

Bromeliaceae





The Bromeliad Society of Queensland Inc.

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GENERAL MEETINGS OF THE Society are held on the 3rd Thursday of each month except for December, at the Uniting Hall, 52 Merthyr Road, New Farm, Brisbane, commencing 7:30 pm.

ANNUAL GENERAL MEETING is held immediately before the February General Meeting

Front Cover: *Billbergia tesmannii*
Rear Cover: *Vriesea espinosae*

By: Kerry Booth Tate
By: Peter Paroz

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CALENDAR OF EVENTS

16th January 2014 Meeting – Steve Flood

20th February – Annual General Meeting, Dennis Kundscheidt

Got information about forthcoming events

Email the Bromeliaceae Editor using the email address below

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or write to us at

**P.O. Box 565, Fortitude Valley
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PANAMA – PART 1

By Bruce Dunstan

This July (2013) saw me head back to Panama to travel with Carla Black, Angel Rodriguez and Bill Fitz. Carla was keen to find *Heliconia darienensis* in the wild for her Mesoamerican Heliconia project. Angel and Bill were keen to come along to take a walk in the forest and find some different bromeliads in Bill's case. Me? I just needed an excuse to get back into the forest and heading to some remote parts of Panama was pretty enticing.

We started in Panama City with Carla and Bill picking me up from the airport after the usual 20 odd hours flying that it takes to get from Australia. We had a quick bite to eat and a couple of beers at a loud cowboy bar on the Interamerican Hwy near the airport, across from Bill's and my lodgings for the evening.

Bright and early we set off east towards the Colombian border and the famous Darien Province, home to paramilitary guerrillas, drug runners and worse if you believe everything written about the place. After 3 or so hours drive we encountered our first checkpoint and gave the military police our details, our letters of permission and our itinerary. Once this was sorted we were off to Puerto Kimba not far off the highway where we jumped on a fast water taxi and headed to La Palma. It's a nice town that can only be reached by plane or boat along the Rio Tuira, a massive river that combines a few others that flow down from the slopes of the tall ranges that cross the border with Colombia and drain the centre of eastern Darien Province.

We were headed to Cerro Sapo, a solitary mountain out on the Pacific coast that rises from sea level to 1100 m. It starts a range of mountains that run along the Pacific coast of Panama reaching the Serrania de Jungurudo (1300 m) close to the Colombian border. As you head across the isthmus at the border you then get to Cerro Pirre (155 m) then further towards the Caribbean side, Cerro Tacarcuna rises to 1875 m as the highest peak. These mountains are very difficult to access currently as the Panamanian Military Police are not allowing people to move around outside the small towns let alone travel to them in this remote part of the province.

To reach Cerro Sapo we needed to catch a boat from La Palma and travel to Garachine out close to the Pacific coast, a 4 hour trip by motorised dugout canoe, but there are faster water taxis that make the trip 3 days a week. To leave La Palma we needed to check in again with the Panamanian Military Police, the 'Fronterizo', to hand over our paperwork again and get their approval for movement. The base at La Palma had some very fast, large speed boats that carried a dozen or so armed police, no doubt to keep an eye on water traffic so close to the border. We waited the next morning from 6:00 a.m. for our boat and guides to arrive. 3 hours later, just after 9:00, they paddled into town having run out of fuel and spent the 3 hours paddling against the river flow. We fuelled up and loaded our bags and set off for Garachine.

On headlands of Punta Alegre, along the way, we spotted *Pitcairnia haliophylla* growing on the exposed rocks just above the high tide line as well as huge flowering clumps of *Tillandsia flexuosa*. As we rounded the point we could see, in the distance, Cerro Sapo swathed in cloud

Welcome to the Darien and the start of our latest adventure.



Below: Waiting for the Fronterizo in Garachine; Carla Black, Angel Rodriguez & Bill Fritz



Below: The view from Casa Vieja to the Pacific Ocean horizon.



Our home away from home; Casa Vieja, the 'old house'.



Below: The Poison Arrow Frog on Cerro Sapo



Below: Lunch on the train up Cerro Sapo; one of the many meals we ate during our adventure.



against the horizon. After 4 hours of riding in the dugout canoe it was great to finally get back onto dry land in Garachine, then another quick trip to the local Fronterizo outpost, where a guy who obviously couldn't read inspected all our paperwork for the next 20 minutes, no doubt a novelty in out-of-the-way Garachine. We set off through the streets looking for lunch but the late start meant the local restaurants had nothing to offer and were closed. Other plans were hastily hatched so we could get something solid into us as we still had a 4 hour walk to our lodgings to complete before it got dark. Our bags were loaded onto horses and off we headed on what was a largely flat track to start with, lined with lowland *Heliconia mariae*, *latispatha* and *platystachys*. As we left the cleared farm areas we started to climb and then head down some of the low rolling hills in nice lowland forest. Along the path large *Werauhia sanguinolenta* grew in the trees and large clumps of the tall *Bromelia karatas* were also spotted. Being lowland meant it was hot and very humid but thankfully the sun was going down and it was starting to get dark. We still had another hours walk by torchlight in the dark forest to complete to get to where were staying on the Pacific coast Casa Vieja, the 'old house', arriving just on sunset.

The next day we headed towards Cerro Sapo on a scouting mission. Our local guide, an Embara man, took us along a trail that went up the mountain. Three years ago a butterfly scientist had camped up on the mountain surveying the local wildlife. We followed this trail behind our Machetero; he swung hard on his machete to make the trail wide enough to walk along and at the same time make it clear

enough for us to return along it. Sadly we saw very few bromeliads in lower elevations due to the forest being seasonally dry. This also applied to other interesting plants so made for a very plain green forest. We climbed up to the Mariposa Man's (AKA butterfly scientist), base camp and were greeted with a pair of his pants draped from one of the small trees next to where he camped towards lunchtime. Lunch today was fried batter or local bread and some dried venison of some local forest deer. As we got higher we started to see some plants of *Tillandsia kegeliana* that had fallen out of the tree canopy above. At this stage we decided that it would be best to turn around and have another go tomorrow leaving much earlier in an attempt to reach the summit.

I joked with Carla and Bill that the only way to explain what we were doing was to say it would be like getting on a Stairmaster, in rubber boots, in a sauna and getting someone to throw biting ants and spider webs at you as you go hard for hours on end. Needless to say we were glad to get back to Casa Vieja that afternoon after 9 hours walking and roll around in the creek to wash off the mud and sweat.

We got up at 3:50 a.m. the next morning for a 4:30 start. After a breakfast of some tough chicken stew and some fried rice tortillas that I just couldn't get down, we were almost ready. I needed some painkillers to get started as my feet had suffered on yesterday's descent, with my toes being pushed forward into my boots. Panadol for breakfast is usually a sign that things haven't gone so well rather than a sign of good things happening in the future, but there was a mountain to climb. Bill decided he would rather spend the day at Casa Viejo with Angel enjoying the view through the coconuts of the wild

coastline and the regular sightings of migrating humpback whales, while we headed back up Cerro Sapo in search of *Heliconia darienensis* and bromeliads that had never seen the light of day, ha-ha. By torchlight, following our Embara Machetero, we set off.

Walking in the forest reminded me of two things Angel has told me over our years of shared travel: 'Nothing good happens in the forest at night' and 'never put your hands where you can't see them'. Sage advice to ponder as we marched through the lower elevations in the dark with just our torches for light. A quick stop as we saw a good sized Fer de Lance lying alongside the path, no doubt hunting for rodents in the pre-dawn twilight of the dark forest. We reached the Mariposa Man's base camps at 8:30 a.m. so were well on track. As we went higher the steeper and more overgrown it became. The clouds that we'd seen from a distance while travelling to Garachine were starting to change the species we were seeing as we got higher - with more moisture there were more epiphytes. There were many species of anthuriums, orchids, gesneriads and more bromeliads. *Guzmania butcheri*, a small reddish plant, became common along with *Tillandsia kegeliana* and *Tillandsia monodelpha*. We noticed *Araeococcus pectinatus* hanging from the trees. It took closer inspection from Carla to find the spines on the lower foliage for us to work out what we were looking at; flowers a little further up the hill confirmed it. As we climbed we could see out of the forest when we got to clearings along the ridge and through the cloud we noticed a peak well above us and a couple of hundred meters further away from where we were. The trail our machetero was taking us up was on one of the slightly lower peaks on Cerro Sapo. We were then climbing hand over hand up rocks, vines and lianas for

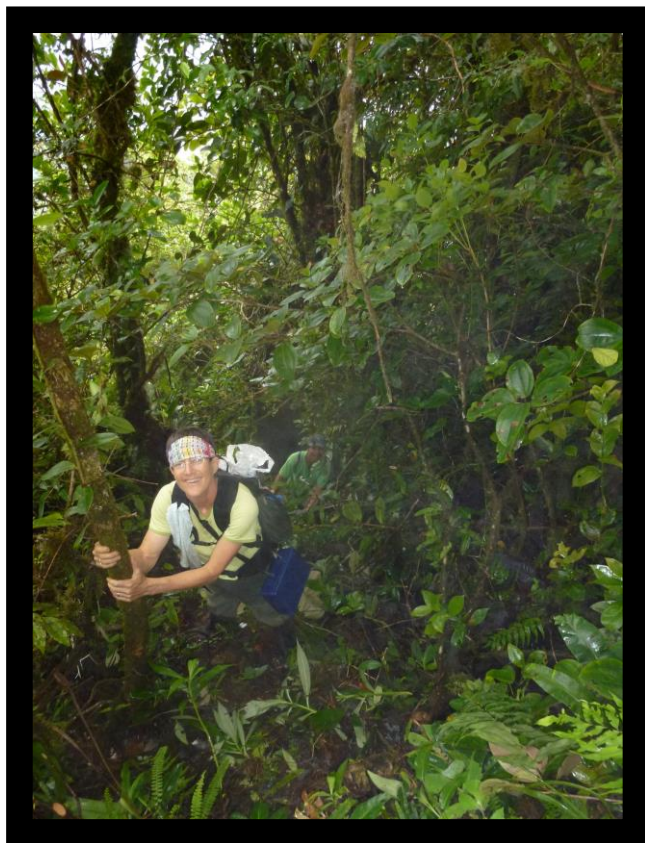
an hour or so as we were entering elfin cloud forest closer to the higher ridges. Everything was shrouded in moss, ferns and incredibly wet. We reached the peak and were greeted by the Mariposa Man's upper campsite, complete with his cooking pots, gas stove, sleeping roll, butterfly nets and extension poles. He had obviously got the local Embara men to help carry everything up to this high camp site 3 years ago and then walked down leaving everything including his pants at the lower camp. What a disgrace! If he had even told the locals he had left things behind I'm sure they could have used some of the waste. Our guide took the cooking pots with him on the return trip, once he'd removed all the stinging black ants that had colonised them for the past few years, as well as the aluminium extension poles. These proved a god send on the descent.

We stopped there realising for us to get to the peak we would still need to head down and the across another ridge and then the final climb up to the actual peak. It was 12:30 p.m. and 8 hours walking and climbing by now so the thought of more climbing was enough for Carla and I to decide we had come far enough today, after all we still had to climb down before dark. While we stopped for lunch I headed down the other side and noticed the plants changed as soon as I had dropped over the ridge. *Guzmania darienensis* covered every small tree and what looked like many *Pitcairnia arcuata*, with huge petiolate leaves to more than 1m, were growing as an understory. I happily collected *Guzmania* seed as the bulk of the plants were well past their flowering peak and were full of maturing seedpods. We had obviously come up the dry side of the mountain and were only seeing some of the diversity that actually grew on the mountain.

We didn't see *Heliconia darienensis* on the mountain, just an isolated clump of *H. latispatha* well above the lowland colonies, no doubt deposited by a passing bird. We did collect a plant of what appeared to be *H. longiflora* growing about 2/3 the way up the hill. When and if it flowers in cultivation we can confirm its identity.

After lunch we started to think about our descent, this time climbing down over all the moss covered rocks, vines and lianas. The long aluminium poles were a great help as we could find somewhere firm to place them and work our way down the steep incline. Having a different view, now from above, of the plants growing in the low stunted trees, allowed us to spot some other nice plants including what I believe may be *Werauhia graminifolia*, a small thin-leafed purplish plant originally described from Costa Rica and also collected in Guatemala. Luckily for me it had seedpods as well. With all the downhill climbing I found my feet were suffering more than yesterday as my toes were being forced into the front of my tight fitting boots. This resulted in blood blisters under a couple of toenails on both feet. We stopped at creeks and regularly sterilized water with a steri pen that uses UV light as a way of killing off any nasty bugs or parasites. While we were sitting in one creek our guide pointed and shouted El Tigrillo! 'The Tiger', a young jaguar that hadn't seen or heard us due to the roaring water flow, came down to either drink from the creek or cross. Hearing our guide the jaguar quickly turned around and sprinted back into the forest. I was struck by how thick through the chest and shoulders the cat was and how powerful it looked, bounding back up through the rocks and into the foliage. We read up about them later and it was no surprise that jaguars kill their prey with powerful bites to the skull.

The remote location explained why we were able to see such amazing wildlife on the trip. We ended up getting back to Casa Vieja at 3:30 in the afternoon, exhausted from the day's adventure and once again the creek was a perfect spot to roll around in, cool off and get clean. As we sat down for a few rums that evening the thought of walking for another 4 hours to get back to Garachine the next morning was something I wasn't looking forward to at all.



Carla and our last pitch up Cerro Sapo



The view to the peak Cerro Sapo



Above: *Tillandsia kegeliana*, below left: *Araeococcus pectinatus*, below right: *Werauhia graminifolia*



SEASOL - August 2013

By True Grant

When I was giving a talk to the Ipswich Bromeliad Society recently, the subject of using Seasol & also of using soluble Calcium for bromeliads came up in discussion. This prompted me to research these topics and to reassess what we are doing in relation to them in our own nursery. I would like to share with you the information I have accessed about Seasol in this article. I will be writing a follow up article on Calcium.

WHAT IS SEASOL?

Seasol is a brand name for a 100% organic seaweed extract. It is made from two species of seaweed – Bull Kelp (*Durvillaea potatorum*) & Knotted Kelp (*Ascophyllum nodosum*) both of which are sustainably sourced. The Bull Kelp grows in the clean oceans around King Island and the west coast of Tasmania where it is collected from the shores of remote beaches. Knotted Kelp grows in shallow intertidal waters. The base of the plant is left intact so that the kelp re-grows.

Seaweed contains a complex mixture of biochemicals including hormones that regulate plant growth. An analysis conducted at the Australian National University scientifically identified hormones called cytokinins and auxins. Cytokinins are known to stimulate cell division & new shoot initiation and have a general effect on shoot growth. Auxins have wide ranging effects on plant growth particularly stimulating the formation of new roots.

Seasol is a plant tonic (conditioner) and is not by definition a fertiliser as it contains only very small amounts of nitrogen & phosphorus.

BASIC ANALYSIS

Nitrogen = .2% (Ammonia & Nitrate form)

Phosphorus = .58%

Potassium = up to 4.3%

Sodium = .9%

Plus many other natural compounds & almost every known trace element. The amount of Potassium is beneficial for bromeliads and the trace elements contribute to overall plant nutrition. Sodium will be discussed later in this article.

SUMMARY of BENEFITS of SEASOL (as listed by the producing company)

- Increases cell division thereby stimulating plant and root growth
- Enhances cell 'strength' resulting in increased tolerance to heat, drought & frost conditions
- The effects of dehydration can be reversed after a single foliar application
- As Seasol contains so little nitrogen and phosphorus, it won't interfere with other nutritional inputs & it can be used all year round
- Optimised plant health reduces the incidence and severity of some pest & disease problems
- The natural compounds in Seasol also help to increase nutrient uptake, so when fertilisers are applied, they are much more effective

WORD OF CAUTION

I was advised by an experienced horticultural chemist that Seasol should not be used for bromeliads due to its high sodium content (.9%) & its high pH (10). High levels of sodium are known to be harmful to bromeliads with leaf tip die back usually one of the first symptoms.

This problem can be experienced with high levels of sodium in the water supply.

We've used Seasol in our nursery for years without any signs of damage to the leaves.

I've also mainly heard of positive results from other brom growers. A few people have reported problems (one grower experienced damage to the centre of the plants using full strength dilution in water). Another grower reported using a stronger dilution than recommended without any damage.

So I rang Seasol and spoke to their Marketing Agronomist. He said that they had not tested Seasol specifically on bromeliads. However they had never received any negative feedback from brom growers. He was of the opinion that the dilution of the concentrate in water for foliar application reduces the amount of sodium to a non-harmful level. He also stated that the pH of leaf surfaces helps to neutralise the high pH.

COMPATABILITY

This is an important issue – will the physical properties of soluble fertilisers remain stable if mixed with Seasol?

The same horticultural chemist as before says no and that Seasol must be applied separately from other fertilisers, insecticides and fungicides.

The Seasol Agronomist said that the main nutrient that causes problems is phosphorus and it is therefore best to avoid mixing Seasol with any phosphorus containing compound.

Seasol has been tested with several insecticides & fungicides & found to be compatible with quite a few. The insecticides commonly used for

bromeliads weren't on the list. The fungicide Mancozeb was listed as ok. We have decided to apply Seasol separately.

DILUTION and APPLICATION

Recommended: 25mls per 9 litres of water every 2-4 weeks

The level of dissolved salts present in the water supply also affects the dilution that should be used (tank water having the least).

We use ½ strength (12.5mls per 9 litres) as an extra precaution due to the high sodium level and apply every 4 weeks.

*Dilution and how often applied is a personal decision. Just be aware of the level of sodium and watch carefully for any damage.

*There are other seaweed products on the market which I haven't researched. The benefits are probably similar, but the information above relates specifically to Seasol.

*Powerfeed is also made by the same company. It's a fertiliser with a higher level of nitrogen than potassium (N12%: P 1.4%: K 7%).

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The Colour In Neoregelias Believe It Or Not

By John Catlan

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Andreas FCBS.org

1. **Inner leaf colour**
2. **Light blushing**
3. **Temperature variation**
4. **Sun tanning**
5. **Ring spot**
6. **Discolour syndrome**
7. **Chlorophyll**
8. **Variegation**
9. **Finger nail**
10. **Speckling**
11. **Fertiliser**
12. **Blood water**

1. **Inner leaf colour:** The centre of many Neoregelias produce a flush of colour which begins with the initiation of flowering. The colour ranges from green, white and various shades of red through to purple. With some Neoregelias the colour fades rapidly while others last for twelve months or more.

2. **Light blushing:** The top layer of cells in the foliage of plants of the *Neoregelia carolinae* complex and others have the ability to flush with colour. This flush of colour is governed by light intensity, day length and nitrogen levels.

3. **Temperature variation:** Especially during spring with fluctuating periods of temperature, Neoregelias such as Neoregelia Bob & Grace and Neoregelia Lambert's Pride, the green banding is initiated. Increased fertiliser may increase the banding but there is a limit. What I believe happens is the discolour-

syndrome layer of cells is laid down during its growth and as the growth exceeds the normal rate it leaves gaps in the colour. All these plants are subject to sun tanning.

4. **Sun tanning:** Is associated with the top layer of chlorophyll cells. The same as light blushing. The difference between light blushing which will fade in decreased light is that sun tanning is fixed. Once it happens, it is there forever. The Neoregelia Charm, Neoregelia Gold Fever, Neoregelia Gespacho, Neoregelia Red Planet, etc are subject to sun tanning and hide the variation of colour in the lower layer of cells for ever, but if you turn the leaf over, you will find the spotting has not changed. In some *Neoregelia concentrica* hybrids you find sun tanning may affect 25cm to three-quarters of the leaf and is normally black and is fixed and is in the top layer of cells. On a dark night, shine a torch from the bottom of the leaf through the black sun tanning, you will find little green flecks, cells that did not tan. Also you can see ring spot in the lower layer of cells that the sun tanning has hidden. Sun tanning starts from the tip of the leaf and works down.

5. **Ring spot:** Is caused by evaporation of water from the meniscus of the cup water and droplets. The cooling effect of evaporation is so sudden that the cells on the leaf surface cannot cope and rupture. They then cease to function allowing sunlight to tan the lower layer of cells. This happens, winter or summer, shade or bright conditions. It is the variation of temperature that begins the effect. Open conditions and low humidity in winter allows for more rapid cooling.

6. **Discolour syndrome:** In a dense forest, the foliage can restrict the light that reaches the forest floor so that it may

be as low as one percent. In these low light areas, the majority of this light is red and plants with discolour foliage have developed this adaption to absorb the maximum of red light available. The green top layer absorbs the blue light, the red light is absorbed and reflected by the bottom layer of red cells. The light that is reflected back through the green cells gives these cells a second chance to absorb the light. When you see discolour leaved Bromeliads you know they require low light.

With *Neoregelia Charm*, *Neoregelia Gold Fever*, *Neoregelia Gespacho*, *Neoregelia Bobby Dazzler*, etc all have these red cells in the middle layer of cells. I believe they are an adaption to take advantage of low light. As this does not fit the meaning of discolour, I refer to it as discolour syndrome. These plants are green spotted and look better and perform better at lower light levels. All these plants have a safety factor against high light intensity. The top layer of cells are subject to sun tanning. In the red spotted layer of cells the colour is fixed and it doesn't matter how low the light level gets within reason, the colour remains.

7. Chlorophyll: Comes in various strengths from yellow in *Neoregelia Gold Fever* to green in *Neoregelia Charm*. The yellow chlorophyll allows the reds to have a clear iridescent colour, while green chlorophyll darkens the red. Fertiliser will darken the chlorophyll cell and consequently darkens the red.

8. Variegation: These are stripes that run the length of the leaf and may be white, yellow, red and anything in between. The only comment is that *Neoregelias* that have the discolour syndrome that are variegated, the chlorophyll cells in the top layer turn white and the bottom layer

stays red. Because the green disappears altogether, the red glows with a clarity that is stunning.

9. Fingernail markings: These red tips to the leaves are intriguing in that in very bright light they darken in colour and in low light they glow. *Neoregelia spectabilis* that has these striking fingernail markings has green centre leaves. Why? I was told it was to attract birds that would pollinate the flowers and I believed them. Then I thought about it! The fingernail colour lasts from the beginning to the end of the plant. So for four to five years, birds visit this *Neoregelia spectabilis* in anticipation of a four week window of opportunity to obtain nectar. Not a very cost effective pastime for birds.

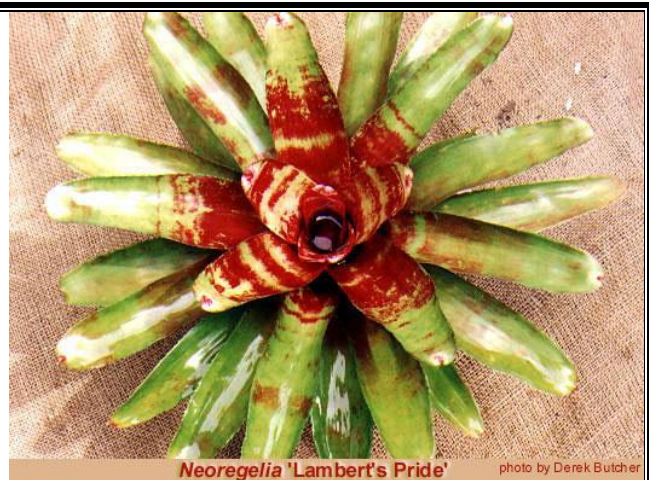
10. Speckling: *Neoregelia Barbarian* has very fine speck markings. These plants are subject to sun tanning but the centre leaves remain speckled.

11. Fertiliser: Very mild fertiliser stress will enhance colour. Too little fertiliser and any excessive stress, light, heat, cold or lack of humidity will damage plants. Too much fertiliser and green will be your favourite colour.

12. Blood water: If you tip the water out of some Bromeliads, you will find it tinged red. The explanation given is that *Neoregelia* growers drip their blood into the Bromeliad cups in an effort to enhance the colour. I've tracked this Bromeliad myth down to a few *Tillandsia*, *Guzmania* and *Vriesea* growers who are jealous of the fact our *Neoregelias* are colourful through their life span while their silver or green plants have to flower before becoming interesting.



Neoregelia
'Bob and Grace'
photo by Jarka Rehak



Neoregelia 'Lambert's Pride' photo by Derek Butcher



Neoregelia 'Charm'
cv. of *marmorata* X *chlorosticta*
© 1998 Michael Andreas

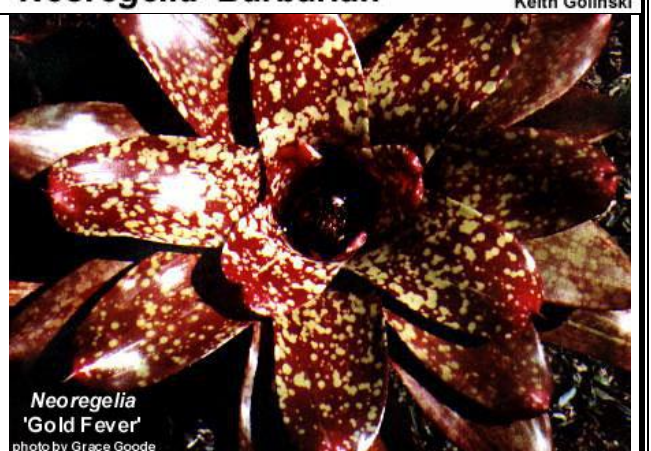


Neoregelia 'Barbarian' photo by Keith Gollinski



Neoregelia
'Gespacho'

photo by Geoff Lawn



Neoregelia
'Gold Fever'
photo by Grace Goode



Neo. Red Planet
photo by W. Paterson



Neoregelia
'Bobby Dazzler'
photo by Derek Butcher



Neoregelia spectabilis

photo by
Derek Butcher

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Where do you put that Bromeliad?
Beginners, come and learn how to grow your
bromeliads

Judges Notes
Judging The Mini Show
October Meeting 2013

By Narelle Aizlewood

There were an excellent number of quality plants tabled in the Novice and Intermediate sections at the recent Mini Show held at the B.S.Q. October Meeting, however the plants entered in the Advanced Section were very light on. Plant Commentary was provided by Pam Butler.

When entering plants in the Mini Show competition it should be remembered that the classifications for entries are for single plants only, and if multiple headed plants in one container or on one mounting are tabled, they must be connected by an intact common rhizome.

There is scope for individual plants placed and entered as Miniature Bromeliad Display dedicated to the Show Schedule for the B.S.Q. however this pertains to the two annual shows held by the B.S.Q. i.e. Spring and Autumn Shows.

Care should be given to ensure that all plants tabled for competition are clean and free of pests and disease i.e. scale insects (Black Pin Spot scale, the brown soft scale and mealy bug etc.) Any plants found to be infected will not be judged.

NOTES FOR SHOW PREPARATION.
A few timely hints to remember when exhibiting your plants.
Plants must be free of disease (scale, mealy bug etc.)
Plants should be centered in pot.

Pots must be clean (free of salt residue, moss, old stickers etc.)

Plants to be clearly and correctly labelled. Check with the Registrar if you are in doubt.

Trim any brown or dead leaves CAREFULLY with sharp scissors. Trim to the natural shape of the leaf, do not just cut it off.

Remove any moss and/or weeds from potting mix.

Wipe leaves carefully with wet cloth (do not scrub). Do not use commercial leaf shine or milk. (Using Clensel in the water is a great help).

If the plant is in flower remove any spent flowers carefully – use tweezers if necessary.

Show that your plants have been given ‘Tender Loving Care’ and not just pulled out of the garden direct to the Competition Table.

Please complete your entry forms before submitting to the Registrar filling in all the necessary information.

To help with the presentation of your entries.

To clean your pots – Any adhesive from labels etc. is easily removed by using eucalyptus oil, lavender oil or even nail polish remover.

If your pot is marked with salts try vinegar but salt residue is very difficult to remove. If the pot is heavily encrusted it will pay to repot.

It is well worthwhile to re-write labels. Poorly presented labels detract from the entry.

For the more succulent type of bromeliads a good finish to your entry is small pebbles on the top of your potting mix.

I hope this information may be useful to you and helpful when getting plants put aside and ready for competition for the upcoming B.S.Q. shows.

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Billbergia Day

By Maxim Wilson

As part of the society's charter to expand our members knowledge of different species, 'Information Days' are held from time to time. Recent workshops which have been held featured Aechmeas and Tillandsias. On Sunday the 29th October it was the turn of the Billbergia enthusiasts.

The coordinator, Michelle Cameron (known for her love of Vrieseas rather than Billbergia) together with the Master of Ceremony, Doug Cross presided over a well-attended day with interesting and useful information. It also provided a wonderful opportunity to socialise with other members of the society. Below is Maxim's account of the day. - Editor

The day was held at Newmarket State School and about 40 people came to learn about Billbergias, which are amongst the first bromeliads introduced to Australia.

1. Len Waite spoke to us regarding his experience with hybridising B. Hallelujah with B Domingos Martins. He was given 650 seedlings from a cross and has brought some plants to maturity.

He described collecting seed from the mature seed pod into a glass of water, rinsing the seeds in order to remove the mucus around the seed, then pouring onto a paper towel for growing. He uses Yates seed growing mix into a takeaway container with holes, and lays fresh seed onto this material. He then leaves it undisturbed.

For growing pups and older seedlings his mix is as follows: 85% bark (>150mm),

15% bark (<150mm), 5% river sand. He only fertilises once when a pup is potted, and uses no foliar feed.

2. Olive Trevor shared how she learnt to grow broms in the 1960's, and was later fortunate to meet up with Don Beadle when she visited Florida in 1996. She spent time at this nursery in Sarasota on the Gulf of Mexico. Don Beadle has hybridised Billbergias for years, and is thought to have made over 2000 crosses, including the beautiful *Hallelujah*.

Olive enjoys hybridising Billbergias and her favourite parent is B Domingos Martins (a cultivar of *vittata*), of which she brought a selection for sale on the day.

In growing *Billbergia* from seed, Olive washes the seeds clean, then lays them on coconut fibre in plastic containers without drying the seed.

3. Doug Cross, from Tallegalla, near Ipswich showed us the results of his first attempts at hybridising nine years ago. He got advice from Victor Prestocki in Perth and made crosses from different combinations of parents. Gold Dust, Show Off, Meadowie Gift, Cherry Fizz, Praise Be and Allan Ladd. Doug was struck by the variation that the plants of a single grex showed when propagated asexually (pups). There seemed to be little stability in the appearance of a particular cross.

The exception was B. Tallegalla Everest (B. Golden Joy purple x B. Praise Be) which he has registered. He observed that some B. Domingos Martins hybrids a quite dark purple when young, yet turn light as they mature.

4. Val Honeywood, from Bundaberg, started growing *B. natuans* 20 years ago.

Val was animated in sharing her passion for Billbergias, and had three plants to illustrate her talk.

A. She hybridised B. Golden Joy purple with *B. amoena*.

B. She proudly showed us B. Val's Joy which has a dark colour when young, and matures into a creamy yellow with marbling as it matures into a beautiful specimen.

C. Her second cross was B. Hidden Treasure which appears to be a (mutation) of B. Selby-Seidel (itself a cv of *amoena* v. *amoena*). This beautiful plant had linear red variegation.

Her preferred mix combines commercial Cymbidium Potting Mix with 10mm pine bark. She uses Organic Extra and granulated and sulphated potash.

5. Doug Cross conducted a lively rare plant auction with top price of \$130 paid for B. Evita.

6. Greg Aizlewood shared his experiences with sexual reproduction of Billbergias. Greg first got serious with bromeliads in 1987.

Greg described crossing B. Hallelujah (of the subgenus *Billbergia*) with B. '*alfonsi-joannis*' (of the subgenus *Helicodea*). While B. Hallelujah normally resists fertilising itself, it can be induced to do so if pretreated with talc. There was considerable speculation about what happens here. He has propagated the progeny from this grex asexually (pups), and has been struck by the marked variation in appearance from generation to generation.

7. Bill Morris was our last speaker, and has a reputation for great work on Billbergias since the 1950's. He wrote the chapter on Billbergias in the book

“Growing Bromeliad”, which was first published in 1988. He has registered about 50 hybrids, including the B. Meadowie series, B. Bills Giant. He also developed the yellow Clivea popular in Australian gardens.

There were many Billbergias for sale, and a couple of tables of plants for show and tell, with two magnificent specimens of *B. alfonsi-joannis*, which were spectacular.

<p>Bill Morris</p> 	<p>Len Waite</p> 	<p>Olive Trevor</p> 	<p>Doug Cross</p> 
<p>B. Pink Patches</p> 	<p>B.Hallelujah Var.</p> 	<p>B.Billbergia Midnight</p> 	<p>Barbara Murray</p> 
<p>Bev, Ruth & Theresa</p> 	<p>Val Honeywood</p> 	<p>Billbergia sales</p> 	<p>A wide variety available</p> 

Another successful day, and clearly very happy participants.

Variegation

by Lynn Hudson

Extracted from Bromelcairns
Cairns Bromeliad Society

What is a variegated plant?

The BSI Bromeliad Glossary page 49:
“The condition of a leaf when certain sections are reduced or totally devoid of green pigments with the result that the leaf has pale stripes, blotches, or bands.”



There is a fascinating range of leaf patterns and markings to be found in the bromeliad family. Variegation, fenestrations, tassellations, zonation and marmoration, are some of the words we use to describe the leaf patterns of our favourite plants.

Years ago leaves with any two colours were considered variegated and thus included *Guzmania lindenii* and *Vriesea hieroglyphica* - *lindenii* has dark upward stripes while *hieroglyphica* has patterns or ‘glyphs’ - these ‘glyphs’ include vrieseas with leaf markings that are irregularly coloured. Some hybridists produce a plant with stripes, blotches and bands

There are eight forms of variegations:
Albo marginated - white leaf margins.

Flavo marginated - yellow leaf margins.
Marginated leaf margins differ in colour to the main colour of the leaves.

Lineated leaves have thin lengthwise lines covering most of the leaf.

Medio-picta literally means ‘painted centre’, the centre is green or pink

Tricoloured the leaves have three colours; usually green, cream and rose.

Quadricolored the leaves have four colours: white, yellow red and green.

Variegated - leaves have lengthwise lines, which usually are not uniform.



It is considered that genetic mutation or a virus probably causes variegations. The seeds can carry a virus caused by the previous infection of the seed producing plant, even before ovule fertilization, or by the infection of the pollen. The virus is often no longer present when symptoms (eg variegation) appear.

Mutation and virus in bromeliads could be caused by one or several factors. Sudden changes in microclimate, temperature, humidity and light could have a strong influence. Biological stress such as prolonged dehydration or poor nutrition and ecological disturbances such as fire, flooding, freezing and cyclones can produce outward changes we can see, therefore they could also induce variegation. Chemical substances are

capable of causing variegation and flower-inducing substances have produced types of variegation in lateral buds. Meristem cloning can produce beautiful variegations.

So we find variegation may be caused by genetic mutation, climate, virus infection, or a combination of factors. Bromeliads are monocotyledons, their seeds are in a closed ovary and they produce seeds of a single seed leaf. They have parallel veins running lengthwise along the leaves. If they have tissue with infected cells, as the leaf grows the problem is transmitted down the entire leaf producing clearly defined lines or bands.

Variegations are rarely found in the subfamily Pitcairnioideae or Tillandsioideae, but are enjoyed in the genera of Guzmania, Vriesea and Alcantarea. In the family of Bromelioideae variegation is common. We have beautiful variegated ananans, aechmeas, billbergias, cryptanthus, canistropsis, canistrums and nidulariums.

Because it is a mutation, a variegated plant can produce variegated, green & albino pups. Some variegated plants are harder to care for and some have a slower growth rate. Very, very rarely variegation is stable, it changes from leaf to leaf or just disappears.

At the World Bromeliad Conference 2002 at St. Petersburg, Bob and I were delighted to meet the esteemed Nat DeLeon who spoke on bromeliad variegation and shared his experience to get as many pups as possible. His tips were:

*Overpot the mother plant before she flowers and feed her both from the top and bottom. The bigger the pot, the more plants you will get.

*Remove the flower spike when it emerges, to release the hormone that induces offset growth.

*Trim and even remove the outside leaves to allow more light to the buds and therefore make more room for the pups to grow.

*If feeding heavily and your plant loses variegation, you are over feeding.

*Cut off any green plants and keep only the variegated pups.

*Place all variegated plants in as much bright light as the plant can stand to produce stronger variegation contrasts.

*Drill the meristem to produce more pups - yuk.

*On seeds - he finds they usually come up albino, then flake and die.



“As rules are meant to be broken and nothing surprises me about bromeliads”, Nat suggested we try anything, like self-pollinating variegated plant flowers to see if they would produce viable seed.

Most people like variegated plants as they tantalize our senses with their beauty. Isn't it amazing that we have them because something went wrong!

Variegated Plants reverting to Plain

Some variegated plants revert to plain plants and some of these can produce variegated offsets. The most common one is *Aechmea Bert*. Bert is a great plant, it is

tough, grows well both epiphytically and terrestrially, in sun and shade - and suddenly you can have a variegated plant. *Aechmea orlandiana* variegated, behaves the same. *Aechmea fasciata* varieties *albo marginata* and *variegata* sometimes throw plain offsets that can produce a variegated offset but some have just a few stripes.



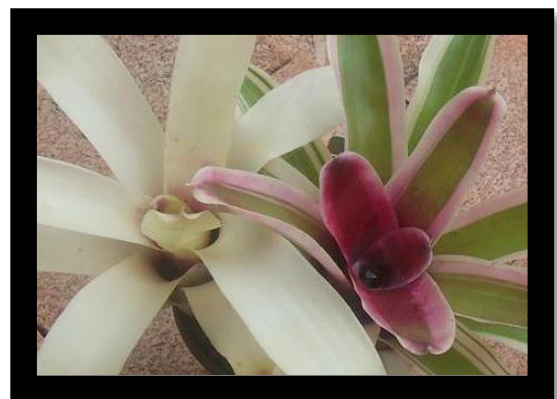
Aechmea Samurai is beautiful, but is frustrating to the grower who has a list of persons wanting one! One plant will be true, the next two or three will be without the yellow stripes. A grower is lucky to get three good plants. Luckily, the plain one is a beauty.

Aechmea chantinii variegated will produce plain offsets but their progeny can produce variegated offsets. My original two plants came from Paul deRoose in 2002 - I asked Paul for 'Samurai', he said he had better, it would give more variegated plants. He was very right! Olive Trevor quarantined them for me. They have been faithful - yes I have had a few plain *chantinii* offsets but I have even had a variegated plant from a plain! This has never happened from a Samurai, but maybe the following will work.

If you have just one stripe on a plant, any plant, place the plant with the stripe to the morning sun. The node at the base of the striped leaf can produce a variegated plant.

The instability can be very disappointing to a buyer who has paid a high price. A good grower/trader will advise you of instability. Currently there are many plants available with stripes, blotches and bands, "breeders breeding lookalikes who think their babies are the next best thing, very distinctive in their eyes and so refuse to cull" (v) should admit one extra spot or stripe does not justify a new name. (Geoff Lawn)

Albino plants lack chlorophyll, the green colouring in plants, they usually appear cream but sometimes they are white. Chlorophyll is needed for photosynthesis. In a few cases the chlorophyll could be latent and develop later. Albino plants are dependent on the mother plant to supply food and they put great strain on the mother plant. It is better to cut the albino off and allow the mother to give you a normal offset. An albino plant seldom flowers and can weaken and even kill the mother plant.



A Note From The Co-editors

By Chris and Jennifer Coulthard

Well we have reached a milestone producing our fourth edition for the year. We wish to take this opportunity to thank all the members who have given encouragement and to those who have experienced disappointment in what we produced, we have taken the comments on the chin and given them due consideration.

Bromeliaceae is one of the mediums the society uses to provide up to date information to its members. Other mediums are the monthly newsletter and the website. The communications used compliment the monthly meetings and regular plant days.

As co-editors, together with John Olsen, we endeavour to balance articles to satisfy all of our members. We try to

gather articles that will fulfil those experts amongst us, and help the beginners. We hope that we have also entertained you, keeping you abreast of current events. We are always on the lookout for articles and images, so if you feel you have a story to tell, let us know. Contact anyone of us.

The committee have a special meeting toward the end of each year to plan and confirm activities for the upcoming year. This meeting is in addition to the regular monthly meetings and usually takes place on a weekend. Barry Kable, (a longstanding committee member) and his wife, hosted the last special meeting (a photo of the committee below).

The committee is confident that 2014 will see a continuation of the innovative and supportive activities we had in 2013.

From the Co-editors we would like to thank you for your support during this last year, and look forward to sharing with you many more adventures, stories and information next year.



Bromeliads In Australia

By Chas. G. Hodgson



Our Australian Trustee Mr. Chas. G. Hodgson in one of his plant houses examining a young plant of *Portea Petropolitana var. extensa* which he raised from seed.

How times have changed, reprinted from BSI Journal Vol1 #2 (1951) with permission

My object in writing these notes is not to pose as an authority on bromeliads, but merely to give some indication as to the extent these beautiful and interesting plants are grown in this country.

Looking back over a number of years of my association with private and commercial growers the number of bromeliad species distributed among them could be counted on the fingers of one hand. Over a long period of years hundreds of other exotic plants have been introduced into this country mostly by wealthy private growers who, in some cases, had large heated glass houses and a staff of gardeners. These exotics were housed more or less under the same conditions. A gentleman once remarked to me that he could not understand why some of his plants were thriving, while

others were not. He said, "They all get the same treatment."

I said, "Yes, that is the trouble. You have plants collected from various parts of the world, from various conditions, all requiring different treatment; here you expect them to thrive under one condition."

I then suggested that he divide his house into three sections and to vary the heat and shade in each section, which he did with marked results.

That has been my observation, also, in regard to bromeliads in those that have been introduced here. It has been, truly, a matter of the survival of the most fit to put up with the conditions provided for them. This became very evident to me when I started to gather some of these plants. I already had a few plants of *Aechmea miniata discolor*, *Nidularium innocentii var. striatum*, *Nidularium amazonicum*, *Vriesia tricolor* (*) with an unidentified *Neoregelia*.

These were the five species referred to above, and represented the range of bromeliads in the various private collections under glass throughout Australia.

Aside from the conservatory or glass house collections the most common bromeliad here is *Billbergia nutans*. This species has survived the test of time. It is blessed with a hardy constitution. One sees it growing in all sorts of conditions, from humble tin dishes to teak orchid baskets, in the ground, in the sun, in the shade; known under various names from "Cactus fuchsia" to that "Pineapple Thing!" It is the "poor man's" bromeliad.

Looking at the few "broms" that I had growing with my orchids, I got an

inspiration that I would like to get more of these plants and not being fortunate, like our worthy president who lives in a country where these plants are indigenous, I had to, as it were re-discover, or rather muster up the plants that were scattered about the country. My first objective was the Melbourne Botanic Garden. In their large hothouses were the familiar five, but here and there amongst the other foliage plants were strangers such as *Aechmea fulgens* which was in bloom with its glorious long lasting flower spike. There were two different billbergias under the one label of *B. zebrina*. I was able to point out that one of them was *Billbergia vittata*. The billbergias were not happy, whereas the nidulariums and aechmeas were doing fairly well under the shade and moisture. The poor billbergias were rotting and for lack of light and a more airy condition, were open and colorless. Then I came across a few plants of *Tillandsia Lindenii*.

After coming to terms about an exchange with the man in charge, who is both a friendly chap and a keen grower, I secured *Aechmea fulgens*, *Tillandsia Lindenii*, *Billbergia zebrina* and *B. vittata*. Next day I visited the gardens again, in order to comb over the outdoor bromeliads. There I saw *Ochagavia lindleyana*, *Pitcairnia sp.*, *Puya alpestris*, *Dyckia rarefolia*, *Dyckia sulphurea*, *Hechtia texensis*, all of which I had but I did not have *Bromelia serra* which I soon spotted. Although it was not doing too well I secured a small plant of it; since then it has developed into a fine specimen in my glass house where it seems to do better than on the outside because of our rather cold climate.

My next objective was to get some literature pertaining to bromeliads. Since my friend in the gardens was librarian to the Field Naturalists Club, I asked him to

keep an eye open for any such literature. He eventually sent me a copy of a Smithsonian Institutions' Annual Report in which was an article by Mulford B. Foster. I said to myself that I would write this fellow. He might be a nice chap. And reply he did.

The fraternity among true plant lovers is stronger than Freemasonry. To make a long story short, as a result of contacting friend Foster, the exchanges of literature and plants added considerably to my knowledge and plant collection.

Then, fortified with a larger collection, and some surplus plants to barter with, I went to the Sydney Botanic Gardens where I received an introduction as an interstate visitor to the propagator. Naturally, we talked easily about the broms. He had, in the houses, *Billbergia vittata*, doing well; *Aechmea Weilbachii*, *Billbergia Morelii*, *Tillandsia lindeniana*, *Cryptanthus zonatus* and another unnamed *Cryptanthus* with chocolate colored leaves; *Quesnelia liboniana*, and nice plants of *Nidularium innocentii var. striatum*, and *Neoregelia tristis*.

Out of doors, he had *Puya dasylirioides*, *Pitcairnia tabuliformis* and *Ochagavia var.*

My next objective was the Adelaide Botanic Gardens. The city of Adelaide is much warmer and drier than Melbourne (where I reside) and is more subject to drought, during which time bore water is used (Australian for well water). This is fatal to some plants because of the lime content.

The Gardens in Adelaide had been very much neglected for some time. At one time they possessed a number of bromeliads but they had gradually died from time to time, until only the hard

leaved varieties such as billbergias, quesnelias, neoregelias had survived. The Gardens are now under a curator who has been given a grant of money to make necessary improvements and he expressed the hope that he would be able to provide the proper accommodation to grow bromeliads. I supplied him with some of my surplus plants and in return received *Billbergia pyramidalis*, *Neoregelia carolinae*, *Quesnelia liboniana*, and some unnamed billbergias which I shall have to grow in order to identify them.

Queensland is the state where the "King of Bromeliads" (pineapples) has been made to feel at home and this delicacy is raised to the extent of supplying all the southern states with this fruit. Owing to the favorable tropical climate, (they have little need for glass structures, most tropical plants will grow luxuriantly) there should be some good collections of broms in the state, but so far as I can learn they are scarce. The Curator of the Queensland Botanic Gardens wrote me that they have growing there *Tillandsia Lindenii*, an unnamed *Puya*, *Billbergia nutans* (which will cover a large area of ground if not checked), several unidentified billbergias and one or two aechmeas. We have agreed upon a favorable exchange of bromeliads.

I have sent a few bromeliads to a friend in North Queensland and he said that they are doing well.

West Australia has no Botanical Garden, but many parks and public gardens. A friend to whom I have sent a dozen broms has said that only *Billbergia nutans* is there.

After combing over the five states here in Australia I have come to the conclusion that, generally speaking, the bromeliads

can be favourably adapted to Australia, especially in Queensland, and that there are probably not more than thirty or forty varieties in this country. There is a vast field for trade in bromeliads here, if and when the dollar embargo is lifted.

My increasing interest has lead me to possess, now, about forty species of broms as well as having created considerable interest in them in the four of our five states in Australia. Apart from the private growers, I have introduced new bromeliads to the Botanic Gardens where the general public can enjoy them, and in doing this I have made many new friends.

7 Dresden St., Heidelberg N. 23,
Melbourne, Victoria, Australia

(*) Editor's Note-There is no legitimate species such as *Vriesia tricolor* but this name has been a synonym of *Pitcairnia maidifolia*.

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Competition Schedule for 2014

- January - MINI SHOW**
Class 1 – Aechmea species & hybrids
Class 2 – Vriesea species & hybrids
Class 3 – any other flowering bromeliad species & hybrids
- February - POPULAR VOTE – any genus species & hybrids + novelty bromeliad display**
- March - POPULAR VOTE**
- April - MINI SHOW**
Class 1 – Bromelioideae not listed elsewhere in Schedule, species & Hybrids
(*Acanthostachys, Ananas, Androlepis, Araeococcus, Bromelia, Canistropsis, Canistrum, Edmondoa, Fascicularia, Hohenbergia, Hohenbergiopsis, Neoglaziovia, Nidularium, Ochagavia, Orthophytum, Portea, Quesnelia, Ursulaea, Wittrockia*)
Class 2 – Guzmania species & hybrids
Class 3 – Pitcairnia species & hybrids
Class 4 – any other flowering bromeliad species & hybrids
- May - POPULAR VOTE**
- June - POPULAR VOTE**
- July - MINI SHOW**
Class 1 – Billbergia
Class 2 – Tillandsioideae not listed elsewhere in Schedule, species & hybrids
(*Alcantarea, Catopsis, Mezobromelia, Racinaea, Werauhia*)
Class 3 – Neoregelia up to 200mm diameter when mature, species & hybrids
Class 4 – any other flowering bromeliad species & hybrids
- August - POPULAR VOTE**
- September - POPULAR VOTE**
- October - MINI SHOW**
Class 1 – Neoregelia over 200mm diameter when mature, species & hybrids
Class 2 – Tillandsia species & hybrids
Class 3 – Pitairnioideae not listed elsewhere in Schedule, species & hybrids
(*Broccinioideae, Lindmanioideae, Hechtioideae (= Hechtia), Puyoideae (= Puya), Navioideae, Pitcairnioideae (= Deuterocohnia, Encholirium, Fosterella)*)
Class 4 – any other flowering bromeliad species & hybrids
- November - POPULAR VOTE**

