

## UNUSUAL PLANTS AND THEIR PROPAGATION

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The coniferous, deciduous and broad-leaved plant collections of the Bureau of Parks, Rochester, N.Y., contain some plants of distinct and unusual habits of growth. The variations in these plants include forms of low, compact, dense, upright, pyramidal, spreading, pendulous, and color variations, not to mention many other characters and traits. The hardiness factor also enters into the picture in relation to hybrid rhododendrons and other plants of a tender nature. The development of hardier clones is a major goal.

The Park Department is interested in maintaining and adding to its fine collections of plant species and clones and is always on the look out for new forms of plant life. Some of these plants have found their way into the trade, others are only in arboretums and collections. The test of time and climate will determine the usefulness of this plant material.

I would like to say a little about the experimental work that is underway at the present time, as well as some of the techniques we have developed or are using for the propagation of specific types of plants. A program of hybridization is going on principally with lilacs, and clones and species of rhododendrons and viburnums. About 150 *Rhododendron* and *Azalea* crosses have been made and are under observation. The rooting of conifers and rhododendrons in unheated cold frames is also under test. The rooting of lilacs, *Viburnum carlesii* and the Japanese red maple from hardwood cuttings is under study. Also various methods have been used in the rooting of other difficult subjects.

We have found that in shield budding some maples the time of starting the budding operation is of the utmost importance and can mean a loss of 50% or more in the bud take. The propagator must determine the proper time to bud. To determine the proper budding time involves several factors, the first of which is the stage of development of your bud stick. The propagator must look for certain factors governing proper maturity of bud sticks and maturity of buds to be used. Leaf buds must have reached a stage close to maturity and wood must be about three-quarters of maturity. When budding *Acer platanoides erectum* and *Acer saccharum columnaris*, all well-matured buds on bud sticks can be used with good results, excluding the two lowest buds. All wood from the shield bud must be removed when budding maples. Also strict attention must be given to observe that the filament that feeds the leaf bud in the center of the eye is not removed when de-wooding, discard the bud if the filament has been removed. The understock must be in a turgid state and the bark must easily part from the cambium. Better results can be attained by inserting the bud below the full length of the T-shaped incision. *Acer nikoense* came through very well side grafted in the greenhouse on an *Acer saccharum* understock.

Evergreens to be used for understocks are potted in October in a soil mixture of equal parts soil, peat and sand. The pots are plunged two-

thirds deep in sand on an open bench with 65°F. bottom heat. Several daily mistings make ideal conditions for the inducement of root action. Side grafting of most conifers can take place when the understocks shows considerable root action. All grafts should be tied with rubber bands and (no waxing) placed on an open bench. Frequent mistings are required to maintain humidity. During winter periods, no shading is placed over grafts. Wedge grafts were used to graft some firs with very good results, eliminating the need for cutting the understock thereby resulting in a smoother and stronger union.

Cuttings of *Stewartia pseudocamellia* can be easily rooted during the winter months by bringing in cut branches and inserting them in water in a warm greenhouse. After the leaf buds start to grow and the stems have elongated, one half to two inches long, cuttings can be made of the soft tips. Insert the cuttings in a medium of 2 parts sand, 1 part peat moss Hormodin No. 3, or stronger, can be used to treat the cuttings. After rooting, the cuttings should be potted in a medium of 2 parts peat moss, and 1 part sand.

A fast and sure method of producing grafted, dormant lilacs is to pot the grafted plants into 3 inch rose pots with a medium of one part sharp sand and one part loam or well rotted compost. Grafting methods employed can be either the whip and tongue or the saddle (wedge) graft. Waxing of wounds is not necessary, but the grafts should be potted at least one inch below the soil so as to encourage scion rooting.

Two forms of Japanese flowering cherries have rooted very well from cuttings which were taken from balled and burlapped plants and forced in a cool greenhouse *Prunus serrulata Senriko (Ojochin)* and *P. s. Torano-o.* Soft cuttings were taken February 19, 1956 and inserted in a medium of 2 parts sand and 1 part peat moss; using Hormodin No. 3, under plastic and bottom heat of 70-75°F, ninety-eight per cent of the cuttings rooted and all had very strong root systems.

*Franklinia alatamaha* roots very well from very soft cuttings inserted in jars of pure water and shaded from the direct rays of the sun. After the cuttings are well rooted they should be potted in a medium of equal parts of sand and peat moss.

*Metasequoia glyptostroboides* propagated very well from strong, hardwood, defoliated cuttings, taken from mid-November to early December. Cuttings were made six to eight inches in length, wounded on both sides, dipped in Hormodin No. 3, and stuck in a medium of sharp sand. Bottom heat was beneficial. Moisture content of the medium was the deciding factor in the successful rooting of Dawn trees. Once watered, refrain from watering again until the surface of the medium is on the dry side, then water lightly and repeat this process until the cuttings are rooted.

(Editor's Note: Mr. Fenicchia concluded his talk with a series of slides which he discussed as they were shown. This discussion is included since valuable information on varieties, clones and propagation techniques were noted.)

1. *Acer ginnala.* Durand Dwarf

- a) The virtues of the Amur maple are well known. Therefore it seemed of interest to have a mutation occur in the Durand-

- Eastman park planting which produced a dwarf form. Propagation of this has been an interesting problem.
2. *Acer grandidentatum* Western Sugar Maple
    - a) This Western Sugar Maple, in fifty years, has made a thirty foot, broadly columnar tree. One characteristic is the gnarled enlargements at the union of the branches and trunk. It grows well from seeds, sown as soon as they are gathered.
  3. *Acer griseum*. Paperbark Maple
    - a) The Paperbark maple is becoming rather well known as a good, small tree. It is probably a Zone 6 tree but its striking bark and autumnal wine-red leaves, call for extensive use. Seedlings grow well but the seeds have a double dormancy. Seeds must be stratified 12 months at temperatures between 32-45°F. After stratification, seeds are fall sown and will germinate in the spring.
  4. *Acer nigrum ascendens*. Slavins Upright Maple
    - a) It is the good fortune of this country to have native maples available, nearly everywhere, for ornamental use. Mr. B. H. Slavin selected this upright form of Black maple, now a mature tree in Highland Park. There is some evidence that in calcareous soils, Black maple is the best street tree maple. We are not making as much use of this form as we should. It can be budded on sugar maple or Black maple understock.
  5. *Acer platanoides erectum*. Mount Hope Norway Maple
    - a) Over fifty years ago there was noted a slow-growing conical form of the Norway maple, in a row planted in Rochester's Mount Hope Cemetery. Considerable use has been made of this form for street tree planting as it withstands the rough conditions of city life. It is easily budded on its own type or side grafted in an open bench.
  6. *Acer platanoides variegatum*. Harlequin Maple
    - a) Leaf color variegations of white or yellow are not too commonly seen in our area but this form with a green center and a wide white margin seems well worth more use. It apparently is the form introduced by an English nursery before 1903. It can be propagated by budding, but it is slow growing until it becomes well established.
  7. *Acer saccharum columnare*. Temples Upright Maple
    - a) Temples Upright, first introduced in 1885 is the distinct form of Sugar maple in which all of the branches are ascending. It is easily budded on its own type.
  8. *Acer senacaensis* (*A. leucoderme* x *A. saccharum*). Seneca Maple
    - a) The Seneca maple originated as a chance seedling in 1919. It was selected from a seedling of the southern Chalk maple, some of which were fertilized by the Sugar maple. The resulting hybrid is typically intermediate in size and smaller in all respects than the Sugar maple. It may be grown by budding on Sugar maple or side grafting in greenhouse.
  9. *Aesculus carnea brioti*. Ruby Horsechestnut
    - a) This is recognized as the best of the hybrids between the common horsechestnut and Red buckeye. The Ruby horsechest-

- nut will be 100 years old next year and it still commands attention. This can be propagated by side or veneer grafting on common horsechestnut understock.
10. *Aesculus parviflora*. Bottlebrush Buckeye
    - a) Bottlebrush buckeye is the prime show of the July flowering shrubs. The variety *serotina* extends flowering a couple weeks later into August and seems to have even longer and showier panicles than the species. This may be propagated from root cuttings or division.
  11. *Carpinus caroliniana* (Upright form). American Hornbeam
    - a) As an addition to the strictly upright trees, this form of the native American hornbeam is one worthy of more attention. Propagation is by budding or side grafting in the greenhouse.
  12. *Cercidiphyllum japonicum sinense*. Chinese Katsuratree
    - a) The Chinese variety of Katsuratree differs in having but one trunk, whereas the Japanese type usually has several. In other respects it is the same useful, pest-free tree. Katsura grows very well from seed and is a fast and a strong grower.
  13. *Chionanthus retusus*. Chinese Fringetree
    - a) The Chinese fringetree is a really choice flowering shrub, too rarely seen. The male plant, especially, is a fountain of delicate white flowers. In habit it may become a small tree. It is easily side grafted on the native fringetree, *C. virginicus*.
  14. *Elaeagnus umbellata*. Autumn Elaeagnus
    - a) This plant's October fruit is very acceptable bird food. It has an unusual color variation in foliage. This is propagated by grafting on its own type.
  15. *Euonymus oxyphyllus*. Japanese Euonymus
    - a) The Japanese (or Korean) *Euonymus oxyphyllus* is one of the small, deciduous spindle-trees which are notable for the rich coloring of their fruits. This one comes in two shades of red. It may be propagated by seed sown as soon as it is gathered and cleaned, or by softwood cuttings.
  16. *Fagus sylvatica* (Globe form). European Beech
    - a) European beech has many forms and varieties but the globe shaped tree, which I have watched for many years, may be something new and worthwhile. It is easily propagated by side or veneer grafting in the greenhouse.
  17. *Hamamelis mollis*. Chinese Witchhazel
    - a) Chinese witchhazel is the most reliable winter-flowering shrub that we have. We have a variety with reddish flowers which we call *superbum*. It is easily propagated by budding on *Hamamelis virginiana* or from cuttings..
  18. *Magnolia cordata*. Yellow Magnolia
    - a) Yellow magnolia is thought to be a southern form of the Cucumber tree. In Rochester it stays as a low tree with a spreading crown. Flowering is usually abundant. This should be side grafted on *Magnolia kobus* seedlings.
  19. *Magnolia fraseri*. Fraser Magnolia
    - a) Recently described erroneously as having rosy-red flowers, the Fraser magnolia, with large creamy white flowers saves its red-

- ness for the ripening fruits. Its leaves are conspicuously eared at the base. Seeds germinate well after stratification in a very sandy medium.
20. *Magnolia kobus borealis*. Hokkaido Magnolia
    - a) The Hokkaido magnolia comes from the northern island in Japan. A Highland Park specimen has developed into a large tree. Every other year it is completely covered with flowers early in May. It can be grafted on *Magnolia kobus* seedlings or grown from seeds.
  21. *Magnolia macrophylla*. Big Leaf Magnolia
    - a) The Bigleaf magnolia requires a most sheltered spot to reach tree-size, in Rochester. However, there is one notable specimen in the former Ellwanger and Barry nursery grounds that reached an exceptional age and beauty. For propagating, stratify the seeds, as soon as they are cleaned, at temperatures of 35-45 degrees. Sow in the spring in a sandy medium.
  22. *Magnolia sieboldi*. Oyama Magnolia
    - a) Oyama Magnolia is the shrubby Japanese plant which extends the Magnolia flowering season into the summer. Side graft this on *Magnolia kobus* and it is also easily grown from stratified seeds.
  23. *Magnolia Slavinii*. Slavins Snowy Magnolia
    - a) Slavins Snowy is a hybrid, early-flowering type, from the seed of *Magnolia salicifolia*. A chromosome count has cast doubt on the published premise that *Magnolia soulangeana* is the other parent. Propagate this by cuttings or grafting on *Magnolia kobus* understock.
  24. *Malus coronaria*. (Unnamed Variety)
    - a) A new seedling in the *Malus coronaria* species, it has double pink flowers. It is easily budded or grown from whip grafts.
  25. *Malus ioensis fimbriata*. Fringe Petal Crabapple
    - a) The Fringe Petal crabapple is a strong-growing clone of the Prairie crabapple with double pink fragrant flowers and notched petals. It follows the Bechtel crabapple in order of flowering. Budding or tongue grafting produce fine plants.
  26. *Malus Katherine*. Katherine Crabapple
    - a) The Katherine crabapple produces long branches that are filled with double white flowers. The tree is as broad as it is high, which is about eighteen feet. Budding is the best method of propagation.
  27. *Malus Species*. (Unnamed Red-fruited Variety)
    - a) Another unnamed seedling was selected for its large fruits of a bright red color, hanging on long after most crabapples have dropped or been spoiled by freezing. The plant is of a dwarf nature with light pink flowers.
  28. *Rhododendron #6* (*Smirnovi* x *maximum* x *caractacus*). (Unnamed hybrid)
    - a) There is considerable variation within this hybrid. Some good forms may later be selected. They are very hardy and strong growers.

29. *Rhododendron carolinianum album*. Carolina Rhododendron  
 a) The White Carolina rhododendron is a natural variety of which there are several clones of varying ornamental value. Seedlings come fairly true to color.
30. *Rhododendron dauricum* x *Rhododendron carolinianum*. (Unnamed Hybrid)  
 a) This is a strong grower which flowers early and roots well from cuttings.
31. *Rhododendron fortunei hybrida*. Fortune Rhododendron Hybrid  
 a) The Fortune hybrids are contributing to our rhododendron flower displays now. The pink-flowered form is one of our better plants and is very hardy. It roots fairly well under plastic. The flowers have abortive stamens.
32. *Rhododendron maximum superbum*. Rosebay Rhododendron Hybrid  
 a) *R. maximum superbum* is an old Parson's Nursery selection or possibly a hybrid of the native Rosebay. It commonly extends the flowering season past the middle of July. It roots well from cuttings, under plastic.
33. *Rhododendron racemosum* x *Rhododendron carolinianum*. (Unnamed Hybrid)  
 a) This has fine foliage and is a strong grower. It roots fairly well from cuttings under plastic.
34. *Rhododendron roseum* x *Rhododendron japonicum*. (Unnamed Hybrid)  
 a) This is best rooted from softwood cutting under plastic. It is a floriferous type.
35. *Rhododendron Smirnovi* x *Rhododendron maximum*. (Unnamed Hybrid)  
 a) This is a very hardy hybrid which roots well from cuttings.
36. *Rhododendron yedoense poukhanense* x *Rhododendron japonica*. (Unnamed Hybrid)  
 a) This is very hardy and a strong grower which roots from semi-hardwood cuttings.
37. *Sambucus canadensis rubra*. Redberried American Elder  
 a) By virtue of its bright red fruit, the red American elderberry becomes a useful ornamental shrub especially for semi-silt or damp ground plantings. This should not be confused with the early fruiting native red-elder. It is grown from root cuttings or division.
38. *Styrax obassia*. Fragrant Styrax  
 a) Fragrant styrax is a large-leaved, tall growing, shrub with pendant clusters of fragrant white flowers. It grows well from seeds after stratification.
39. *Syringa pekinensis*. Pekin Lilac  
 a) One of the interesting characteristics of the tree-like, Pekin lilac is the cherry-like bark which is glossy, reddish brown, and peeling. It is a fast grower from seed and can be used as an understock for budding French lilacs. These plants are abundant annual bloomers, blooming late in June after the French lilacs.

40. *Syringa spp.* Edward J. Gardner  
 a) The finest new American lilac is the double, pure pink Edward J. Gardner. Mr. Gardner, before his illness and death, was doing excellent work with lilacs at his Wisconsin nursery.
41. *Syringa spp.* Sensation  
 a) The recently released Dutch lilac, Sensation is notable in having the first bicolor effect. The purple of the parent Hugo De Vries is edged with white. It appeared as a mutation in 1938. Propagation can be by cuttings or root grafting.
42. *Wisteria venusta.* Silky Wistaria  
 a) The Silky wistaria has white flowers and is characterized by a silky hairiness, covering the leaves. It should be grafted on *W. sinensis* using the whip and tongue graft.

MODERATOR COGGESHALL: Thank you, Mr. Fenicchia. Now Mr. K. D. Holmes, Mt Arbor Nurseries, Shenandoah, Iowa will speak on the "Propagation of Some of the Stone Fruit Trees."

MR. K. D. HOLMES (Mount Arbor Nurseries, Shenandoah, Iowa): After listening to the sessions since arriving Thursday noon, I am convinced that either our methods are completely outmoded, or that the cycle is coming around to the point where our methods are about to become popular again. Be that as it may, my subject is quite different from those discussed so far in these meetings.

Mr. Holmes presented his paper entitled "Propagation of Some of the Stone Fruit Trees." (Applause)

## PROPAGATION OF SOME OF THE STONE FRUIT TREES

K. D. HOLMES

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It has been suggested that I speak on the subject of "Propagation of Some of the Stone Fruits." I will attempt to tell you, rather briefly, of the methods used at Mount Arbor Nurseries. I might start by telling you of the type of record form we keep on all budding operations. We use a large columnar ruled pad, 17" x 11". This record is prepared in our main office and each page carries a main heading showing the type or species and the location, such as the farm number, the block number and section. A sub-heading carries the row number, the variety, budder, date budded, and the amount budded. There is also a space for brief comments and a column for the per cent of bud take that the budding foreman fills in as we re-bud. There is also space for the name of the re-budder, man hours and rate of pay. This column, if filled in as the budding season ends, will give very valuable cost information.

As concerns our actual methods of production I will start with comments on dwarf flowering and dwarf fruiting peach trees. We line out *Prunus besseyi* or *Prunus tomentosa* seedlings which are about  $\frac{3}{16}$ " in caliper. We prefer to get these understocks planted in the fall and bud them the following August. Both *P. besseyi* and *P. tomentosa* are