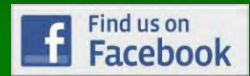


# the Propagator



International Plant Propagators' Society <http://aus.ipps.org/>

Australian Region - Newsletter Winter 2023 - No: 75



## PROPAGATION -ESSENTIAL TO LIFE

*"To hold a seed or a cutting is to hold infinity in the palm of your hand"*

*Jane Edmanson – IPPS, Geelong, 2023*

Jane Edmanson may not have coined the entire quote above, but she certainly made it her own when recounting the old phrase during her engaging presentation at this year's IPPS conference in Geelong. Jane was not alone in the quality of her talk and was joined by a diverse array of speakers, in what proved to be a fantastic event. Those lucky enough to attend were treated to lectures from the industry's best, as well as workshops, field trips, the latest from exhibitors, great food, and of course, a chance to catch up with fellow propagators from across the country - but more on that later.

This issue of the Propagator is perhaps the biggest yet and the following pages are overflowing with content. The publication continues its transformation to full-colour print and the contributions from members have been nothing short of outstanding. Whether it is David Daly's addition on his work the propagation and grafting of conifers, reading of Matt Coulter's breakthroughs in the propagation of the Titan arum, or delving into tissue culture with Dr. Puthiyaparambil Josekutty and Lisa Wightwick, you're guaranteed to learn something new this issue.

Reading on, you'll get the wrap-up to this year's IPPS conference, including recognition of the deserving winners of the prestigious IPPS annual awards. You'll get to meet this year's Six-pack team, as well as meet the new IPPS Editorial Committee and hear about the latest in IPPS globally from our International Director, Tony Vander Staay.

With the 2023 conference done and dusted, it is onward to Ballina in 2024, and the Rod Tallis Award, Six-pack, and South African exchange programs officially open for applications with this issue. Details on the application processes can be found inside.

There's all that and more to look forward to and if you like what you read, why not be part of it? If you're a member of IPPS or have got your hands on this copy of the Propagator, there is a good chance you like nothing better than to learn about the work of fellow propagators. Your work in propagation is no less interesting to us, so consider getting in touch and contributing to the ongoing transformation of the newsletter with contributions of your own, so we can all continue to seek, share and enjoy the read.

Dan Austin – Editor



*Roirama Nursery - one of Australia's best succulent nurseries (toured as part of this year's conference).*

Image: Dan Austin

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## President's Report

We had a great time down at the Geelong conference in May, and many thanks to Clive, Di, Dermot and Pam for all the work they put in to make it a success. It was great as usual to meet up again. We had some really inspiring talks from people renowned in the industry, but for me, I am always impressed by those given by younger attendees such as our South African exchange participants and Rod Tallis awardee. I also want to especially acknowledge our sponsors and trade displays who presented some new and novel items for us to see and try. I will have many fond memories of this event.



As growers we are probably all busy right through the year, getting ready, growing and selling. We learn to be flexible and adapt to events beyond our control in order to achieve our goals. The same applies to how I see the future for IPPS. What else can we say about the future?

The Australian Bureau of Meteorology is telling us that our weather is shifting again as both the Southern Oscillation Index and Indian Ocean Dipole move towards the positive region. Firstly, this indicates a future El Niño event with warmer temperatures and a drier Top End and Eastern Seaboard, and secondly drier conditions through reduced winter and spring rainfall across much of the central and southern parts of the continent respectively. However, the experts are still unsure of this, as atmospheric pressure patterns are not typical of an El Niño. Okay, so we could be going into another dry hot period where consumer demand will change again, we'll make changes and adapt.

Following our AGM there were some changes to our committees that will improve the way we communicate with our members. Our editorial team has a new proceedings editor (Dr Ranjith Pathirana), social media coordinator (Zoe Williams), as well as Daniel Austin (doing an amazing job as newsletter editor) with Clive Larkman continuing as chair and historian. I would again like to acknowledge the support of Norwood for assisting with the publication of our newsletter.

David Daly has come onto the team to chair our awards committee, and a new award was introduced at the Geelong conference for best trade display (won by Garden City Plastics). We again recognised the contribution of many exceptional people this year with various awards (described later). We have already started calling for applications for the South African exchange next year, which will be quite special as the IPPS South Africa Region hosts the international tour at the end of February 2024.

David Hancock has also taken on the vital role of regional meetings and membership committee chairperson. We intend to keep holding regional meetings as part of building the skills of our horticulture professionals around Australia as we seek and share. If you feel that you could help organise one of these regional meetings, please let David or myself know.

We also have a structure in place for our next conferences (Ballina and then Cairns in 2025) and out to 2027, when we host the international tour and conference of IPPS in spring in Western Australia. So, you can look forward to lots of things happening that will need the participation of current and future members.

Don't forget to ask someone else to come along to our events. Seek and Share.

Bruce Higgs



**Geelong Botanic Gardens on a twilight conference tour.**  
Image: Bruce Higgs



## 2023 Conference Wrap-Up

This year's IPPS conference went off with a bang, with the experience of organisers Clive Larkman and Dermot Molloy evident throughout the proceedings, which by all accounts, went flawlessly. Even the weather came out for the four-day event. This was great, given that the conference included extra field trips this year.

While the golf-lovers within IPPS enjoyed the traditional pre-conference challenge on Wednesday the 24<sup>th</sup> of May, this year, an alternative activity was also on offer, in the form of a tour of Boomaroo Nurseries - a world-class wholesale supplier of vegetable seedlings and potted greenlife products. The staff of Boomaroo welcomed participants with an afternoon meal and provided a fantastic and informative tour of their facilities which included automated potting lines, climate-controlled greenhouses and mechanised vegetable seedling production en masse.

Golfers and tour participants alike then met in the evening for an informal meet and greet to launch the conference. The buzzing evening was a chance to connect and reconnect with friends and colleagues from across Australia and set the tone for the rest of the conference.

The speakers in line to present to delegates on Thursday were led by Andrew Laidlaw speaking on the importance of plants in landscapes and his projects at the Royal



Botanic Gardens, Melbourne and Gardening Australia's Jane Edmanson, who delved into the value of propagation in fostering communities.

The team from Garden City Plastics then took the opportunity to introduce this year's Six-pack participants: Joshua Taylor of Peninsula Growers in Victoria, Sharlene Allison of Muchea Tree Farm in Western Australia, Marie Dolly Prosper of Natural Area Holdings in Western Australia, Steph Hastie from TAFESA's Urrbrae campus in South Australia, Laura Coyle of the Royal Botanic Gardens Victoria and Sizwe Ndabeni of South Africa's Shadowland's Nursery. After their introduction, Steph and Sizwe, who were this year's participants in the South African exchange program, had the opportunity to present on their respective experiences in the program.



**From top to bottom: A field trip to Boomaroo Nurseries launched this year's conference, Six-pack participants Joshua Taylor, Sharlene Allison, Marie Dolly Prosper, Steph Hastie, Laura Coyle and Sizwe Ndabeni  
Images: Dan Austin and Zoe Williams**





Clare Hart continued the morning's line-up, speaking on landscape succession strategies and reinforcing the point that plants have a finite lifespan, so when preparing for their eventual demise, we have to be prepared with comparable replacements in a changing climate. The international networks formed through IPPS were illustrated through the subsequent presentation by Danielle Saintpierre, who travelled to Australia from New Caledonia with colleagues from the Siras organisation, to present on the revegetation work Siras has been working on. Danielle's relationship with IPPS has come as the result of a chance meeting and subsequent visits to New Caledonia by IPPS members David Hancock and Dermot Molloy.

Amanda Shade of King's Park and Botanic Gardens led the afternoon's sessions, speaking on the propagation of the gardens' collections and a recent expedition to collect Myrtaceous material in the Kimberly in preparation for any myrtle rust incursion into the state, which unfortunately occurred not long after. Alistair Watt then provided an interesting talk on his days plant hunting across the globe and the rare and unusual plants he has now accumulated, before Dr. Puthiyaparambil Josekutty concluded the day's presentations with a lecture on tissue culture propagation in corporate farms.

Adding to the fieldtrips included in this year's conference, (beyond those offered on the traditional final day of tours), Thursday was rounded out with a trip to the Geelong Botanic Gardens where the Friends of the Geelong Botanic Gardens put on a barbeque



Friday's proceedings started with Marissa Collins speaking on field agronomy in emerging crops and suggested in Australia we are not yet reaching our potential in the production of crops for the essential oil market. Tony Hughes from the nearby Gordon TAFE followed with an informative session on grafting *Prostranthera* species. His techniques using Parafilm to create graft cuttings rather than grafting on to rooted stock will, no doubt, be adopted by many for its ease and high success rate.

The diversity in content continued throughout the day. Miguel Meneses spoke on European trends in propagation substrates and offered potential solutions in the face of declining peat availability. Then came a big one. The 'Rod Tallis Award' for 2023 was presented to Olumuyiwa Akintola Elliott of Garden City Plastics and with his submission entitled – Identification of Changes in the Volatilome of Tomato Plant Roots in Response to Phosphorus Availability – it was one of the most comprehensive and academic papers submitted by an applicant ever.

Matt Mills was next, speaking on recycling and propagation inputs, before Peter Lewis caused jaws to drop at the scale of the production he is involved in in projects in the Middle East. Michael Rundell provided an insight into improving water quality and hygiene in production nurseries before another change of pace with Ian Van Zaten showcasing the mass propagation in plugs undertaken at Ball Australia. David Hancock concluded the day's speakers in good humour with a presentation on provenance propagation before guest were left to prepare for the evening's Gala Dinner.



**From top to bottom clockwise: All the way from New Caledonia - Danielle Saintpierre presents on revegetation in the country, Dr. Puthiyaparambil Josekutty presents to a packed audience, inside the Geelong Botanic Gardens' nurseries, Rod Tallis Award winner Olumuyiwa Akintola Elliott.**  
 Images: Dan Austin and Bruce Higgs



## Gala Dinner, Awards and Fieldtrips

Friday night presented an evening of fun fine food and a chance to recognise the achievements of outstanding IPPS members and industry affiliates. In addition to the previously mentioned Rod Tallis Award, and the Six-pack and South African exchange programs, an additional eight awards were presented this year. A new award for the 'Best Trade Display' was launched allowing attendees to vote on the character and quality of our various industry partners. This year the award went to Garden City Plastics for a great display and friendly team on advisors.

In keeping with tradition, the banter around the 'Peter Smith Perpetual Golf Trophy' was in good supply with this year's winner eventually revealed to be Josh Waterworth. The 'Edward and Mary Bunker Award', which recognises an outstanding contribution from someone who has demonstrated the IPPS motto 'to seek and Share' for the betterment of the industry at large, was awarded to Gardening Australia favourite, and IPPS member, Jane Edmanson, who has lived and breathed horticulture for most of her life.

Two 'Honorary Life Memberships' were awarded this year to members who have made outstanding contributions to the field of plant propagation. The first of which was awarded to well-known IPPS member Peter Waugh. Peter has served in three IPPS regions. He was a passionate member of the NZ Region and served as President and International Director and then became instrumental in establishing and maintaining the Japan Region. Peter has



made outstanding contributions through his business and personal involvement with IPPS for over thirty years.

The second IPPS member to receive an Honorary Life Membership was renowned plant breeder Peter Ollershaw. Peter attended the first meeting of the IPPS back in 1973 and has been Australian President and International Director. He has served on industry related bodies and is a past recipient of the Australian Award of Honour.



**From top to bottom: Josh Waterworth accepts the Peter Smith Perpetual Golf Trophy from Tony Vander Staay, Peter Ollershaw is awarded an Honorary Life Membership with Bruce Higgs and David Hancock. Images: Zoe Williams**



The 'Steve Vallance' Pewter Tankard Award was this year awarded to our immediate past President, International Director and stalwart IPPS supporter, Tony Vander Staay. The Vander Staay family appear several times on the award and have had a long-standing relationship with IPPS. In fact, there were three generations of Vander Staays in the room, when Tony received the award.

The Anita Boucher Award for best paper, this year went to Andrew Laidlaw for his presentation on the importance of plants in landscapes, while the Society's highest award, the 'IPPS Australian Region Award of Honour' went to Ray Doherty. Ray has had the opportunity to undertake many different roles throughout his long and illustrious career in horticulture. He's taken on various leadership roles in the industry, including with NGIQ and the IPPS. He was the 2019 conference convenor and chair of the IPPS awards committee, encouraging youth in horticultural careers; a field in which he is passionate. Certainly, the evening's awards were all well-deserved.

With Friday's celebrations over, delegates were treated to a Saturday of fieldtrips to round out the conference. First on the agenda was a visit to Gordon TAFE, where guests were shown around the site's propagation and horticultural facilities. Participants were then treated to a hands-on workshop on producing graft-cuttings by lecturer Tony Hughes. It was a fascinating session and allowed everyone to remember what it was like to be a student again.

Next it was on to the gardens of television's Vasili Kanidiadis, whose garden didn't disappoint, offering sprawling vista's complemented by vegetable beds, chickens and more. In true Greek generosity, Vasili put on a feast for guests, assisted by his entire family. After a



relaxing afternoon, guests were even gifted the opportunity to dance along to a live squeeze-box performance with the iconic gardener.

The final stop of the day was to one of Australia's best succulent nurseries, Roirama Nursery. This unusual nursery houses many old and rare species and blurs the lines between a garden, an art gallery and a garden centre. It was a great final stop and the day undoubtedly left everyone in anticipation for the 2024 conference - 'Propagation - a Breath of Fresh Air' to be held in Ballina, NSW 22<sup>nd</sup> to the 25<sup>th</sup> of May - so get it in your diaries!



**From top to bottom: Jane Edmanson was awarded the 'Edward and Mary Bunker Award', Tony Vander Staay accepts the Steve Vallance Tankard with Bruce Higgs, Vasili puts on a live performance for the crowd. Images: Zoe Williams and Bruce Higgs**



## International Director's Report

The Society is slowly rebuilding our membership numbers up again. We now have over eleven hundred members worldwide, spread fairly consistently across the globe. We are making some impact on India and China, though the biggest issue is getting enthusiastic local members to start creating a following.



Internationally, the Society is in a good financial position, and to that extent, future international tours and conferences will be supported should the need arise to cancel at the last moment an organised tour. This underwriting policy should allow regions to confidently go ahead and plan future tours knowing that should a cancellation happen, then the international board will reimburse lost deposits.

The calendar for future international tours is as follows: 2024 South Africa, 2025 New Zealand, 2026 Eastern region and 2027 Australia. Now, these tours are open to all members of the Society and not just delegates or directors, generally they are of 10 days length, and very well organised, with a mix of tourist sites and commercial growers, plus you are travelling with a group of like-minded people, and the cost is all inclusive. If you are looking for a great experience at a reasonable cost, it makes for a great holiday, plus it's tax deductible.

Tony Vander Staay

## Propagating the Titan Arum

As a horticulturist, there are not many disciplines as rewarding as propagation. Taking seed or vegetative material from a parent plant to later witness successful offspring or clones thriving as a result of your skills, offers a feeling like nothing else.

Furthermore, as a propagator, there aren't many fields as rewarding as research propagation. Free from the financial and efficiency stressors of retail and production, research propagation is often undertaken at a leisurely pace and regularly allows propagators to work with rare and diverse species, varied in their propagation requirements. Whether the result is bringing an endangered plant back from the brink of extinction, discovering the propagation formula for a plant, or breeding something entirely new - job satisfaction is off-the-charts in this niche avenue of horticulture.

Botanic gardens around the world are Meccas for such propagation and nestled high in the misty hills of the Lofty Ranges in South Australia, the Mount Lofty Botanic

Gardens are no exception. Within these gardens stands a rather unassuming nursery, there is no brightly coloured signage, and you could easily pass by and not realise it was there, but this appearance is quite the opposite of the plants housed inside.

*Amorphophallus titanum* is the botanical name given to the unusual plant that produces the world's largest unbranched inflorescence and anything but 'unassuming' when in bloom, the species commands attention. Brush up on your Latin and you'll realise even the plant's botanical name is eye-opening. With the largest of these flowers reported to have reached three and a half metres in height and smelling of rotten meat, you'd be hard-pressed to pass by an *Amorphophallus titanum* (or corpse flower as it is sometimes known) and not realise it. In fact, the flowers are such a spectacle that when in bloom, they attract thousands of visitors and as the fragrance and blooming events only last a few days, things get pretty crowded.

It has been the role of Adelaide Botanic Garden's propagator and IPPS member, Matt Coulter, to raise these



**Matt Coulter stands with a blooming Titan arum.**  
Images: Matt Coulter





botanical beasts for several years and the work has led to the development of some very effective propagation techniques for the species. As far back as 2013, Matt was experimenting with the plants and it was around this time that he realised, though the plants reproduce naturally by seed and tuber division, leaf cuttings proved to be a viable and far more efficient method of propagation of the species.

The physiology of this plant is quite unique, in that the plant undergoes a dormancy period as a tuber before producing what looks like a trunk, branches and leaves but is actually just a single, compound leaf. These single leaves can be enormous at maturity, and it is during this period of growth activity that Matt utilises his propagation technique.

Branching leaflets are taken from the main plant, cleaned of excessive leaflets and the remaining leaflet surfaces are reduced to minimise water loss. The leaf cuttings are then dipped in indole-3-butyric acid rooting hormone and set in a coir and perlite medium, much like a traditional stem cutting. However, unlike most traditional cuttings, this technique can be carried out by setting the cuttings both vertically and horizontally. The result of these methods is not only the emergence of roots from the leaflet material but numerous new corms as well.

Like many propagators, Matt tends toward the International Plant Propagators' Society mantra to seek and share and has presented his research and techniques at both Botanic Gardens of Australian and New Zealand (BGANZ) and IPPS conferences. He has shared the techniques on YouTube, which can be found here <https://www.youtube.com/watch?v=6BLZSLIU6MI> and regularly discusses the techniques at masterclasses on propagation held by the Adelaide Botanic Gardens.



**From top to bottom clockwise: a single leaf of the Titan arum can resemble a small tree, propagation by leaf cuttings, the enormous tuber of the Titan arum.**

**Images: Matt Coulter**





The *Amorphophallus* genus is diverse and while *Amorphophallus titanum* is certainly the showiest of the species, many others offer attributes of interest. The *Amorphophallus konjac* corm is used to produce the popular Asian noodles known as shirataki or konjac noodles. *Amorphophallus paeoniifolius* is also edible when prepared correctly and while much smaller, produces a flower that is bizarrely attractive in its own right.

*Amorphophallus* species can be found across Australasia with a few species in Africa and with so much left to discover about the sometimes-illusive genus, it is not hard to see why Matt has taken an interest in working with them. Spend a bit of time looking into these plants and you just might too.

### Tried and Tested at Conifer Gardens Nursery

At the recent IPPS Geelong Conference in the Q&A session, I mentioned that we propagate our cuttings by using a cold frame, and someone came back with - what is a cold frame? All propagation is done at our Ferny Creek nursery in the Dandenong Ranges east of Melbourne, at an elevation of 500 metres above sea-level, with cold damp winters and warm summers. Our nursery has been on this site since the mid-1950s and our current cold frame has been used since the late 1970s.

Our conifer cuttings are propagated using semi-hardwood material through the months of late May to August, they are wounded and treated with Clonex Purple 3.0g/L IBA. The cuttings must have matured and are kept from 5 to

7cm long. They are then placed into 128 cell trays in a propagation mix of 66% perlite and 33 % peat moss, before being placed into the cold frame.

The cold frame is inside a polyhouse, it sits on the ground on 4-millimetre blue metal. It is 1 metre wide, and its length is 3 metres (but they can be any length). The sides are made with cement sheets, and it has a lid of Corflute which is hinged at a height of 60 centimetres at the back and is 40 centimetres high at the front. There is no heat-ing, misting or fogging. It tends to stay at a reasonably constant temperature and not too cold as the lid is a tight fit. It gets a build-up of condensation once all the cuttings are in there which creates some humidity. The cuttings will stay in this frame until at least September. It is a slower method of propagating than using bottom heat and misting, but we find our strike rate is extremely high, at over 80% for most cuttings. We don't use misting or fogging as the cuttings easily rot off. All conifers have small scales along the stems and if too much water is applied, it just sits there. Watering of the cuttings is done as needed and in the middle of winter, may only be every 3 weeks or so, depending on the outside air temperature.

Once the weather starts to warm in spring, we will open the lid during the day to regulate the heat and close it at night. Our cuttings are tubed up into 90mm open bottom tubes once an inspection of the root system has occurred and then go into an air pruning crate. This is done anywhere between late September to November even De-cember, depending on the spring weather, with most species then placed outdoors. The weather at Ferny Creek in spring can be 4 weeks later than the rest of Melbourne. This is a tried and tested system though many may find it archaic. Conifers are not the fastest growing and we need a good strong root system.

The grafting of conifers is done through the colder months of the winter using a side veneer graft. Our 'grafting house' is a 1950s-style A-frame glasshouse with small glass panels. It is made of Besser blocks with a concrete floor and raised beds of Besser block filled with perlite. There is no heating or misting and the glass panels don't seal 100%. We find the radiant heat of the sun is enough to warm up the house without too much heat as we don't want scions to dry out. Grafting is similar to cuttings in that we don't want too much moisture on the plants.

The rootstock is trimmed up and placed into the grafting house at least 4 weeks before grafting and the pots are buried in the perlite. This stays warm and gets the sap

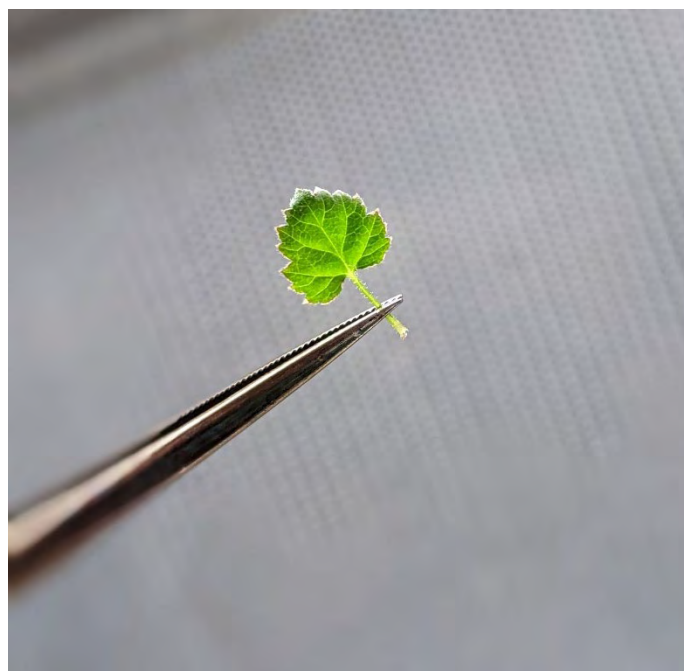
***Strangely attractive Amorphophallus paeoniifolius.***  
**Image: Matt Coulter**



## Insights into Plant Tissue Culture

Many members of our industry would have encountered 'tissue culture' or 'TC' at least once in the course of their careers. I'm usually met with fascination when I tell people I work in plant tissue culture, due in part to the mysterious and technical reputation the field seems to have garnered. So, what is tissue culture? The term 'tissue culture' can actually refer to either the culture of plant or animal matter. Plant tissue culture (PTC) is the *in vitro* (in glass in Latin) growth of plant cells, tissues, and organs in a sterile environment. Chief factors in the plant's survival – light, water, nutrition, heat, and humidity are provided externally, creating a fully-controlled environment in which plant growth can be established and influenced. Typical tissue culture operations are carried out in laboratories equipped with specialised equipment including light and temperature-controlled growth areas, sterilising appliances, and transfer chambers.

PTC begins with the harvesting of plant parts (explants) which are rigorously sterilised and conditioned for the *in vitro* environment. In lieu of soil or other substrates, the explants are placed in a cocktail of water, macro and micronutrients, growth regulators, a carbohydrate source, vitamins, and a gelling agent to hold it all together. After a time on this jelly-like media, the explants will shift into a state of juvenility through the development of very small seedling-like shoots. These shoots can be excised, multiplied, and compelled to root, facilitating reintroduction to the outside environment – these are the major steps in the cycle of micropropagation.



flowing. The rootstock must have sap moving and the scion must be 100% dormant. We graft using a side veneer tied with budding tape. A small amount of grafting mastic is used at the top of the grafting tape to stop water from entering the union. The cambium layers of the scion and rootstock need to be a similar diameter to achieve a good union from the cambium on both sides of the graft. The grafts will stay in here until the scion has flushed new growth in spring and slowly hardened off. This is done by opening the doors and vents in the roof. Once the grafts have taken, we head back 50% of the rootstock and place outside. This occurs in December to January, depending on the species and from this point plants may stay in the tubes or be potted into larger containers.

We don't have the most advanced technology, but the location of the nursery with its specific microclimate is well suited to our plants and we are now the third generation propagating plants on this site. Through our retail nursery, we sell over 600 different types of conifers and many other cool climate plants, some are only propagated in small numbers and some only every second year.

David Daly

**From top to bottom: conifer cuttings in a cold frame at Conifer Gardens Nursery, the tiny leaf of a tissue cultured raspberry.**

**Images: David Daly and Lisa Wightwick**



Micropropagation utilises plant tissue culture methods to mass produce virtually any plant species, year-round. Commercialisation of micropropagation is widespread, with many laboratories operating to supply propagation nurseries with tissue culture plant stock. Species that are difficult to propagate by traditional methods may be easier or more efficient through culture. Other advantages of micropropagation include virus and disease-free stock, clonal propagation of plants with idyllic traits, and non-seasonal production.

Propagators would most likely be familiar with micropropagation. Many have probably purchased and/or handled tissue-cultured plants, but other intriguing applications of PTC are developing; serving the advancement of horticulture, agriculture, genetics, and biotechnology. Notable fields applying plant tissue culture techniques include:

- increasing crop yields (genome editing)
- disease, virus, insect and stress resistance in plants
- synthetic seed production and preservation
- conservation of rare and endangered plant species
- and molecular farming/pharming.

'Molecular farming' is a particularly interesting field where PTC can be used to produce various secondary metabolite products. Secondary metabolites are produced

by plants to aid in survival under stress. The metabolites are valued in many different industries such as pharmaceuticals, food and beverages, textiles, and agriculture. Some familiar examples include: food additives like sweeteners, vanillin and capsaicin and medicines such as morphine and codeine. In some cases, conventional means of farming these metabolites is not viable due to environmental conditions, pests, diseases and slow plant growth. Moving this production to an in vitro laboratory setting negates many of these issues. Specialised plant tissue culture innovations like temporary immersion bioreactors (a liquid culture system) are used to grow plants from which these metabolites can be sourced. Signalling molecules can also be used to enhance yields by initiating plant defence mechanisms, stimulating over-production of the metabolites.

Sustainability is increasingly becoming a focal point of the horticulture industry, but it's something I've never heard mention of regarding micropropagation. So, is commercialised micropropagation sustainable? Commercial laboratories already have the green advantage of being able to produce and house tens of thousands of plants in an area the size of an average bedroom. That ability to mass-produce tissue culture plants equals more plants in the ground, thus improving the environment. The one weak point of plant tissue culture that I have observed is the waste that it can produce through the need for



***Micropropagated Grevillea lanigera 'Mt Tamboritha.'***

**Image: Lisa Wightwick**





sterility. Covid-19 was an eye-opener as to how much waste can be generated by single-use items such as tests, masks and gloves. PTC laboratories can be similar in this aspect - many of the processes and tools require sterility and best practice stipulates single use to avoid cross-contamination. With vigorous testing, I have been able to push these limits somewhat by reusing products where possible and appropriate, in addition to substituting as many single-use products as possible with out-of-the-box alternatives.

One of the greatest waste contributors in commercial laboratories can be the type of vessel the plants are grown in. The most common types of culture vessels are specialized glass jars and plastic takeaway containers. Both have their advantages and disadvantages – glass containers are indefinitely reusable, but use a high labour, water and power cost to wash and sterilise and are better suited for smaller operations. While the idea of glass culture vessels sounds great on paper, incorporating them into a large-scale commercial laboratory may be too costly in labour and other resources, considering some laboratories can hold thousands of culture vessels. Plastic containers are much more readily available in bulk and are cheaper to use in a commercial setting but are unfortunately usually single-use.

At a tour of the Garden City Plastics and Polymer Processors in June of 2022, I was introduced to the PP5 recycling initiative. Pots, trays, and labels that are marked with ‘PP5’ (polypropylene plastic) can be collected, recycled, and manufactured into new products. After this tour, I went back to work and was happy to find that the containers I use in the laboratory were, in fact, PP5 plastic. It’s now part of our standard process that when a culture container must be disposed of, it’s emptied of its contents, stacked with others, and placed in the PP5 collection cage provided to our nursery (via minimal additional labour). I already work to minimise the number of containers being thrown out, but being able to recycle them helps further decrease the carbon footprint of the laboratory. It’s possible to balance efficiency and sustainability; it just takes some lateral thinking and enthusiasm. I will continue to find and test ways of increasing sustainability in micropropagation, and encourage others to contribute to lowering their carbon footprint in any way possible.

Lisa Wightwick

Peninsula Growers



**From top to bottom: A temporary immersion bioreactor. Image source: Plant Cell Technology  
Example of a type of plastic container used in plant tissue culture.  
Image: Lisa Wightwick**



## Tissue Culture Propagation of Cherimoya

Cherimoya (*Annona cherimola* Mill), varieties are the preferred rootstocks for grafting commercially important custard apple varieties. Cherimoya rootstock provides resistance to soilborne diseases, and enhance vigour and productivity (DAF Queensland). However, a shortage of good quality seeds of sought-after varieties of Cherimoya and its poor seed germination record makes it difficult for nurseries to generate sufficient volumes of high-quality, grafted custard apple plants. Decades of research to develop a tissue culture cloning system for cherimoya has not succeeded to commercially clone them (Padilla and Encina, 2011). Although the seed germination issue stemming from various potential causes inherent in cherimoya seeds could not be corrected, reasonable progress was made in tissue culture cloning of two popular varieties of cherimoya.

High rates of Benzylaminopurine (BA) with small quantities of indole-3-butyric acid (IBA) in MS medium (Murashige and Skoog, 1962) induced budbreak, sustained growth, and proliferation of cherimoya shoot cultures. Rooting of micro-shoots in vitro is a big challenge (Encina et al) but a multi-stepped rooting protocol has raised the rooting percentage to  $\geq 60\%$ . Potent Auxin Picloram (20 mg/l) in combination with IBA at 20 mg/l followed by a dark incubation for 15 days, initiated a basal callus that would root. The micro-shoots with callus, when incubated in  $\frac{1}{2}$  MS medium containing 25 mg/l IBA for a month and maintained at low light (600 lux) rooted at high frequency (50-60%). Rooted plantlets transferred to a porous potting mix, when incubated 90% humidity and a temperature of 25-32C, acclimatised with high success (80-90%).



### References:

Murashige, T and Skoog, F (1962). A Revised Medium for Rapid Growth and Bio Assays with Tobacco Tissue Cultures. *Physiologia Plantarum*, 15, 473-497

Padilla, IMG and Encina, CL (2011). The use of consecutive micrografting improves micropropagation of cherimoya (*Annona cherimola* Mill.) cultivars. *Scientia horticulture*, 129(1):167-169

Custard apple information kit. DAF Queensland. <https://era.daf.qld.gov.au/id/eprint/1653/3/2quecus.pdf>

Dr Puthiyaparambil Josekutty

Research Manager, Skybury farms



Top to bottom clockwise: cherimoya culture initiation, proliferation, rooting and acclimatised plants.

Images: Dr Puthiyaparambil Josekutty



# **!APPLY NOW!**

## **Rod Tallis Award**

Did the research and trials of Matt Coulter, David Daly, Lisa Wightwick or Dr Puthiyaparambil Josekutty pique your interest? If so, and you are in the early stages of your career, why not submit your own for the chance at international recognition?

The Rod Tallis Award is named after one of the Society's most respected members, Rod Tallis. Rod was an avid nurseryman with a passion for plant propagating, for the IPPS and for the youth of our industry. He was a mainstay in many of the early conferences and made significant contributions to plant propagation in Australia before his sudden death in 1981.

The winner will have completed a research project, written an article or series of articles or developed a new process or product. They will then write up their work in a paper to be presented at the next IPPS conference. The paper will be assessed on issues of clarity, originality and relevance to the industry. The achievements of the applicant to date will also be reviewed.

The winner will be invited to next year's conference in Ballina, held from the 22nd to the 25th of May. They will have their airfare, accommodation and conference registration paid for. They will also receive one year's membership to the IPPS and a commemorative plaque.

Submit an application by February 2024 using the form found here:

[https://ipps.org/uploads/docs/rod\\_tallis\\_award\\_2024.pdf](https://ipps.org/uploads/docs/rod_tallis_award_2024.pdf)

## **Six-pack Program**

Applications are now open for the chance to be a Six-pack member at our Ballina conference (May 22<sup>nd</sup> to the 25<sup>th</sup> 2024). You will have your airfare, accommodation and conference registration paid for. What we ask is that you assist the organisers with registration and general duties during the conference, and seek and share. You must be 18 years of age, and be nominated by your employer or lecturer using the IPPS nomination form found here:

[https://ipps.org/uploads/docs/0\\_six\\_pack\\_nomination\\_form\\_2024.pdf](https://ipps.org/uploads/docs/0_six_pack_nomination_form_2024.pdf)

and complete the candidate information sheet on the IPPS website here:

<https://aus.ipps.org/>

Send your forms by the closing date of February 2024. You could have the privilege to meet some of the industry's best.





## Meet the New Editorial Committee

There have been some changes in the Australian region of IPPS of late. None more obvious than the fantastic full-colour newsletter made possible by IPPS supporters and sponsors Norwood. However, beyond the newsletter, a new editorial group has come together to facilitate communications and promotion of the IPPS Australia Region. So, now is as good a time as any to introduce you to the group. With her own goals and roles within the Society, I'll say no more and let the youngest member of the group and new social media coordinator, introduce herself.

### Zoe Williams

Hi I'm Zoe,

I have worked as a propagator at Waterworths Nursery, based on the Sunshine Coast, QLD for almost 5 years. I joined IPPS after being a Six-pack participant at the 2022 Leura conference. It was through this opportunity I was able to meet and network with so many amazing people and discover what a great group IPPS is to be a part of.



Also in 2022, I was fortunate enough to be awarded a BBM Global Footprints horticulture scholarship and by the time you are reading this, I will be completing work experience in production nurseries and gardens in the UK!

I'm very excited to accept the new social media role within IPPS Australia's communications committee. I hope with the potential reach of social media, we can gain more exposure, learn more about our members and encourage more people to join, so please like, share, follow and subscribe to our Social media platforms to stay updated!

**Instagram - @ippsaustralia**

**Facebook - International Plant Propagators Society (IPPS) Australia**

**YouTube - IPPS AU Region**

**TikTok - @ippsaustralia**

I would love to post more content from our members! If you have any photos or videos from our recent conference or any propagation/production related material you would be happy for us to share, please get in touch. Even some funny Tik Tokky videos! Please contact us via the email below or on any of the platforms listed above.

[ipps.auregion@gmail.com](mailto:ipps.auregion@gmail.com)

Thanks, Zoe

### Ranjith Pathirana

New to the position of annual proceedings editor is Ranjith Pathirana, MSc (Hons.), PhD. Ranjith began his career as a research officer in the Department of Agriculture, Sri Lanka, where he initiated the National Coordinated Oilseeds Program. He was the coordinator of the program before joining the University of Ruhuna, Sri Lanka, where he was the chair and professor of agricultural biology. There he initiated plant biotechnology programs and was the founding editor-in-chief of Tropical Agricultural Research and Extension, a peer-reviewed international journal.



Ranjith moved to Massey University, New Zealand in 2000 and after two years joined the New Zealand Institute for Plant and Food Research, where he initiated plant conservation research. He pioneered cryopreservation and cryotherapy of horticultural species in New Zealand and established the cryo-genebank in Palmerston North where he was the curator and team leader for 5 years, and the principal investigator of several government-funded projects.

In 2019 he moved to Adelaide and now operates a tissue culture lab at the Waite campus helping with micropropagation of difficult natives for Waite Arboretum and training students and postdocs in more advanced applications of tissue culture such as embryo rescue for interspecific hybridisation, in vitro polyploidisation, mutagenesis, virus eradication from infected clones, doubled haploids for hybrid seed production and more.

He has been a consultant for international organisations such as FAO and IAEA, and several labs and institutions around the world; Canada, Czech Republic, Egypt, Myanmar, Vietnam, Austria and Italy. He has edited books for leading publishers and serves in editorial boards and edits special issues in prestigious plant journals.

His principal interests are in applying in vitro cell and plant biotechnologies for crop improvement, conservation, and elucidating biochemical pathways, particularly in plant stress response.

There is no denying Ranjith is more than qualified for his new role in the International Plant Propagators' Society and we are pleased to welcome him.



## Dan Austin

I'm the new editor of the Propagator newsletter, but what can I say after Ranjith's introduction? I am by no means as qualified or educated but have managed to pull together a rewarding career regardless, perhaps by adjusting the IPPS mantra from 'seek and share' to 'seek and accept' in my early years. It was a time when I was applying for anything and everything I could in the world of horticulture and I was fortunate enough to be successful in most cases, including when applying for the Six-pack and South African exchange programs with IPPS.



I credit IPPS with starting what has been a great career of horticultural travels. Before participating in the Six-pack program, I hadn't been out of South Australia and IPPS provided me with my first trip interstate to a conference in exotic - Dubbo - I loved it! I was back the next year for the South African exchange. After that, things just snow-balled and I have since spent time working with subsistence farmers in Tanzania, I spent a couple of years in the Solomon Islands managing a nursery and horticultural training provider, and also spent a year in Israel working at the Jerusalem Botanic Gardens.

I'm back home now lecturing in horticulture for TAFESA. I also write the monthly articles for IPPS in Hort Journal Australia, which has been great practice for this new role within IPPS, which I'm enjoying and hope you do too.

## Clive Larkman

The team is under the guidance of experienced past President, past International President, proceedings editor and historian, Clive Larkman. Clive has a long history working in horticulture. He's travelled across Asia, the UK and the USA expanding his comprehensive knowledge in the field. He has a degree in biology, a diploma in philosophy and has built Larkman Nurseries and Romantic Nursery into key production nurseries in Australia. He is also behind the popular Herb Chilli Festival held annually in Victoria.



Clive has sat on key Agribusiness bodies: NGIV, IPPS, Primary Training, AIH, TALGA, AgYV, VAC and has been a councillor for his region. His philosophy is akin to IPPS values and he encourages that 'life is for living and we must share our knowledge'.

# !APPLY NOW!

## South African Exchange

The IPPS South African exchange program has changed the lives of many, but this year it's the big one! In Feb/March 2024, the person chosen will spend approximately three weeks in South Africa hosted by local members, where they will work, visit nurseries and other places of interest, plus attend, not just the IPPS South Africa Region conference, but the international conference being held in Stellenbosch – this is huge!

The exchange program is sponsored by the Australian and South African IPPS. After the trip, the chosen propagator will be expected to attend the Australian conference in Ballina, held from the 22nd to the 25th of May.

Now that you are thinking about this or you know someone who may be suitable, check the following to make sure of eligibility:

- You must be over the age of 18 and in the early years of your career of growing plants.
- You must be able to travel to South Africa in Feb/March 2024 and attend our Australian conference.
- Your employer must support this application and your time off work.
- You must be prepared to make notes and take photographs of your great experience and report back at the Australian IPPS conference.

If all of the above suits you and you would like to be hosted in South Africa (at no cost to you, except spending money) and gain from the experience. Then send in the application form which is available on the IPPS website [https://ipps.org/uploads/docs/sa\\_exchangee\\_nomination\\_form\\_2024.pdf](https://ipps.org/uploads/docs/sa_exchangee_nomination_form_2024.pdf) by the closing date of **October 31st 2023**.





## Propagator or Grower - Topics for You

### **Can the Industry Benchmarking Tool Help You?**

The conferences and regional events held by the IPPS are invaluable opportunities for growers and propagators to exchange knowledge and experiences. A face-to-face conversation or subsequent email exchange, allows members to swap in-depth information, relevant to the challenges and nuances of specific scenarios. It is a form of data collection that has no substitute, but as technology continues to advance, big data can also help growers in decision-making.

Around two hundred and seventy nurseries from around Australia have provided statistical data that has been used to create an industry benchmarking tool. By using the tool, growers can easily compare their similarities and differences to the industry at large to form short, medium, and long-term business strategies. The tool allows users to compare their operation's performance to those of a similar size and scale and in the event a nursery is underperforming it will give you an opportunity to hone in on the what, where, why and how of better performers next time you're face to face with other growers.

More information on the tool, including how to access it can be found here: <https://www.greenlifeindustry.com.au/communications-centre/what-living-colour-nursery-learnt-from-industry-benchmarking>

### **Subterranean Pitcher Plant New to Science**

We learnt from Rod Tallis Award winner Olumuyiwa Akintola Elliott that plants can effectively 'call out' to mycorrhizal fungi to assist in phosphorus uptake when supplies are short using volatile organic compound signalling

from their roots. How incredible! So, what else might be going on below ground we don't yet know about?

Well, it turns out a lot. We probably know less about the intricacies of what goes on under our feet than we do about the oceans or space. Certainly at a microscopic level we have only scratched the surface but macroorganisms are also still emerging, new to science. One of the latest being a subterranean pitcher plant! *Nepenthes pudica* is a recent discovery from Borneo and the only known pitcher plant to produce its traps underground.

More on the unique species can be found here: <https://www.sci.news/biology/nepenthes-pudica-10956.html>

### **Free Pathogen Testing for Production Nurseries**

At the recent conference in Geelong, I had a few conversations that indicated several nurseries that had had wet-land recycling systems, have since decommissioned them for underperforming, reaching the end of their recommended lifespan of fifteen years, and returning poor-quality water. So, it is timely that Greenlife Industry Australia is looking into what water treatment options are most effective in controlling pathogens. As part of this research they are offering free pathogen testing to nurseries.

An article on nursery water quality and the survey to access the free testing, can be found in the links below:

<https://www.greenlifeindustry.com.au/communications-centre-content/media-releases-1/2021/how-healthy-is-your-irrigation-water-source>

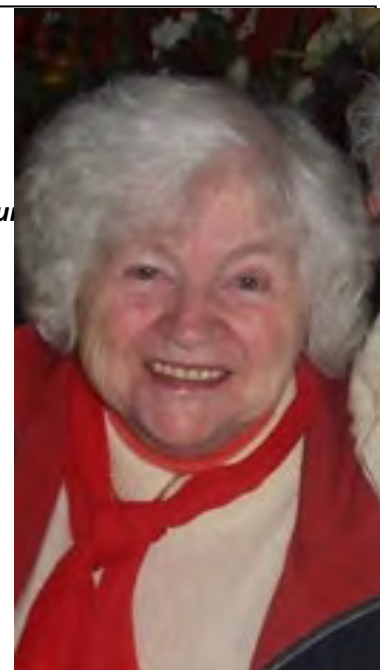
<https://www.surveymonkey.com/r/MZ69BHK>

### **Vale Lois Smith, who passed away peacefully on May 31, 2023**

Lois was a founding member of the IPPS Australia Region. She was awarded honorary membership of the region in 2009. Alongside her husband Peter, she founded Sunraysia Nurseries, in Mildura, in 1952. In 1961 they moved to Gol Gol, where the business grew to be a leading supplier of fruit trees and grapevines, and a mainstay of the local community. She was also instrumental in the development of the Australian Inland Botanic Gardens at Buronga. She completed the initial designs of the gardens, propagated thousands of plants, and oversaw the construction and early years of running the gardens.

Lois and Peter were among the small group of passionate propagators who moved to create the IPPS Australia Region in the early 1970's. Lois epitomised the ideals of the "seek and share" motto. She rarely missed a conference in her active years, and travelled to most other regions.

She is survived by husband Peter, daughter Debbie, 5 grandchildren and 16 great-grandchildren.





## Executive Officer's Report

What an awesome conference and 51st celebration in Geelong, VIC. 'Thank you' to our supporting sponsors this year. A big 'Thank You' to those members who were able to attend. I hope you enjoyed the conference venue and the 'face to face networking' with fellow Members.



### Important Notice

**Membership renewals for 2023 are now OVERDUE.** If you have not received your Membership Renewal Notice, please contact me at [pam@ipps.org.au](mailto:pam@ipps.org.au)

If you are having difficulty paying your subscription, please contact me so that we can look at the various options available for split payments.

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To ensure Office records are kept 'up to date' I would appreciate it if Members could please notify me of any changed contact details. In particular, if you have changed telephone provider recently, please advise me of your new email address at [pam@ipps.org.au](mailto:pam@ipps.org.au) It is important that the Australian & International database records are kept 'up to date', otherwise you could be missing out on receiving information.

## IPPS Australian Region Board for 2023/2024

<b>President:</b>	Bruce Higgs	<a href="mailto:bruce.higgs@bigpond.com">bruce.higgs@bigpond.com</a>
<b>1<sup>st</sup> Vice President:</b>	Ray Parker	<a href="mailto:ray@parkersplace.com.au">ray@parkersplace.com.au</a>
<b>2<sup>nd</sup> Vice President:</b>	Jose Puthiyaparambil	<a href="mailto:josekutty964@gmail.com">josekutty964@gmail.com</a>
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<b>General</b>	Karen Weger	<a href="mailto:karenw1979@bigpond.com">karenw1979@bigpond.com</a>
<b>General</b>	Dermot Molloy	<a href="mailto:Dermot.molloy@rbg.vic.gov.au">Dermot.molloy@rbg.vic.gov.au</a>
<b>General</b>	Natalie Vallance	<a href="mailto:muchtree@nw.com.au">muchtree@nw.com.au</a>
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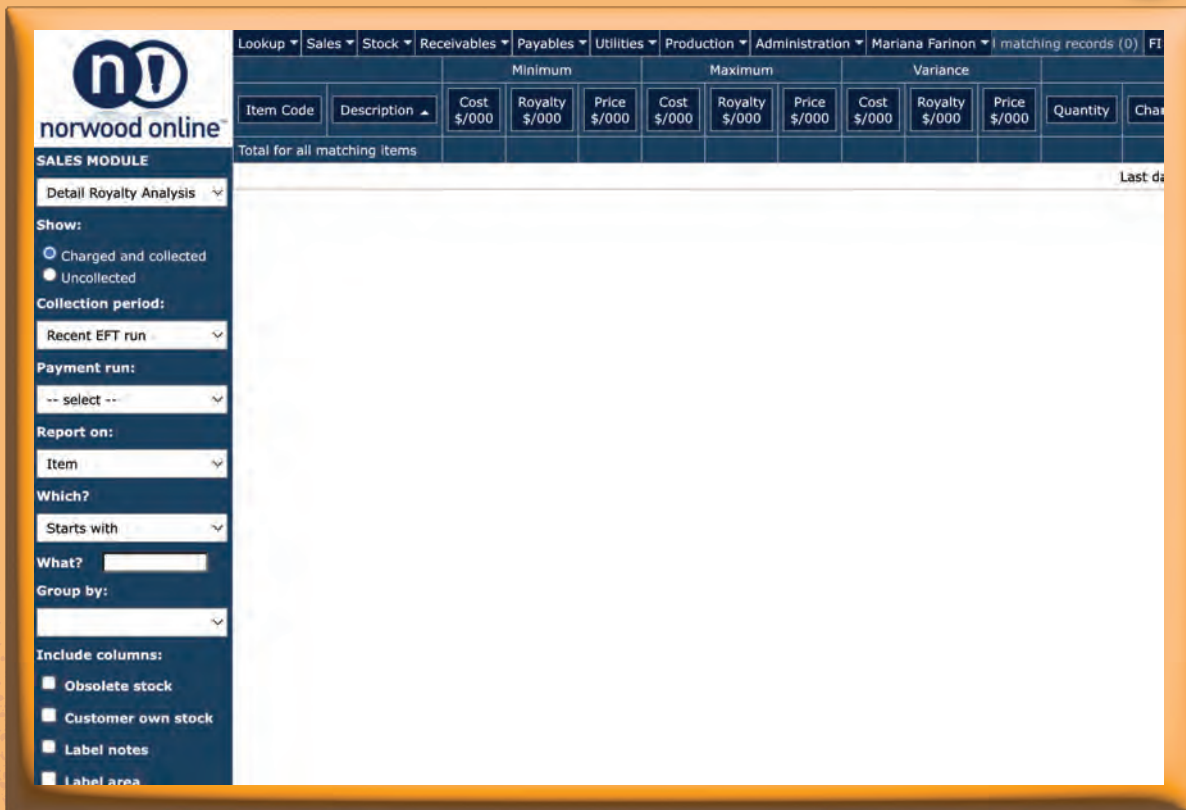






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