Bromeliaceae

VOLUME XLII - No. 4 - JUL/AUG 2008

The Bromeliad Society of Queensland Inc.

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Front Cover:	*Guzmania lingulata* 'Purple'	Photo by Ross Stenhouse
Rear Cover :	*Guzmania* 'Amethyst''	Photo by Ross Stenhouse

Contents

Important things to remember to do:

Sunday, 14th September Bromeliad Field Day at home of Barry and Ann Kable, 281 Redland Bay Rd, Capalaba. B

11th October Stockade Nursery Open Day - 9-12 AM 70 Wades Road, Bellmere, Qld. See add in Bromeliaceae for details

Books For Sale

The Society has the following books for sale:

• Starting with Bromeliads	$18
• Pitcher Plants of the Americas	$60
• Bromeliads: A Cultural Manual	$5
• Back Copies of Bromeliaceae (2005, 2006 Editions)	$4
• Bromeliads for the Contemporary Garden by Andrew Steens	$36
• Bromeliads: Next Generation by Shane Zaghini	$33

Postage and package extra. Unfortunately we cannot supply overseas orders. Please phone the Librarian, Mrs Evelyn Rees (07) 3355 0432 to order books.

Tillandsia 'Mock Orange' - Two Forms

Tillandsia 'Rutschmann's Orange'

Tillandsia crocata 'Rutschmann's Orange'

by Derek Butcher 3/2008.

When Werner Rauh described *T. crocata* var *tristis* in Trop. Subtrop. Pflanz 43: 17. 1983 he mentioned how variable *T. crocata* was. At that time *T. crocata* was considered to be widespread in Brazil, through Argentina to Bolivia He referred to a very large form collected by Dr J Rutschmann of Basel, Switzerland in the grounds of a hotel in Brazil, and which had a 6-7 flowered inflorescence and fragrant, dark orange flowers.

A year later Walter Till created T. caliginosa in Pl. Syst. Evol. 147: 282. 1984 and treated *T. crocata* var *tristis* as a synonym. T. caliginosa coming from Northern Argentina and Southern Bolivia.

The orange flowered *T. crocata* continued to offset and be grown by European specialists. In fact in 1996 it made its way to Australia as *T. crocata* 'Orange' where it would not offset fast enough to satisfy the demand. In dry Adelaide, Australia, 'normal' *T. crocata* have leaves 7cm long but leaves for 'Orange' are 13cm long. Nobody has succeeded in growing self set seed from this plant to prove it is a form of *T. crocata* and not a hybrid. However, it was collected in Brazil far from the habitat of *T. caliginosa* so this cannot be considered to be a parent and we are talking about a putative natural hybrid. Because of a man-made hybrid – see below, this clone needs a more specific name like 'Rutschmann's Orange'

In 2004 Doetterer in Germany, was selling *T. caliginosa*, having obtained his stock from Holm. What is interesting is that a low proportion of these plants do not have the typical glabrous leaf sheath of *T. caliginosa* nor the typical dark brown petals. In fact they have *T. crocata* type leaf sheaths and almost orange petals. It would appear that some foreign pollen has crept into the seed raising project. Because of their hybrid origin they should be called 'Mock Orange'. The problem with identification will be the fact that *T. caliginosa* also has long leaves which remind me of a live floppy mousetail compared to a dead stiff mousetail of *T. myosura*. We must remember here, that *T. myosura* was a 'confused' species for over 50 years until Walter Till created *T. caliginosa* in 1984

So if you do have a *T. caliginosa* acting oddly, think of 'Mock Orange'. More investigation needs to be made because at the moment the Germans are very reticent to disclose details.

Ed. Images opposite used to illustrate this article: Top by P. Tristram, Bottom by D. Butcher

The BSQ Web Site

Don't forget that the society has a web site. We place urgent and general information and information on the site.The URL is:

www.bromsqueensland.com

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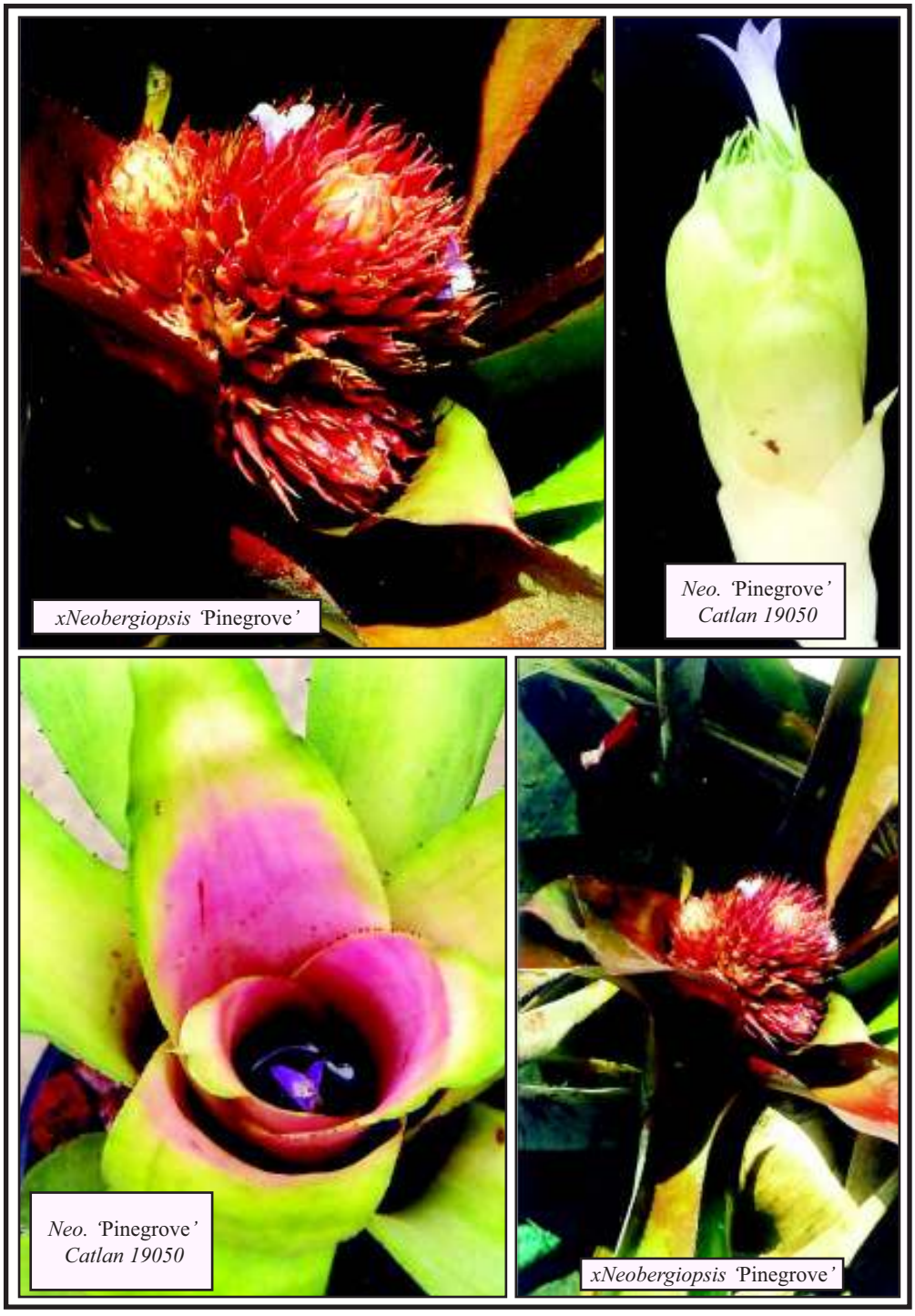
xNeobergiopsis 'Pinegrove'
Neo. 'Pinegrove'
Catlan 19050
Neo. 'Pinegrove'
Catlan 19050
xNeobergiopsis 'Pinegrove'

xNeobergiopsis 'Pinegrove' or Neoregelia 'Pinegrove Puzzle'

Author: Rob Smythe

It is not often that I choose to write about a plant with a wrong name tag otherwise I might write about little else. This one is interesting and obviously is a wide spread error. It would appear that this plant is found in collections in Brisbane and Townsville for sure and probably as far afield as New Zealand. Can you help me track its origin down so that I can correctly register it.

Being an unusual intergeneric cross I was rather anxiously awaiting it to flower. Before this happened I had the previous owner of Pine Grove Nursery, June Buchanan, visit my garden with her son Sean. " Never seen it before," they both assured me. By coincidence, the current owner of Pine Grove Nursery, Ross Little, happened to come through recently. "Not in the nursery now," he said. Now I was curious.

I have borrowed photos of *xNeobergiopsis* 'Pinegrove' and *Neo*. 'Pinegrove' from the FCBS site. As you can see from my two photos on page 6, it is not the former. Once it flowered I knew it to be a *Neoregelia* but it has no resemblance to *Neo*. 'Pinegrove'.

This has turned out to be a mystery that alone I can not solve. If you could let me know who you got your plant from we may get back to the source or do you know that already?

The story could have stopped there but I did mention New Zealand. In Andrew Steens' new book, yes it is mentioned there with a photo to boot and it is the same as my plant and also with the wrong name. By the way my plant is basically green, 50 cm wide, but I have seen it coloured up and it was quite stunning. A burnished tone from memory.

If you have any information please let me know. All Townsville and Brisbane plants like mine, that I know of, originated, using the limited data that I have, from a private collector just north of Brisbane.

Derek Butcher has supplied me with an article connecting *xNeobergiopsis* with Pine Grove Nursery. Seedlings were sent to The Olive Branch Nursery. Technically speaking this is an unlikely connection as the plants reputedly were a cross of a *Neoregelia* onto a *Hohenbergiopsis* so a selfing of the Neo. was out of the question. Non-technically speaking, we are human and the formula may have been reversed on the label. Olive has responded and said she did sell seedlings of this cross and before they flowered.

My conclusion with the knowledge I have so far is that the *Hohenbergiopsis* was crossed on to a *Neoregelia* at Pinegrove Nursery and not the reverse as recorded in the registration. When plants are crossed often the fruit contains selfings as well even where a plant is normally self infertile. These seedlings were then sold to the Olive Branch Nursery and at least one of the crosses could have been sold off before flowering and now is found out to possibly be a *Neoregelia* selfing. From the appearance of the plant I would say all we could say with confidence is that its breeding formula is *Neo*. *spectabilis* crossed with an unknown *Neoregelia* and this then was selfed.

Searching fcbs.org, I can eliminate a lot of the possible unknown hybrid's parent with spectabilis in their breeding. Looking at shape, number of leaves, erectness or lack there of, markings etc. The most similar plant is depicted in a plant photographed by Ted Johnston, namely *Neo*. 'Dawn'. Maybe our mystery intergeneric plant is no more than

Neo. 'Dawn' x *Neo*. 'Dawn'. I don't think the late Jim Buchanan was one for registering hybrids even if he had used the plant, there is no registered record of anyone using it for crossing. Someone out there may be able to take this investigation a step further. If so my address is below.

Someone growing *xNeobergiopsis* 'Pinegrove' is eventually going to realise that their plant is a *Neoregelia* and call it *Neoregelia* 'Pinegrove' but that name has already been used for a plant with links to *Neoregelia* pineliana. Therefore I am going to register the widespread plant as *Neoregelia* 'Pinegrove Puzzle' which it certainly is!!.

Rob Smythe MSc
69 Bundock St
Belgian Gardens 4810
Townsville

Neoregelia pineliana (Lemaire) L.B. Smith

by Derek Butcher

First published in Bromlink (Gold Coast newsletter) May/June 1998

The true *Neoregelia pineliana* is in Australia although there are many with this name on the label. The true one is a narrow leaved plant which has a vivid red centre and produces longish stolons. Ruby Ryde in Sydney got hers from Brazil, whereas the one in Queensland and Northern New South Wales seems to have come via Selby Gardens: Some plants do not even key out to *Neoregelia pineliana*, but one that does, merits discussion. Some few years ago the Buchanans imported a *Neoregelia pineliana* from Seidel in Brazil. While you can get some good plants from Seidel, sometimes his names are wrong. This plant eventually got to John Catlan and was given the number JG19050 and eventually I got the chance to dissect the flower.

Using my Key to *Neoregelia*, I came to *Neoregelia pineliana* but there the similarity ended. Rather than describe this plant I will show the differences:

1. Stolons - short not long
2. Leaf blade - 4cm wide not 1.5cm
3. Centre leaves - rose #38 not red
4. Floral bracts - to half way up sepal, not equalling; entire not serrate
5. Sepals - 2.5cm long not 1.5cm; with scattered scales not glabrous
6. Petal - light blue apex not dark blue.

I would like to call the plant 'Pinegrove' to remind us of its original name and original Australian starting place.

I believe it to be a hybrid of *Neoregelia pineliana* but intend to check again when Elton Leme issues his book on Neoregelias as promised.

A new Nothogenus - *xNeobergiopsis*

By Derek Butcher

First published in J Brom Soc 51(1);7. 2001

A few months ago I received advice from Western Australia that there was a *Hohenbergiopsis guatemalensis* being grown in Australia that had no scape to the inflorescence . At the time this had me worried because *Hohenbergia* and *Hohenbergiopsis* have rather tall inflorescences. In fact the only real difference I can find between these two genera is that *Hohenbergiopsis* does not have appendages at the base of the petals. With the current view that petal appendages are not an important diagnostic at genus level

it is possible that *Hohenbergiopsis* may yet disappear but that is for the future. So you cannot really tell the difference without a bit of poking about amidst the petals!

On a trip to Queensland in August 2000 I found this *Hohenbergia guatemalensis* that didn't have a scape but the owner must have been forewarned that I was coming. Olive Trevor was convinced that a *Neoregelia* must have supplied the pollen for her seedling, now grown up! She had obtained seedlings from Pinegrove Nursery in New South Wales and had even sold a few before they flowered. Clearly a Neoregelia had supplied pollen when it was thought that self pollination had occurred. This combination is unique and we will need to think up a new nothogenera to accommodate this rarity. The rules that apply for naming such nothogenera restricts us to a rather cumbersome *xNeobergiopsis*. To remind us of its origins we decided to call it *xNeobergiopsis* 'Pinegrove'

As an aside, I have friendly rivalry on the Internet as to who grows the proper *Hohenbergiopsis guatemalensis* and so far the Californians are ahead with a somewhat depauperate specimen. I am keen to be in a winning position so if anyone has a photo of the real plant I would be eternally grateful.

Question and Answer

Hi Ross,

I need more information on stimulating pups from the Intercalary Foliar Meristem of broms as described by Rob Smythe in his article " Believe It or Not, But it is All True" in the Mar/April Bromeliaceae

As a relative newbie to growing broms I need the 'i' dotted and the 't' crossed so to speak.

1. How do you thoroughly clean what is left of the plant?

2. What fungicide and at what strength do you use?

3. How do you hang it and on what?

4. Spraying to prevent from drying out how often? I realise this question is like asking how long a piece of string is but it will give me a starting point to play around with.

I would be very grateful if you could forward this email to Rob Smythe in the hope that he has the time to elaborate a bit more and answer my questions.

I look forward to hearing from you and thank you for all your hard work, as you can see I do read the articles and refer back to them as the need arises.

Regards

Cheryl Weaver

and in reply:

Cheryl,

Ross forwarded your 'fan mail' as he called it. This is all new and exciting. I have taken off 21 pups with 3 basal pups starting. In some cases I found more than one pup in the one axil. They are so easy to remove as well. I am not sure what all your questions were.

Cleaning the plant: After cutting away any damaged tissue, I use a strong jet of water.

Fungicide: I use a systemic form. That just means it is water soluble and enters the sap stream of the plant unaltered. I use it at the recommended strengths. Look under fungicide on the web and you will find thousands. Avoid any containing copper. Use what is locally available.

I hang these plants from my bush house roof by making a loop with wire and then bend the wire up with a hook at the top. This

Top and Bottom Images: The mysterious neoregelia masquerading as *Neobergiopsis* 'Pinegrove' . Now registered as *Neo*. 'Pinegrove Puzzle'

can be done quite neatly using aluminium wire and a Coke can. Smaller ones I rap the wire around a pipe. Rougher ones I make out of wire coat hangers and I use pliers. Make them wide enough so that the plant sinks at least half way into the loop. That is, keep the centre of gravity below the loop so that it won't topple out. Naturally it has to be narrow enough that the plant won't fall through it.

Spraying is to stop dehydration but not continuous as this would enhance fungal survival. Common sense is the answer.

Rob

Winter Care of Bromeliads

Author: Peter Paroz

With the arrival of the cooler weather, some adjustment to cultural practice is in order. The following comments apply to coastal S.E. Queensland. Members can make adjustments for their own micro-climate.

• Continue regular fertilizer applications but reduce the concentration of foliar fertilizers. Any major change in fertilizer application may result in a variation in leaf growth which will show as a change in the taper of the leaf. A giveaway to an eagle eyed judge. (Remember: All plant growth emanates from sunlight. Good nutrition is the art of balancing plant nutrients to energy intake from sunlight)

• Keep potassium up in the nutrition program as this is said to improve cold resistance. This is, as far as I have been able to confirm, an unproven thesis. The rationale is that since all potassium in the plant is located in the sap, this results in a lower freezing point of the sap, hence the improved cold resistance.

• The interval between waterings can be extended. Water in the early afternoon where possible so the plants – especially the extreme epiphytes- have dried off overnight.

• For maximum retention of colour, move plants to a brighter position and/or longer effective day length. This is not practical for a large collection but is a possibility for those few special plants selected for the competition table.

• For plants to be grown in the garden, now is the time to start acclimatising the offsets. Plant out these offsets so that they are exposed to the gradual increase in day length and sunlight intensity as we move toward the summer solstice. It's surprising the species and hybrids that can be naturalized in this manner. I have had a clump of *Tillandsia lindenii* growing in full sun for over ten years. (This is not my 'invention'. I became aware of this when I saw some photos of May Neal's garden in Hawaii some thirty years ago where *T. lindeni*i was growing in full sun).

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Ae. 'Blue Tango'

A Question From a Member

Hi Ross,

As a member of the Qld Brom Soc. I thought you might like to include the following in the magazine.

Guzmania "Gisela Don Pepe' and 'Gisela' [yellow variegated]

It seems that the yellow variegated form of *Guzmania* 'Gisela' which is available in Qld. and labelled 'Gisela Don Pepe' is misnamed. The photos of 'Gisela Don Pepe' on the fcbs.org website show an albo-marginated plant,not a variegated plant. I would like to know the correct cultivar name of the yellow variegated 'Gisela',if it has one. There is another variegated form of 'Gisela' with pinker variegation,which has been named *Guzmania* 'Sir Albert'.

All the best,
David Higham

David

Thanks for the question and I have obtained an answer to your question from the best source I know capable of solving such a quandary. Ed.

Guzmania 'Gisela' etc

by Derek Butcher 7/2008.

The Cultivar Register 1998, shows us that in 1990 the then Registrar picked up that the Deroose Catalogue had the following *Guzmania* hybrids on offer.

'Hilde' (*zahnii* x 'Magnifica') photo in Register. No variegates reported. No description or indications where it differed from the reverse cross

'Glory of Ghent' (*zahnii* x 'Magnifica') no photo in Register. No variegates reported

'Gisela' (also 'Giesela') ('Magnifica' x *zahnii*) Red flushed grooved leaved rosette with upright scarlet inflorescence with heavy lush bracts – heavy head with bright yellow knobby lotus-like blooms and bright red primary bracts. Variegated forms in pink and yellow flushes in cultivation by 1996

'Feuer' ('Magnifica' x *zahnii*) no photo

'Muriel' ('Magnifica' x *zahnii*) Green rosette with red underleaf coloration – upright all red inflorescence with large lush primary bracts. There is a variegated version not formally named.

Possibly because of meristemming, variegates started appearing but never formally registered by the instigator. It is interesting that in many cases the first variegated plants to appear in this process are albomarginate.

'Gisela Don Pepe' a variegated form was exhibited by P Deroose at the 1998 World Bromeliad Conference and was added to the register in 2002 Photo held

'Sir Albert' a variegated form with links to 'Gisela' was exhibited at the Bromeliad Society of South Florida Show in 1998. Photo held 'Land Alice' a variegated form was added to the Register in 2000. No photo

'Lady Alice' a variegated form was added to the Register in 2003. Photo held

As you can see, a mixed bag where name changes were made for commercial advantages but not much help for plant identification. Because of the instability of variegations I advised in J Brom. Soc. 55(4): 187-9. 2005 that as Registrar I would only allow one name for a variegated plant linking either to a species name or a cultivar name. Any variations to the variegation would need to be covered by the use of an adjective such

Ae. coelestis var *albomarginata*

as albo-marginate.

We must remember that variegation in Bromeliads covers any coloured longitudinal striping on the leaves and that albo-marginate is but one form of variegation. It just depends on how definitive you want to be.

"Permanent" Black Marker Pens

Author: Rob Smythe MSc

We use these a lot in the garden as they write on everything, don't smudge and don't need sharpening. Their major disadvantage is that they bleach. I decided to do a small experiment.

I collected all my different sorts of marker pens, prepared a clean sheet of plastic. I wrote the name of the pen with its own pen on the sheet. I then left the sheet in the sun for about two hours to be sure the writing was dry. I then placed them in a 30% solution of domestic bleach overnight. A lot faded and one actually turned green. They were then staked out in full tropical sun for two weeks.

Out of the eight I can still read

MSANFORD Sharpie
Noke Permanent Marker
Scribblers –dual Tip

The others had either completely disappeared (2) or fade to a weak brown (3).

Out of the three above Noke was the outstanding success. It was still black. The other two were just a stronger brown than the failures. They might have just deposited more ink.

Unfortunately Noke had been my least favoured pen as it is alcohol based and dries out too quickly if you leave the lid off. It also writes much lighter than the others.

Recently I opened my garden for a field day. Much to peoples disgust I wrote on the leaves with a permanent pen so the folk did not have to pick them up or mess with the tag. For such days you want something permanent but not for a long time in sunlight. Hi-Mckee was outstanding.

After all this I think I will stay with my favourite Scribbler Dual Tip. It has a fine end for writing on labels and a thick end for writing on plants. It writes dark and is a thin pen so I can wear it around my neck using a normal pen holder. I simply glue the narrow end cover into the holder and go from there. If I don't do this I keep losing this cover.

My choice means I just have to get back a bit quicker and make a better label. I find the three for 2 dollars black thick small children's pencils very satisfactory. I have been told there are better quality ones around but I can't fault these so why change. They are easily lost being black so now I put silver or gold bands on them with a spray-can and they don't turn up in the potting mix so often.

Please remember this was not a comprehensive survey. You might like to test your set of pens in a similar way. Once again convenience wins out over common sense.

The Night Flowering *Alcantarea edmundoi*

"The Night Flowering *Alcantarea edmundo*i", in Jan/Feb 2008 Bromeliaceae. People might start to identify their plant from these photos. Rob Smythe have done some taxonomic studies and found out that this plant lies somewhere between *Alc. extensa* and *Alc. edmundoi*. Rob has reported his dilemma to Elton Leme the botanist who described *Alc. edmundoi* and he said he believes Rob's plant is an as yet undescribed species which he has seen in the wild. Until

Ae. correia-araujoi x Canistrum seidelianum

it is described Rob is calling it *Alc. novu*s aff. *patriae* RSS so if you received a pup from Rob with edmondoi as a name you know what to change it to.

Bromeliad Expose : Orthophytums

(by Larry Giroux)

Reprinted, in part, with permission, from Meristem, September 2007, pp 6 – 11.

The genus *Orthophytum* was first named by Beer in 1854. The name comes from the Green – ortho, which means straight and phytum, which means plant; the entire name refers to the erect inflorescence. Since the mid 1800's when this genus was given its name, several additional species have been included in this group, whose appearances no longer adhere to the meaning of their genus name. That being said, the majority of plants of this genus have an upright inflorescence, which bear the floral bracts and flowers. These tend to have soft spines along the edges of the easily fractured leaves. The stalk of the inflorescence is usually 6 to 15 inches (15 to 30 cm) tall with small rosettes of floral bracts with predominantly white petalled flowers. Pale and bright green petals are found on a few of this group of species.

In contrast there is a small group, which have the flowers and floral bracts nestled in the centre of its flattened rosette. This group has been considered some of the most eye catching bromeliads. Most have 40 plus narrow pointed leaves edged with sharp hard spines. At blooming, the centre of the plant and sometimes the entire flattened rosette can flush with red, rose, pink or coral leaves with similar shaded floral bracts. The visually contrasting white flowers draw pollinators from miles away.

There is a third set of plants in which the inflorescence is only slightly elevated above the rosette and has a spreading growth habit. One of these is *Orthophytum supthutii.* It is very unique in that it has large yellow flowers within the centre of a green rosette that does not change colour at anthesis. For nearly four decades after its description was first published, it was considered to be a *crypthanthus*.

Examples of all three of these different types of orthophytums are demonstrated later in this article as well as additional information about *O. supthutii* (Now in a new genus called Lapa.).

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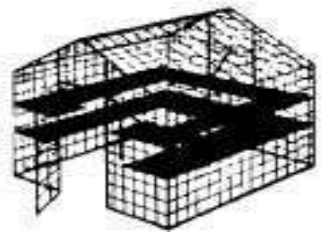

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Aechmea distichantha

The natural habitat of these terrestrials, mimics closely that of another terrestrial genus, Cryptanthus. The 35 or so species grow from sea level to about 3,000 ft (900 m) along the north and central eastern coastal areas of Brazil. Orthophytums tolerate cold better than their closest relatives – the cryptanthus and if provided sufficient moisture, will endure higher temperatures.

Orthophytums require as much moisture as do cryptanthus and are usually found growing in moist areas near rivers, streams and waterfalls. Although they may be found clustered on rocky ledges basking in the sun, these environmentally hostile areas during the dry season, are most likely watered by mountain mists. On a recent trip to this area of Brazil, I did note species of Orthophytums growing on rocky outcrops, where they were receiving infrequent waterings; in addition, I also saw orthophytums growing along the dusty roadside among cacti.

Some horticulturists consider many bromeliads, including orthophytums as semi-succulents or succulents. Penrith Goff of the S.E. Michigan Bromeliad Society has answered the question – What is a Succulent Bromeliad? "Logically, any bromeliad capable of storing large amounts of water in the leaves is a succulent. Thus, it is fair to call the atmospheric tillandsias, the airplants, succulent, as J. Riha and R. Subik do in their book The Illustrated Encyclopedia of Cacti and Other Succulents (London: 1992). However, the term succulent has become so closely associated with earth-bound desert dwellers that we will use the term for those terrestrial bromeliads which have developed succulence as an adaptation to a hostile climate (sunny landscape) to which they have adapted. In general they do not develop the degree of succulence which is common to agaves and aloes, yet there are many which can easily be mistaken for these because the plant structure is so similar."

Orthophytums, especially from the States of Minas Gerais and Bahia, Brazil along with other terrestrial bromeliads such as encholiriums, cryptanthus and dyckias have adapted using succulence for survival during their winter months of June, July and August when the only moisture is mountain

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Above Top: This plant may yet colour up as *Neo.*'Phyllis'
Above: The real FCBS *Neo.* 'Phyllis'

The three images above are all thought to be *Neoregelia* 'Phyllis OT' or what ever it is to be called.

Bi. 'Luiores' (Unreg)

mists, fog or the rare rainfall.

With consideration of their natural habitats, for optimal growth of this terrestrial genus, a medium, which is able to retain moisture while still able to drain well, should be utilized. I have noticed, however that there is a slight difference in the type of growing medium preferred by most of the orthophytums and that small group, which includes *Orthophytum burle-marxii* (see photograph on p. XX), which has an inflorescence nestled in the centre of its rosette. In habitat these plants were noted growing in rocky ground with their roots invading the crevices of the rocks. The soil at locations where others were growing was more sandy or coarse than the loamy soil one would expect; this suggests that these prefer a less water retentive mix in cultivation. This will prevent the biggest problem with growing the group – rot! Epiphytic mixes are, however, to be avoided.

Orthophytum, like Cryptanthus are fertilizer hogs. A time release formula such as Nutricote, either 6 or 9 months is ideal with an occasional soluble ¼ strength dosing of something like Peters for good measure. The desire for N-P-K is so great with the orthophytums, that we see with bi generics of orthophytums and neoregelias (neoregelias routinely should not be fertilized due to loss of colour and lanky growth) that these hybrids such as *xNeophytum* 'Galactic Warrior' (see photograph on p. YY), flourish with heavy feedings.

Once you have achieved the aptness of growing these variable plants, they will reward you with offsets on the scape, from underground stolons and from the base of the mother (see photographs on p. ZZ). Seeds are easily set from species or new hybrids. To date bigeneric crosses have been made with Aechmeas (xOrthomea), Cryptanthus (xOrthoanthus), neoregelias (xNeophytum) and Nidulariums (xOrtholarium); many are worth owning.

So, with water, fertilizer, sun and a selective growing medium for the type of orthophytum you have, you can easily grow and enjoy for generations this unusual and quite distinct group of plants, either outdoors in the warmer climates or indoors in seasonal areas under lights.

Bromeliads in the Landscape

(by Marjorie Lowe)

Reprinted, with permission, from the Journal of the Bromeliad Society, 1999, v. 49(5), pp 202 – 203.

This subject is an extensive one so I will concentrate on one aspect only – an aspect in which bromeliads are far superior to most other plants in suitable climates. I suspect that most of you read gardening articles and watch and/or listen to gardening programs. Sooner or later the subject crops up: what to plant under trees and tall shrubs and how to go about it? The usual advice given is, first, dig over the area to be planted (no mention on whether to use a spade or a fork, what kind of rooting system is present and the damage that can be done if there are surface roots). Second, dig in lots of compost and plant food, and third, usually suggestions (some quite extraordinary) for suitable plants to use. Often no reference is made as to whether the canopy is evergreen or deciduous or has a flowering season. In short, a recipe for hard work and frequent failure. What is needed here is some lateral thinking. Logic suggests using plants that do not require nourishment from the soil (if any), that will appreciate the fast drainage provided by the existing rooting systems (especially fibrous roots) and that have species and cultivars that will take the varying conditions of sun


Vr. carinata
Vr. 'Apollo'
Vr bleherae
Vr. 'Velva Wurthmann'

and shade.

The obvious contenders are epiphytic plants such as bromeliads, orchids, ferns, rainforest cacti, vireya rhododendrons etc. Bromeliads, with their wide range of colourful and patterned foliage and their striking and bright inflorescences that can be available at any time of the year provide by far the greatest range and impact. Most are easy to grow if placed correctly. The canopy, if evergreen, will provide protection from excessive winter rain in mild areas and/or frost in cooler districts.

What to check for:

• Density of the canopy – this can be lightened by careful pruning.

• Height of the canopy – is it high enough to clear the flower spike or to allow the sun to penetrate under the branches?

• Size of leaves – do they decompose easily; do they constitute a grooming problem?

• If the canopy is deciduous – ensure that the bromeliads underneath can stand full winter sun. There is an exception here in that trees and shrubs described as fully deciduous do not necessarily drop their leaves in winter. Most of these exceptions are tropical or subtropical plants that shed their leaves before flowering. In the case of *Chorisia speciosa*, flowering time is usually autumn, so it sheds its leaves late summer. The Jacaranda flowers late spring/early summer and is in leaf all winter. Others in this category are Bauhinia, Brachychiton, some Cassia, Kowhai and Poinciana. All are showy so that the bromeliads below should complement, not compete, during the flowering period.

• Moisture – extra moisture will usually be needed in summer because of the umbrella effect of the canopy. A good hose down will put fresh water in the reservoirs also.

• Maintenance grooming – is usually just removing old and drying leaves and dead parent plants, to allow room for the pups to expand and clump up.

• When choosing plants – are they to be seen from above or below? Are they suitable for sun, dappled shade, morning sun, afternoon sun? Is there enough space to accommodate a mature, well developed clump?

• If only bromeliads are being planted, consider using rocks to define the clumps and add a change in texture to the design. Scoria is light, cheap and weathers very quickly with a little help. Ponga can be used in a similar fashion and tree fern stumps and large pieces of driftwood can be stunning. Another use for pieces of ponga and driftwood is for planting both in and on, making a light portable perch.

For collectors, hybridizers and enthusiasts "the plant is the thing". For keen gardeners the plants are components in the total design and "the garden is the thing".

Consider Growing Vrieseas

(by Ervin Wurthmann)

Editorial Comment (Bob Reilly). Ervin Wurthmann produced many vriesea hybrids and in this article he outlines a strong case for growing vrieseas. While his comments are focused on his experience in growing vrieseas in southern Florida, they would also be applicable in large measure to much of southern coastal Queensland. Reprinted, with permission, from the Journal of the Bromeliad Society (1995), v. 45 (3), pp 110-112.

Vrieseas have enjoyed popularity in Europe for over 100 years. Demand for these plants has fostered many hybrids of which many are still in the trade today. Vrieseas vary in size from less than six inches (15 cm) in diameter to a size with a spread

and height of over five feet (1.5 metres). The smooth-edged leaves may be spotted, blotched, or barred with eccentric markings. The inflorescence usually bears a flattened or distichous spike with yellow, red, green, or purple bracts while remaining in colour for several months.

Culture

Light. Vrieseas are not hard to grow. They do not require as much light as the neoregelias but will thrive under higher light conditions than once supposed. Some of the vrieseas with thin, green leaves will take on a rose or dark purple hue at the base if the plant is grown as bright as 65% shade on an all-day basis.

Soil mix. Soil mix should be well drained to permit frequent watering, which vrieseas prefer.

Potting. I am not an advocate of over-potting having flowered Vriesea hieroglyphica in a 5 inch (12 cm) pot. It is well to add turkey grit or fly ash if you wish to grow *V. fosteriana, gigantea, gigantea* cv. *Nova*, *hieroglyphica, imperialis* in a situation where ample watering occurs.

Feeding. Most vrieseas require a higher level of feeding to grow a top quality plant than do neoregelias. It can be accomplished by top feeding on the medium with osmocote, Sure Gro, or Nutra Coat, all slow-release fertilizers that provide long-time feeding. Soluble fertilizers may be used when watering.

Pests. Pests are few. Soft brown scale can be controlled with Diazinon, Cygon, or Orthene. Occasional fungus can be handled with Dithan M-45, Captan, or Banrot. Read labels thoroughly as dosages will vary according to the material used.

Applications. Small vrieseas are ideal house plants because they will endure relatively low light conditions and are not demanding in terms of temperature and humidity. The more closely the grower can meet ideal light and humidity the more attractive will be the plants. Most are rewarding with their inflorescences that retain their bright colours for many weeks. Many vrieseas are satisfactory bedding plants where the winters are mild and moderate shade can be provided. Some of the larger varieties such as *Vriesea altodaserrae, atra, edmundoi, imperialis, neoglutinosa, philippo-coburgii, tuerckheimii,* and *vinicolor* would do well with almost full sun in frost-free areas.

Selection

After reading price lists and visiting collections you may want to make a list of the plants that you would like to have. Aside from the matter of size, which may be the main consideration, there are other things to think about such as special requirements for air circulation and protection from cold. In some cases there may not be enough information about which plants are cold hardy and which ones are not. In such cases you may have to guess or resort to learning where plants come from and how high, how dry or wet the original growing conditions.

The easiest test is cold hardiness so we will begin there.

Cold Hardy. Nearly all of the Brazilian species and their hybrids possess considerable cold tolerance. Many of them are as tough as neoregelias and can be grown outdoors in the Tampa Bay, Florida, area.

The most cold tolerant are those with green leaves. They include:

Vriesea altodaserrae, atra, bituminosa, bituminosa var. *minor, carinata, ensiformis, erythrodactylon, flammea, friburgenis, incurvata, philippo-coburgii, platynema, psittacina, rodigasiana, schwackeana, simplex* and *vagans*.

Species somewhat less tolerant of cold include those with more decorative foliage such as *Vriesea fenestralis, fosteriana, gi-*


Vr. erythrodactylon (long Spike)
Vr. erythrodactylon
Vr. flammea
Vr. philippo-coburgii

gantean, gigantean cv. Nova, hieroglyphica, imperialis, saundersii, tuerchheimii (from the Dominican Republic was collected by the author in an area where frost occurred).

Vriesea heterostachys, racinae, 'Red Chestnut', and *sucrei* are reasonably cold hardy, but should be protected from frost and subfreezing temperatures.

Not cold hardy. Central American and northern South American vrieseas are for the most part not cold hardy. These varieties will require greenhouse protection during the colder months. They include: *Vriesea chrysostachys, glutinosa, heliconioides, malzinei, rubra* and *splendens.*

The really challenging group. Another group for which, unfortunately, there is no record of hardiness in this area (Tampa, Florida) are those of the gray-leafed types, which somewhat resemble tillandsias. These vrieseas are frequently xerophytic in their native habitat and for that reason require a different method of culture. *Vriesea appenii, barclayana, chontalensis, cylindrical, espinosae, heterandra, hitchcockiana* and *rauhii* are best mounted on cork bark, tree fern plaques, or some kinds of wood. Occasional spraying with a dilute, soluble fertilizer is beneficial. Since some members of this group are from high altitudes it is possible that they may be somewhat cold hardy.

A real challenge to vriesea culture is the group sometimes known as the Thecophylloid vrieseas. These occur in the higher rain belt area of Costa Rica, Guatemala, Honduras, Panama, and the Caribbean islands. Species such as *V. leucophylla, ororiensis,* and *sintenisii* have spectacular inflorescences while *V. montana* has sensationally coloured foliage.

Cultivation of this last group is difficult and almost impossible in warm, humid areas. I have seen very presentable specimens in California. These plants prefer to be mounted on wood so that there is ample air drainage around the roots. A greenhouse with fan and wet wall cooling can enhance your chance of getting them to survive. They should be watered only enough to keep them from dehydrating. It is not likely that they will tolerate any degree of cold.

Neoregelia 'Phyllis' and *Neoregelia* 'Red Gold'

Author: Rob Smythe MSc

Robert Sherlock Smythe has been at it again. Though my initials are RSS the middle name really isn't Sherlock. Sorry not telling. If you have plants with either of the above names on the tags you should read this article as there is a lot of confusion out there. This little project started with a mystery plant and has involved about 150 growers throughout the world. What has come out of my investigations is that there really is confusion. This short article should clear this up.

I asked correspondents to send me photos of these plants in their collections. The two plant names have become very much entwined. I have sorted the photographs out. The group on pg. 29 are all *N*. 'Red Gold'. Grown in full sun this is one of the most stunning Neos. that you are ever likely to grow. The brightly coloured ones are grown this way. I have also shown the FCBS photo which is a poor photo of the same plant. This will be updated soon.

The group on pg. 20 is what I will call *N*. 'Phyllis OT' (Other Type). The real 'Phyllis' as shown on the FCBS has been reported possibly by only one grower. Is it still in the Ipswich area or anywhere else? The OT plants are turning up from all over Queensland and NSW. Unfortunately in my


Vr. sucrei
Vr. saundersii
Vr. glutinosa
Vr. fenestralis

area a lot of Phyllis OT carry the name *N*. 'Red Gold'. Hence more confusion. The photos below will quickly sort this conflict out for you.

I have written to the registrar to see what he can do with regards to having these two different plants with the same name. Since OT is so widely spread and a confirmed *N*. 'Phyllis' is AWOL (so far), I have suggested he just add this photo to the 'Phyllis' file maybe with OT after the name. The other option is to have it separate with the same name.

That is what he did with N. 'Bronze'. Here two differing plants having the same name, were widely distributed but only one was registered. Later the second was submitted for registration. On the other hand when *Neo*. 'Kathleen' was registered and we all had a *N*. 'Kathleen' that differed from the registered one we all had to change our plants names. I will send this to him to get his comments(in brackets below).

[I am always loath to introduce a new name for a plant that has been wrongly identified or the label mislaid because you are adding a further dimension to cultivar identity so when Robert Sherlock comes up with these sorts of problems he knows the Dr Watsons of this world will be asking curly questions. The 'Kathleen' problem mentioned by Rob above, has never had an article written about it but is an interesting case study.

In 2000 Margaret was growing a 'Kathleen' AND a 'Golden King' and both looked very similar if not identical. Referral to the Cultivar Register revealed that 'Kathleen' was there, described as a dark red plant with no variegations, and here we had a variegated plant. 'Golden King' had not been registered so in consultation with Olive Trevor we decided to register 'Golden King' for our variegated plant. In 2004 we found a reference to a 'Yellow King' which had been registered and could well be the same as 'Golden King' but was unproven.]

I have divided the photos into three groups.

Group #1 are, I believe, all *N*. 'Red Gold' - see images Pg 29 .

Group #2 are, I believe, all *N*. 'Phyllis OT' or what ever it is to be called - see images Pg 20

Group #3 is of the real FCBS *N*. 'Phyllis' plus one sent in, not named 'Phyllis' that, under the right growing conditions, may turn out to be *N*. 'Phyllis' - - see images Pg 20.

Reasons for : Non translucent leaves, colour, Tips recurved backwards.

Reasons against: No bars and non black barbs. These may appear in the cooler months. A plant with similarly coloured bars namely N. 'Lilac Dreams' does just this up here in the tropics. This photo comes from Cairns.

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HUGE SELECTION
of
Aechmeas, Vrieseas, Guzmanias, Neoregelias
Nidularium & Tillandsias
together with a variety of rarer species and hydrids
BARBARA and LORRAINE
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Group 1 - All believed to be *Neoregelia* 'Red Gold'

Growing White Variegates from Seed. Everything that You Must Know.

Author: Rob Smythe MSc

Before we start, you need to know that plants are built up by a series of units called cells. The analogy is that a house is made up of bricks. The bricks may change their configuration and form a chimney; the cells may change their form and make a flower. I will be delving into what goes on inside these plant cells so you will probably have to have a glossary from a botanical book or even a botanical dictionary to keep with me. I make no apologies for this as this is ground breaking work which no one, to my knowledge, has researched so fully before.

After a brief talk to BSQ members on variegations I have been hounded to put my thoughts into print. Gradually I have collected experimental evidence which supports my ideas. I must admit that I have had to discard many of my early thoughts. I think now it is more than a theory so, for the first time, I am prepared to put pen to paper.

No one has been prepared to stick their neck out on this subject. In the future others will look back and say, "That bloke was ahead of his time" or "That bloke was playing in his own ball park". Some of what I am about to say is fact and some is theory. No one has ever tried to tell the whole story before. Unfortunately to do it justice it would involve Plant Biology, Plant Genetics and Molecular Biology. Some of the necessary information for understanding the simpler biology is still unconfirmed (Note #1). I must say that I have been thinking about this for years. Bit by bit the clouds have parted. Only within the past week could I explain all my observations with a single theory.

Now what I believe are facts.

Table #1

1) To get variegated seedlings the pod parent must be variegated.

2) To get variegated seedlings the pollen parent does not have to be variegated.

3) No amount of back crossing of seedlings from crosses using only variegated males will return variegates.

4) Variegates are linear lines running the length of the leaf.

5) Variegate types

a) White to Cream

b) Red

c) Black

d) Green on coloured

e) Watermark (thick and thin leaf tissue)

f) Translucent

Bromeliad Field Day

at home of
Barry and Ann Kable, 281 Redland Bay Rd, Capalaba.

Sunday, 14th September

Bromeliads sit under the shade of trees, staghorns cling to palm trees, tassel ferns swaying in the breeze, flowering orchids and bromeliads displayed in the many shadehouses. Plants on Sale 9AM to 1PM, Guest Speakers, Morning Tea provided. Please bring your own chair.

Contact Ruth (07) 3208 0546 (after 4PM) or Bev (07) 3208 7417

These two photographs show us that different leaves are appearing from opposing sides of the plant. One plant has lost the white section of the meristem on one side while the other has lost the green sectors.

All albino seedlings. Seedlings from variegated pod parents are usually all white (albino) or all green.

The photograph above shows that the plant stem is somewhat like a candy cane bar without the twist. A whole string of pups appeared on the upper surface of the near horizontal stem. They obviously are originating from a very white area as they are looking very different from the mother.

Left: A family portrait. Mum, Dad and all the kids. A couple of things you will notice here. One is the whole spectrums of variegations and colouration covering from pod parent to pollen parent. The second shows (by the way all these plants are from the same pod) how insignificant the markings are on the young plants. As they mature lines will broaden and eventually we will finish up with white or green emarginated plants. These seedlings are barely three years old so a lot of development is yet to come. One seedling has advanced to adult morphology and is almost identical to the pod parent. The pollen parent is the one with the broader lilac band on a darker green base. One seedling resembles it but the band has yet to stabilize.

6) We will only be discussing type 'a'.

7) Selfing variegates you usually get mostly all whites or all full green seedlings. You can grow thousands of seedlings, trying as stated in '1', before you ever see a variegated seedling.

8) Tissue culturing of variegates rarely gives variegated plants.

9) There are more variegates in bromeliads than in any other family of plants.

10) Bromeliads are very unique plants and like all living things are capable of breaking the rules on extremely rare occasions.

11) The best mothers for producing variegated seedlings are heavily striated plants rather than only distinctly emarginated plants.

The conclusions that I draw from the above is that variegation is not a result of genetics as carried by the chromosomes of the plants. Variegation is not a result of anything to do with the male parent outside of the process of fertilization of the egg. No one cell produces a variegate seedling i.e. initially it must involve one white and one green cell.

The only other known form of inheritance comes from moieties within the fluid in the cell (cytoplasm). More specifically, in this case, from the chloroplasts within the mother cell. A quick check of the indexes of my botany books suggest that this process called Cytoplasm Inheritance has been reported in plants for at least 10 years. It, as a cause of plant leaf variegation, was definitely known in 1999. With humans the equivalent phenomenon known as Mitochondrial Inheritance [1] (a non nuclear DNA inheritance) has been known since1963. The fact that it caused diseases in humans was first noted in 1988.

Variegations and Viruses

I will clear up a common myth first. A question often asked at my infrequent talks on this subject is, 'Are viruses involved'. The answer is yes and no.

First the 'no' answer.

I have done many tests on young and old plants and have concluded that no variegate forming viruses are present in today's popular white neo variegates (see note #2). I say today because people are deliberately introducing unrelated viruses into bromeliads. I worry about tomorrow. We can blame the tulip growers for popularizing this. Viral infected tulip flowers are stunning. This could be a problem as infected plants mimicking normal variegations might be held on to in an effort to stabilize the chlorotic stripes. Just cutting this plant with a knife and cutting a non variegated plant could transmit viruses from this weed form of a variegated plant. We could wind up with slow growing corrugated, erratically marked plants. Let us make sure these plants are destroyed. History is a great educator. Viruses decimated cocoa plants in the West Indies, citrus in Brazil and the the smaller viroids have decimated coconut palms in the Philippines and chrysanthemums in the USA.

Now for the 'yes' answer.

Broms all seem to carry a predisposition to forming white variegates, though exhibiting this ever so infrequently. Normal leaf tissue is built up of green cells, a result of having light catching green chloroplasts. The white variegations could be due to strings of these cells having lost their chlorophyll or the chloroplasts being completely absent. I think it is the former as these cells appear white to cream but can go other colours in bright light, pink is a common colour. With Neo. ' Bill Morris' they go green with time [2].

Let us go back in time when the first bromeliad evolved. Bromeliads don't form good fossils so I don't know when this was. Somewhere early in its evolution something very modern to science may have happened, namely what we now call Molecular Biology.

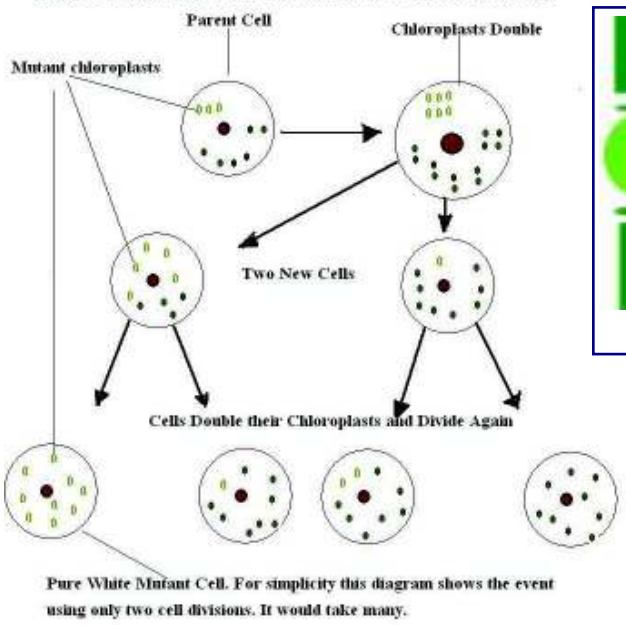


Diagram # 1.

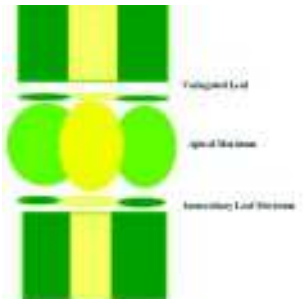


Diagram # 2

Neo. 'Monty'. Named after my all white dog. The first albino bromeliad known to survive and be registered. This appeared from a very old horizontal stem of Neo. ' Bill Morris' . The whole of the apical meristem of this plant would be white. It only survives because green appears with age. This can be explained, See reference #1 p51. Taking pups is a nightmare. Also one should also be aware that there are co-pigments (yellow) and possibly traces of chlorophyll in some such plants, both helping them to survive

My all time favourite. This was line bred from a pup of a friend's seedling which had just the one single pink line as seen on the leaf on the left hand side. Over about 8 years I established Neo. 'Beetroot' (non variegated but spasmodically throwing some variegated leaves) and this beautiful variegate Neo. 'Serendipity Girl'. It is still improving.

A vector which may have been a phase, virus, bacteria or whatever may have entered one of these green cells carrying a foreign DNA string or having the capability of clipping off some DNA in the chloroplast. Thus it is conceivable that a living cell could, as explained later, lose its capability to form chlorophyll. The eventual white cell could even have been a simple mutation and had nothing to do with viruses. This is not all way out stuff. Biologists believe that mitochondria now occurring in plant and animal cells were once bacteria living external to both life forms. The same holds for plants and chloroplasts.

A Non-variegated Plants First Variegation

The important thing is that all that we are interested in, is not in the nucleus of the cell but in its cytoplasm which is the fluid inside the cell. There is an excellent article on 'Mitochondrial DNA in Aging and Disease' in Scientific American [1] which will explain it to you if you need convincing. It is easy to read with excellent illustrations. This first white cell might turn up in the middle of a leaf and never be noticed and disappear with the death of the leaf. The developing of this single white cell is a long process but could happen again in the same plant. The predisposition is there. Sometimes we are blessed with the return of a lost variegate several generations down the track so we all know it is rare.

See Diagram #1 on p33. which is a modification of a diagram taken from reference [1] to now represent plants explaining how that first white cell might evolve from a plant carrying some mutant chloroplasts that have lost their ability to go green. Just a reminder, here I am talking about the first variegation appearing in a non variegated plant and not variegated seedling formation.

I call this the 'like likes like phenomenon' as opposed to the better known and with the opposite result 'opposites attract' phenomenon. Mutant chloroplasts tend to cling together and become divided off in large groups. Bottom left corner illustrates our first white cell. The middle two at the bottom could in the future produce white cells. The one to the right is fully normal. The other possibility is that we are not just dealing with chloroplasts, lost chloroplasts or mutant chloroplasts but with an event that even precedes the chloroplast's presence.

Next step is as follows;

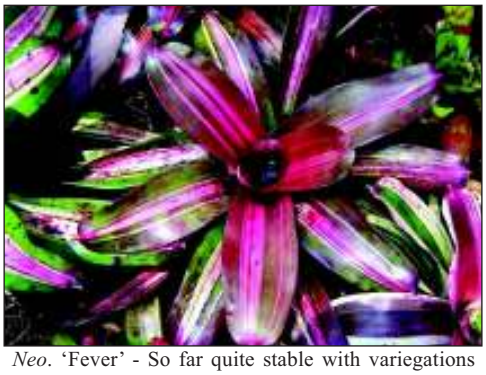
The new white cell appears in the meristem tissue. This feeds off the green tissue around it and starts dividing. The width of each individual stripe may be limited by the distance from the food source. This cell might be present at the base of the leaf and, as the leaf grows, the string of cells may form a white line up one leaf of our plant. We then work hard to get a pup from the base of that leaf to try to get a fully variegated plant. If it first appears in the apical meristem we have to do nothing to maintain it.

Breeding with Variegates

Why are they usually all white or green?

Right now we have a variegated plant and we want to breed from it. Now we have two types of tissue in our plant. I see the stem being something like a candy cane but not twisted i.e. lines of alternating green and white bands of tissue running up the stem. When we get to the end of the line, in a flowering plant, we are up to the ovule and the ovary, the tip of the iceberg. When we pollinate the ovule the seedlings are mostly all white or all green. The ovule comes from a single cell which would be a white or a green cell, hence seedlings are white or green, as the pollen has no say in the matter. From here on I have to speculate and my conclusions are based on the breeding of variegated neos only. I have only had four successes but these also produced thousands of all white or all

Neo. 'Ferny Grove' and sport.- Mine is very unstable as shown. The variegation pattern does not seem to have locked in. It also throws frequent non- variegates.



Neo. 'Fever' - So far quite stable with variegations concentrating towards the centre.

Young variegated seedling. Single edged seedlings are a pain. They obviously have undersized white areas in the meristem. This one always reverts at about this size.

I love these ones which I call 'half 'n half'. This is an aberration of my theory. Drop off the white band on one side Note the top two leaves are mirror images of the bottom two leaves. Just what I would expect.

Neo. 'Iris' - One of my best crosses. If I was asked to define perfection this would be it.

Neo. 'Lost in Space'. - A selected strain and both pod and pollen parent of *Neo*. 'Champers', *Neo*. 'Champer's Bubbles' and *Neo*. 'Iris'.

green seedlings.

Now my successes were always variegates mixed in with a lot of all greens and they appeared from the first leaf. The trays of seedlings are usually all white or all green

Involvement of sperm in forming the odd green plant in a tray of whites.

The generative cell which forms the sperm cell could in some cases break the rule and still have chloroplasts. This is the first breakdown needed to get chlorophyll bearing organisms from the male parent. Where this is known to happen, still only the sperm survives. Any surviving chloroplasts die in transit from stigma to ovule. After defeating both these barriers when the sperm enters the ovule's cytoplasm any chloroplasts still existing are left behind.

Three barriers have to be broken for a sperm to carry chloroplasts in order to make a green seedling using a white ovule. No wonder we rarely see greens let alone variegates in trays of white seedlings. A green bearing sperm has next to no chance of fertilizing the white dictating ovules of the pod parent. This process of chloroplast stripping is not constant from plant group to plant group so I believe what I have suggested is a plausible possibility. Now to complete the section of the story above, getting trays with all green seedlings from a variegated mother the story is simple. All the ovules came from green celled placenta.

Where do the variegated seedlings come from?

My limited observation is that my best variegate producing pod parents are not strongly emarginated but very much striated. This suggests to me that the placenta could be heterogeneous, thus producing both green and white zygotes. How often do we hear of Siamese Twins? Very rarely but in the crowded chambers of an plant ovary they could be much more common. A white and a green zygote stuck together could grow into a plant of mixed green and white tissue. The variegate is born. The green twin feeds the white twin. Tissue culture splits these apart into single cells and hence rarely any variegates are produced. I can't consolidate any other theory to explain this finding. Twin white or twin greens would not differ from normal green or white plants. The feeding is fact. Emarginated plants with too wide a white edge become necrotic at the extremes and these leaves suffer disease and die and often take the whole plant with them.

Why do variegated bromeliads generally have either two white edges or a white strip down the centre?

In the main this is what we see even though some stripes are groups of smaller stripes. Any theory has to explain this as well as the fact that the stripes go through to the reverse side of the leaf and that the leaves can develop in either a clockwise or anti clockwise whorl [2], depending on the lighting arrangement. In the past I always visualized the spreading and bending of a dozen or so playing cards as a model for bromeliad leaf production.

This model did not fit my detailed observations. Only recently I realized there was another factor to consider. Variegates, every so often, go all white or all green on only one side of the plant. If some mutation caused this change why didn't it carry on around the plant or be corrected? I very belatedly twigged to it all—the leaves must be originating from two sources. I got the scalpel out and sacrificed a very young and, also, a more mature variegate to the blade and I now can explain everything, but only if I am clever enough to make a diagram on this computer.

After a couple of hours work I somehow have put a diagram together that will explain how the variegations occur. My dissection of young plants told me that there

Neo. 'Champer's Bubbles' A variegated sport of Neo. Champers. Both these are from my stable and both have show qualities. Note what looks like bubbles in the coloured centre.

Neo. 'Roy's Special' - An amazingly stable variegate in my garden but it is reputedly very unstable in cooler climates

All green seedlings. Seedlings from variegated pod parents are usually all white (albino) or all green.

You don't need variegates to get beautiful seedlings.

A nice grouping of large variegated Neoregelias in Rob's garden. Rob is after very large plants so he needs the largest forms around.

were two areas where leaves started from and these were on opposite sides of the plant. Since knowing this, I have looked at a lot of young plants and noticed that the first two leaves are exactly opposite.

My diagram on pg 33 simulates what I expect would happen. I am suggesting that there are usually three distinct meristem areas at the apex of the growing tip for a mature variegated plant. Diagram 2 depicts a green emarginated plant. If the white is on the margins the meristem colours will be aligned the reverse of what is shown below. The upward growing apical meristem which is actually circular, not flat as depicted, would leave behind a semicircular band of meristem cells, not a straight line as depicted. These then multiply longitudinally forcing the leaf well away from the meristem. This is how leaves grow-from the base.

These meristem bands will multiply width-wise till the leaf virtually wraps around the plant stem. This latter growth could be imagined to occur significantly in the obvious upward forming cup off tissue occurring just above the apical tip. Further to this the leaf bends in one direction or the other [3] and hence does not come up directly above an existing leaf (Not so for some genera of bromeliads). By the time they are fully mature they have moved away about 120 to 140 degrees from the previous leaf so that they usually come to rest about half way between the two mature leaves below them.

Obviously the plant knows when enough is enough and when it is too far for the leaves to grow away from the starting point. At this juncture the whorl formation is continued by the leaves originating from the opposite side. Brilliantly clever of them. This explains a lot doesn't it? Now we know why variegates often go all green or all white and often only on one side of the plant. Some unusual marking appears, then disappears, but comes up again when the whorl is back to the original side. It explains why we get reverted pups from one part of the plant and not from the other. It explains why green emarginated plants tend to go all green and white emarginated plants tend to go all white.

Diagram #2 represents the formation of the leaves with green margins starting with a variegated meristem.

In reality all is not as clear cut as this because small stripes can appear and bands can coalesce. Intermingling of the green and white tissue to a small degree must occur. These lines usually first occur near the junction of the bands. Let us look at the evidence.

If you look at the meristem depicted pg 33 and visualize it in three dimensions you get the following results.

If the first leaf starts in the yellow (actually white) band and wraps around to the yellow band at the back you have a white emarginated plant. If on the other hand the leaf started in the green it would finish in the green and so would be green emarginated (as depicted). Aberrations of this theory can even explain the odd split leaf coloured plant.

For the Botany Enthusiast.

Note #1

I said that possibly the use of a precursor of the chloroplast could be correct but that would deepen and divert my story. What I was thinking of was that the diagram depicting dividing of chloroplasts would ring just as correct in my ears if I substituted proplastids for chloroplasts. Proplastids are the major source of chloroplasts, chromoplasts, amyloplasts and probably other leucoplasts forming at the leaf base (intercaliary meristem). Cell division generation increases in importance as the leaf matures. It is a bit of the chicken and the egg conundrum. Did a cell mutate before the leaf was formed with the meristem

Neo. 'Blast' - Develops into a near perfect competition plant. There is at least one other form of N. ' Blast' around which packs more openly than this one. I believe before registration this one was just called 'Olive's Favourite' and I can guess why.)

Neo. 'Bruiser' (Broadband). - This has evolved from a very unstable Neo. 'Bruiser'. This photo shows the clone with the widest white bands. It is a slow grower but seems more stable than those with narrower bands.

Neo. 'Champers'. This was produced by selfing N. 'Lost in Space'. Don't always need variegates to have a pleasing plant. Yellow/ Green is produced in lots of sun.

Neo. 'Cherry Jam' - One of Skotak's more chunky variegates

Neo. 'DeRolf' - a magnificent cultivar of *N. johannis*. This variegated form of *Neo. ohannis* was collected in the wild. One of the dramatic large Neos. This plant grows large and flat and is a real traffic stopper.

Neo. 'Enchantment' - A beautiful green emarginated plant bred by Bob Larnach. The same mother sported both the green and white emarginated forms. These aberrations are easily explained using the model. Simply a rotation of the leaf initiation point.

proplastids just passing on the inability to form green cells or did the green start in the hustle and bustle of forming the chloroplasts in the meristem? Purely academic, the result is the same.

Note #2

I have tested many different mechanism in an attempt to induce viral transmission. None showed viruses to be present..

#1 I could not transfer virus from one variegated plant to a non-variegated plant (if they were there) by any amount of sap transfer.

#2 I watered freshly germinated seedlings regularly with homogenized variegated leaves. One batch of seedlings had the leaves cut in half to assure contact with the sap.

#3 The ultimate test was to split adult plants in half and join a variegated half to a non-variegated half, making sure that the two growing tips were aligned. No variegated pups at all have appeared from the non-variegated plant.

References

1 Douglas C Wallace "DNA in Aging and Disease" Scientific American August 1997

2 Raven Evert and Eichorn "Biology of Plants"' 6th edition, Freeman Worth 1999 p53

3 R. Smythe "For Competitors and Judges" Bromeliaceae #1 Nov/Dec 2005 p42

Plever's Pills

Author: Mainly Herb Plever of New York

For those who are tired of waiting for plants to flower and don't have access to the mixtures used by Pineapple growers or are not willing to experiment with such.

About the pills, I intended to give instructions on their use at the World Bromeliad Conference in Cairns 2008 but I ran out of time in my talk. I should have prepared a handout. Here, in brief, is the procedure I use (this may be helpful to your members):

1. Don't fertilize for 2 weeks before treatment and one week after treatment. The plant should be at least 3/4 mature. But in any event, if the treatment doesn't produce a bloom the plant will continue to grow and no damage will occur from the pills.

2. Dump the water out of the plant. If it is a huge plant like a mature Alcantarea and hard to turn over, just let the water dry out.

3. Place 1-1/2 inches to 2 inches (3 –5cm) of water in the centre cup. The idea is to restrict the water area and thus the ethylene bubbles to a small area around the meristem to increase the chances of one molecule being absorbed by the growing tip.

4. Drop 3 to 4 pills into the water (depending on the size of the plant). You will see the water bubble like seltzer. You can leave the pills in the cup. They are made of zeolite clay and are safe - and so is the ethylene.

(All flowering plants genetically produce ethylene when they are programmed to flower. The ethylene triggers enzymes which change the meristem from leaf production to inflorescence cells.) It is easier to tap the pills into the vial cap and drop them into the water with the cap. If your hands are sweaty the clay may immediately expand and allow the ethylene to escape before it reaches the water.

5. Billbergia and tubular plants like *Q. marmorata* will produce full bloom within 4 to 5 weeks after treatment. Aechmea and other bromelioids and Guzmania and Catopsis will produce full bloom within 3 to 4 months. In your light, Vriesea and soft-leaved Tillandsia with reservoirs will produce full bloom in 4 to 5 months. They take longer for the bracts to colour up. If you are hoping to

bring a Billbergia to a show and you see that the inflorescence is coming up too fast, place it where it is cool and shady to slow down the bloom growth. Other plants stay in colour a much longer time so the timing for a show is not a problem. Helicoid Billbergias such as *B.decora* keep their bract colour for about 2-1/2 weeks after they reach full bloom.

The Bromeliad World: Diversity and Tolerance of Many Tastes

(by H. Alton Lee)

Reprinted, with permission, from the Journal of the Bromeliad Society, Nov & Dec 1983, v.33(6).

When bromeliad lovers get together, the obvious, common, initial bond of friendship is provided by the plants. The discovery of other, similar interests is always a nice bonus.

Nevertheless, too many of us may forget that people can be interested in bromeliads in different ways with varying intensities. That all bromeliad groups and societies do not seem to understand this truth frequently leads to waning interests and declining memberships.

Consider the following examples of the diversity of interest in these fascinating plants.

Some members' greatest interest is in acquiring new plants. Some collectors want everything available; others are long past this stage of contagion, and some may never have been in it because of financial or space limitations or for other reasons.

There are members with very limited space and funds who may find their greatest fulfilment with bromeliads simply by being with other collectors and seeing and sharing their collections, even if it is only vicariously.

There are bromeliad lovers who yearn to see the collections of others and compare them with their own; and there are members

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who prefer their own gardens, special plants, and their own privacy.

Some people want to know everything possible about each plant in the bromeliad world, both species and hybrids; and there are probably a few who would even buy films showing the actual matings which create each new hybrid, or who would even be interested in collecting pollinating brushes. Then there are others who buy a plant simply because it is attractive and different from others that they know. Nomenclature, genetic history and whether or not it is a hybrid are of minor importance to them.

Some bromeliad members enjoy the thrill of stomping through shrinking, primeval jungles to snatch a given plant from its native environment. There are others who prefer the rigors of UPS and the agony of the post office for their collecting. Others dare to brave the mayhem-ridden highways to see, select and buy their plants. A few probably use all these methods for enhancing their collections.

Heresy though it may seem, some members actually appreciate other plants besides bromeliads. They will surreptitiously find room for aroids, orchids, gingers or even lowly African violets and appreciate them just as much as *Guzmania* 'Orangeade' in all of its glory.

Some members want to read every word that appears in print about bromeliads, collect every book, whatever the language, and see every art representation. There is a further division of interest here between the lay and technical reader. There are others who find little to interest them in the bromeliad literature.

Some members feel that the zenith of bromeliad satisfaction is to grow plants to perfection, according to a given group of judges, and to win coloured ribbons and mock-silver. To others, this enterprise is essentially meaningless. While they may view shows as important, useful and nice. And while they may willingly work at setting them up and selling their own or other people's plants, not even more suitable prizes such as bromeliad-related objects or rare bromeliads themselves would induce them to enter plants. It isn't their "thing".

Some live to sell their plants at shows or meetings; others prefer to trade or give

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CAIRNS WORLD CONFERENCE
(see report page over)

away their surplus.

Some are not satisfied unless they can grow each plant to perfection and "show-quality". Others grow bromeliads only because they look good in a landscape. Still other bromeliad growers labour with their plants only for the personal satisfaction they bring; they couldn't care less what a judge or neighbour thinks of their efforts.

Some members want regular, meaty, thought-provoking programs at the bromeliad meetings with local and regional experts on hand. Others are just as satisfied with a show-and-tell approach provided by local members; and there are a few who are as interested in the socializing and visits with friends as they are in the bromeliads.

Some members are fascinated with political structures and the machinations of bureaucracies. Others worry that when too much time is spent haggling over by-laws and show dates to the exclusion of attention of the plants, much member interest will wither and attendance will decay.

So what it finally comes down to is an enormous diversity of interests and the need for tolerance of a variety of tastes as well as some effort to meet many needs. The situation presents an enormous challenge for the leadership as it struggles to avoid over-emphasizing any one aspect of the bromeliad world or excluding any one particular interest.

Although no reasonable person can deny the importance of active participation by large groups of members, if a society, local or national, is to function and provide the splendid rallying focus which shows and sales can offer, it is also very important to remember that not every person can contribute to every aspect of a society and in exactly the same way or same extent; and not every person necessarily chooses to do so.

Thoughtful, creative leadership, however, can deal with the uniqueness of individuals and their different interests. Bromeliads attract many people of different tastes and abilities, so let us have good, strong organizations, but let us not have mindless regimentation with an overabundance of cumbersome and tedious rules which ultimately alienate the majority and diminish the growing interest in these fascinating and rewarding plants.

Cairns World Conference - 26th to 29th June 2008

Author: Beryl Batchelor.

Jim and I were two of the fortunate people who attended the Conference in Cairns. To say it was a wonderful experience describes it nicely. Firstly full marks to Lynn and Bob Hudson on a first class job. Lynn also organized the Conference last year at Port Macquarie and we thought to top that would be hard but the Conference in Cairns was really a huge success. Aussie Aussie.

My biggest complaint was it all went too quick.

We were amongst the handful of people to transport plants up for the display. A big thank you to Len and Sheryl Waite from the Sunshine Coast for taking most of ours and Barry Kable's plants up to Cairns for us and to Len and Olive Trevor who took some up for us and brought them all home. These people made it possible for Brisbane to put on a display. Olive supplied the Australian Neoregelias. Glen Bernoth worked tirelessly in designing the display along with Barry Kable.

Phyllis and Arnold James never cease to amaze me with their continued energy

and support for our club. Arnold not only transported his own plants up for the display but they both worked to the end. When we arrived with our plants Pam Butler and Helen Moriaty were there madly writing down the names of the plants as we pulled them out of the boxes. This was so Glen could spend nearly all night making up name tags for them all. (I am sure that man doesn't sleep) The end results speak for themselves.

Our display was certainly right up there and done us proud.

It was great to hear the variety of speakers as there was a wealth of knowledge amongst them.

I don't think anyone would come away saying they didn't learn anything . Having speakers from overseas and Australia certainly makes us realize the love of Bromeliads is spread world wide.

The large auction was a huge success and I am sure the Marie Selby gardens and

The Cryptanthus Society would be very pleased by the support.

The bus trips were great as well as the tropical gardens in Cairns are a treat in themselves.

All in all I would say it was highly successful and enjoyed by all who were lucky enough to be able to attend.

I once had a Problem

Author:Ross Stenhouse

Only ONE problem and you grow bromeliads I hear some saying!

Well I have many problems with my bromeliads, however I thought I would share a particular problem I was having with a *Guzmania lingulata minor* that I have as a pot plant in the office at work.

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As with all stories, you need to develop a plot. In this case my work conditions are that I work in a high rise office tower in the heart of Brisbane in a "Pod" (Pod is short-hand for a sort of prison cell where you are allowed to escape at night only to be returned in the morning).

The location is in the centre of the building with high levels of light from influorescent lamps. Being a computer programmer, I am surrounded by heat producing IT equipment. The temp is regulated to 24 degrees during the day and rises to over 30 degrees at night. The atmosphere has a low humidity. The lights are on for about 13 hours a day.

To try and cheer up the pod I decided to grow two bromeliads on my library shelf - the fore mentioned Guzmania and and a *Vriesea* 'Lucille'.

These two plants grow quite well under the conditions and the inflorescence seems to last for many months. The plants initially looked healthy and I regularly watered them every few days. I would get a little water in a glass and carefully pour it around the plants.

Many times I pondered about these strange growing conditions and the influence that has on the plants.

I noticed that after about 1 year, the bottom of the leaves started to die back. Looking carefully I noticed that a crust of salt crystals had built up around the bottom of the leaves.

Easy solution, flush the salt away and change my watering technique. I now take the plants to the sink every week and give the pot a thorough drenching. The plants have really picked up and look great, the Guzmania has about 8 pups at its base.

My pondering now stem around "Am I washing away all the nutriment and should I be foliar feeding the plants as well as giving them a thorough wash every month to wash out the excess salt?"

Calendar of Events

Sunday, 14th September Bromeliad Field Day at home of Barry and Ann Kable, 281 Redland Bay Rd, Capalaba. Bromeliads sit under the shade of trees, staghorns cling to palm trees, tassel ferns swaying in the breeze, flowering orchids and bromeliads displayed in the many shadehouses. Plants on Sale 9AM to 1PM, Guest Speakers, Morning Tea provided. Please bring your own chair. Contact Ruth (07) 3208 0546 (after 4PM) or Bev (07) 3208 7417

11th October Stockade Nursery Open Day - 9-12 AM 70 Wades Road, Bellmere, Qld. See add in Bromeliaceae for details

22nd & 23rd November - Australian Open Garden Scheme , at Anne McBurnie and Philip Beard's garden, 5 Timbertop Court, Capalaba. Prize winning bromeliads, crotons and cordylines as well as unique hand crafted garden pottery for sale. Open 9am -4.30pm

4th December - BSQ Christmas Party - Lakeside Gardens, Mt Cootha - Camella Room. Because of the increasing numbers of members attending the party the management committee has decided that we should break with tradition with the choice of venue. Another alteration will be the necessity to buy tickets in advance for the party to aid the caters in making sure the event is well supplied with food.

GENERAL MEETINGS of the Society are held on the 3rd Thursday of each month except for December, at the Uniting Hall, 52 Merthyr Rd., New Farm, Brisbane, commencing 7.30 pm. Classes for beginners commence at 7.00 pm.

Plant of the Month Programme for 2008

FEBRUARY:	Ananus, Intergeneric Plants, Tillandsias and Full-sun Neoregelias.
MARCH:	Cryptanthus, Tillandsias, Full-sun Aechmeas and Canistrums
APRIL:	Cryptanthus, Tillandsias
MAY:	Spotted Neoregelias, Orthophytums, Tillandsias and Variegated Bromeliads
JUNE:	Alcantareas, Foliage Vrieseas, Dyckias, Hechtias and Asterias
JULY:	Billbergias, Pitcairnias, Cerepegias, Hoyas, Nidulariums and Agaves.
AUGUST:	Billbergias, Foliage Vrieseas, Catopsis and Miniature Neoregelias.
SEPTEMBER:	Billbergias and Guzmanias.
OCTOBER:	Vrieseas, Neoregelias, Nidulariums, Guzmanias and Crassulaceae.
NOVEMBER:	Not often seen Bromeliads and Succulents

Competition Schedule for 2008

Novice, Intermediate and Advanced in each Class of the Mini-Shows and in the Popular Vote.

January: **MINI-SHOW**
- Class 1: Aechmea - species and hybrids
- Class 2: Vriesea - species and hybrids
- Class 3: Dyckia - species and hybrids
- Class 4: Any Other Mature (flowering) Bromeliad - species and hybrids.

February : **POPULAR VOTE:** Any Genus – species or hybrid, Novelty Bromeliad Display

March: **POPULAR VOTE:** Any Genus – species or hybrid, Novelty Bromeliad Display

April: **MINI-SHOW**
- Class 1:Bromelioideae not listed elsewhere in the schedule – species and hybrids.
- Class 2: Guzmania - species and hybrids
- Class 3: Pitcairnia and Pepinia - species and hybrids
- Class 4: Any Other Mature (flowering) Bromeliad - species and hybrids.

May: **POPULAR VOTE:** Any Genus – species or hybrid, Novelty Bromeliad Display

June: POPULAR VOTE: Any Genus – species or hybrid, Novelty Bromeliad Display

July: **MINI-SHOW**
- Class 1: Billbergia - species and hybrids
- Class 2: Tillandsioideae not listed elsewhere in the schedule – species and hybrids.
- Class 3: Neoregelia - species and hybrids – up to 200mm diameter when mature.
- Class 4: Any Other Mature (flowering) Bromeliad - species and hybrids.

August: **POPULAR VOTE:** Any Genus – species or hybrid, Novelty Bromeliad Display

September: **POPULAR VOTE:** Any Genus – species or hybrid, Novelty Bromeliad Display

October: MINI-SHOW
- Class 1: Neoregelia - species and hybrids – over 200mm diameter when mature.
- Class 2: Tillandsia - species and hybrids.
- Class 3: Pitcairnioideae not listed elsewhere in the schedule – species and hybrids.
- Class 4: Any Other Mature (flowering) Bromeliad - species and hybrids.

November: **POPULAR VOTE:** Any Genus – species or hybrid, Novelty Bromeliad Display

Note 1: Class 4 in each Mini Show schedule provides for any flowering bromeliad that would not be in its prime for the appropriate Mini Show.

Note 2: Class 1 (April), Class 2 (July) and Class 3 (October) provide for plants from these subfamilies not elsewhere included in the Mini Show schedule.