

## HYBRIDIZING RHODODENDRONS

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The introduction and growing of new plants is an important part of the nursery industry. New plants result from the discovery of new species — mostly by plant explorers, from mutations of existing known species, or through hybridization.

Every nurseryman constantly surveys his plants in the field and is occasionally rewarded by discovering a superior plant. These are generally variations within the species, but on rare occasions they can be the natural hybrids between even distantly-related species.

When growing plants from seed, the nurseryman has an opportunity to select better strains, and plants grown from seeds selected from these improved strains will generally retain more of the desirable characteristics. Occasionally, even greater variations will occur. Many rhododendrons, azaleas, and kalmias will quite regularly reproduce color shades and plant growth habits similar to those of their parents, if plants of the same characteristics are cross-pollinated or isolated from each other. For example, we grow a selected dark green hemlock, *Tsuga canadensis* 'Westonigra', from seed with practically 100% uniformity. *Tsuga canadensis* 'Pendula' also produces weeping forms with equal consistency. *Betula pendula* 'Purpurea', the purple-leafed birch, comes true from seed about 50% of the time, even from open-pollinated trees. Since our new plant cultivars, except for somatic mutations, originate as seedlings, the nurseryman and plant breeder should always select the best plants as seed parents.

My experience with hybridizing started rather successfully in 1940 when the first cross I ever attempted between *Rhododendron carolinianum* and *R. dauricum* var. *sempervirens*, resulted in the P.J.M. hybrids. My experience with naming new plants also started with this cross. The name 'P.J.M.' is a grex: a name for a group of plants, and not for an individual clone. We did not originally detect variability among the vigorous seedlings, and we rooted cuttings from many of them. Several years later we noticed differences among them, but the plants were already in the trade. I then selected three clones which we now raise exclusively, but most nurseries seem to be content with their own strain. The lesson to learn is to introduce only named clones.

Rhododendrons and azaleas are very easy to hybridize. They blossom within a few years and, in my case, having a nursery that sells landscape-sized plants, we can sell many of the plants after we have selected out the few we need for vegetative growing or for further breeding. My original success with the P.J.M. hybrids sparked in me an interest in the need for hardier and better forms of rhododendrons and azaleas.

My first plan was to breed a pink and a white form of the P.J.M. hybrids. The easiest way to acquire the pink form would have been to inbreed and start selecting progeny that showed signs of variability towards pink. The P.J.M. hybrids were sterile and did not set seeds when inbred. Years later, when the plants matured, they eventually did set some seed. Upon the advice of Dr. Gustav Mehlquist I then started an inbreeding program. In the meanwhile, the only way to change the color was to cross the P.J.M. hybrids with a species with the color desired. The P.J.M. hybrids, crossed with *R. carolinianum* var. *album* produced several thousand plants with faded lavender-colored flowers. I selected two nearly white hybrids and named them 'Laurie' and 'Balta'. These are good selections for a garden but, perhaps, too slow growing as a commercial plant. I then crossed 'Balta' with *R. carolinianum* var. *album*, and the resulting cross produced a good white named 'Molly Fordham'.

The best hardy pink lepidote species in existence in 1958 was *R. mucronulatum* 'Cornell Pink'. I crossed a P.J.M. hybrid with 'Cornell Pink' and obtained a very showy deeper pink deciduous hybrid that I named 'Marathon'. This same cross was also made using a P.J.M. hybrid selection with a slightly petaloid flower and that resulted in one we call 'Weston's Pink Diamond.' This hybrid is a semi-double pink, retains some evergreen foliage, is easy to propagate by cuttings, and is a good commercial plant.

One of the original P.J.M. hybrids was a weaker grower, but had a fairly double flower. I crossed that with *R. dauricum* var. *album*, and a very double-flowered hybrid was the result. The lavender flowers were heavy, and the plant itself was not particularly vigorous, resulting in flowers that drooped, particularly when wet with rain. However, hybrids from crosses with these rather sad offspring have been vigorous and exhibit degrees of doubleness from complete camellia types to trumpet forms. I hope that these plants with flower colors from white through pink and purple will continue to have strong enough stems to hold the beautiful blooms.

Backcrossing a P.J.M. hybrid with *R. carolinianum* resulted in slightly later-flowering plants similar to the species *R. caro-*



*linianum*. I selected a particularly good-foliaged seedling and selfed it. A seedling was selected that was vigorous, early-blooming, and has a large, strong pink flower. It seems to possess the characteristics for which we have been searching for so long. Its name at present is 75-3.

Inbreeding the P.J.M. hybrids, which has been possible to a limited degree, has resulted in strains with deep-colored winter foliage and deeper purple flowers. 'Black Satin' has a coal-black winter foliage color when grown in the sun, while 'Ebony' is lower-growing and 'Princess Susan' is still lower with deep purple flowers. Further crosses with this strain are now developing flowers that are approaching red shades.

My first cross with *R. mucronulatum* 'Cornell Pink' was with a blossom Dr. Robert Tichnor brought to me from a plant in his greenhouse in Waltham, Massachusetts in March of 1958. We fortunately had a *R. carolinianum* var. *album* in bloom that was forced for the Boston Flower Show. We pollinated several flowers and fortunately the seed developed to give us hybrids we call the Shrimp Pink hybrids. Three named clones are 'Wally', 'Caronella' and 'Llenroc'. They bloom a week after 'Cornell Pink' and thus escape late frosts, are good pinks, and are partly evergreen with colorful fall foliage.

Low-growing flowering plants are invaluable in today's landscapes. Dr. Tichnor had that in mind when he crossed *R. × laetivirens* with *R. carolinianum* in the 1950's. The two hybrids, 'Waltham' and 'Desmit', resulted from that cross. They are pink flowering and have excellent evergreen foliage. Dr. Tichnor then crossed 'Waltham' with 'Cornell Pink' and named that deep pink, earlier-flowering hybrid 'Northern Rose'.

The search for a pink form of P.J.M. hybrid, unsuccessful in so many attempts, prompted me to select a good pink form of *R. minus* var. *compacta* to cross with a pink evergreen form of *R. mucronulatum* that I had selected from a group of seedlings. This simple cross resulted in a lovely pink evergreen hybrid, that I named 'Olga Mezitt', after my mother.

Dr. Tichnor and I have been very fortunate to get outstanding hybrids from primary or close-to-primary crosses. We selected good parents and just happened to start crossing lepidotes seriously before many other plant breeders.

Elipidote rhododendrons are the large-leafed types most people recognize as rhododendrons. My interest with this group has been toward developing hardier and lower-growing cultivars. Most of my crosses have been between our own hardy hybrid seedling selections. Eventually patterns and strains develop, such as low growers and plants that consis-

tently flower in similar colors. We have selected and named a number of plants from the hybrids developed in this manner.

A prime goal of most rhododendron breeders is to get a hardy yellow. When Dr. Tichnor went to Oregon in the early 1960's, he left a *R. brachycarpum* × *R. wardii* hybrid with me, along with 50 or so other hybrids he had to leave behind. This hybrid flowered only once and subsequently was winter-killed. I had fortunately saved a few seeds of the open pollinated flowers. I crossed seedlings from these, which were not very hardy, a number of times with themselves and with my own pale creams, which occasionally showed up in the hybrid seedling blocks. The gradual increase in hardiness (to at least  $-15^{\circ}\text{F}$ ) and stronger yellow color tones proves that constant selection and inbreeding can deliver good results.

The naming and releasing of plants for commercial production should be the responsibility of the plant breeder. He must decide which plants are worthy of introduction since he knows their parentage and has observed their progress over the years. He does not, however, know how his plant will perform until it has been observed for all conceivable problems to which plants can be subject until they reach a respectable landscape size.

We grow several hundred plants of each new cultivar that we hope to introduce until they reach landscape size and then we select those that have a good chance of success. We have had a tissue culture laboratory for about 5 years. Growing the trial plants in this manner saves stripping our original plant and several generations of grafted stock plants for scions and cuttings.

My interest in breeding azaleas started about 1935 when Frank Abbott, a rhododendron enthusiast from Vermont, brought us seeds of a cross he had made between *R. molle* 'Louisa Hunnewell' and *R. prunifolium* var. *roseum*. The resulting Jane Abbott hybrids were exceptional in every way — vigorous, hardy, colorful and fragrant — but impossible to propagate before the day of mist and polyethylene. I duplicated that cross using *R. japonium* and *R. prinophyllum* [*R. roseum*] to acquire plants for sale almost yearly, but now, with the ease of propagation under mist, we are growing selected clones. The same parent species are used in Minnesota to produce the Northern Lights azaleas.

Summer blooming azaleas are a wonderful addition to the landscape. They are also attractive items in the garden centers and, beside being very colorful, many are extremely fragrant. I have made many crosses between the species *R. viscosum*, *R. arborescens*, *R. bakeri* and *R. prunifolium*. We have named a



number of cultivars which grow readily from softwood cuttings and sell all the remaining seedlings as hybrid seedlings.

In the 1940's the only hardy low-growing azalea was *R. yedoense* var *poukhanense*. Our landscape customers were asking for better-colored low-growing azaleas that would be evergreen and hardy. I crossed *R. yedoense* var. *poukhanense* with 'Vuyk's Rosy Red' as a start toward that objective. After a number of generations of inbreeding, selections developed hardiness, remained evergreen, and are flowering in shades of deep purple and near-red. By selecting the best of each generation and inbreeding them our goals become gradually attainable.

I have described the need for selecting good species as parents and using the best offspring to continually build toward the desired results. My crosses were made outdoors on flowers about to open. If some pollen accidentally gets onto the pistil while the stamens are being removed, I simply remove the pollen before I make the cross. I do not cover the pistil after making the cross except in times of an impending rain, but I do remove the adjacent flowers to eliminate the possibility of wind contamination.

In summary, the breeding of plants is a simple and logical process that requires a minimum of time and fits in well with our avocation as plant propagators.

## **SEEDLING PRODUCTION USING COMPANION GRASS CROPS**

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Seedlings germinated in open field beds need all possible means of protection in order to survive and make satisfactory stands that result in economically profitable crops for growers. It has long been recognized that nurse crops could provide much needed protection during germination and establishment of nursery crop seedlings. However, controlling the nurse or companion crop presents a near impossible situation, when the companion crop out-grows its useful size and becomes a competition crop that is uneconomical to clean up. This situation left growers with very few options except mainly oats for a companion crop which would freeze out when temperatures reached about 0°F.