The Vireya Venture

Issue No. 68 October 2008

Editorial

Distribution of this issue of T V V is very late and for this we apologize.

Apart from a report of a meeting, the majority of this issue is devoted to a single topic: *"Potting Mixes Suitable for Vireyas"*. It includes new articles, extracts from books and other publications and reprints from back-issues of T V V.

Inspiration for this topic came from an internet discussion group: Yahoo Groups Vireya (*http://groups.yahoo.com/group/vireya*) where numerous postings discussed the use of coconut chips in vireya potting mixes. It was clear that this was a topic of interest so we thought it might also be interesting for T V V subscribers.

Wanted

The supply of articles and contributions to T V V from subscribers has reduced to a trickle. It's a worry if this means there is nothing new to be said about Vireyas!

Please write and tell us what you are doing with your vireyas, and also send photos. Please send your article/letter to:

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Photo of the hybrid R. polyanthemum x (R. macgregoriae x R. rubineiflorum) produced by Andrew Rouse in the pursuit of compact vireyas. One of the parents – (mac x rubineiflorum) is a very compact, red-flowering hybrid. This plant is vigorous, growing outside in a pot not under shade cloth and exposed to Melbourne's winter.

Meeting of Vireya Commercializers in Australia

July 2008

Recently a small group of people gathered in Melbourne to discuss ways to improve commercialization of vireyas around Australia. The work of early vireya importers, growers and hybridisers was acknowledged, but it was felt that we need to move to the next phase in the cultivation of vireya as common garden plants. Issues discussed included:

(i) Plant Quality and Suitability:
- promoting a 'top 10' for each district;
- advertising with people's endorsement;
- selecting varieties for disease resistance, bushiness, flowering and ease of cultivation;
- promoting suitable plants for specific plantings – e.g., Saxon Glow for hedges.

(ii) Public Education. This might include:
- providing succinct cultural notes, particularly the importance of good drainage;
- attractiveness and appeal of vireyas;
- hardier varieties for public plantings;
- targeting garden centres, clubs & flower shows with displays;
- educating commercial landscapers;
- seek support of Botanical Gardens;
- targeting special places, eg. the Butterfly House at Melbourne Zoo and similar places.

(iii) Plant Labels need to be coloured, with correct information on the reverse. Discontinue use of descriptors 'rhododendron' and 'tropical.' Ask Aust. Rhodo. Soc to assist in promoting this.

(iv) Marketing:
- promote the most appealing characteristics;
- articles in horticultural magazines;
- artificially create a demand by restricting initial supply whilst promoting coming availability, then a short, sharp release;
- get help of retail nursery network and understand their cultivation requirements;
- establish an Australian vireya website with a photo gallery and supporting information.

(v) Establishment of a Vireya Growers Network incorporating amateur and commercial growers to evaluate new hybrids. This network would undertake trialling of plants, under a formal Trialling Agreement so as to protect the

hybridist's material. Results of trials to be evaluated at annual meetings and plans set in place for follow-up.

Many thanks to Murray MacAlister for organizing the meeting and driving the agenda. If anyone is interested in participating in this group's activities please contact Murray on his email address: muznbev@aol.com

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Another of the hybrids produced by Andrew Rouse in the pursuit of compact vireyas. This one is: R. luraluense x (R. macgregorie x R. rubineiflorum) but here there is little trace of the red-flowering parent. Again this is a vigorous and weather tolerant plant.

Potting Mixes Suitable for Vireyas

Eds. As mentioned above, the remainder of this issue is devoted to the issue of potting mixes suitable for vireyas in containers. When we started to collect material on this topic we thought it would be a relatively easy job and there would be abundant information in past issues of T V V , in books and magazine articles. How wrong we were !

What information is available is short and lacking details. It seems that authors assume that readers will understand what they mean when they say things like – 'a bark- or peat-dominated, open and free-draining mix, similar to that used for orchids'.

However, it appears that vireya growers, like gardeners everywhere, want to be individuals and to try something different, commonly something available locally. This was amply demonstrated in a report on the June 2006 meeting of the Hawaii Chapter of the American Rhododendron Society at the home of Richard and Sherla Bertelmann, as reported in their Viva Vireya newsletter, Vol.11 July2006.

"(A member) reported she'd had more than a modicum of success with a mixture of perlite, cinder and potting mix; proof of which, she believed, was a mature vireya bearing as many as 45 buds at one time!" ..... "Supersoil?" ..... "Well maybe, but I use Black Gold cactus mix" ..... "I just use wood and coco chips" ..... "Straight cinder with fir bark for me" ..... "Rootone" ..... "No, Dip 'n Grow" ..... "Sunshine Mix #4?" ..... "too moisture retentive" ..... "I use Rootone, cinder and a topping of vermiculite" ..... "I don't like vermiculite .... Won't use any mix containing it."..... "Whatever works for you."

So, there is at least some variability in what vireya growers use as potting mix and not much detailed information about what it is. Consequently, we had to put in some effort to collect the information presented here. We hope you like it.

Any further information that T V V subscribers can supply on this topic of potting mixes for vireyas would be greatly appreciated – just send it to us.

To start off on this topic off we present the comments on **Chris Callard's** terrific website **Vireya.net** (www.vireya.net) under the section on Information, Cultivation.

"Growing Medium. In the wild, the majority of vireyas are found growing either as epiphytes, clinging to branches and trunks high in the tree canopy, with only small deposits of moss and humus covering their roots; or terrestrially, often in crevices on steep cuttings. Both of these aspects provide excellent drainage after the frequent downpours prevalent in these habitats and this is undoubtedly the most important consideration when growing plants in cultivation.

There are many "recipes" used by growers today but a suggested growing medium that is suitable for a wide range of vireyas can be made up from equal parts of coarse peat, fine grade bark and pumice. This will produce a compost of open consistency that will hold sufficient water to meet the plants immediate needs but without risk of water-logging and at the same time allow air to circulate around the roots. Other ingredients can be substituted where appropriate, including perlite, tree-fern fibre or bracken, coarse river sand or grit (a type suitable for ericaceous plants) or leaf mould. Ideally, the mix should be slightly acidic at around pH 5.5 and magnesian limestone can be added if required to lower the pH level."

Eds. This is a succinct description of a general potting mix for vireyas. However, we suspect that vireya enthusiasts would want something more comprehensive and with alternatives. Why use this or that? Such and such is plentiful around my area, can I use it?

We hope the following articles will provide some background and maybe even some new ideas.

Photo of the vireya species R. rousei taken by Andrew Rouse, the son of the late Dr John Rouse after whom the species was named.

Potting Mixes - The Basics

Eds. Here we address some of the basic aspects of potting mixes. We apologise to those subscribers who know and understand all this – we are targeting the less experienced among you.

Question: What is the purpose or function of a potting mix and is it necessary?

Answer: All shrubs and trees need to be secured in one place so they don't blow away and their roots need a suitable environment in which to grow so they can feed the plant. The combination of potting mix plus a container are convenient means by which gardeners meet these two requirements.

Some vireyas are epiphytic (growing on branches of trees) and others are lithophytes (growing in narrow cracks between large rocks). They generally have their roots in small amounts of moss, leaf titter and or rock debris. In these settings vireyas have found their own physical support and root growing environment. But, if you haven't got a handy tree, a crack between rocks, or something similar, the usually choice is to plant them either in the ground or in containers (pots, hanging baskets, etc).

In some climates planting in the ground is definitely best for your vireyas, generally with modification of the local soil to improve its properties. We won't dwell here on the benefits of putting them in the ground – that will be for another time.

There are lots of reasons for growing vireyas in containers – severe climate (frosts or heavy snow in winter), a desire to show them off when in flower, or simply to be able to pack more into a smaller space. If you can provide physical support (eg. stakes) and aren't reliant on the weight of the pot and mix for stability, then the container and the amount of potting mix can be relatively small – vireyas seem to like, or can at least tolerate, their roots being confined.

The root environment for vireyas can be very basic – so long as it provides a minimum of nutrients, an adequate supply of water (without water-logging) with many air pockets, then the roots will usually manage to service a reasonably large plant. Of course, a more generous and 'friendly' root-zone environment will make your vireya grow quicker, produce more luxuriant leaves and more flowers.

Question: How does the potting mix manage the water supply?

Answer: Water is important to vireyas – but not too much nor too little. Gardeners rely on the potting mix being sufficiently free-draining to allow excess water to pass through quickly, but to also retain sufficient of it so the roots don't dry out before the next watering, which may be the next day or even longer. The mix must also allow air to reach the roots so they can 'breath'. Based on observations of natural vireya populations and from years of experience, vireya growers have learnt to use a 'free-draining', 'open' or 'light' potting mix.

To create such a mix growers select a loose aggregate (ie. one that doesn't 'set' and become 'concrete-like' when dry) made up of particles in the range 0.5 - 15mm diameter (coarse sand to medium gravel size) that have some degree of internal porosity (small cavities inside the particles). Because the individual particles are large and there are few fines (particles <0.25mm diameter) the spaces between particles are also relatively large so water can easily pass through the mix and run away.

If the particles were all solid with no internal cavities (eg. quartz sand and gravel) then after excess water has drained away the only water left in the mix would be thin water films on particle surfaces and these would quickly dry up. By using particles that have internal porosity some of the water will penetrate inside the particles and remain there for some time, slowly being drawn out by physio-chemical processes and by plant roots. They are internal reservoirs that can hold water for hours or days.

Question: What are the different types of particulate materials used in mixes for vireyas?

Answer: Particles that have internal porosity are: tree bark (pine bark, fir tree bark or coconut chips), vermiculite (a natural mineral expanded by heating to produce internal cavities), perlite (a natural rock de-natured by heating and expansion to produce many internal cavities) and coke or granulated charcoal (coal or wood heated in the absence of oxygen to produce a porous solid). Pine and fir tree bark and coconut chips are organic materials that break down very slowly over time. The organisms that effect this breakdown consume nitrogen so some additional nitrate fertilizer may be needed to replace this loss. Vermiculite, perlite and charcoal (or coke) are sterile synthetic materials and do not break down, at least not over at person's lifetime.

The common materials that do not have internal porosity are coarse quartz sand, rock fragments and shredded polystyrene. Coarse sand and rock fragments typically have sharp angular edges and many think this is important. Polystyrene is a synthetic organic material that does not break down readily and when shredded the pieces have rough but soft surfaces. Of course they are opposites in terms of their density, quartz and rock particles are dense and give considerable weight to a mix while polystyrene has a very low density and makes the mix light. Clay is generally avoided in potting mixes for vireyas because it can pack into a dense, water-holding and cementing mass which excludes air.

Often used in a potting mix for vireyas is a natural organic material that can retain water and help maintain the desired chemistry of the mix (see below). The most common are peat (also called peat moss), coconut coir (the fibrous part of coconut shells) and garden compost (decomposed leaves). There are questions about the long-term supply and/or sustainability of peat and coconut coir. Home-made garden compost is the closest to what vireyas in the wild encounter and it is the most natural. Compost produced commercially is not recommended.

Question: You describe the ingredients in a potting mix as if they simply provide a physical environment. What about chemistry?

Answer: Yes, the ingredients are essentially inert and only provide a physical environment - none are considered to provide any useful nutrients to the plant, except garden compost. Fertilizers are added to provide these, but we will not discuss these here.

However, there is one chemical aspect that is important and this acidity/alkalinity. Acidity and alkalinity are terms that describe the balance between hydrogen ions (H^+) and basic ions (carbonate CO_3^{2-}; hydroxide OH^- and bicarbonate HCO_3^-) and this is signified by the term pH. In gardening situations pH ranges from around 4 (acidic) through 7 (neutral) to about 9 (alkaline or basic).

All rhododendrons, including vireyas, are 'acid loving' plants. This means that for the plant roots to be able to take up nutrients the water around those roots needs to be slightly acidic (pH 5.5 – 6.5). If the water is slightly basic (pH >7) the nutrients are bound up in forms the plant roots cannot absorb. For a vireya to absorb nutrients from water its potting mix needs to promote slight acidity.

If the water that is used on a plant is essentially neutral (pH ~7), as with most town water supplies, then the pH around the roots will be determined by the potting mix. Mushroom compost is usually quite basic and the addition of limestone or 'garden lime' ($CaCO_3$) to a mix will make it alkaline. The addition of powdered sulphur (flowers of sulphur) to a mix will, over time, make the mix more acidic. Long-term use of ammonium sulphate fertilizer or garden compost will also make a mix more acidic.

One of the benefits of using pine bark, fir bark or peat in a potting mix is that they naturally tend to make the mix slightly acidic. They act as a buffer and lower the pH whenever it rises above 7.

However, vireyas do need a supply of calcium so it is recommended that a little dolomite (magnesium limestone - $CaMgCO_3$) be added to a mix to provide that calcium without increasing the pH.

Question: And what about biological activity in the soil mix, isn't that important too?

Answer: Yes, biological activity in the potting mix is important, but in ways that are not well understood. All sorts or organisms live in soils and also in potting mixes - even if initially sterile they soon pick them up. There are too many to consider here other than the most important, which are microrhiza. These are an ill-defined group of fungi (or organisms that have fungal stages) that can form associations with plants, some beneficial, some simply tolerated and some downright negative. Vireyas are generally considered to require, or at least they are frequently found to be associated with, beneficial microrhiza so the potting mix environment should be conducive to them. What this means and how it can be achieved in a potting mix is not generally known.

Of course there are many other organisms that can get into potting mixes, such as worms, lava, ants, beetles and nematodes (not trying to be exhaustive) and most of these are not desirable. There are many recipes and processes for removing and preventing such incursions but we won't go into them here.

So, that's a basic introduction to potting mixes for vireyas. If you want more details you will have to go and look it up for yourself.

If you want to make up your own mix then follow the suggestions in one or other of the following articles. If you don't want to make your own mix then you can start with a commercial mix for orchids and a commercial mix for azaleas, rhododendrons and camellias and blend the two 50:50.

Graham and Janet Price

A photo of a vireya flower – just to break up all the text. This one is of R. aurigeranum.

The next article, titled: **Potting Mixes for Vireya,** was written for T V V by **Andrew Rouse**.

September 2008

Like many growers I have tinkered with potting mixes for vireyas in pursuit of improving the mix for my growing conditions. The key consideration for me, based in inner suburban Melbourne, are the hot spells during summer. Whilst vireyas enjoy a light and free-draining potting mix, I also require a mix that has sufficient moisture retention to help plants get through hot days, particularly as I'm not always able to water on demand.

For vireya species kept in pots outside, I use commercially available 'acid loving' potting mix (ensuring this has no sand) which I combine with shredded polystyrene in a 3:1 ratio. I will alter this ratio, increasing the polystyrene where I think the plant will benefit from improved drainage. This is a more open mix than potting mix alone (which can compact as it ages in the pot) and it provides better drainage whilst retaining enough moisture to assist the plants when water demand is high.

I avoid commercial potting mixes with sand as I've found that sand aids water logging under prolonged wet conditions. I do use perlite from time to time, however I think polystyrene has better properties. These 'outside' pots get a once a year application of Osmocote (a slow release fertilizer) at half the recommended rate, normally applied in early Spring and they will get a foliar feed perhaps twice per year when I do the rest of the garden. I am less fussy with hybrids and particularly those under evaluation and they typically are grown in 100% 'acid loving' potting mix. I find that hardy hybrids are fine in this mix.

I use a lighter mix for vireyas in the glasshouse - mostly species - where plants are not exposed to extremes of temperature. I combine commercial 'acid loving' potting mix, peat moss and polystyrene, with polystyrene making up about half the mix. On occasions I add aged, shredded tree fern fibre as the drought has provided a seemingly endless supply of dead tree ferns in my neighbourhood that I shamelessly collect from nature strips on green waste collection day. The tree fern is aged to ensure that it has dried out and is no longer 'sappy'. Smooth tree fern - Dicksonia antarctica - is preferable as it is the most fibrous. This provides an open, acidic mix high in organic matter that allows air to circulate around the roots and that has the right balance of good drainage and water retention.

One of the benefits of shredded polystyrene is that its irregular shape and wide range of particle sizes aids air circulation and the mix has a 'spongy' quality that helps the mix to retain its shape. This property is useful when a pot dries out as there is minimal contraction of the mix away from the inside wall of the pot. For weak-rooted vireyas, I increase the proportion of polystyrene and substitute peat and/or tree fern fibre (ie better quality of organic matter) as I've found that this form of tough love can coax better root growth from otherwise poorly rooted plants. Glasshouse plants will get Osmocote if they are re-potted and liquid fertiliser is applied about 2-3 times per year, at half the recommended rate. I no longer use compressed coir peat as I found that I have a better success rate without it.

I also have a number of vireya species growing in aged tree fern logs. Most plants seem to thrive in tree fern logs as long as you keep the water up to them. In my case they do better in the glasshouse. I've experimented with some smaller vireyas such as *R. stenophyllum* by planting them into the end of a tree fern log which is then placed vertically in a pot containing the above glasshouse mix. This aids air circulation around the foliage of the plant, it helps to stabilise the plant and provides good drainage whilst aiding some water retention.

Seeds are sown in a 2:1 mix of sterilised, sieved peat moss and vermiculite. Vermiculite is a recent addition to improve the drainage and structure of the mix. Inexplicably it also seems to have the added benefit that I have less algal scum on the surface of the pots, moss takes a little longer to get established and fewer infestations of fungus gnat fly. Once seedlings get to about 5cm they are transplanted into the glasshouse mix.

Eds. Thanks very much Andrew. In the past we have not been particular fans of polystyrene as we though such a mix was too light, but you make a good case for its inclusion. We will give it a try.

Photo of R. himantodes, from the island of Borneo, which we believe John Rouse imported, propagated and distributed around Australia.

The next item is a reprint of part of an article titled **Peat Substitutes** written by **J. Clyde Smith** from issue #22 of T V V in July 1996. Clyde was Editor of T V V at the time.

"German peat was once a major element in our potting mixes, in striking cuttings and in raising seedlings, but when it became not only hard to obtain but also very expensive, the alternatives of

pine bark and local or New Zealand peat became widely used. (Rice Growers Co-op Ltd) have two products of interest, viz: Sterilized Rice Hulls and Composted Rice Hulls. The sterilized rice hulls have been available here for some time and I have used them in my potting mixes (20% max) as a light weight, well-drained dilutent.

These rice hulls are designed as a bedding material in stables, but they work well in a mix. The sterilized rice hulls are designed for potting mixes as a substitute for vermiculite or to be incorporated in the ground where their potash content (230.9 mg/litre) is a very desirable additive particularly if fertilizing with Blood and Bone.

Also available now is 'CocoPeat', made from Coconut husks imported from Indonesia. As a growing media and soil conditioner, it is claimed to have superior porosity and better water-holding capacity than most peats. It is certainly easy to wet and holds water well. The bag details its properties as: pH 6.3, air-filled porosity 15.9%, water-holding capacity 69.7%. Their suggestion is to add up to 50% by volume of cocopeat to the potting mix to improve wetability and water-holding capacity, even 20% will greatly improve the water-holding capacity.

Eds. It seems that J Clyde Smith had a tendency to use unusual components in his potting mix (see another article from him later). His point is well taken though – think about what you want to achieve and look at what is available locally.

Where the climate permits, as it does throughout most of Australia, vireyas will almost always grow better when planted in the ground, like this R. lochiae in the garden of Simon and Marcia Begg at Olinda.

The following is a précis (heavily edited and all names removed) of a series of posts by 8 people that appeared in May this year on the internet discussion group website: Yahoo Groups Vireya (*http://groups.yahoo.com/group/vireya*) concerning the role of coconut chips in potting mixes for vireyas.

Initial question: In some old posts I read about the successful use of coconut coir chips plus perlite as a potting media for vireyas. I'm ready to try this now that many of my plants need repotting. Do you think this potting media could work in my climate (northern coastal Spain), or does this just suit the tropics. Would coarse peat + coconut chips + perlite be a better alternative?

Reply 1: We do not like Coconut chips any more because we got some containing too much salt that killed some big old plants. We use orchid bark (Douglas Fir) instead, probably any kind of bark that has been sifted to get the fines out and leave pieces of 6 - 13mm in size. We did use course peat but it is very hard to find now so we use a small amount of fine peat and lots of perlite. All that really matters is that the mix drains very fast.

Reply 2: Wow, so the salt content is such a serious matter, I had read about this.

Reply 3: Yes salt, or whatever it was. This is one reason that some areas in Southern California have plant problems - bad water. We are not going to take a chance again with coconut chips and we see no advantage in them over other things. Down in south-eastern USA they use pine bark.

Reply 4: I think the issue of salt content in coconut chips is a thing of the distant past.

Reply 5: I have been using coconut chips for a long time. Yes bark is just fine. Coconut chips tend to produce nice horizontal fibre and I like that, but almost any free-draining, moisture retentive, combo mix seems to work. The plants will let you know.

Reply 6: Maybe you are right, but something killed several *R. stenophyllum* plants after they were top dressed with coconut chips. It took a year to happen and it happened to other stock plants also, some 25 years old. We used it because it looked good. The coconut chip people say their stuff is just great - but they would wouldn't they. Do they really know what they are doing or are they just selling a product? We used coconut chips for 5 years with no problems and then, Bang! I even soaked some of the dry chips in water and tasted it - it was salty (I think). One of our coconut coir suppliers told me to be careful, they could not be trusted all the time.

Reply 7: Coconut chips and the coir are generally OK if one is careful about where it is harvested. We used some from Colima, Mexico, where they had state-of-the-art equipment. According to three soil chemists they tested coir from Sri Lanka and found pathogens, but evidently not in the Mexican supply.

Reply 8: We only use steamed coconut chips, with good results.

Reply 9: We're not having any special trouble with coconut chips. I have several vireyas which have coconut chips in the mixture. They're growing like weeds. For my part I use "gorilla hair" [shredded redwood] as the third component in my mixture - coarse peat moss, perlite and redwood. I stay away

from pumice as some batches have been found to contain salts. Perlite seems to do a better job forming space in the soil because of its angularity which permits the entry of oxygen and water. This in turn promotes the propagation of all the soil organisms which convert soil nutrients into water soluble forms that the plants can use.

Reply 10: Our experience with coconut chips over the last three years has been positive. We have transplanted thousands of vireyas from cuttings into Sri Lanka-origin chips obtained from our local nursery supplier on the Big Island of Hawaii. For us, the excellent wetting ability of coconut chips compared to peat or bark has been very helpful. In addition, coconut chips not only absorb water better than bark, they also drain water better leaving behind significant air spaces which are helpful to the epiphytic rhododendron roots. We feel chips are a superior material for these plants. The packaging of the chips states that they have been washed several times before compression into bales. Hopefully this has/will remove any salts.

Reply 11: It may be Sri Lanka has cleaned up its act re coconut products. We began our experiment about 4 years ago and the tests were conducted before that. Things can change over time. As for the wetting capacity of coconut chips vs coarse peat or bark, I'm not sure that this is really an issue. Coarse peat breaks down extremely slowly under normal growing conditions, too slowly actually to be noticed in the usual growing lifetime. Black peat has an entirely different pH than the reddish-brown coarse type that many use. The purpose is to maintain a fairly even pH, something between 5.0 and 6.5, if at all possible. Coarse peat moss will do that. It is stable and will also absorb many times its own volume in water. As for the bark, it is mainly used to protect the plants from phytophthora -the organisms which break down bark into cellulose are apparently predators of the phytophthora organism. However, I find perlite superior since it is a mineral which does not break down over time.

Reply 12: For my money I would think coconut chips would work perfectly well as a general mulch for anything and particularly well for vireyas, since their little feeder roots are quite fine and must have space in which to roam. So long as coconut chips are free of salts they should be just great.

The next article is taken from **J. Clyde Smith's** book **Vireya Rhododendrons** published by The Australian Rhododendron Society Inc. 1991, p41.

"Obtaining good growth from a plant in a container if regularly watered and fertilized depends on the mix that is used if other adverse physical conditions are avoided. ... The potting mix should have sufficient weight and stability for secure anchorage of a large plant – growth of up to two metres in a 250mm container is quite possible – and it should drain freely and quickly, but be readily wetted after some drying out. Small pots, to 150mm, and shallow containers do not drain as well as deeper pots and may require a coarser mix. If conditions are right then roots will grow to the bottom of the pot but if the mix is too 'heavy' (a clayey soil would be an extreme example) the roots will stay near the surface and the rest of the mix will sour. When the plant is knocked out of the pot (its roots) will look like a pancake leaving the pot still nearly full.

Photo showing abundant fibrous roots on a vireya growing in a very open mix containing what look like coarse polystyrene pieces and coconut chips. This is probably the objective we are aiming for.

Composed pine bark is now accepted as the main component of the mix instead of the imported peat that was once first choice. It will hold moisture but is still free draining. When milled or shredded to size, usually through a 12mm screen, it may make up to 50 – 70% of the mix. The balance is often a matter of personal choice depending on what materials are available locally, and include brown coal, coke, coal wash, wood shavings, coarse sand, crushed rock, compost, peat, scoria, perlite or polystyrene foam. A very sandy soil free of clay may be added in small amounts particularly for larger containers. Fertilizers and minerals such as iron and calcium (as gypsum) may be added but tend to leach out and need supplementing by regular feeding with small quantities of soluble fertilizers, preferably those that contain trace elements and are absorbed through the foliage, as the constituents of the mix are essentially inactive, supplying air and water to the roots, but not essential minerals."

Eds. J. Clyde's inclusion of several coal-related materials (brown coal, coke, coal wash, crushed rock) as potential components in a potting mix probably arose because he lived in the coal mining town of Woolongong south of Sydney. They are not likely to be commonly available in many places.

This next article is taken from the website of **Bovees Nursery**, Oregon USA, where they sell a **Vireya Mix** with the following components:

1 part Chunky Peat Moss
1 part Perlite (Horticultural Grade)
1 part Pumice (Central Oregon)
2 parts Orchid Bark (1/4 to 1/2 inch size)

They also provide a few notes on each component:

We use chunky peat moss but you do not have to. If you want to use any of the fine particle peat moss just add a little bit more Perlite.

What is Perlite? Perlite is a naturally occurring mineral that pops when furnaced. Each particle has a large, irregular surface area enclosing numerous tiny closed air cells. Perlite is lightweight, sterile, chemically inert, permanent, non-toxic, incombustible, rot and vermin resistant, asbestos-free and has a neutral pH.

Pumice is also a natural material. Ours comes from central Oregon and has been sifted to remove most of the fines. Pumice is much the same as Perlite but much heavier.

Orchid bark is Douglas Fir bark that has been sifted and sorted to size. There are very few fine particles in good Orchid bark. Ours has also been heat treated. Great stuff.

Eds. People should be mindful that pumice differs significantly around the world and it will behave differently, being composed of different rock types and compositions and with different textures. In some places it is called 'scoria'. It can break down rather quickly and when it does it forms clay minerals – with their inherent problems in a potting mix. Also, 'pine bark' from Douglas Fir (*Pseudotsuga menziesii*) in North America is not available in Australia, where 'pine bark' is from *Pinus radiata* (Monteray Pine), though we are sure it is a similar bark. You will also notice from some of the articles above that there can be big differences in the colour, particle sizes and chemistry of 'peat moss'.

The final article is taken from **George Argent's** book **Rhododendrons of Subgenus Vireya,** published by the Royal Horticultural Society, 2006. It specifically comes from section 7, p333, titled Cultivation and Propagation and was written by David Mitchell and Louise Galloway from the Royal Botanic Gardens Edinburgh.

"The current compost used in Edinburgh is approximately pH 5.5. It is completely bark based with additional fritted trace elements and magnesium limestone. Rouse (1979) demonstrated that despite vireyas requiring acid conditions they in fact have a high requirement for calcium. Magnesian limestone provides this necessary nutrient without raising the pH. After some years in use, it has been found to be ideal for a wide range of species, from all altitudinal zones (Mitchell 2003).

Edinburgh compost
60 litres medium grade potting bark (2.5-3cm)
40 litres fine grade propagation bark (0.5-1cm)
80g magnesium limestone
40g fritted trace elements

This provides an ideal acid, moisture-retentive yet free-draining, open medium for vireyas. If these materials are not available, many similar products can be obtained from orchid growers as orchids often require similar conditions. Other substrates which may be available include coir (coco-fibre), redwood bark, and ground pumice, the aim always being to create an open, well-drained medium."

Eds. This description of the 'ideal' potting mix composition from the foremost collector and scientist studying vireyas might appear to be the final word. However, just because it works well in their glasshouse in Edinburgh doesn't mean it will be appropriate in your conditions. Everyone should work out what is best for them given their own circumstances and what you have available, with the aim always of maintaining the basic requirements for vireyas.

Well, that's the end of this focus on potting mixes for vireyas. If we got anything wrong or you feel we didn't give the correct emphasis on something please write and tell us so we can include a correction in the next issue.

It is also the end of this issue of The Vireya Venture newsletter. We hope you enjoyed it. The next issue, #69, should appear around December 2008.

Graham and Janet Price

And its another goodnight from Buster and YumYum as they settle down for a night of snuffling, heavy snoring and dreaming. We think they dream about chasing rabbits.