

Methods of Propagation of New Selections at Nurseries Caroliniana[®]

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INTRODUCTION

Since Nurseries Caroliniana specializes in many new and unusual plant selections that are not typically on the market, many plants are acquired where little to no propagation information is available. One must determine whether methods used should be similar to other plants in the same genus or family or whether completely new procedures should be explored. Methods which are investigated are seed, cuttings, grafting, budding or layering.

***ARDISIA CRENATA* ‘BENI KAJAKU’**

Pink peacock coralberry is a striking cultivar of this species which was acquired in Japan that has brilliant burgundy and pink new growth with an added attraction of pink flowers and dark red berries in the fall. An attempt was made to root this cultivar by typical semi-hardwood to hardwood cutting methods under mist with 0% success. The original plants of this selection were allowed to flower and fruit. Berries were harvested and planted in January in 3-gal community pots with approximately 50 to 75 seed per pot using a pine-bark-based nursery growing medium. The containers were placed outside under light pine shade. In early April the seed began to germinate at close to 100%, and surprisingly all came true to type with deep burgundy leaves with not a single green leaf among them. The seedlings were then pricked out in the fall, planted in 4-in. plastic pots and placed in a cold frame.

***ARDISIA CRISPA* ‘KOKKOU DARUMA’**

This species is a much more cold-hardy species than the previous *A. crenata* and is hardy into U.S.D.A. Zone 7b. This particular cultivar has white borders to its leaves with extremely “wavy” margins and brilliant red berries in the fall follow small white flowers in spring. It was purchased in Japan as a grafted plant at a nursery specializing in *Ardisia* species and cultivars. As with the previous selection, an attempt was also made to root this selection with no success. It was thought that the unusual variegated and morphological characteristics of this cultivar would not come true from seed, but upon producing fruit, they were allowed to ripen and removed from the plants and planted in community pots similar to the previous selection. The seed germinated at a very high percentage but showed only green leaves, but late in the growing season, they began to display characteristics similar to its parent with white and wavy leaf margins. It has not been proven that second generation seedlings will produce seedlings as true to form.

***LIRIOPE PLATYPHYLLA* ‘KOREAN GIANT’**

This species of *Liriope* has extremely tall flower spikes to over 1.3 m (50 in) tall, but it is an exceedingly slow divider. Now that the demand is growing, and more product is needed, planting in raised beds gives a faster rate of division. It is a good seed producer and seed have been collected and planted with approximately 50% germination when the testa is removed and planted on the soil surface so that the seed will be exposed to light. The seedlings grow quite slowly initially and may not be economically feasible since they may be crossed with other nearby species. This is not clear since they have not matured enough. Putting this selection in tissue culture might be a more feasible way to increase production and keep it true to form.

ROHDEA JAPONICA

Nippon lily is an exceptional dry shade landscape subject, which much like the previous selection, divides quite slowly. With many new variegated forms available, there is increased demand for these selections. Frequent division seems the most viable means of increase when done from early summer to late winter. The only time to avoid would be late winter to late spring when new foliage is being produced. Tissue culture has proven feasible for green-leaf forms and some vigorous variegated forms, but there is the danger of some reversions in tissue culture, so rigorous culling must be practiced.

EUCOMIS COMOSA 'SPARKLING BURGUNDY'

Sparkling burgundy pineapple lily is in the lily family, *Liliaceae*, and is a bulbous perennial hardy from U.S.D.A. Zone 6-10. It will divide slowly on its own, but far too slowly for commercial production. Initially efforts to tissue culture this selection proved futile. It was found that leaf cuttings could be taken in June and the leaves could be sectioned into 5-7 cm (2-2.8 in.) sections cut horizontally across the fleshy leaf. Being careful to maintain the polarity of the leaf cuttings, they are stuck approximately 1.5 cm (0.6 in.) into un-amended nursery potting soil in a vertical to slightly angled position in plastic trays. These are left un-watered for 2 days to allow the cut portions to callous and then they are watered in and covered with a clear polymer tray-cover to maintain the humidity. The trays are then placed under high pine shade. They are checked every few days for moisture and if necessary the covers are removed and watered with a sprinkling can. Roots begin to emerge from the basal end of the cuttings in about 3 weeks, after which small bulbs will begin to form. The covers are removed when plantlets are about 2 cm (0.8 in.) in height. Trays are then moved to a cold frame which is kept just above freezing for the duration of the winter. Each leaf section will produce from 1 to 8 offsets. The following spring, when the plantlets are approximately 7-8 cm (2.8-3.1 in.) in height, they are divided and potted in a nursery growing medium in 7.5-cm (3-in.) pots and when these become well established they are planted into trade gallons. Thereafter, the plants are grown outside with no protection. *Heloniopsis orientalis* is a closely related species native to Japan which can be produced by this same method, but its leaves are bent into an inverted "U" with both the basal end as well as the apical end inserted into the rooting medium. Propagules will then form at both ends of the leaf cuttings.

PONCIRUS TRIFOLIATA 'SNOW DRAGON'

This variegated contorted form of hardy citrus is most attractive particularly in spring and early summer when it is producing new growth. It is also extremely cold hardy even when grown in U.S.D.A. Zone 6. When most new growth appears, it is practically devoid of chlorophyll in its leaves and stems, but as the growth matures, the leaves will tend to get slightly greener and its stems will slowly turn green also. This plant will root under mist from summer cuttings, but the growth rate is quite slow on its own roots. But when grafted with a simple cleft graft or side veneer graft in February and March with a scion of 2-3 buds, a saleable plant can be produced in one growing season. *Poncirus trifoliata* 'Flying Dragon' seedlings planted in 1 quart pots are used as under-stocks. Grafts are covered with clear plastic cups until new growth is observed.

WISTERIA FLORIBUNDA 'NISHIKI'

Japanese wisterias are usually sold for their extremely long and elegant flowering racemes with colors ranging from purple to lavender to pink and one double flowering cultivar. There are also several variegated foliage types. One is 'Mon Nishiki' with a heavily speckled gold variegation, and another is 'Nishiki' which actually appears to have green speckling over a white background. The former cultivar roots well with semi-hardwood cuttings under mist. But 'Nishiki' has so little chlorophyll that it is almost impossible to root from cuttings, but it is easily grafted with a side veneer graft using seedling *W. sinensis* as the under-stock in February or early March. By this method, one can produce a 3 gallon saleable plant in one growing season.

DIOSPYROS RHOMBIFOLIA

This species of Chinese persimmon is quite popular in Japan as a bonsai subject because its fruit is in scale for a bonsai specimen. There is some dispute as to whether it is *D. rhombifolia* or *D. cathayensis*, with the latter being more evergreen. Some authorities say that they are one and the same. This selection has bright red fruit. Even though this species is dioecious, it was assured by Japanese nurserymen that this cultivar produces fruit without pollination, possibly by means of parthenocarpy. Most of the larger edible types of persimmon are grafted, but initially cuttings of this selection were taken in late spring using semi-hardwood cuttings, wounding and treating with a 10-sec dip of a 10:1 dilution of Dip'N Grow liquid rooting hormone. Initially there was little activity, but after about 8 weeks, 90% rooting occurred with some initiating new growth upon rooting.

***ERIOBOTRYA JAPONICA* 'DOKA'**

This variegated loquat is quite popular in Japan with its white margins, and most of the plants found there are grafted using a side veneer graft. Since green leaf cultivars of this species root quite well with firm wood on bottom heat in late fall and winter, initially this was tried with 'Doka' with poor results. Hence, an attempt to air layer this plant using sphagnum moss as a substrate, and a commercially available Press'n Seal™ food wrap was used to hold the sphagnum in place. The transparent wrap gives good visibility to observe when roots are emerging. The stems were girdled using a pair of bird nail clippers for the space of approximately 2 cm. This was initiated in a cold frame in February and the rooted stems were removed in August. A problem was had with the cambium layer bridging the girdled portion on a number of the layers. Another method which produced good results was a whip in tongue approach graft using seedling loquats in 1-qt containers, attaching them to concrete re-enforcing wire encircling the parent plant. This method produced almost 100% success but it is very labor intensive. But when only small numbers are needed, it is adequate. Both the layers and the grafts were potted with excellent survival.

***YUCCA ALOIFOLIA* 'TRICOLOR'**

This is a rare form of variegation with this cold hardy species which has a broad central yellow band leaf with margins of green on either side. Since division is so slow, an attempt was made to root stem cuttings. The trunk of the plant was cut in sections of approximately 12.5 cm (5 in.) and allowed to dry for 2 days. Except for the terminal, the stems were stripped of all leaves and potted in a pine-bark-based nursery mix with approximately half of the stem cutting below the soil. The rooting medium was watered every 5 days. Roots began to emerge in approximately 3 weeks and then numerous buds began to emerge from around the stems. Upon growing these sprouts off, they are removed and rooted in a similar way and then grown off. If there would be a great demand for this cultivar, tissue culture would be an excellent method to produce larger numbers.

***OSMANTHUS FRAGRANS* CULTIVARS**

The cultivars of this species are our number one selling product at Nurseries Caroliniana. We are trying to acquire new cultivars of this on a regular basis, particularly deeper orange flowering forms and variegated leaf types. We have found that when acquiring new cultivars from Asia during fall and winter, we can grow these under extended day length to induce growth through periods of shorter days by using 100 W light bulbs spaced 2.5 m (8.2 ft) apart in the greenhouse. The ambient temperature will range from 2°C (35°F) to 30°C (86°F) during the winter months and this will result in almost continuous flushes of new growth with a bottom heat of 20°C (68°F). During this period cuttings can be taken when the stems are still green and just firm enough not to "flop." Dip'N Grow rooting hormone is used at a 10:1 dilution rate with a 10-s dip and stuck in 6.5-cm (2.5-in.) diameter plastic pots with mist and bottom heat set at 20°C (68°F). Under these conditions, root initiation can be observed in 15 days.

RHODOLEIA HENRYI

This is a relatively unknown species in the West in the witchhazel family, *Hamamelidaceae*; whereas, the species *R. championii* has been an infrequent occupant of gardens for years, mostly along the gulf coast and down into Florida, mainly in U.S.D.A. Zones 9-10. But *Flora of China* reports *R. henryi* is found at elevations up to 2450 m (8038 ft), which would make this a likely Zone 7 subject if not Zone 6b. The provenance of our selections are not known, but they have survived outside in U.S.D.A. Zone 8 in containers with not protection down to -11°C (12°F) with no damage. It is a large shrub to small tree with red to pink flowers of 5-6 cm (2-3 in.) in diameter from mid-March to mid-April in Zone 8. Even temperatures as low as 7°C (20°F) did not damage its flowers when they were open. We experimented with rooting cuttings from fairly green wood in June and more mature wood in October, using a 10:1 dilution of Dip'N Grow rooting hormone and a 10-s dip placed under mist. Fall cuttings had bottom heat of 20°C (68°F) with extended day length of 18 h using 100 W bulbs spaced 2.5 m on center in the propagation house which was covered with white polyethylene. The younger cuttings rooted at 90%; whereas, the older wood cuttings rooted at 85%. The rooted cuttings were potted the following June in 2-qt pots and grew off quite well with some producing as much as 1 m of growth with little branching. The older wood liners grew off more vigorously than the softer wood cuttings. There were sparse flower buds set approximately 12 months after cuttings were taken, but when shifted to 2-gal containers, there was fairly heavy flower bud set 24 months from the time cuttings were taken.