

A Vireya Seed Odyssey: Some Observations

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Germinating Rhododendron Seed

For the past thirty or so years I have been germinating and growing on rhododendron seed and after thirty years I think I've gotten pretty good at it. Probably because it is so easy! It has been my experience that if one sticks to the typical lepidote or elepidote seed - and particularly hybrid seed - it is absurdly easy. The seed is very forgiving. Collecting and drying seed, and subsequent storing in the freezer, is quite straight forward with no significant viability problems. I have always germinated my ericaceous material on milled sphagnum in plastic-covered containers under lights at around 60-70 $^{\circ}$ F (15-21 $^{\circ}$ C). No damp-off with sphagnum, and the milled sphagnum decreases the problem of moss "over-growing" the seed to just about zero. A real no-brainer for the amateur. The only time I have deviated from fairly standard procedures was to experiment with GA3 (gibberellic acid) to "break dormancy" with seed of the Japanese species *Rhododendron degronianum* ssp. *yakushmanum*. Yak seed was taking almost two months to germinate whereas most species took around four weeks. I sprayed in some yak seed with (as I recall) 400ppm GA3. Treated seed germinated in less than a week. The control sowing took over a month. But breaking dormancy is never really a problem with rhododendron seed; thus no heroic methods are called for.

Section Vireya Rhododendrons as a Special Case

I find the situation changes somewhat when one moves to germinating and growing the seed of section Vireya rhododendrons, which is the focus of this odyssey. It becomes a different and more challenging (and interesting?)

ballgame. The problem it seems to pose for the seed grower is basically one of touchiness. It just seems to be more specific in its needs and less tolerant of "sloppiness". Perhaps this is just a reflection of its needs in general, as many vireyas are epiphytic in nature and detest soggy soil and bad drainage.

Becoming Hooked

Some years ago I became interested in vireyas. I happen to live in an area where they can (with caution) be grown. Strybing Arboretum where they were introduced to horticulture in this country became my hangout. The head propagator at that time, Peter Sullivan (since retired), handled the vireyas from Dr. H. Sleumer's early New Guinea collections and carried on an extensive hybridization program in an attempt to create plants that were more growable for the general public. Sullivan's original selections still grow in a church garden in San Francisco and are probably the oldest vireya (hybrid) specimens in the United States. They are considered by many to be among the finest vireya hybrids available today. Vireyas were then and are still a novelty and a challenge, but their amazing diversity and unique beauty offer the rhododendron specialist an opportunity to grow something very special. I became hooked.

Seed as a Way In

Having been an avid seed grower of traditional rhododendrons, propagation by seed became the obvious way for me to extend my limited collection. Actually it was the only practical way: you quickly find that it is much easier to solicit and receive seed than cuttings! And, if you become interested in hybridizing (as I did), seed rearing is a necessity.

Outside of Strybing, seed was hard to come by. At that time the American Rhododendron Society seed manager in Oregon would send out what little vireya seed she received immediately upon receipt. It had the reputation of having a very short shelf life, and it was thought that stored seed would not germinate. Not

very satisfactory if you run a seed list. This point of view really didn't encourage seed collection and distribution, and as a consequence seed availability was limited. Strybing through its international contacts and its own material was about the only reliable source.

Fortunately, through Strybing, I was put in touch with John Rouse at the University of Melbourne, Australia. Because of its benign climate and proximity to New Guinea, the Melbourne area supports extensive vireya cultivation. Rouse was and still is an internationally recognized collector and grower of vireyas as well as a research scientist. Although not his field of specialty he has investigated issues related to pollination and germination of vireya seed. Over the years, Sullivan at Strybing had been receiving seed from him and gave my name to him as a potential U.S. seed "distributor".

My first seed from Rouse was seed that he had received from a Japanese collector working in New Guinea. To my amazement it germinated vigorously. I felt that this seed must have travelled around a good bit before getting to me, and if that were the case so much for "limited viability". I think that started it all, and I was encouraged to develop and maintain a freezer full and circulate a list of stored seed.

Rouse was generous with his seed and was selfing many of the species in his collection as well as making hybrid crosses. I began to solicit additional seed from Australia and then New Zealand and eventually took over the vireya seed distribution for the American Rhododendron Society. Over the subsequent ten years or so of managing the vireya list a wide selection of seed has been distributed ranging from the southern hemisphere to the Royal Botanic Garden Edinburgh and Kew and from various private sources. Graham Smith at the Pukeiti Rhododendron Trust in New Zealand was extremely generous in his support. I no longer distribute seed for the ARS and John Rouse is no longer

active, but those who grow vireyas have pretty well identified themselves and still receive seed. The Hawaii Chapter of the ARS is now playing an active role in soliciting and distributing seed.

Vireyas from Seed (Or How To Do It)

Based on a good bit of personal observations and communication with others, I quite naturally have come to my own conclusions regarding the handling and germination of vireya seed. As noted above, compared with non-vireyas their requirements seem quite specific, and I have tried to outline the differences and similarities (as I see them) below. Obviously my conclusions are untested in the classic sense and most must be prefaced by: in my opinion ...

In the Beginning

Vireya seed should be collected only when pods are mature. That is when the seed coat is sloughing and the pod is beginning to split. I have germinated "green" non-vireya seed but have been unsuccessful with immature vireya seed. All rhododendron seed dries easily and quickly at room temperature or under gentle heat. It can then be sown immediately or stored. If stored for later sowing or sharing it should go directly into the freezer. No special treatment or desiccator is necessary. I am of the opinion that freezer stored seed as opposed to refrigerator stored seed increases the seed's shelf life.

The Germinating Medium

I germinate all my vireya seed (and ericaceous seed in general) on milled sphagnum moss with perhaps 10 or 15 per cent perlite added. Seed is sprinkled onto the surface of moistened (fluffy) moss and then sprayed in. The container (say, a plastic cottage cheese container with drainage holes - a hot nail does it) is then covered with plastic film, secured with a rubber band and placed under fluorescent lights 4 to 6 inches (10 to 15cm) below the tubes. Rhododendron seed requires light for germination. If the seed is good, germination can be

expected in three to five weeks. The moistened moss may need spraying every two weeks or so, but 2 inches (5cm) of moss assures moisture retention - a thin layer of moss over other media tend to dry out too quickly.

The above seems to be standard procedure for most rhododendron growers in non-tropical climates. In warmer climates, e.g. Hawaii, where 70°F (21°C) is the average and humidity is high, germination on open benches should work nicely. And I am sure that other germinating media would work quite well. Shredded moss and fern fiber is a possibility. Unmilled sphagnum seems difficult and overgrows the seed. Coconut fiber is most often cited as an alternative. I have found it quite dense, but I am sure it could be loosened up with perlite or sand.

I leave my lights on sixteen hours a day and try to maintain (for vireya seed) an ambient temperature of 70°F (21°C). I have concluded that the germination of vireyas is somewhat temperature dependent. That is, non-vireya rhododendron seed germinates nicely at 55 to 65/70°F (13 to 18/21°C), but vireyas do better at the higher temperature. Sixteen hours is more than sufficient for germination and sustained growth, and I feel that it is unnecessary to purchase expensive full-spectrum tubes; cheap cool white tubes are just fine.

Vigor and Viability

Hybrid seed shows the greatest vigor and viability - in general. I have germinated hybrid vireya seed that has been freezer stored for ten years! All seed is stored in the freezer and I go back into my "stash" periodically now that I have discovered the possibility of germinating quite old seed. What does one have to lose?

Wild collected seed often (not always) shows vigor similar to hybrid seed. I am now annually testing seed of *Rhododendron lowii* collected four or five years ago by a friend, Dr. David Binney (New Zealand), on Mt. Kinabalu in Sabah. This seed continues to germinate, and I have sufficient seed to carry on for another

(God willing) five or ? years. The lowii seed is probably "hybrid" seed with overlapping populations of R. retivenium. But that is another story.

To be expected, self-pollinating (most) cultivated species does not show the same vigor or extended viability as does selfing (pollinating) with a sibling. But some do. And some just poop out or produce weak children. There is always a good deal of variation.

Quite understandably folks insist on getting seed of the "real thing", but insisting on hand pollinated seed of the "best form" often results in weak seed. Unfortunately many think that there is only one "real" example of a species. And if I've got one I've got "it": the "true species". Hard for folks to accept the population concept of a "range of variation". It's that range of variation that is most interesting.

Most of this variation is a matter of genetics. What is this "hybrid vigor"? Assuming perhaps that much of the "species" seed collected in the wild is in fact "hybrid" seed in the sense that it results from the cross pollination of different individuals. The only recent paper I have seen on vigor is John Richards' "The Genetics of Vigor" appearing in the Bulletin of the Alpine Garden Society, Vol.61, 1993. I highly recommend it.

This is not to say that technique and environment count for nought! It is always best to do several sowings of the same seed lot at different times and perhaps under different conditions.

Now That They've Germinated

Vireya seedlings are much slower to establish themselves than are non-vireyas. Sometimes they will sit and sit in their seed pan until they decide that it is okay to grow. Some may never make this decision. Again the differences between hybrid

and species are evident. Several potential seed growers have left the fold because of this: "They just won't grow".

This recalcitrance is relatively easy to overcome by merely them to a fresh medium and feeding a bit. Rhododendron growers will recognize this as "Rule #1": if it isn't doing well just move it!

I go a bit further and move seedlings (1 to 2 sets of true leaves) to a mix of 50 per cent perlite and 50 per cent milled sphagnum in community plastic "trays" (6 x 10 in, 2 in [15 x 25cm, 5m] deep) that are "hooped" with cane and covered with plastic film.

They look much like covered wagons. These are put back under fluorescent tubes and the temperature inside the wagon goes up by virtue of the enclosure, but humidity is maintained. A light (1/4 strength) foliar feed at 80°F+ (27°C+) in the wagon generally does the job. Sometimes growth is phenomenal. I never lose a thing.

Coping With Success

After an inch or so of growth the hoops and covering can be removed (perhaps a month or two) and then it's just a matter of space and your growing environment. I move seedlings out of the lights into my protected conservatory very soon. But they could be kept under lights for longer. Some do move seedlings into individual (perhaps 1 in [2.5cm] square) containers and grow them longer under lights. It's really up to you and your overall growing situation.

Transitions can be touchy but small seedlings are very adaptable. I find that a 1- or 2-inch (2.5- or 5-cm) seedling can be moved out of the seedling mix and find its way in rougher growing medium very quickly. My rougher mix consists of mainly of coconut chips, fine fir bark, perlite and bits of rough peat. This can be in

a flat in your greenhouse - any warm well lit area - or into individual squares. The objective is always a well developed and active root system. It is a mistake to think that you must initially produce lush vegetative growth; it's what's going on underneath that counts.

The Big Question

How long does it take to bloom a vireya from seed? The answer is probably an optimistic four to five years. The more vigorous plant will probably bloom sooner and many later. Some growers feel that by taking tip cuttings of 1-inch (2.5cm) seedlings and re rooting them in a peat/perlite mix will in time produce blooms sooner. I know of no data that supports this but certainly a tip cutting of a seedling roots easily and produces a fine new root system in an enclosed high-humidity environment. This is something the advanced grower can experiment with and is one way to cope with a seedling's refusal to grow. It is amazing to take a tip cutting from an inch seedling and see it root!

In Addition

For those interested, and even if you do not pursue your own seeding odyssey, I would highly recommend seeking out a paper by [John Rouse: "The Propagation of Rhododendron Section Vireya From Seed"](#) (see Notes From the RBG Edinburgh, 1985, Vol.43:1, pp99-115).

I feel that Rouse's paper is essential background reading: pollination, seed production, storage, germination, growth processes, the works - and quite readable for the non-botanist.

Growing on to Maturity

Vireyas love warmth, but I think it has to be shown that they do not need to be treated as a "tropical". Obviously they must be protected from freezing and if protected they will grow nicely in a temperate climate, e.g. here in the San

Francisco / Oakland Bay Area and most of coastal California. Admittedly they grow faster where it is warmer year round but they do quite well here. Vireya hybridizers are now having some success breeding material that will take 25°F (-4°C) for short periods. This work is being extended (see below re: *R.saxifragoides*) and evaluated.

Fortunately vireyas take well to containerizing. They can be grown in boxes on patios and back porches and easily moved in and out during winter. They can be experimented with as "house plants" and as hanging baskets in a conservatory. Where the climate supports it they take readily to growing in protected raised beds where sharp drainage is assured.

But however grown some essential conditions must be met:

1. They should be grown in a rough fast draining mix - medium to rough fir bark, coconut chips, redwood fiber, rough perlite or pumice and some chunky peat where available. Really any "chunky" mix avoiding traditional loamy soil. Always keep one eye on drainage!
2. If containerized they should never be overpotted. In fact, a potbound plant is probably to be desired as long as fast drainage is maintained. It's really a matter of aesthetics and the balance between plant characteristics and container.
3. Periodic weal fertilizing will be necessary. Gypsum can always be applied as well as Epsom Salts to maintain a calcium magnesium balance and acidity.
4. Vireyas seem to do well in strong filtered light - full sun is probably to be avoided. But the appearance of your plants will tell you and some colors just do not look attractive in too much sun.

In Conclusion

Establishing an effective technique for raising seedlings opens one up to sampling the fantastic variation within this section of the genus, and I will close with one example that has given me great satisfaction:

In the early 1990s, Os Blumhardt (New Zealand) contributed several hybrid seed lots involving *R.saxifragoides* as one of the parents. *Rhododendron saxifragoides* is a dense cushion forming shrub growing in New Guinea at 9,000 to 12,000 feet (2,700 to 3,600 m) and is on every collector's list of most wanted. *Rhododendron saxifragoides* itself has proved difficult to grow, but we now see (thanks to Blumhardt) that its hybrids grow well and retain its dwarf characteristic. And, in addition, coming from such a high altitude one also hopes for a bit more tolerance for cold temperatures. Thanks to the Blumhardt seed Jim Gerdemann in Yachats, Oregon, is pursuing the hardiness issue with the *saxifragoides* hybrids and other parents, particularly *R.commonae* in both its red and cream forms. I am just having fun growing a spectrum of dwarf bonsai-like pot plants. I am now crossing several clones and siblings and using them as parents crossed with larger flowering *vireyas*.

The criticism is often heard within traditional rhododendron circles that hybrids never really have that "species look". I do not think that this is necessarily the case with *vireyas*. They are so diverse and can be combined in so many ways. You are able to create your own new "species" with that distinctive look. And seed raising is the only way to do it.

I have tried to keep the above "instructions" generic and they should be read more as guidelines than anything else - nothing is hard and fast. Fortunately rhododendrons set copious seed and the seed stores well in the freezer. Experimentation costs little.

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