CLIVIA

FIFTEEN

The Clivia Society www.cliviasociety.org

The Clivia Society caters for *Clivia* enthusiasts throughout the world. It is the umbrella body for a number of constituent Clivia Clubs and interest Groups which meet regularly in South Africa and elsewhere around the world. In addition, the Society has individual members in many countries, some of which also have their own Clivia Clubs. An annual Yearbook and quarterly Newsletters are published by the Society. For information on becoming a member and / or for details of Clivia Clubs and Interest Groups contact the Clivia Society secretary or where appropriate, the International Contacts, at the addresses listed in the inside back cover.

The objectives of the Clivia Society

1. To coordinate the interests, activities and objectives of constituent Clivia Clubs and associate members;
2. To participate in activities for the protection and conservation of the genus *Clivia* in its natural habitat, thereby advance the protection of the natural habitats and naturally occurring populations of the genus *Clivia* in accordance with the laws and practices of conservation;
3. To promote the cultivation, conservation and improvement of the genus *Clivia* by:
   - 3.1 The exchange and mutual dissemination of information amongst Constituent Clivia Clubs and associate members;
   - 3.2 Where possible, the mutual exchange of plants, seed and pollen amongst Constituent Clivia Clubs and associate members; and
   - 3.3 The mutual distribution of specialised knowledge and expertise amongst Constituent Clivia Clubs and associate members;
4. To promote the progress of and increase in knowledge of the genus *Clivia* and to advance it by enabling research to be done and by the accumulation of data and dissemination thereof amongst constituent Clivia Clubs and associate members;
5. To promote interest in and knowledge of the genus *Clivia* amongst the general public; and
6. To do all such things as may be necessary and appropriate for the promotion of the abovementioned objectives.

Front cover

Clivia miniata 'Chiba Peach', Grower and photographer Carrie Kruger, Breeder Philip Crous

Back cover

Shige Sasaki's multipetal x (*C. miniata* x *C. caulescens*)

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Yellow ex Umtamvuna 32C

EDITOR
Joubert van Wyk

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Tribute to John Winter

John van der Linde

John Winter passed away on Tuesday 8 April 2014 after a long illness.

Some of you may not know of him, though you may have clivias grown from seed from plants collected by him.

I thought I would give some details of this remarkable man who left his mark in the Clivia world, and in many other fields.

An aloe, an erica and a leucospermum have been named after him.

John was Curator of the Kirstenbosch Botanical gardens, rated one of the top six in the world, from 1978 to 1998. He was then promoted to Deputy Director of the National Botanical Institute, responsible for all the National Botanical Gardens in South Africa.

John retired in 2001 but continued to curate the Kirstenbosch collection, based entirely on plants collected from their habitats, mostly by him, with Mick Dower and John Rourke accompanying him on some expeditions.

PHOTOGRAPHER – CLAUDE FELBERT

John being awarded Honorary Life Membership by Mick Dower 2004

John Winter in a tunnel at Kirstenbosch with *C. mirabilis* seedlings

He collected many plants in the wild, from a wide range of genera besides clivias, and brought them into cultivation. For example, you may know of the well-known 'Mandela's Gold', a yellow flowering form of Strelitzia regina. This was one of his 'babies', now widely grown.

The clivias he collected included new *C. miniata* forms, such as the group forming the 'Appleblossom' complex. Seedlings grown from seed from those and other clivias, including *C. mirabilis*, are now found all over the world.

John attended the first international Clivia conference in 1994 in Pretoria and then led the establishment in 1995 of what grew into the Cape Clivia Club. John was long-time Chairman of the CCC and was the first Chairman of the Clivia Society, which has members from all over the world, many growing seed associated with John Winter.

John reported on the results of his clivia-hunting expeditions in papers presented to international Clivia conferences. He also wrote several important articles for the Clivia Yearbooks and Newsletters.

As if that was not enough, John was a most successful clivia breeder in his own right, with many show-winners to his credit.

John was a plantsman to his fingertips, humble and gentle and always ready to help other enthusiasts at workshops and individually. Thanks to his generosity many of us have grown and bred better clivias.

He will be sadly missed by Meg, his children, grandchildren and by all those who knew him.

He self-pollinated an orange flowering *C. miniata* collected at the Umtamvuma Gorge (Google it if you wish) and was surprised to see that several seedlings had unpigmented stems. When they flowered this beauty was the best of them. The '32C' refers to the orange colour as determined according to the Royal Horticultural Society Colour Chart, which was all that was available in those early days.

John Winter was made an Honorary Life member of the Clivia Society in 2004. You can read a lot more about him in the citation prepared by Sean Chubb. This can be found in the Clivia Society Newsletter Volume 13, No 2.

PHOTOGRAPHER – CLAUDE FELBERT

John with Felicity Weeden 2005

2014 Clivia Society Conference - Breeders and collections in KZN

Barney Viljoen Collection

I first started with ferns and cycads in 1996 and then in 2006 I sold all my ferns and cycads and started with clivias because it would be more challenging to see what the crosses might result in.

My clivia collection consists of mother plants I got from the following growers: Paul Kloeck, Larry Milligan, Giel Adendorff, Wayne Haselau, Andre van Rhyn, Hottie Human, Francois van Rooyen, Sean Chubb, Danie van Vuuren, Liz Boyd and Louis Lötter.

The two top plants in my collection are my Sikwebezi Bicolour and a plant called Lily which was grown from seeds received from Larry Milligan.

I do a lot of crosses with Vico Yellow, Peach green centre, and bronze and inter-specifics in which I have used Yellow Ngome *gardenii*, and I have also used a lot pollen of Sikwebezi Bicolour and Lily on Vico yellow and will be waiting to see what I receive in three years.

Hottie Human and Barney Viljoen

At the Vryheid show in 2008 I won with my Vico Yellow – Best on Show and in 2009, the same plant also won Best on Show. In 2013 I won with a Peach Green centre. I have also won many medals in the different show classes.

Photos of my plants are available on the web at www.ngomieclivias.co.za.
88 Republic Road, Vryheid, Kwa-Zulu-Natal, 3100, South Africa.
My contact details are: +27 738987673.

Karkloof Clivias

Ben Eden Farm – Glen and Liz Boyd

Ben Eden Farm is situated approximately 120 kilometres inland from the coast in Kwa-Zulu Natal. We purchased the farm in 1988. Our farm has a large portion covered in indigenous forest, home to many pockets of *Clivia miniata*.

I attended my first clivia show in 1999 and that sparked my interest in clivia, especially *C. miniata* which is my main focus.

In 2006 I was given the "Naude's Peach" to work with (my sister was great friends with Olive and Stoffel Naude). It has proved to be one of the most interesting plants to work with. I have bought in many plants from far and wide with the sole purpose of crossing with 'Naude's Peach' .

My other star performer is 'Cameo', bought as a chance seedling at a nursery. Her offspring are proving to be beautiful flowers.

Space is fortunately no problem as we reside on a farm. I have eight shadehouses

Cameo

Insect control

Naude's Peach

Gold Cup

Oxblood

Four Seasons Peach

as well as approximately one hectare of pots under trees.

Every year I do certain crosses and grow out all the seed. In this way I can see on a head of seed what percentage are pigmented and what are unpigmented. This also enables me to see if the cross has given the plants vigour, or if generally the seedlings are weaklings.

I plant the seeds in June on heated seed beds so that by September they have germinated and I can see which were good crosses and which not.

Growing clivia is very rewarding – each year brings new surprises!

Carpe Diem Clivia Collection

Owners Piet & Hannetjie van Wyk

My wife and I started growing clivias in 1992. We tried to attend as many clivia shows across South Africa as possible. We started by buying only the best seeds, offsets or plants from the best-known growers all over South Africa and even plants imported from other countries such as Belgium, Australia etc. We tried to buy available show winners or only the best we could find.

We started crossing our plants as they started flowering and needless to say we grew some beautiful plants ourselves. We only kept the best and sold most of the plants to the nurseries or to the public.

At this stage and time our collection of plants has grown to about 50 000 plants.

Hannetjie and Piet van Wyk

From whom did we buy? The list of growers is endless but here are some of the growers: Pat Gore, Tino Ferero, Pikkie Stumpher, James Abel, Sean Chubb, Lionel Bester, Hennie Kock, Rudo Lötter and his father and uncles, the late Fred van Niekerk, the late Ammie Grobler, Pieter van Niekerk, the late Bertie Guillaume, Chris Viljoen, Nick Kruger, the late Dries Olivier, Hottie Human and Liz Boyd. The list just carries on and on. It is clear that with this collection we have a great gene pool in our hands. We have grown show winners and many more plants that took prizes in their show categories.

I live in a rural area called Gluckstadt and am only available after 6 o'clock in the evening at +27 83 6514350. Gluckstadt is about 40km from the Ngome Natural forest.

Email address: tjoepman@gmail.com

Clivia Passion

Val Thurston

I saw my first clivia in 1970 in the garden of Roy's home down the South Coast. Although we had a garden at home when I was a child I had never come across this amazing and addictive plant and living in a town, was not exposed to the countryside where they grew naturally in the indigenous bush. When I saw these beautiful orange blooms I was immediately attracted to them but unable to take a plant home as, at the time, I was not married and lived in a boarding house in Currie Road, Durban. I worked all week and spent the week-ends riding my horse at Hillcrest. Roy was up the north coast and spent most of his 'free week-ends' down at Renishaw with his family on a sugar-farm which was surrounded by sugar-cane and pockets of indigenous bush in which clivia were abundant.

In 1973 Roy and I were married and moved to our own home in the Upper Tongaat. I was then given my first orange plants by Roy's mother and started my long, exciting and passionate hobby of clivia madness. We were hardly settled and on arriving home after spending the Easter week-end down at Renishaw, were informed that we had to move to the coast as Roy had been promoted. We were now about 1km as the crow flies from the sea. The clivias were uprooted and settled in at our new home. Little did I know that they would not flower well in the coastal humidity and warm winter climate and only seemed to flower late in the season around December, if at all some years. I never gave this much thought as I did not know much about the growing requirements of the species.

The craze really hit me with a bang when I attended a garden wedding in Howick and saw a yellow specimen for the first time. I just had to have one! The owner of the plant promised to give me seed and eventually when the plant produced offsets I would get my plant! It turned out that this particular plant had been purchased at the then Natal Witness Garden Club from Cynthia Giddy and was later named 'Natal Yellow'.

Each year I pestered the owner and was

told that it did not have any seeds, the dog had dug it up chasing moles, or it was rescued and planted in a container to recover. In the meantime I had spread the word around the local Tongaat garden club members that I was on the lookout for a yellow clivia. I managed to get one from a chap who lived in a park-home up at Cato Ridge at the exorbitant price of R35-00 – this turned out to be the 'Celtiskloof' yellow which he had obtained from a friend of a friend from that area.

C. miniata Enchanting

Sheer Delight

At the same time I had heard that a nursery up at Merrivale had managed to obtain some yellows from a local farmer and had put one aside for me. Naturally we rushed up and purchased the plant for R50-00! This turned out to be the Howick Yellow. Well, 13 years later the owner of the Natal Yellow arrived at the house with my offset – I was over the moon as I now had 3 yellow clivia. The Celtiskloof Yellow had in the meantime over about 5 years produced offsets. By that time I had met up after of gap of many years, my good horse-riding friend, Jill Chubb, at the Royal Show. She and I had been riding buddies from years ago when we were teenagers but we had drifted apart going our own way through the years. We were both married and she had 3 children. We visited her on her farm at Eston where I met Sean, who was home for the weekend from Cedara Agricultural College. We got chatting and wandered around the garden admiring his plants and soon found that we had a common interest in cycads, bulbs and, of course, clivia.

I mentioned to him that I had managed to get a yellow plant and he immediately told me about the "yellow" one that had been found in the Eston area. We immediately agreed to swop offsets. When flowering time came I made the epic jour-

Fairytale Green Mascot

ney from Tongaat to deliver my "yellow" clone. Sean produced his "yellow" clone and even before he saw mine, I said that his was not yellow but peach. When we put the two plants side-by-side we could immediately see the difference in colour. His plant was named 'Chubb Peach'.

I joined the newly-formed KZN Clivia Club in 1994. The first KZN Club show was held at the Pietermaritzburg Botanical Gardens, where other yellow, pink and peach plants appeared. Emmy Wittig Pink graced the show tables, with eager clivia enthusiasts putting their names down for offsets. Numerous informative meetings were arranged, member numbers swelled and lots was learnt on how to propagate, pollinate and care for clivia. Seeds and plants of various different colours were exchanged and "clivia mania" spread like wildfire.

Forty years on I am still as passionate and obsessed as ever, have a small collection of many different colour variations and clones. I bred my first attractive Fairytale Series and am still hoping for yet more exciting results from the hundreds of seedlings growing in every bit of shade in my garden and hopefully many more years on the clock to continue my love of this amazing and fickle plant.

Val Thurston wrote a 32-page book "The Clivia" in 1998 - *The Editor*.

Co Creative Clivias

My name is Henry Howard and I have been breeding with Clivias for the past 7 years. I was introduced to Clivias by Hottie Human and I have a great appreciation for him. Co Creative Clivias was chosen as a name because we want to honour God who created all living things through Jesus Christ by simply speaking a word.

We as breeders and growers and collectors have the privilege to "co create" with Him through our pollination and breeding, and also to "co create" with each other and work together in breeding new strains.

Green Throat

We Honour: Everything we have learned we have learned from many other breeders and collectors from all over the world. My clivia mentor has been Hottie Human. Therefore we honour all these breeders and growers who have either contributed directly or indirectly to our plants: Sean Chubb, Francois van Rooyen, Hottie Human, Tino Ferrero, Dries Olivier, Chris Viljoen, Lionel Bester, Carrie Kruger, Val Thurston, Mari van der Merwe, Felicity Weeden, John Handman, Rudi Nortje, Ryder Nash, Larry Mulligan and Louis Lötter. Without all these people it would have been impossible to enjoy clivias. Thanks to a wonderful Clivia fraternity!

Our Plants: We have a wide variety of *C. robusta*, *C. miniata* and Interspecifics. My favourite *C. robusta* is a near white and my favourite *C. miniata* are Florid White Lips and Hottie's Hirao. My favourite Interspecifics are Cransley Peach X Peach *C. robusta*, Florid White Lips X *C. mirabilis*, Natal Yellow x Gem's Golden Renaissance and Kevin Walter's Yellow X near white *C. robusta*.

Breeding Programme: We love making new crosses. For example for the past four years we have been making all kinds of crosses with Florid White Lips. Our aim is to breed smaller, more compact plants that are growing quicker, but not compromising on flower quality. Pastels make nice crosses with Florid White Lips and one finds the ghosting dominating in the next generation. A very interesting cross is one between a *C. mirabilis* X Florid White Lips that Sean Chubb made. This cross has a high flower count and the seeds ripen just as quickly as *C. mirabilis*. It takes 4-5 months for the seeds to ripen. If one thinks that this cross flowers twice a year, one is planting seeds twice a year! Even other pollen that is put on this plant sets seed just as quickly! I believe the quest for breeding smaller quicker growing plants without compromising on flower quality is one to be taken seriously. I have put the pollen of many different plants with very nice flower form and count on my Florid White Lips and they grow quite quickly and it is clear that they are smaller in size. By crossing Florid White Lips with our local South African plants and also with Japanese and Chinese plants we are breeding plants that are tougher than the Florid White Lips, yet quicker growing with nice flowers.

Here is just some of the pollen I have put onto Florid White Lips: Nakamura best ghost Multitepal, Roly's Chiffon, Red broad leaf, Luke special, Ndwedwe Orange Globe, Hottie's Hirao, Chinese broad leafs, pastels, yellows, pinks, oranges, interspecifics etc. Another line is where I put Heritage plants' pollen onto Florid White Lips. It has been proven that Hybrids and Heritage plants make beautiful crosses. Currently I have pollinated Florid White Lips with eight different Umtamvuna clones, 2 Mzamba clones, Luke special, Tracker, Ndwedwe Orange Globe, Ndwedwe Jade green throat, Origin of life, 911, Andrew Gibson, Discovery etc.

We are currently making all kinds of crosses with green throats as well. I am using Hottie's Hirao extensively in my breeding. I believe this is one of the best Hirao's around. It is vigorous, has a nice flower form, umbel and a high flower count.

I have put this plant's pollen on a lot of different top plants, but here are some of them: Belgium Bronze green throat; Daggakoekie (Cross between Pastel Blush X Hottie's Hirao), Variegated Nartjie green throat (ex Dries Olivier plant), Cransley Peach Interspecific GR 2 (bred by Sean Chubb), Natal yellow X Gem's Golden Renaissance (Interspecific bred by Francois van Rooyen), Group 2 Peach, Ndwedwe Jade green throat; Desire, Hesper, Red Green Girl etc. Maybe

the Hirao revolution has not stopped but actually has increased. We can now safely say that Natal yellow and Hirao when crossed with Gem's Golden Renaissance gives Interspecifics with lots of green, and that Cransley Peach when crossed with Peach *C. robusta* gives very green Interspecifics. The green in the Hirao reacts well with green tips of some of the pendulous flowers in *C. robusta* and Ngome types. We can now breed for greener Group 2 plants than Hirao's and Group 2 peaches with green throats and other green throats that have even more green in them. We can breed for picotés with green throats etc. We are in the middle of the green revolution!

We are also breeding for F2 and F3 Interspecifics:

(*C. mirabilis* X Florid White Lips) X Florid white lips. Hoping to get Ghost Interspecifics.

(Kevin Walter's Yellow x near white *C. robusta*) x selfed or X near white *C. robusta*. Hoping to get near white F2 Interspecifics or even better near white *C. robustas* out of 25% of the seedlings.

Cransley Peach (Group 2) Interspecific x Hirao. Hoping to get completely green F2 Interspecifics.

Natal Yellow x Gem's Golden Renaissance x Hirao. Hoping to get a green Interspecific with two other colours.

Valentine (F2 interspecific with Natal Yellow in the breeding and high flower count) x Hirao. Hoping to get nice green throats with pastel tips with a high flower count.

(Florid white lips x C. *mirabilis*) X Hirao. Hoping to get a green throat interspecific with a high flower count.

Kwa-Zulu Natal: A unique province impacting clivia breeding all over the world. I believe that we have a unique opportunity in Kwa-Zulu Natal to preserve the natural heritage of clivia and combine it with endless possibilities for new breeding. The genetic material in clivia in this province is maybe the most diverse in the world. Combining Hybrid and Heritage in breeding will still bring us some of the most amazing results. Some of the crosses that have been made this way are just marvellous: Andrew Gibson x 911 (Hottie Human); Msubo Wow x Andrew Gibson 'Fairytale' (Val Thurston); (Natal Yellow X Naude's Peach 'Pastel Blush') X Hottie's Hirao 'Daggakoekie' (Sean Chubb); Natal yellow x Gem's Golden Renaissance (Francois van Rooyen). I really believe the breeders in this province can contribute in a vast and extensive way to the future of clivia breeding all over the world for many decades to come. Our natural heritage and the way we handle them in KZN can create a wonderful future for clivias in the world.

The Habitat Heritage Collection

The Habitat Heritage collection is a historical collection of rare and unusual clivia originally wild collected from various natural clivia habitats. These specimens have been collected over a long period of time by numerous people. It is both a living museum as well as a captive breeding project. This conservation initiative is housed in a naturally landscaped shade house especially built for the collection. Thurlow Flora, the nursery of Sean Chubb, is the home of the Habitat Heritage collection and is situated at Eston in KwaZulu Natal. The collection is open for any interested parties to visit. The best time to visit this collection is in *C. miniata* flowering season from mid-August until mid-October, although during the *C. gardenii* and *C. robusta* flowering season in late May and early June the display is also spectacular.

Oribi Gorge Yellow

The source of all genetic diversity is to be found in our natural habitat populations of clivia. The outward expression of flower colour and form variation is the best recognisable manifestation of genetic diversity within clivia. The conservation of these natural habitats and the preservation of the diverse gene pool within them are paramount to the future of clivia conservation. The genetic diversity essential for the future cultivation of clivia and the ability of clivia to adapt to changing environmental conditions may be lost. Genetic diversity as represented in the Habitat Heritage Clivia plants must be conserved and protected if clivia cultivation is to have a secure future.

The objectives of the Clivia Habitat Heritage collection are:

- To promote first and foremost the conservation of clivia in their Natural Habitats
- To encourage awareness of the diversity within clivia
- To conserve and document as accurately as possible the history of Habitat Heritage Clivia clones
- To include and represent Habitat Heritage Clivia from all known clivia species
- To preserve the diverse gene pool of Habitat Heritage Clivia
- To provide interested parties access to a gene bank of clivia by providing Living plants in their original clonal form, seed and pollen from Habitat Heritage Clivia

Specimens of clivia within the Habitat Heritage collection do not necessarily have to have been collected very long ago to have Heritage value. However some of the older collected plants have interesting histories and have a particular place in the botanical history of clivia. Each clivia specimen within the Habitat heritage collection is a fragment in history and it is the responsibility of the curator of the collection to preserve it for

Sikwebezi Bicolour

Stanger Natural Hybrid

perpetuity. The intrinsic value of a specimen is in direct proportion to the quality and quantity of the information accompanying it. This information is at least as valuable as the specimen itself. Unfortunately due to many reasons much of the history of some of the Habitat Heritage clones has been lost or distorted and some histories are kept as private secrets, lost to Clivia Heritage.

The Habitat Heritage collection should provide genetic material for breeding purposes and scientific studies. Captive breeding programmes of rare habitat mutations would hopefully decrease the pressure from collectors on the wild populations. This would be done by providing sought after genetic material to potential collectors. The risk of poaching new genetic material hopefully would be too great if the genetic material is made available to collectors. The Habitat Heritage collection gene bank makes the conservation of our unique Habitat Heritage

Lady of Oribi Gorge

Mpumulo yellow

Eshowe clones

Clivia accessible to all interested parties.

The Habitat Heritage Clivia collections primary functions are to collect, conserve, preserve, and study and disseminate information as well as genetic material to clivia breeders, hobbyists and scientists.

Heritage Collection pond

Interested parties wanting to visit the Habitat Heritage Collection can find directions on our website www.cliviasa.co.za or contact Sean Chubb on kzncliviabreeders@cliviasa.co.za or on cell 0843019960.

Eshowe clones

Stanger clones

Entumeni Giant

Natal Yellow

Hilton Clivias

Debbie and Lionel Bester

Both of us have been gardeners all of our lives, me vegetables and fruit and Debbie with flowers.

We bought our property "Leprechauns Leap Nursery" an Orchid Nursery, from Halwyn and Blanche Watkins, of Watkin's Yellow fame, 20 years ago. We were not particularly interested in clivias when we first moved in and viewed them as lovely foliage plants that thrived under trees where little else grew.

The orange flowers were a welcome sight in late winter when little else was flowering in the garden.

I remember our delight at the first flowering season at "Leprechauns Leap" when the first yellow clivias and pastels flowered in the garden. Then the telephone started ringing with enquiries from around the country from clivia enthusiasts wishing to purchase Watkin's yellow clivias.

We sold out the first day and my lifelong business instincts kicked in and the rest is history!

We spent every spare bit of cash we had and more to try to satisfy our growing addiction to clivias, which incidently, is incurable. Today our collection has grown exponentially and we supply seed, seedlings, plants and offsets to our customers locally and worldwide, all year round. We have been working with our clivias full time for the past 4 years and are immensely grateful to be in a position to do so.

Please come and visit this season, as the true joy of growing clivias is in meeting fellow clivia lovers. We are open 7 days a week during August and September and Debbie and I can't wait to meet and enjoy time with you all. To get to our nursery is super easy... Take the Hilton turn off into Hilton Village and follow our Sales signs.

We will organise Phytosanitary Certificates for anyone purchasing material from us and will ship your purchases overseas.

The Gem Wildflowers

Francois van Rooyen

Francois van Rooyen is a fifth generation farmer in Greytown, a small town in the Kwa-Zulu Natal Midlands. His main focus at present is timber cultivation, Nguni cattle and a growing indigenous nursery. The nursery was started 11 years ago in 1998 and has grown and expanded with clivia being at the forefront and where Francois's passion/obsession lies.

Apoline Best

Gem's Hobbit

Gem's Fenell Picoté

Gem's Nathaniel

Francois attended boarding school at Grey College in Bloemfontein and did his military service which kept him away from the farm for some time. Long and much anticipated holidays was the only time he spent on the farm. In 1991 Francois returned to The Gem Farm and joined his father, Pieter, farming.

Following in his father's footsteps, his affinity with Clivia grew to a point where he joined the Kwa-Zulu Natal Clivia Club in 2000. This is when his journey with clivia began. He shared and is supported on this journey by his lovely wife Ginny who is not indigenous to South Africa but a born and bred Texan from Dallas. Francois and Ginny have been blessed by the Lord with triplets, Alexander, Isabella and Pieter, born in 2005.

Gem's Pink Cadillac No. 2

Ngome F2 Interspecific No. 1

Even at their young age they enjoy planting and learning about clivia.

Francois and Pieter strive to breed, preserve and protect the enchanting clivia. The Gem Wildflowers has one of the largest pendulous and habitat heritage collections. They have won numerous awards at clivia shows. Francois has become involved at the provincial and national levels of clubs and the society. He has further had the privilege to be invited to judge many clivia shows over the past few years where he has learned a tremendous amount.

The Gem Wildflowers continue to breed and acquire extraordinary and unusual clivia. Amazing Interspecific breeding has been a fantastic success and much appreciated accomplishment. With each new season brings joy and excitement as to what will flower next.

KZN Clivia Breeders

The Clivia Club in Kwa-Zulu Natal formed in 1994 with a small group of enthusiasts. Realizing that Kwa-Zulu Natal had a huge clivia gene pool with 3 species indigenous to our borders we had a wealth of genetic material which we wanted to share with other clivia enthusiasts. In 2001 the Kwa-Zulu Natal Clivia Club Committee then chaired by Sean Chubb had the initiative to market excess clivia seed produced by the Clivia Club members to other clivia enthusiasts. The Kwa-Zulu Natal seed bank was formed.

The demand for seed both from Habitat and Nursery-grown varieties proved to be almost unsatisfiable. The seed bank flourished each year attracting more and more overseas and local clivia enthusiasts with a wide variety of new and exciting crosses.

The Kwa-Zulu Natal Clivia Breeders was established in 2008 with 3 principal members but also offered seed for sale from other Kwa-Zulu Natal Clivia Club members. Currently Kwa-Zulu Natal Clivia Breeders markets mainly the seed from Val Thurston and Sean Chubb – Thurlow Flora. Both Sean and Val started Clivia breeding programmes in the late 1970s and have a huge genetic base with multiple generation of breeding, thus offering a genetically diverse range of seed including all species of Clivia.

The Kwa-Zulu Natal Clivia Breeders offer top quality genetics in a huge variety of colours and forms, producing many new modern colours, but also maintaining the genetic purity of our habitat Heritage plants. 2014 will be the 14th year we have been offering seed for sale and we pride ourselves in producing seed of the highest quality and true to type. Many seeds offered are line bred and produce an expected outcome. Having in many cases a number of generations of breeding behind an offering, the plants flowered from such seed are highly reliable.

Seed is marketed from the beginning of April until the end of September or until such time as we are out of stock. Two principal methods are used to market our seed and they are via our website and at clivia shows and exhibitions. Our website, www.cliviasa.co.za, hosts our Galleries where customers can view our exciting range of clivia. We also send our seed list to our current and past customers and also any other interested parties. If interested please mail Sean Chubb on kzncliviabreeders@cliviasa.co.za.

Having offered our seed for sale for a long period of time, many of our customers worldwide have had seedlings flower from our seed and we have had numerous comments about our seed and the resulting flowering plants. Below are just a few of the comments we received recently:

"Last year I bought seeds from many breeders. Kwa-Zulu Natal seeds have got

the highest germination rate. 98% of the varieties germinated 100%, like 5 out of 5 seeds. I am very happy with the collection I am growing now. Thank you very much for quality seeds and all these colour variations".

"The quality of the seed is outstanding, and over the years I would have averaged well over 95% germination rates... which is excellent. The seedlings have always been vigorous growers as well. I have also flowered some wonderful plants I otherwise would not have had access to that are now part of my breeding programme. Considering we are being offered the latest crosses, and new-colour breakthroughs, I find the cost of seed, plus the necessary bank charges to be trivial."

"I consider their prices to be a bargain. Fascinating seed and always of good quality. Thanks to all involved. Keep it up!"

"Fact is, those who don't participate in these Kwa-Zulu Natal offerings, are really not keeping up with the cutting edge breeding and are being left behind. Those who already think they have the best of everything are clearly kidding themselves!!"

"Never assume free seed is worthless... Several years ago I received as part of a purchase from Kwa-Zulu Natal some free seed labeled Chubb's 2nd Chance. Judging from the results, it was a pot luck mixture from several parents/breeding efforts. Attached is a photo from one plant out of this group. And yes the other seeds from the Chubb's 2nd Chance packet are just as spectacular, although completely different. For some reason I am developing a preference for surprises."

"Dollar for dollar my greatest satisfaction has come from two seed sources over the years (starting with my first order in 2004 from these two): The Kwa-Zulu Natal seed list and the Cape Clivia Club Seed list".

"I have to say they are the biggest fattest most beautiful seeds I think I've ever seen!"

"I've had excellent germination (germination being to the point of the first green leaf)... certainly above the 95% mark and I have a great crop of healthy seedlings coming along."

"I received the seeds you sent me today. I really appreciate the extra effort you went to. The fact that you also sent me a lot of extra seeds goes way beyond keeping a customer happy! You really didn't have to, but I take note, thanks."

"Seed arrived safely today and it has travelled very well – all seeds look in very good condition. You must have a good reputation with Australian Customs as the package doesn't appear to have been opened for inspection. I expect that also meant I received it a good 4 or 5 days earlier as the inspections can be a bit slow sometimes."

"Sean, these are the biggest fattest seeds I have ever bought, a credit to you and your fellow breeders. Next season I think I will only purchase seed from Kwa-Zulu Natal Clivia Breeders."

Kwa-Zulu Natal Clivia Breeders
WEBSITE: www.cliviasa.co.za
EMAIL: kzncliviabreeders@cliviasa.co.za

Hottie Human & Louis Lötter

Louis Lötter Collection

I first started as a cycad grower and then changed over in 1995 to clivias after visiting the Northern Kwa-Zulu Natal show and seeing Hottie Human clivias.

When I started with clivias, I decided to buy seeds and offsets from the top growers and some of them are eg. Sean Chubb, Hottie Human, the late Dries Olivier, the late Fred van Niekerk, Francois van Rooyen, Tino Ferero, Pikkie Stumpher, Eric Heine, Wayne Haselau, Attie le Roux, Paul Kloeck, Liz Boyd, Ken Smith, Hennie van der Mescht, Rudo Lötter, Charl Coetzee, Lionel Bester, James Abel, Chris Viljoen and Bertie Guillaume just to name some of them.

I started the Vryheid Ngome Interest group in Kwa-Zulu Natal in 2006 and we had our first show display that year. At the show I had the best on show with an Eric Heine yellow. In 2007 the same plant came 1st runner up. In 2009 we had our first big show with judges and I took 6 gold, 2 silver and was the overall winner with most points. At the 2010 show I had the 1st runner up with a seedling of Gunston of Pikkie Stumpher and took 6 gold, 6 silver and 5 bronze and was also the overall winner with the most points. In 2011 I had the 2nd runner up with the Gunston again and took 16 gold, 9 silver and 10 bronze and again also the winner with the most points. At the Kwa-Zulu Natal *C. gardenii* show I won many gold medals for Ngome *C. gardenii* and Sikwebezi Tri colour *C. gardenii*.

Some of my own crosses have already done well at the shows and is proof that the pool I am working with is giving the results that I want. There is a good chance that the seeds you will buy from me could become gold medal plants. I have a good collection of *C. miniata*, *C. gardenii*, Ngome *C. gardenii*, Sikwebezi *C. gardenii*, *C. robusta*, *C. nobilis, C. mirabilis* and *C. caulescens*. I will have seeds, offsets and mature plants for sale from my best crosses.

I stay 20 km out of Vryheid and about 80 km from the Ngome \ Sikwebezi complex. I stay on a game farm and have a lot of space which most clivia growers don't have. Lucky me.

Vryheid, Kwa-Zulu Natal, South Africa
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Saint Charles Grade 3 Clivia Art

During September 2013 Simon Chubb [age 9] presented an oral to his Grade 3

Cherry Tip - Simon Chubb

Golden Glow - Ross Palframan

Golden Fever - Mark Nagel

Maze of Colours - Tom Freese

class at Saint Charles College in Pietermaritzburg. The oral was focused on Clivia colours and the names of many of the Clivia clones.

Night Bloom - Jared Talbot

Perfect Peach - Ross Stanton

Maze of Colours - Tom Freese

Pink Panada - Nathan Buhr

This oral inspired the boys to paint clivia in their art lesson and they had great fun thinking up their own original names for the clones they had painted.

Red Hot Sunlight - Seth Samuel

Sunset Peach - Caleb van Rensberg

Red Riser - Lahir Sooklal

Vela's Joy - Vela Mnyandu

Thurlow Flora

Sean Chubb

Producing Clivia with pedigree
Specialising in colour breeding
Inspired by diversity

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 in 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

Smoothie

Chubb Super Splash

So Excited

118

Astrix

Chiffon Daughter

Gogo Appleblossom

Gunja

Oribi Gorge Yellow F1 2013

Pastel Blush

Pretty Pink Lady

'Des Andersson' s Val'

Zol

times. Not only has Sean won numerous awards at the *Miniata* shows but also dominates the awards at the annual Interspecific and *Gardenii/Robusta* shows held in KwaZulu-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. It is 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 10ºC 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.

Thurlow Flora has a hectare of clivia under 80% shade cloth and is divided into 4 distinct growing areas.

- The most spectacular area is the Mother plant collection where all the breeding and show plants are kept. This area is neatly set out with the different varieties grouped in the colours. It is an awesome sight when the *C. miniata* are in full flower. Areas are also designated for the pendulous species as well as an impressive collection of interspecific hybrids.
- The Habitat Heritage Collection forms part of this same shade house, but in a completely separate area. This area is naturally landscaped and is both a Living Museum and a Captive breeding facility. All the Habitat Heritage plants are planted in pots which are concealed to give the natural forest effect. These pots also make it easy to move plants out of this area into a more controlled environment while plants are being pollinated. Many plants which would naturally grow with clivia in the wild are also planted in this area.
- The largest area is the seedling growing area with an adjoining dispatch shed which also doubles as a show hall and potting shed. In this area all seedlings are grown to flowering. These plants are planted in 4 ½ litre bags at 1 year old and kept in their same bags until flowering. Most plants flower at 4 year or earlier and so very little re-bagging is necessary. All seedlings are grown in the same medium and same size bags which eases management as all are treated in the same manner. Due to an ideal clivia growing climate, no irrigation is necessary in this shade house.
- The last growing area is a germination room with a controlled environment. Seed trays are heated from underneath by heated rubber mats normally used in piggeries to keep piglets warm. The temperature in this room is kept at 22ºC with 18 hours of light per day. Seeds are normally planted in mid-winter [July] and kept in this area for about a year. These ideal growing conditions result in 40% of our seedlings flowering at 3 yrs and up to 90% having flowered by 4 years old.

Nursery management is minimal and 1 full time staff member is employed with another 2 part-time employees in flowering season.

The year time line is as follows:-

- September – Pollination. All pollination is done with breeding for own use in mind. Not all breeding plants are pollinated each year, only certain lines are used every year. All plants to be pollinated are removed from the shade-house to a secure area where there is no wind or insect interference. All plants are hand pollinated in order to guarantee parentage of resulting seed.
- January seed stocktake. As clivia are extremely generous plants as far as seed production is concerned, invariably there are plenty of excess seeds. These are marketed through KZN Clivia Breeders.
- Seed sales begin April with seed being dispatched in July. Excess seed is marketed until end of September.
- July – own seed planted in controlled environment room.
- August – own seedlings are planted out into 4 ½ litre bags into the growing area.
- September, during flowering season seedlings are selected as future breeding plants. A star rating system has proved to be very useful. Plants are rated from 1* to 5* depending on quality, 5* being the best quality normally kept for breeding. Because we are always trying to improve our breeding stock it has become necessary to rate some seedlings as 6* since they are an improvement on the plants rated 5* in previous years. Hopefully as time goes on we will reach 10 and 20* plants. This rating system allows one to have a very good idea of the plant quality even when not in flower. Whilst selecting sales plants there are invariably some which could be keepers or for sale, these are normally selected out of the sales plants by our staff and placed in a '2nd chance' area. Here they are allowed to flower again and checked for quality. This is where the '2nd chance' seed is derived from as most of these plants are self-pollinated.

Seedlings are selected at flowering time using these main selection criteria:

- Vigour
- Colour, pattern and colour intensity
- Individual flower shape and size
- Umbel size and shape at first flowering
- Plant shape and leaf quality

Plants kept for future breeding must have the WOW factor.

Each year the colour groups are evaluated and decisions are made on the quantity of plants required per variety. Of each variety some new seedlings will be selected and the poorest of the older breeding plants will be removed from the breeding group. This way the overall quality of each variety is constantly improving. The older breeding plants are planted under the trees in the garden. Previous year's show winners have been known to be planted in the clivia beds under the forest canopy in Thurlow garden.

A passion for perpetuating rare colour variations in clivia has produced many line bred families of clivia. A full range of colour, form and size can be found in the collection from "Big Mamas" to the "Skinny little Guys". This is a truly diverse collection with probably the biggest gene pool of any collection of clivia. The diversity is truly inspirational.

Sean Chubb has prolifically produced new line bred colours of clivia for some years now and to date cannot be rivalled by any other breeder. The colour varieties of clivia produced by Thurlow Flora can be found in collections across the world. Having bred particular colours for many years now there has been a vast improvement in the quality of plant produced by Thurlow Flora, and some line bred colours are on the 4th and 5th generation of breeding.

Some of the true breeding varieties which have been produced by Sean Chubb

are:

Chubb Peach – originally bred from a habitat plant which was Peach in colour. These Light Peaches can be bred with Group 1 Yellows and produce Peach flowering seedlings. This was a great advantage since a high selection pressure could be placed on the seedlings and thus achieved a fairly rapid genetic improvement.

Chubb Pretty Pink – Originally bred from a habitat plant, Wittig Pink. This variety has been marketed for some years now and has proved to be very popular. This variety flowers early in the season.

Chubb Splash – Originally bred from a habitat plant named Andrew Gibson this variety is basically yellow with red splashes on the back of the petals. The contrasting colours makes this unusual variety very popular.

Chiffon Daughters – Originally bred from a full throated plant named Roly`s Chiffon, this is a colour pattern rather than a mutation making the breeding of this variety fairly easy. These plants improve every year in colour, flower quality and umbel size. A stunning variety, very striking.

Chubb Fantasy Series – Very Feminine dainty Pink and yellow flowers originally bred from a habitat pink named Ndwedwe Pink Fantasy. A fairly variable variety.

Chubb `95 Series dark orange red – Stunning reds with semi-broad dark green leaves. These plants have never failed to win when entered on shows.

Chubb Pastel Blush – Bred from Natal Yellow and Naude Peach, these pastel flowers blush with pink as they age and are most attractive. Often the pastel Blushes display a yellow line on the sepals of the flowers, and are unusual.

Chubb Versicolours and Blushed Yellows – These are Naude Peach F3 generation plants and are proving to be a brilliant line.

Group 3 Yellows – yellow flowering plants which produce red seed pods and are pigmented seedlings. Originally bred from Celtiskloof yellow but now Oribi Gorge Yellow Genetics are helping to improve this variety greatly.

There are numerous other varieties being produced in lower numbers and more recently a super range of interspecifics are being produced.

To Visit Thurlow Flora during August, September and October has left many visitors amazed by the diversity and variation to be found in the *Clivia miniata* collection at the nursery. With the enormous genetic gene pool that makes up the Thurlow flora collection, variation and diversity are the norm. A full range of colour, form and size can be found in the collection.

Diversity at its best.

Club shows

Cape Clivia Club Show 2013

For at least 10 years the Cape Clivia Club Show has been held at the Bellville Civic Centre, but in 2013, a decision was taken to move the Show to the Tygervalley Shopping Centre. Although there was obviously some trepidation about moving from a well-known venue, the move proved to be a successful one.

The actual venue was in the basement of the Food Court of Tygervalley. There was easy access for exhibitors including undercover parking for unloading, which was also relatively wind free, a serious consideration in the Cape.

The Show was very well supported and more than 300 top quality plants were exhibited. The panel of judges and learner judges included Mickey Hoctor, Gerrit van Wyk, Harry Muller, Gerhard Rohlandt and André Swart.

Congratulations to the winners of the various awards who were as follows:

Best On Show	Felicity Weeden
1st Runner Up	Gideon van Zyl
2nd Runner Up	Carrie Kruger (George)
Best Peach	Gerrit van der Merwe (George) (Margarita Blazer Trophy)
Best Own Breeding (Yoshi Nakamura Trophy)	Felicity Weeden
Best Single Floret	Felicity Weeden
People's Choice	Felicity Weeden

Congratulations also to the Novice Entry by Gianpaolo Gilardi that won Gold.

Cape Clivia Club 2013 Show: People's Choice Top 5

Details for the People's Choice for the CCC Show 2013 were as follows:

1st. Felicity Weeden	Large robust orange
2nd. Gideon van Zyl	Multi colour variegated 1st Runner up to Best on Show
3rd. Flip Snyman -	Large bronze green throat
4th. Carrie Kruger -	Bronze - 2nd Runner up to Best on Show
5th. Piet Theron -	Large peach

The stall holders were well supported by the public and sales were good. It was remarkable that there was a big demand for more expensive, unusual and quality plants.

A demo table describing how to prepare and plant clivia seed was a popular feature and a display of photos added colour and interest.

An enormous effort is required to set up the staging and get things in order as well as managing the benching and debenching. A huge vote of thanks is thus due to Clayton Jonkers (Show Manager) and Gideon van Zyl and their teams and a very important couple, Aletta and Pieter van der Merwe, who deal with all the computer and paper work, and Steve Martin for controlling the security.

Photography was efficiently and professionally managed as usual by Claude Felbert. His top quality photos are always a pleasure and inspiration to other would-be photographers.

Thank you Claude.

CCC: Best on Show (BOS)

CCC Class 7: 2nd Runner up to BOS

CCC Class 14: Best Peach

CCC 1st Runner Up to BOS

CCC Best Own Breeding

Eastern Province Clivia Club Show 2013

Eastern Province CC 1st Runner up: Noelia`s Peach - Ricky & Noelia Jardim

Eastern Province CC 2nd Runner up: Bronze Multipetal - Marius Meyer

Eastern Province CC 2013 Show Winners

Eastern Province CC Best on Show 2013: Recurved Orange - Ricky and Noelia Jardim

Eastern Province CC Runner up Best Interspecific on Show 2013 - Gideon Botha

Eastern Province CC Judges' choice Best Potential on Show 2013 (Ghost no 2) - Charl Malan

Eastern Province CC Winner Best Interspecific on Show 2013 - Toll Mostert (owner)

Garden Route Clivia Club - Show 2013

PHOTOGRAPHS TAKEN BY MARIUS MEYER

From left to right: Best on Show: Gold - Gerhard Faber's "Orange", Best on Show: Silver - Kobus & Ida Esterhuizen's "Any Other Colour", Best on Show: Bronze - Gerrit & Susarah's "Unusual Flower", Best on Show: "Own Breeding" - Piet Claassen's large Orange Red, Best on Show: Gerhard van Copenhagen's dark maroon "Small Flower"

Best On Show Gold - Gerhard & Karen Faber - Cat4 Orange

Best On Show Silver- Kobus & Ida Esterhuizen Cat44 Any Other Colour

Best On Show Bronze - Gerrit van der Merwe Cat18 Unusual Flower

Winner CAT 2
Bronze - Kobus &
Ida Esterhuizen

Winner CAT 3
Orange Narrow
Petal -
Piet Claassen

Winner CAT 6 Tulip Flowers - Kobus & Helena Kearny

Winner CAT 8 Yellow Broad Petal - Piet & Jeanette Theron

Winner CAT 10 Yellow Green Throat - Piet & Jeanette Theron

Winner CAT 14 Pastel - Ricky & Noelia Jardim

Winner CAT 33 Other Species In Flower - Nelis van Eck

Winner Cat12 Apricot Peach - Kobus & Ida Esterhuizen

Winner CAT 39 Orange First Flower - Ricky & Noelia Jardim

Winner first flower orange class - Carrie Kruger (grower and breeder)

Joburg Clivia Club Show 2013

Best on Show Flowering Clivia - Glynn Middlewick

Best on Show Non-flowering Clivia - Dawie van Heerden

1st Runner Up Best on Show Flowering Clivia – Gerhard van Coppenhagen

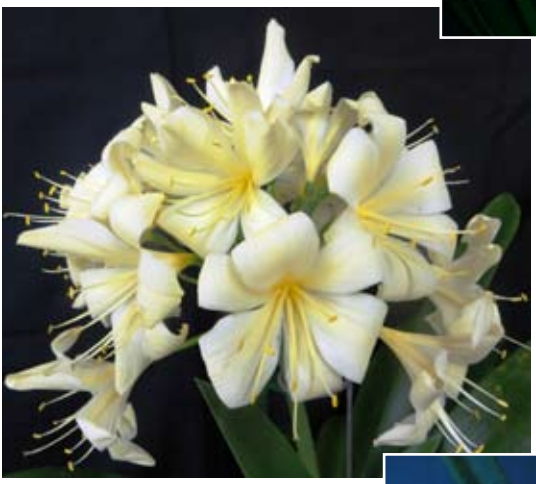
2nd Runner Up Best on Show – Dawie van Heerden

Lowveld Clivia Club Show 2013

Greg Jones (Show Organiser)

2013 marked the Lowveld Clivia Club's tenth anniversary that was celebrated with its tenth annual clivia show held at the National Lowveld Botanical Gardens. The show was judged by John Handman and Dawie Strydom. Paul Kloeck was awarded 'Best on Show', 1st and 2nd Runner Up as well as exhibiting the 'Judges' Choice'.

2nd Runner Up – 'Chandelier' – Paul Kloeck



1st Runner Up – 'Yellow Angel' - Paul Kloeck

'Judges' Choice' – Apple Blossom Type - Paul Kloeck

Best on Show – 'Virgin Blush' – Paul Kloeck

Overberg Clivia Show 2013

It is interesting that although the Overberg Group boasts as few as 10 exhibitors, we succeed in staging a reasonable show every year.

Although the number of exhibits was down this year due to two of our more active members being away, we still managed a nice display of good quality plants. The weather was also very negative and some of our members had no plants at all in bloom for the show!

Our Show Manager and Co-ordinator, Caroline Phipps, married Malcolm Pemberton in 2013. The happy occasion took place in a delightful river boat setting. Despite this exciting occurrence in her life, she did her usual excellent job of getting it all together successfully. Her husband, son and stepson helped to fill the many gaps caused by so many members being absent.

Gerrit Rohlandt arranged the benching, Alex Sherriff efficiently dealt with all the

Best on Show - 'Lady Love'

Overberg 2013 Class 7 - Winner & 2nd Runner-up on Show - Felicity Weeden

paperwork and finances. A big "Thank You" is due to all these people.

The judging was ably handled by Henriette Ströh with Gerrit Rohlandt and Felicity Weeden acting as stewards. Many thanks to Henriette who, despite poor health, made the special effort to be with us.

The winning plants were as follows:

Best on Show:	Lady Love – superb quality yellow
1st Runner Up:	Ultra Pink – superb pink of Cameron Peach breeding
2nd Runner Up:	Pure Passion – large perfect pinky pastel
Best on Show Leaves:	Gerrit Rohlandt
1st Runner Up:	Felicity Weeden
2nd Runner Up:	Felicity Weeden
People's Choice:	Felicity Weeden

Winner & 1st Runner-up on Show - Felicity Weeden

Vryheid Clivia Show 2013

Best on Show (Vryheid - 'Peach Green Centre' - Barney Viljoen

Best on Show - Barney Viljoen 'Peach Green Centre'

Runner up yellow - Leon van Rooyen

Leon van Rooyen – Runner Up, Barney Viljoen – Best on Show and Louis Lötter – 'Overall Points' Winner'

Second runner up 'Orange Green Centre' - Louis Lötter

An update on the breeding of multitepals in Japan

Helen Marriott

Given the existence of a firm base of multitepal *Clivia* breeding in Japan, it is not surprising that further developments continue to arise in relation to the quality and types of flowers, including their colours and colouration patterns, as well as variation in the size of plants. While I am sure that exciting breeding with multitepals is also taking place in other locations, this is a short update (prepared in May 2013) on some of the recent advances in Japan[1].

Fig. 1 Nakayama's multitepal

Orange multitepals and the emergence of "double-like" flowers

As a specialist in multitepal *Clivia*, Atsushi Nakayama has continued to cross orange multitepals x orange multitepals, with excellent outcomes. Among his many blooms are a group of plants with narrow petals that consistently produce 12 petals (and 12 anthers) when mature. In recent years, green throats have also begun to emerge, as have other very high quality flowers. Figures 1 to 6 show some of his blooms. In 2012, a cross of 'Kiyou no mai' (a strong multitepal parent – see CLIVIA 12, p.88) x 'Hanyae' has produced darker-coloured oranges which are "double-like" in appearance. Here the term "double-like" is used in reference to an inner second layer of petals in addition to an outer layer. This year Nakayama named the best of these new, darkish, double-like hybrids as 'Kokuryuu no mai' (Fig 7).

Fig. 2 Nakayama's multitepal

Fig.3 Nakayama's multitepal

As a breeder with various *Clivia* specializations, Kazumi Hattori has also paid some attention to multitepals. Although on a small scale, he produces compact orange or pastel-coloured multitepals which possess eight or more tepals, but, in addition, in recent years he has another type which he has labelled "Yae Botan" (Fig 8). This new type is double-like in appearance and contains many tepals - often 15-25 - but sometimes 40 appear, also on compact plants (and are thus similar to Nakayama's 'Kokuryuu no mai' type of plants). Shigetaka Sasaki has observed that these plants cannot set seed because they either do not have ovaries or else the ovaries are very narrow. Hattori has reported to him that if Yae Botan is used as the pollen parent on another plant with eight tepals, the Yae Botan type of flower results. As can

Fig. 4 Nakayama's multitepal

be seen from the photos, the flowers sometimes lack anthers or stigmas, and thus breeding with them is only possible if some anthers occur which provide pollen for use on other plants.

Sasaki believes that the Yae Botan group of multitepals is probably a mutation from a plant with six tepals which has occurred as the result of inbreeding. He also suggests that this mutation could be the same mutation as that which occurred in

Fig. 5 Nakayama's multitepal

Fig. 6 Nakayama's multitepal

Nakamura's 'Super Multipetal' (the parent of Ian Brown's multitepal, see CLIVIA 3, front cover and inside page), where the centre flower does not have an ovary.

Other colours and colouration patterns

Hiroshi Mitsuhashi continues to produce yellow multitepals, including some very large plants with splendid, big yellow multitepal flowers as a result of 'Vico Yellow' in their backgrounds (See CLIVIA 12 p.90) (Fig 9 & 10).

In addition, he grows some excellent orange multitepals (Figs 11 & 12). Nakamura has also been working with a yellow multitepal, 'Daybreak Wonder' (Fig 13), using it as the pollen parent on yellow or peach *C. miniata* with six tepals.

Fig. 7 Nakayama's 'Kokuryuu no mai'

Fig. 8 Hattori's "Yae Botan" type

His F1 flowers have begun to emerge and among them are some umbels which have one flower possessing eight petals or else a petaloid, with the remaining F1 flowers consisting of six tepals only.

Toshio Koike has not been breeding Group 2 Yellow or Hirao[2] multitepals, but nevertheless, sometimes a plant emerges with two or three flowers which contain seven or eight petals, such as the Hirao shown in Fig. 14. However, with the aim of producing full Group 2 yel-

Fig. 9 Mitsuhashi's yellow multitepal

Fig. 10 Mitsuhashi's yellow multitepal

Fig. 11 Mitsuhashi's multitepal

low or Hirao multitepals, Sasaki has been crossing these yellow or green flowers which contain the regular six tepals with orange multitepals. For instance, he crossed a Koike green-centred yellow *C. miniata* x 'Hanyae' and in the F1 plant which flowered in 2013, the flowers only had six petals, a result which he expected. On the other hand, an unexpected finding was a cross of a Koike green-centred yellow *C. miniata* x Hirao, where neither parent con-

Fig. 12 Mitsuhashi's multitepal

tained any multitepal flowers, but where the F1 offspring did exhibit some multitepal tendency. Sasaki is uncertain whether this is a recessive feature or not in this particular case.

Ghost multitepals are another important variation found, even though in small numbers to date. Nakamura already had a Ghost multitepal 10 or more years ago, but it tends to have smallish flowers, where not all flowers in the umbel are multitepal and, even if they are, eight tepals seems to be the maximum (Fig 15).

Both Nakamura and

Fig. 13 Nakamura's 'Daybreak Wonder'

Fig. 14 Koike's Hirao

Sasaki have been crossing *C. miniata* Ghost plants with multitepals, and have observed occasional ones which display a multitepal tendency in the F1 flower, with or without the Ghost colouration.

Fig. 15 Nakamura's multitepal Ghost

In recent years Sasaki has also been building up his experience with breeding multitepals, mainly crossing orange multitepals with other *C. miniata* or interspecifics possessing six tepals. One of his most promising hybrids so far is a cross of 'Tadai', a large-sized multitepal flower bred by Nakayama, by 'Chiba Lily', the well-known large yellow 'Vico Yellow' hybrid from Nakamura. In 2013 one F1 plant showed large flowers, with one of these possessing seven tepals, a result which he considers as excellent (Fig 16). In another instance, a cross of a multitepal (which may have also been 'Tadai') x 'Chiba Lily' yielded three flowers each possessing eight tepals in the

umbel of 16 flowers (Fig 17).

Sasaki has also undertaken a cross of another Nakayama green-throated multitepal *C. miniata* x 'Q2' (Fig 18), and although not a single multitepal flower emerged in the F1 generation in early 2013, he is pleased with the shape of the umbel and has selfed the plant, expecting the F2 flowers to display the multitepal trait.

Fig. 16 Sasaki's 'Tadai' x 'Chiba Lily'

Multitepal interspecifics

Nakamura has already bred multitepal interspecfics, as found, for example, in 'Overjoyed', which is an interspecific multitepal hybrid x Nakamura 'Super Multipetal', with the multitepal genes thus present in both parents (Fig 19). On the other hand, it is unclear whether 'Ambitious' (See CLIVIA 12 p.92), another multitepal interspecific which is derived from Nakamura's (*C. miniata* x *C. caulescens*) x (*C. miniata* x *C. nobilis*), spontaneously produced multitepals or whether it was the outcome of a deliberate cross. When it first flowered (Fig 20), most flowers possessed eight tepals but on its second flowering, the flowers were wider, more open and most flowers had 10 tepals (Fig 21).

Fig. 17 Sasaki's multitepal x 'Chiba Lily'

Fig. 18 Sasaki's multitepal x 'Q2'

Fig. 20 First flowering of 'Ambitious'

The breeding of interspecific multitepals also strongly features in Sasaki's current breeding programme and he was able to closely observe some F1 flowering outcomes early this year.

Fig. 19 Nakamura's 'Overjoyed'

A cross of a (*C. miniata* x C. *gardenii*) x 'Kiyou no mai' produced mostly multitepal flowers. In another case, he crossed a Nakayama multitepal *C. miniata* with a green throat x a pinkish (*C. miniata* x C. *gardenii*). Of the three plants to flower in early 2013, two flowers on one of these plants each contained a petaloid (Fig 22).

He also observed that this plant was closer to the *C. miniata* flower shape in comparison to the other two plants which had smaller flowers without any petaloids. Sasaki has undertaken a sibling cross of the petaloid and non-petaloid siblings, and again has high expectations for the F2 cross to display the multitepal traits more strongly.

Another three plants based on Sasaki's hybridization of a multitepal *C. miniata* x 'Crayon' (a picotee-like interspecific thought to be from *C.* x *cyrtanthiflora*) recently

Fig. 21 Second flowering of 'Ambitious'

flowered for the first time, and of these, the best sibling produced nine flowers, of which four possessed eight tepals and two, seven tepals, where one of the latter also had a petaloid (Fig 23). In another instance, a second flowering of a multitepal *C. miniata* x (*C. miniata* x C. *caulescens*) produced one-

Fig. 22 Sasaki's multitepal x (*C. miniata* x C. *gardenii*)

third of the flowers with some multitepal tendency (two flowers with eight tepals and three with seven tepals) (Fig 24).

Not unexpectedly, the above limited examples suggest that, as with *C. miniata* intraspecific hybridization, the hybridization of multitepal *C. miniata* with interspecifics may display the trait of additional tepals in the F1 in some instances and that this tendency increases with future generations.

Breeding multitepals

At this stage we do not know which multitepal parents containing which features or degree of multitepal traits are necessary for breeding the "best" multitepals. However, based upon his recent experiences, Sasaki reports that a "strongly" multitepal plant like 'Kiyou no mai', which has a maximum of 24 tepals per flower, will give some multitepal flowers in the F1. This is in contrast to other multitepals, including 'Hanyae' (which has a maximum of 16-20 tepals per flower), which do not seem to produce any multitepal flowers in a first generation cross with a non-multitepal plant.

Sasaki acknowledges that we can occasionally observe a single *C. miniata* flower with eight tepals and suggests that there may be several explanations for this phenomenon. Sometimes, he believes, this may be due to the fertilizer or else because of the plant's hormones, rather than being genetic. Alternatively, he considers it a very good sign if we find two or three flowers with multitepals in conjunction with one of the following characteristics: the stigma has a spiral shape, is bent or has four lobes, or else the lobes on the stigma branch out from lower down rather than at the tip. However, in the case of hybridizing multitepals with interspecifics, he believes that it is a good indicator of strong inheritance even if only one multitepal flower emerges in the F1, given that it is normal for the F1 flowers not to display any multitepal trait. He recommends either selfing or sibling crosses of F1 hybrids, though in general he tends to favour selfing to produce F2 multitepal interspecifics or sibling crosses in the case of *C. miniata* multitepals.

Sasaki himself believes that the best multitepal is a full double flower, with either six tepals in the upper layer and six in the bottom layer, or else a combination like eight by eight. Furthermore, the flowers should have the same number of anthers as tepals. He often recalls his friend's experience of breeding multitepal/double Hippeastrum plants (see CLIVIA 6, pp. 57-59) as an indicator of how to breed good multitepals. In this case, the Hippeastrum breeder crossed a fertile eight-tepal flower with a regular flower containing six tepals (or vice versa) and obtained plants which did not exhibit any multitepal features in the F1 generation, but after undertaking a sibling cross, he obtained multitepals in the F2 generation and further increased the proportion of plants with this trait when he selected the most fertile plants from these for further sibling crosses.

The above examples show that the breeding of multitepals continues in Japan, with increasing variations in flower form and colour, even if on a relatively small scale. Nevertheless, much still remains to be done to increase our knowledge of breeding for improved and consistent multitepal traits such as high tepal/anther count, with or without petaloids, in all (or most) flowers in an umbel, and, importantly, the inheritance of these desirable characteristics. Growing speed and plant vigour may also be priorities, as with any other *Clivia*.

Notes

1. I wish to thank Shigetaka Sasaki for his input of content and photos, and also Kerrie McElroy and Heidi Nerurkar for supplying some of the photos.
2. I have not used single quotation marks for Hirao or Ghost in this text since these names refer to groups of plants, not to single cultivars.

References

Sasaki, S. (2004) Multitepal breeding. CLIVIA 6, pp.57-59.

Fig. 23 Sasaki's multitepal x 'Crayon'

Fig. 24 Sasaki's multitepal x (*C. miniata* x C. *caulescens*)

Genetic variation in Clivia caulescens

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People often think that a species like *Clivia caulescens* is rather uniform with very little variation. A closer investigation will indicate that there exist a lot of differences between plants from different populations and, even in the same population, some differences will be observed. Some "wise" people always ask "why do you split hairs over the little variation present". So let us discuss why we study diversity in populations and how do we quantify the variation.

One of the best measures of determining the health of a species is by looking at its genetic variation. The more variation present in a species the better its chances of survival. Information on the genetic diversity can also be used for breeding purposes. The highest degree of heterosis (hybrid vigour) will be obtained if plants from two genetically total different populations can be crossed.

So with this information as background, how do we measure genetic variation? We study the DNA of different organisms (or in this case different specimens from various

Figure 1 *Clivia caulescens* flowering in nature

populations) and determine to what extent the DNA correspond (or rather to what extent it differs – hence genetic variation).

For the purpose of this study we concentrated on five DNA regions (*atpH-I, matK, rpoB, rpoC1* and *tnL-F* – don't worry about the names; it is just pieces of DNA and the names are only given if somebody wants to repeat this study!) and studied specimens from Soutpansberg, Wolkberg, Magoebaskloof, Mariepskop, Wonderview, God's Window, Bearded Man and Swaziland. All five regions occur in the chloroplast of the plants. The chloroplast is the organelle responsible for the green colour in the leaves and is inherited maternally; therefore the 'podplant' passes it on to its (her?) offspring. So we measure how much difference is present in "mother plants" in a specific geographical area.

Figure 2 *Clivia caulescens* in different habitats

DNA was extracted from a small piece (less than 1 cm) of a young leaf. The extracted DNA is amplified by the PCR (polymerase chain reaction) process[1]. With this process thousands of exact duplicates of a certain piece of DNA is formed. These pieces were send through another apparatus that 'read' the composition of the DNA and give you the DNA sequence; something like ATGCATGAATCGC for example.

The DNA sequences of a specific piece of DNA (for example the trnL-F region) will be compared between different organisms. Statistical analysis of these comparisons will indicate the differences (or correspondence) between different plants. One method of

[1]A mixture containing all the building blocks of DNA is made. A bit of the original DNA from the plant is added, as well as specific primers [short pieces of DNA] that act as starting points for the process to build new DNA. Exact copies of a very specific piece of DNA in the original plant are then formed by alternating different temperatures.

Figure 2 *Clivia caulescens* in different habitats

statistically looking at the data is to determine so-called Genetic Distances. A genetic distance of zero indicates that two organisms are genetically exactly the same. We tried to do at least five different specimens from each locality (preferably 10). In this way you can determine the average genetic distance (or variation) in a specific geographical area, and you can compare different areas to determine how much plants from one area differ from plants in another area (this whole experiment can become useless if people take cultivated plants back to nature – although it may appear to be a noble gesture, it nullifies future research!).

The first part of the study was to determine the efficacy of the different DNA regions. Due to an absence of any variation between different plants, the rpoC1 region was excluded from the study. The other regions showed between 2 and 8.5% variability (atpH-I provided the most variability). The total length of the DNA studied was just over 2 000 base pairs and 85 (3.9%) bases differed between different organisms. These differences are not in genes and are therefore not linked to morphological characters. These figures are higher than in most reported studies. This can be attributed to our long experience working with *Clivia* DNA and knowledge of variable regions in this genus. Sufficient data for a statistical comparison were generated.

Clivia caulescens is distributed along an approximately 400 km stretch along the escarpment, from Soutpansberg in the north to Swaziland in the south, with Mariepskop as an isolated outcrop not currently linked to the escarpment. Instead of giving a lot of numbers we shall summarize the results. Plants in all localities showed a bit of genetic variation. This variation indicates that the plants originated

Figure 3a Stem formation and morphological differences at different localities

from several "mother plants". The variation between different localities is larger than the variation in a locality (as was suspected). The degree of variation is sufficient to indicate that *C. caulescens* is not genetically depleted.

The genetic distances indicate that plants from the northern distribution area (Soutpansberg, Magoebaskloof, Wolkberg) are genetically similar. The same phenomenon was observed for the southern distribution area (God's Window, Wonderview, Bearded Man and Swaziland). The third group consisted of the Marieps-kop specimens. This group differ from the northern and southern groups, with a slightly higher similarity with the northern group.

One plant with a 'Swaziland origin' proved to be very similar, if not identical to the Soutpansberg specimens. These results suggest that the plant was collected near Soutpansberg and either wilfully or mistakenly sold as a specimen from Swaziland.

Somebody may even have collected this plant in the Soutpansberg area, planted it in Swaziland where it was later collected as a specimen from Swaziland. This brings us back to the warning described earlier in this paper, do not try to put cultivated plants back in nature. Not only for scientific purposes but such plants can

Figure 3b Stem formation and morphological differences at different localities

transfer "cultivated diseases" to nature and your attempt to help nature may actually destroy nature!

To summarize: genetic distances indicate that the genetic variation in C. *caulescens* is currently sufficient and there is no need for alarm. Breeders wanting to improve the quality of this species should hybridize plants from either the northern area or Mariepskop with plants form the southern area. These crosses will show the highest degree of hybrid vigour.

The contributions of James & Connie Abel and Fred van Niekerk to this paper are greatly acknowledged.

Virus frustration in Clivia

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Usually the combination of the words virus and frustration will indicate a grower that became frustrated with the number of virus infected plants in his/her collection. In my case it is a totally different type of frustration: the inability to prove beyond any reasonable doubt the presence of a virus in *Clivia*. Let us start this case from the beginning.

The most dreaded words for plant lovers are "virus infection"! A virus infected plant cannot be cured. To save your other plants the infected plant should be burned. Some *Clivia*-lovers will try to forward another view and claim that a virus infection can be cured by certain antibiotics. There is no scientific evidence (or basis) for this theory or a cure for the common cold in humans would have been developed long ago.

A virus is a very interesting thing. It consists of a piece of DNA or RNA, encapsulated with a number of proteins. It is not considered to be a living organism, since it cannot do the majority of functions done by living organisms.

For example, it needs the cells of a living organism to reproduce. It cannot reproduce on its own. Since it is not alive, it cannot be killed by an antibiotic (anti = against & biotic = living). The virus (or the molecule) should be destroyed. If a plant was "cured" with an antibiotic, it had a bacterial infection and not a viral one. Antibiotics can cure pneumonia (bacterial infection) but not influenza (viral infection) in humans.

Through the years people talked about virus infected *Clivia* plants. Usually a spotty leaf was associated with the presence of a virus, although the presence of a virus was not proved. The correspondence on whether the cultivar 'Ella van Zijl' is infected with a virus or not, filled many Newsletters. During the early part of our research on *Clivia* diseases, we received many so-called virus infected specimens. Almost all these specimens reacted positively to fertilizer application. Within six months after applying additional fertilizer all leaves were uniformly green. We used a liquid fertilizer containing all nutrients, including micro-elements. We still do not know which nutrient deficiency caused the light green spots on the leaves.

Another spotty discolouration on *Clivia* leaves is formed by insect infestation. Sometimes the spots will be the first sign of a mealy bug infestation within the inner leaves. Once again the spots may be the result of a nutrient deficiency caused by a decrease in nutrient flow to all parts of the leaf by the bugs.

The 2006 *Clivia* conference was followed by a *C. caulecens* tour. During the tour some specimens at God's Window showed signs of what may be a viral infection. The same symptoms were later observed at Wonder

View and Mariepskop. The symptoms include the appearance of streaky light grey-green areas on some leaves (Fig. 1). Occasionally a bright yellow line appeared on a leaf (Fig. 2). This yellow discoloured part is slightly thicker than the rest of the leaf. A visit to the same site one year later revealed that the number of infected plants almost trebled. Heavily infected leaves (almost the whole leaf turned yellow) were collected and small samples were studied with an electron microscope at the University of the Free State. The remainder of the leaves were send to the Agricultural Research Council facility at Roodeplaat, where they found traces of the virus and positively identified it as the "Tulip Colour Break Virus" (TCBV).

The symptoms of the TCBV start with the slight discolouration of leaves. These parts with discolouration will eventually turn yellow, while larger areas will become grey-green. This process continues till the whole leaf turns yellow. The consequence is that the leaf can no longer act as "food factory" (photosynthetic area) for the plant. The result is slower growth and eventually the plant will die when all leaves are affected. The virus spread very slowly from one leaf to another. It will take almost one year to spread from one leaf to the next one.

However, insects can spread it very fast from one leaf to another and from one plant to another. The problem caused by the slow natural spreading within a plant is that removal of infected parts may appear to result in a "normal" uninfected plant. However, in one year's time symptoms of the disease will reappear, since the disease (virus) is still present throughout the plant. This happens in the *C. caulescens* population where signs of the virus are present in the older leaves. The older leaves of *C. caulescens* die and the plant may appear to be without a virus. However, the next year the signs of the virus reappear!

So a virus has been identified in *Clivia*. We know the effect of this virus on the leaves of a plant. We do not know yet what the effect will be on the flower of the plant. In tulips this TCBV causes the breakdown of

Fig. 1 The symptoms include the appearance of streaky light grey-green areas on some leaves

Fig. 2 Occasionally a bright yellow line appeared on a leaf

anthocyanin formation. This resulted in flowers that start off with a red area, followed by unpredictable white areas where antocyanin could not be formed (*Clivia* flowers should theoretically look like the opposite of a picotee – red centre with white/yellow/green on the outside). These flowers were absolutely beautiful and in high demand, till the virus started killing the plants. The end result was havoc in the tulip trade.

Why am I so frustrated with this virus? To prove scientifically that the plants from God's Window are infected with TCBV, we have to re-infect a plant with an extract containing this virus, and only when this artificially infected plant show signs of the virus you have proven that the virus is responsible for that specific set of symptoms. No attempt to re-infect a plant has yet been successful!

To make matters even worse: I have collected two plants for this study from God's Window with the approval of Nature Conservation. Both plants were heavily affected by the virus. One plant was sacrificed to isolate the virus and the other one was grown under quarantine conditions. Today this plant appears quite healthy and shows no sign of the virus. I experienced the same phenomenon with other *Clivia* diseases; you have to mimic the "correct" ecological conditions otherwise the disease will not develop.

So my frustration is the knowledge that the virus exists and affects *Clivia* but I am unable to prove this scientifically.

However, even without the scientific prove I feel that a warning should be posted: We cannot afford the spread of this virus in *Clivia*. Be aware of plants that may be infected. Be aware of plants with strange colouring patterns. Only buy a plant with a strange colouring pattern when the leaves show absolutely no sign of discoloration. One infected plant in your collection can result in a totally infected collection after something like a mealy bug infestation. Do you really want to destroy your whole collection because you bought one "magnificent" plant with a "unique" colouring pattern?

Acknowledgement: I want to thank Wilmarie Kriel for her input in this paper and her knowledge of *Clivia* diseases in general.

What to do if you think a plant is infected with a virus

1. Isolate the plant (the plant must be kept away from all other plants in such a way that an insect cannot travel from the infected plant to the others).
2. If a virus infection is confirmed, burn the plant (putting it on the compost heap will help to spread the infection).
3. Carefully investigate the plant for signs of insect damage (if there are signs of insect damage, insects must be removed and the plant must get time to recuperate – if "virus type symptoms" disappear, the plant may go back to your collection).
4. Feed the plant well (if "virus type symptoms" disappear, the plant may go back to your collection).
5. Let a heavily infected leaf be tested for a virus (if infection is confirmed: step 2).

Exciting new colour variation in Clivia miniata – *the versicolour flower*

Rudo Lötter

When I first flowered a versicolour Interspecific, Harold Koopowitz described the plant as unbelievable. I named this plant after my daughter Chanel. Since then many versicoloured interspecifics were bred all over the world, proving that this is a feasible colour variation in clivia but yet unknown in *Clivia miniata*.

Interspecific bred by Rudo Lötter Clivia 'Chanel'

In 1995 when I visited the Pietermaritzburg show, there was a plant called Naude's Peach. This plant had several outstanding features: there were two umbels on the same plant, the older blushed to a deep peach and the younger umbel opened yellow; also the older umbel developed red spots on the outside of each petal. Obtaining pollen from Naude's Peach, and not knowing to which group it may belong, using the only pod parent available we pollinated a F1 orange Natal yellow grp2 x group 1 yellow. The seedlings from this cross varied from normal orange to pastel in flower colour. Two of these pastels were selected for quality flowers and labelled F1 Naude's Peach split yellow.

Naude's F1 pastel

I knew that the only way to recover Naude's Peach was to pollinate the two F1 and to wait for the F2 generation. As expected 50% flowered orange 25% yellow and some not yellow or peach but to my surprise versicolour.

Versicolour opening

From these the two best were selected for further line breeding. Seedlings from these flowered and proved that I knew colour variation was made through years of patience and some luck.

Photo submissions

CARRIE KRUGER: Interspecific

Hope - grower and photographer Carrie Kruger

Little Beauty - grower and photographer Carrie Kruger

Marina - grower and photographer Carrie Kruger

CARRIE KRUGER: *Clivia miniata*

Carrie`s Green breeder Nakamura - grower and photographer Carrie Kruger

Carrie`s Peach - grower and photographer Carrie Kruger

Chiba Peach - grower and photographer Carrie Kruger. (Breeder - Philip Crous)

Group two yellow - breeder, grower and photographer Carrie Kruger

Ice Cap - grower and photographer Carrie Kruger (Breeder - Rudo Lötter)

Pink Clouds - grower and photographer Carrie Kruger (Breeder - Charl Malan)

Utopia Vico Pink Two - grower and photographer Carrie Kruger

Utopia Vico Pink - grower and photographer Carrie Kruger

Luke`s Magnificent - grower Luke Kruger, photographer Carrie Kruger

Woodlands Beauty - grower and photographer Carrie Kruger

CARRIE KRUGER: Pendulous

Mini compact dark red *Robusta* - breeder, grower and photographer Carrie Kruger

Robusta Multi petal Lucky Jade, breeder, grower and photographer Carrie Kruger

Robusta Santa Clause, breeder, grower and photographer Carrie Kruger

CARRIE KRUGER: Single flower

Carrie`s Versicolour - grower, breeder and photographer Carrie Kruger

Carrie`s Versicolour - breeder, grower and photographer, Carrie Kruger

Chiffon Beauty - grower and photographer - Carrie Kruger. (Breeder – Sean Chubb)

Giant Multi petal - breeder, grower and photographer Carrie Kruger

Jason`s Bronze - grower and photographer Carrie Kruger

Pink Vogue – grower and photographer - Carrie Kruger (Breeder - Philip Crous)

Carrie`s Green - grower and photographer Carrie Kruger

Dreaming - breeder, grower and photographer Carrie Kruger

TK x Hirao single flower - grower and photographer Carrie Kruger

CARRIE KRUGER: Unusual flowers

Ghost - grower and photographer Carrie Kruger

Zebra - breeder, grower and photographer Carrie Kruger

JOHN HUNTER

Apricot

Bicolour

Euro peach No. 1

Euro peach No. 2

Ghost

Golden White

Green Throat Apricot

Green Throat Salmon

Nakamura red

Watercolour

Interspecific (*Miniata* x *Caulescens*)

Tubular form - *Clivia Nobilis*

Tubular Interspecific - *Cyrtanthiflora*

Tulip Belgian

Watercolour

Wavey pink

WILLIE LE ROUX: Interspecific

Angelique

Cheree

Gigi

Velia

WILLIE LE ROUX: Others

Amore

Aneme

Anya

Charlize

Florencia

Franya

Gina

Girly

Green Angel

Kyra

Le-ne

Liske

Lyla

Maxi

Ruby

Sunel

Tanya

Yutame

Zoe

Kiana

Ohna

Tayla

Vasti

Zetske

SAKKIE NEL

André

Esmé

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Tertia

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