Melbourne Clivia Group Inc.

May 2009
Vol. 2.3

Message from the President

Thanks to all members who brought along variegated plants to accompany the topic at our last April meeting. The display was probably as good as we could have in spring, even without flowers. Some notes that I prepared for that evening are attached here, and you can view some photos of variegated *Clivia* on our website as well (http://www.melbournecliviagroup.org.au/gallery.html). Perhaps we should do a continuation of this topic next year during the cooler months.

Also last month, Lisa's presentation of a database that she has been using to record her *Clivia* served as a very useful introduction to the topic (see her separate text). As she succinctly explained, the keeping of records is essential for those of us who wish to breed and develop the genus. Of course, some members will be happy just to grow an odd plant or two in the garden or in a pot on the one hand, or others may grow many *Clivia* but not have any special interest in the backgrounds of their plants or in growing from seed. In such cases, record keeping may not be necessary. But for some individuals, the keeping of records is very important and it is useful to see the range of options available to us. George Simmler has been using an Excel spreadsheet for his record keeping and has also shared his method with us in this newsletter.

This newsletter contains an introduction to breeding written by John van der Linde of the Cape Clivia Club in South Africa, which nicely illustrates the importance of record-keeping. John's name will be recognized by many members because of his contribution to the South African-based Clivia Society and some of our members know him personally because he showed slides to an earlier group here in Melbourne in November 2005.

Di Matthews follows with an article on the Australian Clivia breeder, Kevin Walters.

Our thanks go to Lyn Rawson who ably looks after our raffle at each meeting and who also brought along photos printed out from Shige Sasaki's website and displayed these on a table last month. Making photos available in this way is another means of sharing together our interest in *Clivia*. I think that Lyn quietly and efficiently set out our supper supplies as well. Thanks to those gentlemen who assisted with reassembling the screen at the end. All in all, many members are now contributing to the successful running of the club.

As announced at the meeting, Consumer Affairs has approved our change of rule to allow the continued use of our present application for membership. We thank Lisa for submitting the required documentation in this regard.

Those MCG members who are also members of the Clivia Society will have received a flyer of a new South African publication due in August entitled *Clivia, Nature and Nurture* by Dirk Swanevelder and Roger Fisher. New material on *Clivia* is always welcome and I look forward to reading this volume when available.

At our next meeting on 19th June, John Bannenberg will lead the presentation on Clivia species. We had already planned to cover *C. gardenii* as our short topic that evening but will now combine it into the main topic. With a little luck, some members will have a pot of *C. gardenii* in flower or in bud that they can bring for display. Please also bring along any pots or seedlings of *C. nobilis, C. robusta, C. caulescens* or *C. mirabilis.* It will be good to be able to compare the shape and form of the plants when displayed together. Ray Argent will introduce his method of gathering berries at the June meeting as well.

The *C. gardenii* raffle for April, which was kindly donated by Ray Argent, was won by John Ritchie. Thanks also to Yvonne Hargraves for donating an offset of an interspecific, which went to Erika van der Spuy. Anyone who can spare some plants or seedlings for sale is invited to place these on the Trading Table for other members to purchase at our meetings (during supper time). The Trading Table application and guidelines can be downloaded from the home page of our website or else you can telephone your sales through to George prior to the meeting.

The committee looks forward to our next meeting and hope that many of you will join us.

Helen Marriott

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Member's Introduction

VU DANG

My interest in Clivias began from a quick need to get a Mother's Day present. My first love has been Australian native orchids, especially Sarcochilus, for the last 10 years.

Three years ago at an orchid fair, I spent the afternoon chatting with an orchid breeder Ken Russells whom I had amassed quite a collection of seedlings from.

As it happened, Ken had also been breeding clivias. The talk developed from orchids to clivias, in particular genetics. I was captivated when he showed me the amazing colors and varieties. So I bought a few plants for Mothers Day that year.

The next year we met again and by then I was fully addicted and again I kept him talking the whole afternoon. I came home with another 30 plants. Since then, I have been purchasing seeds from all around the world and now my little babies are taking over the orchid benches. It's always the same problem, not enough space! Now all I can think about is how my seedlings are doing and why they are growing so slow?

All my clivias are in pots, about 100 of them, mostly 2 and 3 year old seedlings. This year I was particularly interested in miniature clivias and was very happy when Ken brought me a Hime Daruma. I was also able to get some Hime Daruma cross seeds from Toshi in Japan and a selection of Sparrows and Henglans from Mr Cui in China.

And of course I couldn't resist the variegated plants. As for colours, I got a few hundreds seeds from Jim at Cape Seed and Bulbs in South Africa.

Now, I'm constantly assessing the leaf size and colour changes. I won't be truly happy for another 5 years..... at least! My aim is to be able to display a clivia a day.

INVOLVEMENT IN MCG PLANNING AND ACTIVITIES IN 2009/2010

The committee wants to invite members to actively participate in the group, not just by reading the newsletter and / or attending meetings, but to be involved in planning our activities, including suggesting topics for our meetings and newsletters, sharing your experiences and knowledge at meetings, sharing your photos (bring copies to meetings or place some on our website) or contributing ideas for fund-raising, among other things. Sharing ideas about what is successful at other garden clubs can also be useful for us.

We would love to hear your ideas. Please email the committee, telephone or write up your suggestions on the whiteboard at the next meeting or speak to one of the committee members.

NEXT MEETING

Friday 19th June 2009 - 7.30 pm
Uniting Church,
Cnr Burwood Hwy & Blackburn Rd, Burwood

Clivia species (John Bannenberg)
Harvesting berries (Ray Argent)

Bring along your species plant

TRADING TABLE
Plants and seeds available
Buy or Sell

Autumn Jobs

With the colder weather, I am now reducing watering, leaving two weeks between waterings, and I won't water the clivias that are not under cover now that the rain has returned (hopefully). (Helen)

Ensure my plants are protected from frost, either under the eaves on the south side of the house, under cover, in a shadehouse or protected by evergreen trees or shrubs. (Lisa)

Still doing my rounds every day after work to make sure all is well and keep my diary up to date on things happening. i.e. plants making new leaves, looking for flower spikes etc. (George)

I have finally finished potting up my seedlings form last year into olive pots and put them into the polyhouse out of the rain (if we get any). I don't want them to get too wet. The warmth in there will help them to establish themselves before summer. Now that we have cooler weather and the Bluetongue lizards have bunkered down for winter I can spread snail bait through my Clivias, to catch all those small snails that are hatching and hopefully their parents will enjoy a meal also.. (Rae)

Move all my seedlings into the glasshouse for winter so I can still regulate watering and fertilising. (Brenda)

19 Jun 2009 – MCG Meeting
Clivia species (John Bannenberg)
Harvesting berries (Ray Argent)

21 Aug 2009 – MCG Meeting
Interspecifics (Laurens & Helen)
Fertiliser – Brenda Girdlestone

11 Sep 2009 – MCG Meeting
Multitepals (panel)
Photography (George Simmler)

Breeding with a result in mind – Version 2 – John van der Linde

Several years ago I decided to try to breed plants with a higher than average flower count, with nicely-overlapping petals. I wanted full, rounded umbels, held above the leaves. I was not breeding specifically for colour, but an interesting flower colour would be a bonus. I had noticed, without keeping records, that when I did reciprocal interspecific crosses, using a *Miniata* and a plant from a pendulous species, with many more flowers than the *Miniata*, the F1 seedlings with the pendulous plant as mother had more flowers at first flowering than those with the *Miniata* as mother. So another objective of my experiment was to further investigate whether high flower count at first flowering was a trait that was maternally or paternally determined, or whether both parents were co-dominant. I chose as parents the following two plants:

(1)An interspecific *Miniata* x (*Caulescens x Miniata*), given to me by Toy Jennings. It had been grown from seed from Nakamura and had flowered for the second time with in excess of 30 small well-clustered flowers, mainly upwards facing, in an attractive full umbel with no gaps, held just above the leaves. Probably as a result of the *Caulescens* influence, the petal overlap was excellent. The colours were an unusual mix of tones in the pastel range (The "D" range on the small CCC Colour chart). This plant had been judged the winner of the Interspecific class at the 2002 Cape Clivia Club Show, in the year that it first flowered.

(2) A Group 1 yellow *Miniata* which had flowered with 17 flowers. I grew it from seed from Australia, a cross between a (Yellow x Vico Yellow) from Nakamura and the Australian cultivar Col Pitman. The flowers were flat and open, 10cms across, held on 5cm pedicels, and the umbel was rounded though a bit loose, and was held well above the leaves. The overlap of petals was good, but not as good as those of plant (1).

I did reciprocal crossing, grew 15 seedlings of each, and then, for space reasons, selected out 5 seedlings from each crossing. Three from the crossing *with the yellow as mother plant* bloomed in 2007, each with too low a flower count to be acceptable (6 to 9 flowers, which is what I tend to get from first flowerings), though petal overlap had been improved. As an aside, one of these was donated for the August 2007 CCC club raffle.

The only two seedlings to flower before the 2008 CCC Show had *the interspecific as mother plant:* The one I entered in the Show category 33 – 'Own breeding, other cultivar' - had 18 flowers, which I judged to be mainly salmon in colour. Pictured below.

They were 6cms across, larger than those of the mother plant. The petal overlap was exactly what I was aiming at. The other seedling to bloom also has 18 flowers, even more attractive to my mind, but leaves had snout-beetle damage. Pictured below.

I *tentatively* concluded, from the results so far, that higher than average flower count at first flowering *may well* be maternally inherited. Further work with the other seedlings from these crosses yet to flower, and with other plants, is of course needed to test this hypothesis. I have sibling-crossed these two 'high flower count' plants, hopefully to 'fix' this trait in the next generation, which should include 25% that will flower yellow.

This article was first published in Cape News, the quarterly newsletter of the Cape Clivia Club and has been reproduced by permission.

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Please let us know if you have any other news or items of interest to share.
Deadline for next issue – 10 July 2009

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Kevin Walters – An Australian Clivia Breeder – Di Mathews

"Orange is the colour of exuberance and vitality, and that enlivening splash of orange in the spring garden colourscape means that old favourite Clivia miniata is in bloom".....so says one of Australia's oldest and most respected breeders of clivia, Kevin Walters of Toowoomba, Queensland (Kevin Walters p.29).

Kevin Walters has been quietly breeding some of Australia's best clivias for decades, producing some superb orange and yellow clivias, known for their large recurved flowers and beautifully formed spherical umbels.

Kevin Walters

Kevin was fascinated with bulbous plants as a young boy, and this interest was piqued by the garden of his paternal grandmother Charlotte, which was full of bulbs such as Belladonna lilies, hippeastrums, narcissus species, and "drifts of freesias in the front garden". He was given his first clivia in his early teens by his grandmother, who could scarcely have imagined how he would develop them as an adult.

When Kevin first started with clivias as a young man, there was almost no information available on such plants. The books and magazines dedicated to these plants had not yet been written, and it really was a case of trial and error, and waiting patiently, sometimes for years, to see what worked.

Kevin dabbled in clivia hybridising for about fifteen years, but it was only after he used a good form of yellow clivia that he began to achieve his spectacular results. He managed to acquire two Belgian hybrid seeds from Goodwins in Tasmania in 1964. One of these seed grew to maturity and flowered, and he called this plant '1964'.

In the early 1970's, Kevin acquired his first yellow clivia – 'Aurea', from a Mr Pollard in Caulfield in Victoria. He was later able to purchase more of this strain from Adelaide and Glen Innes. It must be remembered that at this time, these yellows were indeed rare and prized plants.

He made his first cross 'Aurea' X '1964' in 1976, and the progeny of this cross included the well-known and highly regarded 'Relly Williams', 'Valerie Martin', and 'Valerie Martin Supreme' – all orange flowering plants with large full flowers, which were 'split for yellow'.

Kevin made another cross in 1979 – 'Aurea' X a Kewensis orange. This orange had an interesting history – the first seed of it came from the Kew Gardens in England, brought back hidden in a handbag. The plants resulting from this cross comprised about a third yellows, one of which had a green throat and was later named 'Monica Conquest'.

The well-known clivia breeder Bill Morris was among the many admirers of these yellow clivias bred by Kevin, and Bill visited him many times, further enlightening Kevin about observing his plants for form, as well as for colour. Kevin credits Bill for opening his eyes to the concept of the flower form; these lessons were further reinforced by the noted iris breeder and judge, Rita Caldwell. Rita explained to Kevin that "the gardener goes for colour whereas the breeder's main concern is form" (Kevin Walters 1987).

Kevin Walters Yellow

Kevin was making friends around the world at this time in his life, and often corresponded with Les Hannibal of California, a well-known bulb breeder as well as something of an expert on crinums.

It was 1992, however, that Kevin remembers with great clarity and pride. Ken Smith of Sydney organised for Yoshikazu Nakamura, universally regarded as the one of the world's best clivias breeders, to visit Australia. Kevin met with Nakamura on several occasions, and Nakamura was so impressed with Kevin's plants that he took a quantity of pollen back to Japan to assist in his own breeding program. Kevin also sent plants and seed to Japan, and some years later, he received back from Nakamura some seed of 'Walters Yellow' X 'Vico Yellow', 'Walters Yellow' X 'Vico Gold', and 'Monica Conquest' X 'Vico

Yellow'. Nakamura also named one of Kevin's plants. This plant was an interspecific (cyrtanthiflora X miniata) bred by Kevin, the colour of which Nakamura said reminded him of the cherry blossom at home, so he named the plant 'Sakura', which means cherry blossom.

By this time, Kevin had also made contact with clivia growers in South Africa, and was in fact one of the founding members of the Clivia Society, along with Nick Primich, and others.

He made the acquaintance of Dr Keith Hammett when he visited from New Zealand, and Bob Pearce, a wholesale nurseryman who accompanied Dr Hammett. These men were also very taken with the yellows that Kevin had bred.

Over the next decade, Kevin was honoured with gifts of seed from Nakamura, as well as growers from South Africa, including Nick Primich, James and Connie Abel, Dawn Strydom, and in more recent times, Sean Chubb and Felicity Weedon. Kevin, of course, reciprocated these favours, as well as sharing and exchanging seeds and plants with other growers in Australia.

In his later years, Kevin has had the desire to return to his beginnings, in regard to one of his early crosses. In 2005, he again crossed 'Aurea' X '1964', and he is also evaluating some of the first and second generation crosses that Nakamura did with his yellows, as well as assessing the progeny of his clivia 'Sakura'.

Clivia bred by Kevin are widely sought after, and are in collections of people around the world, including Japan, South Africa, and North America, as well as in his home country. Collectors worldwide admire and desire the sumptuous flowerheads with the beautiful large recurved petals, for which Kevin's plants are renowned.

He is keen to establish the area where he has lived and worked all of his life to become a centre of excellence for the plant he has spent his life trying to understand and improve.

Kevin Walters cream with green throat

The world of clivias has been, and continues to be, a source of never-ending fascination for Kevin, and we look forward to seeing further results of his endeavours in the years to come.

References

Kevin Walters Australian Garden Journal Vol 6 No 4 April / May 1987.

Photographs used with kind permission from Gary Fry of Toowoomba

Introduction

Clivia offer us not only splendid flowers, but also much variation in foliage and hence provide visual interest and stimulation during the whole year. Zonneveld (*Clivia* 8: 66) defines a variegated plant as showing different colours in a single leaf. In *Clivia*, the variegation can be found not only in the leaves but also in the peduncle (stalk of an inflorescence), pedicels (stalks of individual flowers / berries), and even the berries themselves. Most commonly we find cream / yellow, or a whitish or light green colour on a dark green background, but there is some variation to this generalization. This is not to say that variegation never appears in *Clivia* flowers, as this feature indeed has been observed by the keen enthusiast on rare occasions, and furthermore, oddities, such as striped berries on a solid green-leafed plant, observed last year by Ken Smith in New Zealand, can also occur. Here, however, I will not deal with variegation in flowers or with oddities.

Variegation often appears on the new leaves following germination and so can be enjoyed throughout the life of the plant, with many leaves different from each other. At times, however, a small amount of variegation may appear later in the growth cycle, and, in turn, be passed to its offspring. Alternatively, on occasion an apparently variegated plant can also become a green-leafed plant.

Early in my days of Clivia growing, I obtained one rather weakly variegated *Clivia* and it has produced many good variegated seedlings over the years. However, I have also been excited to find unexpectedly variegated seedlings arise from some of my other crosses, including the use as a seed parent of (a) a multipetal (that had only a single thin cream stripe on one leaf when it was originally purchased as a small seedling); (b) a seemingly green-leafed plant (with orange flowers) purchased from a nursery some years ago, and which I crossed with *C. miniata* 'Aurea'; and, (c) *C. miniata* 'Aurea' x *C. miniata* (a Japanese yellow), where one out of numerous seedlings emerged with variegation. The hybrid mentioned in (b) above has already flowered and I have crossed it back to 'Aurea' again, so I can expect to obtain 50% of the seedlings with unpigmented bases (which should flower yellow) and 50% with pigmented bases (which should flower orange but which will also possess yellow genes). Hopefully some or even most of these offspring will also have variegation in the leaves.

I have also had the opportunity to visit two leading commercial growers of variegates in Japan in recent years and on a number of occasions have seen Yoshikazu Nakamura's wide ranging collection of variegates as well as the excellent plants owned by Shigetaka Sasaki, our member in Japan. Of late, I have a new interest in those seedlings or plants which feature multiple or mixed patterns of variegation, but I will save that topic for another occasion.

Anyone interested in the topic of variegation in Clivia should consult the various articles found in the yearbooks of the Clivia Society (see references below).

1. Categorizations of variegated *Clivia*

The variegation in *Clivia* can be basically divided into two main categories: longitudinal variegation and horizontal variegation. Some of the terms used to describe the types of variegation in *Clivia* have been borrowed from Japanese, no doubt because of the developments in Japan in breeding and growing variegates, and the dissemination overseas of seed, plants as well as knowledge about breeding and cultivation. More recently, influence is also spreading from China in this regard.

Photos which illustrate some of the different types of variegates can be viewed on the MCG website (http://www.melbournecliviagroup.org.au/gallery.html > Variegates. A few photos also show variegate plants in Sasaki's greenhouse and Marilyn Paskert from the U.S. has supplied a couple of photos of Solomone variegates, and John van der Linde (South Africa) has contributed a splendid photo of variegated berries .

Longitudinal variegation

There appear to be several different ways to categorize *Clivia* with longitudinal variegation. Sasaki has suggested that some of the types to be described below are sub-types of "shima(fu)" or the striata type (*Clivia* 5, p.52), but here I will follow Smith's categorization and introduce three main types and several sub-types of longitudinal variegation (personal communication).

The first and by far the most commonly occurring pattern of variegation in *Clivia* involves cream, whitish or light green "stripes" running longitudinally down leaves, from the base to the tip of the leaf. As noted above, the stripes may also occur on the

peduncles, pedicels and berries. This variegation pattern is known as striata or in Japanese, "shima(fu)", where "fu" means variegation. (When these terms are used in English there is some inconsistent use of "fu", with it either being used, or being typically dropped in some cases, as in "akebono" and "fukurin".) Smith describes this type as including lightly patterned striata (just a few stripes), which are sometimes referred to as "pinstripe", right through to heavily patterned striata (which involves bold showy stripes). The variegation pattern is furthermore highly variable across the leaves. I guess that somewhere between 90-98% of the variegates in Australia or even around the world are of this type. Smith observes that this is the most variable type visually: "Anything from a few random stripes, to regularly spaced stripes, to boldly striped – each leaf will be different. You can even get green on green striping".

Another pleasing variation or sub-type of striata variegation, but which is not yet widely known, is "negishi(fu)" which commonly has thin or broken-line lines (very occasionally dots) running lengthwise through lighter or yellowish green leaves. I am sure that I can also find this pattern sometimes arising from crosses involving a seed parent with regular striata variegation. The Japanese polytepal (multipetal) specialist, Atsushi Nakayama, has named an attractive lightish-coloured "negishi" cultivar as 'Kooga'.

According to Smith, the rare variegate known as Mandarin Duck, or "genfei(fu)" where the leaves are divided lengthwise into two equally coloured parts, "is just a weird half and half striata, but because of the cellular makeup of the leaf, it cannot be reproduced from seed, and can grow out easily if the basal cells that start the leaf pattern are disrupted". Amongst my own plants, I can only find one single leaf of a variegate where this pattern occurs but unfortunately, this won't qualify it as belonging to this type! A single leaf with a halfsider pattern seems to occur from time to time.

The second main longitudinal type, which is separate to the widely occurring striata type described above, are "fukurin(fu)", also known as margin or margined variegation, or more precisely, albomarginated / aureomarginated variegates. This variegation pattern involves a green centre, with cream / yellow or whitish (or sometimes different green) edges, and importantly, needs to be symmetrical. Nakamura always has a few "fukurin" plants for sale at his nursery outside of Tokyo, as he is able to purchase the plants as offsets from a middleman dealer. The fukurin sold by Nakamura are invariably orange-flowered, and with thinnish leaves. Broad-leafed "fukurin" are quite rare in Japan, but see the photos on the website for a beautiful specimen that is owned by Sasaki. Nakamura has named one cultivar as 'Itofukurin', which Smith describes as showing a thin white margin due to the epidermal layer being white. In the U.S. the late Joe Solomone produced some magnificent yellow-flowering "fukurin" variegates. While "fukurin" variegates can appear spontaneously in extremely rare cases, propagation is normally through division, so its spread in some countries or regions is quite limited.

The third main type of longitudinal variegation is median variegation, where the plants have a median stripe in the form of a distinct band or centre stripe (or group of stripes – from few to many) running along the mid-line from the base to the tip of the leaf. It is known as "naka(fu)" in Japanese, and according to Smith, produces green-leafed seedlings. Smith also points out that median variegation is represented as a centre variegated mutation, as described here, or else as a "natural mid stripe", as in some *C. mirabilis* and *C. nobilis*.

Horizontal variegation

Providing an entirely different effect are horizontal or transverse banding types of variegation. A small number of growers in Japan, including Nakamura, have been breeding "akebono(fu)", which typically have horizontal whitish bands on otherwise green leaves. As a result of this breeding, outstanding flowers are also coupled with exquisite leaves. Nakamura's "akebono" have long leaves, but smaller "daruma"-type compact "akebono" plants are also found in Japan.

Apart from their leaves, *Clivia* with "akebono" variegation also have creamish peduncles, pedicels and berries, making them stand apart from other types of variegates. Interestingly, Sasaki has noted some similarity with "negishi(fu)" which also have creamish or yellowish green peduncles and pedicels.

In Toowooba, Kevin Walters has named an "akebono" plant which appeared spontaneously as 'Florence Cornford'. Here the "akebono" stripes are deep cream in colour and also feature more in the centre of the crown, although I assume that there is

seasonal variation and as with other "akebono", where the lighter, contrasting colour becomes more pronounced during an approximate six- to eight-week period in late winter and spring. Connie and James Abel outline this feature clearly in *Clivia* 6 (pp.54-56). The Abels also describe "akebono" as usually having one stripe per leaf, with the bands of older leaves remaining close to the centre while the bands on the younger leaves are pushed out to the periphery of the plant. According to Sasaki, there are further variations within "akebono" plants themselves (*Clivia* 5, p.54).

With less distinct bands than in Japanese "akebono", the Light of Buddha variegation has been developed in China (*Clivia* 6, pp.74-80). Here the leaf colour has areas which are more yellow as a result of chlorophyll being distributed throughout the leaf. In recent years, several Japanese growers have imported Light of Buddha seed from China, and so it is now being grown in Japan as well. A variation of this type of plant which is known as Starlight Light of Buddha involves darker coloured dots on the leaves (*Clivia* 6, p.77).

An exciting new development in Japan is the emergence of a new Tiger variegation (unconnected with the older virus-induced 'Taihoh', also known as 'Tiger'), with horizontal, tiger-like bands. Sasaki has described this new pattern discovered and now bred by Hiroshi Mitsuhashi and has also included photographs in *Clivia* 10 (pp.59-62) (as well as on our website). He suggests that the Tiger variegation looks like a scab or welt on the surface of the leaf but that the pattern can also be seen on the leaf's underside.

I am aware that Chinese *Clivia* breeders have identified and developed further categories of variegation in their plants, but as I am not personally familiar with these, I can only refer those interested to the available literature from China or elsewhere.

2. Cultivation of variegates

Position is probably the key to growing variegates, as any direct sun is likely to easily burn the section of the leaf without chlorophyll. For this reason, growing the plants in pots and positioning these in shady areas, probably under shade cloth or another protected area, is highly recommended. Even then, I still experience some dieback in the non-chlorophyll sections of certain leaves, which suggests that these plants need a higher level of shade than other green-leaved *Clivia*. A member of the Cape Clivia Club (South Africa) who reportedly grows variegates well states that the plants need to be under shade where the wind can cool them. If this is done, then the "browning" can be reduced.

Different people give different recommendations for the watering and fertilizing of variegates. One South African grower recommends not giving additional fertilizer other than what is used when repotting, but he repots his plants annually; others recommend giving somewhat less fertilizer (eg about two-thirds the amount given to a green-leafed plant), while still others recommend to give basically the same amount of fertilizer to variegates as to non-variegates, except in the case of those plants which are very strongly variegated (with large non-chlorophyll areas), where the amount would be reduced appropriately. My own practice is to give all seedlings - variegates or not - the same amount of liquid fertilizer, and to give slightly less solid fertilizer to mature plants. But I admit to not knowing the "best" solution. Watering is more or less the same as for fertilization.

Overall, variegates tend to be slower growing, because the non-green leafed sections of the leaves do not contain chlorophyll and therefore do not contribute to the energy needs of the plant that are derived from photosynthesis (*Clivia* 6, p.54).

3. Propagating variegated *Clivia*

It is commonly believed that variegation in Clivia is due to maternal inheritance, that is to say, the variegation is passed through the seed (or pod) parent. A few people believe that there may also be some paternal (pollen) parent influence, but the extent, if any, remains unclear. This claim concerning maternal inheritance applies to the longitudinal variegates, apart from "fukurin", median variegates or Mandarin Duck variegates, none of which can be propagated purposefully from seed. The rule also largely applies to the horizontal variegates, but the new Tiger variegate constitutes an exception.

When using a striata variegate plant as the seed (or maternal) parent crossed with a non-variegate pollen parent, three kinds of seedlings can be expected to emerge:

1. Green leaves;
2. Leaves with variegation; and,
3. Albino (yellowy leaves, without chlorophyll), that will soon die.

On the basis of their breeding, Mick Dower (Cape Clivia Club) and others have confirmed that use of thinly striped variegates (striata type) as the seed parent produces a range of offspring from thin pinstripe through to broad variegation, with no albinos (though I gather there is some disagreement about this), whereas the broader or stronger the variegation is in the seed parent, the higher the occurrence of albinos, even 100% in some cases. These albinos, unfortunately, will not survive. While some people prefer the visual appearance of a plant with broad stripes, a thinly striped plant is better for breeding purposes. Mick Dower has also observed that if pinstriped variegates are used as both the seed and pollen parents, then more variegation occurs in the offspring. Commonly, however, a non-variegate parent is used as the pollen parent. Sasaki recommends that for breeding purposes, we select seed parents where the stripes are no more than 30% of the total surface of the leaves (*Clivia* 5, p.53).

For growing variegates, John van der Linde (also Cape Clivia Club) has recommended selecting seed from berries which are striped. I actually noted on a label once that I sowed seed from a green-coloured berry (on a lightly variegated interspecific), without variegation, but observed that some variegates emerged among the seedlings. Whether the berries did actually have some variegation that my eye could not see remains unclear. For the propagation of striata variegates, Nakamura deliberately selects berries with thin stripes (*Clivia* 5, p.53).

In recent communication, Sasaki recommends that those of us who own striata-type variegates should closely observe the green flower buds before they open. He suggests that some might have thin variegation on the buds themselves. He further claims that in cases where the variegation on the buds is quite pronounced, these may make good breeding parents.

My own experience confirms that sometimes variegated seedlings emerge from an apparent green-leafed plant, as noted above even though the latter sometimes display variegation in a subsequent off-shoot. Smith suggests that generally, when a green-leafed plant produces variegated offspring, it is because the "green" plant is actually a lightly variegated plant to start with.

Although the "akebono" (and I expect also the LOB) pattern is apparently inherited 100% in the seedlings, I have personally found "akebono" and to a lesser extent, Light of Buddha, seedlings difficult to raise from the outset, though the Abels (*Clivia* 6) recommend to delay sowing the seed until early to mid-summer when the new leaves will emerge green due to the seasonal characteristic of the "akebono" banding (Clivia 8, p.17).

"Fukurin" variegation needs to be increased through offsets, and for this purpose, sometimes cuts are made at the base of a parent plant to vegetatively increase the offsets more quickly (see the photo of Nakamura performing such a cut on the website). Plants exhibiting "fukurin" variegation are thus available in Japan, albeit on a very small scale, through division.

An exception to the pattern of maternal inheritance is the newly discovered Tiger pattern of Mitsuhashi, which is transmitted, to a certain extent, when Tiger is used as the pollen parent (see Sasaki, *Clivia* 10).

4. Breeding

In our collections, variegates are predominantly found in *C. miniata*, though nowadays thanks to the breeding of Nakamura and others, there are a few interspecifics which have variegated leaves. In Japan I had the impression that variegates were often produced by other commercial growers for their leaves alone, irrespective of the flower. So here is a definite opportunity for the hobbyist to breed for improved flower form and colour.

If we use a good pollen parent, even on a fairly ordinary flowering variegate, we can breed for other colours, such as yellow, peach or other pastel colours. We can also use other species crossed to *C. miniata* with variegation to get different shaped leaves and flowers out of the main *C. miniata* flowering period of early spring. Furthermore, we can aim to introduce other characteristics into the variegate, such as polytepal (multipetal), Ghost, bicolours and so on.

Importantly, we only need one variegate mother plant to start with.

5. Conclusion

The feature of variegation in *Clivia* adds an extra level of enjoyment to the growing of this plant. A variegate provides an excellent addition to one's collection, especially for those growing their own seed. Some people may be lucky and find a variegate among the plants or seedlings that they already possess. However, variegates cannot be considered as garden

plants but rather as something special that may need a little extra attention, most particularly, pertaining to where the plant is placed. Those who are beginning to grow Clivia may be better to practise growing green-leafed plants or seedlings, and after they have developed some confidence, consider growing a variegate. In general, though, a variegate with thin, striata-type stripes is unlikely to have special requirements, other than sufficient shade and probably also good ventilation. On the other hand, growing and propagating different types of variegates is a challenge which, no doubt, many of our experienced growers find very satisfying.

Notes: Thanks to those friends who read my drafts, especially Ken Smith who advised on the categorization and some definitions.

References

Abel, C. & J. (*Clivia* 6) "Observations on *Akebono*", pp.54-56.

Dixon, R. (*Clivia* 8) "Types of variegation in *Clivia*", pp.73-76.

Dixon, R. & K. Hammett (2004) "Guide to the classification and exhibition of *Clivia* (draft). Accessed 13/4/09. Available from http://www.cliviasociety.org/clivia_guide_main.php#Classification.

Grebe, H. (*Clivia* 6) "In search of a 'Light of Buddha'", pp.74-80.

Marriott, H. (*Clivia* 8) "Nakamura's contribution to *Clivia* Breeding", pp.6-18.

McClelland, W. (& K. Haeberle, illustrator), "Illustrated terms and definitions"/"Illustrated definitions for how to describe clivia". Accessed 13/4/09.
Available from http://www.clellansown.com/descriptiveterms.php.

Sasaki, S. (*Clivia* 3) "*Clivia* in Japan", pp. 24-72.

Sasaki, S. (*Clivia* 5) "Variegated *Clivia* in Japan", pp.52-56.

Sasaki, S. (*Clivia* 10) "Recent developments in *Clivia* Breeding in Japan", pp.59-64.

Zonneveld, B. (*Clivia* 8) "Variegation in *Clivia*", pp.66-72.

Why keep clivia records?

- For breeding purposes— so you know what characteristics the crossing of certain plants produces. You may want to try a good cross again or avoid a bad one.
- For the sale of seedlings. Buyers like to know the breeding of a plant they purchase.

What if you do not have a computer?
If you do not have a computer, the card file system is fine.

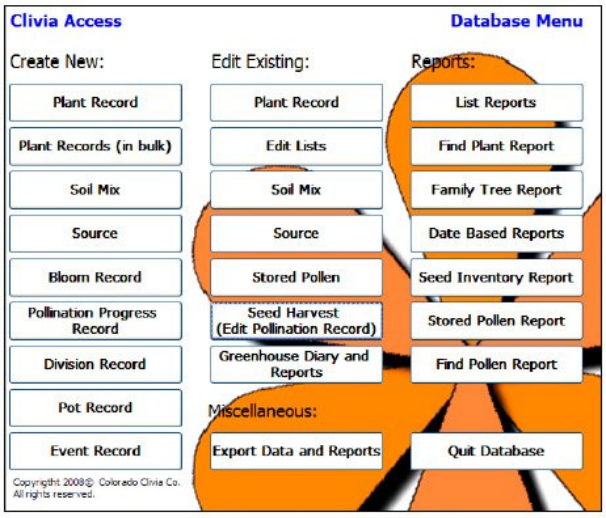
Why keep clivia records on a computer?
Storing records electronically is a more efficient and faster alternative to writing by hand. With electronic records you can store digital images against the record for fast retrieval including parentage photos, duplicate a record (convenient when you have 50 seedlings of a particular cross), and keep records orderly and organised.

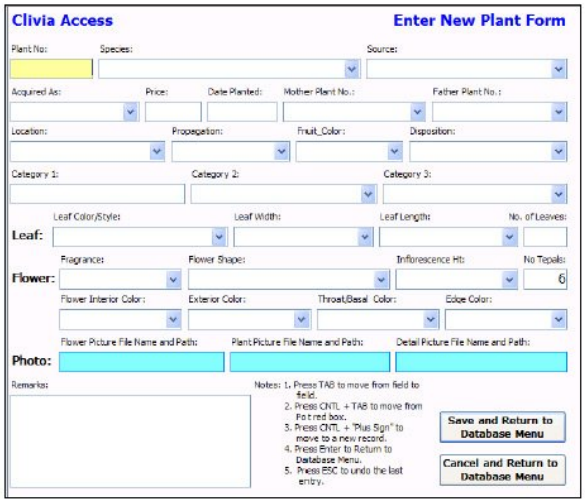
Tips for keeping records

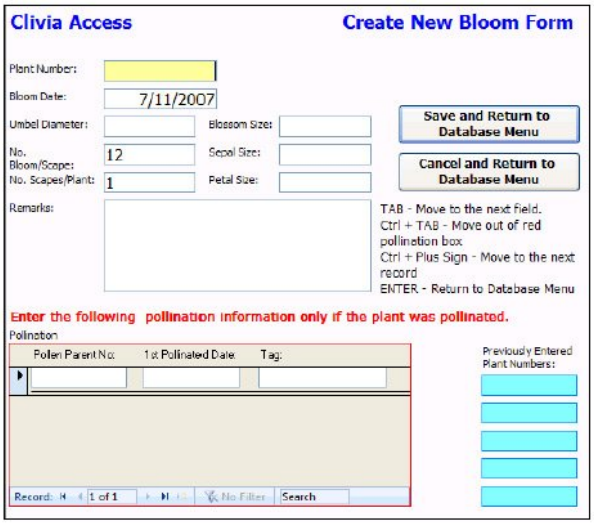
- Always list the pod parent first in a cross. For example, Belgium Hybrid X Aurea, where the Belgium Hybrid represents the pod parent and Aurea, the pollen parent. This standardisation may avoid misunderstandings when buying or selling in the future.
- Use unique ID numbers in the database record which corresponds to the plant tag ID number. This ensures that the plant is clearly identified for quick reference.
- Always back up electronic records or a database to CD, DVD or removable storage device in case of disaster.
- Print out the database list of plants so you can take it to your plants when you are working with them.

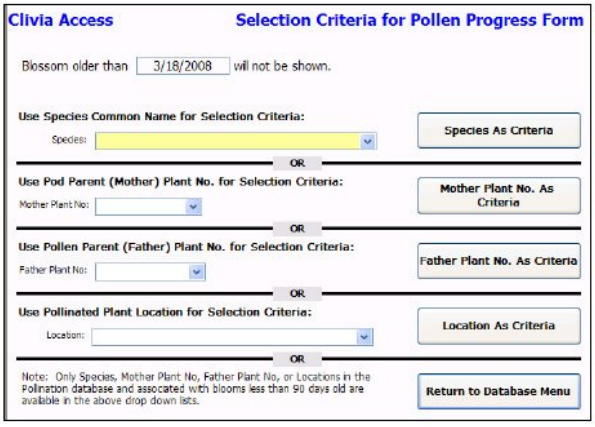
Software written for clivia breeders and growers
Cliviabase – developed by Gideon Scheepers http://www.cliviabase.co.za/
This program is priced at ZAR100 which is approximately AUD $15.
It is easy to use and has the functionality to add information on seeds, seedlings, plants, pollination, fertilisation, parentage, species, as well as plant and flower characteristics.
There is a limitation on some aspects of a plant record where only current information is stored.

Clivia Access developed by Colorado Clivia Company - http://www.coclivia.com/
There is a limited trial version to try or buy for USD $100.
This program is very detailed and complex and takes time to set up prior to use. It has provision for bulk entry as well as individual entry.
Possibly suitable for a big grower or commercial nursery.





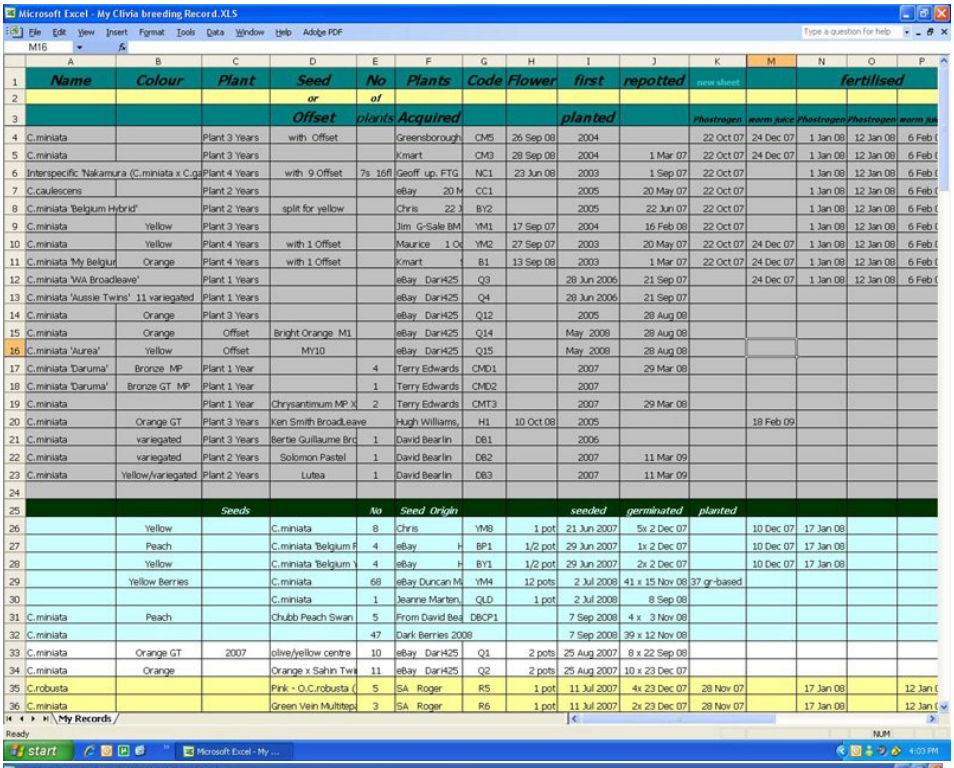




My Clivia Records

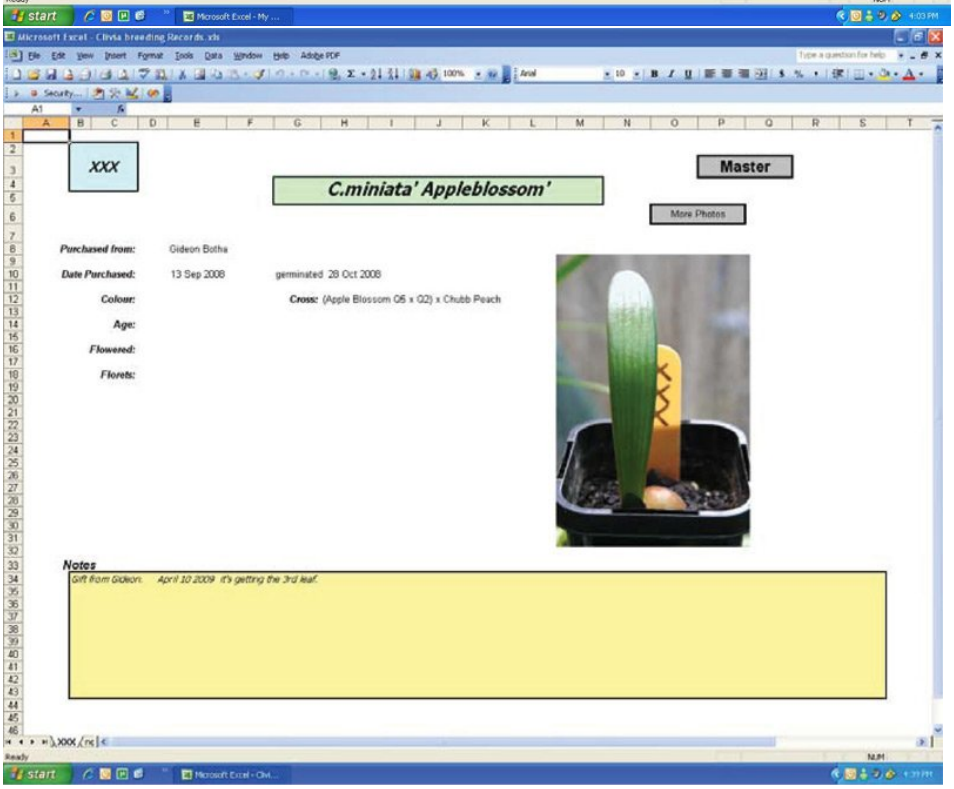
I made my own Excel spreadsheet to keep a record of my activities. After acquisition I give the plant, offset or seed an ID code so I can track its growing life whilst in my possession.

This is an example of my records:



Name	Colour	Plant	Seed or Offset	No of plants	Plants Acquired	Code	Flower	first planted	repotted	fertilised
C.miniata		Plant 3 Years	with Offset		Greensborough	CM5	26 Sep 08	2004		22 Oct 07
C.miniata		Plant 3 Years			Kmart	CM3	28 Sep 08	2004	1 Mar 07	22 Oct 07
Interspecific 'Nakamura (C.miniata x C.ga		Plant 4 Years	with 9 Offset	7s 16fl	Geoff up. FTG	NC1	23 Jun 08	2003	1 Sep 07	22 Oct 07
C.caulescens		Plant 2 Years			eBay 20 M	CC1		2005	20 May 07	22 Oct 07
C.miniata 'Belgium Hybrid'		Plant 2 Years	split for yellow		Chris 22 J	BY2		2005	22 Jun 07	22 Oct 07
C.miniata	Yellow	Plant 3 Years			Jim G-Sale BM	YM1	17 Sep 07	2004	16 Feb 08	22 Oct 07
C.miniata	Yellow	Plant 4 Years	with 1 Offset		Maurice 1 Oc	YM2	27 Sep 07	2003	20 May 07	22 Oct 07
C.miniata 'My Belgiur	Orange	Plant 4 Years	with 1 Offset		Kmart	B1	13 Sep 08	2003	1 Mar 07	22 Oct 07
C.miniata 'WA Broadleave'		Plant 1 Years			eBay DariH25	Q3		28 Jun 2006	21 Sep 07	
C.miniata 'Aussie Twins' 11 variegated		Plant 1 Years			eBay DariH25	Q4		28 Jun 2006	21 Sep 07	
C.miniata	Orange	Plant 3 Years			eBay DariH25	Q12		2005	28 Aug 08	
C.miniata	Orange	Offset	Bright Orange M1		eBay DariH25	Q14		May 2008	28 Aug 08	
C.miniata 'Aurea'	Yellow	Offset	MY10		eBay DariH25	Q15		May 2008	28 Aug 08	
C.miniata 'Daruma'	Bronze MP	Plant 1 Year		4	Terry Edwards	CMD1		2007	29 Mar 08	
C.miniata 'Daruma'	Bronze GT MP	Plant 1 Year		1	Terry Edwards	CMD2		2007		
C.miniata		Plant 1 Year	Chrysantimum MP X	2	Terry Edwards	CMT3		2007	29 Mar 08	
C.miniata	Orange GT	Plant 3 Years	Ken Smith BroadLeave		Hugh Williams,	H1	10 Oct 08	2005		18 Feb 09
C.miniata	variegated	Plant 3 Years	Bertie Guillaume Brc	1	David Bearlin	DB1		2006		
C.miniata	variegated	Plant 2 Years	Solomon Pastel	1	David Bearlin	DB2		2007	11 Mar 09	
C.miniata	Yellow/variegated	Plant 2 Years	Lutea	1	David Bearlin	DB3		2007	11 Mar 09	

Seeds				No	Seed Origin			seeded	germinated	planted		
	Yellow		C.miniata	8	Chris	YM8	1 pot	21 Jun 2007	5x 2 Dec 07		10 Dec 07	17 Jan 08
	Peach		C.miniata 'Belgium F	4	eBay H	BP1	1/2 pot	29 Jun 2007	1x 2 Dec 07		10 Dec 07	17 Jan 08
	Yellow		C.miniata 'Belgium Y	4	eBay H	BY1	1/2 pot	29 Jun 2007	2x 2 Dec 07		10 Dec 07	17 Jan 08
	Yellow Berries		C.miniata	68	eBay Duncan M	YM4	12 pots	2 Jul 2008	41 x 15 Nov 08	37 gr-based		
			C.miniata	1	Jeanne Marten,	QLD	1 pot	2 Jul 2008	8 Sep 08			
C.miniata	Peach		Chubb Peach Swan	5	From David Bea	DBCP1		7 Sep 2008	4 x 3 Nov 08			
C.miniata				47	Dark Berries 2008			7 Sep 2008	39 x 12 Nov 08			
C.miniata	Orange GT	2007	olive/yellow centre	10	eBay DariH25	Q1	2 pots	25 Aug 2007	8 x 22 Sep 08			
C.miniata	Orange		Orange x Sahin Twi	11	eBay DariH25	Q2	2 pots	25 Aug 2007	10 x 23 Dec 07			
C.robusta			Pink - O.C.robusta (	5	SA Roger	R5	1 pot	11 Jul 2007	4x 23 Dec 07	28 Nov 07		17 Jan 08
C.miniata			Green Vein Multitep	3	SA Roger	R6	1 pot	11 Jul 2007	2x 23 Dec 07	28 Nov 07		17 Jan 08



The headings of my columns should be self explanatory.

The different colours are for

- plants and offsets in grey
- different origins of acquisition of seeds i.e. breeders in colour

The codes are also hyperlinks and take you to another page.

Showing on the left is a page of an individual plant.

The more Photos button takes you to a page with photos of its life while the Master button takes you back to the spreadsheet.

Any questions are welcome

george-oz@hotmail.com

MINUTES OF GENERAL MEETING – 17th April 2009

Venue
Uniting Church, Cnr Burwood Hwy & Blackburn Roads, Burwood

Committee
Helen Marriott, Lisa Fox, Rae Begg, Diane Mathews, George Simmler, Brenda Girdlestone

Apologies
Reg Bussell, Audrey Anderson, Laurens and Sharon Rijke

- Meeting commenced at 7.35.
- Introduction by Helen Marriott.
- Previous minutes were accepted by Lyn Rawson, seconded by Di Mathews.

Business Arising
- The change to the Model Rules has been confirmed and accepted by Consumer Affairs.

New Business
- No secretary report other than to mention the next deadline for material for the newsletter is the 10th May 2009.
- There is a new clivia book to be published. Pre-publication orders are available. Ken Smith will be submitting a group order. Helen Marriott will list all members that wish to pre-order.
- June meeting presentation topic will be on clivia species and will be conducted by John Bannenberg. Please bring along any species plants you have.

Treasurer's Report

Opening Balance	$1039.30
Income – Memberships/Raffle/TT	$ 249.00
Expenses – Hall Hire/Web/Newsletter/ Consumer Affairs/Postage	$ 285.70
Balance	$1002.60 including petty cash $95

Main presentation – Variegates by Helen Marriott

Minor presentation – Databases by Lisa Fox

- The raffle prize was a gardenii donated by Ray Argent. We wish to thank Ray for this donation. The raffle was won by John Ritchie. Second prize raffle was an Interspecific offset donated by Yvonne Hargreaves. We wish to thank Yvonne for the donation. This was won by Erika van der Spuy.
- Rae Begg discussed a new potting medium suitable for clivia from Debco that will be available in Bunnings stores. More information when it is available.
- Meeting closed 9.10.

END