BROMELIAD SOCIETY OF SAN FRANCISCO

October 2007

NEWSLETTER

Our next meeting will be held on **Thursday, October 18, 2007** at 7:30 PM
Recreation Room, San Francisco County Fair Building, 9th Avenue at Lincoln Way, Golden Gate Park, San Francisco

October Program

Neoregelia Species

We probably all have several neoregelias in our collections. And most of these are hybrids. Along with Cryptanthus, Neoregelias are among the most hybridized bromeliads. This month, **Roger Lane** will provide a slide show on the Neoregelia species – many of which we may not have seen.

In addition to bringing in the fascinating plants you always provide for our Show-and-Tell plant table, bring in some of your neoregelia species.

October Refreshments

Bruce McCoy and **Brian Ransom** signed up for refreshments this month.

Here are some or our members sharing a joke at the pot luck during our summer peninsula tour. Photo is courtesy of **Peter Wan**

Some of our members in conversation while others are waiting for their raffle ticket to be drawn at **Marilyn Moyer** and **Peder Samuelsen's**. Photo is courtesy of **Peter Wan**.

September Meeting

Carl Carter provided a fascinating slide show on his recent trip to Bolivia. A lot of the puyas that Carl showed us are really nice. Since Carl was able to bring back some of these, let's hope he is able to successfully propagate them. They should do nicely in our climate.

Success with Ethylene Pills – The End of a Long History Using Chemicals to Induce Bloom

This article by Herb Plever is taken from the December 2004 "Bromeliana", newsletter of the New York Bromeliad Society.

Over the past 40 years I have experimented with six or seven chemicals to induce flowering in bromeliads. The latest and best of these (with some limitations) are the new ethylene pills produced by Professor Maurice DeProft, an outstanding biochemist researcher in agriculture and applied biology at faculties in Belgium and the Netherlands.

The earlier indications that bromeliads could be forced to bloom occurred in the 19th century when a wooden greenhouse growing pineapples had a fire and was filled with smoke. Some months after, all the plants bloomed. Botanical investigations found that one of the burned wood smoke was ethylene gas which they suspected had affected the blooming. When I began growing bromeliads in 1960 we didn't understand the significant role that ethylene plays in the induction of blooming in flowering plants. But now modern bio-chemical experiments have shown that all flowering plants manufacture some ethylene gas at the critical time in their maturity when they are biologically programmed to flower. The function of ethylene as I understand it is to trigger the release of certain enzymes which act to stop leaf growth at the meristem or growing point. Then other enzymes modify the meristem so that it starts producing a flowering inflorescence.

One important rule for treatment with any of the chemicals discussed in this article is that you should not fertilize the plants for two weeks before the treatment nor for two weeks afterwards. I don't know the exact reason for this, but I suspect it is because the fertilizer tends to promote leaf production and might lessen the effect of the ethylene gas which is trying to stop leaf growth.

A number of chemicals can produce ethylene. Early on, we found you could force bloom by dropping crystals of **calcium carbide** into the water of the cup. It worked fairly well but the cup became permanently coated with an unsightly chalky coating. At this time in the 1960s the large Hawaiian commercial pineapple growers were successfully using **Florel**, a hydrazine compound, by spraying it on the crops when their plants were mature. Both hydrazine and **acetylene** compounds release ethylene gas when mixed with water. Commercial bromeliad growers began producing ethylene by dipping an acetylene blow torch in a bucket of water and pouring the ethylene filled water into the bromeliad cups. They also attached a hose to a bottle of acetylene gas with a shower head on the other end placed in cool water and allowed the gas to slowly bubble into the water. Then the water was poured into the cup and sprayed onto the plant.

Later a chemical company produced a hydrazine compound – **beta-hydroxethyl-hydrazine – called Omaflora** and we began experimenting with it. The results were very spotty with some flowering but lots of damage. The problem was that the solution was very viscous and it was difficult to measure the correct amount of the chemical to put in the water in the cup. At that time we were unable to obtain Florel.

Brombloie – In 1967 I found a hydrazine compound called **Brombloie** while traveling in Holland and began using it to force bloom on my bromeliads. It had a similar formula as Omaflora – (2 beta-hydroxyethylhydrazine), but it was suspended in a thin liquid which permitted exact measurement. The treatment was extremely simple: you emptied all the water out of the plant, and then dropped exactly 15cc of water into the cup. Then you used a syringe to draw out the proper amount of chemical – ½ cc for soft-leaved plants like guzmanias, ¾ cc neoregelias and nidulariums, and 1 cc for aechmeas, billbergias,

etc. The results were excellent with a few exceptions and my first report of these tests was printed in the Bromeliad Bulletin in the January, 1969 issue.

Thereafter, our chapter began using Brombloie to produce bromels in bloom for our annual March flower show – not an easy thing for indoor growers to do. But we found that we could time the treatment so we could get flowers one or two weeks before the show. Billbergia blooms came up in 3 ½ to 4 ½ weeks, aechmeas, guzmanias, neoregelias and nidulariums flowered in 3 to 3 ½ months and tillandsias and Vrieseas took 4 ½ months to reach full color. When we ran out of Brombloie, we tried to order it from Holland, but were informed that the government had banned its distribution because the compound was suspended in a liquid which was found to be a carcinogen. So we turned to Florel which we were now able to obtain. Unfortunately, the results were even worse than with Omaflora, with many damaged leaves, burned centers or distorted inflorescences. We experiment with weaker solutions, spraying only, fully hydrating the plants before treatment, but still the results were unsatisfactory. Then we read in the Journal about using a new chemical called **Ethrel** which came in different trade names, so we managed to sneak in some **Ethefon** (it was not approved for import) and we tried it. The results were better than with Florel but it was nowhere as effective as Brombloie had been, perhaps because it was designed for light spraying of the foliage and there were questions about the strength of solution which varied according to the time of year and the type of plant. I treated my plants on my terrace (obviously I wouldn't use it indoors) and recalling the reason why Brombloie was banned, I had to worry about the direction of the wind, and cover myself from head to toe.

Thus, matters rested until the World Bromeliad Conference in 1998 where Professor DeProft gave a talk on flower induction with his new ethylene pills. These were being sold at the Deroose booth and I bought a considerable quantity for our New York members to experiment with. The results with no-reservoir tillandsias were not so good, but for potted plants with a cup the results have been outstanding, and the procedure is safe, simple, and clean. The ethylene is encapsulated into tiny clay pills the size of BB shot. When the pills are dropped into water they expand and the ethylene is released. I use a relatively small amount of water in the center cup and little or no water in the axils. We have been using 3 to 4 pills for small plants and 5 to 6 pills for large ones. You can actually see the ethylene gas being released because the water starts to fizz when the pills are dropped in.

For the genera indicated below I have gotten very close to 100% flowering; the time from treatment to full flower seems to take about 2 weeks longer than it did when we treated with Brombloie. Our treatments are at a considerable disadvantage, because they are done indoors and are usually timed to produce blooms for a March or April flower show. This means that you have to begin the treatment in November or December when it is cold and dark in New York. In this context the successful results are all the more remarkable.

POTTED PLANTS WITH CUPS:

Over the past 6 years I have treated hundreds of plants with ethylene pills to have flowering plants for shows and to find out how it would work with different genera. In my latest effort I treated 22 plants in anticipation of a possible flower show in December (which our Board decided not to enter) and 21 of these are blooming now. The only treated plant that I thought did not bloom was a half-grown *Aechmea* Blue Tango. The nice thing about the pills is that if they don't induce blooming, the plant just keeps on growing. But, just before printing I looked into the cup of Blue Tango and saw that a bloom was starting to rise. It really wasn't ready to pup, but the ethylene pushed it into bloom.

Most of the 21 were mature guzmanias for which I can produce bloom 100% of the time, though some cultivars like *Guzmania* Hilda and *G*. Red Pearl need about 4 ½ to 5 months to reach full bloom. Small guzmanias like *G*. Ultra, *G*. Holiday, and *G*. Anita bloomed in 3 ½ to 4 months. There is a difference of about 2 weeks in flowering time between plants grown in good light and those under moderate light. *G*. Neon flowered in 3 months grown in a sunny south window.

I like to experiment with large aechmeas like *A*. Blue Tango with spectacular inflorescences to try to induce them to bloom when they are still only moderately large and don't take up so much space. I have treated 2 plants of *Aechmea* Pink Ice and got full inflorescence in 3 months. One plant was 2 years -3 months old and the other was 1 year – 8 months old at the time of the treatment. The inflorescence of the latter was still a decent size though smaller than the other plant. I even succeeded in blooming a half-grown *Aechmea* dachlamydea v. *trinitensis* despite the fact that it had been weakened by 3 successive scale invasions of different scale and lost many lower leaves. The inflorescence came up in 5 months at a pretty decent size when you consider the negative cultural history. I have successfully treated many aechmeas such as *A. fasciata*, *A racinae*, and *A. miniata v. discolor*.

I have had good success with narrowly tubular plants like billbergias or *Quesnelia marmorata* which all seem to flower in about a month to 5 weeks. Perhaps the long tube and narrow opening slows the escape of the gas and keeps it longer in the water. I don't know how long it takes for the plant to absorb the few molecules of ethylene gas at the meristem necessary to initiate the cessation of leaf growth. It may vary from plant to plant, but I have found that it will work if you can keep the water at the meristem for about ten seconds.

Blooming billbergias can enhance any exhibit, but since they last in color less than a week this is difficult to pull off. The trick is to treat four or five of them so you have a chance to catch one or two in full flower. I have found that *Billbergia decora* is a reliable plant to treat; it is a fast grower, seems to be at blooming size for me every December and has a spectacular longer lasting inflorescence.

Vrieseas and tillandsias with reservoirs respond to the pill treatment 90% of the time. In the summer they will reach inflorescence in 4 ½ months, but when treated in the fall or winter they need 5 ½ months to color up. Recent treatments succeeded in blooming species and cultivars from these genera including *Tillandsia dyeriana*, *T. venusta*, *Vriesea* Eva x Charlotte, *V*. Sherry x Oxford, *V*. Sherry, *V*. Margot which were fairly mature. I have not treated any neoregelias thus far so I have no results to report. I have heard from some hybridizers that they have had better luck with **Ethyfon** than with the pills. I will start some trials with the few light-sensitive neos I am growing.

PLANTS WITHOUT CUPS:

Many potted plants and most tillandsias don't have reservoirs into which you can easily drop the ethylene pills. By slowly and continuously dropping water into the centers with a bulb syringe, I tested the amount of time the water would remain in the center of one of these, a Neophytum Galactic Warrior, and found it to be about ten seconds. The plant did not have a recognizable cup so I treated it by pushing 4 pills down into the most central leaves and slowly poured water on the pills. The plant colored up red in 3 months and the inflorescence emerged above the cup and showed flowers 4 ½ months later. With this procedure I also bloomed a *Tillandsia xerographica;* a 12-spiked inflorescence came up and showed flowers in 5 months.

PLANTS THAT CAN'T HOLD WATER:

I experimented with tillandsias using four types of treatment: (1) creating ethylene by dropping many pills into a small container of water and when the fizzing started, I poured the water over the plants. (2) placing the plants in a glass mason jar the bottom of which had many ethylene pills. Then I poured water into the jar about 1/3 of the way and then I snapped the airtight container shut. (3) placing the plants in a glass mason jar the bottom of which had many ethylene pills. Then I poured enough water into the jar to cover the plants and then I snapped the airtight cover shut. (4) combinations of the foregoing treatments.

As can be seen from the following data, the results were generally negative, but a few successes gave me reason to hope I can find the right method to force bloom. Obviously I don't have the space nor resources to conduct a fully controlled large-scale experiment, but I tried to create controls on a small scale by using 4 to 5 plants of the same species and maturity, setting aside one or two as non-treated controls. Some of the plants I treated were singles I used just to satisfy my curiosity. I had many more failures than successes; only 17 plants flowered and 37 did not. It is likely that refining my prior

treatment with Ethyfon will produce a greater success rate.

To sum up: We now have in place a wonderful sure and safe method of forcing bloom in plants with reservoirs. It would be of great benefit to growers if we could produce large quantities of blooming tillandsias for a flower show. Imagine a wall of flowering tillandsias with masses of different colors! One of these days!

Some of **Roger Lane's** and **Peter Wan's** plants. Photo is courtesy of **Peter Wan**.

Some of our members relaxing at Roger's house during the peninsula tour this summer. Photo is courtesy of **Peter Wan**.

Partaking of the wonderful food provided by our members for the summer peninsula tour. Photo is courtesy of **Peter Wan**.

BROMELIAD SOCIETY OF SAN FRANCISCO (BSSF)

The BSSF is a non-profit educational organization promoting the study and cultivation of bromeliads. The BSSF meets monthly on the 3rd Thursday at 7:30 PM in the Recreation room of the San Francisco County Fair Building, 9th Avenue at Lincoln Way, Golden Gate Park, San Francisco. Meetings feature educational lectures and displays of plants. Go to the affiliate section of the BSI webpage for information about our meetings.

The BSSF publishes a monthly newsletter that comes with the membership. Annual dues are single ($15), dual ($20). To join the BSSF, mail your name(s), address, telephone number, e-mail address, and check made payable to the BSSF to:
Harold Charns, BSSF Treasurer, 255 States Street, San Francisco, CA 94114-1405.

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Join us for a Slide Show on Neoregelia Species!