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Clivia News



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Should you be interested in advertising in the Clivia News, please contact Sakkie Nel at 012-361-6415 for further details

Editorial

Hi Readers,

The editorial position has changed and now lies in my inexperienced hands. Joubert has played an important role in the publication of the Yearbooks and Clivia News for the past six years. In addition to this, he has edited the first of the Clivia News publications for 2018. The Society wishes to place on record our appreciation for the time and effort, Joubert has put into producing the publications over the last six years.

The Yearbook 2019, has a closing date for submission of articles and photographs of the 15th February 2019.

The next Clivia News has a closing date of the 15th January 2019 for articles.

What do you expect going forward? Some authors provide material on a regular basis, others occasionally provide an article on some experience or observation of theirs. The combination of these, make up the articles in our publications. These sources are essential for the Society publications and I would like to encourage everyone to consider writing an article or two, on some or other aspect relating to *Clivia*. All submitted articles and photographs will be considered for publication. We are all well aware of the importance of an image or images with an article, perhaps at the expense of reading!

In this edition of the Clivia News, Paul Kloeck has provided two articles, one on the resilience of *Clivia* and the other on insecticide toxicity. Lena updates us on the 'Anna Meyer Peach'. The practical uses of Jeyes Fluid have also been highlighted in an article by Mike Kitt. Glynn covers the conference from both an organisational point of view and an attendance record. The plants offered at the auction and the prices obtained are also included. Sakkie Nel updates us on the management of potting soils for our *Clivia*. Sean Chubb supplies us with our first conference feature. Alick McLeman provides us with a *Clivia* connection with Kawau Island. Our regular contribution by Helen Sanders is included. I hope you enjoy the read. Some suggestions have been made with regards to a letter column, however with Facebook and other digital media, the turnaround time using such media is much more satisfying. The website of the Clivia Society continues to be hacked by 'domain blockers'. Gideon has been notified and he is working on this ongoing problem of cyber-attacks.

The website is a good platform for all clubs to list their details. Individual clubs are responsible for providing the information for inclusion on their sites and it is not the responsibility of the Society! We are responsible for the loading the information onto the website. Most of the Clivia News publications are listed on the website. Policy is that the most recent editions will not be loaded on the site.

A Facebook page for the Society is up and running. This needs the input of information from clubs and event listing to allow the promotion of shows. No sales will be allowed on this site. 🌸

Glynn

From the Chair

By the time you receive this Clivia News edition, the shows in the Southern Hemisphere will be over. The spectacular blooms on display in the northern provinces of South Africa contrasted with the late display of flowers in the southern regions of South Africa. Pictures on Facebook show a spectacular display in Melbourne. The conference is over for another four years and we look forward to the next venue in 2022. Joburg presented a successful and enjoyable conference, at a venue north-west of Johannesburg. A big thank you to the club!

As you realise, the number of volunteers for positions on the executive of the Society are few and decreasing! Suitable volunteers are out there, but we need to find them. With too many portfolios and too few workers, an unhealthy situation is evident

Toowoomba Clivia Society has successfully applied and been accepted as an affiliated club of the Clivia Society. We welcome the addition to our Society and look forward to mutual benefits going forward.

Our treasurer, Sakkie Nel, is on the mend and we hope his recovery will soon be complete.

The digital production of the Clivia News is a strong consideration at this point. The next edition of the Clivia News will be circulated in digital and hard copy editions. The possibility of the independent clubs printing their own publications from the digital copy should be a possibility in the future. Should there be a strong demand for printing copies, the members will have to cover the costs.

A list of subscription fees is included for the 2019 year. 🌸



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Conference 2018 Johannesburg

At the AGM in 2015, Joburg Clivia Club offered to host the Clivia Society Conference in 2018.

The important aspect of suitable dates was easily decided upon. The dates were chosen to fall between the Pretoria and Johannesburg shows. A one or two-day conference was the next question – two days to encourage people from outside Johannesburg. A suitable venue was chosen, not too expensive for the conference facilities, but attractive, with a good reputation for catering and accommodation.

Suitable topics were decided upon and speakers with the necessary expertise were sought. The budget was the next important aspect to consider. The speakers, some local and some international, were willing to present talks at the conference. In which way could the Joburg Club compensate them for their effort. With a conference like ours, a hobby essentially, there is limited funding. Sponsors were reluctant to provide sponsorship for an event where only 100 brochures or programmes would be printed. Several mentioned that the coverage would not be impressive enough to warrant any sponsorship. What the club could offer the speakers, is free registration fees. If this were done, then the registration fees of the rest of delegates would have to cover both their own conference fees as well as those of the speakers.

A suitable fee needed to be calculated, not too expensive to dissuade delegates but adequate to cover expenses. We were happy if the conference ended with a minimum or even no profit. To ensure the lowest fee possible for the delegates, we would use the profits of the auction to cover the speaker's registration fees. The registration fees, the programme with speakers and their topics were finalised.

Accommodation was a problem at the venue as another conference was booked for the same period. To reserve any accommodation, a fifty percent deposit is necessary. As there is no certainty of who may or may not want accommodation, this was unfortunately not an option.

The first to register were the overseas delegates. The locals registered right up to the last day, which made this a challenge to organise, but fortunately manageable. The conference proceeded well with great, knowledgeable speakers. The food was enjoyed by most and the auction ended the congress, with Cobus Roos, the auctioneer.

The conference is held to bring together a group of *Clivia* enthusiasts; to exchange information, ideas, contact information and learn something that we did not know previously. The membership of the Society worldwide is less than a 1000. A wake-up call for us is that the number of people prepared to attend an event like this is limited. There were some people who considered the event unaffordable. Some members did not wish to take leave from work for the conference. The target market for this type of conference is small. I enjoyed the variety of subjects and speakers and look forward to the submission of the written articles for publishing in the *Clivia News* or *Yearbook*.

James Abel successfully arranged a self-drive tour to *C. caulescens* territory and I believe all the visitors enjoyed the excursion.

Several of the overseas visitors seem to be planning to visit the next conference in 2022 and they hope it will be in Cape Town. This positive view towards the next conference is an encouraging point. 🌸

Glynn Middlewick


“The conference is held to bring together a group of *Clivia* enthusiasts; to exchange information, ideas, contact information and learn something that we did not know previously. The membership of the Society worldwide is less than a 1000.”

Auction






Auction Plants and the winning bids:








Thank you to all those who participated in the auction, including the sellers that put up plants. A special thank you to Joubert for organising the auction.







Cobus Roos, thank you for your role as the auctioneer and for obtaining fair prices for the plants. Listed below are the auction plants and the bids that were successful.







No	Breeder	Winning bid	Plant
1	'Griet' seedling – Sakkie Nel	R1000.00	
2	'Ngome Canary' – Wayne Haselau 5 star Ngome yellow. Full head.	R1500.00	
3	'Melrose' – Sean Chubb Flowered offset. Show winning pink petite spider.	R1900.00	
4	'Red Sunburst' – Norman Weitz	R1000.00	
5	'Cindy' – C&J Abel 'Cindy' bred by Ian Coates and named after his late wife. Ian's photo of the flower.	R5000.00	

No	Breeder	Winning bid	Plant
6	Hattori bicolour – John van der Linde An offset from a plant John brought to SA from Japan.	R3250.00	
7	Orange Tetraploid – John van der Linde Orange tetraploid (a gift from Aart).	R1600.00	
8	Proceedings of First Clivia Conference - C&J Abel Proceedings of the first conference of the Clivia Society held, at the National Botanic Gardens in Pretoria (30 pages).	R250.00	
9	Dark Bronze – Felicity Weeden The cross was made between 'Top Star' (an exceptional bronze green throat from Louis Lotter) and a bronze green throat from Christo Lotter's C10/16 line. Own breeding. Won Gold in 2014.	R250.00	
10	'Aquarius' – Sean Chubb flowered offset.	R4000.00	
11	'Hantie' – Norman Weitz Breeder unknown. Winner at various Clivia Shows.	R3000.00	
12	'Uber' – Wayne Haselau 'Uber' flowering from seed. First flower.	Not sold	

No	Breeder	Winning bid	Plant
13	'4Tune' – Aart van Voorst Orange tetraploid <i>miniata</i> (Dutch <i>miniata</i> X Belgian hybrid treated with colchicine).	R1400.00	
14	'Green Giant' – Norman Weitz Breeder Francois van Rooyen. Judges Choice at 2018 NCC Interspecific show Not sold.		
15	'Johelene' Multitepal Yellow – Sean Chubb Large offset, has flowered.	R6750.00	
16	'Virgin Blush Multitepal' – Paul Kloeck. Was bred out of 'Virgin Blush' (selfed). Produces 35 multitepal flowers. (In shade it fades to the pink colour of 'Virgin Blush', while it has this peculiar dark pink shade in full light). It offsets readily, produces excellent pollen and sets well when selfed or crossed.	R6000.00	
17	'Gem's Golden Renaissance' – Francois van Rooyen Pollinated with '777'. High flower count, Yellow Ngome <i>C. gardenii</i> . Has revolutionised interspecific breeding.	R10000.00	
18	'Rocketman' – John van der Linde It is a (multitepal bronze green throat) x ('Malachite'green-tipped flower <i>C. gardenii</i> x multi-petal bronze green throat). All 12 flowers were multitepal. It is one of the subjects of John's multi-petal breeding programme talk.	R10500.00	
19	'Appleblossom Yellow' – Gerhard Faber An offset. A cross between an unknown yellow x (AB Q3 x AB Q7). Compact plant with AB leaves, a full head, broad tepals and recurving flowers.	Not sold	

No	Breeder	Winning bid	Plant
20	'1955 <i>Mirabilis</i> ' x 'Hirao' – Gerhard Faber Flowering size seedling. Compact plant with median leaf striation. Sibling flowered with dark carmine and green and purple pedicels and ovaries.	Not sold	
21	'Koba Bignaut' (Mother of 'Griet') #1 – Sakkie Nel An offset.	R2000.00	
22	'Emerald Eye' – Glenn Miles. Has won the multitepal class twice in East London as well as been selected as Judge's Choice. Has been placed first in Port Elizabeth in the Ghost Multitepal Class with a green throat. Acquired from Ian Vermaak, who bred it from an Ian Brown Multitepal and Bronze pollen.	R22000.00	
23	'4Yellow' – Aart van Voorst Yellow tetraploid <i>miniata</i> , only offset of original plant (Dutch yellow from Jaap Keijzer X Yellow Pat Gore treated with colchicine).	R4000.00	
24	'Cameo Plus/Best' – Liz Boyd Actual plant in picture. Cameo Plus/Best is a Cameo child. Pollen parent unknown.	R11500.00	
25	'Love Child' – Sean Chubb Flowered offset of original clone.	R10000.00	
26	'Pension Fund Robusta' – Paul Kloeck It is a massive plant. First flower has 42 light yellow tightly packed flowers on the umbel. Very large broad 7-8 cm leaves. This plant suckers profusely. Produces excellent pollen but takes poorly.	R6500.00	

No	Breeder	Winning bid	Plant
27	'Howling Moon' – Hilton Atherstone An offset.	R5000.00	
28	'Jane's Delight' – Wayne Haselau Fabulous multicoloured Oribi Gorge Pink <i>C. robusta</i> ex Andries Bruwer. Breeds well, offsets well and flowers consistently.	Not sold	
29	Print of painting of <i>C. mirabilis</i> by Auriol Batten – Allan Tait. The painting accompanied the description by Dr John Rourke for the official description of this plant as a new specie in 2003. An A3 limited edition print no 4/10 is made available printed by Silvertone international on Innova Fiba soft textured 350gsm art paper. Permission to reproduce this special work was granted by Christopher Batten, son of Auriol and the copyright holder of all her artworks.	R5000.00	
30	'Piet's Pride' – Piet van der Merwe Very attractive green flower with pink/peach edges. The plant is healthy, new leaves are 54mm broad. Bred by Piet van der Merwe (Van der Merwe Clivias) out of 'Tipperary'.	R10000.00	
31	'Oribi Gorge Yellow' – Sean Chubb Large flowered offset of original clone.	R5500.00	
32	'Griet' seedling #2 – Sakkie Nel	R2300.00	

No	Breeder	Winning bid	Plant
33	'Discovery' – Sean Chubb Versicolor habitat Heritage plant. Flowered offset.	R5000.00	
34	Chiffon Daughter 'Party Time' – Sean Chubb Large flowered offset.	R1250.00	
35	'Blushing Virgin' – Paul Kloeck This is the first offset ever on offer. 'Blushing Virgin' has only ever been exhibited at five shows and has been BOS 4 times and RU once: 2008 Best on Show LCC; 2009 Best Flower on Show NCC; 2013 Best on Show LCC; 2015 Best on Show LCC; and 2016 RU BOS Joburg. Seven F1 siblings bred out of 'Blushing Virgin' have been Runners up BOS.	Not sold. Seedlings of 'Blushing Virgin'	
36	<i>C. caulescens</i> x 'Jadestone Angel' - a <i>C. mirabilis</i> – seedling – Gerhard Faber <i>C. caulescens</i> (red with lots of green, and yellow ripe berries) x 'Jadestone Angel' <i>C. mirabilis</i> ('Yellow' <i>mirabilis</i>) – seedling. Photos of siblings that have flowered	R4000.00	
37	Original – Registration of <i>Clivia nobilis</i> – J&C Abel. Pages of the original registrations on the same day of <i>Clivia nobilis</i> and <i>Imatophyllum aitonii</i> , obtained personally in 2001 at the first conference of the North American Clivia Society at Huntington Gardens, LA.	R950.00	
38	'Skwebizi Versicolor Reflection' – Sean Chubb Flowered seedling of 'Skwebizi Versicolor'.	R4000.00	

No	Breeder	Winning bid	Plant
39	'Koba Blignaut' (Mother of 'Griet') – Sakkie Nel An offset.	R3500.00	
40	'4Security' – Aart van Voorst Giant tetra <i>C. robusta</i> (SCU16), one of two offsets from the original plant	Not sold	
41	'Gem's Apoline' – Francois van Rooyen Pollinated with 'Howling Moon'. Multiple Show Winning Yellow. Brilliant breeder, amazing recurved full umbel.	R11000.00	
42	'Rembrandt' – Francois van Rooyen (Green Bronze x Hirao #8) x Hirao #8.	R9500.00	
43	'Pikkie's Bronze' – Cobus Roos Split for Hirao/Group 2.	R2000.00	

Clivia resilience

Paul Kloeck

I am writing this article and sharing our experience to give some comfort to the many collectors who send seeds and offsets all over the world and who are rightfully concerned about potential delays due to the problems experienced with South African postal services.

On Monday the 8th June 2017 we sent a consignment of *Clivia* seeds to Alex Mikhalevitch in California, USA. The postal address on the envelope had one digit missing (our fault) and despite having Alex's telephone number boldly written on the envelope, the USA Department of Agriculture did not bother to contact Alex, nor were they willing to help when trying to resolve the issue from South Africa. The parcel lay around somewhere for nine and a half months and was eventually returned to South Africa on 22nd March 2018. We have no idea where or how the seeds were stored and at what temperature in the USA.

We were however, very interested to examine the condition and viability of the seeds. We paid our import duties and proceeded to immerse the seeds in a Kickstart solution for 24 hours.

Before dispatching seeds anywhere in SA or abroad we wash our seeds in an anti-bacterial/fungicide solution and then sterilize them in a plant sanitizer, Sporekill, the active ingredient of which is Didecylidimethyl Ammonium Chloride 120g/l.

We were very pleased to notice that none of the seeds had any mould or fungal spores on them. Four seeds were dry and totally shrivelled, but the balance appeared to be fertile following their immersion in water.

We decided to germinate the balance of 41 seeds. Interestingly, 12/15 apple blossom seeds germinated and are continuing to grow well. Only three of the other seeds that germinated, are struggling to thrive.

The second incident occurred more recently.

We carefully cleaned and sterilized two consignments of 10 offsets, destined for South Korea. They were posted by express airmail from White River on 19th March 2018. We were assured that delivery would definitely take place



Seeds returned nine and a half months later from California.

within 5 -15 days. After all, the motto of the South African Post Office is 'we deliver whatever it takes'.

After three weeks, having tracked the parcel, on a daily basis, both from Korea and SA we enquired from the post office what the delay was. We were informed that SA was experiencing political problems with North Korea and that no parcels were being forwarded (despite the fact that South Korea should not have been affected). The plants were being detained by SA Customs, but no further elucidation was forthcoming.

For the next two weeks no progress was reported and we requested the post office on 19 May to return the plants and reimburse the R3 500 charge for express airmail.

So far, there is no response to our claim, nor have we received any reimbursement from the SA Postal Services.

On the 12th of June, JunHyung Lee notified us that the second consignment of plants had reached quarantine in Korea and on the 14th June they were released from quarantine. These plants had been very tightly packed in newspaper and compressed into as small a box as possible. We both expected the worse. No plants can survive in anaerobic conditions for that long!

Unbelievably the plants, although looking shrivelled, as the photos show, had survived the storage and harrowing ordeal of travelling from South Africa to South Korea for a period of 72 days.



The condition of the plants when they arrived in Korea, after spending 106 days in the postal system from South Africa.

While all of this was going on, I decided to replace most of the offsets, as JunHyung Lee had paid for them up front and it was no fault of his that they had not arrived at their destination. I sent them by DHL courier from Nelspruit on the 11th June and three days later JunHyung Lee confirmed that the plants were in quarantine in Korea. A valuable lesson was learnt in the process. While courier services may well be significantly more expensive than SA postal services, they are far more reliable.

Then to our surprise, the first consignment, dispatched from White River, South Africa on the 19th March arrived in the Republic of Korea around the 25th June and was released from quarantine on the 27th June. Three plants were destroyed and seven survived a staggering 101 days.

I enclose a few photographs of the condition of the plants after this harrowing ordeal. Note the interesting potting soil.

I have also included one photograph of how *Clivia* is able to bounce back after the devastating fire experienced in Knysna a while back. The resilience of *Clivia*, both plants and seeds, to incredibly adverse conditions is truly phenomenal. 🌸



Looking much better with one plant pushing a bud!



After the fire in Knysna, the resilience of a *Clivia* is demonstrated.

Uses for Jeyes Fluid in the garden

Mike Kitt

Jeyes Fluid has been a household name for many years and rightly so. It is safe and reliable, both for indoor and outdoor use in gardening applications.

Jeyes Fluid is excellent to use over the winter months when the garden is lying dormant and is less likely to be tended. It keeps most insects away and protects plants.

In using Jeyes Fluid I have discovered specific applications for this excellent product in the garden, in and around the house and for indoor plants, and I'm sure you'll find them as essential to your gardening routine as I have over the past years.

OUTDOOR USE

General all-round garden treatment

25 ml Jeyes Fluid to 5 l of water

Apply with a watering can or garden mist spray, preferably at sundown to reduce the possibility of scorching and to catch most insects.

All round garden spray

1/5 bar of blue mottled soap

20 l of tepid water (this is to prevent soap from gelling)

10 ml bicarbonate of soda

15 ml Jeyes Fluid

Grate soap and melt in 1 l of boiling water. Add other ingredients, adding Jeyes Fluid last. Mix and use as is, do not dilute further. Apply with a watering can, drenching plants and soil. The mixture will keep for a considerable time.

Algae growth on trees and shrubs

25 ml Jeyes Fluid to 5 l of water

Apply with a garden spray, drenching the affected areas and hose down afterwards. Jeyes Fluid eats away all green and black algae collected in cracks over the hardened surface.

Fungal infections on lawns and plants in shaded areas

25 ml Jeyes Fluid to 5 l of water

Apply to infected areas, especially in the rainy, hot months and in areas with high humidity.

Spraying of vegetables

20 ml Jeyes Fluid in 5 l of water

Allow at least 24 hours after application before eating the vegetables. Preferably apply in sunny weather, as mixture may not dry in overcast conditions and may cause tainting of the vegetables.

Preparing beds for sowing or planting

40 ml Jeyes Fluid to 10 l of water per square metre.

Soil should be cultivated in spring. Two weeks before sowing and planting, fork or rake solution into the soil. Rake or dig over again after two weeks. The soil is now ready for use.

Deep sterilization of soil

For eelworms and fungal disease - 50 ml Jeyes Fluid to 5 l of water

Apply and leave ground fallow for as long as possible (2 weeks)

Spring treatment for herbaceous borders

a) *5 ml Jeyes Fluid to 5 l of water per square metre.*

Treat soil once a week with this solution as plants began to grow.

b) *10 ml Jeyes Fluid to 5 l of water*

Spray once a week with this solution as foliage begins to develop. Apply to the point of run-off. Continue this treatment right through to flowering period.

Roses

10 ml Jeyes Fluid to 5 l of water

Spray foliage thoroughly once a week to prevent fungal infection.

Black spot

a) *20 ml Jeyes Fluid to 5 l of water*

After leaf fall or pruning, burn all leaves and twigs. Apply solution to the soil. This will kill fungal spores before they're washed into the soil by the rain.

b) *100 ml Jeyes Fluid to 5 l of water*

Spray pruned bushes with this solution only before new growth appears. After leaf break, resort to general application for roses.

Lawn care

5 ml Jeyes Fluid to 5 l of water per square metre

To keep lawns in a good condition, apply every two weeks from August to May.

Ant control

Pour neat Jeyes Fluid down ant holes and wash down with water. Repeat frequently.

GENERAL USES**General house sanitizing**

20 ml Jeyes Fluid to 5 l of water Apply with a brush or spray.

POT PLANTS**Potting soil, compost, etc.**

60 ml Jeyes Fluid to 5 l of water per cubic metre of soil

Apply to the soil and cover soil with a black plastic sheet to increase the temperature and improve sterilization. The soil is ready to use after approximately four days depending on the weather, i.e. sunny weather will speed up the sterilization.

Sterilizing pots, seed trays, containers, etc.

60 ml Jeyes Fluid to 5 l of water

Clean containers in water, then soak them in mixture for about an hour and allow to dry. They're now ready for use. If containers are too big, drench them through, applying mixture with a watering can.

Sterilizing potting soil mixtures

5 ml Jeyes Fluid to 5 l of water

Apply to potting soil to sterilize the soil.

Sterilizing green house soil

10 ml Jeyes Fluid to 5 l of water. Saturate soil completely.

Indoor pot plants

5 ml Jeyes Fluid to 5 l of water

Soak soil of indoor plants by immersing or drenching once every two weeks in this mixture.

TOOLS**Cleaning rusted garden tools, ornaments and implements**

Apply neat Jeyes Fluid onto rusted items and allow to dry in the sun. Repeat. The item will stay rust free for over two years when left unpainted. Be careful with plastic items, as Jeyes Fluid may stain them.

Sterilizing tools and knives

20 ml Jeyes Fluid added to 5 l of water

Soak tools in this mixture, then rinse in clean water.

Do not wash your hands in Jeyes Fluid.

PRECAUTIONS

Be careful when using Jeyes Fluid on polythene and polystyrene, as it may leave stains. Do not use Jeyes Fluid on members of the cucurbit family (cucumbers, melons, etc.), celery, lettuce under glass or exotic indoor plants.

In my experience Jeyes Fluid had always been safe when used in the above applications. This does not, however, eliminate the possibility of adverse reactions, and should therefore be applied with caution, at the user's own risk. 🌹

Insecticide toxicity

Paul Kloeck

The one insect that gives most enthusiasts a severe headache almost all year round, is Mealybug (Pseudococcidea).

These woolly scale insects are particularly severe and troublesome in the hot, humid climate of the Lowveld. The fact that all of us, no matter how big or small, has a space problem and tends to pack too many plants too close to each other exacerbates the problem.

I have found that Imidacloprid (Kohinor 350 SC, Confidor etc) used at a concentration of 40ml per 10 litres of water, used as a drench or foliar cover spray, is the most effective and causes the least problems when administered two to three months before flowering. Being a systemic product, it takes about two weeks for the effect to kick in but also provides lengthy protection, not only against Mealybug, but also against the damage caused by the Lily borer (Brithys crini).

At 'Clivia Kingdom' we also alternate between Organophosphates (Malasol, Chlorpyrifos) and Pyrethroids (Polytrin).

These are contact insecticides and one must pay particular attention to the timing of their use. Never use organophosphates 2 to 4 months prior to flowering.

I enclose several photographs of the effect that organophosphates have on subsequent flowers, when applied too close to the flowering period. Malasol or Chlorpyrifos administered at the correct dilution, are excellent insecticides, but used at the wrong time will cause severe abnormalities in the flower and umbel. In this particular case Malasol was administered during March 2018, two months before the expected flowering of some of the pendulous plants and one unseasonal *C. miniata*. One will note that all the outer whorls of the tepals in images 1 to 4 are considerably shorter than the inner whorl of tepals. Some of these flowers may even be quite beautiful, but beware!



Notice that the outer whorls are shorter than the inner whorls.





Despite the shorter outer whorls, the plant is very attractive!



R12 000 was offered by a consortium of three, very well-known breeders, for this magnificent *C. caulescens* (image 5) at the Lowveld Clivia Club Interspecific and Pendulous Show in 2017.

Fortunately, the offer was declined by the owner who held it back to see if the bloom would flower in a similar fashion the following year. 🌺

The Plant that launched Colour breeding

Lena van der Merwe

The formation of the 'Clivia Society', lies in the quest for a yellow *Clivia*. Cynthia Giddy and Wessel Lotter were some of the earliest growers of yellow *Clivia* in South Africa. Wessel was very curious about everything and was prepared to attempt to breed anything. Wessel succeeded in breeding a true, yellow *Clivia*. He achieved this by crossing a yellow with an orange *Clivia* and then back crossing them. He shared his results with other *Clivia* breeders.

In an effort to improve the quality of their yellow *Clivia* flowers, the breeders crossed their yellows with their best orange *Clivia*. The outcome of many of these F1 crosses flowered orange. Anna Meyer (figure 1), very unscientifically, used peacock feathers to pollinate her *Clivia* plants. She used pollen from her yellow plant in the pollen mix. The resultant seeds were germinated and planted in her garden. Anna's friend, saw a peach *Clivia* flower in the flower bed. Anna potted it up because she thought it



Fig 1 Anna Meyer

was exceptional.

At the 1996 *Clivia* show, of the then *Clivia* Club in Pretoria (now the *Clivia* Society), Anna Meyer benched a plant, dug out of her garden (figure 2). The plant caused a sensation and was the talking point of the visitors. Nobody wanted to move away from this plant owing to the new, unusual colour on display. It was exhibited, out of reach of the visitors, so that no pollen could be stolen. Anna was not prepared to sell any of the pollen. I overheard a gentleman offer her R5000.00 for the plant. This price was exceptionally high at the time. Yellow *Clivia* plants sold at R300.00 and were considered very expensive. Anna declined this offer. In the editorial of the Newsletter volume 6, number 1, January 1997, Meg Hart wrote: "Rumour has it that Anna Meyer sold an offshoot of her plant to an unidentified buyer for R3000.00!"

At the Northern *Clivia* Club show of 1999, Anna's peach, 'Best on Show'. Benched at the 2000 show, it was now a beautiful display plant, with four umbels, in a large heavy pot (figure 3). It won awards for: 'Most unusual flower', 'Special merit award' for exceptional beauty and genetic quality and received a 'Special merit prize' in another category".

As the show organizer, I was responsible for the safety of the plants in the hall. I locked up

at the end of the day and was the first one there the next day. As is usual, we photographed the plants after the judging was completed, in a separate, suitable place. When the plant was lowered on to the table, one of the umbels broke off. Unknown to the organizers, this peduncle/scape had been eaten by a pest and was only one third intact. When Frikkie lowered the container onto the table, this umbel broke off. This



Fig 2 'Anna Meyer Peach'



Fig3 'Anna Meyer Peach' as a display plant



'Anna Meyer Peach' – image supplied by Pieter Saayman.



Fig 4 'Dollie'



Fig 5 Frans van Zyl with his selfed 'Anna Meyer Peach' seedling.

was at 23:30 on the Friday night. We put the umbel in a glass container and hid it between the leaves at the back of the plant. Nobody noticed that the umbel was not part of the plant during the show. I phoned Anna the next day, Saturday morning at 06:30, with the news. For years to come I, as show manager, was blamed for her monetary loss for not being able to sell seeds from this umbel. Jacques, Anna's assistant, photographed with this umbel in "Clivias" by Harold Koopowitz page 260, admitted to me that he knew of the damage to the scape caused by a chewing insect.

At the end of the 2003 show, while we were de-benching exhibits, Anna sat on the steps of the hall, selling seeds of this plant at R 50-00

each. I know of two members who bought seed: Koos Geldenhuys and Frans van Zyl. Anton Potgieter also bought a berry with 10 seeds. Frans van Zyl's plants took a very long time to flower, but fortunately they flowered true to the original 'Anna Meyer Peach' colour.

Koos Geldenhuys said he used the pollen of his Anna Meyer peach seed and obtained beautiful peaches from it. He unfortunately lost many of his plants when moving from Pretoria to the Western Cape, but still has the plant which he named "Dollie" (figure 4). The genes of this plant are now in several of his present plants.

Of Anton Potgieter's 10 seeds, one did not grow, 1 flowered peach, 2 apricot, 1 yellow and 5 turned out to be orange. Anton kept all the plants as they have a good umbel shape and the leaves are in the order of 50 mm wide. By hybridizing the peach one with 'Pottie's' peach, a good apricot flower resulted. He also used the pollen to breed lovely peaches.

This Anna Meyer peach plant can be considered as the beginning of the quest for *Clivia* colours, other than orange and yellow and the decline in the popularity of orange and yellow *Clivia*. Frans, as well as Anton, mentioned to me that the original Anna Meyer plant died. Somewhere, someone should still have the offset sold in 1996.

Any colour can be obtained from the mixing of the anthocyanins (pink, orange or red pigments in *Clivia*), carotenoids (yellow pigments) and chlorophyll (green pigments). Concentrations, dilutions and distributions of one or more of these pigments, or their absence, gives rise to all the spectacular colours we see lately. Chapter five in "Clivias" by Harold Koopowitz gives a good explanation of these pigments in *Clivia* in the different species. Hybridizing of the different species not only change the shape of the flowers, but also the colour and colour distribution.

In this 'Anna Meyer Peach' saga lies an important lesson: Be scientific when you start hybridizing *Clivia* species or clones. Follow the trend and give your plant a 'name', but keep good records of how you hybridised the plant, in case you want to breed more of the same hybrid. 🌸

The use of compatible *Clivia* for improved breeding results

(Clivia Conference 2018)

Sean Chubb

Initially I thought this topic was simple and would not pose too many challenges in preparing a paper. How wrong I was, there are so many different areas of breeding that it could almost be said that any two *Clivia* bred together are compatible.

What exactly are 'compatible breeding plants'? If two plants are 'compatible' in breeding it can be said that by breeding them together, the breeder will produce offspring, perhaps better than both parents, but there must be an improvement towards the 'standard' requirements set by the breeder.

The breeder must have a well-planned goal – specifically designed to improve their form and standard towards an ideal goal. 'Compatible' plants could be said to be two plants, that when bred together produce offspring that are closer to the standard of perfection set by the breeder, than their parents.

Then again, although it is every breeder's target to reach a very high standard, neither Mother Nature, in thousands of years of breeding, nor man, has been able to produce the perfect *Clivia*. With this in mind, understand that nothing in this world is perfect and out *Clivia* are no different.

I remember hearing something quite profound, that I believe holds true. It has to do with our idea of perfection, and how it relates to the breeding and improvement of *Clivia*. It goes something like this; "Perfection is a target to shoot at, a target that we will never hit, because the closer we get, the farther it moves away." If this is true, and I believe it is, we must accept that perfection, while it is a worthy goal, is something that does not exist, and all we can hope for is to move closer to that point.

All *Clivia* have faults, including the best plants

we know of. As long as the faults are not genetic, the family or strain can be improved through selective breeding.

When you look at your *Clivia*, assess the 'balance' of the plant and ask yourself – "How is the balance of the *Clivia*, and where could it be improved? What about the colour of the flowers, any improvement needed there? How about defects, do the plants have any?" If you carefully examined any plant, you would find that there are areas in which all plants could be improved. The fact that some *Clivia* are winning more shows than others only illustrates they have fewer faults than their competitors.

There are many different traits a breeder could select for to improve their *Clivia*. The larger the number of traits that are selected for improvement at any single time, the slower the progress is with breeding. It is advisable to breed for one or two traits at a time, but keep the other goals in mind, so as not to move too far from your ultimate vision of perfection.

The attraction of the *Clivia* with their extraordinary flowers have led me, as a breeder, to concentrate mainly on the colour and form of the flowers of the *Clivia*.

Every book I have ever read on the subject of selection and breeding of flowering plants, emphasizes the importance of a desirable flower colour. To ensure and safeguard the future of *Clivia*, breeders need the desire and tenacity to maintain uniform strains, with plants that have the complete package of form, function and beauty.

Whether we know it or not, we all select *Clivia* based on the colour of their flowers. This is especially true during the purchasing stages. I believe we all have a colour preference, and that certain colours seem to appeal more than

others. Some colours are admired more than others, so there must be something about colour after all. I believe it is more enjoyable to look at a *Clivia* that has an extraordinarily colouring, rather than the common orange-coloured *Clivia*.

The beautiful range of colours and patterns that are found among the various species of *Clivia* are one of the best examples of how man can experiment and improve on nature. Through the powers of selective breeding, he can modify any group of *Clivia*, and in time fix their traits in such a way that they become uniform and consistent. This is how colour varieties are created.

In habitat, nature is very conservative with her colours and patterns in *Clivia*. This has much to do with their environment, and their ability to attract pollinators. An interesting fact is that the pollinator is only attracted to the visible part of the flower. This then follows, that the pendulous species have little or no colour on the inside of their flowers.

Colour is more important than you may think:

I'm sure that you're aware of the belief that no *Clivia* can have bad coloured flowers. For most breeders of *Clivia*, the flower form and plant quality are considered more important than any other traits. I believe that this way of thinking is detrimental to the improvement of the *Clivia* as a whole. Although I too believe that flower form and plant quality are important traits, the importance of the flower colour should not be overlooked because it is considered less important.

A family that is uniformly coloured is a family that is uniform in other traits as well:

There are over thirty different colour varieties of *Clivia* in existence. Yet, if you were to ask all those who breed them, what they consider a good or bad colour, the opinions vary considerably. This makes the issue of colour a complicated matter.

What is a breeder to do?

Ensure that the plants you chose to use in a breeding programme not only have a suitable

flower colour, but are also alike in many of their characteristics and traits. Should you do this, you will have a better chance of creating and maintaining a successful strain.

It is also important, when selecting *Clivia* plants for breeding, that the pollen parent matches the pod parent in as many traits as possible, and vice versa. This is also true when it comes to their constitution, such as their vigour, vitality, and overall health, and ability to resist and fight disease. A strain of *Clivia* that has several different colours, usually also proves to be highly diverse in many other characteristics and traits. Varied colours in a strain of *Clivia* are an indication of the diversity of the gene pool.

The pollen parent should be a good match with the pod parent:

Clivia that are true to colour, demonstrate their uniformity in other areas as well. Breeding programmes, where the pollen parent is properly matched to the pod parent, show the purity of the strain and the knowledge and skill of the breeder.

Evidence of a properly bred strain, one that is true to colour, can be seen by observing the various pollinating done by the breeder. This is especially true where a pollen parent is used on many pod parents. In a properly matched pollination, all plants should be matched identically with regards to colour and conformation

Pollen and pod parents are heterozygous in many of their traits, and this is particularly true for the flower colour. Be careful in matching colours correctly. This could happen if you are breeding pinks for example, ensure you do not mix a pink with a plant that looks pink, but is a light orange.

I've seen many well-established and reputable strains that would occasionally produce unwanted progeny. Depending on the family or strain, this is, in most cases, of minor inconvenience only and can be corrected through selective breeding practices. Even though these off -coloured flowers excel in conformation and colour, don't breed them back into your pure strain. Cull these off-coloured plants and breed only with the plants that have the proper colour of flowers to ensure the uniformity and consistency of your strain.

These off-coloured individuals, if judged to be of sound quality and good flower colour could be the basis of a new colour strain. This strain however will vary in flower colour and other qualities as well. These off-coloured plants may also display qualities from a distant ancestor like disease resistance and vigour. All these traits are to be evaluated to assess whether they are worth preserving.

MUTATIONS ARE NOT THE RESULT OF A SLOW CONTINUOUS SELECTION

Mutations in *Clivia* are distinct deviations from the normal strain of *Clivia*. They could present themselves in a variety of forms. The most well-known mutations are the mutations seen in the flower colour. Mutations are distinct from ordinary variations. Mutations may be described as a sudden but accidental deviation from the normal type. Mutations are unexpected and unanticipated new types, these do not come as a result of a slow process of selection. Mutations have no intermediate stage between the old type and the new. Mutations are a sudden changes in form and/or colour of the flower.

It is impossible to predict the appearance of mutations. Some are easy to perpetuate while others affect the plant in a way that makes them infertile. The appearance of mutations happens very seldom, breeders need to keep a look out for them and to recognise the potential, if any, in the mutations that do occur. As breeders we cannot wait for new mutations to occur, we need to work with variations and selections as described below.

VARIATION AND SELECTIVE BREEDING

Variation through selection is an effective tool for improving a strain of *Clivia*. Although variation is responsible for producing an

exceptional individual, selection is responsible for preserving it. Charles Darwin describes two distinct types of selection, unconscious selection and methodical selection.

Unconscious selection is when a breeder uses only the best genetic material available to him. This is done not with the intention of establishing a new strain or type but improving the strain already in existence.

Methodical selection is to do with fixing of new and desirable traits and establishing a new strain from the existing strain. Here the breeder must be constantly on the lookout for new and valuable characteristics. These valuable characteristics are used as the basis of a new breeding program. The easiest characteristics to select for are flower colour and plant form.

What the breeder needs to do, is recognise the valuable variations in a strain and methodically select these variations over generations to gradually establish a new more desirable strain. So methodical selection is the tool the breeder needs to use to eventually achieve perfection.

Once you understand what perfection actually means in relation to your *Clivia*, breeding to improve a trait and knowing when to stop is the first sign of a mature breeder. In other words, you must understand at what

point a trait is good enough for the time being, and to then concentrate on another trait. You will never stop trying to improve your *Clivia*, but your time and effort is best utilized by improving the weak points of the *Clivia*, instead of trying to perfect one or two insignificant traits. There is a point when that trait is about as good as it's going to get.

It is a continual challenge that doesn't end until you are left with the very best *Clivia* possible.

Remember, great *Clivia* are the result of breeding from the very best breeding plants in your collection, not from the mediocre *Clivia*. 🌸

"It is a continual challenge that doesn't end until you are left with the very best *Clivia* possible. Remember, great *Clivia* are the result of breeding from the very best breeding plants in your collection, not from the mediocre *Clivia*."

The Kawau Connection

Alick McLeman

I now live in Snells Beach, a small town on the Pacific east coast of New Zealand, about 80kms north of Auckland City. From my living room I have a view across a lovely bay, Kawau Bay, to the island guarding the entrance to the bay. Kawau Island has an interesting *Clivia* connection with South Africa.

The connection began in 1862 when Sir George Grey, then Governor of New Zealand purchased the island. He paid £3,700 and set about creating the hideaway of his dreams. There had been a small copper mine on the island and Sir George transformed the twenty-year old house formerly occupied by the mine manager into a mansion, by adding twenty more rooms to the original ten. It is now called 'Mansion House'.

Grey, an enthusiastic amateur botanist and natural historian, also created an extensive garden and imported plants and animals from all over the world (including zebra) in furthering his interest. The zebra have long since departed, but the island is still home to a mob of wallaby, cherished by some residents but seen as a pest and unwanted Australian immigrant by others. Although Grey sold the island in 1888, the extensive garden, together with many of the plants and trees he introduced, remain to be enjoyed by visitors to the island. In the garden are huge clumps of *Clivia gardenii*. This raises the question: why *Clivia gardenii*?



'Mansion House'

Historians among you would know that Sir George Grey was at various times in the 1800s Governor of South Australia, Governor of New Zealand and Governor of the South African Cape Colony, and later Premier of New Zealand for a few years. Of particular interest, is that he was Governor of the Cape Colony from January 1854 until December 1861. He was Governor of New Zealand both before and after his time in South Africa.

His term as Governor of the Cape Colony coincided with the time that the *C. gardenii* species was collected in Natal, by Major Robert J Garden in 1855. The species was subsequently named in Garden's honour.

So, did Grey know or get to meet Garden? As a



Masses of *C. gardenii*

collector, did he perhaps obtain an offset or two from him? I have no way of knowing, but it can hardly be a coincidence that this unpretentious species is found in Grey's Kawau garden. It's the sort of thing an enthusiastic amateur botanist would import into his collection of

fauna and flora.

So could this be the original variety of *C. gardenii* discovered by Major Garden? I leave you to draw your own conclusions. But I took the ferry across to Mansion House at the end of May to enjoy the plants in full bloom. 🌺



Masses of *C. gardenii*

Managing soil fertility and plant nutrition

Sakkie Nel

Dr Lena van der Merwe, in Yearbook 19, published three articles on the requirements for healthy roots. I want to look at the importance of the soil composition and the requirements for cultivating healthy *Clivia*.

Properties and composition of soil

- Plants need soil to stay upright and to obtain nutrients, water and air.
- It is important to understand the chemical and physical properties of soil and to understand their influence on the ability of plants to grow.
- Soil with ideal properties is not always available for cultivation, but steps can be taken during soil preparation to correct or at least improve the condition of the soil.

Physical soil properties

- Physical properties include texture, structure, depth, layering (stratification) and aeration.
- Texture is a fixed soil property and ranges from clay to sand.
- Soil with a clay content of between 7% and 30% is suitable for most plant growth.
- Soil ranges from having no structure to being granular. Soil structure determines the aeration, water penetration and drainage of the soil.
- Aeration refers to the ability of the soil profile to supply air to the roots. Poorly drained soil becomes water-logged and anaerobic (without oxygen), which may result in root death.

Chemical soil properties

- Chemical soil properties include the pH of the soil, electrical conductivity and resistance, fertility level, cation exchange capacity and organic matter.
- pH indicates the acidity of soil. The optimal pH of soil for most plant production is between 6.5 and 7.5. In pots the pH is usually lower and can be as low as 5.5.
- Electrical conductivity, EC and resistance indicate the salinity of the soil. Soil salinity

affects both the soil fertility and the physical properties of the soil

- Soil fertility indicates the ability of soil to sustain plant growth.
- The cation exchange capacity of soil determines the ability of soil particles to bind with nutrients and have them available to release to the roots.
- Organic matter in the soil consists of dead plant and animal material, microbial debris, and humus.

Basic symptoms of nutritional deficiencies

- Each nutritional element has a very specific role and function in the metabolism or life of a plant.
- The most limiting element is the nutrient element present at the lowest percentage of its optimum concentration. Even if only one nutrient element is not at optimum concentration, the plant will be limited in its ability to grow.
- Nutrient deficiency symptoms are specific to the nutrient that is not at an optimum level, but the effects may be blurred by a combination of deficiency symptoms or symptoms of other factors.
- The fertilization program should keep the nutritional elements at optimum levels. Mild deficiencies can be tolerated during certain times of the year.
- The cause of the deficiency needs to be identified to deal with it effectively.

Plant nutrition elements

There are 16 main nutrients or elements that plants require for normal growth and development. These nutrients are divided into two main groups, the macro-elements that are required in relatively large quantities and the micro-elements or trace elements, which are required in very small quantities.

The macro-elements are carbon, hydrogen, oxygen, nitrogen, potassium, phosphorous, calcium, magnesium, and sulphur.

The macro-elements are generally present in soils, but not necessarily in adequate concentrations.

Macro elements

Three important elements that can be added to soil for plant growth are nitrogen, phosphorous, and potassium. The numbers that appears on fertilizer packaging such as 3:1:5, indicates the N: P: K ratio (nitrogen, phosphate and potassium) that the specific fertilizer in the bag contains. In a 3: 1: 3 fertilizer for example, there are 3 parts of N for every 1 part of P and every 3 parts of K. This means that fertilizers that are high in nitrogen (those with a high N value) are suitable for leafy vegetables such as lettuce and lawns because it stimulates vegetative growth. An example of a lawn fertilizer is one that has a NPK ratio of 7: 3: 2.

A more balanced NPK ratio such as a 2:3:2, is suitable for flowering plants.

The remaining macro elements (calcium, magnesium and sulphur, are also important.

The main reasons why each nutrient is important to plants:

NITROGEN

- Nitrogen is essential for the synthesis of proteins in plants.
- Nitrogen is necessary as a building block for genetic material.
- Nitrogen is an essential part of the green pigment chlorophyll.
- Nitrogen is good for leafy vegetables or as a general tonic to boost plant growth.

Where do we find nitrogen?

- Plants use nitrogen in two forms, these are ammonium and nitrate.
- These are both available in inorganic fertilizers.
- Ammonia will stimulate leafy growth.
- Applying nitrate or urea, as an inorganic fertilizer or as a foliar spray very quickly stimulates crop growth.
- Take care when applying these as they scorch the plants easily, when used in too high a concentration.
- Nitrogen is also found in organic matter, such as lawn clippings, compost, manure and bone meal.

What does a plant look like that is deficient in nitrogen?

- Plants are stunted.
- Leaves are pale green or yellow (chlorosis).
- Yellowing is normally seen on the older leaves first.
- On closer inspection yellowing starts at the tip of the leaf, progressing down the middle of the leaf to the leaf base.

PHOSPHORUS

- Plants require phosphorous throughout the year.
- There is a strong relationship between the phosphorous and nitrogen requirements of plants.
- If there is no nitrogen, the plant cannot take up phosphorus from the growth medium.
- Phosphates is essential for the growth and development of stems, roots, seeds, flowers and seedlings.
- In crops phosphates improves crop quality, increases root growth and leads to earlier crop maturity.

Where do we find phosphate?

- Phosphorous occur naturally in soils.
- Phosphors deficiency can be corrected by adding phosphorous to the irrigation water in the form of potassium phosphate, or a foliar application of ammonium phosphate.
- As with nitrogen, scorching of leaves may occur.
- A long-term source of phosphorous is super-phosphate, which is added to the soil.
- Bone meal is also high in phosphorous and breaks down relatively slowly. It is also a source of calcium.

What does a plant that has a phosphorous deficiency, look like?

- Plants are stunted.
- Leaves take on a purplish colour.
- The undersides of the leaves become characteristically purple, especially the veins of the plants.
- Fruits mature late and seeds do not develop properly.
- The change in colour, first develop on older leaves.

POTASSIUM

- Potassium is important for a range of plant growth processes.
- Potassium is not an important element for the structure of the plant.
- Potassium is important for photosynthesis and aids in the plant's overall vigour, strength, water uptake and disease resistance.
- Potassium plays a role in maintaining the water balance of the plant, controls transpiration, and activates enzymes.
- Potassium improves the plants' flower, fruit and seed quality.

Where do we find potassium?

- Potassium does occur naturally in the soil
- Potassium deficiency can be overcome by a foliar application of potassium sulphate, or potassium nitrate. A more long-term source of potassium, is potash, which is worked into the soil.

What signs does a plant with a deficiency in potassium show?

- The first sign of potassium deficiency is the leaves turning dark green.
- In time, the leaves become a purple-brown colour.
- This discoloration is followed by a yellowing of the leaf edges, leading to a browning and dying off (necrosis), of the leaf.
- Weak stems with yellow or brown discolouration or leaves with a similar colour change, are a tell-tail sign of potassium deficiency.

CALCIUM

- Calcium is a major constituent of the cell walls.
- Calcium is involved in nitrogen metabolism and activates enzymes.
- Calcium helps to build strong stems.

Where do we find calcium?

- Calcium occurs naturally in the soil.
- The effects of calcium can generally be reversed.
- This is corrected by a foliar application of calcium nitrate.
- Agricultural lime and gypsum may be added to the soil.

How does a calcium deficiency affect the plant?

- Common symptoms of calcium deficiency are stunting, wilting and dark green discoloration.
- Leaf margins become scorched.
- Roots are poorly developed and the root tips die off.
- In fruit crops, a deficiency causes blossom rot. This condition is irreversible.

MAGNESIUM

- Magnesium is an essential part of the green pigment, chlorophyll and is thus an extremely important element.

Where do we find magnesium?

- Magnesium occurs naturally in the soil.
- Magnesium deficiency is common and can be corrected by foliar application of magnesium sulphate, also known as Epsom salts. Magnesium is also found in commercial fertilizers.

What does a plant that is deficient in magnesium, look like?

- A plant that has a deficiency of magnesium, develops yellow leaves.
- Usually the older leaves of the plant, rather than the young new leaves, develop this symptom.
- The margins of leaves turn yellow, spreading to involve the whole leaf.

SULPHUR

- Sulphur is important for the production of chlorophyll.
- Sulphur is important as a protein constituent.

Where do we find sulphur?

- This element is naturally found in soils
- Sulphur is found in super phosphate, calcium sulphate and gypsum.

What does a plant that has a sulphur deficiency, look like?

- A sulphur deficiency affects the quality and flavour of fruit and vegetables.
- It is seen as a light purple discoloration of petioles, stems and veins, with the leaves turning pale yellow.

- c) Dead spots and patches may develop on the leaves.

Micro elements or trace elements.

Trace elements are necessary in the plant to facilitate the usage of other elements by the plant. They are required in very small amounts. Intensively farmed soils such as vegetable gardens, heavy clay soils or light sandy soils often are deficient in trace elements.

IRON

- Iron plays a vital role in the formation of chlorophyll during photosynthesis.
- The lower the pH, the higher the amount of iron available to the plant.
- Iron can be applied as iron chelates and iron salts.

Where do we find iron?

- Iron occurs naturally in soils.
- Iron can be applied as iron chelates and iron salts.
- Deficiency develops if the pH of the growth medium is too high or if anaerobic conditions develop in the soil or if there is too much magnesium is found in the growing medium.

What signs does a plant show with a deficiency of iron?

- Iron deficiency symptoms are similar to those of magnesium.
- The major symptoms are yellowing of young developing leaves.
- The veins remain green but the rest of the tissue becomes yellow, causing a mottling effect on the leaf.

MANGANESE

- Manganese is essential for the manufacturing of "sugars".
- Manganese is required for nitrogen metabolism.
- The lower the pH, the more manganese that is available for the plant.

Where do we find Manganese?

- Manganese is found naturally in the soil.
- Manganese can be applied as manganese sulphate.
- Care must be taken however, as this element is toxic in high concentrations.

What appearance does a plant display with a deficiency of manganese?

- Manganese deficiency results in an overall leaf discoloration and may also cause necrotic spots.
- The discoloration develops first on young leaves and thus may easily be confused with iron deficiency.
- In severe cases of deficiency, the leaves become distorted.

ZINC

- Zinc plays a role in enzymes synthesis.
- Zinc is involved in also involved in the synthesis of the plant hormone indole-acetic acid.

COPPER

- Copper plays a role in the activation of several enzymes and affects cell wall formation.
- Plants require very little copper.

Where do we find copper?

- Copper, a trace element is found naturally in the soil.
- Copper deficiency can be remedied by the application of copper sulphate or blue vitriol.

What does a plant that is deficient in copper look like?

- Copper deficiency causes stunting of the plants, leading to shortened inter-nodes and small leaves.
- Chlorotic blotches develop on older leaves, gradually spreading to the younger leaves.
- Affected leaves change to a dull green or bronze with the edges curling upwards.

BORON

- Boron is required for healthy plant growth.
- A plant that lacks boron cannot take up calcium from the soil.
- Boron easily becomes toxic to the plant, and thus boron toxicity is more common than boron deficiency.
- Beetroot plants are highly susceptible to boron toxicity.

Where do we find boron?

- Occurs naturally in the soil.
- Boron deficiency can be readily corrected using sodium borate (borax). This may be

used as a foliar spray or added to the soil.

What does a plant that is deficient in B look like?

- Boron deficiency is first seen as yellowing of leaf tips on older leaves.
- The growth tip or stem apex dies off and the veins supplying the young leaflets become clogged.
- The tops of plants assume a bushy appearance, the stems and petioles become brittle causing them to break easily.
- The leaves may develop orange to yellow discolouration.
- Roots become blackened.

MOLYBDENUM

- Molybdenum is involved in the activity of enzymes and is essential for the conversion of nitrogen from the air into a soluble form that the plant can use.
- Mo becomes more available to the plant as the root medium pH is increased.

Where do we find Molybdenum?

- Found naturally in the soil.
- Molybdenum deficiency can be corrected by applying a foliar application of sodium molybdate or ammonium molybdate.
- Molybdenum deficiency is uncommon, but may be found in acid soils. (South African soils are poor in molybdenum).

What does a plant that is deficient in molybdenum look like?

- Older leaves become mottled and this spreads slowly to the younger leaves. Later on, the leaves become scorched and curled.

CHLORINE

Chlorine is essential for plant growth, but chlorine toxicity is more common than deficiency. An analysis of water for chlorine is especially important for hydroponics.

Appearance of leaves with a chlorine deficiency

- Dead spots and patches may develop on leaves. 🌸

2019 Membership fees to the Clivia Society

Three Clivia Newsletters and a Yearbook, are issued to paid-up members every year. Subscription fees are paid to the following persons:

NO.	GROUPS, CLUBS OR INTERNATIONAL INDIVIDUALS	2019
1.	Australia: Pay to Lisa Fox in Australia: lisa.fox@gmail.com Equivalent of \$25.00 US	Aus\$35.00
2.	International mem: Pay to Sakkie Nel: corgas@vodamail.co.za Equivalent of \$25.00 US	US \$25.00
3.	New Zealand: Pay to Tony Barnes: tony.john@xtra.co.nz Equivalent of \$25.00 US	NZ \$40.00
4.	United Kingdom: Pay to Sakkie Nel: corgas@vodamail.co.za Equivalent of \$25.00 US	Br £ 20.00
5.	United States: Pay to www.northamericancliviasociety.org USD \$25.00 per year	US \$25.00
6.	European Union Pay to Sakkie: corgas@vodamail.co.za Equivalent of \$25.00 US	Euro €22.00
7.	RSA Club Treasurers: Pay fees in bulk to the Clivia Society, not later than 31 March of each year... ++Postage extra will be added	R150.00 ++

Students and scholars pay only 50% of the abovementioned membership fees.

Overseas members: The Clivia Society's PayPal particulars:

The Clivia Society: corgas@vodamail.co.za

NO.	PUBLICATION	PRICE
1.	Yearbook 1,3,5 – 19 R70.00 – POSTAGE INCLUDED	US\$10.00
2.	Digital copy of yearbook 2 & 4 (Out of print) Each R60.00	US\$5.00
3.	Ten or more copies of yearbooks by a Club or Group each POSTAGE EXTRA	US\$9.00
4.	Book: <i>Cultivation of Clivia</i> R80.00 – POSTAGE INCLUDED	US\$15.00
5.	Ten or more copies of <i>Cultivation of Clivia</i> by a Club or Group each POSTAGE EXTRA	US\$14.00
6.	Book: <i>Kweek van Clivia</i> R80.00 – POSTAGE INCLUDED	US\$15.00
7.	Ten or more copies of <i>Kweek van Clivia</i> by a Club or Group each POSTAGE EXTRA	US\$14.00
8.	Clivia Color Chart II R200.00 – POSTAGE INCLUDED	US\$20.00
9.	Book: <i>Illustrated Terms and Definitions for describing Clivia</i> POSTAGE INCLUDED	US\$23.00
10.	Book: <i>Illustrated Terms and Definitions for describing Clivia</i> Reg. airmail included for RSA	R287.00
11.	Clivia Newsletters 1992 – 2017: Digital copies on website: www.cliviasociety.org No charge	

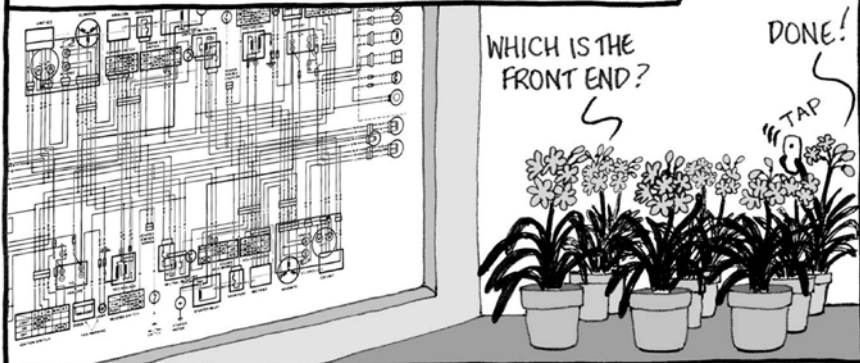
Advertisement costs in Clivia News

(THREE EDITIONS PER CALENDAR YEAR)

1.	Smalls – 1 to 6 lines	R 45.00	US\$ 3.00
2.	Smalls – 7 to 10 lines	R 75.00	US\$ 5.00
3.	Quarter page – 65 mm wide x 100 mm deep	R145.00	US\$ 10.00
4.	Half page – 130 mm wide x 100 mm deep	R 260.00	US\$ 18.00
5.	Full page – 130 mm wide x 185 mm deep	R 500.00	US\$ 35.00
6.	A5 single page insert supplied by advertiser	R 580.00	US\$ 40.00
7.	A4 single page insert supplied by advertiser	R 1150.00	US\$ 80.00

...AND SO IT WAS THAT CLIVIA WERE CHOSEN FOR SPACE EXPLORATION BECAUSE OF THEIR LONGEVITY, APPARENT RESISTANCE TO LONG PERIODS OF BOREDOM, AND THEIR MODEST IN-FLIGHT REQUIREMENTS ...

BEFORE GRADUATING FROM THE ACADEMY IT WAS A REQUIREMENT TO MEMORISE THEIR SPACESHIP'S WIRING DIAGRAM :

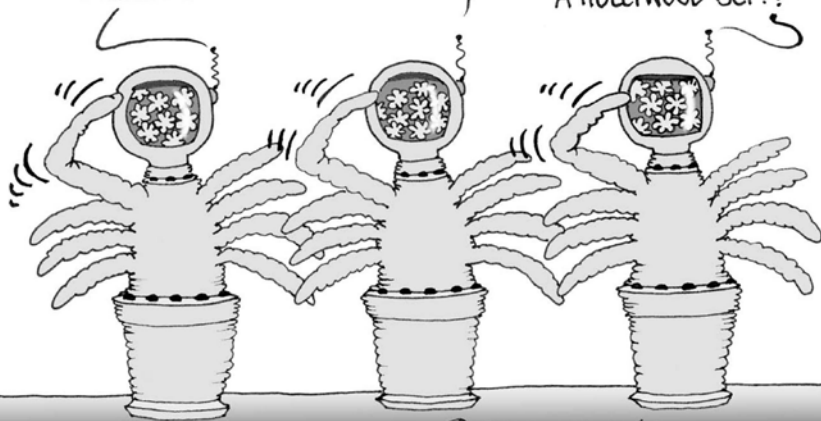


THE FIRST GRADUATES:

ON TO NEW FRONTIERS!

WHEN WE GET TO BE FAMOUS, WHO WILL BE ABLE TO RESIST OUR POLLEN ??

HOW WILL WE KNOW WHEN WE GET THERE THAT IT'S REAL SPACE AND NOT A HOLLYWOOD SET ??



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