Clivia News

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Editor's Report

The winter solstice has passed for the Southern Hemisphere, so we can look forward to longer daylight hours. There will still be those cold nights in the Highveld areas with the occurrence of frost. Joburg seems to have less frost lately. Is this a result of global warming or is the protection provided by the afforestation of cities and towns?,

The numbering of the Clivia News publications will change from the 1st of January 2020. We want to correct the confusion caused by the existing numbering of Clivia News releases. From January next year, the first Clivia News will be Vol 29 number 1, released in February, the Yearbook in May, number 2 in August and number 3 published in November. The Yearbook 21 will be for the 2020 year.

The KwaZulu-Natal Club has their twenty-fifth anniversary in 2020. To highlight their progress over the years, an inclusion of their history will be published in the next few Clivia News editions. A big thank you to our regular contributors, who provide us with articles for publication. Sean Chubb has provided me with several articles on 'Habitat Heritage' plants. These articles will be published in forthcoming publications.

The Club Show photographs of South African Clubs is included in this publication. I would like to include photographs of the various shows in the February copy of the Clivia News in 2020. Please take photographs of your various shows this year, which will be included in the February publication.

Glynn Middlewick

COVER: Collage of flowers of Pikkie Strumpher on front cover.

BACK PAGE: Pikkie Strumpher 'Fancy Girl'

Chairman's Report

This edition of the Clivia News includes an obituary of Attie Viljoen. On behalf of the Clivia Society, I would like to offer our condolences to his family and friends.

An ongoing problem in South Africa, is the service provided by our postal system. A solution to the problem, would be to supply only the digital form of the publications. The argument against this, which may be relevant, is that this would discourage membership of the clubs. Another way of helping with the timeous delivery of the publications to some, is to have different types of membership. A choice could be made between membership with hard copy delivery and membership with digital delivery.

The Society will continue to provide the format of publication that the membership prefers. he Cape Clivia Club hosted the Annual General Meeting on the 11th of May 2019. A big thank you to Dave Garriock and his committee for his efforts in ensuring that the meeting was a great success.

Leading on from the AGM, was a wake-up call for members of the Society. The Society is not sustainable in its present form. Following fours years of loss making, withdrawing from our saving funds to cover losses, change is necessary. Clayton Jonkers, our new treasurer, is tasked with finding a solution to our problem.

An increase in the affiliation fee of R100.00 for each member was asked for and granted by the meeting for 2020 onwards. This brings the affiliation fee to a total of R250.00 per member to the Society. The Society will contain expenditure, by limiting the number of pages in the publications and reducing the number of copies printed to a minimum. Printing of the Clivia News and the Yearbook in hard copy is the main expense of the Society. The meeting voted to continue with the printing of the publications. Digital copies of the Clivia News will appear on the website, two years after the publication of the hard copy.

This edition also includes an interesting phenomenon of a nine month old seedling, flowering, from Neethling du Toit. Regular features of: 'Good, bad and the ugly' and 'Clivi-Arta' from Helen Sanders are included. Felix Middleton includes an interesting article on the importance of knowing the pedigree of seed for breeding purposes. Elize Strumpher reveals her secret for germination success with her seeds. Sean Chubb will start with a series of articles on 'Habitat Heritage' articles. In this publication he outlines the background of his 'Heritage' collection. KwaZulu-Natal Clivia Club celebrates their twenty-fifth anniversary next year. Included is an historical record of the activity of the club. The Clivia News ends with a photographic record of the various interspecific and miniata shows in 2018.

The KwaZulu-Natal Club has submitted several articles, I hope that many other clubs are challenged to also submit articles!

Glynn Middlewick

Obituary Attie le Roux

In Memorium
Willem Adriaan Le Roux (Attie)
1951/06/30 – 2018/11/19

Attie was born in Vanderbijlpark on the 30th June 1951. He finished his schooling at Wonderboom High School and then embarked on a career in sales, an attribute and characteristic that was to define him for the remainder of his life.

Attie was a master salesman and spent the early part of his youth selling art, rare Persian carpets and rugs. He collected and bartered Cycads and bred and showed Bull Terriers, achieving considerable success and financial rewards from both hobbies. This was followed by plunging into real estate and his success in this field enabled him to purchase a dairy farm and dabble with the elements. Severe drought put an end to this venture and eventually Attie found his way down to the Lowveld where he resided with his mother and brother on a small holding outside White River.

Attie was a founder member of the Lowveld Clivia Interest Group in 2003 which later grew into the Lowveld Clivia Club of which he became an executive member. He left the Lowveld for a short while to care for a relative in George, interacting with many of the revered clivia enthusiasts from the Garden Route, East London and Port Elizabeth clivia clubs. He returned a few years later and once again became actively involved in the Lowveld Clivia Club.

Attie devoted the last 12 years of his life equally dividing his time between raising his daughter Anna (in the process mentoring her on Clivias) and nurturing his own Clivias, specialising in all the pendulous species of which he was able to source numerous and excellent heritage clones. He studied *Clivia nimbicola* in the indigenous forests of Bearded Man on the South African/ Swaziland border and identified 4 different colonies. These were written up in Clivia Yearbook 11.

Attie possessed an incredible memory and knowledge of almost every named clivia, not only in South Africa, but throughout the world. He also interacted with leading personalities worldwide and sourced many seeds from China, Japan and elsewhere, the offspring of which are presently being enjoyed in many parts of South Africa.

"Attie possessed an incredible memory and knowledge of almost every named clivia, not only in South Africa, but throughout the world."

To those who knew him well, Attie will always be remembered as a "loveable scoundrel''. He was a natural-born trader and barterer. When visiting in person or dealing with you by cellular phone, he would articulate his greatest asset and convince or persuade you to part with your most valuable plant or offset at a fraction of its true value.

He was an outstanding mentor to all the members of the Lowveld Clivia Club and unselfishly shared his vast knowledge and experience with all of us. His memory and his invaluable educational input to all members of the Lowveld Clivia Club will be remembered for a very long time indeed.

Paul Kloeck on behalf of the LCC

Is this a new record?

Neethling du Toit

I couldn't believe my eyes! There in front of me, in the sea of green, was a speck of colour, reddish orange with a bit of white and green. My first thought was that my eyes were playing a trick on me, or that somebody, possibly my wife, was trying to fool me by putting a flower where it did not belong. On looking closer, however, I saw a small flower. The tiny little seedling really had a flower! A real flesh and blood (or maybe sepal and petal) flower!

The seeds, a cross between White Lips and a Ghost were planted in a seedling tray directly in *Clivia* medium on 30/3/2018. I push the seeds halfway into the medium and if they start forming a root and it grows in the wrong direction, I turn it around so that the small root is buried. Apart from that bit of attention I do nothing else. The seeds have to survive on their own.

I found the flower on 1/1/2019, nine months after I had planted the seed. I water my seeds with waste-water from my fish tanks, similar to hydroponics and experience exceptional growth and vitality. Some of the seedlings are now at the two leaf-stage and some have three leaves. The flowering plant has three leaves. I harvest my seeds when they are still greenish, just starting to change colour, because we have problems with monkeys. The monkeys like the outer flesh of the berries.

The flower has bits of dark green in it, as if it is a mixture of a flower and a leaf. It has got a tiny stigma and three anthers. The pollen did not ripen. I tried to pollinate the plant by using pollen from a 'White Lips' cross that was given to me by the well- known *Clivia* breeder, Chris Welgemoed. It will be a real miracle if it produces seeds!

Clivia good, odd and ugly #11: Surprises

Connie and James Abel

Over extended periods of clivia enthusiasm, we all have our tales of pleasant and unpleasant surprises when seedlings first flower. For us two of the former were:

A. The formal version is that we created "Chinese Lantern" (attached) with super glue!

   The unofficial version is that we have no idea why, when the tepals strain to open, their tips cling to each other in desperation! Whatever the reason, it makes for charming pictures both before and after opening.

   Some years ago, the first photo on Sep 13 showed the flowers bulging. By Sep 22, nine days later, two of the five had popped (photo), with the opened tepals retaining the inward curving shape that they had been forced into by the adhering tips. Inverted, they have the lovely shape of Chinese lanterns or mechanical grabs?

B. And then to counter the deserved popularity of multitepals, we had a seedling going the other way! It had only four tepals per flower as shown. Obeying the 2:2:1:1 rule of ratios of the numbers of flower parts (2 tepals : 2 anthers : 1 lobe : 1 locule), it had only four anthers and two stigma lobes leading down to two locules in the ovaries. Flowers (they are not florets) with an odd number of tepals are confused in the ratio!

Will the next advance (regression ?) have only two tepals?

Please send reports of similar unusual clivias to Connie and James at: jcabel@absamail.co.za

Pedigree Notation: Managing information when breeding with *Clivia*

Felix Middleton

The onset of each new year is marked by a significant shortage of colour in the *Clivia* greenhouse. The miniata flowering season is over. In the months leading up to the next miniata flowering season, seed lists are released that leave the enthusiast spoilt for choice. With the zeal of true gamblers, enthusiasts buy seeds, often at very high prices, in the hope that the seed will develop into the next show winner in a few years' time. These endless lists, bear evidence of the variety of crosses of seed available, but I worry about the soundness of the material and reliability of the pedigree claimed on the lists. I need to confess to a personal character flaw, I am a pessimist, wary of anything unusual. All new information I receive is taken with a pinch of salt! As a potential buyer, I like to see as much information as possible about the flowers hybridised, before placing an order. Like many *Clivia* growers, I have very limited resources and cannot afford to nurture any material that is not true to type.

All seed lists, contain superficial descriptions of the male and female parents in the cross, but often lack background information on the actual genetics and breeding results. Breeders and sellers have the right to advertise their wares as they wish to, but there is a fine line that separates effective advertising and devious behaviour. Withholding information and claiming improbable results, should be regarded in the same light as deliberate deception for profit. The issue of ethics in *Clivia* conservation and marketing is a subject for a further discussion.

I have no interest in material where the basic information is not supplied. For me, the bare minimum should not only be a description of the parentage, but also which plant was used as pod parent and which was used as pollen parent. Other information such as the breeder's care when pollinating is important to me. I would like to know whether the breeder isolates the flowers when pollinating them, whether the flowers are emasculated or not. These facts are not freely available. For my own breeding, I utilise a standardised pedigree notation where I incorporate as much information as possible but with a minimum of script.

Picture 1: Keeping an accurate record of a cross is important. However, the record needs to survive at least to flowering. Many of us own a superior plant from a catmix or ratmix where pedigree information is lost due to pet activity.

Why have a standardised pedigree notation?

Some of the advantages of using a standardised way of depicting a pedigree:

1) It enhances the commodity value of the material in a breeding program. In recent times several *Clivia* breeding programs or parts of breeding programs have been offered for sale. The worth of a collection is directly related to the correctness of information on the individual plants in the population. Plants in these collections are generally not flowering at the time of purchase, as well as having many immature

plants. A collection to be sold "voetstoots" (as it is!) is worth much more if it contains detailed pedigree information. I will even go so far as to say that a buyer will pay more for a collection that is not in flower but bearing detailed breeding records than for the same sized collection in flower but without any breeding records. Detailed breeding records provide a breeder with insight into the possible colour compatibility of the material. For example, a yellow crossed to a yellow does not necessarily yield yellow offspring. However, a Group 1 yellow crossed to a Group 1 yellow will produce yellow progeny.

Picture 2: Natal Yellow/Belgian hybrid. An orange is an orange until you are presented with a pedigree.

2) The generation interval for *Clivia* is long. It may take 5 years or more for the progeny of a cross to reach maturity and show their potential. Records need to survive this period as memory alone will not suffice. Without detailed records a breeder will not be able to recreate a cross that proved to produce superior progeny. Furthermore, we may plan crosses better and can predict the outcome of similar crosses, if we keep detailed records of past crosses.
3) A potential buyer of seeds needs to be sure that he purchased what he was looking for. This is especially true for growers that have limited space to cultivate their plants. When presented with an accurate pedigree, a buyer can, with our current knowledge on compatibility breeding, select only those crosses which have a high probability of producing the desired types.

Before I describe the method that I use for my crosses, we will need to revisit some breeding terminologies.

Picture 3: Emasculating flowers before the pollen is shed, is essential, if you want 'true to type' offspring. Pendulous species need to be emasculated before the flower opens. This is not an easy task. Most breeders prefer to use *C. miniata* as the pod parent with interspecies crossings.

Breeding nomenclature

Several terminologies have been developed for breeding purposes. Most of these are standardised and are accepted by animal and plant breeders alike. It enables breeders to communicate results and methodology and eliminate misunderstandings related to heredity.

Crossing: Making a cross between two individuals by transferring pollen from one plant to the other is also known as creating a hybrid. Seed obtained from this original cross is called the F1 (first filial or Filial 1). The objective is to create diversity and therefore new types, or more specifically to create a plant that harbours traits from both parents. Often, depending on the degree of relatedness between the parents, the progeny is stronger, healthier and more robust than the parents.

Picture 4a: Good record-keeping: coding harvested pollen with pictures for backup.

Picture 4b: Noting the pedigree after pollination

Out-crossing (known x unknown): This terminology is loosely used by plant breeders who allow a flower to take pollen from another in its vicinity. Pollinating with a mixture of different pollen, transporting a plant together with other plants while in flower and taking an emasculated plant to a show are some ways to facilitate an outcross. Most breeders do not like this strategy as the pedigree and therefore potential of the resulting progeny is unknown. Many breeders even shun this approach as the lack of a true pedigree precludes prediction of an accurate breeding value. The term outcross may also refer to a plant that, due to incorrect pollinating procedures, produce unexpected progeny. Fertilisation in nature, by butterflies or sunbirds, can also be regarded as outcrossing. In contrast to plant breeding, in animal breeding outcrossing is defined as using different breeds to create hybrid vigour.

Selfing (F2: A x B): Self-pollination is achieved by placing the plant's own pollen onto itself. The pollen can be from the same flower, from a different flower on the same umbel, from a second umbel on the same plant, or from a clonally propagated offset or sucker of the same plant. The stage of self-pollination is usually captured in either the S or F notation. S1 denotes the first generation of self-pollination after a cross. S2, the second etc. The F notation as described above may also be used where it describes the number of generations after a cross. The seed from a cross is noted as F1, the seed from a 'selfing' of the F1 progeny is termed the F2 etc.

Sib-crossing (AB x AB): Self-pollinating a plant has the advantage of stabilising or fixing a trait of interest but has the disadvantage of unintentionally stabilising other traits, often deleterious, due to the genetic bottleneck effect. Usually a breeder wants to stabilise a single trait but also wants to keep a considerable amount of variation to enable selection of other plant characteristics in future generations. Crossing siblings that were created from the same initial cross will enable a breeder to keep the variation while at the same time stabilising the trait of interest. Although regarded as the F2 generation, it cannot be called a S1 generation as the segregation ratios of traits differ in progenies when compared to 'selfing' a F1.

Backcrossing (AB x B): Crossing a hybrid to one of its parents is called backcrossing. This breeding method is used to obtain progeny that look like the recurrent parent but retain a limited number of traits from the donor parent. Increasing the flower count on a compact plant will not be accomplished by using a selfing strategy alone. The trait for compactness is complex and a backcross to incorporate more of the compact plant genotype is needed. Making use of a backcrossing scheme to incorporate a recessive trait into a good background takes more skill and patience. Refer to the insert below where the recessive yellow trait is incorporated into a superior genetic background.

Reciprocal crossing A x B vs. B x A): The inheritance of traits is generally not influenced by the pod or pollen parent. Most genes are situated in the cell nucleus and are inherited as one copy from the female and one copy from the male. But there are exceptions to this 'even' distribution of genetic material. Some heritable elements are situated in the cytoplasm of a cell. As the male gametes do not contain cytoplasm, these genetic elements are only passed on to the progeny through the female gamete. A good example of this is leaf variegation. If you want to breed variegated Clivia, you need to use a variegated pod parent as the trait is not

passed on from a variegated pollen parent. We are finding more and more traits, mostly those that are linked to leaf characteristics, which are inherited in this way. Many breeders use the easier way, to emasculate *C. miniata* as the pod parent in interspecific breeding. However, there are advantages of pollinating the reciprocal cross.

Stabilise or fix a trait. In breeding a trait, such as Group 1 yellow, which is recessive colour and therefore needs to be present as two copies in an individual to be expressed. One from the pod-parent and one from the pollen-parent. When crossing a 'true to type' Group 1 yellow with a 'true to type' orange, the F1 (orange) is said to be 'split' for the Group 1 yellow trait. In the F1 the observable trait (phenotype) is orange as the group 1 yellow trait (genotype) is masked by the dominant orange trait. The self-pollinated progeny of a split, the S1 or F2 generation, will segregate for yellow. The yellow trait has been stabilised or fixed in these yellow offspring as they are now true breeding for yellow. Selfing or sib-crossing these yellows will always produce yellow flowering plants. The concept of stabilising can also be used where complex traits are managed. If a trait that is present in the parent, is the same in all the progeny after selfing, the specific trait has been stabilised. In organised research, the concept of stabilising a trait is formally known as fixing a trait. However, to spare the laymen the unnecessary confusion when the concept of "fixing" is misinterpreted as "correcting", we have adopted the term "stabilise" in our discussions on *Clivia* breeding.

Breeding a compact yellow by backcrossing

First cross: Compact orange (RR) x Normal sized yellow (YY)

Resultant F1 progeny (orange phenotype) is of intermediate size but split for yellow (RY)

Second cross: F1(RY) x Compact orange (RR)

Resultant progeny contains compact plants, but all are orange

(RR) – fixed for orange

(RY) – split for yellow

Third cross: self at least 5 of the most compact progeny.

Some progeny families will only contain orange (RR = RR)

Some progeny families will contain yellow and orange (RY = RR, RY and YY)

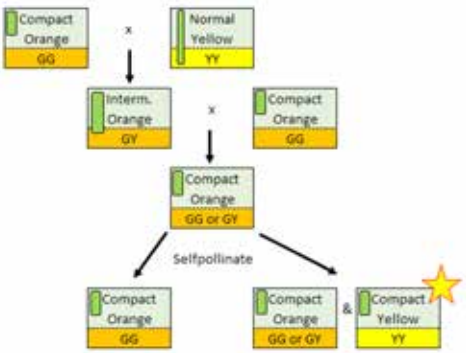


Table 1: Nomenclature to describe the allelic notation of yellow and orange

Genotype	YY	RR	YR
Phenotype (what we see):	Yellow flower	Orange flower	Orange flower
Allelic description	Homozygous for	Homozygous for yellow allele	Heterozygous orange allele
Breeding outcome	Progeny from selfing will be yellow	Progeny from selfing will be orange	Progeny from selfing will segregate for yellow and orange
Breeding type of individual	True breeding yellow	True breeding orange	Split for the trait
Stability	Yellow trait is stable	Orange trait is stable	Trait is not stable

'Purdy' nomenclature to describe a pedigree

The following is a pedigree notation that I have been using for my own breeding. Like many breeders, I don't like to be told how to document my plant material. The idea here, is not to dictate a notation that all breeders need to follow, but rather describe the notation that many breeders use. The notation was proposed for cereal crops in 1964 by HM Purdy, a plant breeder by trade. Although this system has been adopted by many amateur breeders, as well as small breeding companies, most large corporate breeding companies make use of more complex systems. The more complex systems are formulated to capture additional information such as selection history as well as to compensate for unconventional breeding strategies such as doubled haploid breeding and GMO trait introgressions. Interestingly, modifications and alterations to the general 'Purdy' notation are often also implemented by multinational companies to confuse competitors.

For the enthusiast breeder the conventional 'Purdy' system is adequate as it is simple to implement and easy to understand. It is a system whereby all the crucial information needed to document the breeding method and selection history is captured. We will only discuss three basic crosses by using this system.

A) 'Purdy' simple cross of creating a hybrid where plant A is crossed to plant B. The pod parent is always noted first in a pedigree.

Notate as A/B if A is pod parent

Notate as B/A if B is pod parent

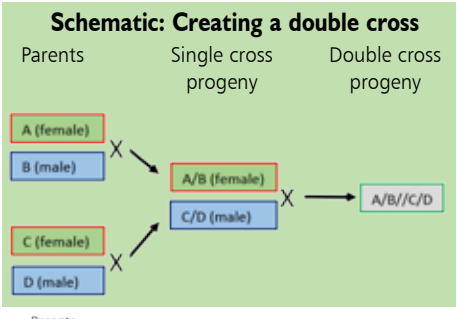
The advantage of knowing which parent is the 'pod' parent:

1) As an enthusiast, I would rather buy an 'Apoline'/Daruma cross where 'Apoline' ('Gems Apoline') was used as the pod parent. In the unfortunate but possible event that the cross was unsuccessful, I will either have F1 'Apoline' progeny (selfed) or an outcross with 'Apoline' (stray pollen). To me this will be more valuable than a Daruma F1 or outcross.(Daruma as 'pod' parent.)
2) In crosses where variegation (Akebono / LOB / striata etc.) is present, a cross with the variegation in the pollen parent will not result in progeny with variegation being present. The pedigree notation allows the breeder to see which one of the parent's cytoplasm is present in the progeny.

Picture 5: Seedlings from a Daruma/*C.nobilis* cross. As Daruma was used as pod parent, the stunted progeny on the right are clearly true to type interspecs. However, the seedlings on the left are likely also interspecies as they are not typical Daruma selfed seedlings. These deductions are only possible when detailed pedigree information is available. As a matter of interest, the plants in picture 6 have recently flowered and they are all semi-pendulous *C. nobilis* hybrids. Some are compact while others have longer leaves, a trait inherited from the *C. nobilis* parent.

B) 'Purdy' double cross where two hybrids are crossed

Notation: A/B//C/D. From this notation we can deduce that an A/B hybrid was crossed as pod parent with pollen from a C/D hybrid.



C) 'Purdy' notation in a backcross where a Hybrid is crossed back to one of its parents.

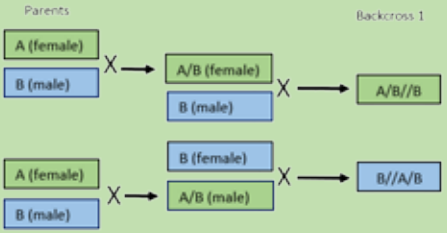
Notate as A/B//B where the hybrid was used as the pod parent (alternative A/1*B)

Notate as B//A/B where the hybrid was used as the pollen parent (alternative B*1/A)

In both crosses B was used as recurrent parent. However, the cytoplasm of A is still present in

the progeny of the first cross where it has been replaced by the B cytoplasm in the second cross.

Schematic: Creating a backcross



The outcome of both crossing schemes is similar, in that a larger portion of traits from parent B than Parent A will be expressed in the progeny. However, the expression of cytoplasmic inherited traits such as leaf variegation, will differ. In the first approach the cytoplasmic traits of parent A will be expressed in the progeny where in second scheme the cytoplasmic inherited traits of parent B will be expressed in the backcross progeny.

Picture 6: FI10 Ngome *gardenii*/'Gems Apoline'.

It is important to always note the female parent first.

The notation is complicated when a variety name contains special characters or spaces between words. For instance, in the pedigree above the correct name of one of the parents in FI10 is

Practical examples of using 'Purdy' pedigree notation:

Most of the crosses that I conduct are with pendulous species and inter-specifics. I seldom have the privilege of having named varieties. To manage my small collection of plants, I maintain a database of all my material. The database includes, among others, information on origin, date acquired, flower count, species and flowering dates. To simplify the system, I make use of codes. The prefix FM is used to identify a *C. miniata*, FP a pendulous species and FI an interspecific. For instance FM01 is a compact broad-leafed Florid White Lips, where FI10 is a pink interspecific, from a cross between 'Gem's Apoline' and 'Gem's Golden Renaissance'.

If I cross these two individuals, the most effective way, is to denote the cross as FM01/FI10. This allows for a simple way of referencing the material in the database, as well as noting the cross on the label, during pollination.

Pic 7: FM01: Compact 'FlorID White Lips'

Table 2: Alternative ways of documenting a cross

Reason for coding	Pedigree
Description that you will generally find on a seed list (giving very limited information)	Good ghost x Pink interspecific
Coded pedigree for my database documentation and for ease of writing the crossing label	FM01/FI10
Pedigree notation if the interspecific is a named variety	'FWL'/'Gems Orient Express'.
Pedigree notation if the interspec. has not been named	'FWL'//'Gems GoldenRenaissance'/' GemsApoline'
Pedigree to simplify the name but may infringe on a breeder's rights, especially if the pedigree is formally used in the public domain	'FWL'//'GoldenRenaissance'/
Pedigree that may assist with predicting the outcome of the cross	BLGhost//Ngome*Gardenii*/ Group1Yellow (BL= Broad Leafed)
Pedigree to show the presence of the species	*miniata//gardenii/miniata*
*Pedigree to denote recovery of open flower type or show the backcross phase	min*1/gar or BC1F1: min*1/gar

*This is often a practice in breeding as the objective of most breeding programs with pendulous species is to regain the open flower or *C. miniata* form by way of backcrossing.

'Gem's Golden Renaissance'. I will amalgamate the name to 'Gems GoldenRenaissance' as this will reduce confusion in the 'Purdy' pedigree notation system. Additionally, some of the older data collection software systems cannot manage names with special characters or spaces.

Summary

When buying seeds, make sure that you gain as much information on the cross as possible. The only way to be sure, is to either ask the breeder how the cross was structured,or if the breeder used a standardised system, you will be able to predict the outcome.

Picture 8: It is nice to own a pretty *Clivia*. Knowing how it was created will enable you to plan for similar results or even improve on the type.

Clivia Seed Germination – my way

Elize Strumpher

Germination

1. Soak a brick of coconut peat in a container of water, ensuring that there is enough water to loosen up the hard peat. Squeeze out any excess water.
2. Clean your seeds (peel the flesh off the seeds), remember to remove the fine film adjacent to the seed. Place the seeds in a dilute bleach solution. (5ml in 500 ml of water). Always soak your seeds in this solution prior to germination. Seeds bought from other growers should also be soaked in this solution.

   There is no harm in soaking the seeds in this dilute bleach solution for an hour.
3. Add the moist coconut peat up to 2/3 full in a container.(ice cream tub or any Tupperware like container). Do not make the peat too wet! I use transparent containers, which makes it easy to check the moisture on the inside of the container walls, without opening the lid.
4. Place the seeds on top of the moistened coir, in rows about 1 cm apart. There is no need to leave large spaces between the seeds. Press lightly into the coir, but do not cover the seeds with the coir.
5. Fill a spray bottle with a freshly mixed dilute bleach solution. This solution (freshly mixed), will also be used for the future moistening of the seeds during the germination period.
6. Lightly spray the seeds with the dilute bleach solution and place the lid on the container.
7. Mark the container with the names of the crosses in the container or use partitions between the rows and label carefully, if more than one type of seed crossing is in the container.
8. Place the container in a warm area, with a temperature between 22 – 25 degrees centigrade. Do not place the container in direct sunlight. I use a warmer which has a controlled temperature of 25 degrees centigrade. A thermostat is used to control the temperature.
9. The seeds can stay untouched for about 10 days before you need to check for moisture content. If there is no moisture visible on the sides of the container, spray the seeds with the dilute bleach solution. Don't make the coir too wet! A fresh solution of dilute bleach with every spray is recommended.
10. Check regularly on the moisture content of the container. When germination starts, the developing roots absorb more water. Over watering should be avoided.
11. Germination starts within 2 - 3 weeks. When the first green leaves appear, the roots are often already well developed, up to 2cm long. The seedlings are now ready for transplanting into seedling trays.

TRANSPLANTING

1. Use the same potting medium as you would use for your mature plants. There are as many potting mediums as there are clivia growers! You can add some fertilizer, like Rapid Razer (or something similar) or well composted kraal manure and bone meal. The potting mix must be well drained.
2. Plant the germinated seedlings into seedling trays with the roots covered by the soil, but not too deep. The leaves should not be covered by the soil.
3. I find that the seedlings produce at least 4 leaves during their first year. To achieve this, fertilize the seedlings regularly with a nitrogen rich foliar feed. We use a product from Hygrotech named Hygrofert (5.3.1) which is a water-soluble fertilizer that you spray on the seedlings, once a week. Some growers believe that you should "spray less, more often", while others prefer to

spray "more, less often". This same feeding program is followed until the seedlings are ready to be transplanted into individual pots.

4. Seedlings should be watered regularly and must not be allowed to dry out. Large clivia plants can survive without water for a period, but seedlings must be watered regularly. (at least every 3 days during dry periods.)
5. Seedlings can safely grow in the seedling trays for a year. Transplant each seedling into a pot (20cm), where they may remain until they flower. From then onwards you can transplant your plants into larger pots.

The *Clivia* 'Habitat Heritage' collection

Sean Chubb

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 *miniata* flowering season from mid-August until mid-October, although during the robusta and gardenii flowering season in late May and early June the display is also spectacular.

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 recognizable 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 KwaZulu-Natal 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* species.
- 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 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 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, owing to various reasons, some of the 'Habitat Heritage' clones have been lost or destroyed and some historical are kept secret.

The 'Habitat Heritage' collection should provide genetic material for breeding purposes and scientific studies. Captive breeding programs of rare habitat

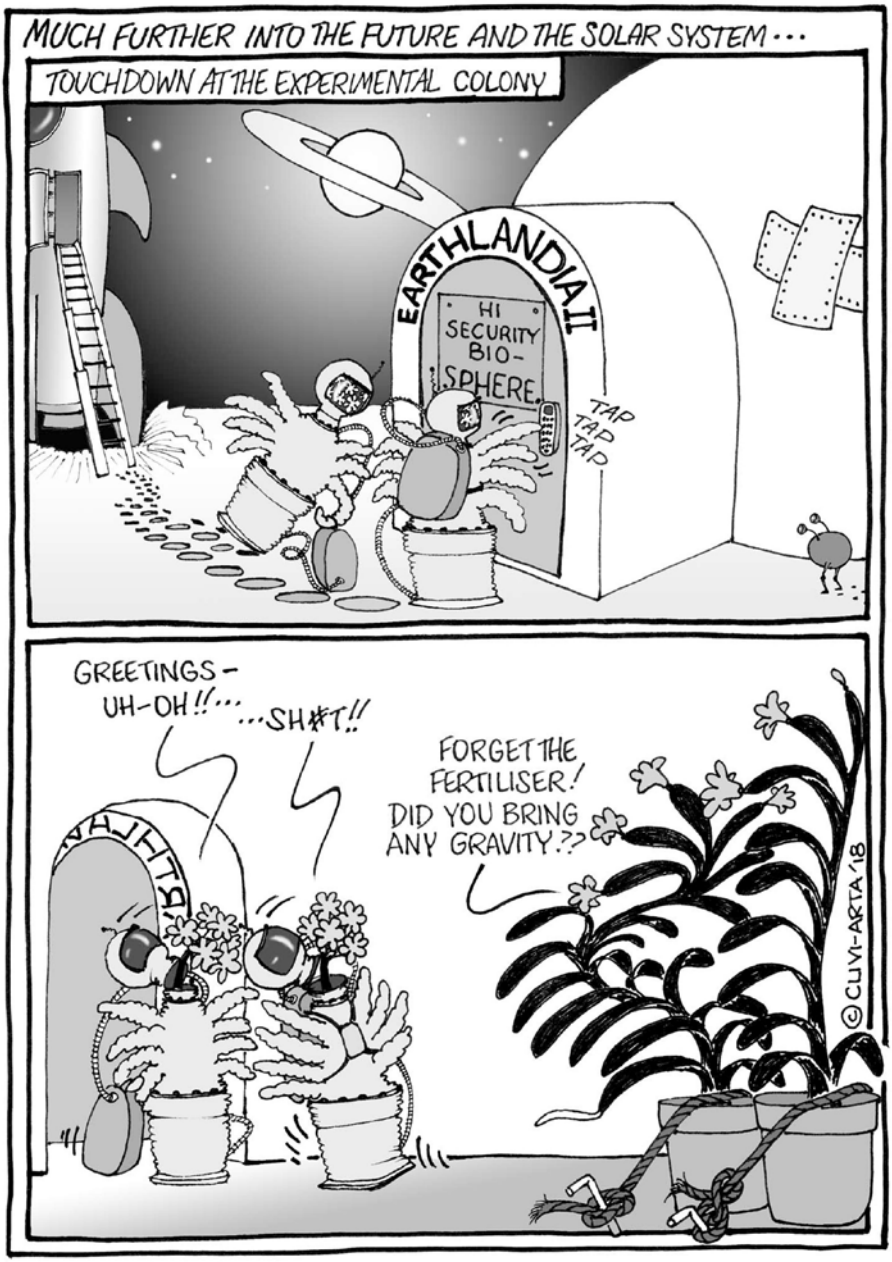
mutations would hopefully decrease the pressure from collectors on the wild populations. This would be done by providing sought after genetic material to potential collectors. The risk of poaching new genetic material hopefully would be too great if the genetic material is made available to collectors. The 'Habitat Heritage' collection gene bank makes the conservation of our unique 'Habitat Heritage *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.

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.cp.za or on cell 084 301 9960.

Clivia-Arta

Helen Sanders



History of the KwaZulu-Natal Clivia Club
Part 1 – 1994-1999
25th Anniversary 2020

First Committee: KwaZulu-Natal Clivia Club

Chairperson
Sean Chubb
Joined the Clivia Club
in Pretoria in 1994

Committee Member
Des Andersson

Committee
Member Brian Tarr,
Curator of
the National
Botanical Gardens,
Pietermaritzburg
joined the Clivia
Club in Pretoria in
August 1993

Secretary/ Treasurer
Val Thurston
Joined the Clivia Club
in Pretoria in 1994

Saturday, 14 March 1994:

KwaZulu-Natal held their first "Meeting", under the trees at the Pietermaritzburg Botanical Gardens. Interested parties brought a variety of plants, some of which had been dug out of the ground and potted at the eleventh hour for display and discussion. Michael Noyce shared some Eshowe Yellow seed with members – later named Noyce's Sunburst. Brian explained the history of what became one of many wild clones protected and conserved in a Heritage Collection.

On conclusion of the meeting Des Andersson invited all those interested in Clivias to join the Clivia Club. James Abel, Chairman of the main Club in the Transvaal, was eager for the Natal members to form their own Club.

Saturday, 26 August 1995

The first Mini Show was held at the Pietermaritzburg Botanical Gardens in the Lecture Hall with the kind permission of the curator, Brian Tarr. The colourful display of plants in flower were viewed by more than 50 people, many of whom expressed surprise at the variety of blooms and range of colours.

Brian Tarr gave a most informative talk on Clivias, the areas where they had been located in habitat and the different species in those areas.

Best on Show was awarded to the habitat plant 'Chubb Peach', belonging to Sean Chubb.

'Chubb Peach'
Original Clone.

Sean Chubb discussed techniques of pollination and preparation for sowing and recommended a mix of coarse river-sand mixed with a commercially prepared potting soil.

Sunday, 27 August 1995

A visit was arranged to the farm of Mr & Mrs T Antel in Baynesfield. Sadly, due to the lateness of spring rains, only a few plants were in flower. On the return journey we visited Sean Chubb's nursery on Thurlow Farm.

Original photograph – 'Naude's Peach'.

Trophy Cup donated by Val Thurston.

August / September 1996

A Mini Show was held inside the Botanical Gardens Hall. Mrs Olive Naude brought along a magnificent creamy peach plant which was named 'Naude's Peach' and was of great interest and admiration. This plant was voted the Best plant on Show.

Listed below are some of the pioneer clivia enthusiasts for the year of 1995/1996:

Emmi Wittig, Carole Beckett, Howard Cook, Lennard Westbrook, Gerry Camp, R Murray, Althea Platt, Pat Quin, Violet Antel, Pat Bennett, Bobbie Maxwell, Michael Noyce, Charles Cadman, Cynthia Giddy, Daan Dekker, Ian Smith, Trevor Coleman, David Moon, Olive Naude and Roly Strachan. Roly, who was very generous with handing out plants from his huge collection, also welcomed all members to visit his farm and home. Emmi Wittig, is to date one of our oldest members.

Roly and Barbara Strachan

One of the first Pink *miniata Clivia* hailed from the Emmi Wittig collection and is known as 'Wittig Pink'.

Roly at the age of 94 passed away in July 2013. One of the first Pink *miniata Clivia* hailed from the Emmi Wittig collection and is known as 'Wittig Pink'.

Saturday, 14 September 1996

The first Annual General Meeting of the Natal Clivia Club was held, in the Botanical Gardens' Lecture Hall in Pietermaritzburg. The elected committee members were: Sean Chubb – Chairperson, Des Andersson, Committee Member and Brian Tarr – Committee Member.

There was a good turnout and the Chairman, Sean Chubb, mentioned that the membership had grown from 36 members in 1995 to 50 members.

GARDENII ESHOWE VISIT

21st & 22nd September 1996

The Natal Clivia Club organised its first habitat tour to the Eshowe area in Zululand. The party was able to view clivia in their natural habitat – one interesting factor was that there was a strain of *gardenii* that was growing in a swampy area of the forest and when compared to other specimens in the area, was found to be much smaller – hence the name 'Eshowe Dwarf' *gardenii*. We also visited the home of Charles Cadman, whose very interesting pastel coloured specimens drew a lot of attention.

September, 1997

Best on Show : Brian Tarr NBI –
'Watkins Golden Glow '
Runner-up: Sean Chubb - 'Chubb Peach'
MOST POINTS : Sean Chubb –
Val Thurston donated a Cup to be presented.

1997

The establishment of the 'Habitat Heritage' collection started.

The pioneer yellows that were the original plants in the 'Heritage Collection'.

Additional Committee Members 1997

Treasurer -
Brenda Nuss

The first known yellow clone classified as *Clivia miniata var. citrina* was discovered in 1892 in Eshowe in Zululand, Natal. It was found by a Zulu cook whilst out collecting firewood and employed by the resident commissioner, Sir Melmoth Osborne. The plant was removed from the site and presented to Sir Charles Saunders, Osborne's assistant, whose mother was an artist and recorded the specimen in watercolour. The bulb

Published illustration from C. Letty drawing

was then sent to the Royal Botanical Gardens in Kew, classified and documented. The plant continued to flourish and is known today as the famous 'Eshowe Yellow'. It is fertile when self-pollinated, offsets readily and the berries are yellow when mature. The flowers are large, pale cream in colour, with narrow recurving tepals.

Scan of original Cynthia Letty drawing courtesy
SANBI Pretoria

Katherine Saunders recorded on the back of her painting of the first habitat collected yellow: 'Yellow Imantophyllum from Eshowe, flower withering after two days in the post bag. Most lovely, delicate, peculiar shade of yellow, not orange, but like straw colour, mixed with pink, quite inimitable to me. October 8th – 1893'. This drawing had been sent to Kew with the bulb by Maud (her daughter). The plant was formally described by Watson of Kew Gardens as *Clivia miniata var. citrina* in 1899 and published in "The Garden" magazine. An offset of this plant was sent to family friends of Sir Charles Saunders, Mr B Nicholson in Swaziland, and it

was one of these that was used by Cynthia Letty to illustrate the varietal form of *Clivia miniata*, although erroneously published as 'var. *flava*' in 'The Flowering Plants of South Africa'. The plate is also identified as *Clivia miniata var. flava* in the book on Katherine Saunders (1980s).

In1896, Miss Grace Mare bought another yellow clivia from an Indian grower. He had collected it at the foot of the Howick Falls.

It has strap-like leaves and trumpet- shaped yellow blooms. This is a vigorous clone, sending out numerous side-shoots known today as 'Howick Yellow'. It is self-sterile, but produces interesting results when cross-pollinated. The berries are yellow when mature.

When Grace Mare had to leave Howick for health reasons, she gave her plants to her niece, Audrey Tanner, in 1956. They were grown at the Tanner house for ten years before being moved to the current address in Blackridge. The family is pleased to have their father's name associated with this wild-collected clone.

Dweza yellow

Brian Tarr, of the Pietermaritzburg Botanical Gardens also had a habitat yellow, known as 'Tsolo Yellow'. This, broad tepalled, pale yellow clone was found in the Transkei, Eastern Cape. The plant is fertile when self-pollinated, offsets freely and the berries are a distinctive mixture of red, yellow and green. The name was later changed to 'Dweza yellow'.

A peach, found in the Ingwahlume Valley near Eston in around 1945, later named 'Chubb Peach' has proved to be a great plant to use to breed improved peaches, with broader petals and a higher flower count.

A number of yellows and peaches were found around the year 1996. These habitat plants were named: 'Mvuma Yellow', 'Alpha Thurston', 'Beta Thurston', 'Gamma Peach'. These plants were found in the Upper Tongaat of Ndwedwe, in the indigenous bush found around the sugar cane farms inland of the Natal North Coast.

The 'Naude Peach', belonging to Olive Naude of Kloof, which caused huge excitement and interest, is still being used to this day, in breeding programs.

1998

As interest grew and the shows continued to be a resounding success, the club decided to have their next September Show at the Royal Show grounds. This was held in the upstairs, Wooden Pavilion, with stall holders setting up their stands around the show area below. An attractive collection of clearly labelled 'wild clones', in the possession of various member

'Mvuma Yellow'.

'Alpha Thurston'.

'Beta Thurston'

'The Clivia' written by V A Thurston. First Edition – 1998

BEST ON SHOW: Val Thurston – Alpha Thurston – Habitat Plant.

MOST POINTS : Sean Chubb.

Pen Henry from Australia and Des Andersson were the judges.

Val Thurston launched the first *Clivia* book, printed at home. 'The *Clivia*', dedicated to her husband Roy and son Nicholas. 'In gratitude for the many hours spent photographing flowers, collecting, peeling and planting seeds, transplanting seedlings and plants. This enabled her to conduct a breeding programme with selected wild collected and donated genetic material in an attempt to conserve and preserve these clones.

1999

The Annual Show was held in the "Quilting Hall" at the Royal Show Grounds. Best on show went, once again, to Brian Tarr for the stunning 'Watkins Golden' and Most Points went to David Moon. Membership increased to 94 members and the show attendance swelled to a record of over 400 visitors.

This is the first of a series of articles from Kwazulu-Natal Clivia Club.

Shows in South Africa in 2018.

Most clubs in South Africa had miniata shows in Sepember 2018. A few had interspecific shows. The show reports of the various clubs, were part of the club submissions to the Annual General Meeting in May 2018. The reports of the shows held in Toowoomba and Melbourne were included in Yearbook 20. The Show result of the September shows will in future be included in the February edition of the Clivia News.

Cape Clivia Club

Best on Show – flowering – 2018 - Gerrit Rohland.

Judges at the Cape Clivia Club show. From left to right: Danie Pretorius, Karl Rost and Leon Blom.

Eastern Province Clivia Club.

Marius Meyer with the Best on Show and the runner-up to Best- on - Show in 2018 – Eastern Province Clivia Club.

The Eastern Province Clivia Club held their 2018 show in a shopping centre for the first time.

Free State Clivia Club

FCC Best on Show Stefan Ferreira – Flowering - 2018.

FCC 1st Runner up to Best on Show – 2018 - Hennie van der Mescht.

FCC Second runner-up to Best on Show – 2018 - Stefan Ferreira.

FCC Best on Show - Foliage – 2019 - Hennie van der Mescht.

FCC winners - Stefan Ferreira and Hennie van der Mescht.

Garden Route Clivia Club

GRCC Interspecific Show - Best on Show 2018 – Carrie Kruger.

Runner- up to Best on Show Interspecific 2018 – Carrie Kruger.

Second runner-up to Best on Show- GRCC Interspecific 2018 – Nico Cloete.

People's choice- GRCC Interspecific show 2018 – Carrie Kruger.

GRCC Second runner-up to Best on Show – 2018 – Kobus Kearney.

GRCC - Best Green on Show – 2018 – Carrie Kruger.

GRCC Best on Show – Flowering – 2018 – Ricky and Noelia Jardim.

GRCC Runner-up to Best on Show – Flowering – 2018 - Ricky and Noelia Jardim.

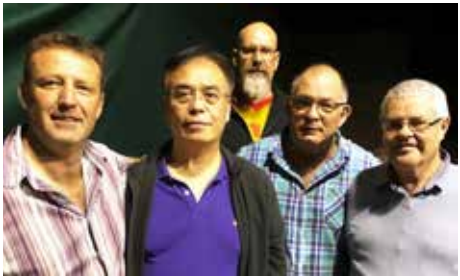
Garden Route Clivia Club winners on display 2018.

Joburg Clivia Club 2018

JCC Best On Show – Flowering - Andre Swart (JCC) – 2018.

JCC Runner-up to Best on Show – Flowering – Liz Boyd 2018.

JCC Second runner-up to Best on Show – Flowering – Johan Etsebeth – 2018.



Joburg Clivia Club show 2018 – Judges: left to right – Francois van Rooyen, Eddie Pang, Danie Pretorius, Learner judge Hendrik Botha and judge Hennie van der Mescht.

JCC BOS Foliage plants Hilton Atherstone – 2018.

JCC Runner-up to BOS Foliage plants – Liz Boyd – 2018.

JCC Second Runner-up to BOS – Foliage plants – Hilton Atherstone – 2018.

JCC Floral Display – Corra van Heerden

KwaZulu-Natal

Best on Show – KZN – 2018 – Francois van Rooyen.

Runner – up to Best on Show – KZN – 2018 – Louis Lotter.

Second runner-up to Best on Show – 2018 – KZN – Louis Lotter.

Best on Show – Foliage – 2018 – Val Thurston.

Newcastle Interest Group

Best on Show – 2018 – Newcastle – Henry Howard.

Runner-up to Best on Show – 2018 – Newcastle – Henry Howard.

Alfred Everson III congratulates Alfred Everson II for winning the most points on the show in Newcastle – 2018.

Vryheid Interest Group

Piet and Riana van Wyk of the Vryheid Interest Group.

Lowveld Clivia Club

LCC Interspecific Show 2018 with the winners Paul Kloeck left and Hilton Atherstone right.

LCC 2018 – Second runner-up – Flowers – Ian Radmore.

Best on Show LCC Flowers – Neethling du Toit – 2018.

LCC 2018 – Best on Show Foliage – Ronnie Brink.

Northern Clivia Club

Winners in the Flowering Section at the NCC show in September 2018.
Best On Show – Flowering – Hilton Atherstone – Centre.
Runner-up to BOS Flowering – Pikkie Strumpher – left.
Second Runner-up to BOS Flowering – Johan Etsebeth – right.

Floral display at the NCC Show in September 2018.

Best on Show – Flowers 2018 – Hilton Atherstone

Judges at the NCC show in September 2018.
Back L to R Joubert van Wyk and Carrie Kruger.
Front L to R Felicity Weeden and Karl Rost.

Runner-up to Best on Show Flowers 2018 NCC – Pikkie Strumpher.

NFCC Best on Show J Espag.
NFCC Best on Show 2018 – J Espag

Foliage BOS Pikkie Strumpher. Runner-up to BOS Hilton Atherstone (Left). Second Runner-up to BOS Paul Kloeck Light of Buddha – right.

Runner-up to BOS 2018 – NFCC – J Kruger.

NFCC 2018 – J Wiesner – Most points on Show.

NFCC Second Runner-up to BOS 2018 - Stefan Ferreira.

2019 Membership fees to the Clivia Society

Three Clivia Newsletters and a Yearbook, are issued to paid-up members every year.
Subscrption 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 members: Pay to Glynn: gcmidd@mweb.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 Pay to Glynn: gcmidd@mweb.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 Glynn: gcmidd@mweb.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.

For International members the fees are 25 US dollars a year or the equivalent fees listed above for various countries. Fees may be paid in advance. The amount due is calculated on the fee of 25 US dollars a year.

The Clivia Society's PayPal address is: gcmidd@mweb.co.za.

Please remember to include your physical address for delivering of your purchase.

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: Cultivation of Clivia R80.00 – POSTAGE INCLUDED	US$15.00
5.	Ten or more copies of *Cultivation of Clivia* by a Club or Group each POSTAGE EXTRA	US$14.00
6.	Book: Kweek van Clivia R80.00 – POSTAGE INCLUDED	US$15.00
7.	Ten or more copies of *Kweek van Clivia* 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: *Illustrated Terms and Definitions for describing Clivia* POSTAGE INCLUDED	US$23.00
10.	Book: *Illustrated Terms and Definitions for describing Clivia* Reg. airmail included for RSA	R287.00
11.	Clivia Newsletters 1992 – 2017: Digital copies on website: www.cliviasociety.org – download free of 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

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