



## **COFFS ORCHID NEWS MARCH 2024 PUBLICATION OF THE COFFS HARBOUR ORCHID SOCIETY**

**7 Kotuku Street, Coffs Harbour. NSW 2450**

**Email: [chorchidsociety@gmail.com](mailto:chorchidsociety@gmail.com)**

**Web: [www.coffsorchidsociety.org.au](http://www.coffsorchidsociety.org.au)**

### **EDITORIAL:**

A new orchid year has begun with a well attended February meeting where the basics of orchid nutrition were presented, with some useful tips on how to keep your prize plants well fed. The series of talks called 'Back To Basics' will conclude at the April monthly meeting when there will be a presentation on the major pests and diseases of orchids.

There has been much discussion among the Committee and the general membership about the format of the monthly meeting; when the meeting is held and at what point the supper break should occur. Also it has been suggested that it may be better to hold a day-time meeting because many members find night-time driving difficult or find night-time meetings onerous. Previously, a number of surveys have been conducted but members seemed to be split two ways as to which option they would prefer and the Committee considered that nothing would be achieved from moving the Thursday night meeting to a day-time function. Unfortunately, some members are unable to attend the night meetings and so miss out on the camaraderie of meeting with fellow orchid growers. Others, come to the meeting but leave at the supper break and so miss out on the guest speaker or after supper activity.

The rationale behind scheduling the supper break early in the meeting is to give members a chance to stretch, enjoy supper with fellow members and investigate which orchids were awarded by the Judges. It also provides valuable networking time for members. This also means they are slightly freshened-up for the after-supper speaker or activity. Many other Orchid Societies throughout the State have adopted this approach to their meetings.

The Committee is aware that there are a variety of opinions among the membership and this Editor's opinion is that there should be a discussion session at a future meeting to hear what are the member's concerns. The result will undoubtedly be a compromise as often happens in situations where opinions are divided and the status quo might be the result.

This Editor's opinion is that the current format, with an early supper break, is ideal and should be maintained. We are aware that there is a lot of business to be transacted during a general meeting, and much of this is essential for the proper functioning of the Society. However, it would be helpful if the content could be reduced or pruned to what is essential ensuring the pre-supper section of the meeting is as short as possible. It is essential that members are fully informed on what their Committee is trying to achieve and what other undertakings are occurring in the world of orchids.

## CHOS COMMITTEE 2023-2024

PRESIDENT:	CAROLE DAVIS	026658 1354	carolenlarry@bigpond.com
VICE PRESIDENT:	PETER GOUGH	0409 045 645	hacc51@gmail.com
SECRETARY:	KERRIE GOSLING	0427 515 887	kerrie506@gmail.com
TREASURER:	PAIGE SINCLAIR	0427 591 901	paigesinclair@me.com
COMMITTEE:	CHRIS HATTON	0414 942 298	pchatton@bigpond.com
	PAUL HATTON	0426 978 923	pchatton@bigpond.com
	FRANK PAPPALARDO	0448 802 146	
NEWSLETTER EDITOR:	BOB SOUTHWELL	0417 695 834	bssouthwell@bigpond.com

## CONTACT DETAILS

### SPONSORS

#### SHEARWATER RESTAURANT

Brekkie and Modern Australian dishes in a bright, upscale location with outdoor tables and lovely views over Coffs Creek. 321 Harbour Drive, Coffs Harbour.  
[www.shearwaterrestaurant.com.au](http://www.shearwaterrestaurant.com.au) or Phone 6651 6053.

#### COFFS HARBOUR PRODUCE

Coffs Harbour Produce Cis at 26 June Street in Coffs. They carry a good range of fertilisers, insecticides and fungicides for orchids, as well as general garden needs. Phone 02 6652 2599.

#### COFFS COAST MAZDA

For new Mazda vehicles, also second-hand vehicles and ALL your servicing needs. Ring for an appointment 02 6652 3122 or visit 211 Pacific Highway, Coffs Harbour  
**You won't be disappointed .**

#### DARK STAR ORCHIDS

Dark Star Orchids. 0416 195832 or (02) 65644088.

Hans and Sue run a small nursery west of Bowraville. They specialise in rare, unusual and hard to find species of many orchids particularly Bulbophyllums, Dendrochilums, Stanhopeas, Coelogynes and lots of other genera.

[www.darkstarorchids.com.au](http://www.darkstarorchids.com.au)

email [darkstarorchids@skymesh.com.au](mailto:darkstarorchids@skymesh.com.au)

#### BRUCE HALL

Bruce provides raffle prizes for Autumn and Spring Shows.

#### OFFICEWORKS

Officeworks carries an excellent range covering all stationery needs, computers/monitors/printers, and associated technology. They sell a wide range of smart phones and watches, plus furniture and workspace solutions. If you are looking for low prices on everyday essentials, it's all there at Home Base, Coffs Harbour. Phone 66 919100 or check out the full range at [officeworks.com.au](http://officeworks.com.au).

### CALENDAR, 2024

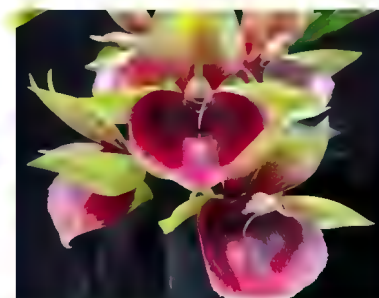
7 Mar— Growing Plant Competition Draw Plus Orchid Video

4 April—Back To Basics—Part 4 Pests and Diseases - Paige and Bob

2 May—Terete Oncidiinae Orchids - Bruce Hall

6 June—Creating Different Zones in a Greenhouse—Peter Gough

Note: The Committee meets on Tuesday following the Monthly Meeting.



### CHOS BANK DETAILS

**BSB No: 533-000**

**ACCOUNT No: 32817199**

### ROSELLA ORCHIDS

#### Spring and Autumn Show Sponsor

Located in South Grafton and can supply a wide range of orchids but specialises in Cattleya and Vanda genera. They also stock a large range of hardware and accessories for orchid growers. Nursery is closed to the general public except by appointment.

[www.rosellaorchids.com.au](http://www.rosellaorchids.com.au)

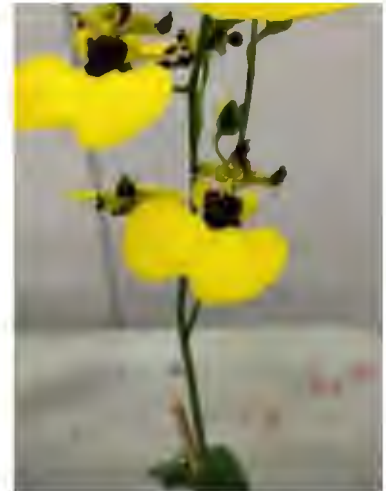
PHOTOS FROM THE CHOS FEBRUARY MONTHLY MEETING



**Cattleya Comets Tail  
benched by Paige  
Sinclair**



**Cattleya Hwa Yuan Bay  
'She Shu' owned by  
Peter Gough**



**Oncidium Aloska  
'Claire' benched by  
Rhonda Smith**



**Dick Cooper's  
Dendrobium Yvonne**



**Lc. Natalie Clarke x Lc.  
Jungle Gem benched by  
Rhonda Smith**



**Dendrobium King  
Dragon 'Princess'  
owned by Helen Seiver**



**Clowesetum Black  
Jade benched by Paige  
Sinclair**



**Catasetum hybrid benched  
by Rhonda Smith**



**Peter Gough's  
Dendrobium smilliae**



## CHOS COMMITTEE REPORT

January and February have been busy months for the Society Committee with two meetings conducted on 23rd Jan and on the 6th February. The following summary outlines the major discussions that occurred at these two meetings.

- ◆ The December Awards Presentation Luncheon was held on 2nd December and was an outstanding success.
- ◆ A new supply of Raffle and Welcome Plants were purchased from Rosella Orchids in South Grafton.
- ◆ The 2024 Growing Competition Plant will be a Mini-Catt. 32 Plants have been ordered from Barrita Orchids. The plant draw will take place at the March meeting.
- ◆ BCU has advised CHOS that our cheque facility will be closed and cheques will no longer be issued by BCU. The Society will open an account with a Visa Debt Card attached as an alternative to using cheques. Same signatories to be used.
- ◆ Membership is now overdue and should be paid ASAP for members to remain financial.
- ◆ Updated Marketing Policy and Procedures, Bunnings BBQ Policy and the Glad Fleming Annual Trophy Procedures were tabled and accepted. Roster of Members to assist at each Monthly Meeting to be drawn up with work teams in the following areas: [a] Set-Up of meeting room [b] Judging Monthly Competition [c] Pack-Up meeting room [d] Clean-Up Meeting Room
- ◆ Design of new Society Polo Shirts tabled and approved. Shirts to be "Apple" colour with the new CHOS Logo embroidered on the shirts. Confirmation of costs, sizes and availability at next meeting. Members to pay for shirts and the CHOS to pay for the cost of attaching the logo.
- ◆ New supplies of Kiwi Bark has arrived. Available from Paige Sinclair.
- ◆ The Society will close their Post Office Box at the Coffs Harbour Post Office from February this year. The CHOS mail address will now be 7 Kotuku Street, Coffs Harbour. NSW 2450.
- ◆ Review of meeting room set-up for display of plants at Monthly Meetings. To start tables from the back door and allow more movement space in front of the tables. Cable protectors to be used to prevent tripping hazards due to electrical cords.
- ◆ The Committee is still investigating a larger venue for the Autumn and Spring Shows. This year's Autumn Show will be held at the Botanic Gardens.
- ◆ \$8,000 [currently in fixed deposit] to be offered as a loan to Woolgoolga District Orchid Society and to be used towards the 2025 AOC Conference.
- ◆ Ludo from Ulmarra has been a CHOS Sponsor for many years. He is now moving to South Australia. We thank Ludo for his long-term support and wish him success in his new ventures.
- ◆ Discussion of Show Organisation, Roster, etc. New procedures to be used to register show plants. Full details will be given in the April Newsletter. This will act as a trial run for what will occur at the 2025 AOC Conference.
- ◆ Next Committee Meeting will be held at "The Workshop" on 12th March at 10.30am.

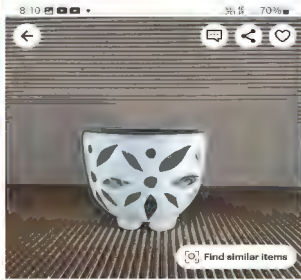
## POPULAR VOTE AT THE CHOS FEBRUARY 2024 GENERAL MEETING



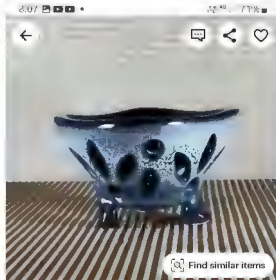
**Popular Vote at  
the CHOS  
February Meeting  
was awarded to  
Paige Sinclair  
for her  
Clowesetum  
Black Jade  
Congratulations!**



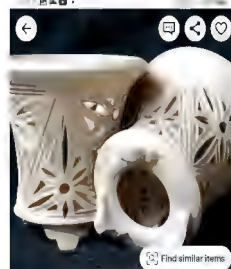
Kathy Lee from Walcha [Phone 0456375765] has contacted the CHOS and has offered for sale the ends of a line of ceramic Phalaenopsis pots which look very attractive in an indoor setting. Kathy says the pots are fired and glazed white clay pots which have never been used. She also has for sale a heating mat.



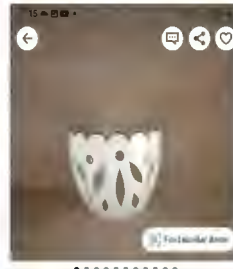
LOW IN STOCK **Star Seller**  
**AU\$47.37+**  
Ceramic pot for orchids. White glazed with legs.  
**MagicClayArt** 2,348 sales  
Est. arrival 29 Feb-22 Apr **★4.92 (525)**  
\* Seller GST included (where applicable). Additional GST may be applied by Etsy at checkout  
Height\*



IN STOCK **Star Seller**  
**AU\$33.16**  
Miniature, handmade ceramic pot for orchids. On sta...  
**MagicClayArt** 2,348 sales  
Est. arrival 29 Feb-22 Apr **★4.92 (525)**  
\* Seller GST included (where applicable). Additional GST may be applied by Etsy at checkout



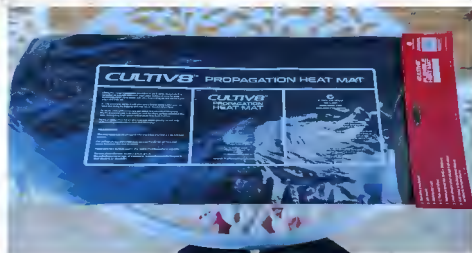
LOW IN STOCK **Star Seller**  
**AU\$50.53**  
Designer Orchid pot for Orchid planter for Flower vas...  
**RodionPresent** 1,777 sales  
Est. arrival 18 Dec-22 Jan **★5.00 (487)**  
\* Seller GST included (where applicable). Additional GST may be applied by Etsy at checkout



IN STOCK **Star Seller**  
**AU\$23.69+**  
Ceramic pot for orchids. White glaze.  
**MagicClayArt** 2,348 sales  
Est. arrival 29 Feb-22 Apr **★4.92 (525)**  
\* Seller GST included (where applicable). Additional GST may be applied by Etsy at checkout  
Size\*



IN STOCK **Star Seller**  
**AU\$50.53**  
Neofinetis pot White pot Orchid pot for Orchid plants...  
**RodionPresent** 1,777 sales  
Est. arrival 18 Dec-22 Jan **★5.00 (487)**  
\* Seller GST included (where applicable). Additional GST may be applied by Etsy at checkout  
Add to basket



**Contact Kathy on  
0456 375 765 or by email on  
belle64jardin@gmail.com**

**CHOS MEMBERSHIP FEES WERE DUE TO BE PAID BY THE BEGINNING OF FEBRUARY, 2024. THEY WERE SET AT THE 2023 AGM AS \$10 FOR INDIVIDUALS AND \$15 FOR FAMILIES. IF FEES ARE NOT PAID BY THE MARCH MEETING THEN THESE UNFINANCAIL MEMBERS WILL BE REMOVED FROM THE MEMBERSHIP LIST. PLEASE PAY PAIGE CASH OR BY DIRECT DEPOSIT**

[See Page 2 for Bank Details]

I don't feel like I'm getting older... It's more like my warranty has expired and my parts are wearing out.

Having an empty laundry basket is the BEST 5 seconds of the week.



**Life is the most difficult exam.** Many people fail because they try to copy others, not realizing that everyone has a different question paper.



**SPONSORS' SPOT:**

**DARK STAR ORCHIDS**

**Dark Star Orchids nursery**, located in the beautiful Mid North Coast of NSW, is a leading orchid grower and online orchid seller of **rare and exotic orchid species** for collectors and enthusiasts. We will frequently add to and change the orchids in our nursery, so please come back and visit us regularly.

**Shipping:** Price excludes shipping. Shipping is a flat rate fee of \$15 per order across all states of Australia.

All prices are GST inclusive.  
All plants are shipped bare-rooted. Check out our website.

[www.darkstarorchids.com.au](http://www.darkstarorchids.com.au)

email [darkstarorchids@skymesh.com.au](mailto:darkstarorchids@skymesh.com.au)

Dark Star Orchids. 0416 195832 or (02) 65644088. [Hans and Sue]

**CHOS MARCH MONTHLY MEETING—Thursday 7th March starting at 7.30pm.**

A highly informative Video will be shown on 'Orchid Myths'

The new Plant Growing Competition Draw will take place during this meeting

It would be greatly appreciated if you would bring a contribution for members supper.

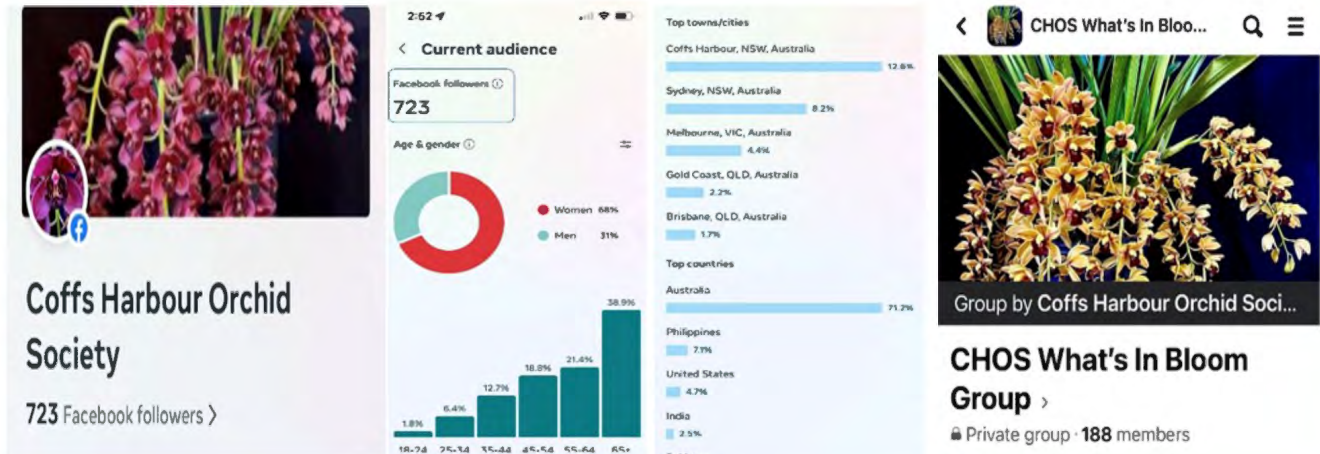
**Duty Persons for this meeting:**      **Judges:** Bruce Hall / Matt Connell

**Packing Up:** Volunteers on the night      **Cleaning Up:** Volunteers on the night



## Coffs Harbour Orchid Society Facebook

February 2024 – Currently, the Coffs Harbour Orchid Society has 723 likes. This is up by 1 person from January 2024. Our 'What's on Bloom' page, is up by 1 person to 188 members, for the same period.



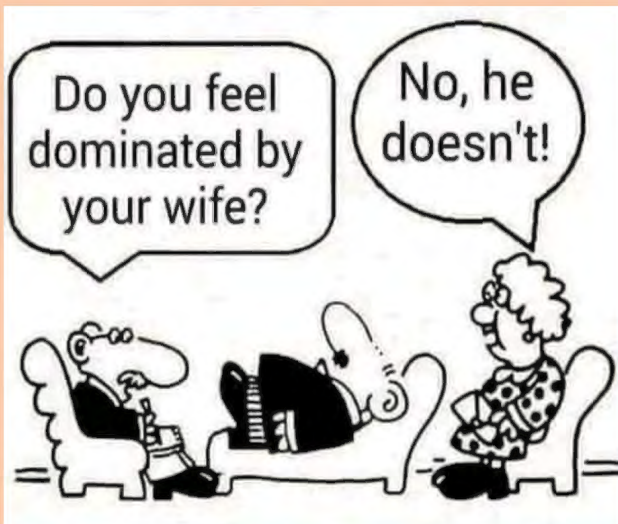
**CHOS SUPPLIES OF ORCHID BARK:** The CHOS now has a NEW supply of Kiwi Bark and Charcoal. Kiwi Orchid Bark is a hard, clean, uniformly graded *Pinus radiata* bark suitable for growing orchids. The Society sells 50 litre bags for \$45 each.

Kiwi bark comes in four sizes— No.2: **3 to 8mm**; No.3: **8 to 20mm**; No.4: **20 to 25mm**; No. 5: **25 to 50mm**. (The 8 to 20mm size would be equal to mixing 9 to 12 and 12 to 18mm grades of Orchid bark and would be the ideal size for general potting purposes).

**Supplies of 15mm charcoal (Orchid Char) are also available. These are in 19kg bags and sell at \$45 per bag.**

Supplies are available from Paige Sinclair— Mobile: 0427 591 901

You can pick up the bark from 4 Jean Street, Coffs Harbour or make suitable arrangements with Paige regarding delivery. Payment can be via cash or Direct Deposit (Bank details Page 2).



## The list of orchids I need to buy





**This is the spectacular Mini Catt  
*Cattleya Beautiful Sunset*, which is  
the plant selected for the 2024 CHOS  
Plant Growing Competition.**

**This is a hybrid between *Cattleya  
Orpetii* and *Cattleya sincorana*.**

**Thirty two plants have been pur-  
chased from Barrita Orchids and the  
allocation draw will take place during  
the March Monthly Meeting.**

**A Growing Guide will be issued with  
each plant. All plants have been sold.**

**Here is an interesting product that was suggested for  
use on orchids by Rhonda Smith during a recent talk at  
the Nambucca Valley Orchid Society meeting. Rhonda  
says she learnt this trick from well known Coffs Har-  
bour grower Helen Seiver.**

**When you are repotting add a small amount of Bug  
Killa insecticide to the potting mix. This contains  
systemic insecticides that kill sucking insects such as  
aphids, mealy bugs and scale insects. When you water  
the pot mixture, the insecticide is taken up by the  
plant roots and into the plant sap system where it is  
ingested by the sap-sucking insects. Provides at least  
two months protection. Available online from Pestrol  
Australia and other online stores plus some Bunnings  
outlets. Also available in containers up to 1 kg.**



**Woolgoolga District Orchid Society  
Inc.**



**2025 AOC**

**International Conference & Show**



# What needs to be done to make orchids grow?

A Feature Article By Dick Cooper

I have learnt over the past 50+ years of growing orchids that –

1. Orchids enjoy being fed;
2. Orchids can't breathe underwater or in heavily compacted potting media;
3. Healthy roots are essential for good growth;
4. Movement of **fresh** air is important; and
5. The pH of the water in pots should not be ignored.

Overwatering and underfeeding need to be avoided. I have known people who don't feed their orchids at all, or do so quite sparingly such as once or twice a year. I suspect that some people underfeed orchids in the same way that they don't fertilise their garden or pot plants. Plants are no different from humans in that they need food in order to survive and thrive. However, plants can't break down organic material - like the proteins, carbohydrates and fats that humans and other animals can - instead the materials plants require for successful growth and completion of their life cycles are inorganic substances and they are mostly absorbed when plants take in water.

Orchids happen to be able to survive (and even grow and flower) on quite small amounts of nutrients: they are not gross feeders and they can draw their basic needs from the surrounding environment **if** they are exposed to the open air. That is why we need to provide water if our orchids are grown under a hard roof.

If exposed to the elements, orchids will cope without being watered or fertilized because they can draw some nutrients from rainwater and air, they make use of sunlight in the process of converting those nutrients into useable forms and bathe in regular fresh breezes. In nature when it rains, water falling through the tree canopy or through the forest floor absorbs nutrients. As the water washes over the orchid roots, the nutrients in the water are absorbed by the orchid roots. If orchids are excessively shaded, are not able to obtain sufficient sunlight (so they can't easily produce chlorophyll), are unable to receive water and/or can't easily draw in carbon dioxide (because their roots are underwater or their media is so compact that it prevents the roots accessing the air) then their growth, general health and their longer-term survival is likely to be affected. Unhealthy-looking orchids usually have unhealthy roots – if any orchid looks unhealthy, step 1 is to take it out of the pot and check the root system. There are ways to address a lack of roots.

These days, with developments in analytical chemistry the beneficial nutrients used by plants are reported to total 21 chemical elements - this list may well increase in the future. These nutrients are not necessarily essential for all plants but are certainly essential for most. The entire group includes: Hydrogen, Oxygen, Nitrogen, Carbon, Phosphorus, Potassium, Calcium, Magnesium, Sulphur, Boron, Chlorine, Copper, Iron, Manganese, Molybdenum, Sodium, Cobalt, Vanadium, Nickel, Zinc and Silicon. Some, the macronutrients, are taken-up in larger quantities and contribute over 95% of an orchid's biomass (when totally dehydrated, i.e. dry weight) whereas the others (the micronutrients) exist in the plant's tissue in very small quantities only (less than 0.02% of the plant's dry weight).

Orchids are known to use at least 17 of these chemicals: they provide the essential food that orchids need to function, Orchids draw these chemicals from the media in which they grow and from the surrounding air, and most are taken up in the form of molecules or ions dissolved in water. Of itself, the potting mix provides no food (which is not the potting medium's purpose).

Consider, for example, an orchid on a bark or wooden mount or one simply placed in an open pot, such as a Vanda.

Vandas and mounted orchids best demonstrate that the media does not directly benefit these plants nutritionally: they happily grow with their roots completely exposed to the air. This is not to suggest that you should not use a potting mix but the main purpose of potting mix is to anchor the orchid in a container. A loose mix allows air to reach the roots and provides a water storage source to the roots. In addition, many orchids require a symbiotic association with a fungus called mycorrhiza to facilitate the uptake of nutrients by converting those nutrients into forms that orchids can use.

**[Note 1:** Regardless of what fertiliser packets say, there is no such thing as a complete fertiliser. Some chemicals don't readily mix and none provide all chemicals needed by plants, e.g. calcium, oxygen, hydrogen and carbon dioxide. In addition, regardless of the fertilizer you choose to use, it is best to limit or avoid those containing urea.]

**[Note 2:** As Scott Barrie pointed out at the recent WDOS Workshop 2024, *orchids don't absorb the bits of fish, seaweed, etc. found in fish emulsions, seaweed extracts, i.e. Seasol, Charlie Carp and the like.* These are organic materials and if you chose to use these additives they have to be broken down into positively and negatively charged ions by the [mycorrhiza](#) in the potting media. The same thing applies to blood and bone. It is OK to use such additives, especially on young plants as an added tonic. Seasol helps plants develop healthy, strong root systems and helps maintain the potting medium in good condition as well as providing a phosphorus supplement. Similarly, fish emulsions provide useful nutrients when converted by the mycorrhiza. These are said to make the plant stronger and more resilient to disease and can provide a fine film of fish oil on the foliage which aphids, for example, detest.]

By providing access to the outside environment, orchids draw on light, air and moisture and utilise the occasional dead insect, leaves or other nutritious items that land on the plant to meet their needs: these being converted with the aid of that orchid's particular mycorrhiza. Orchids can extract calcium and other chemicals in this way. But instead of relying on the natural environment to provide all the nutrients needed to support your orchids, a better way is to feed them using a fertiliser. This will help them maximise their growing and flowering cycles. Once the chemicals in fertilisers are converted to the required water-soluble forms of inorganic molecules and ions, the orchids then absorb and process those nutrients.

Growers can either introduce nutrients to the orchid via a fertiliser added to water and poured/sprayed over the plant and potting media OR they use control-released prills (the little fertiliser balls, such as Osmocote). Most nutrients are collected through the roots but some enter through the leaves, this is why I think it is a good idea to fertilise in a liquid form covering the whole plant not just the roots.

For the nutrients to enter through the roots, the chemicals in the fertiliser are first absorbed and stored by the velamen layer, velamen is the white outer covering found around the roots of epiphytic orchids. The velamen releases the nutrients when required by the actual roots which then transport it through the plant proper. Once within the orchid, the plant is able to convert the chemical molecules/ions into sugars to meet its' specific needs. The conversion process is undertaken with help from the Sun (providing light energy), chlorophyll (this is what makes leaves green) via photosynthesis and carbon dioxide.

Gaseous elements (Carbon, Nitrogen, Hydrogen and Oxygen) may be absorbed from the air via the plant's stomata as well as through the roots. Stomata are microscopic pores that provide pathways



enabling regular exchanges of gases to and from the plant and to expel moisture from it. In general, an orchid's stomata is mainly located on the underside of the leaves. Carbon dioxide provides the most important elements (Carbon and Oxygen) for all plants. In the presence of light energy, the chlorophyll in the leaves converts carbon dioxide, and the liquid nutrients absorbed by the roots, into sugars which in turn provide the energy for all of an orchid's metabolic, structural and reproductive processes. It follows that a lack of light, chlorophyll, carbon dioxide, or water will severely affect the growth of your orchid.

### **How do you know what nutrients your orchids need?**

Some people don't think they need to be fertilised at all. Some think a regular watering is sufficient. Others know their orchids need feeding and buy packets of fertiliser and just follow the instructions but plant growth can be affected if nutrients are applied haphazardly or in excess of requirements. So, what needs to be considered?

For orchids to grow well, the useful chemicals can be separated into three groups, namely Nitrogen, Phosphorus and Potassium – these are called macronutrients because they are used in the largest proportions. If you look at any fertiliser packaging, these primary foods are shown as N (nitrogen), P (phosphorus) and K (potassium). In Australia, NPK is listed on the packaging as a percentage of the elemental nitrogen, phosphorus and potassium.

I use a fertiliser that delivers NPK in the ratio 10%: 10%: 23% plus traces of other chemicals; The fertiliser available to WDOS members is based on Campbells Yellow with some added Magnesium. The NPK of Campbells Yellow is in the ratio 11.8%: 13.2%: 16.6% plus traces of other chemicals. The relatively high Phosphorus and Potassium and low Nitrogen in both these fertilisers is aimed at stimulating flowering and improving flower formation throughout the life of the plant.

**Nitrogen** is required in the production of proteins, chlorophyll and other organic compounds for green leafy growth, improves plant growth and leaf quality. Too much nitrogen (as in Hi-N fertilizers) encourages lots of rapid growth, fewer or no flower, softer/weaker substance and, for some orchids, lots of keikis. Too little nitrogen affects flower yields, causes yellowing of the leaves and stunts growth.

**Phosphorus** is necessary for overall growth and vigour, photosynthesis, protein formation and almost all aspects of growth and metabolism, respiration and flowering, resistance to infections and environmental stress. It enhances flower colour. Too much phosphorus without adequate zinc levels can cause a zinc deficiency.

**Potassium** aids in the formation of sugars, starches, carbohydrates, protein synthesis and cell division in roots, bulbs and leaves. Deficiencies result in low yields, mottled, spotted or curled leaves, sometimes the leaves may appear scorched or burned.

[**Note 3:** If your potting mix has a low pH\* (<4) this will result in phosphate being chemically locked up in the mix. Deficiency symptoms are purple stems and leaves; maturity, growth and flower yields are retarded and bud/flower drop may often occur.

\*pH refers to the alkalinity or acidity of any liquid solution. It really is a separate subject so I will leave it for another day, meantime I hope you will accept that pH is of relevance to orchids because it can effect what nutrients will be available to your orchids. The optimal pH for most orchids is 6.5-6.8, i.e. slightly acidic, now you don't actually have to adjust your

water's pH if you don't wish to but if you use tapwater checking the pH and then doing so, if outside the optimal range, puts the cherry on top of your orchid's nutrient cake!

I use Coffs tapwater. Whenever I directly test my tapwater the pH reading is around 8. To alter the pH when I fertilise I add a small measure of Phosphoric Acid – this lowers the pH of the water to 6.8.]

Calcium is another macronutrient. It is essential for influencing the absorption of nutrients, neutralising acid condition in the potting mix, promoting early root growth and neutralises toxic compounds produced within the plant. Calcium is required to enable the formation of cell walls and cell membranes, similar to the role of calcium in the formation of our bones. It also facilitates the uptake of other nutrients. Calcium, once deposited in plant tissue, is immobile (non-translocatable) so there must be a constant supply for growth. A lack of calcium, stunts new growth, flower spikes become soft and bendy so that they don't support the flowers well, flowers don't last as long, terminal bud-drop is more likely, there may be reduced spacing between nodes and the leaves may appear yellow. Most fertilisers do not have sufficient calcium to meet the needs of your orchids. Some growers add calcium in the form of lime. If you apply excess lime to your pots, you could end up with deficiencies on boron, iron, manganese, zinc and copper.

[**Note 4:** Coffs water contains small amounts of calcium, magnesium, chloride, magnesium, sodium and sulphur compounds.]

Other key nutrients are Magnesium and Sulphur. **Magnesium** is essential for the making of chlorophyll and to produce carbohydrates, sugars and fats. Without Magnesium the plant may refuse to flower and older leaves may appear mottled or yellow especially at the distal end, leaves may droop and the plant may be stunted. Excess magnesium limits the absorption of potassium. Water leaches magnesium so it must be supplied when fertilising. Some people apply it via a foliar spray.

**Sulphur** aids the structure of amino acids, proteins, vitamins and enzymes, is essential to produce chlorophyll and is important in protecting the plant against stresses and pests. Sulphur readily leaches from the media so it is important to be included in your fertiliser or contained within the water supply.

The main micronutrients Boron, Chlorine, Copper, Iron, Manganese and Molybdenum. These are required in small amounts (traces).

**Boron** is required in miniscule quantities only but is necessary for cell wall formation, membrane integrity, calcium uptake and may aid in the translocation of sugars. Boron affects at least 16 functions including flowering, pollen germination, fruiting, cell division, plant-water relationships and the movement of hormones. It must be available throughout the life of the plant but within the plant boron is not translocated and is easily leached from the potting mix. Deficiency kills buds, causes leaves to become thick, curled and brittle. Other parts of the plant may be discoloured, cracked and flecked with brown spots. It is a chemical that I think is best to leave it up to the fertiliser producers to include it on their mix.

**Chlorine** is involved in osmosis (the movement of water with or without nutrients within and between cells), the ionic balance necessary for plants to take up mineral elements and undertake photosynthesis. Deficiency symptoms include wilting, stubby roots, chlorosis (yellowing) and bronzing. Odours in some plants may be decreased. Chloride, the ionic form of chlorine used by plants, is usually found in soluble forms and is lost by leaching. Some plants may show signs of toxicity if levels are too high.



**Copper** is concentrated in the roots and plays a part in nitrogen metabolism and may be important for the enzyme systems that use carbohydrates and proteins. Deficiencies cause die back of the shoot tips, and terminal leaves develop brown spots. Copper is bound tightly in organic matter and may be deficient in highly organic soils. It is not readily lost from soil but may often be unavailable. Too much copper can cause toxicity.

**Iron** is necessary for many enzyme functions: it acts as a catalyst for the synthesis of chlorophyll being essential for the maintenance of chloroplast structure and function. Iron is essential for the young growing parts of plants and, in combination with the macronutrients and secondary nutrients, aids continuous and healthy growth. Excess iron is not usually noted in orchids but deficiencies show as pale colouring in young leaves followed by yellowing of leaves and large veins (which is not the only reason why leaves turn yellow). Under conditions of high pH (alkaline) iron is rendered unavailable to plants even though it may register as abundant in a potting mix from which it is lost by leaching. Applications of an acid nutrient formula containing iron chelates, in soluble form, would likely correct the problem.

**Manganese** is involved in enzyme activity to enable photosynthesis, respiration, and nitrogen metabolism to occur. Deficiency in young leaves may show as a network of green veins on a lighter green background similar to iron deficiency. In more advanced stages the light green parts appear whiter and leaf drop occurs. Brownish, black, or greyish spots may also appear near the veins. In highly acidic soils (low pH), manganese may be too readily available and become toxic.

**Molybdenum** is a component of the enzyme that reduces nitrates to ammonia. Without it, the synthesis of proteins is blocked and plant growth ceases. Nitrogen deficiency (light green leaves with rolled or cupped margins) may occur if plants lack molybdenum.

If chemicals are not present in the fertiliser I use I occasionally add other products to my orchids in an effort to take those chemicals into account. These include Sodium, Cobalt, Nickel, Silicon, and Zinc and all are reportedly essential for the growth of plants. There are lots of different trace element products on sale, including products manufactured by Manutec and by Searles.

**Sodium** is involved in the movement of water through, and for balancing nutrient ions within plants.

**Cobalt** is required for nitrogen fixation and is a component of several enzymes and proteins, participating in plant metabolism. It is toxic to plants at higher concentrations resulting in pale-coloured leaves, discoloured veins, leaf loss and iron and magnesium deficiencies. The demand for cobalt is much higher for nitrogen fixation than for ammonium nutrition. Deficient levels could result in nitrogen deficiency symptoms, leaf chlorosis (yellowing) and necrosis (tissue death) and retarded growth.

**Nickel** is reported to be required to break down urea to liberate the nitrogen into a useable form for plants and it aids iron absorption.

**Silicon** builds stronger, tougher cell walls making them harder to be penetrated by chewing and sucking insects, improves heat and drought tolerance and better resists fungal infections, improves leaf erectness, stem strength and prevents or depresses iron and manganese toxicity. It also may help to compensate for toxic levels of manganese, iron, phosphorus and aluminium as well as zinc deficiency.

**Zinc** is essential to carbohydrate metabolism, protein synthesis and internodal elongation (stem growth). Deficient plants have mottled leaves with irregular chlorotic areas. Zinc deficiency leads to iron deficiency (which displays similar symptoms). Although Zinc is least available between pH 5.5 and 7.0, lowering the pH too much can cause zinc toxicity.

Then the question becomes – **‘How much fertiliser and how often?’**

I recommend the "weakly, weekly" approach. This means applying a small amount of the fertiliser each week. I find that this regime is better than applying a fuller dose of fertiliser once a month.

What is a small amount?

Five (5) grams of fertiliser per 9 litres works out at about 0.6 parts per million of my fertiliser per litre. Every 3 months I apply a mix of Epsom Salts at 2.5 gms to 9 litres, Condy's Crystals (Potassium Permanganate) at 2 gms to 9 litres and Potassium Sulphate at 5 gms to 9 litres.

Epsom Salts (Magnesium Sulphate) is said to contribute to bigger, healthier, more robust plants, with larger and better coloured flowers. Epsom salts is especially beneficial if you use tap water that is high in salts. I find that the tap water at Safety Beach has a pH reading of over 7.5, i.e. it is too alkaline. When fertilising I adjust the water to lower the pH to about 6.5. However, at this time of year, my orchids are watered everyday directly from the tap. To counter this, every few weeks I water the orchids with Epsom Salts to remove/lower the pH. Other growers report that by feeding their orchids with Epsom Salts from time to time plant growth is improved, flowering is more frequent, flowers are bigger, the foliage is greener and pests are deterred.

I have an automatic sprinkler system installed and my orchids receive a small amount of water each day. This ensures that they are never dry. I mention this because to avoid burning the roots it is best not to fertilize a completely dry plant. If you don't water daily, I recommend watering the day before applying a fertilizer solution. [**Note 3:** Some orchids have a dormant period and require little or no water (and fertiliser) at this time, e.g. Catasetums. If you have plants that require less water at times, always observe the recommended culture.]

Earlier I mentioned the importance of fresh air moving over your orchids. Fresh air needs to be replaced in orchid houses because, just like humans, the plants don't want to repeatedly take in used, stale air. Ideally, air should enter from one end of the shadehouse, move through and over the plants and then have the opportunity to exit at the opposite end. Fresh air supports an orchid's metabolic processes, distributes cool and warm air over the leaves, dries excess moisture, and limits the spread of harmful bacteria and fungi.

This article is a guide only: it is definitely not absolute.

*Dick Cooper*