

The pit is 16 ft wide inside, 100 ft long, 6 ft deep and it is 11 ft from the floor to the ridge. The roof is constructed of 4 × 10 ft Filon sheets. The walls are 1 ft thick with 5/8 inch steel reinforcing rod set on a 2 ft wide footing. A 3 ft fan set in one end provides ventilation when needed.

EDITOR'S NOTE: Mr. Hoogendoorn showed slides of how the plant materials are placed into the deep pit storage and what they looked like when removed. Plant materials which have been over-wintered in the deep pit are grafts of *Viburnum carlesii* 'Compactum', *Hamamelis* × *intermedia* 'Arnold Promise', *Cedrus atlantica* 'Glauca', *Cedrus atlantica* 'Glauca Pendula', *Cornus florida* 'Rubra', *Cornus kousa* var. *chinensis*, *Cornus* 'Rochester', *Magnolia* 'Balleriniana', and cuttings of *Acer griseum*, *Hydrangea macrophylla* 'Nikko Blue' and *Pyrus calleryana* 'Bradford'.

CLAY BERG: When do you take your 'Bradford' pear cuttings and how do you treat them?

CASE HOOGENDOORN: We take them in early July and treat them with Hormex #30 and stick them in sand.

NEW AND NOVEL COLD HARDY RHODODENDRONS

DAVID G. LEACH

North Madison, Ohio 44057

I've done a lot of work for the handicapped — the nurserymen. You fellows who sell rhododendrons are a unique industry dealing in living antiques. My colleagues and I have been producing 1977 style rhododendrons for cold climates, and I'm here to persuade you to give up your horticultural Stanley Steamers for new Buicks, whether they come from my production line or somebody else's. Nearly all of the rhododendrons you are selling were introduced in England just as our Civil War was ending 110 years ago. They were designed for spacious estates and large gardens, for mansions and three-story Victorian houses. They were intended to be grafted, and to bloom only within a 10-day period at the end of May. They were not produced for American growing conditions. All told, they're about as well suited for the last quarter of the 20th century as the spinning wheel is for the production of nylon. Times have changed.

I joined the Plant Propagators' Society either the year it was founded, or the year after, because I was then doing some experiments with rhododendron propagation. I have continued my membership through the years but in some ways I feel like an illegitimate son at a family reunion. It seems to me that nurserymen are busily grinding out the great gray world of 1984 whereas the industry professes to be dedicated to the amenity of the living environment, to the addition of a varied grace and

beauty to human habitation. Your trade association talks about the greening of America. It will be green, all right — the somber shade of Japanese yews, with maybe here and there a golden privet for jazzy contrast. I'm sympathetic to the economic problems of the industry, but if you are not to become operators of plant factories turning out standardized items on a mass production basis, some of you are going to have to accept the responsibility for contributing to American horticulture as well as making a profit from it. There is such a thing as the horticultural equivalent of a concrete and asphalt wasteland, monotonous and tiresome. And we're rapidly reaching that point. Variety is the single most important factor in the quality of an environment. It seems to me each of you should do your bit to add quality as well as quantity to your efforts. Perhaps each of you could take a little flyer in a genus of plants that might fit into your trade: maybe a couple of Gresham magnolia hybrids instead of the old, ungainly soulanganias with their muddy colors. Or the striking new flowering cherry hybrids from Japan or Collingwood Ingram in England, instead of *Prunus serrulata* 'Kwanzan', tiresomely familiar with its flawed flowers like little cabbages. Or maybe a new rhododendron hybrid or two, from one of the contemporary breeders, which are even more unlike the century-old hybrids which now dominate the trade. It's a rough, uphill battle but even a little effort from many directions would greatly enrich the horticultural resources for American gardens. My plea is to give as well as get. Accept your share of responsibility to contribute your mite of the new, the unfamiliar, the beautiful to the market that supports you. Last spring I spent 2 months in Japan. One of the nurseries I visited was growing 600 different kinds of azaleas. That seems like a ridiculous extreme, but the fact remains that the spice of variety has made Japanese gardens world-famous. I decided to come here as a spokesman for all breeders of ornamental plants, but since I deal mainly with rhododendrons, I hope I have a story about the creation of hardy hybrids which will interest you.

Most consumers today are urban, or suburban, and they live in a house with a standard lot 60 × 150 ft. A couple gets married, buys a house in a development, plants one of the old hardy rhododendron hybrids and by the time their children have graduated from college, they have a plant that covers most of their back yard. Today, a couple with a new home could plant 'Rangoon'. It's hardy, grows happily in a container and having been bred from dwarf species, will never get more than about 4 ft tall. The original seedling from the cross stands about 3 ft after 23 years. 'Small Wonder' is another dwarf which blooms at a different season. It flowered fully after -20°F. All of

the new hybrids I will discuss have been through -35°F in the mountains of western Pennsylvania, and are bud hardy to -15° to -20°F . Both 'Rangoon' and 'Small Wonder' make good, solid mounds of attractive foliage throughout the year.

The old rhododendron hybrid called 'Catawbiense Album' was introduced by Anthony Waterer in 1865. He gave it a Latin name because that was a sign of education and erudition at the time. There's nothing very much wrong with this rhododendron, except that it never entered Waterer's head to test it for easy rooting, and a lot of propagators have trouble with it. Waterer did not care how quickly it made up into a salable plant. When planted into the average small garden today, it will quickly grow out of scale. For the same planting purposes, a modern rhododendron hybrid called 'Swansdown' is noticeably superior and has larger flowers. It roots very readily, is more heavily foliaged, and produces a budded, salable plant more quickly. For large gardens, monumental buildings and parks it is much more profitable to grow, and altogether a better bet, than the 110-year-old 'Catawbiense Album'. Other semi-dwarfs for the small garden would be 'Anna H. Hall', or 'Alaska', a pure white which has the added bonus of an unusual and distinctive foliage providing variety in the landscape.

The all-time best selling pink was introduced 110 years ago and in my judgment is one of the ugliest rhododendrons in flower ever created. It's a dirty pink with a lot of blue in it; the name is 'Roseum Elegans'. True, it roots like a weed, and it grows under all sorts of conditions, and it has a good plant habit, but judged on the quality of its flowers, it's a real dog. It is not even available in milder climates, to the best of my knowledge. As a matter of fact, it's been so overdone in the east that in some areas consumer resistance has developed to it. Well, what are the alternatives? For a bright pink rhododendron, there is 'Bravo', just as hardy, just as free blooming, just as easy to root, just as adaptable, just as densely foliaged, but with a vast improvement in flower color. Tony Shammarello's 'Pinnacle' is ironclad-hardy and a big advance in flower color over 'Roseum Elegans'. The second best-selling pink is probably 'Everestianum', introduced by Anthony Waterer in England in the 1840's. It's a color my grandmother would have called "common", meaning it lacks style and distinctiveness. An alternate from my own breeding, just as hardy and just as easily grown, is 'Bangkok'.

Nurserymen have said for years that men will buy almost any rhododendron so long as it's red, and they've been selling almost any rhododendron with red flowers. The most popular for the last 20 years or so has been 'Nova Zembla'. One just as hardy is 'Scarlet Blast', another more of a cherry red is named

'Bengal'. Both are of conventional large size. But, to my mind, the wave of the future is typified by 'Singapore', a semi-dwarf scarlet rhododendron which will never get more than about 4 ft tall.

Now let us consider blooming seasons. With the exception of *Rhododendron* 'Boule de Niede', all of the standard hybrids in commerce were bred to flower within about a week at the end of May, and that was because the old Knap Hill Nursery in England which produced them, was subject to frequent late frosts. Our conditions here in America are different. For years the landscape architects have been asking for pink rhododendrons that would bloom early, with the dogwoods and the daffodils. I would think garden center operators and nurserymen would like to have a big splash of color, such as only rhododendrons can give, when spring has newly arrived and gardening interest is approaching its peak. 'Longwood' comes into bloom at this season. This is also the season for the small, scaly leaved rhododendrons, of which the best known are 'Pioneer' and 'P.J.M.' 'Pioneer' loses its leaves in winter when it gets a little older, it is not bud hardy in really cold climates, and its creator, Joe Gable, didn't like its color. An advanced generation descendant of 'Pioneer' is 'Malta'. 'Malta' is a much better, clearer color; in addition, it is sterile so it sets no seeds and therefore covers itself with flowers every spring. It is evergreen throughout the winter, and much more bud-hardy than 'Pioneer'.

'P.J.M.' is hardy as an oak, and it has fine winter foliage which turns purple as it gets colder. But its rose color has a lot of blue in it and I don't imagine Eddie Mezitt would claim it to be the ultimate in flower color. 'Wally' is a Mezitt hybrid rhododendron, just as hardy, but the color is a vivacious, clear pink. It has done very well for me, and I think Eddie has made a great improvement over 'P.J.M.' 'Balta' is another Mezitt hybrid at the same season as 'P.J.M.' with white flowers.

How about late-blooming rhododendrons? With one exception, my introducers have disclaimed any interest in rhododendrons that bloom after the first of June. But just maybe they'll turn out to be wrong. We have relatively cheap swimming pools, hibachis and gas-fired grills, reflecting the great American migration to outdoor patios in the summer. It seems reasonable that a market could be developed for color from woody plants to decorate outdoor living areas when the use is so heavy. 'Bali' is one which blooms its head off at the end of June, and 'Summer Snow' which helps to celebrate the Fourth of July.

We don't have any ivories in the trade now. But one I called 'Ivory Tower' is the most free flowering rhododendron I

know. This was released a few years ago. But the longer you continue breeding, the greater your resources become for further improvement, and the more rapid the progress becomes. The problem always is, where to draw the line; release the best you have, even though you're reasonably sure that the next several years will produce something better still. A perfect example is one that presently bears the appealing name 66-LL-50. It has a large flower truss and has bloomed fully this past spring after the coldest winter in Cleveland's history. If it holds up well for another 3 or 4 years it will be tested for ease of rooting. If it passes that test, propagation will be limited by the number of cuttings available, so it will take 4 or 5 years to produce 3 stock plants for each of my 6 introducers. These fellows are inclined to be skeptical, so they may delay introduction to see how the hybrid will perform under their nursery conditions. It may be 6 to 8 years before they sell the first plant.

A wild species from Tibet called *Rhododendron wardii* has been my best source of yellow color. It's so tender it is hard to keep it alive even in a cold pit in my area. I began the search for hardy yellows nearly 40 years ago, crossing *R. wardii* with a white *R. catawbiense* from the mountains of North Carolina. The first generation hybrids were pale pink and tender, but the genes for yellow and hardiness had to be there. Now I have a true yellow in combination with hardiness. The color is not as deep as I'd like but the glossy green foliage and good plant habit of *R. wardii* has been recaptured. The testing and propagation of stock plants for the introducers is yet to come. By the time the introducers are satisfied with it and have propagated enough stock to begin selling, 15 years will have passed since the seedling first bloomed in the field. In all 41 years will have passed from the start of the breeding project until the final product is offered for sale. It is almost impossible for a hybridizer to live long enough to see his productions become popular and widely distributed in the trade. The first hybrid I released was bred in the 1930's. Ted Van Veen sells it, as do about 30 other nurseries in the United States, Canada and overseas. It's name is 'Janet Blair', and after 40 years from its first bloom it is still a long way from being widely available at the friendly neighborhood garden center.

But back to the search for yellow-flowered rhododendrons. What's the competition? 'Goldsworth Yellow' has been the only thing that even approaches being yellow. It's more of a pale apricot color, a lanky grower, and it won't keep its buds over winter even in a Zone 6a climate. 'Sahara' is a much better color than 'Goldsworth Yellow'; it is ironclad-hardy, and it makes a dense plant, well furnished with foliage, whereas 'Goldsworth Yellow' does not. 'Peking' is more yellow, but there's a question

in my mind whether consumers in the East will accept the loose, informal flower truss as they do on the West Coast and in England. 'Limelight' has the full, firm truss but not with the color saturation of 'Peking'. I'd be interested to know, if the two were side-by-side in bloom in a salesyard whether buyers would go for the deeper yellow or the fuller truss.

'Good Hope' is the best seedling from the breeding project described above. My introducers got it last year. So we're getting closer all the time to the intense yellow color of the tender West Coast hybrids. Yellows and oranges are the hardest to breed in combination with real subzero hardiness, which undoubtedly accounts for their absence from the marketplace. There have been no oranges at all for eastern growers, but there are now some close approaches. I thought I had an orange winner in one I named "Virginia Leach." It rooted easily and grew vigorously, but 2 years ago I discovered that the leaves of young plants stick straight up in the air when the temperature gets below about 20°F. I had never seen anything like it before and I haven't since. If it happened to most hybrids I would have thought it was a rather funny quirk. But nobody wants a rhododendron with vertical leaves in midwinter, so it had to be discarded. This illustrates the importance of testing over a period of at least 5 years. The most unlikely defects can suddenly appear, and there is no way to anticipate what they might be. Another example is a hybrid I called 'Tahiti'. It propagated routinely for me in a Nearing frame. But when cuttings were put in a bench with mist and bottom heat in a greenhouse, they soon dropped all of their leaves. So I have learned to expect the unexpected in testing new hybrids. 'Poppinjay' is probably the best of the oranges. The leaves twist a bit and some think this is a fault; others don't. Personally, I prefer a smooth leaf which is green and bright.

There are many failures and many disappointments in breeding woody plants. I thought it would be nice if hobbyists had in hardy form something approaching the large leaved species and hybrids grown in mild climates on the West Coast and England. I got pretty close to what I wanted in 'Spellbinder'. I never expected it to have any commercial appeal. It has huge leaves and its appearance is entirely different from any other rhododendron I have ever seen in a cold climate. It bloom very early. Its appearance is so exotic that it probably arouses more comment than any other rhododendron at my hybridizing and trial grounds, whether it's in bloom or out of bloom. But the disappointment is that anything so unusual refuses to root. The stems of cuttings are nearly half an inch in diameter. About one in ten root for me. Others who have tried it with bottom heat have rooted about 25%, and Lanny Pride using some kind

of a witches' brew made up for him by a friend, got 50%. The failure to root is just one of many unseen defects that plague the rhododendron breeder.

In recent years there has been at least a small market for truly dwarf rhododendrons, the small leaved kinds that used to be called dooryard or rock garden rhododendrons. These are generally not over 2 ft tall. 'Ramapo', Guy Nearing's hybrid, is the best I know of these, and I see it in nurserymen's lists fairly frequently. A newer hybrid from Nearing is 'Mary Fleming'. It's a blend of yellow and pink, and I've never met anyone who didn't like it. Zone 6a is the limit of its bud hardiness. Ted Van Veen imported 'Pink Drift' from Holland, and it turned out to be much hardier than I expected, but it's a very satisfactory rhododendron in Zone 6a. One of my contributions which I called 'Tow Head' is of about equal hardiness. It lost its buds last spring, for the first time after a winter that converted Zone 6a to about 4b. At times, the chill factor was -70°F .

Finally, how does a hybridizer's workshop differ from a commercial nursery? For one thing, considerable space has to be found for the selections made each year. They have to be moved into an area where they can be watched individually for a few years. I have a woodland, where I plant out the preliminary selections for observation. At an early age, a good many will show foliage or other defects, or limited bud hardiness, so they are dug out and discarded. Plants must prove that they are worth the space they occupy or they are destroyed. Hybrid seedlings, transplanted from flats, are grown for 2 years in ground beds; they're protected the first year, and then they're on their own. From the ground beds they go into the field, under a mulch of wood chips. They're watched for signs of being superior or distinctively different from anything in commerce. That is the first basis of selection. They must be better, and they must be different than anything now available. I must have grown about 250,000 seedlings since I first began breeding. The worthless are destroyed and others take their place. A breeder always has in his mind's eye the most sensational rhododendron ever produced, preferably one with red, white and blue flowers which will shoot off skyrocketes and play the Star Spangled Banner on the 4th of July.

Thursday Afternoon, December 8, 1977

Dr. Harrison Flint served as moderator for the New Plant Forum.

MODERATOR FLINT: Our first speaker on this portion of the program will be Ray Evison from the GB&I Region.