

(Tasmanian honeysuckle) and *Melaleuca squamea* are both found at sea level in the State and introductions from that source would be most unlikely to survive outdoors in the British Isles. However, *Banksia* can grow at 1100m in an area that is exposed to very cold weather and *Melaleuca* can be found at 1350m on the edge of a highland bog. I would be very surprised if either of these ecotypes had ever been introduced into cool temperate gardens and, without doubt, this is where the source of increased cold hardiness lies.

## REFERENCES

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## **THE FLOOD OF AMERICAN HYBRID RHODODENDRONS: AN EVALUATION**

KENNETH N. E. COX

*Glendoick Gardens, Ltd.*  
*Glencarse, Perth PH2 7NS*  
*Scotland*

Rhododendron hybridising started in Britain about 1800 when some of the European and North American species were first crossed. Important breakthroughs occurred with the introduction of red flowers from *R. arboreum* and the first group of what is known as the hardy hybrids were raised by the great Victorian nursery firms such as Waterers at Bagshot and Knaphill, and at Cunninghams nursery in Edinburgh.

Among the best known hybrids of this period, are 'Cunningham's White', 'Gomer Waterer', 'Christmas Cheer', 'Purple Splendour', and 'Cynthia'. The next phase was marked by the introduction of more Himalayan species such as the enormous flowered *R. griffithianum* and later, the yellow species *R. campylocarpum* and *R. wardii*. In German and Dutch nurseries, breeding was being carried out from 1890 until World War II, with the Dutch hybrids such as 'Britannia', 'Betty Wormald' and 'Kluis Sensation' becoming popular wherever rhododendrons were grown.

The Edwardian and Georgian eras in Britain saw the hybridising mantle being taken up by the aristocracy and gentry. Lord Aberconway, Lionel de Rothschild and several others directed armies of gardeners raising thousands of seedlings made from crossing the new species as they were introduced by Forrest, Kingdon-Ward, and others. Among the hundreds of worthless named hybrids many important breakthroughs were found and this

group of hybrids still provides the largest scope for the rhododendron hybrid enthusiast who would rarely be without 'Elizabeth', 'Loderi', 'Lady Chamberlain' 'Crest', and 'Fabia', etc.

After the war, many of the great gardens and nursery firms went into decline, and the flood of new hybrids appearing at London shows slowed to a trickle. With the exception of the Waterer and Hydon *R. yakushmanum* hybrids and some new dwarfs from Glendoick and elsewhere, very little useful hybridising has been done in the U.K. since 1945. In West Germany, D. Hobbie, H. Hachmann and others have been active, while Australia and New Zealand have also seen a considerable amount of breeding activity. But all this is dwarfed by the hybridising that has taken place in the U.S.A.

Starting on the East Coast in the 1920's an assortment of enthusiasts such as the industrialist Charles Dexter, the nurseryman Tony Shamarello, and Joe Gable began crossing rhododendrons. Many important hybrids were raised, many of them particularly suitable for the extremes of heat and cold found along the U.S. East Coast. These pioneers were succeeded by many keen nurserymen and amateurs and there are now hundreds of named hybrids bred from Nova Scotia to Georgia, and from Cape Cod to Indiana. The best known of these include 'Dora Amateis' and 'Scintillation'. It is the West Coast, however, that has produced the most suitable hybrids for the U.K. The most populous parts of Oregon and Washington have a climate very similar to that of the U.K. and, soon after the first importations of rhododendron species and hybrids from Britain, breeding programs were begun. Nurseries run by Whitney, Lem, Van Veen, Greer, and many amateurs have been making thousands of crosses each year and over the last two decades we have been collecting and evaluating some of the fruits of these labours at Glendoick. Many of the hybrids we have received from across the Atlantic are better than anything raised in Europe, and we have been propagating and distributing many of them for many years. In last year's new entries to the International Rhododendron Registry, less than 10 percent of the new hybrids were British. Germany, Australia, and New Zealand accounted for 20 percent and the USA and Canada for the other 70 percent. There is no sign that this trend will not continue in the future.

The recent progress in micropropagation of rhododendrons in the U.S.A. and Europe has, during the last few years, seen many excellent new American hybrids on the market here for the first time in large quantities. The most important advantage of this method of propagation is the speed of introduction of new species and cultivars, and their international distribution. Tiny plantlets in sterile medium can be brought into this country at a fraction the cost of the traditional methods.

At last the Chelsea Show may actually have some new rhodo-

dendrons to make headlines in the horticultural press, in the same way that newly named roses do. This is a time to promote all that is new in rhododendrons, from the smallest creeping types for the rock garden, up to the enormous blowsy giants.

Unfortunately, with the advantages of the new technique have come several largely avoidable but nonetheless worrying problems.

The first is that of what is available. Some of the best hybrids are now indeed in tissue culture, but many are not, and a large proportion of those being offered for sale in the U.K. really are not suitable. Many have been bred for harsher climates than our own, and their ornamental value is only to be appreciated in areas where the tenderer types will not survive. If new hybrids are blindly distributed, the whole chain from wholesaler to retailer and customer is going to feel disappointed and deceived.

The second problem ties in with this, in that micropropagation allows new introductions to be made very quickly. Once a small shoot is successfully multiplied in a test tube, theoretically there is no limit to the number of young plants that can be produced in a short period of time. This allows untested hybrids to be churned out, with their short-comings only discovered later by the unfortunate customers. The worst example amongst rhododendrons has been 'Pink Petticoats', one of the worst commercial hybrids I have ever seen, with appalling hanging foliage. In exceptionally favourable conditions, it can produce a reasonable show, but it is hardly the cultivar for the mass market.

There are other similarly poor choices in tissue culture in Britain and in the U.S.A. and hopefully the companies concerned will have the foresight to destroy worthless material, preventing it from spoiling the market. The new *Kalmia latifolia* cultivars are a case in point, where the nurseries producing them had not even seen them flower, let alone tested them. We had several utterly worthless hybrids, which have subsequently been discontinued, but I see no reason why we should have to do the selecting.

The third problem that we have encountered is that of naming. We know of at least 23 instances of incorrectly named rhododendron cultivars from tissue culture batches from the main U.K. and U.S. labs. Not all the plants of one cultivar are necessarily wrong, although sometimes this is so. We have all the resources available to identify rhododendrons at Glendoick, but we cannot be expected to recognize hybrids we have never seen. Often the plants flower for the first time after the age at which they are sold to our customers, and for us this means considerable financial inconvenience as well as a compromising of our reputation. Many other nurseries, through no fault of their own, have been and will be distributing hundreds of wrongly named hybrids.

There are several reasons for the naming mix-ups. Micro-propagules look much the same from one cultivar to another,

usually not developing recognizable characteristics until they are a year or so old. For various reasons microprop nurseries tend to label their test-tubes with codes rather than names, and it only takes one wrong digit in one of the many transferrals from tube to tube, and the wrong name may later be applied. But of course it is new hybrids which no one has seen before which are most likely to be confused.

Apart from general vigilance and more skilled staff, there is a limit to what can be done. I feel that it is up to the micropropagation laboratories to compensate for some of the value of the stock at the time the mistake is noticed, even if this involves three to five year-old plants. It costs us a fortune in postage to replace wrongly named plants, especially if they have been distributed in hundreds, or sent to Japan.

### EVALUATING HYBRIDS

Having made general comments about new hybrids, it seems worthwhile to summarize what criteria we use to make judgments in evaluating them.

1. **Flowers.** Not as important as might be expected, flowers must be of an acceptable standard, but commercially we would always prefer a hybrid with, say, pale yellow flowers, if it was easier to produce commercially. Yellows is probably the most important area for breeding, as a really satisfactory larger hardy hybrid for general cultivation has yet to be produced. Things are improving though. Texture of flowers and how long they last is important especially to garden centre sales. Early and late flowerers have a novelty value but more work needs to be done to breed free-flowering late hybrids.

2. **Habit and foliage.** For garden centre sales, this is very important. Healthy deep green leaves on a dense, bushy plant are always sought after. *Yakushmanum* hybrids are amongst the best, although they are rather slow-growing. Novelties such as variegation and red leaves are also popular.

3. **Hardiness.** Not only winter-hardiness, but the hardiness of opening buds, the weather-resistance of foliage, and a self-preservation attitude towards growing, i.e. does not grow in a mild spell in March-April, and doesn't shoot up soft new growth in September which is clobbered by the first frosts.

4. **Tolerance of commercial conditions.** This is really the bottom line, of course. A beautiful hybrid, ideal for a woodland garden with a patient owner is often totally unable to withstand the rigours of mass-production, particularly in the area of container tolerance. Rhododendrons are hard to grow well in pots, and they are among the most reluctant of ornamentals to thrive in this way. Soil temperature and pH, fertilizer levels, and many other factors are critical. To be a successful commercial plant for garden centre

sales, the most important requirements are:

- budding up at a 3 year plant or less (2 years for a dwarf).
- takes a standard amount of fertilizer
- vigorous, forming a large enough bush in the given time
- pest and disease resistant, and easy to keep healthy. (A new powdery mildew has begun to affect rhododendrons over the last few years, and some new American hybrids are unfortunately very susceptible.)
- looks good in a pot.
- attractive name; 'Scarlet Wonder' sells better than 'Gartendirektor Glocker'!

#### NEW AMERICAN HYBRIDS—A BRIEF SURVEY

**Dwarfs.** Not many American hybridisers have concentrated on dwarfs, but several excellent ones have been raised. 'Anna Baldsiefen' is a tight upright plant with masses of bright pink flowers. Very free-flowering and hardy anywhere in the U.K. but rather early flowering. Later, and equally hardy, is 'Dora Amateis', now well-known, which has very fine white flowers. 'Ginny Gee' is one of the freest flowering hybrids ever raised, with masses of pink and white flowers on a compact plant. It is sure to become a standard. From the same hybridizer, Warren Berg, comes 'Patty Bee', a large-flowered pale yellow type, and the two-tone pink of 'Too Bee'. Warren has found an excellent parent in his own introduction from Japan, of a very dwarf form of the species *R. keiskei*. We have also found this a good parent at Glendoick, and there are sure to be many more hybrids produced from it.

For something more unusual, try the daphne-flowered 'Maricee' (alas no scent), or one of the bi-generic hybrids 'Arctic Tern' with ledum-like flowers, or 'Brilliant' with waxy red flowers, and red new growth. Other good-doers include the upright pale pink 'Flip', the deep yellow 'Goldilocks' and the ironclad 'PJM' group with rosy purple flowers in early April. We also think highly of the early flowering 'Snow Lady', a slightly less vigorous version of 'Cilpinense', but with purer white flowers. It flowers in March–April so is vulnerable to frost, but worth a gamble.

**Medium growing hybrids.** Medium-sized hybrids are becoming the most important and popular group of rhododendrons in the U.K., mainly due to all the new *R. yakushimanum* hybrids. Hybrids growing 3 to 4 ft tall and wide in 10 years are an ideal size for the suburban garden, and the American hybridizers have produced many fine plants of this size.

'Bruce Brectbill' is a sport of the well known pale creamy-coloured English hybrid 'Unique'. 'Bruce Brectill' is identical in habit and foliage but with showy pink flowers that we prefer to those of 'Unique' itself, and we have no doubt that it will become a

commercial standard in the U.K. 'Cupcake' is one of the few good "yak" hybrids from America and we like this especially for its precocious budding, its deep green foliage, and for the fact that it opens its flowers a week or so earlier than most of the other "yaks", so stretching the season. The colour is an apricot salmon, fading to pale pink.

Of similar colour is 'Jingle Bells', a larger grower with lax trusses of unusual orange and yellow. 'Ken Yaneck' is close to the species, *R. yakushmanum* but with flatter-faced, pinker flowers. The plant under this name released in tissue culture in 1985/86 was 'Yaku Princess', a similar but inferior plant.

'Molly Ann' would be our tip for the perfect commercial medium grower with its glossy rounded leaves, neat upright habit, and its carmine red flowers but, unfortunately, it seems to be very susceptible to powdery mildew. 'Riplet' is one of our own particular favourites with red flowers fading to near cream. Too early and a little tricky for container production, we anticipate the German hybrid 'Lampion' will fill the market for a commercial hybrid in this colour. A potentially very successful curiosity is 'Cream Chiffon', a white double-flowered compact grower. The flowers look like gardenias, and we find the plant free-flowering.

**Larger hybrids.** These are traditionally the mainstay of the rhododendron nurseries, and form the public perception of what a rhododendron is supposed to look like. Despite the fact that most of these will eventually grow too big for all but the larger garden, they are planted in huge numbers everywhere.

In the U.S.A., the Massachusetts industrialist, C. Dexter used the very hardy, tall, vigorous *R. fortunei* as a parent, producing the now well known 'Scintillation', which has brownish pink flowers, and deep shiny foliage. This is one of the most versatile hybrids ever raised, being tolerant of extremes of heat and cold, and never likely to be damaged in a U.K. winter. 'Ben Moseley' [reddish-purple flowers, blotched deeper] and 'Brown Eyes' [pink with a very striking brown flare] are two of the best Dexter hybrids at Glendoick.

Among the reds, are some outstanding plants for the enthusiast: 'Grace Seabrook' and 'Taurus' have tall, upright, conical trusses of deep waxy red, of a fine pure colour. Both have excellent deep green foliage, on very vigorous plants. They are rather slow to bud up, however, usually at approximately 5 years, and their flowering in late April, probably means that they will not be suitable for the mass market.

'Markeeta's Prize' and 'Halfdan Lem' have flowers of a more translucent and less rich colour, but they have larger flowers than the 'Britannia' type Dutch hybrids.

The finest red flowers of all are on 'Captain Jack', but this is a stubborn plant, hardy enough, but slow to flower, inclined to have

poor foliage and hard to root. A first class enthusiast's plant, but not for the mainstream.

Among the yellows, 'Hotei' (named after a Japanese God) is the best known. Really deep yellow flowers, in tight trusses on a compact, tidy bush. Slow to bud up, fastidious about drainage, and hard to keep growing well, especially in a container. I fear that it is not suitable for the garden centre trade or for general planting. Hopefully some of the many 'Hotei' hybrids coming on the market will not suffer from the same problems.

'Golden Star' is a much easier, more robust plant, but with much paler flowers. Again, as with most yellows, not free-flowering until four to five years of age, but easy to please and one of the hardiest of this colour. Hard to root, but now it is in tissue-culture, so hopefully will become better known.

'Frontier' is paler still, pale pastel pink, fading to cream, ideal for lovers of 'Laura Ashley'. Free-flowering, and with good foliage, but has had some mildew problems with us in Scotland. Another fine pale yellow is 'Odee Wright', which opens with some pink and bronzy tints, fading to pale yellow, in large full trusses. Free-flowering from a young age, and a slow-growing compact plant with deep green shiny leaves. One of the best all round commercial plants in this colour, and sure to become widely grown.

**Multicolored hybrids.** The most important lines of breeding to come from across the Atlantic will probably turn out to be the multi-coloured hybrids. Tastes in colour are always changing, but the current fashion seems to be for these combinations of yellow, pink, apricot, peach etc, and we find once seen in flower, they are much sought after.

'Tidbit' is a combination of straw yellow and red, on a neat bush with glossy pointed leaves. Not for the coldest gardens, but generally rugged and easy to please, and one of our favourites.

'C.I.S.' has a peach, pink and reddish combination, giving a marvelous display in flower. Unfortunately, its drawbacks are rather numerous, being hard to root, slow to bud up, mildew prone, rather sparse, and often having poor foliage. Its flowers are so fine, that it is definitely worth growing, but it is not a plant for mass distribution in microprop, and I expect that those U.K. labs that have it will probably discontinue it.

'Virginia Richards' is an all-round finer plant and, in our opinion, one of the finest hybrids ever raised. Opening salmon pink, fading to cream with a red blotch, on a compact bush with good foliage, budding up young, and very hardy. Alas, it is very susceptible to mildew and unless a satisfactory control is developed, it will remain only an enthusiast's plant. The *crème de la crème* of the multicolours is surely the magnificent 'Lem's Cameo', with enormous frilly pink and cream flowers blotched red. Hard to propagate, and requiring masses of fertilizer to avoid chlorosis, it

may only be a specialist's plant. As yet not in microprop, and perhaps should not be put onto the mass market.

A further group of fine American hybrids is the 'Wallopers', a group of sturdy giants with massive conical trusses from white and pink to light red. The best in our opinion are the pink and white 'Lem's Monarch' and the light red 'El Camino'. These take a while to bud up, but they are so striking, that most people are prepared to wait.

My survey could go on and on; there are probably close to 2000 different named American hybrids in some stage of commercial production in the USA and Canada, and the numbers look certain to increase more and more. With this flood of material, nurseries must be ruthless. Do not take on a new plant unless you are willing to admit that it supersedes an older one, and then cease distributing the older one. Cultivar preservation is one thing, but proliferation of cultivars only confuses the customer.

Most importantly, the tissue culture laboratories need feedback, and should be held responsible for what they are producing; ask questions, request photographs of new cultivars, and demand compensation for incorrectly named plants. Lets take a leaf out of the rose business' book in launching new hybrids with sound commercial and marketing practices, exploiting the advantages that we can get from micropropagation, to offer the public what they want.

There is a potential market for far more rhododendrons, and this can only be realised by providing the right plants for the right situation.