

Far North Coast Bromeliad Study Group N.S.W.

Edition: April 2025
Agenda: General Discussion

Venue: PineGrove Bromeliad Nursery
114 Pine Street Wardell 2477
Phone (02) 6683 4188

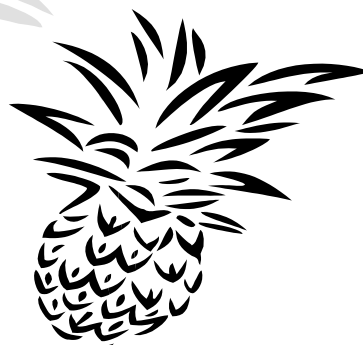
Study Group meets the third Thursday of each month
Next meeting May 15th 2025 at 11 a.m.

Editorial Team:

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Meeting March 20th 2025

The meeting was opened at approximately 11.00 am

The nine members were welcomed.

Four apologies were received.

General Business

Due to rising running costs of our Group, mainly Newsletter printing, it has been suggested and approved unanimously by our members that we increase our monthly attendance fee to \$5.00.

Hopefully the 'Fertilizer Confusion' article last month has sorted out some of the mysteries of the NPK numbers that had some growers concerned regards what they were actually using.

Kayelene is happy now that we've sorted her Vriesea out, oooops I mean xVrieslutheria, more label changing to be done.

One discussion always seems to lead into another, after discussing dioecious plants, male and female flowers last month. Hopefully some of you got quite keen and got your magnifying glasses out to go check those boy and girl bits in any of your flowering plants. That will definitely help if you wish to have a go at hybridizing because now you can recognize the essential parts you need to deal with in creating your own new hybrid.

There are several types of hybridizers, which one are you?

1. The lacklustre hybridizer: one who tickles everything and anything without care about what pollen is going from what to what with little consideration toward pollen contamination, that's called the 'dirty brush' syndrome, anything goes.
2. The hybridizer: a true hybridizer selects two plants with the desired traits one wishes to see transfer into a new creation. Once these have been selected they are isolated away from any other plants to avoid cross contamination. The plant that has been selected as seed parent will have its stamens emasculated, cut off before they dehisce, before its pollen becomes ripe and its anthers open and self contaminates the hybridizing process. Pollen can now be taken from the pollen donor plant or use previously selected and stored pollen once the stigma of the seed parent is receptive. If necessary cover the inflorescence that has been pollinated with a bag to avoid cross contamination.
3. The opportunistic hybridizer/seed grower: a person who randomly collects birds and bees garden pollinated seed and grows it and refers to oneself as the hybridizer. This person is an opportunistic seed grower not a hybridizer.

Open Popular Vote

| | | |
|-----|------------------|---------------------------------|
| 1st | Kayelene Guthrie | <i>Aechmea</i> 'Shining Light' |
| 1st | Shane Fitzgerald | <i>Neoregelia</i> 'Cherry Girl' |
| 2nd | Ross Little | <i>Neoregelia</i> 'Koah Adder' |
| 3rd | Keryn Simpson | <i>Aechmea</i> 'Burning Bush' |

Tillandsia

| | | |
|-----|------------------|--|
| 1st | Shane Fitzgerald | <i>Tillandsia kalmbacheri</i> |
| 2nd | Deb Baker | <i>Tillandsia</i> 'Copper Penny' |
| 3rd | Keryn Simpson | <i>Tillandsia recurvifolia</i> var. <i>subsecundifolia</i> |

Monthly Genus — Nidularium and Neoregelia

| | | |
|-----|------------------|--------------------------------------|
| 1st | Shane Fitzgerald | <i>Nidularium</i> 'Bahia Variegated' |
|-----|------------------|--------------------------------------|

Judges Choice

| | | |
|-----|---------------|-------------------------------|
| 1st | Keryn Simpson | <i>Aechmea</i> 'Burning Bush' |
|-----|---------------|-------------------------------|

Web Links for Checking Correct Identification and Spelling ?

Bromeliad Cultivar Register (BCR): <http://registry.bsi.org/>
Refer to this site for correct identification and spelling of your hybrid or cultivar.

Bromeliad Species Database (BSD): www.bsi.org/members/?bsd
Refer to this site for species identification, photos, descriptions and more.

New Bromeliad Taxon List : <https://bromeliad.nl/taxonlist/>
Refer to this site for latest species name changes and correct spelling.

Bromeliads in Australia (BinA) <http://bromeliad.org.au/>
Refer to this site for its Photo Index, Club Newsletters many with
Table of Contents Index and there's Detective Derek Articles.

Keep these web sites set as desktop icons for quick reference access.

Where do I Find the Dates ?

www.bromeliad.org.au then click "Diary".
Check this site for regular updates of times, dates and addresses of meetings
and shows in your area and around the country.

Show, Tell and Ask!

Donna had an issue with a sick plant, its centre leaves came out easily and it had a dreadfully foul smell. It was suggested it may be crown rot brought about by the excessive wet, humid weather we've been experiencing lately.

A: It is not the rain that creates rot, poor drainage in the pot rots the roots, if your mix has gone quite muddy then that often harbours pathogens that will create rot on bottom leaves. Centre rot is not caused by water, it is caused by the fungal rot 'Phytophthora cinnamomi' which is a very virulent rot, it is an air borne, water borne and soil borne rot. Rain on the plants, even in big amounts is cleaning and beneficial, especially on our Bromeliads.

When removing plants with suspected crown rot take care not to spill the water on other plants. Set the plant upside down to allow it to dry for a few days can help the rotted area to dry and heal over. Other suggestions have been to add food grade cinnamon powder into the centre of the plant. Spray plants with a fungicide like Fongarid, Ridomil, Banrot may help.

What is Phytophthora cinnamomi?

Phytophthora cinnamomi (*phytophthora* root rot) is an introduced plant pathogen (disease causing organism) that belongs to a group of micro-organisms known as water moulds. Water moulds were once included in the fungi kingdom and, as a result, *Phytophthora* root rot has been called a fungus in earlier interpretation literature. Water moulds have a motile or animal-like stage which fungi do not. As the name water mould suggests, it requires moist conditions to thrive. Its food source is the root and basal stem tissue of living plants. *Phytophthora* root rot grows as microscopic sized filaments (mycelium) within susceptible host plants. It consumes the host plant causing lesions (areas that appear rotten) which weakens or kills the plants by reducing or stopping the movement of water and nutrients within the plant. **Caution:** remove all rotted areas of the plant back to clean tissue, treat with a fungicide or food grade cinnamon powder and allow to dry. Sterilise any implements used to trim infected plants with boiling water to avoid contaminating other plants.

The following reprinted in part from: The Bromeliad Society of Queensland Journal: Bromeliaceae Vol. XLI - No.4 - July/August 2007:

The pineapple industry has developed a simple 'baiting' test for detecting *phytophthora* in soil and water, and is suitable for screening potting mixtures. The procedure depends on the ready attack by the organism on the white tissue at the base of a bromeliad leaf. The original test used a young leaf from a pineapple top; but any immature bromeliad leaf with about 20 mm of white basal tissue is satisfactory.

Fill a glass jar to about 100 mm with the water to be tested and place the test leaf in the water so that about 25 mm of the leaf is submerged. Use a thin skewer or wire to pin the leaf at the required depth. Allow to stand for 10 days. Phytophthora is indicated by the development on the white tissue of a blue/black line of attack and a foul smell. A less invasive organism, Pythium, is indicated by a cotton wool like growth around the leaf.

For soil or potting mixture, boil and cool some water. Place 3 or 4 teaspoons of soil or potting mixture in the bottom of a glass jar and gently pour in the boiled and cooled water without stirring; and set the leaf so that the tissue is 30-35 mm above the soil. Incubate as above.

Information taken from: **Root Rot and Heart Rot** by Peter Paroz.

How to Secure Difficult Offsets



Shane brought along a newly removed Cryptanthus offset to show how he secures them into the pot until established.

He dips the base of the offset into food grade cinnamon powder before setting it into the potting medium, skewers are pushed into the potting medium close to the offset to hold it down firmly, he finds this method very successful.

There have been many suggested methods over the years to secure difficult to establish offsets like Cryptanthus, Dyckia, Orthophytum to name but a few that often have recurved leaves. These recurved leaves that are pointing downward have a tendency to push the offset up away from the potting medium, therefore it is necessary to secure them firmly down to the medium.

For more difficult offsets that keep pushing themselves up and away from the potting medium it may be necessary to tie them down. Elastic bands are very useful for this by stretching the band over the plant and under the base of the pot. Alternatively use string/twine or plastic coated wire (not copper) tied over the plant and under the pot. Remove once the plant is established. The more stable your plant is the quicker the roots will take hold of the potting medium.

Quesnelia with Strobilate Inflorescence

Ian brought along a Quesnelia for identification, the classification of Quesnelia includes two subgenera:

Subgenus *Quesnelia* which comprises a group with a simple densely strobilate inflorescence and pollen with psilate exine (lacking ornamentation of the outer most coat of a pollen grain or spore).

Subgenus *Billbergiopsis* which contains the rest of the species of dense to lax inflorescences and pollen with reticulate exine (a pollen grain's outer wall in the form of a network-like pattern of ridges (muri) enclosing spaces (lumina)).



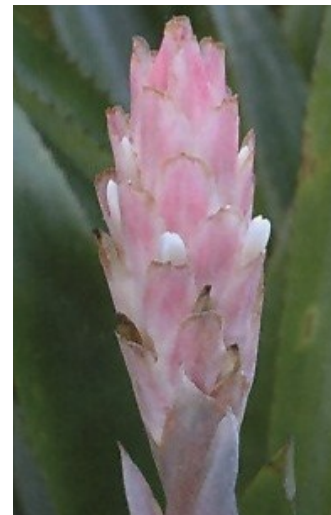
Quesnelia is a genus in the subfamily Bromelioideae named by Charles Gaudichaud-Beaupré in 1842 after M. Quesnel the French consul to French Guiana, probably because he was the first to introduced the plant into France in approximately 1840.

Initially the genus was monotypic with the type species being *Quesnelia rufa*, this name is now a synonym of *Q. quesneliana*. There are 24 accepted species in the genus and two varieties which are endemic to east and south-east Brazil. Inflorescences range from attractive to simply stunning, the plants grow best in bright light to full sun, but can tolerate low light. The small Quesnelias take well to cultivation, in fact most are relatively easy to grow. A note of caution, many of the larger Quesnelias are vigorous and heavily armed and will require plenty of room. They are epiphytic, terrestrial, saxicolous and rupicolous.



*Quesnelia
quesneliana*

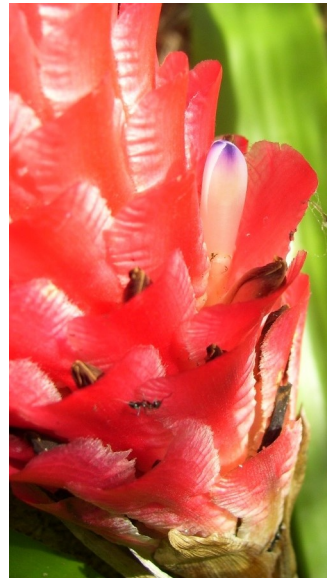
*Quesnelia
conquistensis*



The three *Quesnelia* with strobilate inflorescence that we discussed are:

Quesnelia arvensis which grows rupicolously or epiphytically close to rocky coasts at sea level and is also found epiphytically in coastal forest swamps and in mangroves. It is endemic to the south portion of the Atlantic Coast, occurring from the southwest of the state of Rio de Janeiro to the extreme east of Paraná. It flowers 50-80 cm high and has heavily textured dark green leaves with more pronounced spines than those of *Q. testudo*. Its inflorescence is simple, dense, subglobose to short cylindrical, rarely cylindrical, (4.5) 5.5-13.0 (17.5) cm long and 4.5-8.0 cm diameter. *Quesnelia arvensis* floral bracts have flat and uniform margins, and cobwebby indument (covering of hair). Its petals are free, oblong to subobovate, apex rounded cucullate, 1.8-2.5 cm long and 0.5-0.7 cm wide, white with dark or purple blue apex, its fruit are violet when ripe.

Quesnelia quesneliana: is found in restingas as an epiphyte or rupicolous on rocky outcrops in the Atlantic Pluvial Forest, extending to the highland slopes at altitudes ca. 700 m. It is endemic to the south east portion of the Atlantic Coast occurring from north Espírito Santo, reaching the extreme east of Minas Gerais, to the central-south portion of the state of Rio de Janeiro. It flowers 50-150 (200) cm high and has a flower head longer and thinner than the other two. The inflorescence is simple, dense, short to long cylindrical, 7.0-20.0(27.5) cm long and 4.5-8.6 cm diameter. Its floral bracts are elongated and wrinkled along their edges (wavy margins), the base with white woolly indument. Its petals are free, oblong to subobovate, apex rounded cucullate, 2.3-2.8 (3.6) cm long and 0.7-0.9 cm wide, white with dark or purple blue apex, its ripe fruit are rose to violet.



Quesnelia quesneliana

Quesnelia testudo: grows terrestrially in coastal scrub (restinga) from near sea level to 800 m altitude in Sao Paulo, Brazil. It flowers 30-45 cm high, it has spines on its lower peduncle bracts. The inflorescence is simple, very densely cylindric, 9-11 cm long, 3-6 cm in diameter. Its floral bracts are flat, uniform or slightly crisped on the margins, pale rose. Its petals are erect, 18-20 mm long and are pale violet.

These three are similar species and relatively difficult to tell apart and all have that strobilate inflorescence with 'shocking pink' floral bracts, so checking the finer details is important before making a random identification decision.



Aechmea 'Shining Light'
1st Open Kayelene Guthrie



Aechmea 'Burning Bush'
Judges Choice Keryn Simpson



Neoregelia 'Cherry Girl'
1st Open Shane Fitzgerald



Tillandsia kalmbacheri
1st Tillandsia Shane Fitzgerald



Catopsis subulata
grown by Deb Baker



Tillandsia 'Copper Penny'
grown by Deb Baker



Tillandsia recurvifolia var. *subsecundifolia*
grown by Keryn Simpson



Neoregelia 'Koah Adder' unreg.
grown by Ross Little

Monthly Genus for March was *Nidularium* and *Neoregelia*



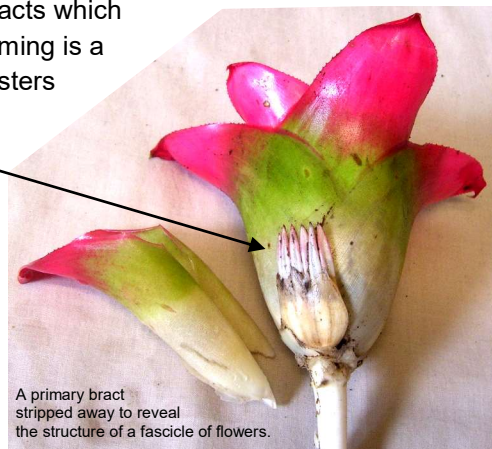
Nidularium 'Bahiana Variegated'
1st Monthly Genus Shane Fitzgerald



Nidularium innocentii
grown by Kayelene Guthrie

The genus *Nidularium* was described by Charles Antoine Lemaire in 1854. The epithet *Nidularium* comes from the Greek *nidulus*, meaning 'small nest'.

Hidden within a *Nidularium's* primary bracts which are often red, pinkish or orange at blooming is a branched inflorescence made up of clusters of flowers referred to as fascicles.



A primary bract
stripped away to reveal
the structure of a fascicle of flowers.

The bract colour can last for months maintaining a colourful show in ones garden. The soft, thin leaves of many

Nidularium do not tolerate full sun exposure. They grow mostly as terrestrials or saxicolous, occasionally epiphytically in moist, shady parts of the forest. Having small spines along their leaf margins makes them a lot more pleasurable to work with than many other more heavily spined Bromeliads.

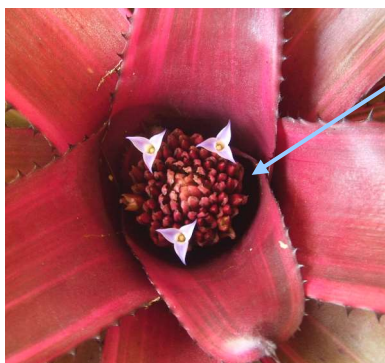


Neoregelia 'New Wave'
grown by Deb Baker



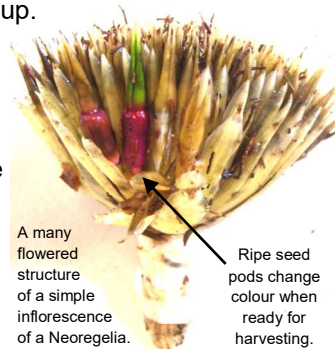
Neoregelia unknown hybrid
grown by Keryn Simpson

The genus *Neoregelia* was established in 1934 to honor Edward von Regel. First collected and described by Beer in 1856 as *Bromelia carolinae* later to become *Neoregelia carolinae* when L.B.Smith established the new genus *Neoregelia*.



Neoregelia differ from *Nidularium* by having a simple inflorescence (one piece, a single unbranched inflorescence). A few do have a branched inflorescence but it is still contained within the central cup.

Unlike *Nidularium* the central leaves of *Neoregelia* flush with colour, not the primary bracts.



A many flowered structure of a simple inflorescence of a *Neoregelia*.

Ripe seed pods change colour when ready for harvesting.

Neoregelia is a variable group of plants ranging in size from just a few centimetres to well over a metre across. Their leaves vary from soft which prefer dappled light, to quite rigid which will handle very bright light to full sun. They are well armed with spines 1mm up to 7mm long.

Neoregelia are predominantly grown for their foliage colour ranging from striped, speckled, banded, concentric barring to some being quite plain until flowering time when their centres turn brightly coloured in hues of red, pink and blues. Many are grown as epiphytes and also seem content grown as terrestrials.

Keryn asked about encouraging more offsets/pups from her plants.

If your plant has initiated flowering mode and the tip of the flower spike is visible within the crown of the plant, snap/cut it off. Your plant is using a lot of energy to develop that inflorescence rather than offsets/pups, so the earlier it is removed the better. Liquid foliar fertilize the plant will help promote growth, alternatively add one or two slow release fertilizer prill (balls) into each leaf axil will also help promote growth directly to the plant via its leaves.

Another popular method used to induce offset/pup development pre flowering is to stab the plant: use a screwdriver or similar and push it down into the centre of the plant to damage/destroy the central growing tip - apical meristem. This will stop further growth of the plant and development of an inflorescence and will encourage offset/pups. Again fertilize the plant after this action.

The term 'rubra' was used again recently which reminded us of the following response from Derek Butcher in our FNCBSG NSW Newsletter October 2017.

Rubra' is it Valid or NOT ?

compiled by Ross Little

"Let us get rid of the term 'rubra' used with *Alcantarea imperialis* or at least try. Nobody has defined this quasi-botanical term by writing a description under the ICN rules as a botanist would do. It is not acceptable under the ICNCP rules for a cultivar either."

Nobody has defined what 'rubra' refers to:

- Is it the red leaves or red peduncle/primary bracts or must it have both ?
- Does a tinge of red in the leaves qualify ?

The use of the word 'rubra' in this context should be banned from Bromeliad Newsletters. Regrettably some growers will always use the word on their labels even though it has no botanical validity in conjunction with botanically described, Latinised words *Alcantarea imperialis*. After some discussion it has been agreed that there is no way a single cultivar name could be used for this ill-defined red form of *Alc. imperialis*. The redness is quite normal however variable the plant may be. Remember the term 'rubra' is only a descriptive trade or nursery name. The use of such terms should be banned.



If you must use a descriptor use '**red form**' .

Acknowledgements: Peter Franklin, Geoff Lawn and Derek Butcher.

Bromeliads - Houseplants for Today and Tomorrow Part 7
by Walter Richter (Translated by Adda Abendroth, Teresopolis, Brazil)
From: BSI 1968 V18 (5)

Reproduction by Seed

Bromeliads have found two different ways to insure species survival. The issue of side-shoots seems to be the more primitive solution: it takes care of direct continuation for one thing and also allows for spread, but only within limits. A much more efficient way of diffusion is reproduction by seed.

Seeds are generally abundant. In this case, however, two factors of insecurity loom ahead: maturation of seed takes time, and it must combine with the prevailing peculiarities of the climate. As was explained in previous chapters, seed cannot germinate during the dry period. It must be ripe while moisture is still available. Besides the hazard that not every flower gets pollinated, dangers of various kind threaten advanced phases of fruition. In addition, nothing guarantees that a sufficient percentage of seeds will have a chance to germinate. Since a bromel shoot flowers only once, the inability inherent in its systems to repeat the process the following year like other plants do, is compensated for by the issue of side shoots. Probably the majority of pups can flower within a year of the bloom of the mother plant. This applies to conditions prevailing in the plant's homeland. I must admit, though, that as yet no research on the subject is on file. In cultivation most of the plants take more time to develop an independent offshoot in condition to bloom. Briefly the conditions described show that two ways of development can be made use of. One is the quicker and surer means producing one or more pups which soon flower and produce seed; the other is the possibility of diffusion on a large scale by seed, entailing, however, a longer development from germination to bloom.

Both processes hold great interest for the grower. Multiplication by off-shoots insures prompt and foolproof reproduction of a limited number of plants. It enables the grower to perpetuate a rare species from which it is difficult to obtain seeds, since the majority of bromels are self sterile. This means that two or three specimens must flower simultaneously if fertilization and fruiting are expected to occur. Perpetuation of a spontaneous mutation that may seem worth while can be processed in this manner. It applies also to the preservation of exceptionally beautiful crosses that might vary if they were multiplied by seed. No other ways of propagation exist in the bromeliads.

Raising large numbers of seedlings is no problem when seed is available, self grown, or imported. In cultivation multiplication by seed is the only way to achieve new results. Sometimes it may also be the only possible way of spreading new hybrids over great areas. Some countries, as the United States, have put in force rigid plant protection measures that are a menace to certain species no matter what their age may be. Delicate plants do not survive the harm inflicted by fumigation.

Of the two forms of multiplication I prefer reproduction by seed.

Cultivation of Group 1 — BSI Vol. 19 (5)

Discussion of the plants in previous chapters has made it clear that the species making up Group 1 — Aechmea, Billbergia, Neoregelia and Nidularium — are much hardier than Guzmania and Vriesea. From the economical point of view, it is necessary when raising large sets of seedlings to keep the two groups separate from the very beginning, and much more so if outstanding results are to be achieved.

The beginning of the growth period is such an important item in the life of the plants that I shall start my explanation of cultivation measures at this point. The exact moment of commencement of growth depends on conditions prevailing in the surroundings. Longer sun-hours in January and February spell the end of the winter rest period, as temperatures rise in the glasshouse. Let in all the light you can; humidity can be raised by a slight spraying before midday. Bright, sunny days generally end with a sharp drop in temperature towards night. Compensate for this drop by raising the artificial heat. A medium reading from 12 to 15°C on overcast days and at night is best. The increasing intensity of sunlight in March and April may cause burns on the plants should it get too strong. As yet we don't use shading; rather we start the hardening treatment by aerating the house after midday and by more frequent spraying. The process should be continued in the months that follow.

An exception to the general rule in connection with the above treatment concerns the various species of Nidularium, especially *Nidularium innocentii* and its varieties. Their reaction to light differs from the rest of Group 1; they dislike direct sun. They are the one bromeliad that should always be shaded. The other measures are the same as described for the Group. By the end of April heating can generally be discontinued. During the night the houses remain closed. Aeration should be keyed to the outdoor temperature and the local situation. The roots should be kept uniformly damp; excess or lack of water should be avoided. In May, even on hot days in April, shading becomes a necessity.

In my efforts to find a process to profit by direct sunlight in order to obtain hardy, well shaped, and good looking plants of a pleasing color, I have evolved and tested the following method. The first heat spell is successfully beaten with a slight spray of shading paint on the panes, just enough to prevent leaf burn. Rain accompanying a thunderstorm will soon wash away most of the paint. I then put on another spray if necessary. By June or July successive squalls will have reduced the shading on the panes to a thin veil—which provides a most advantageous grade of light effect. The plants get larger, their leaves broaden, and, if goes with the species, put on a fine dress of silvery scales. During the summer months, the houses are aired all day long—from morning till evening, if the weather is warm. The houses are closed only on rainy days when the air cools fast. The plants cannot take the double assault of adverse conditions and will soon lose their prime condition. Correct regulation, carefully regulated supply of light, warmth, and humidity improve growth and may occasionally produce a quite large specimen.

The hardening process is continued through September by plenty of aeration and, as far as possible, uninhibited access of sunlight. Always remember, though, that direct sunlight can cause burning if the air panels remain closed. Transition to winter should start in October. Lots cultivated in double boxes should be moved into the houses in the beginning of the month. It is best to put them on suspended side-boards; there they will benefit from the light and won't be too wet. In addition, you save space on the benches where you may want to put other plants. It is well to affix a lath on each side of the suspended boards; close the sides with heavy cardboard nailed on the laths. Fill the space with ground peat and sink the pots in that. The arrangement is a precaution against too rapid or excess drying. Smaller plants can also be preserved in this manner; put them in boxes with peat and put the boxes on the suspended board.

Watering routine in winter is practically limited to a weekly inspection with hose or watering-can in hand. Otherwise, one spraying before midday is enough when it is not too cold. The temperature for Group 1 is 12 to 15°C. A slight drop is admissible during the night, but the low should never stay at 12° for any period of time. If periods of severe cold cause an inevitable decline of the house temperature, stop watering and spraying until conditions return to normal. If the temperature drops even more, empty the water from the funnels. If the plants are kept too wet in winter, there is always the risk of damage. But do not let the pot mix get too dry. Owing to its very composition, once the mix has dried out completely, it cannot regain the ability to absorb and retain water.

Cultivation of Group II (Vrieseas, Guzmanias and Tillandsias)

Again we will start with the beginning of the growth period. Conditions, however, differ somewhat from those of Group 1 (Aechmeas, Billbergias, Neoregelias, etc.) which in a way undergoes a sort of rest period in view of the climatic conditions and the treatment the plants get. The higher temperature of 15° to 20°C required for Group II calls for more humidity, as a diet of warmth accompanied by drought would mean catastrophe, or at least an attack of pests where bromeliads are concerned. Biologically well-balanced ambient conditions are a safe measure against pests. Suppression of growth as in Group I does not occur in Group II. Transition to the new growing period is consequently less evident. Sunshine in spring is often quite intense and may cause burning as early as February. Cryptanthus—which should be included in Group II despite its often hard and sturdy leaves—is especially touchy at this time of year. Therefore, shading must be thought of quite early in the year.

On sunny days in spring, spray before midday when the house is permeated with warmth, once or twice, to raise air humidity. On overcast days, or when it is cold, spraying should be given only if the temperature in the house is above 18°C. Remember the iron rule that plants should be dry by evening, while air humidity should be sufficiently high. As the season proceeds, temperature must be raised. Aeration should begin only toward the end of April or the beginning of May.

Vriesea splendens and its hybrids are so warmth-hungry you can hardly overdo the heat, but direct sun during hot spells is apt to burn their leaves; therefore give them lavish shade—it will improve their looks. Group II does not react to light by enhancing the design on the leaves as does Group I. You can tell if a *Vriesea* has received too much light if it has yellowish leaves and faded or deficient markings. Development of the spike is also affected by too bright a location. The stalk stays shorter than normal and colors are poor. In short, the effect of too much light on Group II is the opposite of that on Group I. It is one of the reasons why I stress segregation of the two groups in cultivation. Optimum results can be gained only if you give each group its proper treatment, not when combined cultivation forces you to compromise.

Ground humidity must be maintained fairly high during the growing period, both in soil and in pots. It is therefore necessary to give extra heat even in summer, especially during spells of bad weather because a high humidity level lowers temperature considerably. For extensive seedling lots of *Vriesea* and *Guzmania* I recommend night heating all through the summer. Better growth will certainly make up for the extra outlay.

During the vegetation period the plants should always get the benefit of uniform and constant warmth and humidity, resembling conditions in their homeland. Spraying may be raised to 4 or 5 times daily in summer. Use the finest spray and avoid puddles on the ground. Shade must always be given, plenty of it. How to provide it depends on facilities at hand. Permanent shading with shading spray must not be overdone. Movable shading apparatus is ideal. It enables the grower to give the plants full benefit of available luminosity, which also affects the prevailing temperature.

As autumn nears, shade is given more sparingly. Hardening for Group 1 is not necessary, not even advisable, because we do not intend to interrupt the plants natural growth; we want them to reach bloom maturity as soon as possible. Only the climate, involving the seasonal changes is apt to temporarily slow down development factors. Let me repeat, our winter does not impose a rest period on bromeliads. During the cold months aeration should cease entirely. To counteract drought caused by heating, keep the pathways and the areas under the tables moist by spraying when warmth grade in the house permits. The well-known gardener's rule that spraying water should equal the temperature in the house is now under dispute and is given less importance. Personally I have a strong feeling against spraying very cold water on warm plants or applying cold water where the air is warm.

Temperature in the house should be about 18 to 20°C in the winter. A decline to 15° is not harmful if it is only temporary. Still lower temperatures are bad for this group. Higher temperature may be kept for the hybrids and certain species. Warmth underground helps the development of *Vriesea splendens* and can sometimes provoke premature flowering.

To be continued