VIREYA VINE
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R. S. F. PO BOX 3798, FEDERAL WAY WA. 98063
E. White Smith, Editor

I've got chlorosis. I have had it for a long time and I do not like it. You probably have it too. I am talking about the yellow leaves on my Vireya Rhododendrons (on other Rhododendrons to). I have tried different things but nothing has worked. SO I have done some asking around and might have an answer. This is really pretty simple and I already knew. The question came up a few weeks ago when I was visiting Bob Badger in Kent, Washington. He told me that he had heard a talk given by a researcher at the Western Washington Experiment Station (Washington State University) in Puyallup. The researcher said to watch out when using the nitrate form of nitrogen and to use the sulphate form instead. Then I asked Dr. George Ryan about this problem and he said to use the ammonuim sulfate form of nitrogen and to use iron chelate. I have also learned from reading labels in garden stores and from some of my own fertilizers, that some of these formulations use a nitrate form of nitrogen. Many also use the sulfate nitrogen in their mixes. Dr. Ryan is writing a paper about phosphate and nitrogen use on Rhododendron and Azaleas. He will probably have it printed in the American Rhododendron Society Journal. George let me read what he has been working on and I now understand a little more about how nitrogen works. Please understand that there is disagreement about sulphate vs nitrate. The published research tells the story both ways. You don't need to use both iron chelates and ammonuim sulfate because the ammonuim sulfate it's self will do the job. I am going to use both and try to solve my problem.

Probably the key to my chlorosis problems will be cured when I use iron chelate. Iron gets tied up in soils and cannot be used by the plants. Whether the pH is high or low does not appear to matter if the iron is tied up. Adding iron sulphate (ferrous sulphate) will not help because the iron is still tied up in the soil. Chelates are reported to be the answer. From what I can tell; Iron chelates "hold on to the iron (Fe) so that it doesn't get tied up in the soil, so that it can be taken up by plants".

Where do you get it (iron chelate)? In the USA, the Ortho Co. makes a product called "Greenol - Liquid Iron 6.13%" that should work. I have always liked Ortho Products even though they are more costly. I think that I get more actual chemical for the money spent. While I was looking for iron chelate I found quite a few products that do have chelate iron in them, like, one 30% nitrogen, soluble product listed .35% iron chelate, another was a 20-20-20 mix with .15% iron chelate. I did not want any more N-P-K but only wanted the iron chelate. Chlorosis can be due to "iron deficiency, manganese deficiency, magnesium deficiency and others. Chlorosis that results from using the nitrate form of nitrogen is prevented by using iron chelate. Remember that using ammonuim sulfate will lower the pH of your soil. This can be undesirable if it gets too low. Many Rhododendron growers are using dolomite limestone to keep the pH at a reasonable level. Dolomite is cheap, easy to apply and is slow acting. It breaks down quite slow and need to be used every year in my opinion.

Today is the 26th of February 1989, a cool, sunny, Sunday and I spent the morning fertilizing my outside Rhododendrons with Ammonium sulfate and iron chelate (Ortho Greenol). I also gave the Vireyas in the greenhouse a shot of the iron chelates. We have had a real cold snap here in Tacoma. It got down to +5'F here at my house but the greenhouse held at 50' with out any problems. I think that a few more days of very cold weather and the cold would have began to come into the greenhouse from the frozen ground outside. It has not been that cold here in Tacoma for at least 10 years. For the last few years we have had lows of only 23'F.

Last fall Jim and Janice Gerdeman from Yachats, Oregon (Southern Oregon coast) stopped by to look at my Vireyas. Jim is interested in growing some plants outside and is busy trying. He saw that I had 3 or 4 large plants of R. kawakamii in the greenhouse and suggested that I should try one in the ground outside. OK, just to make Jim happy I planted a kawakamii near the greenhouse wall facing south and in full exposure. What happened to this plant? Is it dead? Heck NO, it looks good at this time. We only had 1 inch of snow and I did sweep some over this kawakamii, but it got very cold and the ground was frozen at least 6" deep. Are some Vireyas really hardy? ???

The following is a list of the plant nutrients that you might find in a fertilizer mix, with their chemical symbols.

Ammonium - NH_4;
Ammonium nitrate - NH_4NO_3;
Ammonium sulphate - $(NH_4)_2SO_4$;
Calcium - Ca;
Calcium nitrate - $Ca(NO_3)_2$;
Calcium sulphate - $CaSO_4$;
Copper sulphate - $CuSO_4$;
Diammonium phosphate - $(NH_4)_2HPO_4$;
Ferrous sulphate (iron sulphate) - $FeSO_4$;
Iron - Fe;
Magnesium - Mg;
Magnesium phosphate - $Mg(H_2PO_4)_2$;
Magnesium sulphate (Epsom salts) - $(MgSO_4)\cdot H_2O$;
Monoammonium phosphate - $NH_4H_2PO_4$;
Monosodium phosphate - NaH_2PO_4;
Nitrate - (NO_3);
Nitrogen - N;
Phosphorus - P;
Potassium - K;
Potassium chloride - KCl;
Potassium nitrate (saltpeter) - KNO_3;
Potassium sulphate - K_2SO_4
Sodium nitrate - $NaNO_3$;
Sodium chloride - Table salt - NaCL;
Superphospate (calcium phosphate) - $Ca(H_2PO_4)_2$;
Urea - $CO(NH_2)_2$;
Zinc sulphate- $ZnSO_4$;

From Mitch Mitchell, Volcano, Hawaii
Dear VV, August, 1988

In Graham Smith's letter to the VV which appeared in Issue #10 he described his hanging baskets. Graham tells about 'wooden slat baskets 30 cm square and 15 cm deep, lined with 1 layer of shade cloth material. This sounded like a great idea to me and I thought surely in this orchid growing community I would have no trouble finding a good selection. What a surprise awaited me...not only was the supply almost zero, but those that were for sale were frightfully expensive.

So, I said to myself, they should be very easy to make and proceeded to the hardware store to purchase the redwood material. The redwood only came in 1" X 6" and it had to be ripped to 1" X 1"s. I needed enough for 12 boxes. Drilling the holes, finding and inserting the threaded material and assembling the redwood pieces was a lot more time consuming, not to mention expensive, than I had visualized it would be.

After going through that exercise it came as a very pleasant surprise to discover in a garden shop, oversized, galvanized wire baskets (13" diam X 9" high) for about $3.00. After spraying them with black paint they were lined with shade cloth. The plants look quite happy in the baskets. I use essentially the same mix that Graham Smith described except, instead of saw dust I use shredded tree fern fronds.

R. A. Mitchell, Jr.
P.O. Box 298
Volcano, Hawaii 96785
Phone, (808) 967-7209

Thanks Mitch, another thing that is good instead of shade cloth is the plastic screen door material that is now available. I have used moss and find that it breaks down and gets mushy.

I was very happy to meet Mitch and his wife at one of the dinner's in Wollongong last October. Our paths crossed again at the "Patuha Farm Lodge" near New Plymouth, NZ. The Mitchell's were there 2 days before we arrived. When you go to visit Pukeiti is probably worth your trouble to stay at this "farm Lodge" (motel in the middle of nowhere). Actually it is on a sheep farm right next to Pukeiti and Egmont National Park.

From Neta Budil Tacoma, Washington
Dear Vireya Vine, Feb. 6, 1989

Our Vireya Rhododendron "Princess Alexander" brings us much pleasure these winter days. At this time there are twelve clusters of flowers in bloom. They remind us of Stephanotis, fragrant but with larger flowers. This plant grows best in a south window in our dining room.

Elwood and Neta Budil
806 So. Proctor
Tacoma, Wa. 98405
(206)759-6066

Thanks Neta for the note about Princess Alexandra. The Budil's are my wife's (Marlene) mother and father. They have been in the retail florist business since just after WWII and know a lot about plants. Rhododendron's are their favorite plants. They have an extensive planting of hardy hybrids and species. Elwood got me started in Rhodies 30 years ago. The Budil's belonged to the American Rhododendron Society when every one had to drive to Portland Oregon for meetings (before any chapters were formed). They were also among the founding members of the Tacoma Chapter (the first meeting was in their house). It is an easy two and a half hour drive to Portland now on our modern freeways but back in the late 40's it must have been a major undertaking to get there.

About 15 years ago I got a cutting from another Rodie nut (DR. Bill Avery) here in Tacoma and grew many of these plants for a few years. I still have my original large (now) plant but do not root cuttings of it any more because I was having trouble with mildew on them. Princess Alexandra is one of the old (1840's + -) hybrids that were done buy Veitch in England. The cross was R. jasminiflorum X Princess Royal. Princess Royal is R. jasminiflorum X javanicum.

With the help of you Viners, I would like to develop a list of Vireyas that do well in a home (house, apartment, etc.). Some people think that I am a species person and but that is not true. Yes I do like the species Rhododendron's but I also like the good hybrids. In the last few years I have needed to limit my collection to species (because there are not too many available) and good proven hybrids. When I first started with Vireyas I tried to grow many a hybrid seed batch. Very few were any good and most got thrown out. I also made a mistake of not trying any hybrid seed with R. leucogigas as a parent. I thought they would get too big for my small greenhouse. But now I know better, ie, a lot of the real fine, large, showy hybrids have R. leucogigas in them. I think what scared me off from the larger plants is when I grew a plant, from seed (CW Sikkim) of R. maddenii. It was growing in the greenhouse bench the year that it finally bloomed and it also went through the top glass. I pulled it out and set the plant under the lath house and it froze to death that winter. Now that was not a very nice thing to do but this maddenii was 6 years old from seed, 8 feet tall and had a 4" trunk. It was also putting out 2 flushes of two foot growth per year.

Hay, Hay, Back to subject of Vireya Rhododendron's as house plants. I know that Saint Valentine will grow in the house. R. retusum should do well also. Many of the dwarf species might be successful as house plants.
What do you Viners think? Wait a minute, what are the ground rules? The plants need to be HAPPY in the HOME environment, not just stay alive, you should not need to give any special care like pans of water for humidity and things like that. A list of Vireya house plants should be useful to commercial growers who would like to try Vireya Rhododendron's as an other crop.

You Viner's must think that I like Saint Valentine. Oh Boy do I. I must because I have rooted over 50 already this year (and this is only April). What am I going to do with them? What if they all live and grow up? St. Valentine is just too good to not grow and give away. I have never had any cultural problem with it. No mildew, no spider mites, branches well when pinched, blooms when young and roots automatically. What more could you ask from a plant? Over the years I have given over a hundred away and I suppose they all are dead now. Marlene and I go to the meetings of the American Primrose Society. I have never been able to figure out that genus but we do like primrose's and the people are good plant persons. I always take a couple of St. Valentines for the Primrose exchange table and they get snapped up fast.

Note to all VINER'S: Does this issue of the Vine look like all E. White Smith to you? I do not want it that way but, I do not have any of your letters to print. I am getting so desperate that I am about to start copying (typing) some of the stuff from four Vireya Vines done by Bob and Marge Badger. Unfortunately we do not have the first 4 Vines on Computer disk. Bob and Marge did them on a friends Apple II computer and the computer and disk are gone. In case you really care it would have been hard to get the info from the disk anyway because almost nothing else will read Apple computer disk but Apple computers. We can read and copy almost any other computer disk to the IBM format except for Apple.

In lieu of letters from Viners I shall give you folks some interviews that I have done.

At the International meeting in Wollongong, Australia last October, I met Len Craven who lives in Camberra. Len knew that my small group planned to drive through Camberra on the way south to the Melbourne area and asked us to stop by and see his collection. Len met us in Camberra and guided us to his home. He has a greenhouse full of Vireya Rhododendrons. While we were standing around in his greenhouse looking at and talking about the plants he happened to pick up a pot and some bugs ran out from where it was. I asked Len if those bugs did any damage and he said "I think they eat my compost". I said "but they don't hurt the plant?" and Len said "no, but they eat my compost". OK fine, they only eat the compost, what does that hurt? Well sure it hurts. Why do we put peat and organic things into the potting mix for anyway. Just to feed some bugs? NO NOT ME. I am not ready to feed bugs just because. What is this bug that I am talking about? I don't know. They are about 1/4 of an inch long with many legs. They are oval shaped, but roll up into a ball if you bother them. I have always called them "pill bugs". You will see them under almost every rock or log in the yard. They are always under something and are under the Vireya pots in my greenhouse. I would think that any of the insecticide would kill them. After all they are eating my potting mix.

I was at a friends house in Christchurch, New Zealand last year looking at and talking about Rhododendrons (what else is there be to talk about?). They had one of their neighbors come over to meet us because she grew Vireyas also. My friends are John and Beverly Bitteridge and they grow Rhododendrons but not Vireyas. Their neighbor is Evelyn Boswell and she grows all kinds of Rodies. During the conversation Evelyn said that she has the best luck getting Vireyas to branch if she prunes mature wood instead of pinching back new growth buds. OK boys and girls, we have been taught to pinch new growth just as it starts to push. After the pinching the dormant eyes will hopefully pop out and we will get more than one growth. Evelyn has a very good point to her theory. I have noticed that pruned plants branch very well. You also have a cutting that has matured for rooting that you will not have with an expanding growth bud. I am going to need to think about this some more.

Last week Fran Rutherford sent me a little thing that he had been working on. It was on paper and I asked Fran to give it to me on computer disk and we will have a finished Vireya Vine. Remember that Fran went to Papua New Guinea in 1987 and is very interested in the area now.

From Fran Rutherford, Port Orchard, Washington
Dear VV, April 1989

MT KAINDI
Northeastern New Guinea

Note: TEMPERATURE is stated in FAHRENHEIT, RAINFALL is in INCHES

RAINFALL

Station at 3,960 feet (1,200 m) (Wei)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Min	2.2	2.9	2.7	2.2	2.7	1.7	1.0	2.3	2.3	2.6	3.4	4.5	30.5
Mean	7.5	7.8	9.6	6.7	5.3	4.0	4.2	3.1	4.0	5.3	7.2	9.4	74.1
Max	11.4	14.9	15.7	12.9	10.2	11.7	7.8	6.3	8.3	13.1	11.7	15.8	139.8

Station at 7,800 feet (2,362 m) (Kaindi)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Min	3.8	11.3	4.2	5.9	5.3	3.0	4.6	3.6	3.7	4.1	4.6	6.0	60.1
Mean	9.1	17.7	10.8	9.0	8.4	7.1	6.4	5.3	5.8	7.2	10.3	9.4	106.5
Max	14.4	24.0	17.4	12.1	12.4	11.0	9.5	6.5	7.6	9.0	16.2	20.3	160.4

Station at 9,320 feet (2,864 m) (Bulldog Road)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Min	6.5	6.7	8.6	8.7	4.7	3.0	3.1	4.4	4.3	8.4	4.7	6.4	69.5
Mean	13.2	9.9	12.1	11.5	8.9	6.9	6.0	5.6	7.2	10.2	9.4	11.9	112.8
Max	23.5	14.7	15.8	13.3	11.2	10.2	7.9	8.4	9.3	12.2	14.0	15.7	156.2

Notes: Means were calculated from nine year record for Wei and from four year records for Kaindi and Bulldog Road. The highest and lowest monthly and annual totals recorded during these periods are also shown. Readings on Bulldog Road were made once a month.

TEMPERATURE

Station at 3,960 feet (1,200 m) (WEI)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
Min	65	65	64	65	64	60	61	60	62	63	63	64	63
Mean	71	71	71	72	70	67	67	68	70	71	71	71	70
Max	81	82	80	82	82	78	78	80	82	83	84	83	81.25

Station at 5,940 feet (1,000 m) (WEI -2)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
Min	57	56	59	55	56	56	56	55	56	59	59	59	57
Mean	62	61	61	61	62	61	61	62	62	62	62	62	61.5
Max	71	70	70	71	71	70	69	71	71	72	71	72	71

Station at 7,800 feet (2,362 m) (Kaindi)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
Min	53	54	55	55	55	54	53	52	53	53	53	55	54
Mean	58	60	60	60	58	58	57	57	58	59	58	58	58.5
Max	66	67	67	67	67	65	61	64	65	67	66	66	65.5

Station at 9,320 feet (2,864 m) (Bulldog Road))

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
Min	37	45	43	43	39	41	39	39	37	41	41	41	40.5
Max	73	64	72	63	59	57	61	59	61	61	64	73	64

Notes: Means were calculated from nine year record for Wei 1, three year Wei 2, from six year records for Kaindi and 4 year records on Bulldog Road. The highest and lowest monthly and annual totals recorded during these periods are also shown.

All weather information, soil analysis and general climate information is copied from or summarized from "Guide To Mt. Kaindi" "Background To Montane New Guinea Ecology" by J.L. Gressitt and Nalini Nadkarni, Wau Ecology Institute Handbook 5, 1978. Mt. Kaindi is located in the Morobe District near the town of Wau. Part of Bull Dog road (now abandoned) is in the general area. Mt. Kaindi is in many respects typical of the mid-montane environment of northeastern New Guinea. An all weather road goes from Wau to the summit and also to the Eddie Creek. It is a good place for first time Vireya explorers to start. The Wau valley contains a population of Vireyas within easy travel of the Wau Ecology Institute.

Vireyas which are native to Mt. Kaindi are R. nummatum, lindaueanum, phaeochitum, leptanthum, konori, solitarium, gracilentum, alticolum, macgregoriae and aurigeranum. If you go into Eddie Creek area you can also, find herzogii, invasorium, superbum, inconspicuum and luteosquamatum. Bull Dog road has nummatum, lindaueanum, invasorium, herzogii, superbum, phaeochitum, konori, solitarium, yelliotii, maius, cruttwellii, pleianthum, anagalliflorum, gracilentum, purpureiflorum, vitis-idaea, alticolum, luteosquamatum, inconspicuum, christi, macgregoriae, culminicolum and aurigeranum. Exploring along Bull Dog road would be a major undertaking.

There are four principal vegetation subtypes, all mixed rain forest, on Kaindi. The lowest zone is Araucaria mixed rain forest (in some places lower montane rain forest without Araucaria). Next is oak forest often mixed and sometimes nearly pure. Followed by elaeocarp mixed rain forest. On the summit ridge and upper lateral ridges we have Nothofagus (Southern or Antarctic Beech) mixed semi-moss forest.

A typical day would be fog in the early morning hours with clearing by afternoon. Most rain falls during the afternoon or evening (about 70% at night). Rainfall generally increase with altitude but there are many micro-climates. When our party was there in August, they were experiencing an unusual drought of three weeks, yet we ran into a localized cloud burst at Maria Creek. Fog drip is extensive and a significant factor in plant growth. For our purpose, day and night should be considered to be of the same duration (12 hours).

Relative humidity varies in association with temperature, precipitation and the frequency of fog. The mean annual humidity at 3,900 feet is about 80% and at 7,800 feet about 90%. Both weather stations at 3,900 and 7800 feet are usually saturated at night.

As you observe from the above charts, diurnal (daily) temperature variation is much greater than annual variation of minima and maxima. However, temperature variations remain almost constant throughout the year. But, there is a significant difference between the highs and lows of each day and the difference is relatively constant throughout the year. This may be an important factor for some species. Temperature does decrease with altitude and the difference between day and night temperatures increases. Also, there are greater temperature variations between months.

Wind velocity averages only 3 KM/5KM per hour year around.

Due to the high rainfall levels, tropical soils are generally leached and lack significant quantities of such nutrients as Ca, Mg, K, and Na. These elements are stored in the vegetation itself and are constantly being recycled as vegetation decays. Also, rainfall does contain appreciable quantities of inorganic nitrogen. Assuming, that most of the derives from the fixation of atmospheric nitrogen and its reaction with water, half would be present as ammonia nitrate and half as the hydroxide. Thus vireya's, in New Guinea. are constantly being bathed with an very dilute of ammonium nitrate as well as other forms of nitrogen. This may explain why vireya respond so well to foliar feeding. I obtain at least 25% more growth with foliar feeding than with pot fertilizing alone.

Soils on Mt. Kaindi are no exception. A study made in 1977, show that in general, soils are; 1. Have a very low pH; 2. Have virtually no exchangeable Ca and Mg; 3. Have an extremely high Cation Exchange Capacity; 4. Have a high concentration of organic matter; In my opinion, the best specimens of small leaf vireyas on Mt. Kaindi, as well as on other mountains, were growing on rotting logs or in heavy forest debris.

For most species, the flowering period falls between March and October, with occasional bloom during the rest of the year. Usually, the peak flowering period is June and July. At Agian which is located at the eastern tip of P.N.G., Rev. Cannon Norman Cruttwell states that the peak flowering is in May and June and again in September and October. Most experts believe bud set tends to occur during the drier periods. It would be helpful to know, for various species, the length of time between bud set and flowering.

AN OPINION ON GROWING VIREYA'S IN CULTIVATION

TEMPERATURE; In cultivation, especially in a greenhouse, it is not practicable to create separate micro-climates for each group of Vireya's. Hopefully, we can create a climate in which most will grow and flower well. Dr. Pieter van Royen points out that "the genus as a whole does not seem to be limited by temperature, but many species exhibit optimum growth over narrow temperature ranges". In cultivation a temperature range from 40 to 80 degrees would be satisfactory for most species.

WATERING; I grow my vireyas in an open porous mixture which is not too water retentive. In the summer months relative humidity is low and the temperature quite high which results in the pots drying out rapidly. With perfect drainage, it is almost impossible to over water in the summer. I have to water daily. In the winter, when the relative humidity is very high and the temperature low, I only water when the soil is dry to the touch. Vireya's will tolerate periods of dryness without ill effects. Graham Smith has been able to induce bud set on mature plants which have completed a growth cycle and the new growth harden off, by withholding watering to the wilting point. I am sure this works as long as too much plant stress does not develop which would make the plant susceptible to disease. More plants are killed by over watering than by under watering.

LIGHT; Light is considered to be very important to plant development and bud set. Vireyas are equal day plants. In New Guinea, each day is approximately 12 hours in length. The sun is always almost directly overhead. The composition and intensity of light is considerably different than in the U.S. and may be very important to the optimum growth of vireyas. Adding additional lighting in the greenhouse during winter months is helpful.

FERTILIZER; I prefer not to use fertilizers containing large amounts of ammonium nitrate as this chemical can cause plant chlorosis. Fertilizers whose nitrogen base is ammonium sulfate or urea is preferred.

Bill Moyles is the American Rhododendron Society Vireya Seed Exchange person and all seed should be sent to him along with request for seed. Get your name on Bill's list and tell him what type of seed you want. Bill is working very hard on this project. His address is;

A.R.S. Vireya Seed exchange
4243 Norton Ave.
Oakland, Ca. 94602

Another Vireya News Letter in Print? Yes there is one done by some of our good friends in New Zealand. The Editor is Michael Cullinane and the Publisher is Joyce Waters. Michael has been one of our better letter writers. He is in VV # 9,13,14 and #18. Joyce lives in Wellington NZ and grows Vireyas on a very steep hillside.

They are putting out the "Vireya News." It is much the same as the VV but is sent mainly to New Zealand subscribers (100 +). The cost is $2.00 NZ per copy, or $2.50 Australian dollars to overseas subscribers. They now have issue # 7 out.
They say that overseas' currency is acceptable and overpayments will be credited.

Editor: Michael Cullinane
Rose Tree Gardens
P.O. Box 8
Russell 0293, New Zealand

REMEMBER; You can send money to the Vireya Vine and /or buy from the Rhododendron Species Foundation with your credit cards. If you do not live in the USA a Credit Card payment could save you a lot of money and time. MasterCard and Visa.
The RSF had many good Vireyas for sale this year. I think that there some left. I don't think that I bought them all.

VIREYA VINE
Rhododendron Species Foundation
P.O. Box 3798
Federal Way, Washington 98063
U.S.A.