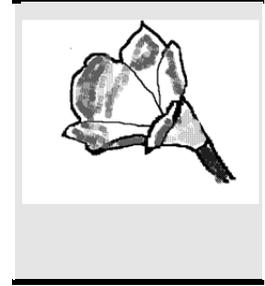


Club

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Volume 2 Number One January 1993

Colour in Clivia

The colour of a Clivia flower is controlled by the concentration or amount of two different pigments. One is yellow and this pigment is a member of the carotenoid or xanthophyll group (the name carotene comes from the carrot, in which there is a high concentration of carotene giving the orange colour).

The other is red and is a member of the anthocyanin group. This group varies in colour from pink to purple and is responsible for all the colours of flowers except yellow or orange. In the normal clivia flower the orange colour is caused by a mixture of yellow and red pigments. Variations in the orange colour are caused by changes in the concentrations of these two pigments. For example, reddish clivias are caused by an increased concentration of the red anthocyanin. If this higher concentration of anthocyanin is accompanied by a lower concentration of carotene then the red colour becomes a truer red (less orange tone). Thus to breed a true red one would have to breed out the yellow - in effect producing a white background instead of a yellow one.

In breeding light coloured orange flowers one has to decrease the concentration of red pigment. This leads to buff or flesh coloured flowers.

Now the concentration of red anthocyanin and yellow carotenoid varies in individual clivias in nature thus giving rise to the natural variation in orange colour observed in different clones of the plant. Selection of different coloured plants and breeding from them can intensify or decrease the colour.

Colour variation produced by mutation

The main mutation or "sport" to occur in *Clivia miniata* has been the yellow mutant. This has apparently occurred in nature a number of times as a number of different yellows have been collected. This mutation simply involves a failure of the biochemical reactions inside the plant which leads to the formation of the anthocyanin pigment. Without the red pigment, the only pigment present to colour the flower is the yellow carotenoid pigment, thus the flower is yellow. In clivia plants (as distinct from the flowers) the anthocyanin pigment is also present, However it is only present in sufficient concentration to be seen at the base of the leaves. This is most noticeable in seedlings and young plants where it appears as a purple stain at the base of the leaves. It is purple because the mixing of red and green (chlorophyll) pigments produces purple. If the plant mutates so that it cannot produce anthocyanin then the flower will be yellow and the plant will be plain green without any purple stain.

Just as the orange flowers vary in concentration of the pigments giving rise to different tones of orange, in the total absence of anthocyanin there is still a variation in the concentration of yellow pigments giving rise to a variation in the depth of yellow colour. In other words some yellows are deeper coloured than

others. Some are quite light in colour so that some parts of the flower can appear white. Thus a white clivia is simply a yellow mutant (no anthocyanin) in which there is so little yellow pigment that the flower appears white. As it requires two chance occurrences in the one plant to produce a white clivia from a normal orange one, white is much rarer in nature than yellow. However by deliberately crossing two pale yellow plants it should be possible to obtain whites or near whites in one or two generations.

The only other colour variants known at present in *clivia miniata* are the so called pink forms. These I suggest come from the very pale orange (buff or flesh coloured) plants. These plants at times have a suggestion of pink in the flower. I believe these are the plants which, as well as a low concentration of anthocyanin, also have a low concentration of carotene. Thus a pink flower is one with low anthocyanin (red diluted to pink) superimposed on a white background instead of a yellow background.

Hence a breeding program for whites could also be used as a breeding program for pinks. This would be accomplished by crossing very pale yellow (or near whites) with pale orange flowers which have pinkish casts. Once really pinkish flowers were obtained then pink crossed with pink could be used to intensify the pink while secondarily further reducing the yellow pigment.

Bill Morris

Tissue Culture of Clivia

More often than not the response about this method of culture for *Clivia* is negative. Very little success has been achieved, yet it is not impossible to do. The major stumbling block (as far as I have encountered) is multiplication. It appears that culture *in vitro* is possible on a range of media, but to make it worthwhile, rapid multiplication of the culture is required. If this doesn't happen, then you don't get very far. The article I came across during my research outlined results for various plant parts cultured. Immature embryos were "saved" by tissue culture, but not increased. That is, from one immature seed they obtained one "cultured" plant that had to be grown on to maturity. The technique represented a reduction in time compared to traditional seed sowing. This is fine from a breeding point of view as it may reduce turnover time between generations of about one year. The results didn't give much hope from a commercial point of view. Mind you, a lot more research may have come up with the multiplying media since the publication of that article. Does anyone know if that is the case?

The small trials we conducted in the lab at work failed to achieve any multiplication of *Clivia*. *Agapanthus*, on the other hand, multiplies on culture very readily. It is a lengthy process to determine the correct media for a particular plant species. I have heard that various labs are culturing *Clivia* *in vitro*, but I don't have specific media details. The extent of the success of these ventures is unknown to me.

Ken Smith, Australia

Clivias and their Cultivation

Printed by kind permission from Graham Duncan's article in "Parks and Grounds" Vol. 59. (1991)

Clivia is a showy evergreen, shade loving genus, comprising four species, which is endemic to South Africa. This choice garden plant is rapidly gaining in popularity as its valuable horticultural uses become more widely appreciated amongst gardeners and in the horticultural industry at large.

Appearance

Of the four species, the most suitable for general cultivation is *Clivia miniata*, commonly known as "Bush Lily", while *C caulescens*, *C gardenii* and *C nobilis* are more collectors items and not quite as easily grown as *C miniata*.

C miniata produces an umbel of trumpet-shaped blooms in many different shades of orange or red, and there are also several different yellow forms of this species, known as *C miniata var citrina*. The species is mainly spring-flowering and it occurs naturally the forest of Natal, Swaziland and the Eastern Transvaal.

The three other species *C caulescens*, *C gardenii* and *C nobilis*, all have narrow pendulous flowers in shades of orange tipped with green.

C nobilis occurs in the Eastern Cape and is recognised by its rough, leathery foliage which has blunt tips and is generally a smaller plant than the other two. It flowers mainly in early summer, but sporadic blooms may occur throughout the year.

C gardenii occurs in Natal and Transkei and it has fewer, longer flowers borne in a semi-pendulous position, with clearly protruding stigmas. It blooms in autumn.

C caulescens comes from the Eastern and Northern Transvaal and is easily recognised in mature specimens by its distinct main 'stem'. It flowers in early summer.

Cultivation

Dappled shade is the most suitable location for growing clivias but they will also thrive in fairly heavy shade. They can take some morning sun but should have shade for the rest of the day. Excessive exposure to sun results in severe scorching of the foliage. Clivias are seen to best advantage planted in large drifts under evergreen trees and as subject for large containers on a shady patio. They can take light frosts but in areas of extreme winter temperatures, protection is required.

In the landscape they can easily be mixed with other shade-loving plants like *Protasparagus densiflorus*, *Impatiens* and the low-growing *Plectranthus* species. Clivias can also be grown indoors in positions receiving good light but not direct sunlight.

The underground portion of the Clivia plant is a rhizomatous rootstock with perennial fleshy roots similar to that of *Agapanthus*. It is important when planting clivias from nursery bags or replanting newly divided plants, to ensure that they are placed at the same level as they were growing previously, as planting too deeply can cause the leaf bases to rot. In the landscape, plants can be spaced 40-50 cm apart, and three plants can be grown in a 35 cm diameter container.

The growing medium should ideally be a slightly acid, very well drained loam with much well decomposed organic matter. Bone meal can also be mixed into the soil. Most importantly, the soil must be prepared very well, because once clivias have been planted, they should remain undisturbed for many years. Best flowering results are always obtained from well established clumps.

Clivias require regular deep watering during their flowering and growing period which is mainly from spring until the end of summer. They can withstand fairly dry conditions during winter, but are not adversely affected by heavy winter rainfall such as in the southern suburbs of the Cape Peninsula, provided the soil is very well drained.

Clivias, in particular *C miniata*, are gross feeders and benefit greatly from regular applications of liquid fertiliser like Seagro or Supranure, particularly when grown as container plants. Fertilisers are best applied

from spring until the end of summer, and established clumps in the landscape can be mulched annually in spring with well rotted compost.

Propagation

Clivias are easily raised from perfectly ripe seed. The seed can take up to 12 months to ripen on the mature plant, and it is harvested once the outer fleshy covering of each berry has turned a bright red or yellow. This fleshy covering is removed revealing the hard, irregularly shaped seeds which are then sown in a well-drained medium such as equal parts river sand, loam and fine compost.

The seeds are simply pressed into the medium to rest just below the soil level and are best sown in deep seed trays, placed in a shaded position. They must be kept moist and germination takes place from about six weeks onwards, but can often take several months. Seedlings can be potted-up into two litre nursery bags at about 12 months old, and planted out into the garden or into permanent containers at 18-24 months. *C. miniata* can start flowering in its third year from seed if well grown, but the other three species take a couple more years to flower.

Offsets form very readily on *C. miniata*, but less frequently on the other three species. They can be separated when large enough, after the flowering period, and should be replanted immediately. Very large clumps can be lifted and then prized apart placing two forks back to back in the centre. It is essential to retain as much root material as possible on each separated offset. Newly planted offsets will usually take a year or two to settle down before regular flowering commences again.

Propagation of offsets is the most reliable method of obtaining exactly true-to-type material. Attempts to propagate clivia by tissue culture have proved unsuccessful to date.

Pests and diseases

The most important pest attacking clivias in South Africa is the highly destructive lily borer, also known as amaryllis caterpillar. Preventative spraying with a carbaryl-based insecticide gives effective control. Snout beetles cause damage during summer by eating holes into the leaf margins and can be controlled with Ripcord. Mealy bug sometimes attacks the leaf bases of plants and can be controlled with Dursban. Slugs and snails can cause severe damage to the flowers and foliage. A fungus causes leaf die-back from the tips but can be controlled with weekly applications of Captab or Mancozeb.(M45).

Availability

The orange and red forms of *Clivia miniata* are freely available while the yellow forms remain as sought-after collector's items. The other three species are occasionally available from specialist bulb nurseries, and plants are offered from time to time at the Botanical Society's Annual Plant Sale at Kirstenbosch which is usually held at the end of March.

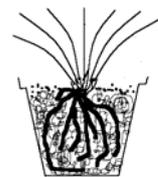
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1. Duncan, GD,1985. Notes on the genus *Clivia* Lindley, with particular reference to *C. miniata* Regel var. *citrina* Watson. Veld and Flora 71(3):83-85
2. Du Plessis, N M & Duncan, G D 1989. Bulbous Plants of Southern Africa: A guide to their cultivation and propagation with water colours by Elise Bodley. Tafelberg Publishers. Cape Town.

Culture Tips

And now for something completely different....

Have you ever tried growing Clivia in crumpled up newspaper? Well, you should. I was shown this simple technique by Mr Nakamura when he visited Australia in October this year.



Simply crumple up newspaper loosely and place in the bottom of a pot. Now position a seedling Clivia in the pot, after washing the soil from the root system, and continue to fill the pot with crumpled newspaper. Do not pack down tightly. Place a small amount of granular fertiliser (the type you normally use) on top of the newspaper and water as normal.

The advantages are: it recycles the newspaper, is a lightweight medium, is cheap and easy to do and, surprisingly enough, it holds moisture around the roots.

So far the few plants I have done are doing very well. No setbacks at all. It is a curious method that might prove beneficial to the choice plant that keeps rotting in traditional soil mixes. Whilst it is OK for the collector, I suppose it wouldn't be suitable for plants that are going to be sold?

Wait until I tell you how to pot up Clivia in rocks!

Ken Smith, Australia

Dear Friends of Clivia

In Vol. 1 No.2 of "Clivia Club" Mr. Dennis Tsang proposed interbreeding Clivia with *Cryptostephanus densifolius*.

An index has never been prepared for Plant Life - *Herbertia*, the official magazine for the American Plant Life Society, now known as the International Bulb Society. So far I have found mention of *Cryptostephanus* in volumes ;-

1948- *Herbertia*. R.A. Dyer. pp18-19. A write-up and sketch of *Cryptostephanus vansonii*.

1949- *Plant Life*. Jozef Benjamin Gouws's paper of four years study was published pp54-81. He covered several species including *C vansonii*, *Clivia caulescens* and *Clivia miniata* chromosome count $2n=22$. On p.73 is a drawing of the rootstock of *Clivia caulescens*. I used the drawing of *Haemanthus magnificus* in my notes of the new *Scadoxus*. On p.74 he states *Cryptostephanus* does not belong to *Amaryllidaceae*.

1963- *Plant Life*. p54. A small paragraph by Gordon McNeil. *C vansonii* seeds take eighteen months to ripen. Dr. Gouws reports chromosome count $2n=24$.

1980- *Plant Life*. Notes on the genus *Cryptostephanus*. pp102-106. Includes *C densiflorus*, *C haemanthoides*, *C vansonii*, where found and culture.

Perhaps Dr. Gouws is still alive and can be approached about the possibility of the proposed *Clivia* x *Cryptostephanus densiflorus* cross when someone ventures into the wilds on a collecting trip. Food for thought.

sincerely
Les Larson

Dear Mr. Primich,

Enclosed is a cheque for R10, being the membership fee for the Clivia club. I would be pleased if you could let me have the first newsletter if available, as I am a little at sea as to who is who!

I think Piet Vorster's idea of placing a joint order with a Japanese breeder is great. I would eagerly come in on this venture.

Thank you for all your time that you must be putting into the Clivia Club, and also a pat on the back for your daughter-in-law who has displayed such courtesy in taking club calls! Thank you. My phone number is (011) 882-2973.

Sincerely
Denise Currie (Mrs.)

Dear Friend,

Please register me in your association. I am a plant collector with an interest in bulbs, especially amaryllids. I also have a small collection of *Clivia* types which I would like to expand.

Les Larsson of Western Australia told me about you, and that you had already sent two newsletters, including information from Japan. Please could you send me copies of these. I understand the proposed subscription is US\$10.00 which I enclose.

I look forward to hearing from you.

Yours sincerely
David Brundell

Dear Nick

Thank you for your letter and seed. Nakamura San has been and gone. A very exciting time for us to have someone visit with so much knowledge and experience. He was here in Toowoomba for only a few hours. To explain. His plane landed in Brisbane at 9.20 am on Monday 5th Oct and it was 11.45 am before we arrived home. We left Toowoomba at 5 pm to overnight in Brisbane as Nakamura San's plane left Brisbane at 7.25 the following morning. To catch a plane from here means leaving at least 3 hours before. Obviously large-flowered *Clivia* are not to Japanese taste as Nakamura San was most impressed with my *mini miniatas* (which I thought as weedy) and with the strain *Midget* which is much smaller than *Twins*. Let me know if you don't have *Twins* over there as I can send you some seed. It could be that a yellow of any size would be acceptable in Japan, similarly with a variegated one. I am beginning to appreciate small *Clivia*. My *mini miniatas* come from *x cyrtanthiflora* which may have been crossed with *miniata*. Resultant seedlings vary from *x cyrtanthiflora* types to *mini miniatas*, some with flesh-pink colouring. Strangely, not one of my flesh-pink *Clivia* flowered this year.

Nakamura San admired my yellows, not *Aurea* so much, but *F1* yellows from *Aurea*. I don't know why he thought these better than *Aurea*. I am not that good an observer. Many are the times that visitors have noticed things about the *Clivia* that I haven't.

The cultivar *Aurea* originated in Melbourne, Victoria. If the owner of the nursery that has been distributing it for so long knew its history he/she would not say what it was. I had never asked but I know others have. The name *Aurea* should be applied to this cultivar only as it is a published name in garden magazines so by common law is allowed to have that name. I think it is difficult to name yellows as they are usually so

alike. I note the colour and not the shape. So much so that visitors here over the years have pointed out two yellows that are "different" and not runts like I do have with tepals very much reduced in size, giving an ugly appearance which doesn't stop some from raving over them. They too, only see the colour. I have named these two good yellows. One has a green section in the tepal, the other has much wider tepals. A yellow seedling flowered for the first time this year, one with very narrow tepals, almost like the common orange Clivia in shape. Nakamura San was much taken by the common Clivia in Australia, and spent a day studying the form in Sydney's Botanic Gardens. It is so common here one barely notices it except when seen growing in the mass as in older suburbs of Sydney. When happy, *Aurea* seems to offset well. I find it offsets much more rapidly when in the ground. As you say some Clivia are very reluctant to offset.

I have seen the photos you sent over. Nakamura San took them with him on this trip around Oz. Very impressive. I think Bill Morris is right when he says if you cross a yellow with a yellow of the same genetic background you will get 100% yellows. I am finding that seedlings from such a cross have no colouring in the leaf bases. It would be nice to obtain a true yellow....after all citrina means citron-coloured. My species flowered well this year.. by species I mean *miniata*, temporarily forgetting the others. The seed came many years ago from Blombos along with seed of *gardenii* and *nobilis*. The resulting '*nobilis*' is not really *nobilis*, perhaps some hybrid. I love the species *miniata* for its long stems and open umbels which could take a lot of handling, i.e. the umbel can be compressed without damage. A lady at work told us how when she was a child in Durban 50 years ago the native people used to bring Clivia blooms into town to sell. How fares *Clivia miniata* in the wild now?

As for an article for the newsletter I was hoping you would have used relevant bits from my *Herbertia* article. However I'll adapt from that one. I haven't much more to say apart from what was in that.

My Clivia will be shown on a national TV gardening show on the 6th November. These things are very segmenty so will last two minutes at the most.

Best wishes
Kevin Walters

Dear Editor,

Many thanks for the yellow clivia, was delighted to receive it.

I have had a number of clivia for many years, but it was only this year in September that I planted fifty seeds. Had quite given up hope when this week 17 leaves appeared, I had not realised germination would take about two and a half months.

I would like to endorse Piet Vorster's suggestion of a joint order from Japanese growers. Herewith my subs with thanks.

Yours sincerely
Chloe Stuart

Dear Mr. Primich,

Its nice to hear from you again via the Clivia Club. Well done! The last newsletter is very interesting (vol.1 No.2) especially the planting of seed. I have tried all sorts of different methods, and my results with just leaving the complete seed (in its case) in a quiet shady spot in the garden seem to be as good as shelling them out and putting them into special soil mixes.

My main reason for writing is to apply for one and hopefully two of the yellow clivia you advertised. I enclose cheque for same.

Many thanks
sincerely
Chris Barker.

Dear Members

I am at times tempted to call you Dear Cliviers, but I will forgo this for now. I have been queried by Bill Morris, and Dr. Barker on the reason I advocate darkness for seed germination. I meant to answer this in the last letter, but it slipped my memory. I have over the years conducted experiments on what could possibly be the best method for germinating various seed.

When I started growing Clivia I noticed there were strange gaps in the germination of a batch of seed. I conducted various experiments over a length of time, but unfortunately have lost the records of this, although no doubt it could easily be repeated. Anyway, the thing was it became apparent that darkness hastened the emergence of the radicle. I found it had no further benefit than this. In a batch of seed, I found that when covered, one or two seeds would emerge ahead of the others, but would still develop green parts in spite of the darkness.

There is certainly no harm in leaving the fruit on the seed and letting it germinate this way. It probably supplies both the darkness and the moisture factor. Indeed, most of the seed in nature seem to germinate this way. The fruit dissolves into a rather frightful looking mess, but strangely enough not evil-smelling, and shortly after this the radicles will start emerging. I have wondered if there is some chemical in the rotting fruit which might cause this.

I think Dr. Barker might find that when he is germinating his first yellows, that he may not care to follow the natural method. It is hardly suitable for shadehouses or glasshouses where you want to keep control over all forms of rot and fungus. Serious breeders tend to have a few hundred seeds at a time on the go. Most of us are amateurs, and do not have much space in which to operate. When you are growing the majority of your plants in the pot you are also not able to allow the peduncle to fall to the ground to deliver its seed. Things left lying around the garden are also apt to fall prey to any passing predator, some of them being human.

My Cryptostephanus vansonii bore flowers in early November. Small star-like white ones with a distinct, faint pinkish-brown cast to them. I duly crossed them with Clivia nobilis and was pleased to see the ovaries fattening. I kept this plant along with other choice yellow Clivias in my living-room. I put them outside in a small narrow alley to pick up a bit of rain and wash the leaves off. A terrific hailstorm came down and by chance was aligned with the alley. The poor Cryptostephanus took an awful beating. The peduncle was utterly destroyed as were most of the leaves. The Clivias stood up much better, and are only peppered with little white marks where the hail struck them. I will have to wait until another season to repeat the experiment.

The cross between the Clivia miniata hybrid and the Eucharis amazonica also came to an end as far as the E. amazonica is concerned. All the seeds aborted after showing a little promise. On the Clivia there is one very full ovary, and that is all. I shall ripen this seed and keep a special eye on it. Perhaps it is only a case of parthenogenesis. I have tried various crosses with other amaryllidaceae but have had no significant result. Please note the response from Ken Smith and Les Larson in this letter on these issues. Things are looking up and getting exciting.

Kevin Walters sent me an article for publication. (It will appear in the next newsletter). A pretty good article, but it was accompanied by a gem of a letter which I have taken the liberty of printing here. I hope he forgives me. Please note that you should mark your letter not for publication if that is what you desire. Along with his letter he sent about sixty seeds of yellow Clivias. I would guess that about thirty to forty yellows would result from this lot. Kevin said "dish them out among the members." This gave me a bit of a

problem, because it would hardly be fair if I phoned the few members who have been in touch with me and said come and get them. I could hardly post you all one each! So I have planted them and will use the seedlings to hand out as prizes for literary achievement. Starting next issue I will award a prize for the best letter, say three green-sheathed seedlings, and a prize for the best article (six green-sheathed seedlings.), by one of our non-pro's. We all know who they are. There are also some reds, and I am sending them to the others who asked for Ken Smith seeds and lost out. Let us all put our pens to paper and produce the best ever newsletter next quarter!

Nick Primich (ed)

WANTED

Seed of *Agapanthus inapertus albus*, the white-flowered form of the pendulous *Agapanthus*. A plant was listed as *Agapanthus inapertus ssp inapertus "white"*, in Veld & Flora Dec 1985, page 124. I would be happy to exchange seed.

Ken Smith, Australia

Colour

I suppose we could think of colours as adjectives in the language of sight. They help to define and classify the images that the retina sends to the brain.

I have no wish here to launch into the world of physics, but it is hard to establish any ground without a little science. We are all aware of Newton and his spectrum. Most of us can recite the colours of the rainbow. Seven colours indeed! Seven hundred if you want to look a little closer.

There it is, we can keep it simple or make it overly complicated. Let's stay simple. Primary colours are red, yellow, and blue. If we arrange them in the traditional circle we get between red and yellow, orange; between red and blue, purple; between blue and yellow, green. These are the primary colours and they vary in hue and saturation. They are also known as the chromatic colours, as opposed to white and black which are the achromatic colours and vary in lightness and brightness.

There are various standard colour charts around which help to sort it out if one becomes confused, but the chromatic colours can be combined with the achromatic colours. Thus we could have a greyed blue, which is a blue with a little black in it, and a little white. Is grey not an admixture of white and black?

Crimson is on the blue side of red, and scarlet is on the yellow side. Somewhere, in-between, is a thin, rare band of true red. Now pink is not a weak red, but rather a colour on the red side of purple. So for your *Clivia* to be pink per se, there would have to be some blue coloration. Bill Morris tells us that anthocyanin is responsible for all the colours of flowers except yellow or orange. According to the acidity of the flower, the anthocyanin varies from red to blue through pink, and on to blue-green and green. That is why I am glad that Bill speaks of the "so-called" pinks. This flesh, or pale salmon, or buff whatever it is not a pink at all. We still have to see a pink *Clivia*, and let's hope that day may still come.

Nick Primich.

Hybridising with other Genera

Can it be done? Has it been done in the past and what would be the outcome for future breeding if it is truly successful?

Past horticultural literature lists some crosses as if they were "matter of fact" and suggests that other crosses may have been achieved. In my thesis I listed those crosses that came to my attention. The success of these crosses needs to be questioned. Only by careful consideration of the plants used in the crosses, and detailing results of any personal hybridizing work, will we learn about the potential to create new hybrids.

How far removed from *Clivia* will these supposed hybrids be? Is the crossing with other genera worth it?

One of the earliest records is of *Cliveucharis*, a cross between *Clivia miniata* and *Eucharis grandiflora*, published in 1891. *Cliveucharis pulchra* is described as a hybrid raised in M van Houtte's nursery out of *Clivia* by the pollen of *Eucharis amazonica*. What do they look like? Does anyone have these plants growing? Do they really exist?

Gordon McNeil reported on several crosses in his article (Herbertia Vol 41). This included using *Agapanthus*, *Allium*, *Cyrtanthus*, *Narcissus*, and *Tulbaghia*. The plant called *Clivia* (?) 'Green Girl', a supposed cross of *Clivia miniata* and *Hippeastrum*, was illustrated in that article. Plants of 'Green Girl' were offered in the 1985 catalogue of the International Growers Exchange. They were described as "pink with green stripes. Fragrant and sold for \$US75. It would be interesting to see tangible proof that these plants exist.

What do you get when you cross a plant that has a true bulb with a plant that has a rhizome? What if one plant is evergreen and the other parent is deciduous? What results if one type produces round, white, fleshy seed and the other flat, black, dry seeds? Can we succeed if we match up some plant characters, or must they all match? If anyone can supply chromosome numbers for these genera, I would be grateful.

Anybody who grows *Cryptostephanus vansonii* will know how similar in appearance it is to *Clivia*. Apparently early specimens were thought to be *Clivia* until investigation of the flowers showed otherwise. It is a beautiful plant in itself, but is also more plausible to suggest that crossing with *Clivia* will be successful. I am attempting this cross this season and will let you know through this newsletter of my success or failure.

Amaryllis and *Crinum* are two other species that have been used in crossing with *Clivia*. Does anybody know of these? I would urge you to think about these hybrids and report through the newsletter any findings you may have. I have been challenged to think hard about them and not just accept that they can be easily done.

What are your thoughts on this aspect of *Clivia* culture?

Cryptostephanus vansonii* X *Clivia

This season I have been deliberately pollinating the flowers on my plant of *Cryptostephanus vansonii*. A mid-orange flowered *C miniata* is the pollen plant. It happens to have roll petal flowers, but basically is flowering late so I am using it. Each flower is liberally dusted with pollen, with a follow up in the next day or two. 23 have been treated at the time of writing. The umbel has 42 flowers, although I don't know if all will progress fully.

There is a marked change in the treated flowers after a day or so. The top row of anthers is stained red. Ovaries are swelling and the petals are closing, with a distinct line forming at the base just above the ovary. I can't tell at this stage if self-pollination has occurred but the signs are promising that crossing with *Clivia* is a real possibility.

I am heartened by the comment of our editor on page 9 Vol 1 No 1 of the newsletter, "crosses readily the Clivia". I also note that Ian Coates, in his articles of Feb 1990, states that he has a seedling from this cross that is distinctly different from both parents. It was three years old then so perhaps has flowered by now. Does anyone know of this hybrid plant?

I will keep you posted
Ken Smith, Australia

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Connie Abel, 89 Brampton Road, Lynwood Manor, 0081
Mrs. W.E. Allison, 10 Vestness Road, Valhalla, 0185. General.
C. Barker, P.O.Box 154, Knysna, 6570. Growing & selling. Looking for yellows.
Herman Burger, Topaz nr.2, Murrayfield, 0184. General
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Howard Cook, P.O.Box 6, Gillits, 3601. General
Denise Currie, 303 Cromwell Road, Lombardy East, 2090. General.
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E. Ellis, P.O.Box 2824, Jhb, 2000. General.
Mrs. Dulcie Emanuel, P.O.Box 97, Rosetta, 3301. Beginner esp. yellows.
Mr. A. Gibello, P.O.Box 253, Great Brak River, 6503. General.
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A.N. Grobler, P.O.Box 75376, Lynwoodrif, 0041. General.
A.J. Hankey 7 Orion St., Kensington, 2094. General.
Mrs. C. Howie, 7 Ripple Close, Newlands, 7700. General, buyer of yellows.
J. L. Holmes, P.O.Box 4063, Idas Valley, 7609. General.
Engelina Joubert, P.O.Box 16, Settlers, 0430. General.
Dot Kropf, P.O.Box 904, Stutterheim, 4930. General.
Penny Lennox, 2 Ascot road, Milnerton, 7441. General.
Prof. Roy A. Lubke, Schonland Botanical Laboratories, Rhodes University, Grahamstown. 6140. General.
Keith Macmullen, P.O.Box 2155, Cramerview 2060. General.
Mr. M.D. Mey, 55 Black St., Parkdene, 1460. General.
Lukas Otto, P.O.Box 309, Muldersdrif, 1734
Mrs. L. Robertson, 59 Harewood Drive, Nahoon, 5241. General.
Mrs. V.M. Rodel, P.O.Box 9206, Cinda Park, 1463. Beginner.
P.E. Shanahan, 27 Pat Newson Road, Epworth, Pmb.3201. General.
Mr. A.V.V.R. Schweizer, 14B Pioneer Rd., Irene, 1675. General
Mrs. R. Stevenson, 4 Karee Street, Randpark Ridge X1, 2194.
Ms. Dorene Theron, Amoi Estate, P O Box 810, Stellenbosch, 7600.
Mr. J.H. Uys, 25 Elbertha St., Stellenbosch. 7600. General.
Ms. D. van der Merwe, P.O.Box 651006, Benmore, 2010. General.
Willem H.J. van Deventer, Pirokseenstraat 672, Elarduspark X6, 0181. Pretoria. General.
Laila van Heerden, P.O.Box 15766, Lynn East, 0039. General.
Mrs. C. van Vuuren, P.O.Box 6292, Homestead, 1401.
P. Vorster, Botany Department, University of Stellenbosch, Private Bag X5018, Stellenbosch, 7599. Hybrids & Cultivars.
Mr. G. J. Wiese, 12 van der Westhuizen Ave, Durbanville, 7550

Australia

Milton Edwards, P.O. Box 499, Belgrave, Victoria 3160. General.
C.J. Grove, 39 Pandora Drive, City Beach, 6015, Western Australia. Breeder
R. Harrison, P.O. Box 161, Wanneroo, 6065 Western Australia. Breeder.
Jerd Seeds, P.O. Box 3424, Mildura, 3502. Australia. Seeds.

Les Larsson, 31 Solomon Street, Palmyra, 6157. Western Australia. General.
Ron May, 11 Loch Street, Toowoomba, Queensland, 4350. Breeder, fancier.
W. Morris, 37 Brocklesby Road, Medowie, NSW. 2301. Breeder.
John Roper, 11 Kianga Street, Graceville, Queensland. 4075.
Ken Smith, 593 Hawkesbury Road, Winmalee, NSW. 2777. Breeder.
Kevin Walters, 20 Wyalla Street, Toowoomba, Queensland. 4350

Hong Kong

Dennis Tsang, 104 Hing on House, Wo Lok Est, Kwuntong. General.

Italy

Davide Rossi, Via Gravelona 22, Vigevano 27029, Pavia General.

Japan

Yoshikazu Nakamura. Clivia Breeding Plantation, 4-28, Kurodo Mobar-city, 297 Chiba Prefecture. Japan. Breeder.

New Zealand

Dr. K.W.R. Hammet, 488c Don Buck Road, Massey, Auckland 8. General.

Sweden

Borje Svensson (Mr.) Studentstaden 4, S-75233, Uppsala. General.
M. Edquist, Syreng 19, 57139 Nassjo, Sweden. General.
S. Hvegholm, Kvartebo, 36076, Alghult, Sweden General.

Switzerland

Sir Peter Smithers, 6921-Vico Morcote, Switzerland.

United Kingdom

A.F. Gosden, 12 Maes-y-felin, Penrhyn-coch, Aberystwyth, Dyfed, SY23 3EN United Kingdom. General.
C.M. Atkinson, 7 Leafy Way, Locking, Weston Super Mare, Avon BS24 8BD United Kingdom. General.
B&T World Seeds, David Sleigh, Whitnell House, Fiddington, Bridgwater, Somerset, TA5 1JE. United Kingdom. General.

USA

D.S. Casebier, Brown University, Box H, Providence, R I 02912, General.
Dr. R.L. Douth, 1781 Glen Oaks Drive, Santa Barbara, California 93108. General.
Donald J Hunter, Rancho Soledad Nurseries Inc, P O Box 1689, 18539 Aliso Canyon Road, Rancho Santa Fe, California 92067. General.
Victor D Newcomer, M D Inc, 1260 15th Street, Suite 1024, Santa Monica, California 90404.
David West, 209 N 18 Street, Montebello, California 90640. General.

Zimbabwe

I.D. Waldie, 17 Adare Road, P O Chisipite, Harare, Zimbabwe.

On the Compost Heap

It was rumoured that red faces were seen in the editorial office when the final copy was being done. We are not too sure if there are any yellow stripes down any backs, but I'm green with envy over the computer's new blue cover. Also, I blushed pink with embarrassment at our new members' list. Shame on you! Where is a poor worm to get her next meal from? Oh! Perhaps nobody told you that they had not updated the list to spare the shame. They hope everyone will pay by the next issue.



Our editor is so busy with non-clivia things that he forgot to mention the people who want to get a joint-Japanese order through. Someone had better take charge of this matter, and find out what can be got from the Japanese. Who amongst us can speak any Japanese? (or write it.)

Don't shout too loud.
Lily Borer