Foreword

Special Edition Reference Book on Interspecific Hybrid Clivias

The end of July here in the Southern Hemisphere means, spring is looming and best of all Interspecific Flower Season is now in full swing here in South Africa. Words always fail to describe the breathtakingly beautiful Interspecific Clivia flowers during this time of year. I get blown away by the spectacular colours and the potential hiding in the genes of these extraordinary plants.

Occasionally in life our paths cross with someone unique - a special connection is made...When.you.ask.them.their.age.the.reply.is:."69.years.young."..Even.more.unusual. if it is someone you've never met face to face before. A few years ago, I was privileged to meet Gary Conquest, via the internet.

What an honour to articulate the foreword of a book for someone who has been involved in Clivias for almost their whole life. Well known and loved by many Clivia enthusiasts around the world, Gary is dedicating his time to document and unselfishly share tons of information about these plants with as many people as possible. He already has three editions of Growing Clivias for Beginners Reference Books to his name.

Although Interspecific Clivia crosses are not something new it has only in recent years become a mainstream breeding focus in the Clivia World, opening up a magnitude of flower colour variations, patterns and shapes with an extended Clivia flowering season to mention a few qualities.

Gary's.main.purpose.has.always.been.to.educate.and.this.reference.book.on. Interspecific Clivias is no exception. It is an extremely valuable and thorough source of information – with contributions from many Clivia breeders and covering all aspects of Interspecific Clivia breeding. I highly recommend this book to all Clivia and plant enthusiasts.

They say the secret to happiness is not what you have or what you've. accomplished. It is about who you have lifted up, who you have made better. It's.about. what you have given.

Well done Gary. You are a true ambassador for Clivias.

I look forward to meeting you in person, one day, over a cup of coffee and discuss amongst other things, Interspecific Clivias.

Until then.

Manie Maree

Clivias4africa

21 July 2020

SPECIAL Reference Book for growing Clivias for Beginners

August 2020

INTERSPECIFIC Clivias

A special Reference Book on growing Interspecific Clivia Hybrids

Many years ago, breeders began experimenting with genetics and there began a new industry on Interspecific Hybrid Clivias. Today, the beautiful colours of the Hybrid Clivias catch the eyes of every lover of Clivia. Within this edition I have obtained articles from renowned breeders of Interspecifics. They are informative, intelligent articles gained from growing experiences.

Kerrie McElroy: 'Wild Child'

Lisa Fox: 'Stanmore Bronzed Green Girl'

World renowned Authors, Breeders and Growers who have graciously allowed their articles to be published here for the betterment of everyone who wishes to go to the next level in growing Interspecific Clivia Hybrids.

(in no special order)

- Helen Marriott, Australia
- Carrie Kruger, RSA
- Pier Theron, RSA
- the Late Rudo Lotter, RSA
- Willie Le Roux, RSA
- Clivia Society, RSA
- Kerrie McElroy, Australia
- Michael Loh, New Zealand
- Lisa Fox, Australia
- Annie de Wet Steyn, RSA
- Tony Barnes, New Zealand
- Francois van Rooyen, RSA
- Lionel Bester, RSA
- Giovanni Bouwer, RSA
- Sean Chubb, RSA

Index of Articles

AN INTRODUCTION TO INTERSPECIFIC HYBRIDS

Helen Marriott

Prologue

Following an introduction to interspecifics at the 21st August 2009 meeting of the Melbourne Clivia Group (MCG), the text below was published in the club's subsequent newsletter in Oct 2009 (Vol. 2.5). As I re-read the text nine years later in 2018, I feel that the basic outline concerning interspecifics still stands today, though in the intervening years we have seen much more breeding, especially in South Africa and on a smaller scale in Japan and elsewhere, of interspecifics. As a result, many more examples could be given of outstanding plants, though most of those specifically referred to below have stood the test of time. In the interim, the breeding of new interspecific hybrids where at least one parent is an interspecific has increased substantially. Furthermore, more resources on *Clivia* have been published. The original 2009 text has not been updated with such content but basically follows the earlier paper with only minor adjustments and with several more photos added.

Introduction

In contrast to intraspecific hybrids which are hybrids between different forms of one *Clivia* species, commonly, but not exclusively *C. miniata*, **interspecific** hybrids are hybrids between different *Clivia* species (Duncan 2008 p.17). Among the various exciting prospects for the development of the genus *Clivia* in the coming years, surely one must be the further advancement of *Clivia* interspecific hybrids involving crossings of the existing species - C*. caulescens, C. gardenii, C. miniata, C. mirabilis, C. nobilis*, and *C. robusta*. To start with, I recommend a visit to some websites that contain photos of interspecific hybrids. A list is given at the end of this text, but for seeing photos of the latest hybrids one of the two email groups/forums is highly recommended as well as the gallery on the MCG website.

Clivia x *cyrtanthiflora* is the name given to the first recorded hybrid bred in Europe in the 19th century between *C. nobilis* and *C. miniata*. This hybrid (or later generations of it) seems to have arrived in Australia relatively early in the country's history of the introduction of *Clivia* and can be found in large massed displays in some Australian botanic gardens (eg Melbourne, Sydney and Adelaide) as well as in some older private gardens. It has often been incorrectly referred to as *Clivia nobilis* in the past in Australia (as well as in some other countries) and sometimes is now informally referred to as oz nobilis. With its original parentage involving *C. nobilis* (a pendulous species with a tubular flower) and *C. miniata* (the non-pendulous species with upright, trumpet-shaped flowers), this is typically a strong plant, may flower two or three times a year and deserves to be more widely grown. It is not commonly available in retail stores, at least in Victoria, and often seems to have been passed around through divisions.

In their natural habitat in South Africa, *Clivia* species that are growing in close proximity occasionally form natural hybrids. In 2006, *Clivia* x *nimbicola* was the first formally described naturally occurring hybrid, involving *C. miniata* and *C. caulescens* (Clivia 5 pp. 78-80; Clivia 8 pp.23-27). A natural hybrid of *C. miniata* and *C. gardenii* is also pictured in Duncan (2008 p.105). While we may learn of other naturally occurring hybrids in the future, it is predominantly

the interspecific hybrids that are increasing in many countries as a result of deliberate breeding efforts.

These days, with the spread of *Clivia* around the world, the various *Clivia* species as well as numerous different types of interspecific hybrids are now increasing in accessibility. We can thus enjoy observing interspecific hybrids in public places as well as in our own gardens or collections, and, if we wish, also create our own hybrids.

Some attractions of interspecific hybrids

Some of the appealing features of interspecific hybrids can be summarized as follows:

- Expansion of the flowering period of *Clivia*, with the interspecifics predominantly flowering in Melbourne from June to August, and with some of them producing another flower stem during another season. *C.* x cyrtanthiflora may produce two to three flowers a year.
- Great diversity of flower form, with new flower shapes and umbels, e.g., semi-pendulous flowers.
- Different leaf combinations, eg, *C. miniata* (daruma-type) x *C. nobilis*.
- New colours and new colour patterns or combinations in flowers, eg, flared green tips, different colour(s) of the inner and outer surfaces of the flowers; and,
- A hugely under-developed category of *Clivia*, thus allowing much scope for new creations.

Indeed, there is considerable potential for the development of *Clivia* with more growing and breeding of interspecific hybrids.

Types of interspecific hybrids

Koopowitz (2002 p.304) proposes a classification of the different types of primary hybrids involving crosses of two different species. He recommends group names be used to cover these hybrids, e.g., *Clivia* Minilescent Group for *C. miniata* x *C. caulescens* and so on. Although these group terms have some limited following, my impression is that the majority of *Clivia* growers or breeders continue to refer to the description of the full cross. Similarly, there is also a tendency for the natural hybrid involving *C. miniata* and *C. caulescens* to be labelled as such, and some people find use of the term C. x cyrtanthiflora also problematic, in that it referred to the original cross made in the 19th century rather than to the subsequent generations bred from it. Sometimes I follow the informal practice of Nakamura of using abbreviations on his own plant labels: MC for (*C. miniata* x *C. caulescens*), MN, MG and so on.

Yoshikazu Nakamura's *C. miniata* x *C. caulescens*

When seeds that are purchased are not specifically labelled, as in "my breeding mix" or else "interspecific hybrid", it is sometimes difficult to identify the parentage of the resultant plant(s), so in addition to the flower, other features such as the leaf and overall appearance of the plant itself, or the flowering time, may need to be considered. Even then, some plants remain indistinguishable, especially as the number of times *C. miniata* is used in the cross increases and it becomes more miniata-like in appearance. When identification is still not possible, statements such as "origin unknown" are sometimes used to accompany photos in published texts.

When an interspecific hybrid is named, sometimes the information on its background is not always readily available. Knowing that Rudo Lotter's 'Chanèl', for example, is an F2 *C. nobilis* x *C. miniata* is useful information for anyone trying to create a similar cultivar. In this regard, Ken Smith's "A checklist and register of Clivia cultivar names" becomes an indispensable reference, though not all named plants are recorded here.

General characteristics

After *C.* x *cyrtanthiflora*, the most commonly available interspecific group/category available in Australia is probably the combination of *C. miniata* and *C. gardenii*. These hybrids are likely to be fast growing, offset readily, flower in winter, and have flowers that may be semi-pendulous, slightly curved and perhaps with green tips on flared tepals. In Melbourne, these interspecifics seem to mainly flower in June and July. Bill Morris's 'Flame' is a large-flowered orange interspecific hybrid of *C. miniata* and *C. gardenii*. The late George Hellen in Queensland often used *C. gardenii* in his interspecific hybridization. Not infrequently, the tepals of the hybrids exhibit green tips, inherited from the *C. gardenii* parent, but sometimes the green colour can be diffused throughout the tip area. The yellow interspecific 'Moondrops' (see photo in Clivia 2 p.39) is one well-known example, among others, from the Wessel/Rudo Lotter family, which has specialised in interspecifics. 'Moondrops' is an F2 hybrid of *C. gardenii* x yellow *C. miniata*. The interspecific named 'Gay Delight'(Clivia 8 p.10 where it is misspelt) which was grown from Nakamura seed by Laurens Rijke was on display at our last meeting. It has an attractive multicoloured flower and is thought to be an F2 *C. miniata* x *C. gardenii* cross (not a cross with *C. caulescens* as originally claimed). Shige Sasaki has recently crossed an orange C. *miniata* with multitepals x C. 'Heleborus', an interspecific of unknown which has a slight green centre. The offspring is bronze in colour, with a green centre, and as expected in the F1, does not have multitepals but these should emerge in the F2.

Bill Morris's 'Flame'

Yoshikazu Nakamura's 'Gay Delight'

Shige Sasaki's Multitepal x 'Heleborus'

New crosses of *C. miniata* and *C. nobilis* tend to be labelled as such. Here, the leaf texture and leaf tips, as well as its floriferous characteristic seem to be strongly influenced by the *C. nobilis* parent. These hybrids also may inherit some green colouration. The plants often flower in winter and may produce a second flower in another season. 'Chanèl', mentioned above, was described by Rudo Lotter as a kind of bicolour, with the outer surface of the tepals being red and the inner surface yellow. I have heard, however, that as the flower ages this distinction is weakened.

Interspecific hybrids of *C. miniata* and *C. caulescens* typically flower in July/August in Melbourne, but also may produce flowers at other times, such as summer. At one stage Yoshikazu Nakamura (Japan) bred some extraordinary hybrids, and Laurens Rijke was fortunate in purchasing a good quantity of these seed. Inheriting the large plant form of *C. caulescens*, the interspecific hybrids may grow into largish plants themselves. Yoshikazu Nakamura's outstanding cultivar 'Daydream' combines *C. miniata* and *C. caulescens* (see below). 'Mandala', which is featured on the cover of Duncan's (2008) publication, is also a hybrid of *C. miniata* x *C. caulescens*. 'Stanmore Moulin Rouge', another Nakamura hybrid named and owned by Nick Powell (Queensland), is produced from (*C. miniata* x *C. caulescens*) x self. Keith Hammett, in New Zealand, has also produced some excellent interspecific hybrids, including 'Golden Nugget', a cross of (*C. caulescens* x *C. miniata*) x self (see Clivia 9 p.51).

Yoshikazu Nakamura's 'Daydream'

Nick Powell's 'Stanmore Moulin Rouge'

Following the discovery of *C. mirabilis* in 2001, the South African National Biodiversity Institute (SANBI) has actively been utilizing this new species in a range of interspecific hybrids which first flowered in 2006 (Clivia 9 pp. 47-48; Duncan 2008 p.110-111). *C. robusta* has also been used in interspecific hybrids by breeders and collectors during the last decade or more.

When we have interspecific hybrids in our collections there will be many observations that we can make. For instance, if an interspecific hybrid produces flowers at different times of the year, we may observe a change in the flower colour across the different seasons or even in different growing situations. This seems to be due to environmental factors, especially the light intensity. In my own experience, the Australian form of *C.* x *cyrthanthiflora* can flower regularly in any of the four seasons, and flowers more often than any of the other interspecific hybrid forms. In contrast to *C. miniata*, many interspecific flowers have a solid colour inside, rather than a

contrasting throat colour in the basal area, as tends to be the case with orange-flowering *C. miniata*.

Breeding interspecifics

While *Clivia* can be enjoyed either as pot or garden plants, some of us will also be interested in the hybridization of interspecifics. In his introduction of interspecific hybrids, Rudo Lotter (CD or website) indicates that when colour mutations, leaf variations and other genetic variations within the six species are taken into consideration, an endless array of breeding possibilities exist. Quite commonly *C. miniata*, with its many variations, is used as the seed or mother parent and then crossed with one of the pendulous species, but it is also sometimes used at the pollen parent. Although there are some differences of opinion, it is thought that each parent contributes 50% to the genetic constitution of the offspring (eg Wessel Lotter, Clivia 2 p.34; Johan Spies, Clivia 8 p.35). While inheriting characteristics of both parents, Rudo Lotter claims that a cross between *C. gardenii* and *C. miniata* will be more pendulous looking than a cross of *C. miniata* x *C. gardenii*. Undertaking a reciprocal cross, where each parent is used as the seed or maternal parent and vice versa is the best way to investigate the differences of using the same parent as the seed or pollen parent. Less commonly, pendulous species are crossed between themselves.

Wessel Lotter indicates that not all interspecifics will be attractive and he himself personally prefers those that are semi-pendulous, semi-open, gracefully curving flowers (Clivia 2, p.40). Different people, nevertheless, appreciate different flower forms and some of us like many different variations.

To maximize the potential of interspecifics, the breeding of more than one generation is necessary. Rudo Lotter, for example, argues that in a first generation cross (F1), such as crossing *C. miniata* x *C. gardenii*, the siblings will not exhibit a lot of variation. To bring out further characteristics that are recessive, the best F1 siblings are crossed between themselves (or selfed) to create the F2 generation. It is through this method that we can obtain yellow interspecifics in the second (ie F2) generation.

These days an increasing number of yellow interspecifics are available, but if we wish to breed our own, this can be achieved using a good form of yellow *C. miniata* and crossing it to one of the other species. By following Wessel Lotter's (Clivia 2, p.41) example of a step-by-step description of an interspecific hybrid involving *C. miniata* x *C. nobilis*, reproduced below, a yellow interspecific will emerge:

(1) Cross *C. miniata* (yellow) x *C. nobilis* (or any other species) =
100% F1 orange split (heterozygous for) yellow hybrids.

(2) F_1 orange split yellow hybrid x F1 orange split yellow hybrid =
25% F2 yellow hybrids
25% F2 orange hybrids
50% F2 orange split yellow hybrids.

(3) F_2 yellow hybrid x F2 yellow hybrid =
100% F2 yellow hybrids.

(Clivia 2 p.41).

In other words, a yellow interspecific hybrid can be achieved in the second generation.

Although it has been suggested that we only need to proceed to the second generation (F2) in interspecific hybridization, Keith Hammett indicates that quite often, recessive traits are not expressed until generations much later than the F2 (personal communication), so there may in fact be reason to proceed to F3 or F4 though sibling crosses or selfing.

Yoshikazu Nakamura's experience is that excellent interspecfic hybrids can be achieved already by the second generation (F2). He has often selfed his F1 interspecific hybrids, thereby bringing out many attractive features in the flowers of the F2 generation. In selecting parents to hybridize, he pays attention to small features found in the species parent that might be accentuated in the subsequent interspecific hybrid, for example a round tepal in a small pendulous flower. 'Clementina', named by Laurens Rijke, is probably the very best cultivar to emerge from Yoshikazu Nakamura's crossing of (*C. miniata* x *C. caulescens*) x self (see Clivia 7, inside cover). Note that if an F1 interspecific (or any other F1 for that matter) is subsequently used in a cross with a different parent, it becomes a new F1.

Main hybridization patterns

In his classification of interspecific hybrids, Graham Duncan (2008:101) defines primary interspecific hybrids as "first generation hybrids between different *Clivia* species". A cross of *C. miniata* x *C. gardenii*, or *C. gardenii* x C*. miniata* is thus a primary interspecific hybrid. Numerous other examples have been noted above. Given the increasing availability of these primary interspecific hybrids in recent years, these plants are now often being used in new crosses, whether it is with *C. miniata* or another combination. Graham Duncan refers to such crosses as advanced hybrids, involving hybrids between primary hybrids and species. Where three or more species are involved, Keith Hammett recommends that the term complex hybrid is an appropriate term (personal communication).

Although *C.* x *cyrtanthiflora* is already a primary hybrid, it is now often crossed to *C. miniata* again. Given its widespread distribution in many *Clivia*-growing countries, it is not surprising to find it used in many new interspecific hybrids. The photo of Lisa Fox's attractive plant, 'Felicia', bred by John Craigie in Queensland and reproduced in the July newsletter and the current website, is yellow *C. miniata* x *C. cyrtanthiflo*ra. Kevin Walters has named another delightful cross of *C.* x *cyrtanthiflora* x orange *C. miniata* as 'Sakura'. My own crosses using *C.* x *cyrtanthiflora* are now beginning to flower and I am interested to see the amount of variation that occurs, particularly based on whether *C.* x *cyrtanthiflora* is used as the seed or pollen parent and according to the use of different *C. miniata* (or other) parents.

John Craigie's 'Felicia'

In the May 2009 MCG newsletter (Vol. 2.3), John van de Linde outlined his experiences of undertaking a reciprocal cross of [*C. miniata* x (*C. caulescens* x *C. miniata*)] x *C. miniata*. He reports obtaining a higher flower count where the interspecific was used as the maternal plant in the cross. Yoshikazu Nakamura's special cultivar 'Daydream', mentioned above, is a hybrid of (orange *C. miniata* x yellow *C. miniata*) x (*C. caulescens* x yellow *C. miniata*) (see Clivia 8, pp.13-15; Clivia 9, pp. 49-54). In quite a lot of his hybridization, this breeder has used (orange *C. miniata* x yellow *C. miniata*) as one parent, and this also applies to his interspecific hybrids such as 'Daydream' and others.

When backcrossed to *C. miniata*, the flowers of the interspecific hybrids are characteristically larger in size and sometimes look more *C. miniata*-like. Laurens Rijke has produced some lovely interspecifics hybrids using Yoshikazu Nakamura's orange (*C. miniata* x *C. caulescens*) x *C. miniata* 'Aurea', achieving a number of highly attractive plants from just one cross, some of which have been named, such as 'Patsy', 'Pansy', 'Primrose' and 'M. Rose', displaying a range of different flower shapes and colours. Whereas the majority of primary interspecifics or variations of them seem to flower in Melbourne during June and July, the interspecifics that are crossed back to *C. miniata* primarily flower during August, thus overlapping with the start of the main *C. miniata* flowering season itself.

Laurens Rijke's 'Pansy'

Yoshikazu Nakamura's interspecific with *C. nobilis* in its heritage

If we wish to retain the predominantly pendulous/semi-pendulous feature of an interspecific, rather than to cross it back to *C. miniata*, two hybrids of the same type could be crossed together, as in a sibling cross, for example, (*C. miniata* x *C. caulescens*) x (*C. miniata* x *C. caulescens*). Alternatively, to produce an interspecific hybrid that will carry a variety of different genes and which might flower at different times of the year, one could cross hybrids based on different species, such as (*C. gardenii* x *C. miniata*) x (*C. caulescens* x *C. nobilis*). Another way is to cross an interspecific hybrid to a single species, as in (*C. miniata* x *C. caulescens*) x *C. gardenii*.

The Queenslander mentioned above, George Hellen, sometimes backcrossed his (*C. miniata* x *C. gardenii*) to either *C. miniata* or to *C. gardenii*. The cross that I own of 'Green Imp' is of the latter type and this may explain the predominance of green in the tip and median section of the flower, since it has *C. gardenii* twice in its parentage. In 2009 Yoshikazu Nakamura backcrossed some yellow interspecifics (based on *C. miniata* and *C. gardenii*) to yellow *C. miniata* and, as expected, found all green-pigmented seedlings. He planned to cross these yellow interspecifics with (orange *C. miniata* x yellow *C. miniata*) the following year and no doubt hoped for some new and different colouration patterns in the resulting flowers.

George Hellen's 'Green Imp'

Creating our own interspecific hybrids

It is certainly not difficult to create our own interspecific hybrids. Planning the goals of the hybridization and then selecting suitable parents is a good place to start. This may involve selecting features in the parents that we wish to produce in the offspring.

Since the different species may flower at different times of the year, storing pollen in the refrigerator (or freezer) will probably be necessary, making sure that it is labelled and dated. Pollen might also be available at MCG meetings from time to time. Some people say that pollen will remain viable in the freezer for seven years; kept in the refrigerator, the pollen will certainly last for the season (or year) when it is used but probably up to three years.

Interspecific hybrids with variegation are still relatively unusual, so using a variegated *C. miniata* would be a good choice for those who like variegates. Crossing interspecifics that we already own back with *C. miniata* or with another species is also worthwhile. In other words, there are seemingly endless possibilities. It goes without saying that we should keep full records of our crosses.

Variegated interspecific of *C. miniata* x *C. gardenii*

Current and new directions in breeding

It is interesting to speak with breeders about their current work in interspecific hybridization or to view photos of some of the outcomes. We can also examine some of the seed lists that are put out by *Clivia* growers from around the world to see examples of the crosses that they are currently making. At the forum held in New Zealand in October 2008, Jim Shields suggested that the most interesting developments in *Clivia* will come from among the serious backyard hybridizer. Although he made this remark in general, it is not hard to envisage that growing and breeding interspecific hybrids is one area where creativity – or sometimes luck? – may have a role. In any case, we can continue to be stimulated by seeing some of the fantastic new crosses arising from hybridization that is being done locally, nationally and internationally.

Websites (as of 2009) to view photos of interspecific hybrids:

MCG: (http://www.melbournecliviagroup.org.au/gallery.html)
Rudo Lotter: http://www.rudosclivias.co.za/ (see under Clivia showcase)
Shige Sasaki: http://members.jcom.home.ne.jp/clivia.3/ (see under My collection: Interspecific hybrids; Nakamura collection: Interspecific hybrid)

Other internet resources:
Yahoo Clivia Enthusiast group: tech.groups.yahoo.com/group/clivia-enthusiasts/
The Clivia Forum: www.cliviaforum.co.za

My thanks to Keith Hammett for advising on an earlier draft of this text.

References

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Lotter, W.J. (Clivia 2) Advanced hybridising of *Clivias*. (pp. 34-41)

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

Marriott, H. (Clivia 9) *Clivia* caulescens and its hybrids. (pp.49-54)

Rourke, J. (Clivia 5) Natural interspecific hybrids in *Clivia*. (pp. 78-80)

Spies, J. (Clivia 8) Genetic aspects of *Clivia* breeding. (pp.31-38)

Truter, J.T. et al. (Clivia 8) *Clivia* x nimbicola – a stunning beauty from the Bearded Man. (pp. 23-27)

Bells of Beauty – Interspecific Clivias *(written by Carrie Kruger Utopia Clivias, South Africa)*

These days, with the spread of *Clivia* around the world, numerous different types of interspecific hybrids are now increasing in accessibility. We can thus enjoy observing interspecific hybrids in public places as well as in our own gardens or collections, and, if we wish, also create our own hybrids.

While Clivias can be enjoyed either as pot or garden plants, some of us will also be interested in the hybridization of Interspecific varieties. When colour mutations, leaf variations and other genetic variations within the six species are taken into consideration, an endless array of breeding possibilities exist.

Although the Interspecific Clivia is not well known to the general public, they are grown and collected by most Clivia growers all over the world.

Interspecific "MirrorJoy"

What are interspecific Clivias?

These are plants that have been bred from crosses between the different **Clivia** species.

The resulting Clivia is then referred to as an interspecific. This is a new trend in breeding Clivia which may flower at different times of the year.

The flowers are pendulous, but larger and more open than those of the original wild species. In second and third generations flowers become larger with more flared or open flowers.

These plants can flower any time between May and September yearly, with the main flowering time in July when Clivia clubs have small interspecific shows and displays to promote these plants.

Interspecific f1 "Lemon`n Lime"

Interspecific f2 "Hey You"

How do we breed/create Interspecific Clivias?

Among the various exciting prospects for the development of the genus *Clivia* in the coming years, surely one must be the further advancement of *Clivia* interspecific hybrids involving crossings of the existing species – C. *caulescens, C. gardenii, C. miniata, C. mirabilis, C. nobilis*, and *C. robusta*.

Clivia miniata, with its many variations, is used as the seed or mother parent and then crossed with one of the pendulous species, but it is also sometimes used at the pollen parent.

Clivia Nobilis

Cultivation and care

- Interspecific Clivias are no different to growing *Clivia miniata* when it comes to cultivation requirements.
- They require water once a week if it does not rain during the hot months.
- In winter water sparingly and only if necessary.
- The best planting mixture consists of a well-drained mixture of fine and coarse bark, filter sand, polystyrene and "Flexi Coat" slow release fertilizer.
- Mature plants are fed with Hyper Feed every 3-6 months
- Seedlings and young plants are fed with liquid fertilizers for example "Kick Start" or "Sea Grow" every 8 weeks.
- Plants are treated with a systemic insecticide and fungicide once every 6 months

Interspecific "Strawberry Parfait" – a true pink

Advantages of Interspecific clivia hybrids:

- They multiply well.
- They are robust, fast growing and more resistant to pests and diseases.
- Expansion of the flowering period of *Clivia*, with the interspecific types predominantly flowering from June to August, and with some of them producing another flower stem during another season. Certain varieties may produce two to three flowers a year;
- Great diversity of flower form, with new flower shapes and umbels, eg, semi-pendulous flowers; upright tubular flowers or bell-shaped flowers

- Different leaf combinations
- New colours and new colour patterns or combinations in flowers
- A hugely under-developed category of Clivia, thus allowing much scope for new creations.
- They are fast growing and more disease resistant than *Clivia miniata* .
- Most of the new and unusual colours in Clivias originate from interspecific breeding

Interspecific f1 "Pixie Slippers"

Conclusion:

There is considerable potential for the development of *Clivia* with more growing and breeding of interspecific hybrids.

Many growers believe that the future of *Clivia* lie hidden in these genetics. Clivia breeders consider interspecific breeding as the "new age" of breeding

We continue to be stimulated by seeing some of the fantastic new crosses arising from hybridization that is being done locally, nationally and internationally.

Interspecific "Jingle Bells" – a versi-colour

Interspecific "Applemint"

Interspecific "Warmheart"

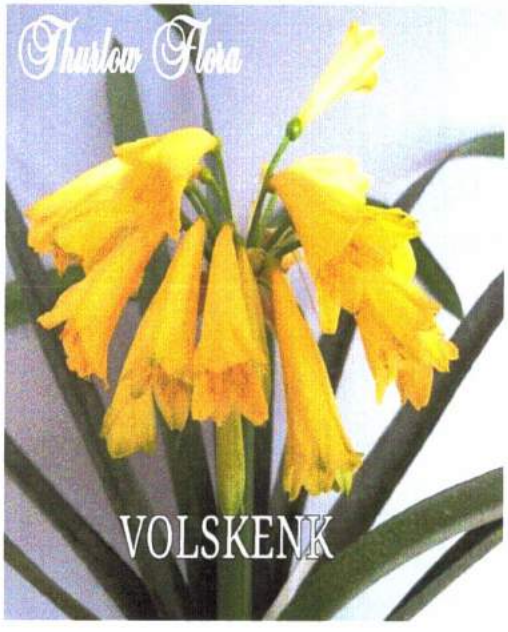
Interspecific F1 "Ombre"

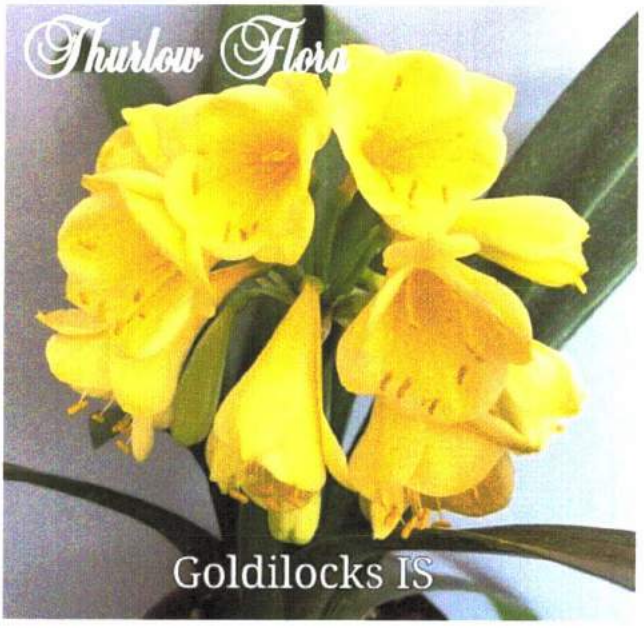
Interspecific "Light of Africa" -LOB interspecific


Thurlow Flora
Stanger Natural Hybrid

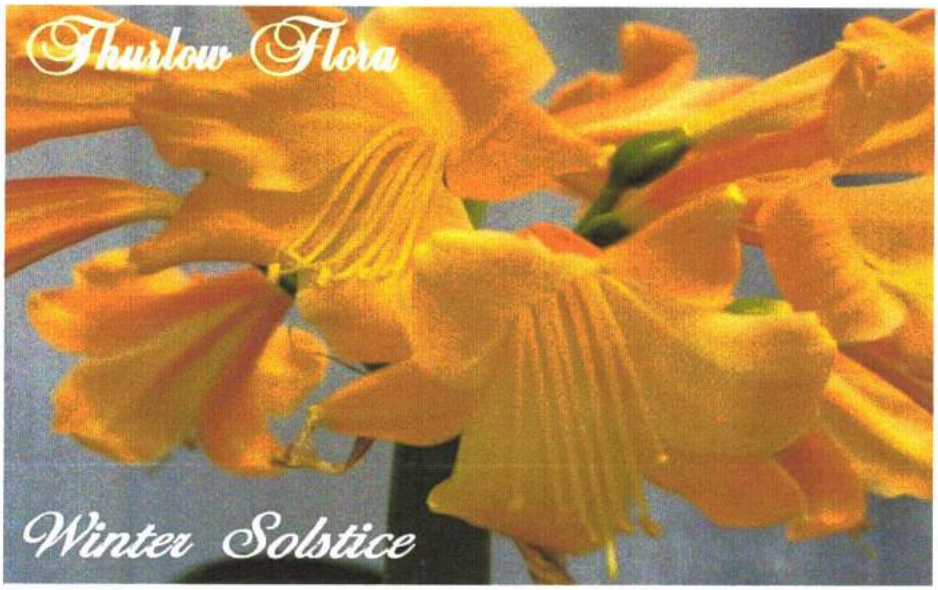

Thurlow Flora
GLADYS BLACK BEARD


Thurlow Flora
BAM BAM


Thurlow Flora
VOLSKENK


Thurlow Flora
Goldilocks IS


Thurlow Flora
MAXED


Thurlow Flora
Winter Solstice


"Aquarius"
Thurlow Flora


Thurlow Flora
HEY YOU


Thurlow Flora
GOLDEN SUNSET


Thurlow Flora


DL 2008
Thurlow Flora


Thurlow Flora
"Flinstone"


Gypsey


Thurlow Flora
Green of Hearts


Thurlow Flora
FWL Mirabilis


Thurlow Flora
Stanger Natural Hybrid


Thurlow Flora
Simone

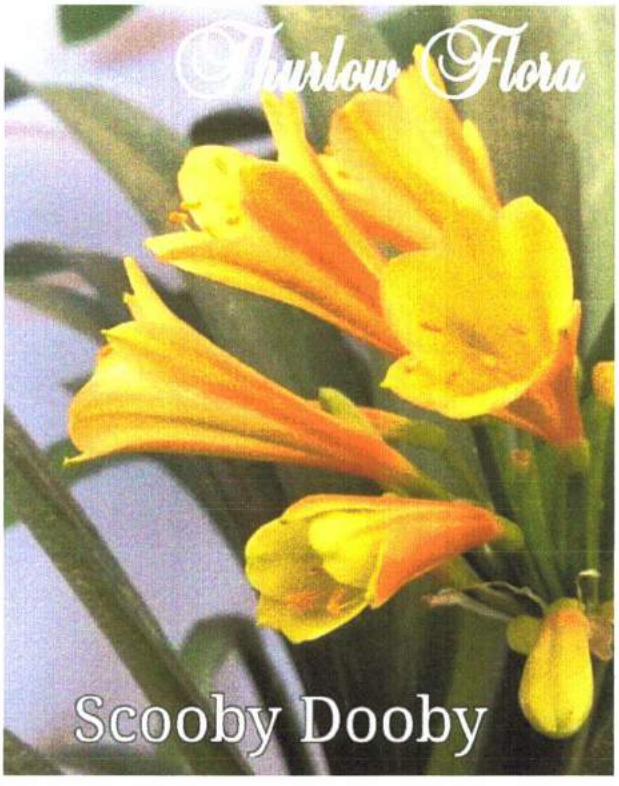

Thurlow Flora
Haemoglobin


Thurlow Flora
Jack of Hearts


Thurlow Flora
Christmas Gift


Pinked Ice
Thurlow Flora


Thurlow Flora
"Brilliant"

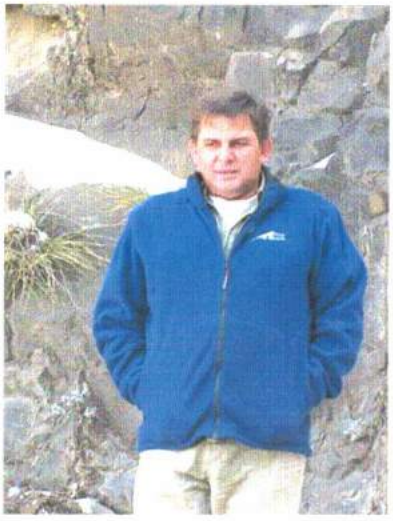

Thurlow Flora
Scooby Dooby


Thurlow Flora
Freddy

THURLOW FLORA

SEAN CHUBB

Producing Clivia with pedigree, specialising in colour breeding



Contact Us

Address: Eston, Kwazulu Natal, 3740, South Africa Phone: +27 (0)31 781 1978

The interest in Clivia started at an early age while attending high school at Hilton College. Sean would collect and grow Clivia seed found growing wild in the forest. The real passion for Clivia colour breeding began in 1987 with a Peach plant subsequently named Chubb Peach.

With a taste for the unusual and uncommon Sean's efforts in breeding Clivia has concentrated on breeding and perpetuating rare colours and colour combinations. With a good grounding in Genetics and a practical approach to Clivia breeding Sean's passion for perpetuating rare colour forms has resulted in numerous pure breeding line bred families of rare Clivia colours being commercially available.

Sean is also passionate about conserving Clivia history and has probably the most complete collection of Wild occurring Clivia mutations and colour forms. An important part of the Clivia collection at Thurlow Flora is "The Clivia Heritage Collection", a Living collection of rare historical plants. This is a conservation effort to preserve rare Clivia forms and thus Clivia History.

Sean is a showman and enjoys entering Clivia on the various Clivia Shows held in Kwa-Zulu Natal. Since 1994 Sean has entered the annual Miniata show and every year Thurlow Flora has won numerous awards with many Best on Shows as well as runner-up best on shows. Sean has also won the showman of the year award many times. Not only has Sean won numerous awards on the miniata shows but also dominates the awards at the annual Interspecific and Gardenii/Robusta shows held in Kwa-Zulu Natal. Some shows entering as many as 60 plants.

Thurlow Flora is a specialised Clivia nursery growing Clivia plants with pedigree and specialising in colour breeding. Situated in Eston, predominantly a sugar and timber growing farming area. The climate is warm in the summers with night temperatures cooling, rainfall of about 1000mm per annum. Thurlow Flora experiences a high number of cool misty mornings and sometimes whole days. In the winter the night temperatures are generally below 10 C but seldom experiencing frost. This climate has proved to be ideal for all Clivia species. A long flowering period is experienced in all species and seems not only to be due to the Climate but also the genetic make-up of the different Varieties. The different varieties seem to follow the same sequence of flowering each year. The Chubb Pretty Pinks are always the first to flower from Mid-August and normally ending with the Natal Yellows in Mid-October. The peak flowering being the middle of September.

http://www.cliviasa.co.za/ kzncliviabreeders@cliviasa.co.za

Clivia over 12 months (3) Winter (June - August)

By Helen Marriott

Following on from May, *C. gardenii* (Figs. 1-2) continued to flower in Melbourne during the month of June, alongside the less commonly found *C. robusta*. Occasionally, a plant produced two flowering stems, one in May, followed by another in June, as did *C. gardenii*, 'Malachite'. Intraspecific as well as interspecific hybrids of the pendulous flowers also expand our collections these days.

From early to mid-winter, *C. miniata* x *C. gardenii* interspecific hybrids began to demand attention. For instance, two siblings from the late Mick Dower's cross of 'Goblin'/'Green Goblin' x Hirao just overlapped in their blooming time and

Fig. 1 'Malachite'

Fig. 2 'Harburg Blush'

showed slightly different flower shapes, one possessing more rounded inner tepals than the other (Fig. 3). John Winter's interspecific hybrid of 'Kirstenbosch Yellow' x 'Ngome Yellow' flowered impressively, with 26 flowers on this occasion (Fig. 4).

Also valuable for breeding purposes are the multitepal x interspecific hybrids emanating from Japan which flowered during this winter period. Showing much potential is Shigetaka Sasaki's multitepal x 'Day Tripper', a *C. miniata* x *C. caulescens* interspecific hybrid (Fig. 5). Similarly, his multitepal x *C. gardenii* also exhibits a multitepal tendency in its first F1 flowering (Fig. 6) and is thus a positive sign of its breeding potential. Even with the multitepal used as the pollen parent, the multitepal characteristic is already visible in the F1 shown in Fig. 7 of (*C. miniata* x *C. caulescens*) x 'Nakamura's Super Multipetal', though admittedly this multitepal is known as a strong parent for inheritance of that gene.

These three months have seen a continuation of *C. minata* x *C. caulescens* as well as *C. miniata* x *C. nobilis* interspecific hybrids (Figs. 8-10), and, of course, further interspecific hybrids based on the Australian forms of *C. x cyrtanthiflora*. Quite a few Australians are using this group of plants in their own breeding. Recently, one cross of *C.* x *cyrtanthiflora* x 'Aurea' produced an attractive fawn-coloured flower (Fig. 11) and another plant, when crossed with an orange pollen parent, produced a flower with contrasting colours on the inner and outer tepals (Fig. 12).

Interspecifics which are crossed again to *C. miniata* are increasing in number in many places, further expanding the range of these hybrids. Figs. 13-14 show one kind of bi-colour pattern found in 'Juliet', a (*C. minata* x *C. caulescens*) x yellow *C. miniata* interspecific hybrid. Here we can imagine that the *C. miniata* used in the primary cross was also yellow. Bred in Melbourne by Laurens Rijke is 'Madeline Rose', a multi-coloured flower which is also derived from (*C. minata* x *C. caulescens*) x 'Aurea' (Figs. 15-16). In this case, the two umbels which flowered in consecutive months on the same rhizome displayed rather different colouration patterns, not unsurprisingly because

Fig. 3 'Charity' ('Green Goblin' x Hirao)

Fig. 4 'Gypsy Queen' ('Kirstenbosch Yellow' x 'Ngome Yellow')

Fig. 5 Multitepal x 'Day Tripper'

Fig. 6 Multitepal x *C. gardenii*

Fig. 7 (*C. miniata* x *C. caulescens*) x 'Nakamura's Super multitepal'

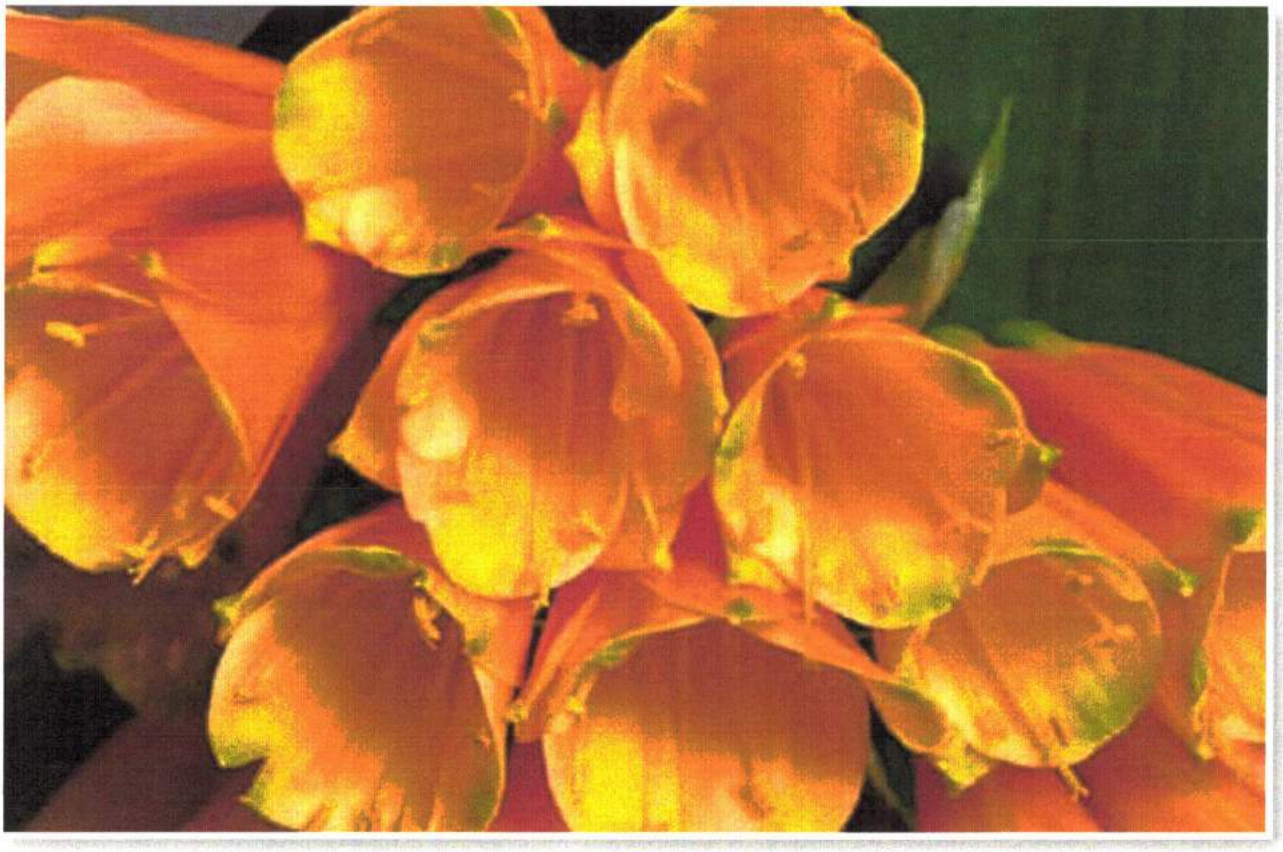


Fig. 8 *C. miniata* x *C. caulescens*

Fig. 9 *C. miniata* x *C. nobilis*

Fig. 10 *C. miniata* x *C. nobilis*

Fig. 11 *C.* x *cyrtanthiflora* x 'Aurea'

Fig. 12 *C.* x *cyrtanthiflora* x *C. miniata orange*

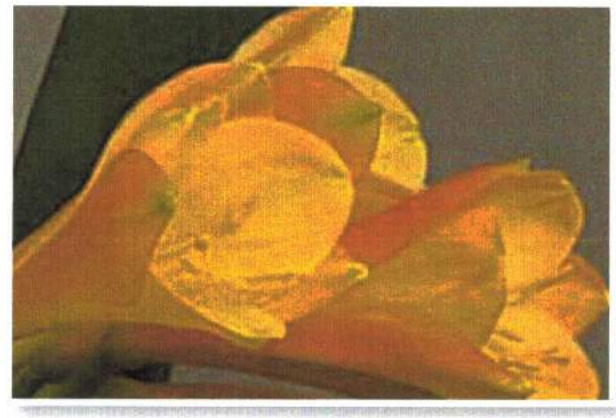


Fig. 14 'Juliet'

Fig. 13 (left) 'Juliet' 2013

Fig. 15 'Madeline Rose'

Fig. 16 'Madeline Rose'

Fig. 17 (*C. miniata* orange x yellow) x 'Day Dream'

Fig. 19 Variegated *C. miniata* x *C. gardenii*

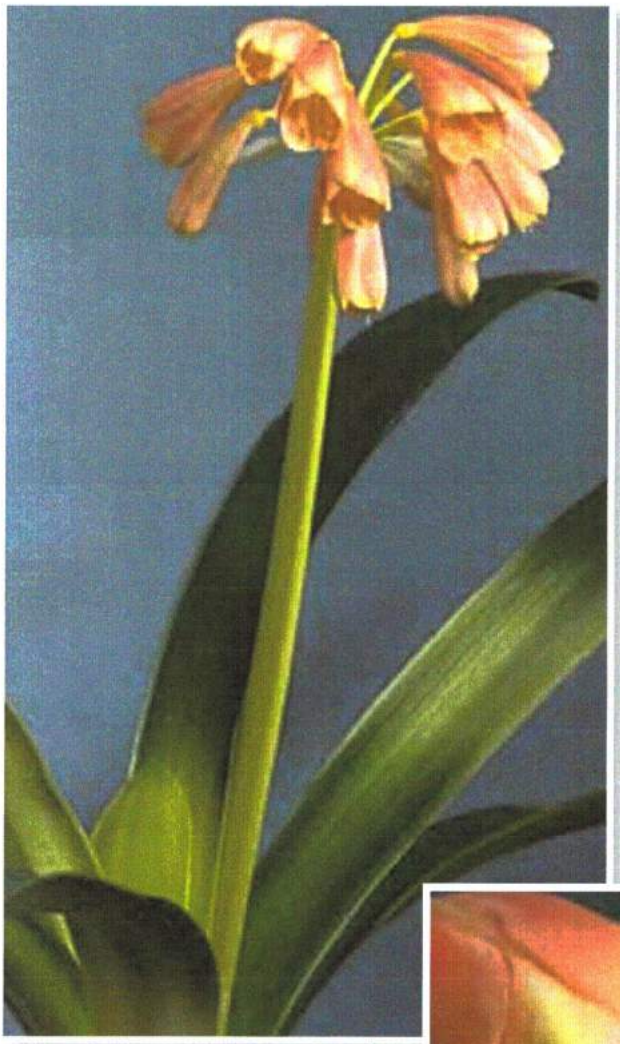


Fig. 20 Light of Buddha x (*C. miniata* x *C. caulescens*)

the second flower developed and bloomed inside, but also quite different flower sizes and shapes. Since there was only a relatively small difference in the number of flowers in the two umbels (23 and 20 flowers respectively), this was rather unexpected.

Winter is the main flowering period for interspecifics and some of them certainly take centre stage. A pot of Yoshikazu Nakamura's (*C. miniata* orange x yellow) x 'Day Dream', which now has seven rhizomes, each produced a flowering umbel this year (Fig. 17). On the other hand, there are also special flowers from recalcitrant plants which never seem to produce offsets, have few flowers, are not good seed setters and do not provide much, if any, viable pollen. I consider this greeny (*C. miniata* x *C. caulescens*) x self as one such example (Fig. 18), though it does produce a little pollen.

Interspecifics with variegated foliage add further interest. Fig. 19 shows an extremely vigorous *C. miniata* x *C. gardenii* which frequently produces new offsets. Since interspecifics with other than striata variegation remain unusual, deserving special attention was a first flower on Nakamura's Light of Buddha x (*C. miniata* x *C. caulescens*) hybrid (Figs. 20-21).

While winter is the prime time for seed preparation, it also provides an opportunity for the enjoyment and close observation of berries, particularly their colours, shapes and sizes. This year I have become more aware of the range of

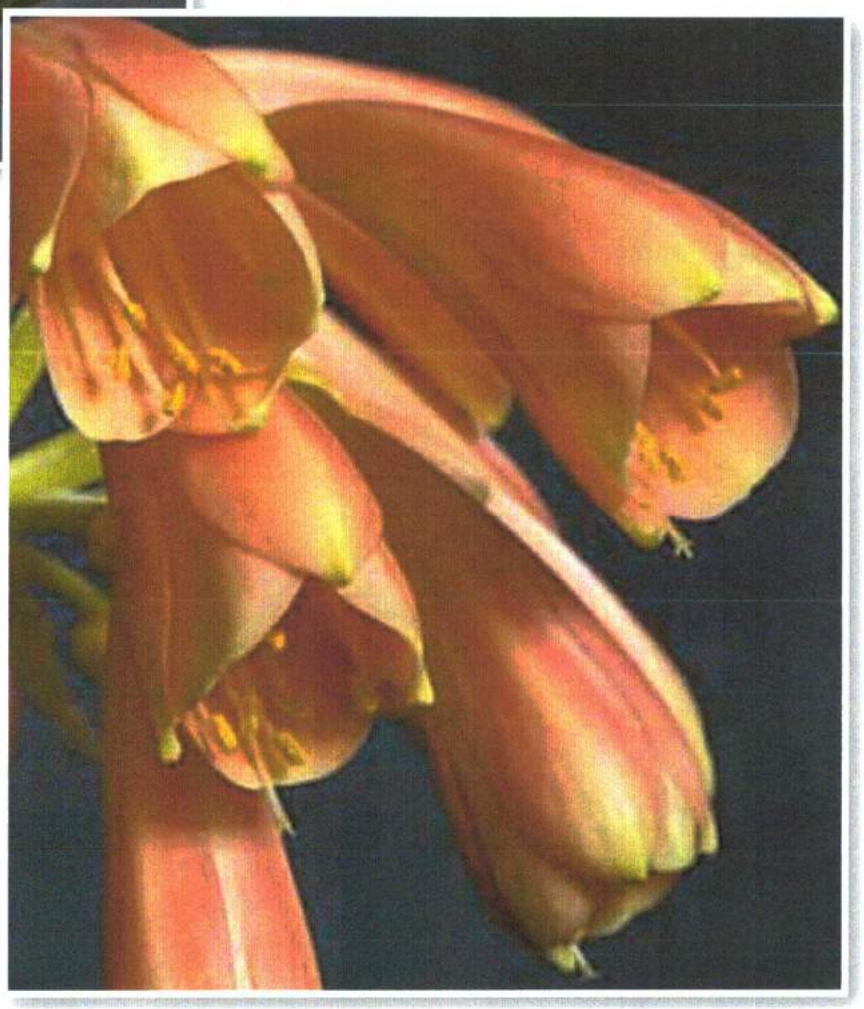


Fig. 21 Close-up of Fig 20 flower

Fig. 22 Mixed berries

variation in berry colour among the "European Peaches" and even among orange-flowering *C. miniata*. Berries from five different plants are found in the vase arrangement shown in Fig. 22, and all of them have some 'Vico Yellow' in their heritage. For example, the darkish brown berries on the right come from an orange-flowering plant derived from 'Vico Yellow' as one of its parents. The pastel/green berries on the bottom left also followed an orange flower, similarly thought to include 'Vico Yellow' in its parentage.

Australia has just experienced the warmest 12 months since climate records commenced 150 years ago and furthermore, this winter has been the warmest one on record for the state of Victoria. This warmth seems to have promoted the rapid growth of buds on *C. miniata* as August progressed and, like other members of the Melbourne Clivia Group, I started to wonder which plants would be at their peak – if not passed their peak – on 21 September for our CLIVIA EXPO. As the official start of spring approached, a few *C. miniata* engaged in battle with the interspecifics for space inside the house and these included several Gladys Blackbeard hybrids, 'Original Green Girl' with its delicate first flower, and even a multitepal (Figs. 23-24), among others. Unexpected were two umbels on *C. nobilis* which flowered in late August, somewhat earlier than usual (Fig. 25).

As one's plants increase in size and require bigger pots and as new Clivia come into flower,

Fig. 23 'Original Green Girl'

Fig. 24 'Chibayae'

Fig. 25 *C. nobilis*

the problem of space is exacerbated for some of us "backyard hobbyists". Nakamura's recent advice was as follows: "In order to progress (in our breeding), we need to reduce, rather than increase the number of Clivia we grow. To make space, it's better to dispose of mature plants rather than seedlings". This advice seems easier said than done! ▼

CLIVIA ROBUSTA & ITS INTERSPECIFICS

General

Clivia robusta or otherwise known as the 'Swamp Clivia' has been identified as a species in its own right through DNA analysis of plants grown from seed. These were grown by Dr. Keith Hammett after he received seeds from Graham Duncan of the then NBI (now SANBI). These were collected in Pondoland where most of the *Clivia robusta* populations are found. This plant is named after its robust growth habit, with some plants reaching up to 1.8m in height.

Description of *Clivia robusta*

These plants are generally large, although in drier areas they tend to be stockier with broader leaves. The leaves are between 30 - 90 mm wide, strap-shaped and up to 1.2m in length.

They produce pendulous flowers from April through to July in colours ranging from yellows, pale to deep orange and scarlet reds. Flower shape could be short and stocky to long and narrow with green tips. They reproduce well, setting plenty of seed and young seedlings are often found on the forest floors.

Natural habitat of *Clivia robusta*

They are found predominantly in Pondoland. A small colony also occurs in the Southport area on the KZN coast. They grow mainly in swamp forests or next to streams. Colonies also occur well away from water, growing only in leaf mould and also in rocky areas.

Small colonies also occur in the Eastern Cape close to Port St Johns. The colonies that occur in the pristine swamp forest of South KZN are remarkable and in flowering season give a spectacular display of flowers.

PHOTO – ANDY FORBES HARDING

C. robusta in habitat.

PHOTO – CARRIE KRUGER

C. robusta 'Ruby Glory.

PHOTO – CARRIE KRUGER

C. robusta '5 Star'.

Interspecific f1 Andy Forbes Harding

Breeding interspecifics from *Clivia robusta*

Alan Tait, a well known breeder of a great variety of plants started interbreeding with *Clivia robusta* in Autumn 2004, using *Clivia miniata* 'Coromandel Strain' as berry parent and *Clivia robusta* as pollen parent.

These are some of his findings

Seed was sown in 2005. When seedlings were big enough to handle, they were transplanted into 2l bags and kept under 60% shade. The first plants flowered in June 2008. Some plants had up to 3 spikes. The resulting leaf width and length varied greatly, as did number and size of flowers per umbel, flaredness of flowers and to a lesser degree, the colour of flowers. A small percentage showed superior characteristics, including compact plants, short, broad leaves and umbels of many beautiful open flowers in pastel shades.

There were even a small number of variegated seedlings!

Last year his F2 seeds were sown and now the wait for even better results! &

Carrie Kruger

Utopia Nursery, Sedgefield

With thanks to Andy Forbes Harding and Allan Tait for their contributions of information and photos!


Star Versi
Utopia Clivias


Utopia Clivias
Dad's Memory


Carnival
Utopia Clivias


Utopia Clivias
Candy Green


Utopia Clivias
Bronze Bomb


Utopia Clivias
Brilliant


Yellow Sparkles
Utopia Clivias


Bells of Beauty
Utopia Clivias


Utopia Clivias
Bella Rouge


Bella Rouge
Utopia Clivias


Autumn Whisper
Utopia Clivias


Utopia Clivias
Autumn Angel


Athene
Utopia Clivias


Aquarius
Utopia Clivias


Apricot Dreams
Utopia Clivias


Utopia Clivias
Amazon Bronze Dark Brown

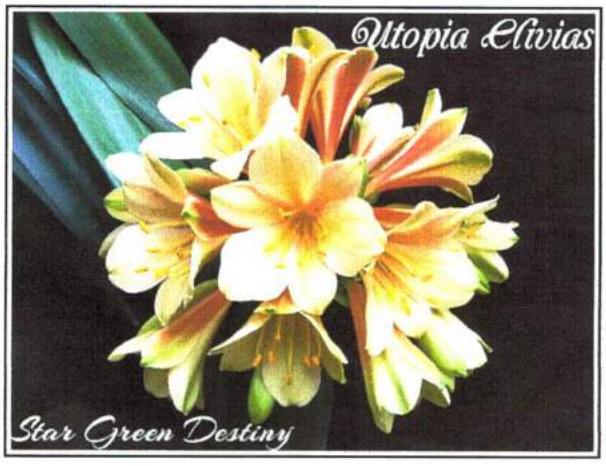

Star Versi
Utopia Clivias


Utopia Clivias
Tartan


Sweet Dreams
Utopia Clivias

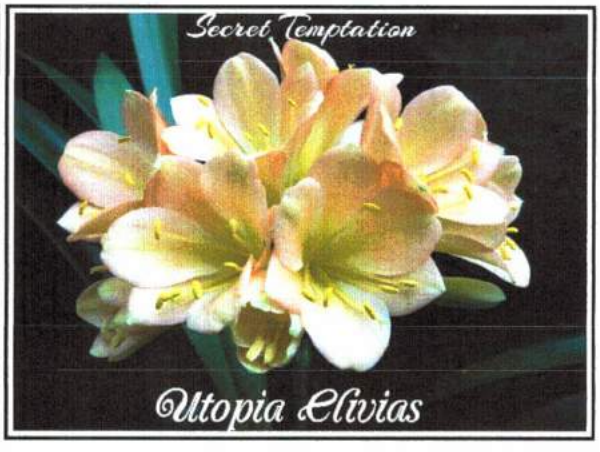

Sweet Chilli
Utopia Clivias


Starburst Green
Utopia Clivias


Utopia Clivias
Star Green Destiny


Utopia Clivias
Spirit Ember


Solar Flare
Utopia Clivias


Secret Temptation
Utopia Clivias


Secret Strawberry
Utopia Clivias


Secret Rose
Utopia Clivias


Secret Destiny
Utopia Clivias


Secret Desire
Utopia Clivias


Rocketman
Utopia Clivias


Utopia Clivias
Planet Earth


Utopia Clivias
Over the Moon


Over the Moon
Utopia Clivias

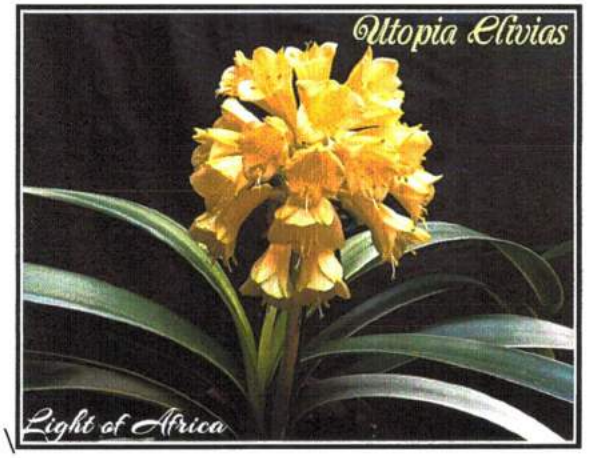

Utopia Clivias
Noteworthy NP


Utopia Clivias
Nakamura Sunset


Utopia Clivias
Luminosity with 2 umbels


Lucid Dreams
Utopia Clivias


Utopia Clivias
Lingerie Pink


Utopia Clivias
Light of Africa


Utopia Clivias
Lava Flow


Utopia Clivias
Mint Candy


Utopia Clivias
Vintage Veil


Utopia Clivias
Golden Eye


Glistening Rose
Utopia Clivias


Firefly versicolour
Utopia Clivias


Emmadale
Utopia


Dreaming
Utopia Clivias


Dreamcatcher
Utopia Clivias

CLIVIAS FOR ALL SEASONS

Can interspecifics flower throughout 12 months of the year?

Helen Marriott (Australia)

From time to time I see reference to claims that *Clivia* bloom for their Australian owners over eight months of the year. However, as my own collection of *Clivia* – including interspecifics – grew, I had the impression that here in Melbourne, Australia, interspecifics, in conjunction with the other pendulous species (or intraspecific hybrids) available up to date (*C. caulescens, C. gardenii, C. nobilis* or *C. robusta*), resulted in flowers (or buds) throughout the full year. It was also my impression that the Australian forms of *C.* x *crytanthiflora* in my garden flower during any of the four seasons, though slightly less so during spring.

Like other growers of *Clivia*, I am of course delighted to be able to enjoy *Clivia* flowers or their buds, and frequently also berries, over many months of the year, but I became curious to understand a little of the patterns behind this flowering. I thus started to keep simple records of the months when interspecifics were in flower, commencing in December 2008 and continuing until the present (mid-November 2010).

My observations are from a hobbyist perspective, recording the flowering times of the interspecifics which I happen to be growing and where I have some knowledge of the plants' apparent background. I thus have not counted those plants just labelled as "interspecifics" or where they emerged from general "breeding mixes" or else where they are named cultivars for which I have no definite parentage background. My main interest was to identify the months when the interspecifics were in flower, and more particularly, to identify the parents involved in these flowering patterns.

To date, my own collection of interspecifics is primarily based on combinations of C. miniata with three pendulous species – *C. caulescens, C. gardenii, C.nobilis* – with very few combinations with *C. robusta*, and, of course, some *C.* x *crytanthiflora*. I will employ the term primary interspecific hybrid for the first generation hybrids between different *Clivia* species, and am still searching for an appropriate term or terms to describe subsequent combinations.

Despite what I felt were fairly simple and worthwhile aims, when I came to do the analysis, the more I studied my records, the more problems I found with them. I was dealing with an unspecified number of plants, with unequal numbers in any of the varying combinations.

Also, I had not, for instance, differentiated between first and second flowers from the same rhizome in any one year, nor did I distinguish between flowers on the main rhizome in a pot, or offsets which flowered in the same pot. Quite a few flowers were counted twice, if they flowered in one month but continued flowering into the next, as was often the case.

Of most concern was the fact that I had insufficient knowledge about the backgrounds of some of the interspecifics. For instance, though a plant may have been grown from Nakamura seed which was labelled as *C. miniata* x *C. caulescens*, sometimes I was unsure if this is a primary interspecific hybrid or if the latter had been selfed or crossed back to *C. miniata*, since Nakamura produced all three kinds of interspecific hybrids. I wanted to include 'Moonchild' in the analysis, but because I am doubtful about it being a primary interspecific of *C. miniata* x *C. gardenii*, I have omitted it from the analysis, though obviously have been more lax with other cases where ignorance reigns.

Because of all of these problems, at times I felt like abandoning any effort to analyse the

results, but given the time put into the exercise to date, have proceeded anyway. A more rigorous observational study can be undertaken by others in the future.

I attempted to produce a chart which separated the primary interspecifics hybrids from other kinds of interspecifics. The primary interspecific hybrids were categorized according to the following simple patterns:

(a) (*C. miniata* x *C. nobilis*) or (*C. nobilis* x *C. miniata*) or C. x *cyrtanthiflora*;

(b) (*C. minata* x *C. gardenii*) or (*C. gardenii* x *C. miniata*); and,

(c) (*C. miniata* x *C. caulescens*) or (*C. caulescens* x *C. miniata*).

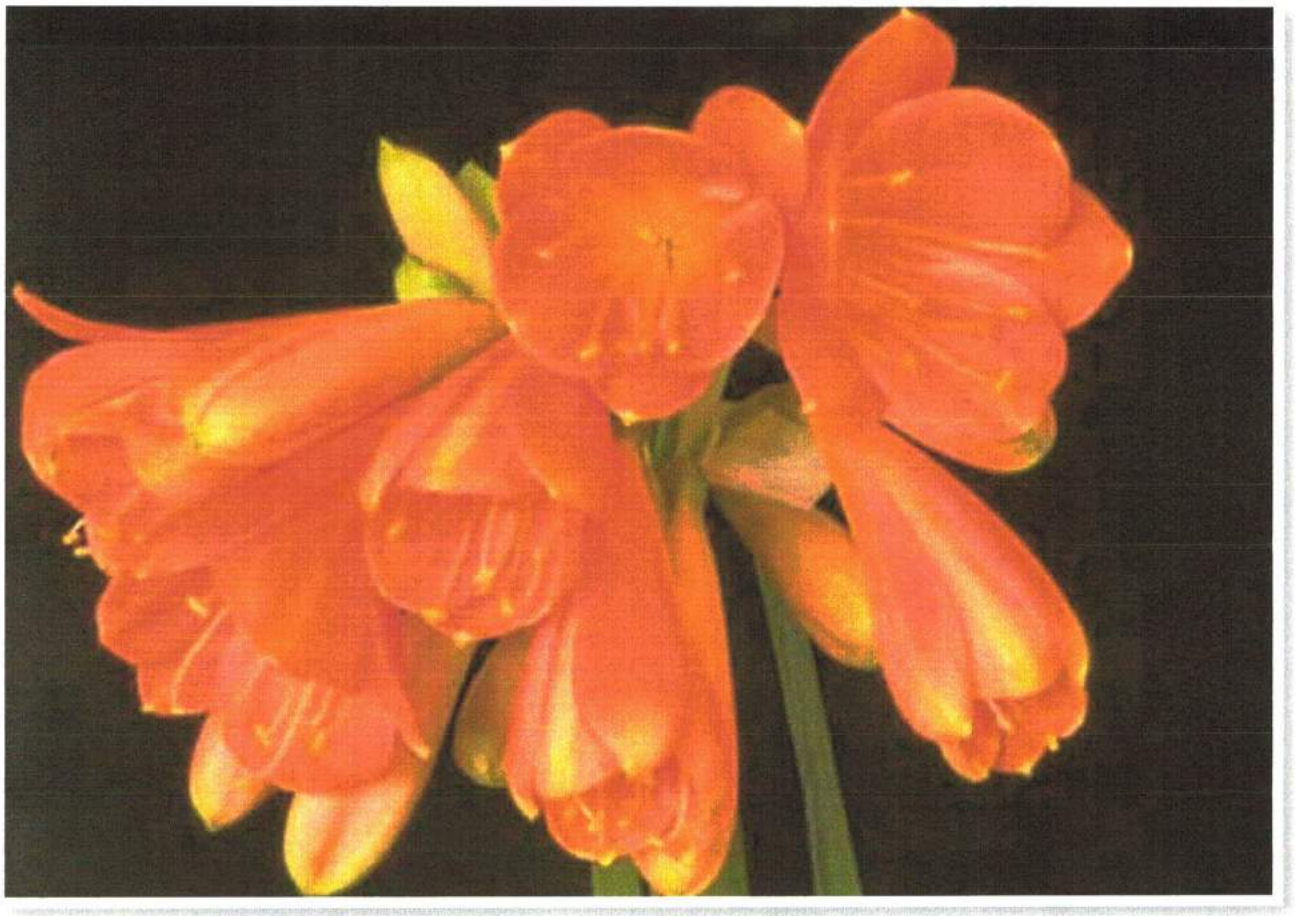
Since I also have a number of interspecifics where a primary interspecific has been crossed again to *C. miniata*, in the main, and only very occasionally to another pendulous species, I analysed a further group which I have loosely labelled as "other interspecifics, for want of a better term.

Koopowitz (2002), followed by Duncan (2008), employ the term "advanced interspecific hybrids", but I have heard that such a label may apply more to orchids than to *Clivia*, so I remain unsure of a suitable alternative. As with the primary interspecific hybrids, three subcategories were created, such as (*C. miniata* x *C. caulescens*) or (*C. caulescens* x *C. miniata*) which are crossed again to *C. miniata* (in nearly all cases).

The table that I produced, not surprisingly, shows fairly small numbers in some of the monthly cells, so I shall only descriptively summarize some of the main or interesting findings:

1. Of the 193 instances of flowering recorded (remember that this is over a two-year period and includes repeat flowering, multiple flowers in the same pot or divisions), 54% of this flowering occurred during winter, with July and August being the main months.
2. Spring was the next season to produce the highest number of interspecifics, with 20% of the flowers occurring at this time, the majority of which flowered in September.
3. Summer and autumn together produced just under one-half the number of the winter flowers, slightly over 13% and 13% respectively.
4. A month by month sub-total shows substantial monthly variation. The month with the highest to the lowest number of interspecific flowers was as follows: August (50), July (40), September (25), June (14), December (13), January, March and May (9 each), October (8), April (7), November (5) and February (4) instances.
5. Primary interspecifics involving *C. miniata* and *C. gardenii* flowered in late autumn (May) and in winter (June, July and August) but never during the other months.
6. (*C. miniata* x *C. gardenii*) or the reverse cross, crossed again to *C. miniata* occurred mostly in late winter (August) and a little in mid winter (July), early spring (September) or mid summer (January), but only rarely in two of the other months (April or October).
7. Primary interspecific hybrids involving *C. miniata* x *C. nobilis*, its reverse cross or *C.* x *cyrtanthiflora* flowered over 10 months of the year, but not in October or November, even if the number of occurrences were low in some of the other months.
8. When crossed again with *C. miniata*, interspecifics from *C. miniata* and *C. nobilis* or *C.* x *cyrtanthiflora* flowered in every month except January, with the majority of instances occurring in early spring (September).
9. Primary interspecifics involving *C. miniata* and *C. caulescens* flowered in every month except October, but when crossed again with *C. miniata*, flowered most commonly in August and September, but not in December or in the period February to May.
10. Due to the small number of instances, I have not attempted to analyse other combinations such as (*C. miniata* x *C. gardenii*) x (*C. nobilis* x *C. miniata*), which were classified under "other combinations".

Mid-winter *C. miniata x C. caulescens.*



Early spring *[(C. miniata x C. caulescens) x miniata].*

Mid-summer 'Mandala' (from *C. miniata x C. caulescens).*

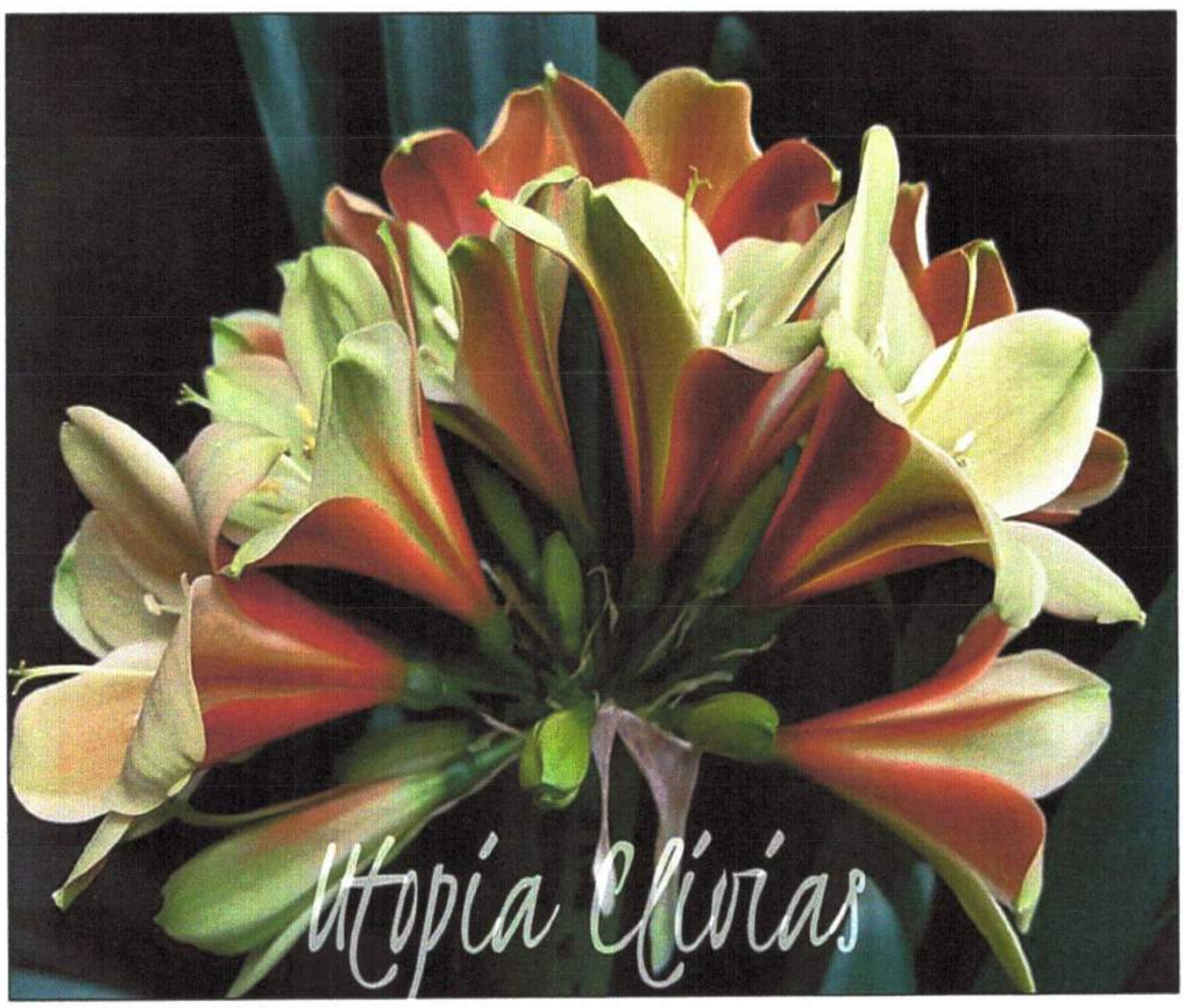
Early autumn *C. caulescens x C. miniata.*

The re-blooming characteristic of interspecifics involving *C. nobilis* (or *C.* x *cyrtanthiflora*) and *C. caulescens* may account largely for their wider spread throughout the year in comparison with the more restricted flowering of interspecifics based on *C. gardenii*. Since I wish to extend the flowering season over early autumn, mid to late spring and summer, this means that *C. gardenii* or its interspecific hybrids should not be my first choice in further crosses.

This exercise was an observational one of the plants in my collection and is quite different from a rigorous one, where, for example, equal numbers of plants of any particular combination would be used and much more rigorous recording criteria developed. I have not attempted to decipher any differences according to whether a particular species was used as the seed/pod or pollen parent and nor have I analysed re-flowering, which I actually consider to be an important feature of interspecific flowering.

As I write this short text in the "quieter" period of early November, interspecifics in flower are limited to an unspecified one from a breeding mix and another involving (*C. miniata* x *C. nobilis*), crossed again to *C. miniata*. How- ever, *C. nobilis* and *C. caulescens* are in flower, and some late flowering *C. miniata* are still displaying a few flowers – this year anyway.

Can interspecifics flower in every month of the year? I think I can give a positive answer, with the qualification that the frequency varies considerably according to the season or month. I hope that one will flower at Christmas time again this year. &



Karoo Clivias started with the new found love for clivias. We got our first few garden oranges in 2008 and after a lot of research we found that there's a lot more things to clivias than just beauty.

So, we started to buy a few yellow plants and later on we joined the local clivia society and bought lots of new and exciting plants and seedlings. a lot of generous members gave us very very nice gifts that turned out to be wonderful plants.

Today we have a collection with more than a thousand plants and have plants from big growers and even from Germany. America and China. We are making new crosses each year and also sell seeds to the public during March to August. and seedlings throughout the year. We are aiming to grow good quality plants in the future to make our customers happy.

We are adding a lot of new seeds and seedlings to our current lines to expand our gene pool in our collection and so we can be able to produce better quality plants for our customers.

More articles will be added to the website shortly as well as more videos in our YouTube channel.

Karoo Clivias

South Africa +27 71 8748569

Clivia INTERSPECIFIC - 2020

Pink Marshmellow X Pink Elegance - Figure 1 - © 2020 Colorado Clivia Company

Clivia INTERSPECIFIC - 2020

Red Cyrt X Jean Delphine - Figure 2 - © 2020 Colorado Clivia Company

Clivia INTERSPECIFIC - 2019

Not Holmes Red X Dark Red Cyrt - Figure 3 - © 2020 Colorado Clivia Company

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Clivia INTERSPECIFIC - 2020

Not Holmes Red X Dark Red Cyrt - Figure 4 - © 2020 Colorado Clivia Company

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Dark Red Cyrtanthiflora - Figure 5 - © 2020 Colorado Clivia Company

Clivia INTERSPECIFIC – 2020

Not Holmes Red X Pretty Pink - Figure 6 - © 2020 Colorado Clivia Company

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Grower's Guide

for

Clivia miniata, Clivia caulescens, Clivia nobilis, Clivia robusta, Clivia mirabilis

and

Clivia gardenii

Clivias are undeniably the aristocrats of horticulture. They are classed among the most d4sirable of all connoisseur plants, offering not only spectacular flowers, but also interesting variations in both le& variegation and plant form. The plants are easy to care for and make an ideal houseplant.

Depending on the size of your plant and its growing conditions, a Clivia will add four, to six leaves per year. Maturity and flowering will occur after 13 leaves have grown--typically in three to five years. After the first flowering, subsequent flowerings tend to be larger and more spectacular.

Clivia gardenii and robusta varieties usually bloom in the fall/early winter. Clivia miniata and sometimes nobilis varieties usually bloom in the late winter/early spring. Clivia caulescens bloom sporadically.

Caring for a Clivia

Clivias are easy to care for and can thrive under a variety of conditions. Listed here are our general recommendations and an outline of the specific processes we use. Growers can adopt these processes or develop their own, and still be very successful growers of Clivias.

Colors.

Most Clivia miniata have one or sometimes two large multi-blossoms, orange flowered, umbels. Through selective breeding, yellow, red, bronze, peach, apricot, pink, cream, and other specialty colored flowers are possible. Colors other than orange are rarer and significantly more difficult to breed. Variegated leaves are also possible. Miniata blossoms are trumpet shaped, while blossoms of the other five species of Clivia are pendulous and tubular in varying configurations.

Sunlight.

Full shade/bright indirect sunlight (indoors or outdoors) is best. If given too much light, the leaves will become sunburned. Clivias do very well in home or office settings when they are placed in a bright room, in locations with a limited amount of direct sunlight, or in offices with typical fluorescent lighting. Our clear glazed greenhouse is equipped with 85% shade cloth due to Colorado's mile high elevation (because less sun is filtered out by the atmosphere).

Temperature.

Normal indoor household temperatures and outdoor summer temperatures are ideal. **Do not freeze Clivias.** Our greenhouse is set to cool to 83°F and heat to 47°F year-round.

Pots.

Slightly root bound Clivias are more likely to flower. Porous clay pots with drainage holes help mitigate, but not solve problems with over watering and are ideal. If watering is controlled and a very porous soil mixture is used, other pot types can be used successfully. Bottom drainage holes are mandatory. Do not place pots in saucers with standing water. The pot should always be able to drain freely. When repotting only go up 1 or 2 sizes from the current pot size. Colorado Clivia prefers to use standard clay pots for our plants.

Water.

Water only when the soil has dried out from the last watering. Do not let the Clivia stand in water. Water early in the day to prevent leaf rot. When you think it is time to water, place your index finger into the soil. If the soil is only slightly damp approximately 1 1/2 inches down from the surface, then it is time to water. If the soil is wet, wait a day or two and try again. During different times of the year, you will have to water more or less often.

Fertilizer.

Clivias respond well to the application of fertilizer. Slow release granules, periodic chemical fertilizer applications, or natural fertilizer applications are all successful in providing nutrients. We recommend a fertilizer with micro-nutrients and applied using label directions. Over the years, we have successfully used as our standard fertilizer program cow manure, fish fertilizer, seaweed fertilizer, and chemical fertilizers in the 10-10-10, 20-20-20, 15-5-25, and 15-5-15 formulations. We use the standard fertilizer program from January to September. In October we switch to a similar dilution of high bloom fertilizer. In November and December, we only use clear water/no fertilizer. If chemical fertilizer is used, we recommend periodically flushing the salts out of the soil using clear water.

Soil.

Soil for Clivias must provide excellent drainage, have high aeration characteristics, be porous, and be slightly acid. A medium course, bark based, orchid mix is ideal. Also acceptable are various Cactus mixes. Avoid 100% peat moss potting soils, as they retain too much water. When using bark-based soil mixes, completely change the soil every several years. The mix we use is 80% 1/4 -inch to 1/2-inch pine bark chips, 5% peat moss and 15% perlite.

Water--Soil--Fertilizer Balance.

Organic soil mixes, such as those containing bark, are naturally acidic. Water across the United States can range from almost distilled (very soft) to almost brackish (very hard). Soft water has little influence on soil pH, while hard water helps create basic pH soil. Chemical fertilizers can range from basic to acidic. The combination of all three items in the pot will determine the overall pH experienced by the plant.Clivias prefer a slightly acidic soil environment, a pH of 6.5 to be exact (7.0 being neutral). A soil environment that is too acid will cause micro-nutrient toxicity and damage your plant. If you use an organic soil mix and have slightly hard water, then a somewhat acid fertilizer is appropriate. In Colorado we have very soft water and use a slightly basic fertilizer, the bark soil mix provides the little bit of acid. Specifically, we use Jack's 15-5-15 with extra calcium and magnesium. Depending on your water, you may need to adjust your fertilizer.

Dormancy.

An eight-week dormancy period of 50°F or lower nighttime temperatures starting about Nov. 15, will induce flowering in the early spring. Flowering is also encouraged by no fertilizer and limited watering during this dormancy period.

As long as the plant is cool but does not freeze, receives bright indirect sunlight and gets occasional watering, dormancy will be achieved. Many growers use a partially heated garage (bringing the plant indoors when it's really cold), a spare room kept cool, or a cool basement area to create dormancy. Some varieties do not require dormancy to initiate blooming. In those few varieties, dormancy will create much more impressive blossoms.

Insects.

Most insects tend to stay away from Clivia. Mealybugs, armored Scale and fungus gnats are the rare exceptions. Overwatering causes fungus gnats. Mealybugs and Scale are introduced when other plants bring the pest in contact with your Clivia. While Clivias tolerate a wide range of chemical insecticides, Permethrin, neem oil, and phosphate soaps are usually labeled for safe indoor use and are effective against insects on Clivias. Multiple applications will probably be required. Read and follow all label instructions.

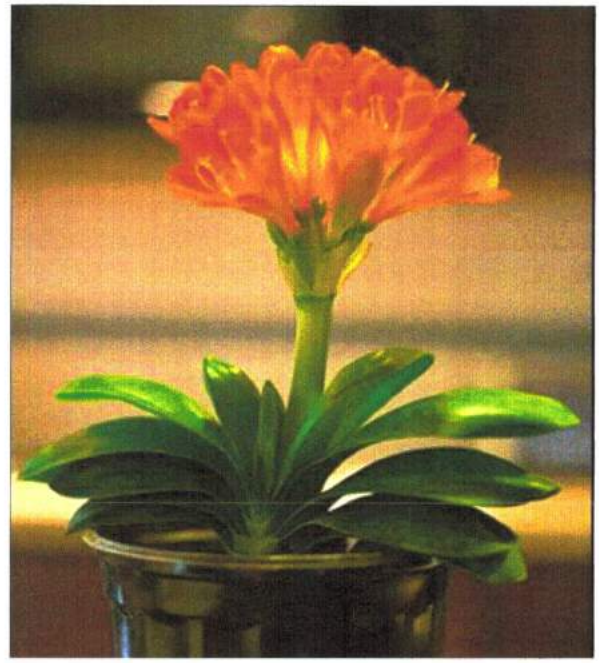
Disease.

Although unusual, the most common disease of Clivias is root: rot. This is caused by overwatering. A proper watering program will prevent problems. A wide range of fungicides can be used to prevent and cure problems. Read and follow all label instructions.

Bare Root Plants.

Most of Colorado Clivias plants are shipped to customers bare root. When you receive a bare root plant, open the box immediately and carefully remove the plant from the packaging. Large plants are typically tied into the box. Place the root ball in a bucket of clean water and allow it, to re-hydrate for a couple of hours to overnight. Then pot the plant in its permanent soil media and pot, often times Clivia need to be staked or caged upright until they settle into the soil, usually a month or two after repotting. Then the supports can be removed.

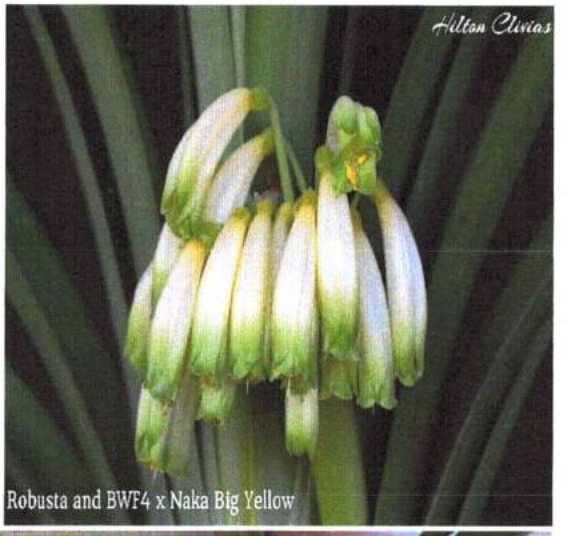
Enjoy your new plant.



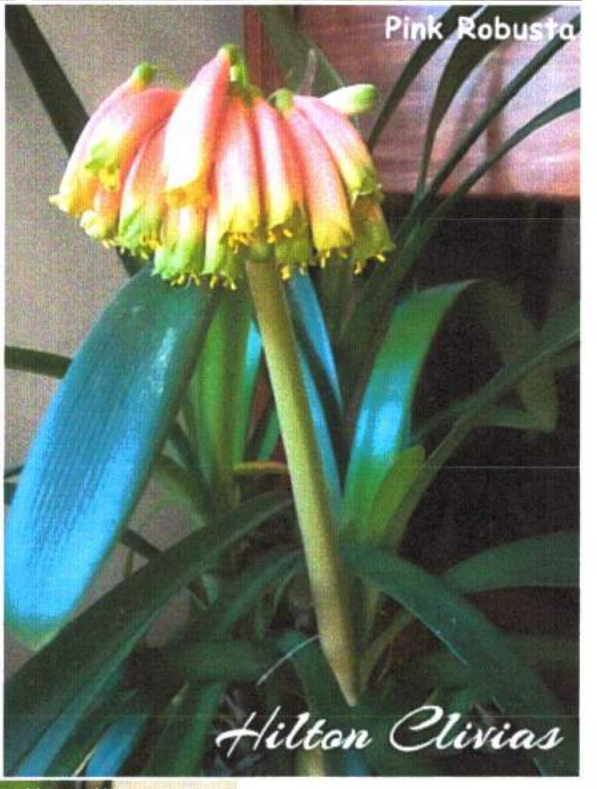
Colorado Clivia Company
2635 Youngfield Street
Golden, Colorado USA
303-292-1002
www.CoClivia.com
info@coclivia.com

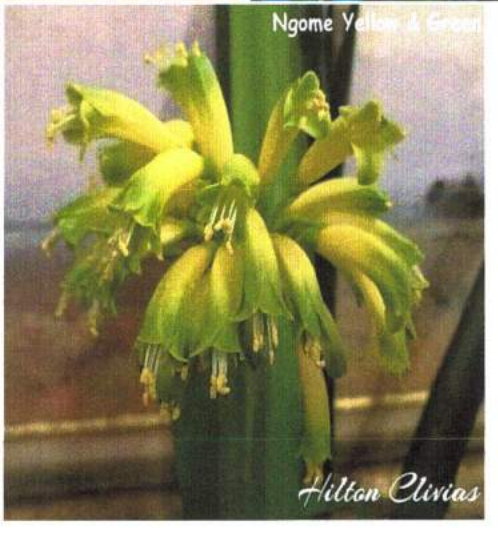

Light of Dawn
Hilton Clivias


(Rudo's Pink Sensation x Daruma Y) x Angel's City

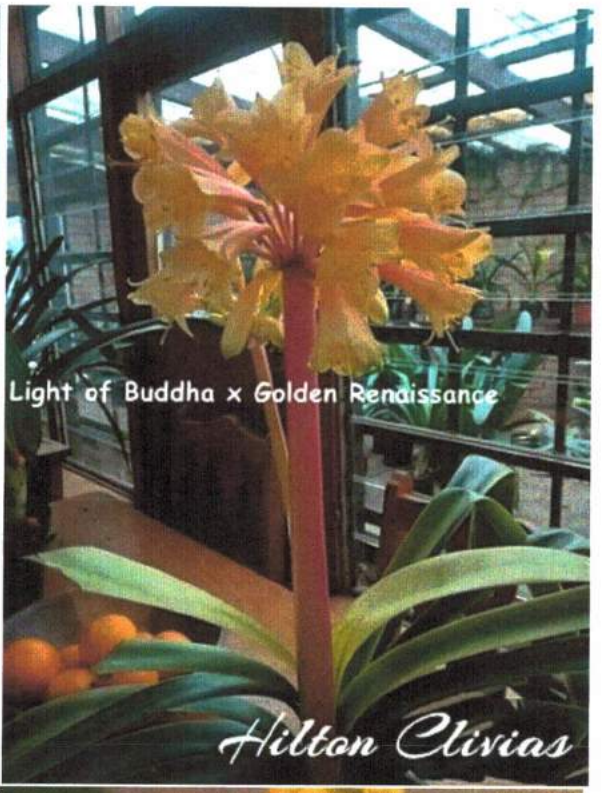

Hilton Clivias
Robusta and BWF4 x Naka Big Yellow

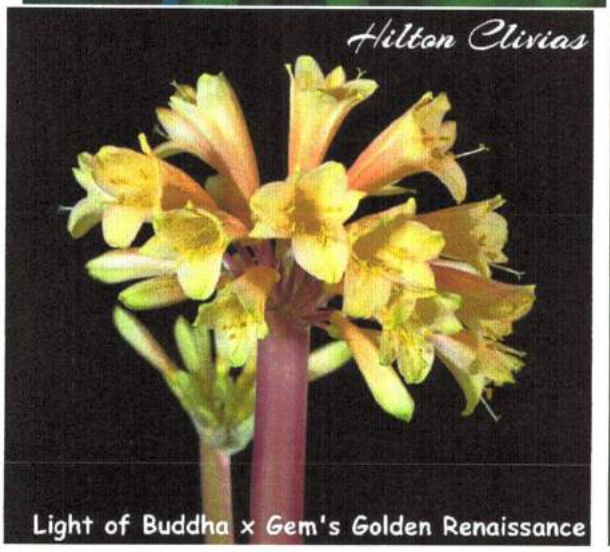

Mermaid
Hilton Clivias

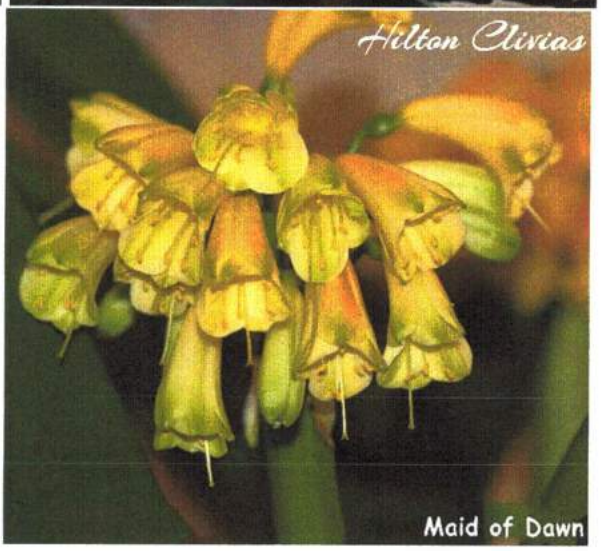

Pink Robusta
Hilton Clivias


Hilton Clivias


Light of Dawn
Hilton Clivias


Light of Buddha x Golden Renaissance
Hilton Clivias

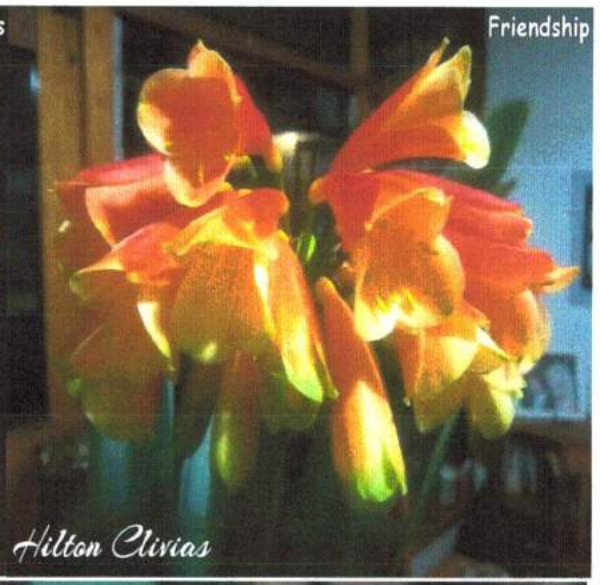

Hilton Clivias
Light of Buddha x Gem's Golden Renaissance

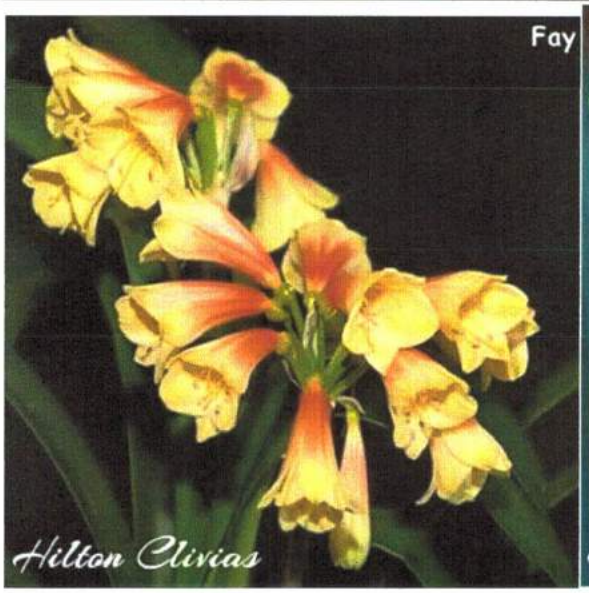

Hilton Clivias
Maid of Dawn


Hilton Clivias
Hilton Interspecific Dark Orange IS x Self


Hilton Clivias
Hilton Interspecific 4783


Giddy Yellow x Yellow Caulescens
Hilton Clivias


Friendship
Hilton Clivias

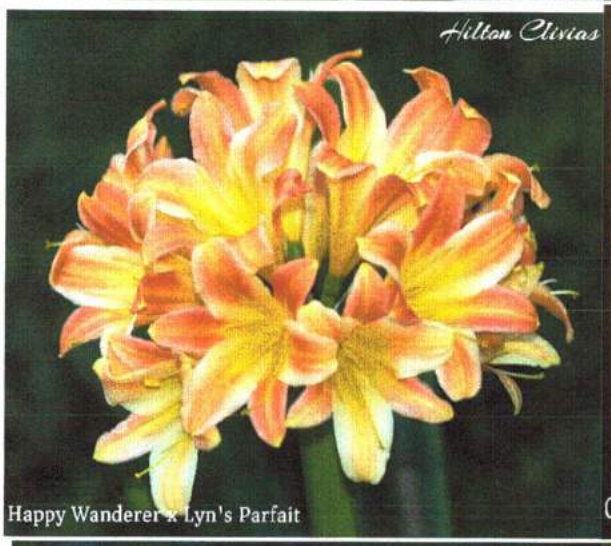

Fay
Hilton Clivias


Brian x Golden Renaissance
Hilton Clivias


Brian x Gem's Golden Renaissance
Hilton Clivias
Hilton Bella May
Hilton Clivias
Hilton 5 x TK
Hilton Clivias
Hilton Clivias
Hilton 5 x TK
Hilton Clivias

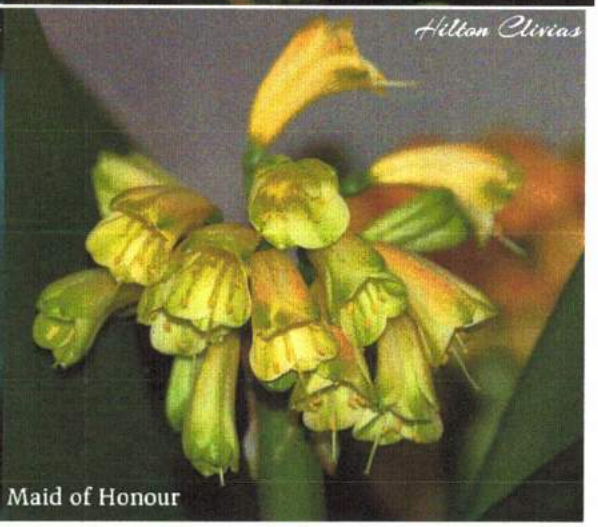

Tropical Smoothie


Hilton Clivias
Flamingo F1

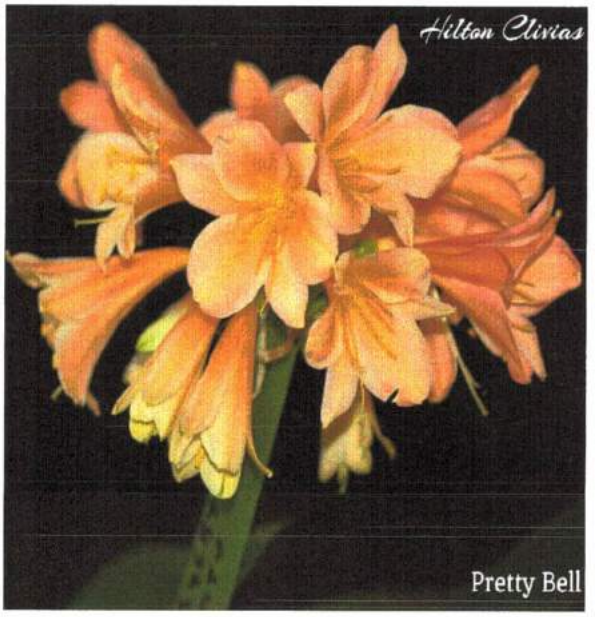

Hilton Clivias
Happy Wanderer x Lyn's Parfait


Hilton Clivias
Camilla's Dawn No 1


Hilton Clivias
Hilton Interspecific

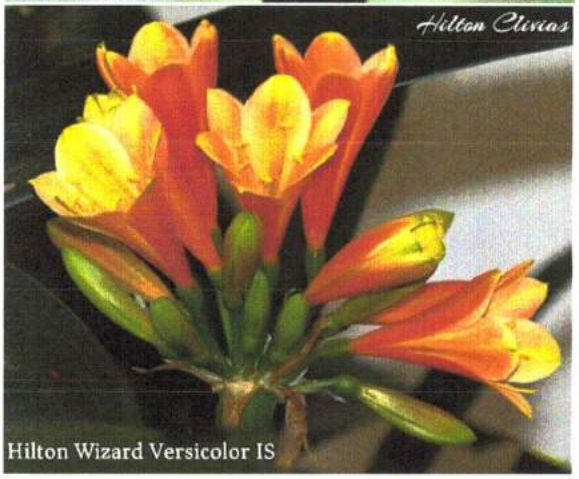

Hilton Clivias
Maid of Honour


Hilton Clivias
Yellow Blush Interspecific


Hilton Clivias
Pretty Bell

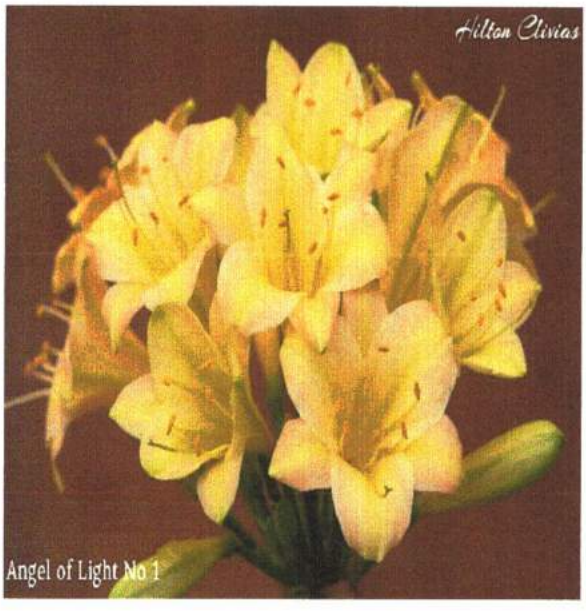

Hilton Clivias
Hilton Mirabilis

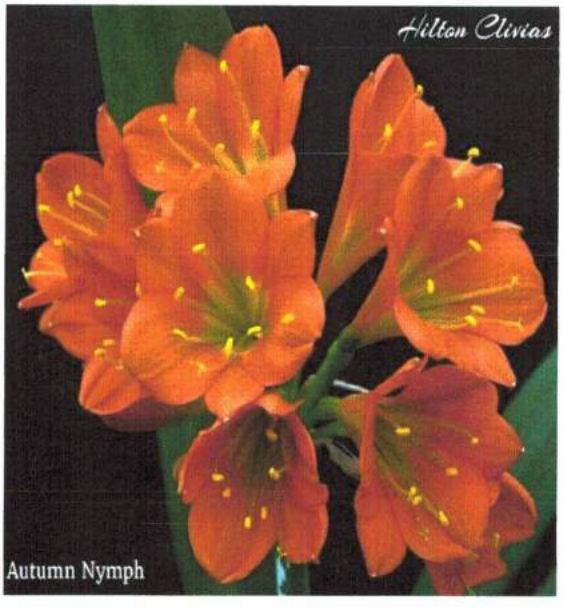

Hilton Clivias
My Champion x Malachite

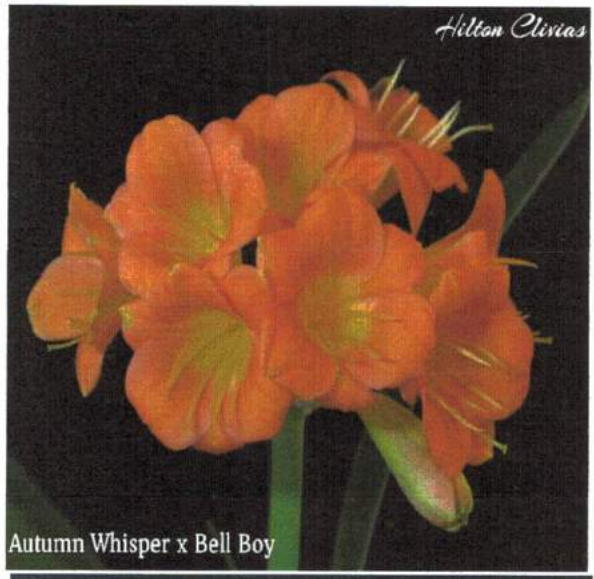

Hilton Clivias
Hilton Wizard Versicolor IS

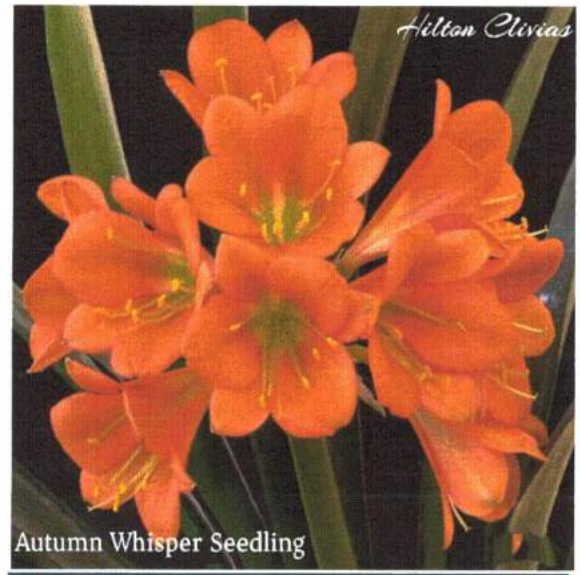

Hilton Clivias
Caulescens x Crown Prince

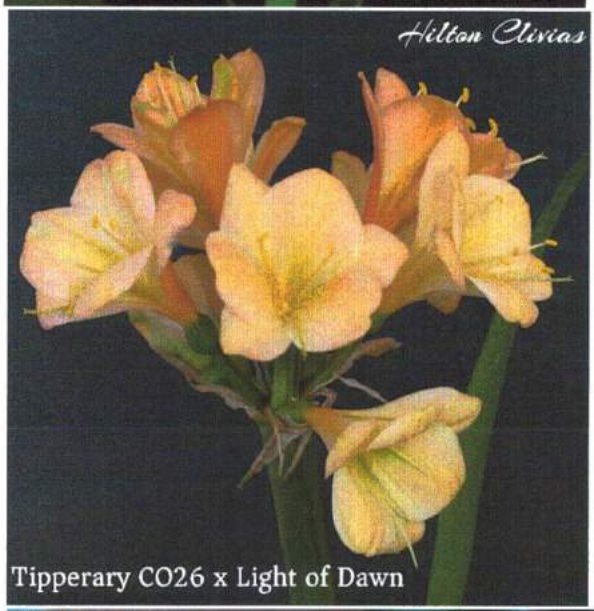

Andy Forbes Harding

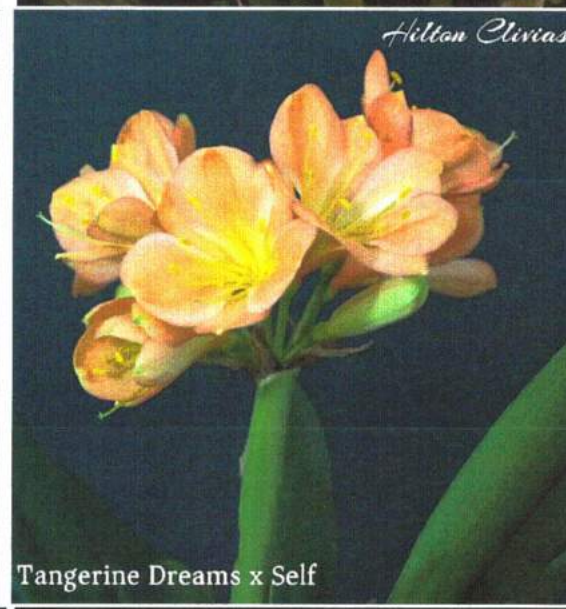

Hilton Clivias
Angel of Light No 1


Hilton Clivias
Autumn Nymph


Hilton Clivias
Autumn Whisper x Bell Boy


Hilton Clivias
Autumn Whisper Seedling


Hilton Clivias
Tipperary CO26 x Light of Dawn


Hilton Clivias
Tangerine Dreams x Self


Hilton Clivias
Flamingo x Self


Hilton Clivias
Brian x Golden Renaissance

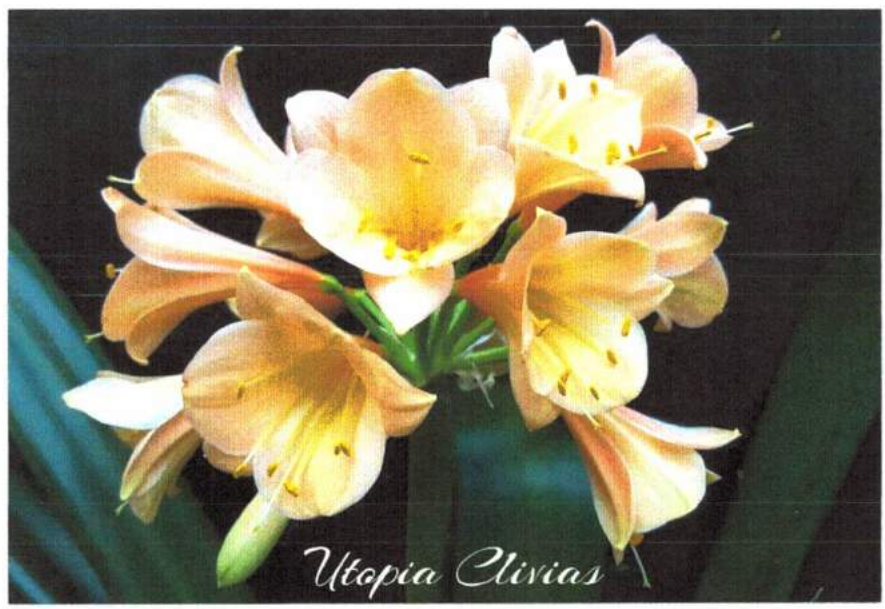
The "Secret Series" of pink Interspecifics

by Carrie Krüger - Utopia Clivias

Pink clivias are still rare and hard to come by. With the large gene pool in interspecific breeding, pink flowers are now also seen in the interspecific range of clivias. My first pink pastel types emerged from ten plants I received as a gift from a friend in 2007, as two-year old seedlings. These were all grown from seed of the same cross namely, (Coromandel Orange x Group 1 Yellow) x 5 Star (Gardenii x group 1 yellow). These F1 plants are all split for Group 1 Yellow and therefore, when sibling crosses are made, a percentage of them have green stems.

"Secret Kiss"

The first of these ten plants flowered in 2009 and to my surprise, it was a beautiful creamy pastel which developed pink tinges as it matured. The flowers were large and semi-open on a small to medium sized plant. It flowered during the interspecific time and I decided to take it to the Eastern Province Interspecific Show where it was voted best on show. I named this one "Secret Desire" as it was desired by so many at that show.



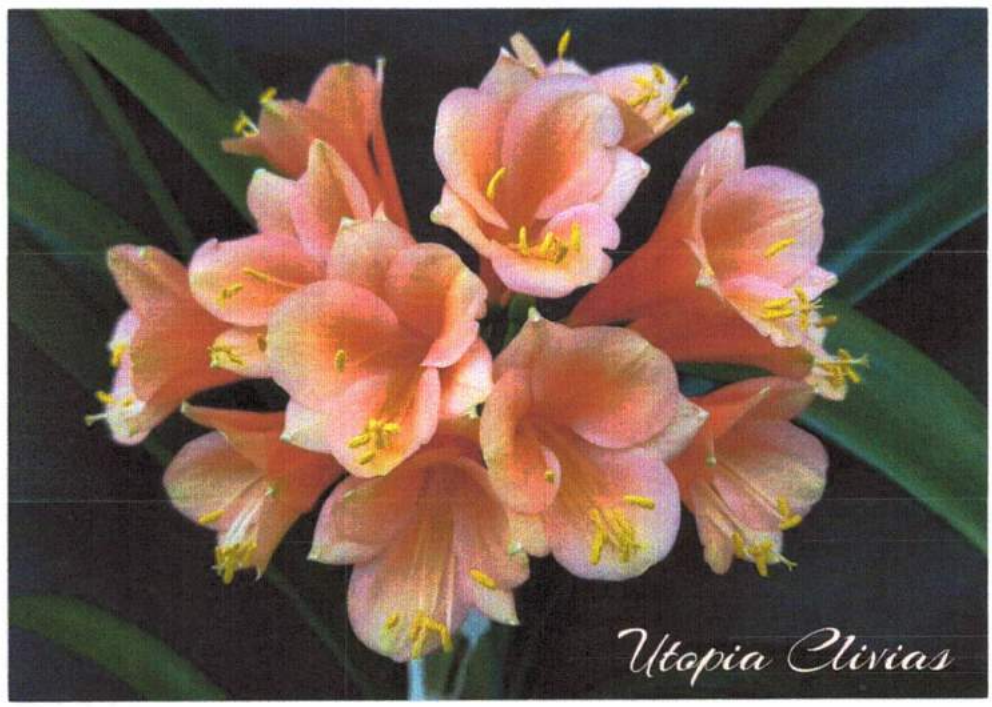
"Secret Desire"

During 2011 two more opened. I participated in both the Eastern Province and Garden Route Clivia Shows, where both these plants were selected as winners. At the Eastern Province show in July, "Secret Wish" was voted best on show. It is salmon pink with semi-open flowers on a sturdy medium sized plant. In August the third plant started opening and I named her "Secret Hope". Although all the flowers were not open yet, it was voted second

best on show. It is a beautiful pink with large semi-open flowers on a medium sized plant. Since then, others have all flowered, mostly as beautiful pink pastels. Two of the ten plants flowered as yellow interspecifics.

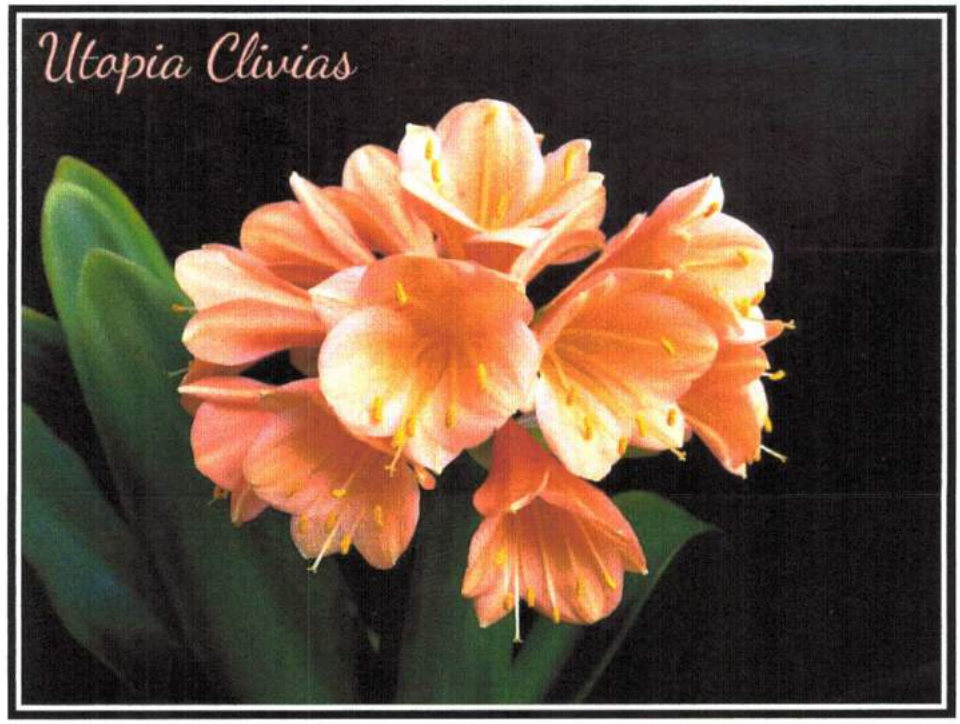
"Secret Hope"

They do not all flower during show times, but I have named and numbered them for breeding purposes. I did sibling crosses with them and the first f1 flowered in 2015. It was a beautiful large pink semi-pendulous flower named "Secret Child". Although the flower count was low, as the plant was only three years old at that stage, I have good expectations for the crosses. "Secret Mystery" flowered in 2019. This was also a sibling cross.



"Secret Mystery"

The other plants in this range are as follows: "Secret Love" has lovely salmon pink flowers on a semi broad leaf, compact plant. "Secret Rose" opens in a lovely round cream flower that matures into an apricot pastel. "Secret Destiny" is almost a pure pink. "Secret Strawberry Parfait" has the pinkest flowers and is the only one that offsets well. "Secret Baby Doll" is a more pendulous flower in soft shades of cream, pink and pastel.



"Secret Love"

"Secret Destiny"

What makes these plants stand out from the rest, is the size of the plants. Most of them are much smaller and more compact than the average interspecific with shorter leaves. They are neat, tidy plants and it seems that the umbels keep on improving every year. They have viable pollen and set seeds well. I am extremely excited to see the results of all these sibling crosses,where I used the pollen on pink miniatas and other interspecifics.

"Strawberry Parfait"

We have since then crossed some of the Secret Series with "Dreaming Series" plants and lovely pastel versi colours have flowered.

"Sweetheart"

We look forward to seeing many more beautiful flowers from these crosses.

Early results of interspecific breeding

By Piet Theron

As I only started with my Clivia collection in 2002 only a few clivia plants were available locally. These were mostly F1 oranges. Yellow interspecifics were, as today, very sought after. The only plants that were in my possession were a *C. gardenii* x Yellow *C. miniata* (Fig 1) that I received from Ian Vermaak as a seedling and a *C. caulescens* x Chubb's peach (Fig 2). When the two plants flowered in 2004 Geraldine pollinated them and the seed were germinated in 2005.

My first aim was to breed my own yellow interspecific. The green stemmed seedlings were religiously kept but as has been experienced often it was actually the pigmented stems that held some of the better results. Geraldene kindly assisted me with the cross pollination. She used a small brush which probably resulted in self pollination and cross pollination. In retrospect this was probably not so bad, as it lead to virtually 4 different crosses made at the same time.

I know that the really serious breeder will go to great length to guarantee a specific cross. The unknown surprise factor is however then largely eliminated. Lately I have been using a toothpick for ease of application.

Figure 1. *C. gardenii* x Yellow *C. miniata*

First flowering was before 4 years. A multitude of characteristics were evident on growth form and pattern and flower shape and colour.

Results are shown here as they have flowered over the years.

The first to flower was (Fig 3) a Versicolor that reminded me of "Chanel" that was the best interspecific around for so many years. The second to flower (Fig 4) was an orange that

Figure 2. *C.caulescens* x Chubb's peach

Figure 3. Red outside and Peach inside

Figure 4. Orange with ghosting

Figure 5. Yellow multipetal interspecific

Figure 6. Yellow interspecific

Figure 7. Yellow like small *C. miniata* interspecific

Figure 8. Pink Interspecific

somehow seemed a little odd. This manifested itself as ghosting on subsequent flowering on the inside of the petals. However this seems to be an attribute that get's lost on a narrow petal such as shown. The third one (Fig 5) flowered last year 2011 and surprised me with 40% multipetal yellow flowers. (Fig 6) 2011 has a better yellow flower with flaring although an untidy leaf distribution. (Fig 7) also a yellow 2012 is looking more like a small *C. miniata* especially the umbel arrangement.

(Fig 8) The Pink Interspecific is now flowering and is probably the pick of the lot. Two others have also flowered and are fairly good orange examples. I still have a number of them as they were mostly kept and the results are awaited with anticipation.

To me the big value in this breeding exercise, having the genes of three species thrown into the mix is that you only need to have two Interspecifics to start off. Eventually you may end up with a whole collection of varying nature and then decide what really works for you and what to continue with.

It would be worthwhile to repeat the whole process if you are one of our younger members. Initially select the the best examples of the different species that are available to you, in this instance it does not need to be a very expensive plant. Some of the more experienced members will gladly supply you with pollen if asked.

Up to now the initial parents have not been pollinated with any other pollen, thus I don't have results to compare. The first one flowered before 4 years and the last one now at 7 years. They had not been given the optimum amount of attention to promote quick flowering. On seeing the last one they were all promptly recovered from the garden and varying stages of neglect to be repotted and nurtured , maybe for flowering next year.

Recently Rouzell van Coller also showed breeding results on the forum that elicited the wide variety of results obtained from a specific cross. I hope this stimulates further interest in breeding for improved interspecifics and especially to show the variety that exists. We have to continue looking for the ultimate beauty.


Meteor Showers (yellow miniata x caulescens)
Michael Loh, Michael's Clivias NZ


Meteor Showers (yellow miniata x caulescens)
Michael Loh, Michael's Clivias NZ


Kiwi Torch (miniata x cyrthanthiflora)
Michael Loh, Michael's Clivias NZ


Interspecific of mystery seed from China
Michael Loh, Michael's Clivias NZ


Harburg Blush gardenii
Michael Loh, Michael's Clivias NZ


Harburg Blush gardenii x yellow miniata
Michael Loh, Michael's Clivias NZ


F2 minigard
Michael Loh, Michael's Clivias NZ


F2 Caulescens x miniata
Michael Loh, Michael's Clivias NZ


F1 Caulescens x miniata
Michael Loh, Michael's Clivias NZ


F1 Green Goblin
Michael Loh, Michael's Clivias NZ


F1 Green Goblin (gardenii)
Michael Loh, Michael's Clivias NZ

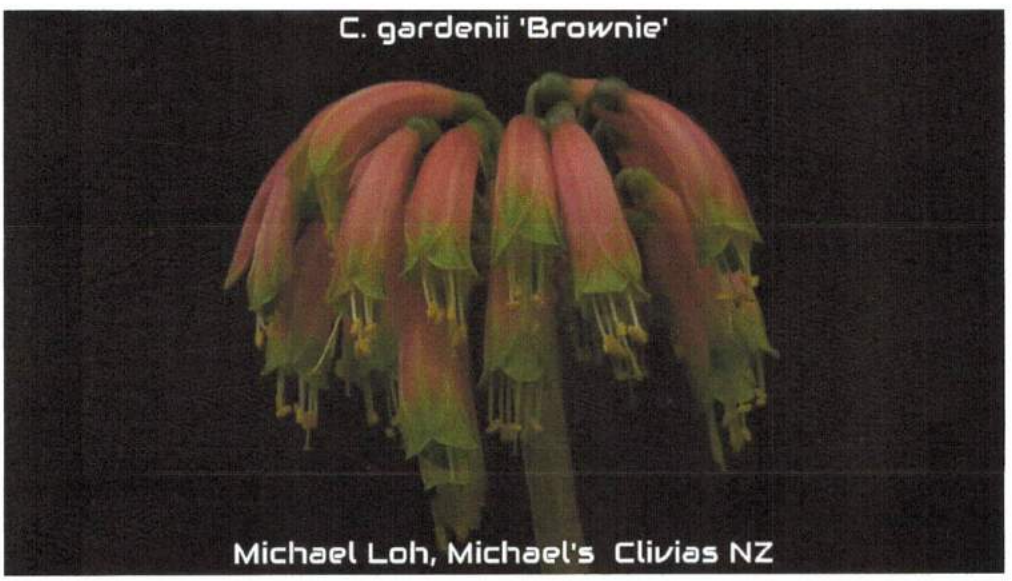

F1 Emmadale
Michael Loh, Michael's Clivias NZ


F1 Caroline's Pride
Michael Loh, Michael's Clivias NZ


Below Left = Unknown
Top Right = Wind Chimes
Below Left = Gardenii
Bottom Right = F1 Caroline's Pride
Michael Loh, Michael's Clivias NZ


C. caulescens x C. yellow mi
Michael Loh, Michael's Clivias NZ


C. caulescens x C. mi
Michael Loh, Michael's Clivias NZ


C. gardenii 'Brownie'
Michael Loh, Michael's Clivias NZ


C. cyrthanthiflora Noz
Michael Loh, Michael's Clivias NZ


C. cyrthanthiflora
Michael Loh, Michael's Clivias NZ


C. cyrthanthiflora x Self
Michael Loh, Michael's Clivias NZ


Alphagard (gardenii x miniata)
Michael Loh, Michael's Clivias NZ


Alphagard (yellow miniata x Green Goblin gardenii)
Michael Loh, Michael's Clivias NZ


(yellow miniata x caulescens) x Self
Michael Loh, Michael's Clivias NZ


Yellow miniata x Yellow caulescens
Michael Loh, Michael's Clivias NZ


Michael Loh, Michael's Clivias NZ


Yellow Interspecific with unclear breeding
Michael Loh, Michael's Clivias NZ


Wind Chimes F1 Harburg Blush Gardenii
Michael Loh, Michael's Clivias NZ


Red nobilis x red miniata
Michael Loh, Michael's Clivias NZ


MP Interspecific (MP Caulescens x MP miniata)
Michael Loh, Michael's Clivias NZ


MP Caulescens
Michael Loh, Michael's Clivias NZ

Hilton Clivias

www.hiltonclivias.co.za

e-mail: lbester02@telkomsa.net

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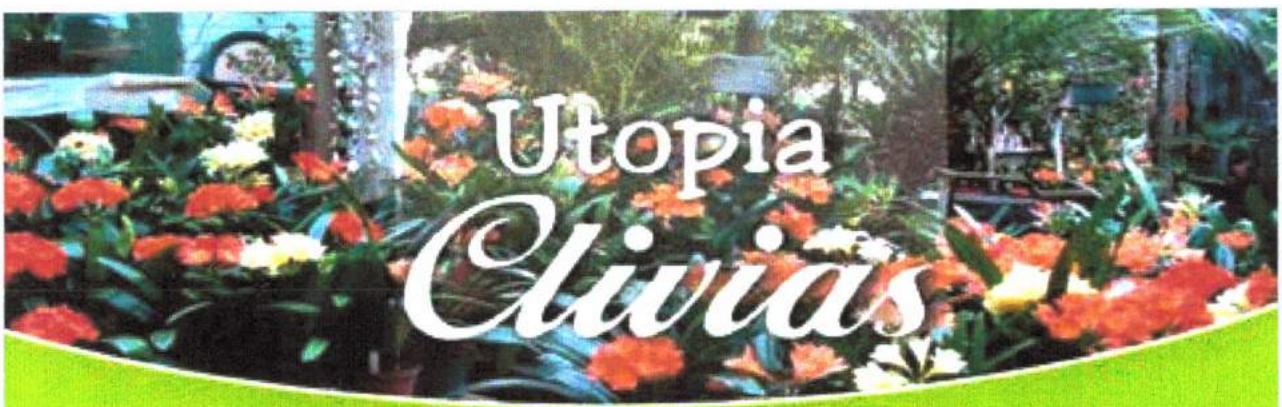
and plants
Worldwide



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+27 83 343 1288 (cell) +27 44 343 2183 (t)
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NATURAL INTERSPECIFIC HYBRIDS IN CLIVIA

C. *miniata* X C. *caulescens* hybrids from Mpumalanga

John Rourke, Compton Herbarium, Kirstenbosch

Hybridization through man's deliberate intervention has played a pivotal rôle in *Clivia* breeding during the past one hundred and fifty years. Now there are not only first generation interspecific hybrids but a whole series of backcrossings, resulting in plants of complex parentage, using the four species that have until recently been available to growers.

However, natural hybrids, that is, hybrids found in the natural habitat where two species grow sympatrically, flower simultaneously, and have by chance been cross-pollinated by birds or insects, have not yet been reported in *Clivia* literature as far as I am aware. I was first alerted to the presence of naturally occurring *Clivia* hybrids by Willem Froneman, horticulturist at the Lowveld National Botanical Garden in Nelspruit in the eastern Transvaal province of Mpumalanga.

When the Lowveld Garden was established in 1969 some *Clivia miniata* plants collected in the wild on The Bearded Man were planted out in the garden. (The Bearded Man is a 1455*m* high peak on the Swaziland-Mpumalanga border, capped by a patch of Afromontane evergreen forest, inhabited by both C. *caulescens* and C. *miniata*). At the time the plants were collected all were in a vegetative state and were assumed to be C. *miniata* but on flowering one or two hybrids appeared bearing flared tubular flowers. Clearly, they were natural hybrids taken unsuspectingly from nature when not in flower. Could there be any more of these natural hybrids still growing in their natural habitat?

I made several trips to The Bearded Man to examine the *Clivia* populations there, but never succeeded in finding any hybrids. An interesting form of *Clivia miniata* predominates at this site. Growing at nearly 5000 ft (1455*m*) above sea level this form presumably has a higher degree of cold tolerance than the Transkei or Natal forms that occur in coastal forest at sea level. Individually the flowers are much larger than Transkei *Clivia miniata*, but the umbels are usually fewer flowered and flowering occurs much later, usually from mid October to November. In part this is a response to a cool, elevated habitat but it is also genetically fixed as plants brought back to Kirstenbosch have continued to be late flowering. These features alone make The Bearded Man populations of C. *miniata* particularly interesting.

Figure 1: Pale, blush pink form of C. *caulescens* from The Bearded Man, Mpumalanga.

On the moister southeast facing side of The Bearded Man summit, C. *caulescens* can also be found, growing on steep rock faces. It too flowers in late spring and early summer. A most unusual, arresting colour form – a pale blush-pink, occurs at this site (*Figure* 1). Both species were observed flowering in late spring but despite a careful search no hybrids could be detected.

Then, an opportunity arose to make a winter visit to The Bearded Man. Neither C. *caulescens* nor C. *miniata* were in flower in late July but to my great surprise several obvious natural hybrids were in full bloom. They were a delicate pale blush apricot, clearly betraying the pale blush-pink genes of the adjacent C. *caulescens* in their parentage.

Most significantly, the examples I saw were all very old plants with well developed rhizomes just over 50*cm* long – another legacy of C. *caulescens* in their parentage. They had probably been growing there undisturbed for well over 50 years, if not longer.

Two hybrid plants were selected from the wild population for cultivation at Kirstenbosch, both with pastel flowers. These have been grown on for several years and have flowered annually at different times between May and July and on one occasion in November. Both are exceptionally robust and vigorous with showy umbels carrying between 27 and 29 flowers (*Figure* 2).

The presence of such hybrids in nature immediately raises the question of pollinators. Orange-red tubular flowers like the normal colour form of *Clivia caulescens* are almost invariably pollinated by sunbirds although reliable confirmed sightings have not been reported in this particular case. Would sunbirds be attracted to pale pink forms? The best we can do is to assume that the likely pollen vectors in bringing about a C. *miniata* x C. *caulescens* cross (or *vice versa*), at this particular locality, would have been sunbirds.

Figure 2. Natural hybrid (C. *miniata* x C. *caulescens*), from The Bearded Man, Mpumalanga.

Another interesting feature of these hybrids is the shift in flowering time from late spring (both parent species) to early or mid winter (hybrids). Precisely why these hybrids should flower several months earlier than either parent is not clear but it certainly provides a useful extension to the flowering season. Willem Froneman tells me that some of his wild-sourced natural hybrids from the same locality flower several times a year but that there is no predicting as to when flowering spikes will be produced.

One might also expect to find natural hybrids between other species although I have not personally observed any and to the best of my knowledge none have been reported. *Clivia miniata* and C. *gardenii* grow together at numerous sites in Natal and the Transkei but their significantly different flowering times virtually preclude naturally occurring cross pollination from taking place. The only other possible combination is C. *nobilis* and C. *miniata*. These do have flowering times that overlap. I have observed these species growing sympatrically at just two sites; one, at Qora mouth in the Transkei, the other in the lower Kei River valley at the confluence of the Gaguga River and an unnamed stream. In both instances no obvious natural hybrids could be found. It is of course entirely possible that like the C. *caulescens* x C. *miniata* hybrids from The Bearded Man these would bloom outside the main September flowering period and would therefore not have been evident at the time of my visit. But this is mere conjecture until field observations prove otherwise.

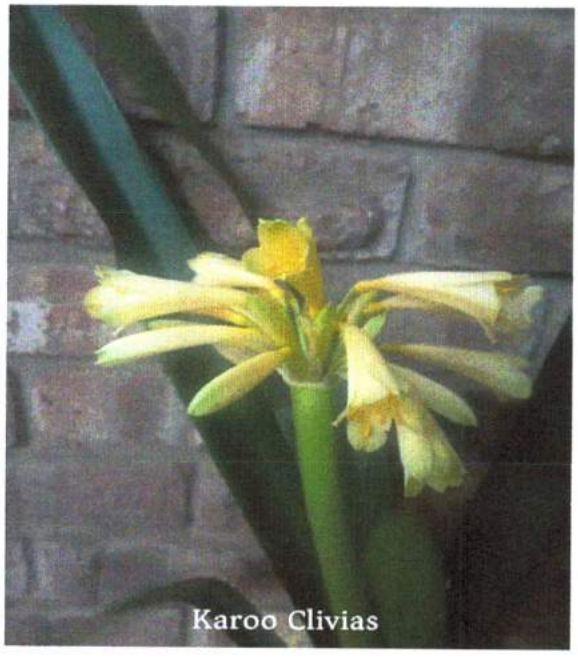
Observations on naturally occurring *Clivia* hybrids in wild populations are woefully scarce as are reliable data on pollinators. This is an open field where sound observations and photographs of pollinators in action by naturalists and wildlife photographers can contribute much to our knowledge of Clivias in the wild.

Interspecific *Clivia*: Grower: Mick Dower.

Karoo Clivias


Karoo Clivias


Karoo Clivias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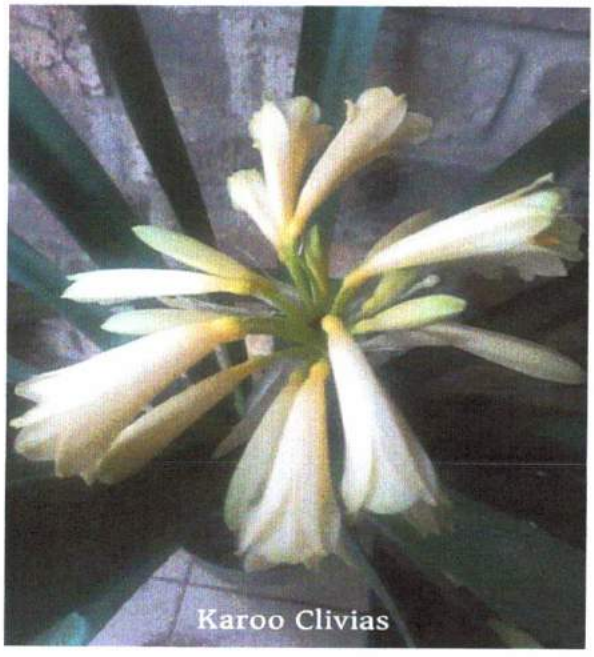
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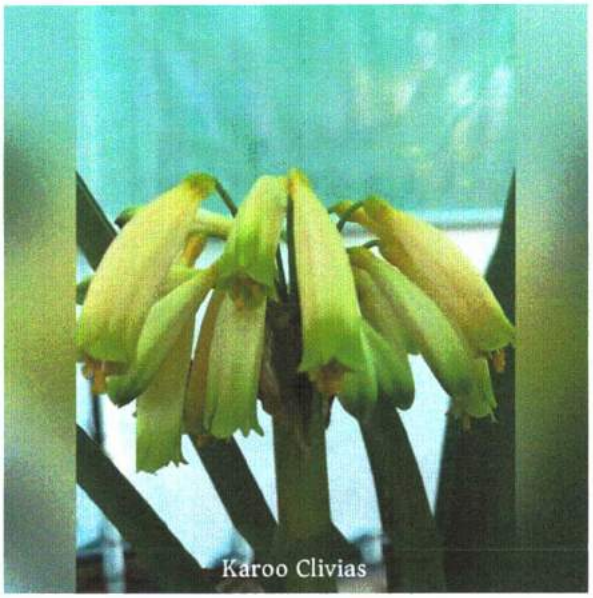
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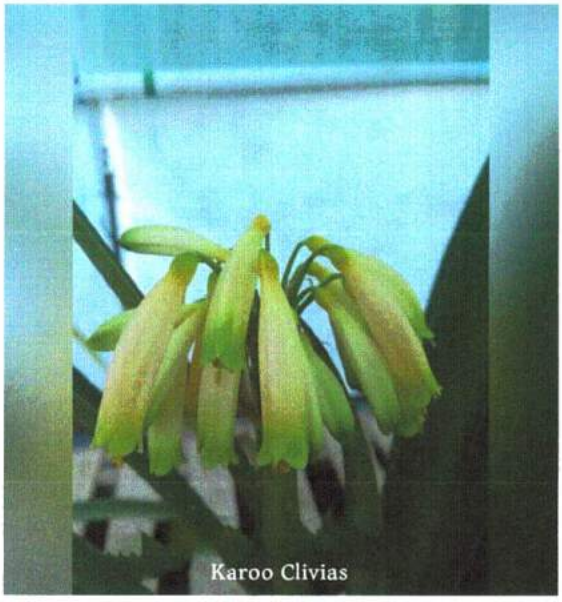
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Interspecific Breeding

Francois van Rooyen

The increase in interest in interspecific *Clivia* has surprised me. A few years ago, there was very little interest and no demand for interspecific *Clivia*.

Why breed interspecific *Clivia*? The interesting colours found in the pendulous species and the versicolour present in most pendulous species are desirable features to try and include in *C. miniata* flowers. With these in mind, what has developed, is that the interspecific plants have extended the flowering season and more importantly have developed to such an extent, that today they are appreciated by and appeal to growers as a, separate groups, of outstanding plants. They are neither narrow tubular flowers nor inferior *C. miniata*, but instead are appreciated for their unique beauty.

As breeders, we are spoilt for choice, as there are six species of *Clivia* to use for our breeding programmes. There is no correct or incorrect way to breed interspecific *Clivia*. All six species may be used successfully. Five of these six species are pendulous and one is an upright species.

Desirable features of the parents:

If we want to breed a desirable interspecific plant, what should we consider the most important factors in choosing suitable parents.

a) Flowers. This is the most important factor here. Chose specimens with at least thirty flowers in the umbel. The greater the number the better. *C. nobilis* umbels are known for the large numbers of flowers present. Flowers should be chosen for their size, the bigger the better.

b) Leaves. The leaves play an important role in the overall appearance and balance of the plant. Leaf quality is often neglected in the breeding of interspecific plants. When you start a breeding line, please include the leaf appearance as an important factor in selecting the parents.

c) Peduncle. The height of the peduncle is important. The height should allow the display of the umbel above the surrounding leaves. Preferably choose a tall peduncle. A cross with the short peduncle of a Chinese plant, however does work well.

d) Colour. Most pendulous species are versicolour. Choose flowers for their interesting colours or combination of colours.

e) Flower shape. When you are choosing a *C. miniata* parent, if possible, select a bloom that is large and recurved. These desirable qualities may not appear in the first generation but will be evident by the second generation.

f) Pod or pollen parent. Claims have been made previously that the choice of which parent is to be used as pollen and pod parent is important, however this is not so in the breeding of interspecific plants.

'Compatibility'

When using the word 'compatible', I am referring to the production of green-stemmed seedlings. There is a varying compatibility of the pendulous species with group 1 and group 2 yellow *Clivia*.

- Yellow *Clivia caulescens*, when crossed with a group 1 yellow, produce yellow seedlings.
- Cream Midlands *C. gardenii*, when crossed with a group 1 yellow, produce green-stemmed seedlings. Use the Midlands *C. gardenii* as the pod parent and this will result in faster growth and maturity of the seedlings.
- *C. robusta* displays no obvious compatibility with group 1 yellows. The close relationship of *C. robusta* to *C. gardenii* would lead one to expect green-stemmed seedlings with group 1 yellow flowers.
- *C. nobilis* yellow is compatible with group 1 and 2 yellows and green-stemmed seedlings will result.
- *C. mirabilis* yellow is compatible with group 1 yellows.
- *C. Ngome* complex. When crossed with

5 Star Versicolor' Breeder and photo Carrie Kruger.

Q08 Interspecifc – photo and owner Carrie Kruger.

'Spirit Ember' Breeder and owner Carrie Kurger

both group 1 and 2, they produce green-stemmed seedlings. The flowers are yellow, but blush with age.

When the Ngome *C. gardenii* are crossed with '777' and 'Andrew Gibson', green-stemmed seedlings are produced.

The importance of the 'Generations' in breeding

1) When crossing *C. caulescens* with *C. miniata*, good results are achieved in the first generation. These results are improved in the second generation of plants.
2) When crossing Ngome *C. gardenii* with *C. miniata*, good results are achieved in the first generation.
3) C. nobilis crossed with *C. miniata* results in some good first generation plants, but the F2 generation is even better.
4) *C. mirabilis* crossed with *C. miniata* produces good results in the first generation.

The importance of 'refuelling' your interspecific crosses

If and when your interspecific crosses start resembling 'inferior quality *C. miniata*' flowers, consider 'refuelling' your plants. This is done by crossing your 'miniata- like' interspecific with a good quality pendulous plant. Good results will ensue!

Interspecifics may be crossed with pendulous species or with *C. miniata* plants and neither is necessarily incorrect.

Inter-pendulous species crosses

Crossing pendulous species with each other is a consideration when looking for hybrid vigour or the development of interesting colour combinations. Hybrid vigour is not evident if species are closely related. The results of crossing the pendulous species with each other, depends on which species are used.

a) *C. nobilis* crossed with *C. mirabilis* results in no hybrid vigour, however the F1 results

are very pleasing. These seedlings are slow growing. The slow growth of these plants may obscure the hybrid vigour.

b) Crossing Midlands *C. gardenii* with a Ngome *C. gardenii*, provides hybrid vigour.

c) A *C. mirabilis* crossed with a *C. caulescens* provides varying results, but excellent growth and flower count are evident from the hybrid vigour.

d) Midlands *C. gardenii* crossed with *C. robusta* provided no evidence of hybrid vigour, indicating their close relationship to one another.

Previously, interspecific breeding was based on crossing a *C. miniata* with a pendulous species. The F1 generation was then crossed with a *C. miniata*, as was the resultant F2 generation. This eventually resulted in poor quality *C. miniata* blooms.

What advice would I give to anyone interested in breeding interspecific hybrids?

Firstly, don't be afraid to experiment.

Secondly, select good quality plants as parents and persist with the breeding into the second generation to appreciate the improved results.