BROMELETTER

THE OFFICIAL JOURNAL OF THE BROMELIAD SOCIETY OF AUSTRALIA INC.

Issue: **Volume 51 Number 4- July/August, 2013.**

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B.S.A. Website
www.bromeliad.org.au
president@bromeliad.org.au
President Ian's Mobile:
0408 202 269

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COMMITTEE

President	Ian Hook (e-mail <ianhook1@bigpond.com>)	(02) 9614 6334
Vice President (1)	Robyn Firth	(02) 4774 2332
Secretary	Marilyn Heaps	(02) 9502 3231
Treasurer	Alan Mathew	(02) 9516 5976
Editor	Eugene Morris	(02) 9743 6443
Assistant Editor	Gary O'Connell	(02) 9558 8980
Member	Helga Nitschke	(02) 9624 1528
Member	Gary Lock	(02) 9836 2801
Member	Ron Farrugia	(02) 9533 2546
Member	Owen Heaps	(02) 9502 3231
Member	John Cornale	(02) 9823 0987
Member	Joe de Gabriel	(02) 4976 1409
Membership Secretary	Kerry McNicol (e-mail: membsec@bromeliad.org.au	0439 998 049

BROMELIAD SOCIETIES AFFILIATED WITH THE BROMELIAD SOCIETY OF AUSTRALIA INC.

Bromeliad Society of Victoria. The Secretary, P.O. Box 5142, Studfield. Vic. 3152.

Caboolture & Districts Brom. Society Inc.The Secretary, P.O. Box 748, Caboolture Qld. 4510.

Cairns Bromeliad Society Inc . The Secretary, P.O. Box 28, Cairns. Qld. 4870

Gold Coast Succulent & Brom. Society The Secretary, P.O. Box 94, Southport B. C., Southport Qld. 4215.

Hunter District Bromeliad Society Ms. Elizabeth Kentish, 23 Blamey Avenue, New Lambton. NSW 2305.

Townsville Bromeliad Study Group, c/- Mrs K Greenway, 10 Holstein Place, BLACK RIVER. Qld 4814.

Material for Bromeletter – address to:
E-mail: almorieu@optusnet.com.au
All other correspondence to:
The Secretary, Bromeliad Society of Australia Inc.,
P.O. Box 340, RYDE NSW 2112.

Please Note

BROMELIAD plants will be on sale at the Club from 12.30 p.m. before the monthly meeting.

MEETING VENUE AND TIME
SECOND SATURDAY OF EACH MONTH AT THE BURWOOD R. S. L. CLUB,
Cnr. Shaftesbury Road and Clifton Avenue, Burwood.

Meetings commence at 1.00 p.m. in the First Floor Conference Rooms/ Auditorium.

MEETINGS PROGRAM

July 13, 2013	**Special 50th Anniversary Celebrations.** **Talk: Pressed Flowers. Susan Lewis**
August 10, 2013	**Show and Tell Members.** **Talk: To be arranged.**

EVENTS CALENDAR

July 13th, 2013. BSA 50th Anniversary Party, Burwood RSL Shaftesbury Rd, Burwood.
August 9th/11th, 2013 Cymbidium Club of Aust. Inc. 2013 National Orchid Extravaganza at Dural Rec. Centre, 25a Kenthurst Rd, Round Corner, Dural. Judith Brooks (02) 9773 9197.
October 12/13, 2013. BSA Spring Show, Burwood RSL. - as above.
April 16 to 19, 2015. 18th Australasian Bromeliad Conference, Parramatta. NSW.

Life Members:
Grace Goode O.A.M
Bill Morris
Ruby Ryde
Keith Ryde
Andre Staelens
Ken Woods

Editor:
Eugene Morris,
20 Boronia Street,
Concord West. NSW
(02) 9743 6443

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- **CARDHOLDER** signature (essential).
- Payment details (membership renewal, book purchase, postage, etc.) with $A amounts for each item.

AUTUMN SHOW
MAY 26. 2013

GRAND CHAMPION OF SHOW	ROBYN FIRTH	AECHMEA 'XAVANTE'
RESERVE CHAMPION	ROBYN FIRTH	QUESNELIA MARMORATA 'TIM PLOWMAN'
SPECIES AWARD	ROBYN FIRTH	BILLBERGIA 'DOMINGOS MARTINS'
NOVICE CHAMPION	E. CARUANA & S. WAIN	NEOREGELIA 'SHAMROCK'

AUTUMN SHOW 2013.

There was an excellent display of top quality plants by Open and Novice growers.. There were 83 plants benched and 14 exhibitors and our members and visitors enjoyed the display. Thanks to all who helped in placing exhibits, recording and marking winners. Judges were Eileen Killingly and Terry Davis, assisted by Edwina Caruana and Stephen Astill, Student Judges. Terry Davis and Robyn Firth were the Show Registrars.

Class 1. Pot of Aechmea

1st	Robyn Firth	*Aechmea 'Xavante'*
2nd	Carolyn Bunnell	*Aechmea orlandiana*
3rd	Robyn Firth	*Aechmea nudicaulis* 'Rosea'

Class 2 Billbergia Specimen

1st	Carolyn Bunnell	*Billbergia* 'Tickled Pink'
2nd	Robyn Firth	*Billbergia* 'Ole'

Class 3 Billbergia Colony

1st	Robyn Firth	*Billbergia* 'Domingos Martins'
2nd	Lydia Hope	*Billbergia* 'Hallelujah'
3rd	Philip La	*Billbergia* 'Poquito Mas'

Class 4 Pot of Cryptanthus

1st	Robyn Firth	*Cryptanthus* 'Cascade'
2nd	S. & L. Astill	*Cryptanthus* 'Kamehameha'
3rd	Joe de Gabriel	*Cryptanthus* 'Arlety'

Class 5 Neoregelia Species

1st	Carolyn Bunnell	*Neoregelia* 'olens cv'Marie'
2nd	Carolyn Bunnell	*Neoregelia* 'La Nina'
3rd	Robyn Firth	*Neoregelia wurdackii*

Class 6 Miniature Neoregelia

1st	Marie Micallef	*Neoregelia* 'Aquarius'
2nd	Carolyn Bunnell	*Neoregelia* 'olens cv'Marie'
3rd	Philip La	*Neoregelia* 'Heart's Blood'

Class 7 Pot of Neoregelia Hybrid

1st	Carolyn Bunnell	*Neoregelia* 'Wally'
2nd	Carolyn Bunnell	*Neoregelia* 'Charm'
3rd	Robyn Firth	*Neoregelia* 'Groucho'

Class 8 Nidularium/Canistropsis

1st	Carolyn Bunnell	*Nidularium innocentii*
2nd	Robyn Firth	*Nidularium* 'Rubens'
3rd	Robyn Firth	*Canistropsis billbergioides* variegated.

Continued on Page 5.

AUTUMN SHOW, 26/05/13:

CONTINUED FROM PAGE 4:

Class 9 Tillandsia Specimen

1st	Carolyn Bunnell	*Tillandsia ionantha* hybnrid
2nd	David Scott	*Tillandsia duratii*
3rd	Ron Farrugia	*Tillandsia hondurensis*

Class 10 Tillandsia Colony

1st	Carolyn Bunnell	*Tillandsia ionantha* hybrid
2nd	Eileen Bennett	*Tillandsia recurvifolia* var *subsecundifolia*

Class 11 Vriesea

1st	Carolyn Bunnell	*Vriesea racinea*
2nd	Robyn Firth	*Vriesea* 'Solar Flare x Red Chestnut'
3rd	Robyn Firth	*Vriesea* 'Red Chestnut'

Class 12 Foliage / Variegated Bromeliad

1st	Robyn Firth	*Vriesea* 'Highway Beauty'
2nd	Carolyn Bunnell	*Neoregelia* 'Tomato Soup'
3rd	Joe Micallef	*Neoregelia* 'Blushing Zebra'

Class 13 Pot of Other Genera

1st	Robyn Firth	*Quesnelia marmorata* 'Tim Plowman'
2nd	Rona Bolton	*Dyckia* 'Warren'
3rd	Lydia Hope	*Orthophytum* 'Warren Loose'

Class 14 Pot of Intergeneric

1st	Robyn Firth	*xQuesmea* (*Aechmea orlandiana x Quesnelia edmundo)*

Class 15 Mounted Bromeliad

1st	Robyn Firth	*Quesnelia marmorata*
2nd	Robyn Firth	*Tillandsia juncea*

Class 16 Terrestrial Bromeliad

1st	Robyn Firth	*Orthophytum* 'Snow Flake'
2nd	Robyn Firth	*Orthophytum* 'Silver Cloud'

Class 17 Artistic Arrangement

1st	S & L Astill	'Bamboo'
2nd	S & L Astill	'On Wood'
3rd	Carolyn Bunnell	'Kaboom!'

Class 18 Novice

1st	E Caruana & S Wain	*Neoregelia* 'Shamrock'
2nd	S & L Astill	*Cryptanthus* 'Moonbeam'
3rd	E Caruana & S Wain	*Tillandsia cocoensis.*

THE BROMELIAD SOCIETY OF AUSTRALIA INC.

SPECIAL GENERAL MEETING

NOTICE IS HEREBY GIVEN
For a Special General Meeting of the members of the Society to be held at 1.00 p.m. on
SATURDAY, 14TH SEPTEMBER, 2013
At
Club Burwood (Burwood R.S.L.)
96 Shaftesbury Road,
BURWOOD.NSW 2134

The purpose of the meeting is to consider the following special resolution relating to the alteration of the Constitution:

That the wording of Clause 29 be adjusted by replacing the word "audited" with the word "inspected'.

Clause 29 will now read:

"The yearly financial Accounts made up to the thirty-first day of December of the previous year and duly inspected shall be submitted by the Treasurer to the meeting. (See Rule 38.)

The normal monthly meeting of members will follow immediately on the closing of the Special General Meeting.

Only financial members of the Society will be permitted to vote at the Special General Meeting.

Plant of the Month Competition
April, 2013

Open	**Judge's Choice.**	
First	Helga Nitschke	*Guzmania* Unknown.
Second	Ron Farrugia	*Tillandsia stricta.*
Third	John Cornale	*Quesnelia marmorata* var.'Tim Plowman'
Open	**Members' Choice**	
First	Helga Nitschke	*Guzmania* Unknown
Second	Joe de Gabriel	*Hohenbergia leopoldo-horstii*
Third	John Cornale	*Quesnelia marmorata* var.'Tim Plowman'.
Novice	***Judge's Choice***	
First.	Gary Lock	*Tillandsia stricta.*
Second	Kerry McNicol	*Neoregelia* 'Hot Tips'
Third	Joy Clark	*Tillandsia rodrigueziana*
Novice	**Members' Choice**	
First	Gary Lock	*Tillandsia stricta.*
Second	Warril Evans	*Tillandsia caerulea*
Third	Kerry McNicol	*Aechmea purpureorosea*.
= Third	Kerry Boytek	*Neoregelia ccarolinae x concentric*
= Third	Joy Clark	*Tillandsia rodrigueziana*

May, 2013

Open	**Judge's Choice.**	
First	Sandra Southwell	*Tiilandsia* 'Dawn'
Second	Sandra Southwell	*Tillandsia crocata*
Third	David Scott	*Tillandsia duratii.*
Open	**Members' Choice**	
First	Sandra Southwell	*Tillandsia* 'Dawn'.
= First	John Cornale.	*Tillandsia fasciculata*
Second	David Scott	*Tillandsia duratii.*
Third	John Cornale	*Neoregelia* 'Palmares'.
=Third.	Sandra Southwell	*Tillandsia crocata*
= Third	Sandra Southwell	*Tillandsia* 'But Rob'.
Novice	**Judge's Choice**	
First	Joy Clark	*Tillandsia lindenii.*
Second	Kerry McNicol	*Tillandsia* 'Borumba.
Novice	**Members' Choice**	
First	Joy Clark	*Tillandsia* lindenii.
Second	Kerry McNicol	*Tillandsia* 'Borumba'..

Margaret Draddy Artistic Competition

First	John Cornale	*Till.* Garden.
Second	Joy Clark.	Picture Perfect.
Third	Helga Nitschke	Garden.

SHOW & TELL
MAY, 2013

This month's Shown and Tell was opened by ***Alan Mathew***, with a plant which showed on the label that it was *Aechmea* 'J.C. Super Star', a plant with green and red leaves and a pink inflorescence. He also has a similar plant where the flowers have touches of blue in them, but this one doesn't. He thinks it is something that Hummell might have played with. Some members likened it to *Aechmea* 'Burning Bush'', but there was no agreement after a short discussion.

Alan's second plant was of a medium size, in a 200mm pot, which he thought might be a *Neoregelia concentrica* cross, i.e. a hybrid, but it was a very vertical plant, as if it had been in a lot of shade. Alan said that this was not necessarily correct, about 50/50 would be closer. A couple of the central leaves had a purple stripe, some were specked and others sparkled. President Ian thought that it could be a *Neoregelia gavionensis* but, after some discussion, there was no definite conclusion about its identity.

John Cornale showed a *Tillandsia* 'Houston' which was growing well in a pot and had two pink inflorescences. It was growing well and he intends to keep it growing as is for the time being.

His second plant was one which he bought on e-bay a few years ago for $80; at the time they were selling in nurseries for twice that amount. Iiits name is *Tillandsia grandis* and it produces pups only when it is a small plant. It is a slow grower and, at the moment, is showing ten pups. He will not be removing them soon.

Kerry McNicol showed twso plants which she brought in about two months ago, one labelled *Nidulariumi* 'Maggie Hicks', the other one *Wittrockia smithii.* Kerry's story and subsequent e-mails exchanged with Derek Butcher, are presented on Page 10 of this issue of Bromeletter. Two photos are shown in the colored section.

Next was ***Owen Heaps,*** who received a rousing welcome back to the meetings after a prolonged stay in Sick Bay.

His first plant was *Tillandsia lorentziana,* growing on a cork mount but without a label which has been lost. Following in order of presentation were:

Tillandsia juncea, a clump which flowers regularly.

Till. tricolor, in a pot.

Till. baileyi, on a small mount. It would probably be better in a pot with half each of pine bark and cork.

Till. streptophylla, in a pot and growing very well.

Till. albida, also growing very well in a pot.

Till Unknown. It was thought to be *Till. secunda,* but identification will have to await its flowering.

Till. pendulata, another *Till.* Growing very well in a pot.

(Continued on Page 9)

Show and Tell—May, 2013. (*(Continued from Page 8)*

Terry Davis' contribution centred around some *Dyckia* seedlings which he grew from seed obtained from a grower in Brisbane. They are named 'Little Red Devil', but the name is not registered. *Dyckia* 'Red Devil' is.

President Ian commented that, when you take seed from a hybrid, the babies could be anything. The only way to perpetuate a hybrid and obtain a plant to which you can attach the same name, is to propagate it vegetatively, in other words, with a pup. If you have seed from something that is a hybrid, even if it was fertilised by itself, the progeny could be any one of the parents or some proportion of the different parents, or a bee or an ant or the wind could have done things to the flower and you will end up with something completely different. Growing from seed you have to be very careful if you want to obtain a hybrid. You can think that, as you have 10,000 seeds, you will be able to make 10,000 copies of the same plant. You won't. Each seed is a different plant and you have take extra care so that you don't put the same label on something which is nothing like what you were hoping for.

Terry mentioned that he has been buying some *Dyckia* seed from Brazil and the only ones he can be sure of being actual species are those that are wild collected, meaning that they have been taken from a plant which is growing wild out in the country. Alternatively, they need to have been hand-pollinated.

President Ian's contribution to Show and Tell was on the subject of *Billbergia pyramidalis* var.*concolor* and *Billbergia pyramidalis* var *pyramidalis.* This latter plant is a slightly reedier one, a bit more closed in and has a lot of grey in it. Interestingly, it flowers two weeks later than *concolor,* so, in another couple of weeks, you will see it come out all around the countryside.

Lots of people will have *Bill. pryamidalis* growing and flowering in their collections. They produce lots of pups and are a great plant for filling in a space under a tree. They can be grown cool and, once they begin growing, they form an almost indestructible clump which will keep dogs and cats out. They can out-perform Ivy, which is not an easy thing to do. If anyone asks how you know that they are *Billbergias,* just ask how long the flowers last. If the answer is "Not long", then you know it is a Billbergia, because the flowers are short-lived. At the moment they are flowering well all over Sydney and the country. They are actually all clones of the one plant. In fact, we don't have millions of *Billbergia pyramidalis* in Australia, we have only one. Genetically, they are all the same one plant, all flowering on the same day all over Australia. It is amazing!

Next, Ian went on to the variegated form of *concolor*. One plant came up with some white edging and, surprisingly, it is so closely related to the others that it, too, flowers on the same day. Even though it has a cultivar name, with a capital letter and is not in italics, it is still classified as a Species, which is why there is some confusion. In reality, you could still enter it in a Species competition and get away with it

NIDULARIUMS

Follow up by Kerry McNicol regarding the query made about *Nidularium* 'Maggie Hicks', and *Wittrockia smithii* at the March meeting.

When Ken Woods informed us that he thought the 'Maggie Hicks' may have originated in South Australia, I emailed the SA Society for more information. Very kindly, Derek Butcher provided me with some information. After a few emails to and fro, the following has been paraphrased from Derek's emails.

'Basically, *Wittrockia amazonica* was described from the north in Brazil, later *Wittrockia smithii* was described, but because it came from the south in Brazil it was considered a different plant, partly because they didn't compare the two when describing *W. smithii;* due to distance separation they didn't even consider to compare them. It was only much later it was realized that collection data was in error and a comparison was done, so the first named takes precedence. Then Elton Leme studied them further and decided he didn't like the fit in *Wittrockia* and placed them into *Nidularium.*
Hence, *Wittrockia smithii* and *Nidularium amazonica* = *Nidularium amazonicum.*
Early in the 1980's Maggie Hick, Josie Tonkin and ourselves (Derek and Margaret Butcher) grew *Wittrockia amazonica* from the USA seed bank. When the plants flowered there was similarity but slight differences. All had dull primary bracts and not the bright colour you expect with *Nidularium*. Anyway since then there has been lots of writings on this species, some eight pages . So there were problems with identity in the past! BUT we now have the name *Nidularium amazonicum*. I see great similarity with your plant in its two forms with what I think is *Nidularium amazonicum*.'

I have changed the *Wittrickia* to *Nidularium*, but because the plants grow differently, and are only two clones of a number of resulting seedlings, I will label them both *Nidularium amazonicum* but will add 'Maggie Hicks' on second, for my own reference.

Treasurer's Report - (1):

Treasurer Alan Mathew gave the following details regarding our Operating Account to March 31, 2013:

Brought Forward	**$9,667.80**
Plus Income:	**1,397.60**
Less expenses	**2,941.12**
Bank Statement as at 31/03/2013:	**$8.124.28**

SPECIAL 50TH ANNIVERSARY EVENT

On July 13th, 2013, The Bromeliad Society of Australia will celebrate the 50th Anniversary of its formation with a party and lunch.

The occasion will provide us with the opportunity to welcome as many of our long-standing members and former members as we can muster.

We hope it will prove to be an outstanding attraction and will provide everyone with the chance to renew relationships and friendships which were established and grew over many years and which, in lots of cases, are continuing today.

We need to know who will be coming so our Secretary, Marilyn Heaps, will be happy to take your call on (02) 9502 3231

A Note from Derek Butcher:

Eric Gouda has decided that no longer is *melanocrater* a variety of *T. tricolor* but a species in its own right

Tillandsia melanocrater L. B. Smith Emend E Gouda.

It was treated as a variety of *T. tricolor* Schlcht. & Cham. but the differences are good enough to treat it as a separate species.

Tillandsia tricolor has typical glabrous floral bracts with distinct lepidote apices, while *T. melanocrater* has glabrous bracts.

It is smaller with the inflorescence within the leaves, while in *T. tricolor* the peduncle of the inflorescence mostly exceeds the leaves.

Ed. Note also - some *T. triclor* circulating in Sydney may actually be *T. botteri*. See note on www.bromeliad.org.au

ELTON C. M. LEME

The name 'Elton C. Leme' has been associated with Bromeliads for a very long time and, according to one report, his garden is the equivalent of a living legend in International Bromeliad circles.

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His home is in Rio de Janeiro, in Brazil and he is the author of many authoritative books on bromeliads and an acknowledged expert on the Bromeliads of Brazil. He is also a High Court Judge in Rio de Janeiro, with a special interest in Environmental law. Recently he was appointed as Chief Justice of Brazil., the nation's highest judicial position.

At our May meeting, on a motion put by Keith Ryde, members agreed to congratulate Mr Leme on his appointment.

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Kerry McNicol's Photos. See the articles on Pages 10 above & 17 below. (Show & Tell—June)

Neoregelia 'Satsuma'

Neoregelia 'Satsuma' Variegated.

x*xNeomea* 'White Ghost'

Neoreelia 'Royal Pepper

Don Beard's article on Photosynthesis; Pp 18/20 Figure 8. *Alloteropsis semialata* – transverse section of C4 leaf showing veins and BSC.

Pres. Ian Hook & Robyn Firth, Grand Champion of Show , Reserve Champion and Species Award. - May 25, 2013

Pres.& E. Caruana & S. Wain, Novice Champions, Autumn Show, May 25, 2013.

Aechmea 'Xavante" Grand Champion Autumn Show 2013. Robyn Firth

Billbertia Unknown. 2nd Judges & 3rd Novice. Warril Evans.

Guzmania unknown. 1st Judges & Members Open. April, 2013. Helga Nitschke.

BROMELIAD SOCIETY OF AUSTRALIA INC.

At the Meeting of the Society on May 11th, 2013. the following Motion, of which due notice had been given in the Bromeletter, was put to the meeting and was carried unanimously:

Clause 42 and the heading AUDITOR are to be deleted and replaced with the following:

"**INSPECTION OF ACCOUNTS.**

The accounts of the Society shall be prepared by the Treasurer at the end of each calendar year. These accounts will be inspected by an Independent Accountant who shall report thereon, such report together with the accounts to be presented by the Treasurer at the Annual General Meeting.

Should an Independent Accountant not be available to act on an Honorary basis, funds shall be provided to obtain accounting services on a professional basis."

The reason for this alteration is that, under the old Clause 42, a complete audit of the accounts of the Society was required. This is expensive and time consuming and is not required by the Office of Fair Trading for small organisations. An inspection by an Independent Accountant is all that is required.

This amendment will now be included in our Constitution.

Blank labels or the next best thing!

(Continued from Page 15)

Any of you who have read the S A Bromeliad Gazette will realise that I use unidentified or wrongly identified plants at meetings as inspiration to investigate their history when home in my Den! The said plant has had its photo taken and is discussed in the next Gazette. I go through all available literature and internet and don't rely on just one source. Other groups should be encouraged with this way of learning because it must be remembered that off-the-cuff decisions can often be wrong.

BLANK LABELS OR THE NEXT BEST THING!

By Derek Butcher May, 2013.

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Some people like blank labels, some like a little information, some like a lot. I hope you will bear with me in this article. I hope you will agree that it is not worth writing information unless it is fairly accurate and I hope to give you some clues about solving your problem.

First, let us deal with a plant with no label. Wait until your plant is flowering and take it to a meeting and ask around. You should get lots of suggestions ranging from the certain to the not so certain. Many will take the most positive for granted but if you are a Doubting Thomas like me, read on. I also like the pleasures of life. Do you like to get a warm fuzzy feeling when either you have proved someone else wrong or proved yourself right? Or helped someone to correct a wrong name? I do! Read on!

The answer will either be a species or a hybrid (Remember a Latin name generally signifies species). If species, check against the photo on fcbs.org and if you are really keen and want plant descriptions etc, contact WWW Bromeliad Society and join the Encyclopaedia of Bromeliads Project. If a hybrid, check the Bromeliad Cultivar Register at http ://botu07.bio. uu.nl/bcg/bcr/index. php and if it is not there you may like to contact the hybridist and encourage registration. The only thing left is a formula where the hybridist has been too lazy to even think up a cultivar name and register it.

When hybridists cross two plants and successfully get seed they generally record both parents for their own benefit. The seed parent should be recorded first with an 'x' between each name. This is the minimum requirement to identify a grex and should remain in the hybridists' records. It is when these youngsters are ready to leave the nest that the hybridists should decide if their hybrid was a success or failure. If a failure, plants should be destroyed; a hybridist should try to set a high standard. If a success, consideration must be made as to registration. If undecided, the formula continues. This is the hardest problem to solve unless you know the hybridist and can ask questions and perhaps encourage a grandfathering-in type registration, but if not then continue reading.

There are questions that need to be answered:

1. How accurate is the formula?
2. Where did the plant come from?
3. Has the formula been recorded previously? Check parentage in the BCR under Advanced Search to see if your hybrid has been done before. How similar is your plant? Should you discuss the problem with the Registrar?
4. Is the seed parent name shown first?
5. If you were certain in your own mind they are the same, you could use the registered name.
6. BUT, if in the slightest doubt, stay with the formula on the label.
7. If the plant were really unique and you had pursued all avenues to trace the hybridist, albeit unsuccessfully, you are free to increase the plant by asexual means (offsets etc) and register with your own name.

(Continued on Page 14)

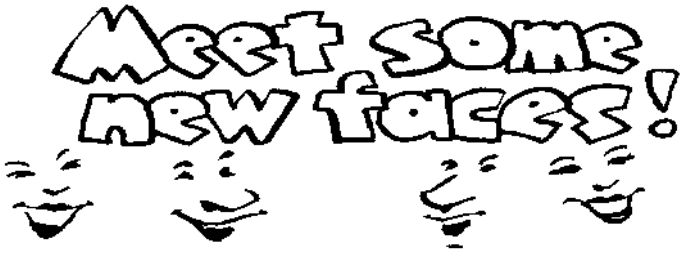
SHOW & TELL
JUNE, 2013

Kerry McNicol began this segment with four plants which have been doing mysterious things.

There's something strange in the neighbourhood . . . . as the song goes.
The first indication of funny business going on is, after many years of owning this plant *Neoregelia '*Satsuma', I have noticed a variegated pup on one of the many colonies that have developed over the years. The variegation is broad but not a strong variation from the purple colour of the plant, more like a green/beige. I am hoping that this variegation will stabilise, more because of it being my 'first' variegation, than it being a beautiful plant. See Photos Nos.
Next is a curiosity, which I have seen before on some plants and that is a 'fusing' of leaves on a plant (either partial or full), this one happens to be a *xNeomea '*White Ghost'', my first fully 'home' plant to flower and it has several fused leaves. I have asked a few people but have not found any definitive reason for this other than a suspicion that it is some genetic flaw. Photo
Lastly, is the flowering of this *Neoregelia* 'Royal Pepper 'outside the well of the plant! Rather odd, but having had 'double' spikes in some Vrieseas and researched that, the conclusion is likely to be an undeveloped pup which has struggled to flowering resulting in a 'double header' or in this case a flower by itself. See Photo No.
Looking closely, it looks very much like a quilled pup, which has not grown but managed to flower . . . . or . . . . perhaps I should lay off the mushrooms for a while.

Warril Evans brought along a large plant with plain green leaves and was seeking a name for it. The plant was identified as a *Billbergia* but that was as far as it went, so its identity will have to wait until it flowers.

Robyn Firth's contribution was a large plant, *Hohenbergia correia-araujoi,* It is endemic to Brazil, discovered in 1979 and is a species of genus *Hohenbergia.* The flowers are fairly ordinary but the wide leaves are beautifully marked with colored horizontal bands. The lower half of the plant is like a very big bulb from which the leaves grow upwards to form the upper part of the plant It needs good light, otherwise it will become green and strappy. It is not cold tolerant and it is normal for the outer leaves to hang down. ***President Ian*** took the opportunity, at the end of Show and Tell, to thank everyone who helped with the Autumn Show on May 25/26. It was a great success, the new layout was good, the choice of plants was good and particular thanks go to David Scott and Joy Clark, who organised the terrific display and also to Gabrielle, who very patiently sold raffle tickets on both days. Ian has received a letter from Chris Larson, Brom. Producer from Victoria, saying that the members should be congratulated on the color and standard of the plants. He usually takes a few minutes off to walk around the area and this Show had a lot more sales plants of good standard, grown very well in backyards and in winter. As a result, he had to do a double-take on walking past quite a few of the tables. Show entries may have been down but all of the others were up. Sunday tailed off a bit, which was surprising but when people come and what they buy will inevitably change every time.



WELCOME TO NEW MEMBERS.

We continue to attract new members into the Society and we would like to welcome Ash Jebelli, Fred Miranda, Emine Muharrem, Kevin O'Neill, Kaive Polis, Malveena Sargeant, Shaloo Sood, Annie Alarcorn, Gladys Arizabaletta, Pattie Bradbury, Anthony Davis, Robyn Pogmore, Hendrik Grundling, Deborah and Mark Hurst, Gleness and Robert Larnach.

as our latest to come to admire, enjoy and learn about the wonderful world of Bromeliads.

From my e-mails ... Obituaries:
In a Uniontown, Pennsylvania , cemetery:
Here lies the body of Jonathan Blake,
Stepped on the gas instead of the brake.

PHOTOSYNTHESIS FOR BROMELIAD GARDENERS

Part Two of a three-part article, presented to the Far North Coast Study Group, NSW.

Photosynthesis 2 by Don Beard.

C4 Plants: Occurrence and History

As stated before C4 plants include many grasses and sedges, many weeds including crabgrass and nutgrass. Also corn, sorghum, millet, sugarcane, and salt bush.

C4 plants make up 4% of the world's plant biomass, 15% of all plant species and 20% of plant commercial production. C4 plants are common as monocots (one seed leaf), 50% and uncommon as dicots (two seed leaves), 0.6%. Some plants are intermediate between C3 and C4 pathways, i.e. C3 plants exhibiting C4 traits. Some young plants can switch from C3 to C4, some C3 plants have C4 characteristics in their roots, stems, and petioles. Obviously one is not drawing too long a bow to think only minor adjustment was needed for a C3 plant to evolve into a C4 plant.

Recent earth history describes a decreasing CO_2 level. During the Cretaceous (some 130 million years ago) CO_2 was at a level four to five times that of today. This level seriously decreased in the late Oligocene (25-30 million years ago) and continued decreasing to the end of the Miocene (5-10 million years ago) to about 400ppm (parts per million), a little more than today's level. Under these conditions C4 photosynthesis has developed a number of times in a number of plant lines in the 25-30 million years since the late Oligocene, getting to today's numbers by the end of the Miocene. Assuming that low CO_2 is a pre-condition for the development of C4 plants, paramaters such as increasing aridity, high light habitats, increasing temperature and seasonality, fire and the distribution of grazing animals, are all thought to play an important part in this evolutionary trend.

At temperatures 22C - 30C, Quantum yields for C3 and C4 plants are the same
Temperatures above 30C, quantum yields are greater in C4 plants
Temperatures below 22C, quantum yields are greater in C3 plants.

C4 Plants.	**C3 Plants.**
- Can shut stomata in heat of day	Can't
- First product has 4 C atoms -	First product has 3 C atoms
- PEP and RuBisCo -	RuBisCo only
- Tight gas barrier about BSC -	No barrier
- BSC have chloroplasts-	BSC have no chloroplasts
- Venation... parallel and closer. -	Venation… anything
- PEP loves CO_2 and wont take up O2	RuBisCo can't tell difference between CO_2 and O2
- CO_2 absorbed and used fast -	CO 2 absorbed and used slowly
Photosynthesis restricted to BSC	Photosynthesis operates in all mesophyll Chloroplasts
No photorespiration -	Up to 30% photorespiration
Can utilize low CO_2 -	Needs high CO_2
High rates of photosynthesis and growth, particularly in tropics;	Lower rates of photosynthesis. Can't handle arid situations and high temperatures.
Drought tolerant. -	
Dominate open hot arid environments.	- Low water usage efficiency.

(Continued on Page 20)

Photosynthesis. (Continued from Page 19).

On a final note, rice is a C3 plant. Science has for some years been striving to develop it into a C4 plant. Imagine what that might do for rice production and the world's food problems.

References: As with Photosynthesis 1, this presentation was gleaned from the following scientific articles and internet pages:

Sage et al, 2011, The C4 plant lineages of planet Earth. J. Exp. Bot.
Sage 2004, The evolution of C4 photosynthesis.
New Phytol. 161: 341-370.
www.en.wikipedia.org/wiki/C4_carbon_fixation
www.marietta.edu/~spilatrs/biol103/photolab/c4photo.html
www.creation.com/c4-photosynthesisevolution-or-design
www.ehleringer.net/Jim/Publications/271.pdf
www.plantsinaction.science.uq.edu.au/edition1/?q=content/2-1-5-c4-photosynthesis
www.life.illinois.edu/govindjee/Part1/Part1_Hatch.pdf
www.oregonstate.edu/instruct/css/330/two/
www.en.wikipedia.org/wiki/Photosynthesis
www.emc.maricopa.edu/faculty/farabee/biobk/biobookps.html.

Photosynthesis 3 by Don Beard.

This is the final talk in a series of three on photosynthesis. An alternative title may well have been " Photosynthesis for Bromeliad Gardeners". (Previous articles can be seen in FNCBSG(NSW) Newsletters Apr. 2012,pp 6-7; July 2012, pp10-14.)

In this article the CAM photosynthetic pathway and CAM plants are discussed. CAM is an acronym for Crassulacean Acid Metabolism, meaning the type of acid metabolism found in the Crassulaceae, a family of succulent plants. It was developed as an adaptation to arid conditions. Briefly the CAM pathway involves the plant shutting stomata during the day to reduce water loss, opening them at night to collect CO_2 and storing the CO_2 as the 4C molecule malic acid. Then the next day with the stomata shut, CO_2 is reproduced and used for photosynthesis. The malic acid gives the leaf of the CAM plant a bitter/acid taste during the night which disappears during the day.

The term CAM is generally attributed to Thomas and Ransom in 1940, but 2000 years ago the Romans noticed the distinctive acid taste that CAM leaves have at night. However it wasn't until the early 1930's that the process was suspected and then verified during the 1940's. The process was almost completely understood by1980. Examples of CAM plants include bromeliads, orchids, cacti and Jade plants. Most are epiphytes or succulents.

Mechanism.

CAM probably developed as a two part (day/night) 24 hour cycle as an adaptation to increased water efficiency. At night during lower temperatures the stomata open and atmospheric CO_2 enters and is fixed in the spongy mesophyll cells by an enzyme reaction (PEPC) forming HCO_3.

(Continued on Page 21)

Photosynthesis.

(Continued from Page 20)

Malate is produced which synthesises malic acid to be stored in the cell's vacuole overnight (remember it is dark and no photosynthesis can occur without sunlight).

Night CO_2 --> HCO_3 (with PEPC) --> Malate --> Malic acid (in vacuole)

At dawn the stomata close, the malic acid moves from the vacuoles, is converted to malate and decarboxylated in the chloroplasts into CO_2 and PEP. The CO_2 concentrates around the enzyme RuBisCo and photosynthesis via the Calvin cycle results.

Day Malic acid --> Malate decarboxylated --> PEP + CO_2 (for Calvin cycle).

In the late afternoon the stomata open and this day/night cycle repeats.

The water efficiency of this process is demonstrated by the fact that C3 plants lose 97% of their water by transpiration whereas CAM plants lose little to none. All this is achieved by just shutting the stomata during the day.

CAM Types

Obligate (Constitutive). Night uptake of CO_2 occurs at all times i.e. only the CAM photosynthetic pathway is used by the plant.

Inducible (Facultative). These plants only use CAM when stressed, and can switch from C3/C4 to CAM, depending on the environment.

CAM Cycling. With these plants the stomata don't open at night. The plants have to recycle the CO_2 produced by respiration. These are usually well watered lants that keep their stomata open during the day. Benefits of this type of CAM are not at all obvious. This may be a precursor to CAM Idling.

CAM Idling. This photosynthetic pathway is used by plants which are often drought stressed. With these plants, the stomata are closed both day and night. Here as with CAM Cycling there is night time assimilation of respiratory CO_2. The benefit here is that metabolism continues during severe drought. These plants usually have a rapid response to rain showers.

Plants using the last three CAM types are usually found in areas where water shortage alternates with water excess. Epiphytes and lithophytes also use these pathways. Often the benefit of continued metabolism (survival) is at the expense of quantum yield (growth). Plants which can switch photosynthetic pathways between CAM and C3 depend on environmental factors for the switch e.g. plants under water stress will switch to CAM as will plants under saline stress. Plants which are dry then exposed to moisture switch to C3. Note some C4 plants can switch to CAM (no bromeliads use the C4 pathway). Some plants express CAM in their stems and branches. With CAM photorespiration is limited, transpiration is limited and so water efficiency is at least five times greater than for C3 and C4 plants.

(To be concluded in next issue.)

OFFICE-BEARERS:

Public Officer	Gary Lock
Book Sales	Ian Hook
Librarian	Grahame Macfarlane
Catering	Helga Nitschke, Lydia Hope
Raffle Sales	Helga Nitschke.
Pots, Labels, etc – Sales	Ron Farrugia
Plant of the Month	Terence Davis and Anne Bray
Show Registrar	Robyn Firth
Show Co-Ordinator	David Scott.

Treasurer's Report - (2):

Treasurer Alan Mathew gave the following details regarding our Operating Account to April 30, 2013:

Brought Forward	**$8,124.28**
Plus Income:	**1,115.98**
Less expenses	**1,645.83**
Bank Statement as at 30/04/2013	**$7,594.43**

LITERATURE

TITLE	AUTHOR	PUBLICATION COST ($A)	POST/PACK ($A)
Growing Bromeliads - 3rd. Edit-Ion.	Bromeliad Society of Australia Inc.	$10.00	$6.00
Bromeliads for the Contemporary Garden. Completely Revised Edition.	Andrew Steens	$35.00	$6.00
Bromeliads, A Cultural Manual.	BSI	$5.00	$2.00
Bromeletter Index—SeptOct,1979 -Nov/Dec 1989—Vols. 16 to 27.	Geoff Lawn / Derek Butcher	Contact Book Sales	
Bromeliads– The Connoisseur's Guide, 2007.	Andrew Steens	$31.00	$6.00

SEED BANK

The Seed Bank provides a service to members of the Bromeliad Society of Australia, supporters of the Seed Bank and other interested enthusiasts, for the collection and distribution of all types of Bromeliad seeds from local and overseas sources.

Seeds cost 50¢ per packet for Members and Seed Bank supporters (plus postage) or $1 per packet (plus postage) for all other enquiries.

Enquiries for seeds should be directed, for the time being, to
Terry Davis
(02) 9636 6114 Or 0439 343 809

The following Seeds *are now available:*

Aechmea bromeliifolia var *albobracteata, Aechmea rubens, Aechmea warassii, Alcantarea geniculata, glaziouana and vinicolor, Guzmania sanguine (Costa Rica form), Till. balbisiana, Till xfloridana, Till pohliana,* Vriesea guttata, *Vriesea saundersii.*

Thanks to Bob Hudson, Qld., Laurie Mountford, NSW, Chris Larson, Vic. Werner Raff, NSW and Terry Davis, NSW for their valuable contributions to the Seed Bank.

Thank you, Supporters of the Seed Bank.

A continued supply of fresh seed is constantly required by the Seed Bank to ensure that the Bromeliad needs of tomorrow will be met.

MEMBERSHIP APPLICATION:

ANNUAL SUBSCRIPTION: Renewal due January 1st for membership year January to December.

Membership: Australia A$20
Overseas Membership: Asia/Pacific Zone A$30. Rest of the World A$35.

New Membership requires a $5 joining fee, plus Annual Subscription. (Those joining after October 1st are covered for the following year.)

Note: Un-financial members add $5 rejoining fee when re-applying for membership.

If undelivered, return to:
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