green leaves. The original plant has a symmetrical, conical growth habit that is 12 feet high and 8 feet wide.

6) *Ilex* x 'Accent' (Kosar) *Proc. 41st Mtg., Holly Soc. Amer.* P 13 1966 N A 28260. P I 329154 Zone 7a?

'Accent' is a male selection produced by the hybridization of *I. integra* Thunb x *I. pernyi* Franch. by W. F. Kosar in 1960. The cultivar is a single-stemmed, evergreen shrub of narrow, conical growth habit with dark green, fine textured foliage. The leaves are elliptic, $\frac{5}{8}$ to $1\frac{3}{4}$ inches long and $\frac{5}{8}$ to $\frac{7}{8}$ inch wide, with 3 to 4 soft small spines on each margin. In 11 years the plant has grown to 8 feet in height and 3 feet in width. It was introduced as a pollinator for 'Elegance', as well as for an accent plant in the landscape.

7.) *Ilex* x 'Elegance' (Kosar) *Proc. 41st Mtg., Holly Soc Amer.* P. 13 1966. N A. 28261 P I 329153 Zone 7a?

'Elegance' is a female selection from the same F_1 seedling population as 'Accent', with similar foliage and growth habit. The cultivar has fruit $\frac{3}{8}$ inch in diameter that ripens as early as October to red (46B). The original plant in 11 years has grown to 8 feet high and 2 feet wide.

8.) *Ilex* x 'Oriole' (Kosar). *Proc. 41st Mtg., Holly Soc. Amer.* P. 13. 1966. N.A. 28322. P.I. 329156. Zone 7a.

'Oriole' is a female selection made by W. F. Kosar in 1956 from an F₂ population resulting from a sibling cross of an F₁ *Ilex myrtifolia* Walt. x *I. opaca* Ait. hybrid produced by H. T. Skinner in 1949. The cultivar is a compact, slow-growing, fine-textured, red fruited plant. The thick, leathery leaves that resemble *I. myrtifolia*, are 2 to 2³/₄ inches long and 1/2 to 5/8 inch wide with 3 to 4 small spines on the upper half of each leaf margin. The fruit is 7/16 of an inch in diameter and bright red (Red 46B to Orange Red 33A). The original plant has attained a height of 5 feet and a width of 6 feet in 15 years.

9.) *Ilex* x 'Tanager' (Kosar). *Proc. 38th Mtg., Holly Soc. Amer.* P. 12. 1965. N.A. 28323. P.I. 329155. Zone 7a.

'Tanager' is a female selection of the same origin and of similar growth habit to 'Oriole'. It differs in that the fruit is more like *I. myrtifolia*; 5/16 of an inch in diameter; bright red (Red 45A to Red 40A); and more exposed on the branches. The original plant is a globose shrub that in 15 years has grown to 6 feet high and 7 feet wide.

10.) *Lagerstroemia indica* L. 'Catawba' (Egolf). *Baileya* 15(1):8. 1967. N.A. 28861. P.I. 316671. Zone 7b.

'Catawba' is a selection from a cross of *L. i.* 'Dwarf Purple' x *L. i.* 'Light Lavender' made in 1960. The abundant, compact inflorescences are borne on terminal and lateral branches over the entire plant from late July to September with scattered recurrent flowering. The dark purple (Violet Purple 733/1) inflorescences are complemented by the glossy, dark green foliage. The glossy, thinly coriaceous foliage is resistant to mildew, and in autumn turns a brilliant orange-red. Growth habit is compact and globose that in 11 years has grown to a height of 10¹/₂ feet and a width of 11 feet.

11.) *Lagerstroemia indica* L. 'Cherokee' (Egolf). *Baileya* 17(1):1-2. 1970. N.A. 30167. P.I. 326427. Zone 7b.

'Cherokee' resulted from a cross of *L. i.* 'Hardy Red' x *L. i.* 'Low Flame' made in 1960. The cultivar is introduced because of its brilliant red (Red Purple 63A) florets that begin to open in late July and maintain a good recurrent display through September. The compact panicles are borne in abundance on terminal and lateral branches over the entire plant. The red flowers are complemented by the dark green, glossy, thinly coriaceous leaves. The compact plant in 11 years has grown to a height of 8 feet and a width of 7¹/₂ feet.

12.) *Lagerstroemia indica* L. 'Conestoga' (Egolf). *Baileya* 15(1):8-10. 1967. N.A. 28862. P.I. 316672. Zone 7b.

'Conestoga' resulted from a cross of *L. i.* 'Alba' x *L. i.* 'Low Flame' made in 1960. This selection has consistently produced abundant, long-tapered in-

florescences that arch gracefully outward each season. The flowers, which open lavender (Phlox Purple 632/2, 632/3, and lighter on the same inflorescence) and change to pale lavender, produce a multiple-colored inflorescence. Flowering begins in mid-July before most crapemyrtle cultivars are in flower and continues over a period of 2 months. The heavy foliage is only slightly susceptible to mildew. 'Conestoga' has an open growth habit that in 11 years has grown to a height of 10 feet and a width of 14 feet.

13) *Lagerstroemia indica* L. 'Potomac' (Egolf) *Baileya* 15(1):10-12 1967. N A 28863. P.I 316673 Zone 7b.

'Potomac' was selected in 1962 from an *L. indica* seedling population treated with colchicine. Each season the cultivar has consistently produced abundant flowers which begin to open in mid-July with recurrent bloom until October. The flowers, in large, terminal panicles, are clear medium pink (Phlox Pink 625/1). The dark green, leathery leaves are highly ornamental, with only slight mildew susceptibility late in the season. The vigorous, upright growth habit indicates that the plant will develop into a large, tree-like specimen. In 12 years the plant has grown to a height of 15 feet and a width of 13 feet.

14) *Lagerstroemia indica* L. 'Powhatan' (Egolf) *Baileya* 15(1).12-13. 1967 N A 28864 P I. 316674 Zone 7b.

'Powhatan' resulted from a cross of *L.i.* 'Dwarf Purple' x *L.i.* 'Light Lavender' made in 1960. The light lavender (Imperial Purple 33/1 with base slightly darker) flowers begin to open in late July and continue to provide a good display until late September. The glossy, thinly coriaceous leaves are highly tolerant to mildew. 'Powhatan' is a dense, globose plant that in 11 years has grown to a height of 10½ feet and a width of 10½ feet.

15) *Lagerstroemia indica* L. 'Seminole' (Egolf) *Baileya* 17(1)·2-5. 1970. N A 30166 P I 326426. Zone 7b

'Seminole' resulted from a cross of *L. i.* (hardy pink) x *L. i.* 'Low Flame' made in 1960. 'Seminole' was introduced because of its clear, medium pink (Red Purple 67B, base 59C to lighter shade 64D) flowers that begin to open in mid-July with recurrent bloom until October. The dense, dark green leaves are thick, leathery, and highly ornamental. The dense, globose plant in 11 years has grown to a height of 8½ feet and a width of 8½ feet.

Magnolia

The eight deciduous magnolia cultivars are all sterile F₁ triploid selections that resulted from hybridization of *Magnolia stellata* (Sieb. & Zucc.) Maxim. and *M. liliflora* Desr. The cultivars all are multiple-stemmed, deciduous shrubs with a rounded or erect growth habit, 7 to 12 feet in height. The growth habit and flower color approaches that of *M. liliflora*. The flower color and number of tepals per flower may vary from year to year, depending upon environmental conditions. All flower later than the *M. stellata* parent and thus tend to escape damage by spring frosts. In the hybrids varying degrees of fragrance have been inherited from *M. stellata*.

16) *Magnolia* x 'Ann' (Dudley & Kosar). *Morris Arb. Bull.* 19(2):28. 1968. N.A. 28344. P.I 326570 Zone 6.

'Ann' resulted from the hybridization in 1955 by Francis deVos of *M. l.* 'Nigra' x *M. s.* 'Rosea', as did the cultivars 'Judy', 'Randy', and 'Ricki'. 'Ann' commences flowering in early to mid-April and is the earliest to flower of the eight cultivars of this series. The erect, tapered flower buds are red purple (71A) at the base, grading to lighter red purple (70B) toward the apex. The flowers are 2 to 4 inches in diameter with 6 to 8 erect tepals, purple (75D) on the inside surface, red purple (72B) on the outside surface, grading into lighter red purple (74D) at the apex and margins. The original plant in 16 years has grown 7 feet high and 5 feet wide.

17) *Magnolia* x 'Judy' (Dudley & Kosar) *Morris Arb. Bull.* 19(2):28. 1968. N.A. 28345. P.I 326571. Zone 6.

'Judy' (*M. l.* 'Nigra' x *M.s.* 'Rosea') is the slowest growing of the series, and flowers in mid- to late April. The erect flower buds are red purple (71A to 70A). The small flowers are 2 to 3 inches in diameter, with 10 tepals, with the inside surface of the tepals creamy white (155A) and the outside surface red purple (70B fading to 70C and 70D). In 16 years the original plant has attained a height of 7 feet and a width of 5 feet.

18.) *Magnolia* x 'Randy' (Dudley & Kosar). *Morris Arb. Bull.* 19(2):28. 1968 N.A. 28346 P I. 326572 Zone 6.

'Randy' (*M.l.* 'Nigra' x *M.s.* 'Rosea') is extremely floriferous and flowers in late April. The pointed flower buds are red purple (71A) grading to lighter red purple (72B) above the middle. The flowers are 3½ to 5 inches in diameter, star shaped, with 9 to 11 tepals, with the inside surface white (155D) and the outside surface red purple (72A or 73A to 72D or 73D). The original plant has a height of 9 feet and a width of 10 feet.

19.) *Magnolia* x 'Ricki' (Dudley & Kosar). *Morris Arb. Bull.* 19(2):29. 1968 N A 28347. P.I. 326573. Zone 6.

'Ricki' (*M.l.* 'Nigra' x *M.s.* 'Rosea') is erect and flowers in late April. The long, slender flower buds are red purple (71A to 73A through 73C). The flowers are 4 to 6 inches in diameter, with 10 to 15 tepals, often twisted, with the inside surface either white (155D) or stained purple (71A to 75D), and the outside surface red purple (74C or 61B) at the base fading to purple (75A through D) or red purple (74C and D). The original plant in 16 years has grown to a height of 11 feet and a width of 6 feet.

20.) *Magnolia* x 'Betty' (Dudley & Kosar). *Morris Arb. Bull.* 19(2):26. 1968. N A 28348 P I. 326574 Zone 6.

'Betty' resulted from hybridization of *M. l.* 'Nigra' x *M. s.* 'Rosea' by W. F. Kosar in 1956. It flowers in mid- to late April. The pointed and sometimes curved flower buds are red purple (71A) with some fading at the apex (73D and 74D). The flowers are large, up to 8 inches in diameter, with 12 to 19 tepals;

white (155D) on the inside surface and the outside surface grading from greyed purple (187D) at the base to a red purple (73D and 74D) at the apex. The original plant in 15 years has grown to a height of 10 feet and a width of 9 feet. 'Betty' is an outstanding cultivar with large flowers borne in abundance.

21.) *Magnolia* x 'Susan' (Dudley & Kosar). *Morris Arb. Bull.* 19(2):26-27. 1968. N A. 28350 P I 326575 Zone 6.

'Susan' resulted from a cross of *M.l.* 'Nigra' x *M.s.* 'Rosea' by W. F. Kosar in 1956. It flowers in mid- to late April. The erect flower buds are red purple (71A, 72A) grading into lighter red purple (71B) at the apex. The fragrant flowers are 4 to 6 inches in diameter, with 10 to 15 twisted tepals, red purple (74D) on the inside surface, and the outside surface deeply colored with varying gradations of red purple (70A, 72A and B or 73C, 70C and D, 73D, 74C and D). The original plant has a height of 7 feet and a width of 7 feet. 'Susan', with its smaller stature and abundant flowering, is an outstanding cultivar.

22) *Magnolia* x 'Jane' (Dudley & Kosar). *Morris Arb. Bull.* 19(2):27 1968 N.A 28349 P.I. 326576 Zone 6.

'Jane' resulted from a cross of *M. l.* 'Reflorescens' x *M. s.* 'Waterlily', made by W F Kosar in 1956. It flowers in early May and is one of the last to flower in the series. The slender, erect flower buds are red purple (71A) grading to lighter coloration (74C and 74D). The flowers are very fragrant, cup shaped, 3½ to 4 inches in diameter, with 8 to 10 tepals, white (155D) on the inside surface with the outside surface grading from a red purple (78B or 73A) at the base into a light red purple (73D and 74D) at the apex. The original plant in 15 years has grown to a height of 12 feet and a width of 8 feet.

23) *Magnolia* x 'Pinkie' (Dudley & Kosar) *Morris Arb. Bull.* 19(2):27 1968. N A. 28351. P.I. 326577 Zone 6.

'Pinkie' resulted from hybridization of *M. l.* 'Reflorescens' x *M. s.* 'Rosea' by W F Kosar in 1956. It is the latest of the series to flower in early to mid-May. The blunt flower buds are red purple (70A) at the base, grading to lighter red purple (70D) along the margins and apex. The flowers are cup shaped, 5 to 7 inches in diameter, with 9 to 12 broad tepals, white (155D) on the inside surface and the outside surface pale red purple (73A, 74D) at the base to almost white at the apex. In 15 years the original plant has grown to a height of 8 feet and a width of 9 feet.

24) *Magnolia* x 'Freeman' (Hyland). *U.S.D.A. Plant Inventory No.* 169-274 1967 N A 7717-3 and 12203 P I 277263 Zone 7

'Freeman' is a selection of *M. virginiana* L. x *M. grandiflora* L. produced by hybridization by O M Freeman in 1930 and 1931. The cultivar is a single-trunked, evergreen tree, densely branched, of relatively narrow, columnar growth habit. The leaves are thick, leathery, elliptic to oblanceolate, 4 to 6 inches long and 1¼ to 2½ inches wide, resembling those of *M. grandiflora*. The cream-white, cup shaped, 5 inches in diameter flowers have a strong lemon fragrance. Flowering occurs with a major flush during May and June, followed

by a second but lesser flush of flowers during August. The 40-year-old plant is now 41 feet in height, with a trunk girth of 12½ inches d.b.h. and branch spread of 19 feet.

25) *Magnolia* x 'Maryland' (Meyer) *Newsletter Amer. Mag. Soc.* 8(1):8-9 1967. N.A. 7717-6. P.I. 358717. Zone 7.

'Maryland' (*M. v.* x *M. g.*) is of the same origin as 'Freeman'. The cultivar has a wide spreading growth habit. A 15-year-old plant of 'Maryland' is now 20 feet high with a 14-foot breadth. 'Maryland' has a hardiness range similar to *M. grandiflora*.

26) *Malus sieboldii* (Regel) Rehd. 'Fuji' (Jefferson) *Amer. Hort. Mag.* 47(1):22-24. 1968. N.A. 2073. P.I. 325156. Zone 5.

The horticultural merits of *Malus sieboldii* 'Fuji' were recognized by Roland M. Jefferson in 1968. The origin of the cultivar is unknown. The parent plant at the U.S. Plant Introduction Station, Glenn Dale, Maryland, is approximately 40 years old and 28 feet tall with a spread of 46 feet. The abundantly produced flowers are greenish-white (157D) with occasional traces of red purple (66D), and have the 8 to 10 inner petals loosely clustered in an erect anemone-like arrangement. The yellow (Greyed Orange 63A) fruit is approximately ½ inch in diameter.

27). *Metasequoia glyptostroboides* Hu and Cheng 'National' (deVos). *Amer. Hort. Mag.* 42(3) 174-177 1963. N.A. 10920. P.I. 286608. Zone 5.

'National' was selected from a seedling population of over 200 plants grown from seed (P.I. 161688) received in 1948 from W. C. Cheng, the Arboretum, National Central University, Ting Chia Chiao, Nanking, China, through arrangements made by the Arnold Arboretum. The cultivar has a narrow pyramidal growth habit and compact branching. The original tree in 23 years has a trunk girth of 16 inches d.b.h. and is 58 feet tall and 24½ feet wide. 'National', like the species, is a deciduous conifer with bright green summer foliage that turns an attractive copper-red in the fall. With age the lower trunk becomes attractively buttressed.

28). *Pyracantha* x 'Mohave' (Egolf) *Baileya* 17(2):79-82. 1970. N.A. 32225. P.I. 347258. Zone 6.

'Mohave' resulted from a cross of *Pyracantha koidzumii* (Hayata) Rehd. x *P. coccinea* Roem. 'Wyatt' made in 1963. 'Mohave' was selected for attractive fruit that ripens early and remains ornamental until mid-winter; foliage that is heavy, dark green, and semi-evergreen to evergreen; dense, upright branching; and resistance to fire blight and scab. The fruit is firm, waxy, and dark orange red (Orange Red 32A) as it ripens in mid-August, changing to red orange as the season advances. Bird damage has been insignificant, or none, while other cultivars have been stripped of fruit. The original plant is now 8 years old; has a height of 13½ feet and a width of 16 feet. Since it has been hardy to -5° F., it can be expected to survive wherever *P. coccinea* and its cultivars are grown. The upright growth habit makes the plant adaptable for

specimen, hedge, or espalier landscape use. 'Mohave' was awarded a Certificate of Preliminary Commendation by The Royal Horticultural Society (England) Floral Committee in 1971.

29) *Pyracantha* x 'Shawnee' (Egolf) *Baileya* 14(2) .61-63 1966 N A. 28179 P I 315887 Zone 7b

'Shawnee' resulted from an F₂ seedling selection of *Pyracantha* 'San Jose', which is considered to be a spontaneous hybrid of *P. koidzumii* (Hayata) Rehd. and *P. fortuneana* (Maxim) Li. 'Shawnee' was selected for abundant inflorescences of glossy, clear yellow to light orange (Cadmium Orange 8 to Orpiment Orange 10) fruits that have an ornamental effective period of up to 7 months; semi-persistent foliage; dense branching; and resistance to fire blight and scab. The original plant has a height of 9 feet and a breadth of 10½ feet. Bird damage to the fruit has been insignificant, or non-existent, while other nearby pyracantha plants have been stripped of fruit

30) *Viburnum* x *rhytidophylloides* Sur 'Alleghany' (Egolf) *Baileya* 14(3) .108-109 1966 N.A 28865 P I 316675 Zone 5b.

'Alleghany' was selected from an F₂ *V. rhytidophyllum* Hemsl. x *V. lantana* L 'Mohican' seedling population in 1958. Plants have very dark green, coriaceous leaves; abundant inflorescences, resistance to bacterial leaf spot, hardiness, and vigorous, dense, globose growth habit. The foliage, which tends to be deciduous to semi-persistent, is intermediate between the parental species. It is smaller than *V. r.*, and is more leathery than *V. l*. The rugose, coriaceous leaves are resistant to leaf spot and are highly ornamental. The abundant, yellowish-white flower inflorescences in May are effectively displayed above the dark green foliage. For several weeks in September and October the fruit becomes brilliant red (Currant Red 821/1) as ripening advances to black at maturity. In 13 years the original plant has attained a height of 10½ feet and a spread of 11 feet.

The cross, *V. r.* x *V. l.*, was previously made in Holland to produce *V. x rhytidophylloides* 'Holland', and by Henry Tubbs of Willowwood Farm, Gladstone, New Jersey, to produce *V. x rhytidophylloides* 'Willowwood'. 'Alleghany' has smaller, more persistent leaves and a more compact growth habit than the latter two cultivars. Although 'Alleghany' is hardy to Zone 5b, in more severe climates the naked flower buds may be winter-killed.

31). *Viburnum dilatatum* Thunb 'Catskill' (Egolf) *Baileya* 14(3) 109-111 1966. N A. 28866. P.I. 316677 Zone 5b.

'Catskill' is a dwarf growing *V. dilatatum* seedling selection made in 1958 from plants raised from seed obtained from Japan. 'Catskill' was selected for the compact growth habit; smaller and rounder leaves; and good autumn coloration. The compact, wide spreading growth habit has been constant. The smaller, dull, dark green leaves, which are more nearly round than on most *V. d.* plants, assume good yellow, orange, and red fall coloration. The creamy-white inflorescences are produced in mid-May on new growth. The dark red (Brick Red 016 to Currant Red 821) fruit clusters, which are dispersed over the plant, ripen in mid-August and provide a display until mid-winter. The original plant, now 13 years old, is 5 feet high and 8 feet wide.

32) *Viburnum x carlcephalum* Burk ex Pike 'Cayuga' (Egolf) *Baileya* 14(1):27 1966. N A 28180. P I. 315888 Zone 5b.

'Cayuga' is the result of a backcross made in 1953 of *V. carlesii* Hemsl. x *V. x carlcephalum* Burk ex Pike (*V. carlesii* x *V. macrocephalum* Fort.). 'Cayuga' is distinct in producing abundant inflorescences with pink buds (Rose Opal 022 / 1) that open to white flowers in late April; compact growth habit; and medium textured foliage, with tolerance to bacterial leaf spot and powdery mildew. The leaves, which are less susceptible to bacterial leaf spot and powdery mildew than those of *V. carlesii*, are a darker green, smaller and not as coarse as those of *V. x carlcephalum*. In the autumn the foliage turns a dull orange-red. Although the inflorescences of 'Cayuga' are smaller than those of *V. x carlcephalum*, their greater numbers present a mass effect and a more ornamental plant. The flowers open from one side of the inflorescence in such a way that nearly all inflorescences have pink buds accenting the white, waxy flowers. 'Cayuga' is a compact, spreading, deciduous shrub to 5 feet high. Plants have been hardy as far north as Ithaca, New York.

33) *Viburnum dilatatum* Thunb. 'Iroquois' (Egolf). *Baileya* 14(3):111-112. 1966. N.A. 28867. P.I. 316678. Zone 5b.

'Iroquois' resulted from a cross of two *V. d.* selections made in 1953. The cultivar was selected for large, thick textured, dark green leaves; abundant inflorescences of creamy-white flowers; large, glossy, dark scarlet fruits, and dense, globose growth habit. The heavy textured foliage is ornamental at all seasons, glossy green in summer, and orange-red to maroon in autumn. In mid-May the inflorescences transform the plant into a mound of creamy-white. The glossy, red (Orient Red 819 to Cardinal Red 822) fruits are larger than those on most *V. d.* plants. The flat, wide spreading fruit clusters contrast well with the dark green leaves. The fruit, which ripens in late August, persists after the leaves have fallen, and often the dried fruits are in abundance in mid-winter if not eaten by birds earlier. The original specimen is 9 feet high and 12½ feet wide.

34). *Viburnum x burkwoodii* Burk. & Skip 'Mohawk' (Egolf). *Baileya* 14(1):27-28. 1966. N.A. 28181. P.I. 315889 Zone 5b.

'Mohawk' resulted from a backcross of *V. x burkwoodii* (*V. carlesii* Hemsl x *V. utile* Hemsl.) x *V. carlesii* made in 1953. The cultivar was selected for the dark red (Currant Red 821 / 2 to 821 / 3) flower buds which open to white petals with red-blotched (Currant Red 821 / 3) reverse, abundant inflorescences, strong, spicy clove fragrance; compact growth habit, and foliage resistant to bacterial leaf spot and powdery mildew. The brilliant red flower buds appear several weeks before the flowers begin to open, and extend the effective ornamental period of the plant to several weeks rather than a few days as with other *V. c.* types. The strong, spicy clove fragrance is very pleasant and a noteworthy attribute of 'Mohawk'. The glossy, dark green leaves, which turn a brilliant orange-red in autumn are highly resistant to bacterial leaf spot and powdery mildew. The original plant is a compact shrub 7 feet in height with spreading branches to 7½ feet. 'Mohawk' has been hardy as far north as Ithaca, New York. In colder regions the plant may survive, but the naked flower buds may be frost damaged.

35). *Viburnum lantana* L 'Mohican' (Egolf) *Baileya* 14(3):112-115. 1966. N A. 28868 P I. 316679. Zone 4.

'Mohican' was a seedling selected in 1956 from a population grown from *V. l.* seed received from Poland. The plant, as deciduous shrub, was selected for compact growth habit; thick, dark green leaves, fruit that turns orange-red and maintains an effective display of 4 or more weeks, and resistance to bacterial leaf spot. The creamy-white flowers and expanding pale green leaves appear together for a week in late April-early May. The orange red fruit (Jasper Red 018 to Blood Red 820) begins to ripen in early July and remains effective for 4 or more weeks, whereas fruit on other *V. l.* plants pass rapidly from orange to black. The original specimen in 15 years has grown to 8½ feet high and 9 feet wide.

36). *Viburnum* x 'Oneida' (Egolf) *Baileya* 14(3):115-117. 1966 N A 28869 P I 316676 Zone 5b

'Oneida' resulted from a cross of *V. dilatatum* Thunb. x *V. lobophyllum* Graebn made in 1953. This deciduous shrub was selected for the abundance of flowers in May and sporadic flowers throughout the summer, the glossy, dark red (Fire Red 15 / 1 to Cardinal Red 822) fruit that persists until late winter, and the thin textured foliage that turns pale yellow and orange-red in autumn; and upright growth habit with wide spreading branches. Because of the two or three sporadic flowering periods, abundant fruit is produced that ripens in August and persists on the plant until mid-winter. The original plant has grown to a height of 10 feet and a width of 9½ feet.

37) *Viburnum sargentii* Koehne 'Onondaga' (Egolf) *Baileya* 14(3) 117-119 1966 N A 28870 P.I. 316680 Zone 5.

'Onondaga' was selected from a selfed population of *V. s.* in 1959. 'Onondaga' may be distinguished by velvety, pubescent, dark maroon (Erythrite Red 0027) young leaves that maintain a maroon tinge when mature. The dark maroon foliage is evident as soon as the buds expand and is distinct until the leaf matures. The plant will produce a greater foliage display if pruned to induce dense branching. The inflorescences, composed of creamy-white sterile and fertile flowers, are effective against the maroon foliage. The sparse, red (Orient Red 819 to Chrysanthemum Crimson 824) fruit ripens in September and contrasts well against the foliage. The smaller stature, up to 6 feet high, is less than half the size of most *V. s.* plants and provides a plant adaptable for smaller properties.

38) *Viburnum sieboldii* Miq. 'Seneca' (Egolf) *Baileya* 14(3):119 1966. N.A. 28871. P.I. 316682. Zone 5b

'Seneca' resulted from a self-pollination of *V. s.* The plant was selected for the abundant, large, pendulant inflorescences of firm red fruit on red pedicels which persists on the plant up to 3 months before turning black and falling. The massive, creamy-white panicles are produced in May-early June as the young foliage unfolds. The panicles are supported on stout, spreading branches that are picturesque at all seasons. The pendulant, multiple-colored clusters of orange-red (Indian Yellow 6 / 2 to Jasper Red 018, ripening to Blood Red 820) fruit are spectacularly displayed above the coriaceous, green foliage. Birds

normally eat the fruit of *V. s.* before it has matured, leaving only the red pedicels which provide an ornamental display. However, the fruit of 'Seneca' is very firm and is not devoured by birds even when the fruit becomes fully ripe. Although 'Seneca' is tree-like and has attained a height of 14 feet and a width of 13½ feet, the plant can be trained with several branches from the base and kept as a large spreading shrub. This cultivar will undoubtedly equal in size plants of the species and be as much as 30 feet with gnarled trunk.

39) *Viburnum sargentii* Koehne 'Susquehanna' (Egolf) *Baileya* 14(3) 120
1966 N.A. 28872 P. I. 316681 Zone 5

'Susquehanna' was selected in 1959 from a seedling population raised from seed obtained from Japan. The plant was selected for the heavy branched, corky trunk, coriaceous, dark green foliage; abundant flowers and fruit; and upright growth habit. *V. s.* as commercially grown usually is not the true species, or it may be an inferior form of the species. The large inflorescences of sterile and fertile creamy-white flowers are produced on the new growth and provide an effective display for a week in late May. The large clusters of fruit are yellow-green (Yellow Ochre 07 to Burnt Orange 014) during the summer, ripen to glossy, dark red (Capsicum Red 715 to Currant Red 821) in September, and remain on the plant until mid-winter. The sturdy, corky branches are attractive for landscape use either when covered by the large, glossy leaves, or when the plant is dormant, exposing the corky, fissured trunks. The original specimen, now 12 years old, is 15 feet high and 16 feet wide. The cultivar is ideal for park planting but not suited to the small home garden.

Availability of New Cultivars

The Plant Science Research Division of the Agricultural Research Service, U.S. Department of Agriculture, has no plants of the cultivars introduced by the U.S. National Arboretum for sale. A limited number of plants for propagation purposes have been distributed to cooperating arboreta, botanic gardens, research institutions, and wholesale propagation nurseries for evaluation and stock increase. As the cultivars are commercially propagated, they will become available to the retail nurseries, and consequently to the consumer.

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MODERATOR FLEMER: It should be apparent that the National Arboretum has an extensive breeding program encompassing a number of genera. If you have never taken the time to go to our National Arboretum, I think you will find it is a great treat to any plantsman.

Continuing on with our emphasis on new plants I will turn the podium over to Al Fordham for our session entitled "New Plants—Slides and Descriptions".

MODERATOR FORDHAM: I believe all of you are familiar with the way this section of the program is run, and the usual stipulations are pertinent here. With this in mind, I have a short paper which will preface this section of the meetings which has to do with some of the many variants of Canadian hemlock and their propagation.