

the Propagator



International Plant Propagators' Society <http://aus.ipps.org/>
Australian Region - Newsletter Spring 2023 - No: 76



THINK BIG, START SMALL

"From a small seed a mighty trunk may grow"

Aeschylus

Spring has sprung and along with the warmth and colour comes this issue of the Propagator, embodying a theme that will mean different things to different people. Some of Australia's, and indeed, the world's, best nursery operators are members of the IPPS Australian Region. For these, often multigenerational propagators, the idea of thinking big and starting small will probably bring back memories of the early days of their nurseries. Starting from small and humble beginnings and working up to the world-class facilities they operate today.

For younger propagators entering the industry, things can be daunting, and it can feel that, although you think big, everyone around you is already big and by starting small, you'll never catch up. However, our industry is still growing and there is still plenty of room to establish new nurseries. Young horticulturists just need to find the right wave to ride and while the indoor plant boom may have peaked, the native seed industry is expanding with several new producers establishing in recent years. This is just one example of opportunity and no doubt new trends will continue to emerge.

One of the reasons that large and successful nurseries are the way they are, is because their owners are excellent at making big things happen in small, logical steps. This was illustrated perfectly on a recent visit to Native Plant Wholesalers in South Australia's South East. This is a large and established nursery but owner and director, Phillip Dowling, hasn't stopped thinking big and starting small. During the visit, I was introduced to a plant I didn't know existed. *Acacia terminalis* 'Pink Sunshine' was found in the wild about thirty years ago on the east

coast of Tasmania. Unfortunately, the plants proved rather difficult to propagate from cuttings and tissue culture, so their commercial release has been limited. But taking on the challenge and starting with a small handful of plants, who knows what big things may happen for the species at Native Plant Wholesalers?

Then there are those within the IPPS membership, who work in tissue culture. For them, thinking big and starting small is part of everyday life. They, by the very nature of tissue culture, start small to achieve big things, working with minuscule portions of plant tissue to create thousands of plants that have the potential to save endangered species or produce entirely new cultivars.

Regardless of what the phrase means to you, the ability to think big and start small is a great mantra for success in life. So, whatever big things you want to achieve in the world of propagation, a great small step to help you on your way, is to grab a cuppa, sit back and learn from the best, in the articles ahead in this issue of the Propagator.

Dan Austin - Editor



Acacia terminalis 'Pink Sunshine'.

Image: Natalie Tapson

THIS ISSUE

President's Report

Achieving Success in Ex Vitro Vexations

Overcoming Graft Incompatibility

Long-Term Weathering of Recalcitrant Seed

Conference and Awards Open

International Director's Report

Volcanello Nursery Visit

Global Footprints Scholarship Report

Propagator or Grower, News for You

Executive Officer's Report

President's Report

As folk are busy with Spring, I was just thinking how different the weather has been for us on the East Coast this year compared to last year. We have had well below average rainfall so far and are experiencing mid to high 30-degree days, so irrigation demands have increased. Greater energy costs including fuel, electricity, and gas with consequent flow-on costs for transport, materials, and production are now a real issue. However, a plus is that more sunlight has been accompanied by earlier flowering.



Planning is well underway for our Ballina conference in May next year. As in previous years, we have a Southern African Region exchange planned for next year and this will really be special as it coincides with the international tour there, so a young horticulturist will have the opportunity to learn from industry leaders from around the world, as well as the experience of immersing themselves in a different culture and being challenged with different approaches to growing. There is only one winner, so I encourage anyone interested to get their application in.

We will, as usual, also have a GCP IPPS Six-pack assisting at Ballina. This is a great opportunity for younger people to apply for this award, details and link are in this news-

letter. The Rod Tallis Award is one of our most prestigious awards for research conducted to solve some horticultural problem or advancement of plant knowledge. If you know someone who has conducted some trials or carried out a related study, please encourage them to apply.

Your board has been working on actions arising from last year's planning meeting and seeking ways to further improve the benefit of the society for members. David Hancock is overseeing our regional meetings and membership as committee chair. It is encouraging to see a growth in member numbers, especially for what effect this can have on the industry. Tony Vander Staay (our International Director) and others will be attending the International Tour and meeting in October hosted by the Southern Region of the USA. Look forward to his report on that in our next newsletter.

Wishing you all a busy and profitable time this spring.

Bruce Higgs

Achieving Success in Ex Vitro Vexations

Lisa Wightwick

**Plant Tissue Culture and Micropropagation Specialist
Peninsula Growers**

It's no secret that I adore plant tissue culture. My longstanding passions for plants and science were able to meet and flourish in the laboratory environment. I happily spend my days surrounded by a forest of minuscule plants sustained in plastic habitats. It awes me to envisage the physical space these plants would occupy were they fully grown in their natural environments. Plant propagation is fostered by this vision of potential – we may only be involved in the very beginning of the plant's journey into life, but we look to their future with the hope they flourish and have a positive impact on the world around them. Unfortunately, this future is not always as bright as we would wish for tissue culture plants, as challenges in logistics, handling, and growth can lead to poor success rates and discourage growers from utilising them. With the information ahead, I hope to connect the worlds of the laboratory and nursery, giving end users a greater understanding of achieving success with tissue culture plants.

When plants enter culture, they revert to a juvenile state, much like a seedling. Certain features and processes in ordinary plants that help regulate water loss are vastly altered in tissue culture plants. Stomata, the pores on leaves that open and close for gaseous exchange and control the loss of water vapor (transpiration), are extremely slow to close or may not close at all.



**Sunset at Ballina, a conference bound to be a winner.
Image: Taka Nozaki**



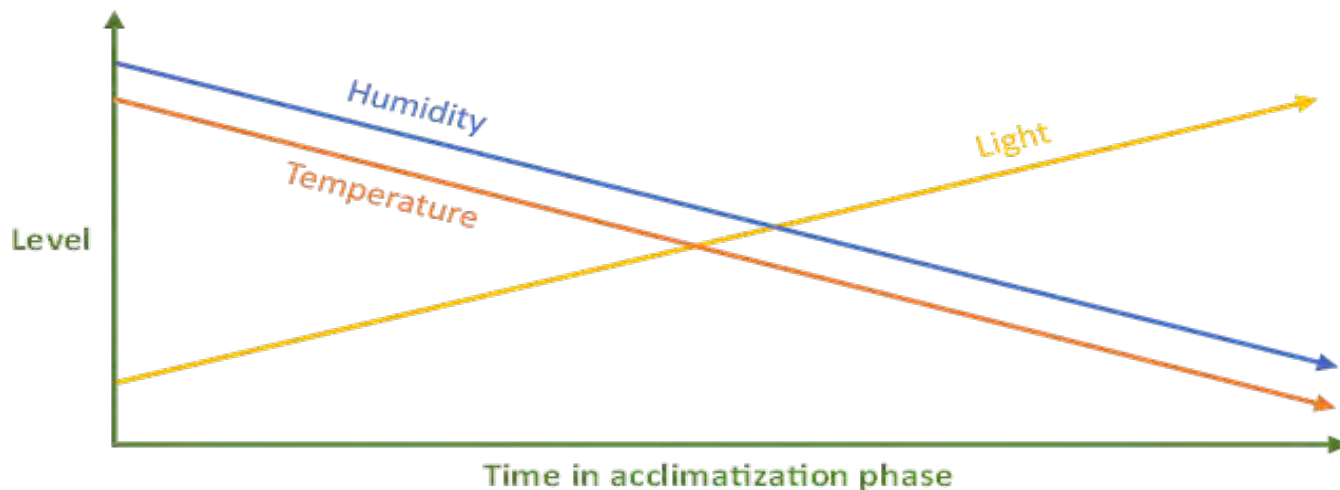
Water is readily able to escape from the vegetation of these plants through the stomata. A less developed vascular system leads to poor water conduction between the roots and shoots of cultured plants. The leaves of plants in vitro do not develop epicuticular waxes in typical amounts or with the same chemical properties as plants outside of culture (Davies et al., 2018). This perilous combination of factors put the plants at high risk of desiccation and death unless certain precautions are taken. In the culture environment, the vessels in which the plants are kept have a relative humidity of 95-100% and water is supplied through the gel media, keeping the plants protected from drying out. When it is time for the plants to be removed from the culture environment (deflasking), the plants need to be gradually weaned from the controlled environment. My favourite metaphor describes newly deflasked tissue culture plants as 'in intensive care' and then becoming 'outpatients' as they progress through the acclimatisation process. Temperature and humidity are progressively decreased while light levels are increased.

With time, deflasked plants regain normal function and strength, growing as any other plant propagated from seeds or cuttings would. Understanding these principal traits of tissue-cultured plants can go a long way in help-

ing growers achieve successful transplants and acclimatisation. Additionally, there are other useful considerations ranging from purchase to planting, a compilation of which are listed below.

Purchasing

- Seek reputable suppliers – choose Australian where possible. If importing, make sure the supplier provides mandatory documents such as import permits and phytosanitary certificates. The Department of Agriculture, Fisheries and Forestry website has straightforward guidelines for importing live plants.
- Develop a good relationship with Quarantine when importing. Open communication assists in the event of issues during an inspection and allows importers to keep abreast of any delays. Issues that arise during inspection can cause delays that can last weeks and, in some cases, plants may be destroyed if contaminated or suspected to be a prohibited species. Suppliers with a good track record of reliability and quality will have an easier time passing their stock through quarantine.
- International suppliers that conduct business in Australia are still bound to the Australian Consumer Law and must take accountability for the stock they export. Some suppliers have a high-volume focus and quality may be lacking. Always inspect incoming stock and document progress.
- To reduce shipping volume and to help avoid quarantine issues, many international suppliers will pre-deflask plants and seal them into bags. Unfortunately, this procedure deprives the plant of its nutrient and water sources from days to weeks before planting. Take caution with this type of purchase and note that these plants may arrive under stress.



From top to bottom: A range of tissue culture succulents that have been successfully acclimatized, a graph of the principal environmental factors and their changes with time.

Images: Lisa Wightwick



Delivery and Timing

- Request shipments arrive at the start of the working week – suppliers are usually flexible and can arrange this. In commercial production nurseries, having the stock arrive early in the week supports production and is beneficial to the health of the plants. Having cultured stock sitting over the weekend (particularly in summer) can degrade the quality of the plants.

- Couriers are notorious for hurling packages into vans despite ‘fragile’ or ‘this way up’ labels. If consignments are damaged on arrival, take photographs, and contact the courier and supplier immediately. Most courier services have clauses in their terms and conditions that cover up to a certain value for damage or loss of deliveries. Check your products as they are delivered – take note of the delivery time, verify numbers, and most importantly check the quality and health of the plants on arrival.

- Take caution when buying in over Summer – temperatures in transit are generally not regulated and exceeding 30°C can cause irreversible damage to plants. Communicate with the supplier to time the shipping for cooler periods and request insulated boxes with cooling packs.

- Time of year makes a big difference to the success of plant acclimatisation. Research and trials are important tools for success – though existing information on the plant of choice can serve as a guide for their treatment.

- Timing is important – plants should be deflasked as soon as they are received. The longer the time between the laboratory and acclimatisation environments, the higher the chances of a decline in survival.

The Product

- Good quality cultures will yield good results – plants should have consistent root growth, healthy foliage, and sterile media. Look out for any significant browning of the leaves, tips, or dying plants (occasional browning of the basal leaves can be normal). Plants should be of a reasonable enough size that they can be planted into a mix without disappearing. Plants that are too tall will be less able to support their own weight and prone to wilting.



From top to bottom clockwise: Examples of poor-quality tissue culture plants, spindly and excessively long stems, large proportion of dead material and inconsistency of plant form, a failure in root growth due to an excess of auxin, examples of vibrant, uniform and high-quality tissue culture.

Images: Lisa Wightwick



- Bacteria, fungi, and algae can contaminate cultures and have undesirable effects on their growth and survival. Check incoming cultures (if still in their original containers) for any colourful, textured blotches throughout or on top of the gel media. Bacteria usually have a shiny appearance, form circular patterns and typically will grow on top of the media surface. Fungus has a powdery appearance and can grow on top of and through the media. Algae is characterised by its bright green colour and similar texture to bacteria.

While unwanted, contamination is not always detrimental to cultured plants and successful deflasking can still be achieved through a few simple strategies:

1. If the culture is contaminated, check the health of the plants – any dying material will indicate that the contamination is negatively impacting the plants and their survival rate will likely be low. Contamination can also hinder root growth. Compare clean/contaminated cultures side by side to get a good idea of if the health is affected.

2. Dispose of severely affected stock. If the plants are still in good condition despite bacterial/fungal presence, then proceed to deflasking. Take personal safety precautions such as wearing gloves, eye protection and masks when handling contaminated stock.

3. Separate and deflask contaminated cultures last – this will decrease the chance of cross-contaminating the clean plants. Contaminated stock should be labelled to aid in troubleshooting in the eventuality of a decline in their health or survival.

4. Bacteria and fungi that infect cultures feed on the nutrient and carbohydrate-rich medium, and once removed from this environment, will usually die off. Removing any gel media residue from the plants should be a standard part of the deflasking process.

5. Avoid deflasking any cultures containing fungal contamination in areas with high airflow. Fungi produce

spores that can become easily airborne and can spread to contaminate other areas of the nursery.

6. Tissue culture stock can be treated with a variety of different bactericidal and fungicidal products.

Deflasking and Acclimatisation

- Trimming vegetation and roots of TC plants may be necessary but risky. Cut ends are like open wounds, leaving the already vulnerable plant at a greater risk of microbial infection. Avoid, if possible, any cutting of TC material until hardening is complete. If roots or shoots are excessively long and must be trimmed, ensure tools are sterilised. Trialling a small amount of stock is a good idea to minimise loss.

- Deflasking should be carried out with careful consideration of ambient temperature and humidity. As a general rule of thumb, the humidity should be kept as high as possible and the temperature below 25°C. High tem-



From top to bottom clockwise: A failure in root growth due to an excess of auxin, a bright pink specimen is a bacterium contaminant, a common type of fungi, although a fungal contaminant is present the health of plants is not always negatively affected.

Images: Lisa Wightwick

perature has a greater impact on transpiration regardless of the humidity level - even in high levels of humidity, cultured plants exposed to overly hot conditions lose water significantly faster and are near defenseless to desiccation.

- Wilting of certain species can be a common and damaging issue – some remedies include the use of antitranspirants, deflasking in cool environments, frequent misting of plants with water while deflasking and opening lids of containers 5-7 days prior to deflasking to kick-start hardening.

- General hygiene practices are important both during deflasking and acclimatisation – deflasking stations should be thoroughly cleaned before and after use, tools should be frequently sterilised and workers should wear gloves (not only for hygiene but for safety reasons). In the greenhouse, air circulation helps to minimise fungal growth (botrytis etc.). Areas where deflasked plants are stored must be regularly cleaned to prevent cross-contamination. Check plants and substrate for any fungal or algal growth – these can quickly overcome the cultured stock and must be treated with appropriate measures.

- Take care if using any plant growth regulators on cultured plants that don't have roots – applying auxins can potentially have detrimental effects if the plants already

have taken up auxins from the culture media. Cultures are commonly placed on media containing auxins prior to deflasking but may fail to grow roots. If extra auxin is applied when deflasking, it may have a compounding effect with the auxin the plants have already absorbed, affecting the plants' health and quality.

- Dispose of culture containers responsibly – if stock is sent in plastic containers, check the underside for the recycling mark, tap out the contents, and place them in the appropriate bin. If the recycling number is a 5, the plastic can be recycled through the PP5 initiative.

- Check on the plants at weekly intervals post-deflasking. Observe their health, identify and treat any issues that may arise, and make necessary changes to their environment as needed. Changes to humidity, temperature, and light are generally made at weekly to fortnightly intervals.

It's my hope that these tips and tricks may enlighten or even prove useful to those who currently utilise plant tissue culture, those who may be considering it, or are simply passionate and interested growers.

References

1. Davies, Jr, F.T, Geneve, R.L and Wilson, S.B. 2018. Plant Propagation, Principles and Practices. Hartman and Kester, Ninth Edition.



Botrytis on deflasked Grevillea plants. The botrytis has overcome some of the plants and caused them to die.
Images: Lisa Wightwick

Overcoming Graft Incompatibility

John Mason

Lecturer

ACS Distance Education

The ability of plants grafted together to form a successful union and grow satisfactorily into one composite plant is known as graft compatibility. However, anatomical mismatching, poor craftsmanship, adverse environmental conditions, disease, and graft incompatibility can lead to graft failure. Graft incompatibility is an interruption in cambial and vascular continuity leading to a smooth break at the point of the graft union. Normal vascular tissue does not develop in the graft union.

Graft incompatibility can be caused by adverse physiological reactions between grafting partners, viruses or phytoplasma transmission, and anatomical anomalies of vascular tissue in the callus bridge. Knowledge of suitable scion and rootstock matches is important for those working in the nursery industry where there is less tolerance for mistakes and wastage. For home gardeners and horticultural researchers, testing out different combinations can be educational and satisfy curiosity. Generally, compatibility is largely influenced by the degree of genetic similarity between scion and rootstock. However, it is known that some plant families contain genera that are easier to graft than those in other families even to the point of inter-generic grafts, whereas plants in some families remain extremely difficult to graft. Even where genera or species within a family can be grafted, it is still important to select a compatible rootstock.

In most cases, graft union malformations caused by incompatibility may be linked to external symptoms. In-



compatible graft combinations have been linked with the following symptoms:

- a large percentage of cases fail to form a successful graft or bud union
- in the later part of the growing season, the foliage turns yellow, accompanied by early defoliation. Drought stress causes a decline in vegetative growth, the appearance of shoot dieback, and general tree ill health
- trees die prematurely in the nursery, where they can only live for a year or two
- significant variations in scion and rootstock growth rates or vigour
- differences in the start and end of vegetative growth for the season between scion and rootstock
- overgrowths above or below the graft union.
- graft components falling apart cleanly at the graft union
- rootstock suckers.

Although graft incompatibility ultimately refers to graft failures, the time taken for grafts to fail has led to the delineation of different categories of graft incompatibility, namely - immediate graft incompatibility, partially delayed graft incompatibility and fully delayed graft incompatibility. These are not precise categories and there is often some overlap between them.

Immediate graft incompatibility refers to when the graft union fails immediately or soon after the first bud opens. To be sure that it is a question of incompatibility, careful examination of the graft union is needed. This will help to determine whether the graft failed because of incompatibility or because of environmental factors like drying out of the wound or mechanical factors such as poor matching of the cambial tissue or loose binding of the graft tissue.

Partially delayed graft incompatibility is where the graft union fails after a period of time which can be anywhere from several months up to 5 years. Once again, it usually occurs during the propagation stage due to a mismatch between rootstock and scion. It can be difficult to detect due to the varying growth of some plants from one season to the next.

Fully delayed graft incompatibility refers to when grafts fail years later, and it can be anywhere from 5 years up to 20 years after grafting. When this occurs, it can often

Matching vascular cambium is valuable in achieving successful grafts but does not guarantee compatibility.
Image: Dan Austin



be identified by overgrowth of the rootstock or scion. If the scion grows too vigorously it may be observed by what is known as an 'inverted shoulder' at the site of the graft union where the stem is thicker above the graft site. The canopy can become top-heavy and may cause the graft to fail under strong winds or plant stress. If the rootstock is too vigorous the overgrowth forms a 'shoulder' or thicker stem on the rootstock side of the union. Overgrowth of the scion or rootstock does not always suggest incompatibility though, and such plants do not always fail.

Graft incompatibility can also be categorised as either translocated or localised. Symptoms of "translocated" incompatibility can be seen early in the plant's development. Reduced glucose transfer at the union, shrivelling of leaves, leaf chlorosis leading to leaf reddening, and early leaf drop are some of the most typical signs. The rootstocks have indications of translocated graft incompatibility such as leaf reddening, severe leaf curling, leaf

drop, and so on.

Localised incompatibility causes deformity at the graft union due to physiological and morphological alterations, resulting in impaired union formation and, in extreme situations, the tree falling apart at the junction after several years of grafting. Loss of the vascular cambium, a slower pace of tissue development, inefficient lignification, and disruption of vascular continuity are all symptoms of localised incompatibility. The graft union may rupture as a result of these alterations.

The most known example of localised incompatibility is between pear and quince. When pear cultivars are used as scion and quince is used as rootstock, prunasin, a cyanogenic glycoside found in quince but not in pear, is translocated into the phloem cells of the pear scion, where pear enzymes disrupt the prunasin in the graft union region, resulting in hydrocyanic acid as one of the decomposition products.

Long-Term Weathering of Recalcitrant Seed

David Hancock

Founder and Consultant

Natural Area Consulting Management Services

The propagators at Natural Area have learned not to discard seed trays/material that have either failed or given poor initial results. This only applies to species that do not normally germinate readily or for which a germination timing and or trigger is unreliable or not well established. Our experience has been that when seeds are retained and exposed to longer-term seasonal conditions, they will often choose to respond in their own time. These characteristics seem particularly relevant to Ericaceae and Cyperaceae.



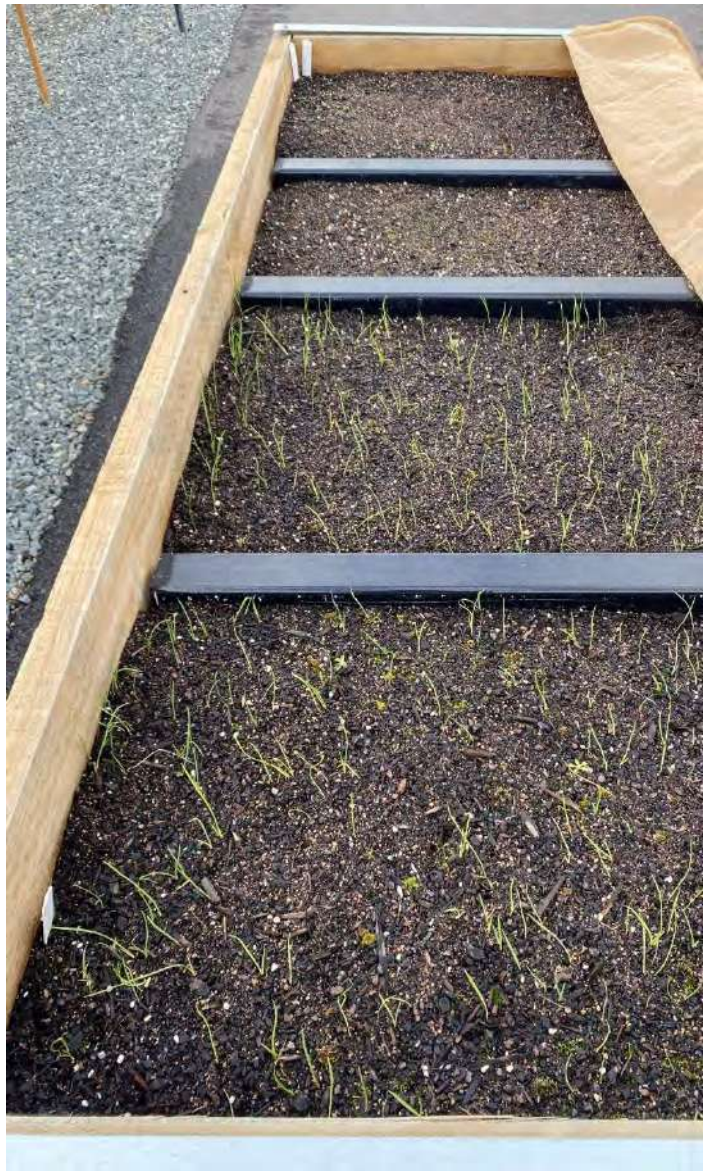
From top to bottom: While a graft may seem successful, fully delayed incompatibility can take between 5 and 20 years to present, one of several weathering structures at Natural Area Nursery.

Images: Dan Austin and David Hancock

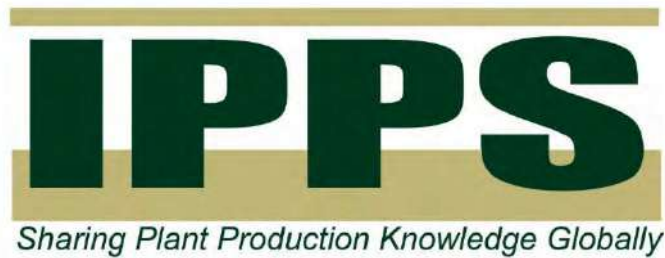
The main issues for the long-term retention of seeds are space, maintenance, and predation. Our process involves removing ungerminated seeds from the original seed-raising mix (using sieves) and combining multiple lots to reduce space demands and resowing into an area constructed for the purpose. The new housing needed to be vermin-proof to avoid predation through a long weathering period. The weathering area would not usually be irrigated, the idea being to only expose the seeds to the natural variations in temperature and moisture. The weathering areas could be treated with germination aids at future times, e.g. smoked water, physical smoke, hydrogen peroxide, mild acid, and heat. The process also helps to keep the reprocessed seeds in a separate area to avoid contamination from mould etc. to new season sowings. As germination occurs, irrigation is added to develop seedlings ahead of potting.

The photos show two of a number of different areas used at Natural Area for this technique. You will note the use of shade cloth (used at the top and bottom of the structure) and/or bird net and that the structure is positioned well off the ground and sealed against predators from the bottom but also allowing for drainage.

Applying lanolin to the bench legs also deterred ants. The nursery recently potted over 1,200 plants and additional germination is taking place. Seed growers may be surprised by what can be achieved with little work and lots of patience. Just think about how many seed trays may have been disposed of before giving those costly seeds a second chance!



From top to bottom: *Second year germination of weathered seed, weathering structure at Natural Area.*
Images: David Hancock



52nd IPPS Conference 2024



Ballina RSL, Ballina

Wednesday 22nd to Saturday 25th May, 2024

'Propagation – A Breath of Fresh Air'

More information and a registration form will be available shortly at www.ipps.org

REGISTER NOW and we will invoice you in February. Contact Pam Berryman – pam@ipps.org.au for more information

!!!APPLY NOW!!!

Rod Tallis Award

What a great collection of propagation experience there has been in this issue so far. If you are in the early stages of your career, why not submit some of 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

Six-pack Program

Applications are now open for the chance to be a Six-pack member at our Ballina conference.

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 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



International Director's Report

The international board had a Zoom meeting early in June, and a calendar of upcoming meetings was discussed and is listed below:

The Eastern Region of North America will be held from September 26th to 29th. The Europe Region between October 11th and 13th. The Japan Region is gathering between October 14th and 15th. While the Southern Region's conference with the international pre-conference tour will be held from October 18th to November 1st, concentrating on the Washington area on the East Coast.

The following future international tours have been resolved:

- 2024 South African Region Feb/March
- 2025 will be in New Zealand around May
- 2026 Eastern Region of North America
- 2027 Australia Region Sept/Oct
- 2028 Western Region of North America
- 2029 Europe Region
- 2030 Japan Region (tentative).

So, the next few years are locked in. It was also decided that should a region not be able to hold a planned tour because of factors outside its control and deposits are already paid. The international board will assist in ensuring regions avoid severe financial stress. No set amount was locked in, and each case would be appraised on application.

The education committee met to discuss the best way for the international body to support regions that are hosting the international tour in regard to the exchange recipients. They proposed that IPPS International pay for the short tour version for the respective exchange student each year. How this would impact our current position I am not sure, this is something to be clarified at our next face-to-face meeting.

In further news, the international board is still open to bringing in India and China, if we can get some more momentum there. The Western Region is sponsoring India, though their structure seems to be mostly involving university lecturers. I am not sure what our next move is with China, but it is heartening to see more members signed up.

Tony Vander Staay



Volcanello Nursery Visit – 2023

Clive Larkman
Founder
Larkman Nurseries

Very few people have heard of Vulcano Island which is a volcanic island off the coast of Sicily, in the middle of the Mediterranean Sea. It is one of six volcanic islands; Stromboli being the most well-known because of its iconic volcano shape and constant outflow of steam. We visited the Island of Vulcano which is a smaller island with a very impressive live volcano in the middle. We were there to celebrate Matt Mills' and his partner's birthdays – it was quite a long journey of 52.5 hours from the time we left Melbourne until arriving at the villa but well worth it!

The typical Mediterranean climate was 30 degrees each day, very dry and the vegetation on the island was basically Mediterranean climate-type plants. Plenty of colourful bougainvilleas, neriums, *Lantana camara*, palm trees, hibiscus, and some endemics like *Cistus creticus* were to be found all over the island. We were in the village of Volcanello and the houses and buildings had fantastic plantings of colourful pots and gardens. The locals definitely enjoyed having plants in and around the houses.

We came across a retail nursery (not a garden centre) belonging to Angelo Dei Sapori who welcomed and shared his growing techniques. Of course, the motto for IPPS is to seek and share, so we were very happy to share our growing techniques with him. He showed us his "pride and joy". He had grafted two varieties of finger limes onto a very old 6-inch diameter citrus (unknown species) tree. The grafts had taken well and produced two large heads. He said he harvests over 1 kilogram of fruit every October. Quite impressive as these plants have not been in cultivation in Australia for that many years.



Clive and Di Larkman at Angelo Dei Sapori's nursery
Image: Clive Larkman



He also grafted his own varieties of olives which were amazingly healthy. He had 6-inch pots of capers for sale which were amazingly bushy and healthy. Like most good nurseries he had a mix of the common plants including basil, herbs, chillies in full fruit, hydrangeas, dipladenia, and many other exotics. He also had a huge

range of succulents that were in a wide range of pot sizes from 5cm at 1.50 Euro to 15cm *Euphorbia* 'Medusa' at 20 Euro. These were very full and well-grown pots that would sell for well over \$100 in Australia.

Working through Google Translator we determined that he has a nursery on the main island of Sicily where he grows over one million plants. Several days a week he brings a truckload of plants by ferry to Vulcano to sell to the locals. All the islands are very dry and very hot with poorly structured soils. The potting mix we take for granted does not seem to exist, so he uses local soil in his pots. It makes for tough conditions in a hard environment, so the quality of his produce was quite impressive. We even found a pair of rusty ARS secateurs and noticed he uses the same Danish trollies as we do to transport his stock.

It was great fun meeting an old-fashioned, passionate nurseryman, successfully plying his trade in non-ideal plant growing conditions. It shows the same passion and skills are needed and rewarded no matter where you are in the world.

Di and Clive Larkman and Jane Edmanson

From top to bottom clockwise: A diverse collection of succulents, Angolo Dei Saponi with a double grafted finger lime, Di Larkman with a healthy *Dracaena speciosa* (Syn. *Sansevieria*)

Images: Clive Larkman



Global Footprints Scholarship Report

Zoe Williams
Horticulturist
Waterworth's Nursery



Upon touching down back on Australian soil, I have a new-found appreciation for many things including the beautiful Queensland weather, Australia's 'can do' attitude, work ethic, and our unique flora and fauna.

My Global Footprints Scholarship journey has been the most inspiring, challenging, rewarding, and encouraging experience of my whole life. This is something I will be forever grateful for. It's hard to think two months ago, I had never left Australia and was terrified at the thought of travelling alone and working in a foreign country. I had spent over six months planning my trip and securing work experience placements in production nurseries and gardens in the UK and Europe, with the incredible help and advice of BBM, IPPS, our mentors Graham Ross, Narelle Smith, and previous Global Footprints scholars, Ash Walker and Tyler Howard.

Anxious yet full of excitement I stepped foot on that plane, little did I know this would be the beginning of the best learning adventure of my life. My first placement was with the Royal Parks and Hyde Park Super Nursery. Hyde Park Nursery supplies flowers and shrubs across all 8 of the Royal Parks in London. It is also one of the first major glasshouse facilities in the UK to use Deforche Cabrio technology, to assist with the acclimatisation of young plants. This climate control technology used at Hyde Park, maximises space and means plants no longer have to be moved outside for hardening. More on the system can be found here:

<https://www.floraldaily.com/article/9007060/royal-parks-to-build-one-of-the-uk-s-most-innovative-super-nurseries/>

This placement allowed me to practice new propagation skills I had never undertaken before such as seed sowing and to learn more about biological controls and companion planting to combat pests. During my placement, I was lucky enough to be able to attend the Ball Colgrave Summer Showcase in Banbury and attend the BTS Bruce Springsteen and The Chicks concert live in Hyde Park!! (After work of course). I also spent a day working in St James Park with head gardener Verity, planting the new Nash beds, and a day in Hyde Park with head gardener Beth. It was really insightful learning about how the parks are maintained and managed.

During my 2 weeks in London, I also had the chance to travel to Kew Gardens and Oxford Botanical Gardens. A fellow scholar, Remy Alonso, organised access for me to tour the Kew Gardens Herbarium and Library. With over seven million specimens, Kew's Herbarium collection is one of the largest in the world. It is very easy to get lost if you don't know your way around! We hunted out some Australian specimens during our visit. It is incredible to see how old some of these were and the location they were collected. Some very close to home!

My day trip to Oxford would not have been possible without the amazing help of IPPS member John Mason. He connected me with Timothy Walker - an ACS tutor in the UK, botanist, gardener, lecturer, and author. I caught the train from London Paddington to Oxford station. After only corresponding via email, Tim had stated he would be waiting at Oxford wearing a yellow bucket hat for identification purposes. I was a bit worried I wouldn't be able to find him but that yellow bucket hat did its job! Now, why am I going on about this yellow hat? Tim chose the colour yellow for a particular reason! Yellow is one of the first colours you see when looking at a garden



Images: Sowing *Erysimum Cheiri* seeds, maintaining pelargoniums and geraniums at Hyde Park Super Nursery.
Images: Zoe Williams

or landscape. When used correctly it can also make a garden appear larger than it actually is. This was also inspired by Gertrude Jekyll a premier influence in garden design. She put her imprint on modern uses of "warm" and "cool" flower colours in gardens.

We visited many Oxford University campuses. Including Somerville College where Tim is a lecturer. Past students include Indira Gandhi and Nobel Prize winner Dorothy Hodgkin (a British chemist whose most influential discoveries include the confirmation of the structure of penicillin and insulin). The architecture around the colleges is just incredible, and the sheer age of the buildings is extraordinary. The colleges quibble over who is the oldest, but Tim says it is UNIV, the college he attended! Upon entering Tim's tutorial room, I was greeted by green life and also some Australian banksia seeds!

Somerville remained a women's college until 1992. It has a late Victorian theme, it has also always been very non-conformist. It has never had a male principal. It was also the first Oxford College to have a nursery.

Next, we visited the Oxford University Botanical Gardens. This is the oldest botanic garden in Great Britain and one of the oldest scientific gardens in the world. Tim



was the director of these gardens for many years. The gardens are on top of a cemetery. The soil has an average PH of 8.1. The purpose of this garden is to teach and conserve. Plants are grown here for medical and botany students. They are laid out in families so lecturers can stand at the front of the row and speak about the plants. Although quite a small garden, its planting is very well thought out and relevant. It has evolved over the years since Tim was the director. Many formal paths now meet informal paths. But many trees still remain in the same place including a yew tree that was planted during the civil war. These old trees give the garden maturity, you



From top to bottom: Schoneveld Breeding, Plant Xperience – Holland, Zoe at the Eden Project in Cornwall. Images: Zoe Williams

can't fake. Tim said he used to show the original catalogue that was published in 1648 when guiding tours. This is now locked away in a safe for preservation.

A story of Tim's was from when conducting a tour for a group of school students many years ago. He asked if anyone knew what plant he was pointing at, and a young 8-year-old boy answered confidently *Catharanthus roseus*. Surprised he asked does anyone know what is made out of the plant? Again, the boy answered, vincristine. What is vincristine used for he asked? The young boy answered cancer chemotherapy. It turned out the boy had battled and beat leukemia as a child...He said that's the plant that saved my life.... The power of plants. More than half of all cancer drugs and antibiotics are based on plant molecules!

On a lighter note, Tim said in the 1980s, as a trainee, he used to clean the glasshouse roofs with just a ladder and 2 planks of wood to stand on. Safety standards have come a long way in England since then! The radical herbaceous Merton Borders of the garden were worked in with the collaboration of Professor James Hitchmough. These took around 3 years to mature and are absolutely beautiful. The rock garden features rocks that were hand-selected from a quarry. These 8-tonne rocks were

rolled from the front gates and then levered into place!

My next work placement was at the Eden Project in Cornwall, England. The Eden Project began as a disused china clay pit. Keep in mind that the pit was 60m deep, had no soil, and sat 15 metres below the water table. This was transformed into what is now a world-renowned experimental garden, and the home to the largest indoor rainforest in the world. The side-by-side before and after images of the site are extraordinary.

I spent my week at the Eden Project working with the Growing Point Nursery team. The Growing Point Nursery produces plants for a Rainforest Biome, Mediterranean Biome outdoor gardens, retail store, and food for Eden's hundreds of thousands of annual visitors. This nursery has just been moved from an offsite location to its new home base at the Eden Project. It is so new in fact, it is still not finished, I am going to have to head back and see the progress in the future.

The nursery and the biomes at the Eden Project are heated by geothermal energy. The geothermal operation is the first of its kind in the UK in 37 years. During my placement, I collected seeds, toured the biomes, sowed seed, potted, processed vegetative cuttings, and har-



Gardens at the Palace of Versailles, France.
Images: Zoe Williams



vested vegetables. Eden's Growing Point is peat-free. The propagation mix used is a blend of compost and coir. They are also transitioning away from using Osmocote. They are currently trialling Carbon Gold Enriched Biochar. This organic fertiliser has had great results so far. Pests are treated with biological controls. Powdery Mildew is treated with Karma, an organic fertiliser.

My scholarship allowed me to visit the Palace of Versi and Claude Monet's Garden in France where 2021 Global Footprints Scholar Ash Walker is back working now! Ash has certainly set the precedent for future horticulture scholars, to go back overseas upon finishing their scholarship trip. Truly inspiring!

On a short trip to Holland, I was fortunate enough to have the opportunity to tour Schoneveld Breeding and Plant Xperience. Huub Van Oorspronk gave a really insightful tour of both of these facilities and the local garden centre. Schoneveld Breeding is a worldwide market leader in breeding cold-loving pot plants such as *Cyclamen*, *Primula*, *Ranunculus*, and *Campanula* species. They supply seeds and work with growers throughout the entire supply chain. Supplying customers with growing recommendations, marketing, and sales support.

Sustainability is at the forefront of their business; their goal is to breed new varieties with lower environmental impacts. I was lucky enough to tour the research and development laboratory where practical trials are conducted. These trials provide research into what is needed to improve seed production, germination, disease prevention, shelf life, and storage.

My last work experience placement was at Jens Meyer Jungpflanzen (Germany). I will be forever grateful to Jens & Imke for opening up their home, meeting their family, showing me the area, and opening their nursery to me to complete work experience. I learned many new propagation techniques and grafting skills during my place-

ment and also had the opportunity to tour many nurseries within the Ammerland region including Heinz and Zu Jeddeloh and Park de Garten. This region is filled with nurseries on every corner you take.

Founded in 2003, Jens Meyer Jungpflanzen specialises in producing high-quality young plants including conifers, deciduous trees, grasses, and rhododendrons. In today's times of plant supply, quantity is not considered the benchmark, superior quality is. This nursery is the perfect example of this.

I will be forever grateful for this opportunity that was made possible by BBM Youth Support. This trip has not only allowed me to grow professionally but personally and learn more about how we can contribute to creating a more sustainable world. This is vital, especially right now in 2023. Healthy ecosystems and biodiversity are fundamental to life on our big planet. There are many reasons why sustaining the horticulture industry is so important. Sustainability and horticulture go hand in hand. Our future generations are the pillars of sustaining green spaces, plants, and gardens all around the world.

I strongly encourage anyone aged 18 – 25 in the horticulture industry to apply. You will not regret it. It is an opportunity of a lifetime. I also wanted to extend this and say a big congratulations to 2022 IPPS Six-packer Tia Wagner who has just been awarded a 2023 Global Footprints Horticulture Scholarship.



From top to bottom: Grafting Westerstede rootstock (*Hymoaellis intermedia*) at Jens Meyer Jungpflanzen, Germany, a trip of a lifetime, Saxer Lucke, Switzerland. Images: Zoe Williams

Propagator or Grower - New for You

As another issue of the Propagator nears its end, I'd like to take the opportunity to thank this quarter's contributors for their excellent articles. I have learned a great deal since adopting my role as editor last year and it is a credit to the International Plant Propagator's Society Australian Region, the diversity in expertise that continues to arrive in my inbox for each issue.

With this in mind, don't hesitate to get in touch with any content you feel will benefit members. Long, short, or somewhere in between, I'll find a place for your work to feature within the pages of the Propagator.

Dan Austin - Editor

Genomic Research to Assist Conservation

There is no doubt botanic gardens around the world play host to some of the planet's most innovative propagators, so it is no surprise several members of IPPS fall under this umbrella. Recent news from the Botanic Gardens of Sydney illustrates how technology is increasingly contributing to such innovation. Within the site's laboratory facilities, genomic research guiding the recovery of threatened flora and of particular interest, genetic information is helping to guide the establishment of a genetically diverse ex-situ collection of native guava (*Rhodomyrtus psidioides*) before it becomes extinct in the wild as a result of myrtle rust (*Austropuccinia psidii*). More can be found here:

<https://recer.org.au/2023/09/conservation-genomics-guiding-recovery-threatened-flora/>

Keeping Water Use Efficient

Like everything, nursery running costs are on the rise and water is always a major contributor. If this rings true to you and it has been a while since you've reviewed your irrigation practices, why not jump on to the Greenlife Industry Australia website and access the Australian Plant Production Standard, where you will find links to a range of free water management toolbox calculators.

<https://nurseryproductionfms.com.au/irrigation-toolbox-calculators/>

New App to Support IPM Will Launch in November

For years I have been showing students the Biobest Side Effects Manual on their website. It is a brilliant database that allows users to enter the various pesticides they may use and generate a list of their toxicity on a range of beneficial insects. So, I was disappointed when the landing page displayed a 'page not found' error recently. After contacting the organisation, good news, the old page

has been decommissioned to make way for a new app launching in November. Watch this space for availability.

<https://www.biobestgroup.com/side-effects-manual>

Native Bees as Pollinators

With the news that the approach to the parasitic mite (*Varroa destructor*) incursion will transition from eradication to management in NSW, comes the realisation that the flow-on effects this pest will cause to industries reliant on the European honeybee, will see major changes in the years ahead. While there isn't anything appealing about the unfolding scenario, it is encouraging to know research is already underway to maximise the benefits of alternative pollinators. Scientists are researching proliferation of the bees through diet.

More on the research can be found here:

<https://www.horticulture.com.au/hort-innovation/news-events/media-releases/2022/buzzworthy-quest-uncovering-stingless-bees-perfect-pollination-cuisine/>

!LAST CHANCE!

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 3 weeks in South Africa hosted by local members, where they will work and visit other nurseries and places of interest in South Africa, including tourist venues, plus attend not just the IPPS Southern African Region Conference but the international conference being held in Johannesburg – this is huge!

You must be:

- over the age of 18
- in the early years of your career
- able to travel to South Africa in Feb/March 2024 and report back at the Australian IPPS Conference.

Your employer must also support this application and your time off work.

If all 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

<http://aus.ipps.org/members/exchange/south-africa-exchange> by **October 31st**

Executive Officer's Report



IPPS Combined Proceedings

Papers submitted by all regions in 2022 are now available for downloading from the International website – www.ipps.org. There is a Paper submitted by William (Bill) Barnes on the IPPS Website: 'A How To' which explains in detail, the significant changes that have been made to the website. This paper will assist members in understanding how to use and navigate around the website. Very interesting reading.

Preparations are in full swing for next year's 2024 CONFERENCE BALLINA – 52nd IPPS Conference, Ballina RSL. 'Propagation – A Breath of Fresh Air' Wednesday 22nd to Saturday 25th May 2024

Make a note of this date in your diary and I look forward to seeing more members next year in Ballina 2024.

Registration forms, along with information, will be available shortly on the international website: www.ipps.org

Contact Details

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 your telephone provider recently, *please* remember to forward your new email address to me at pam@ipps.org.au

Pam Berryman

IPPS Australian Region Board for 2022/2023

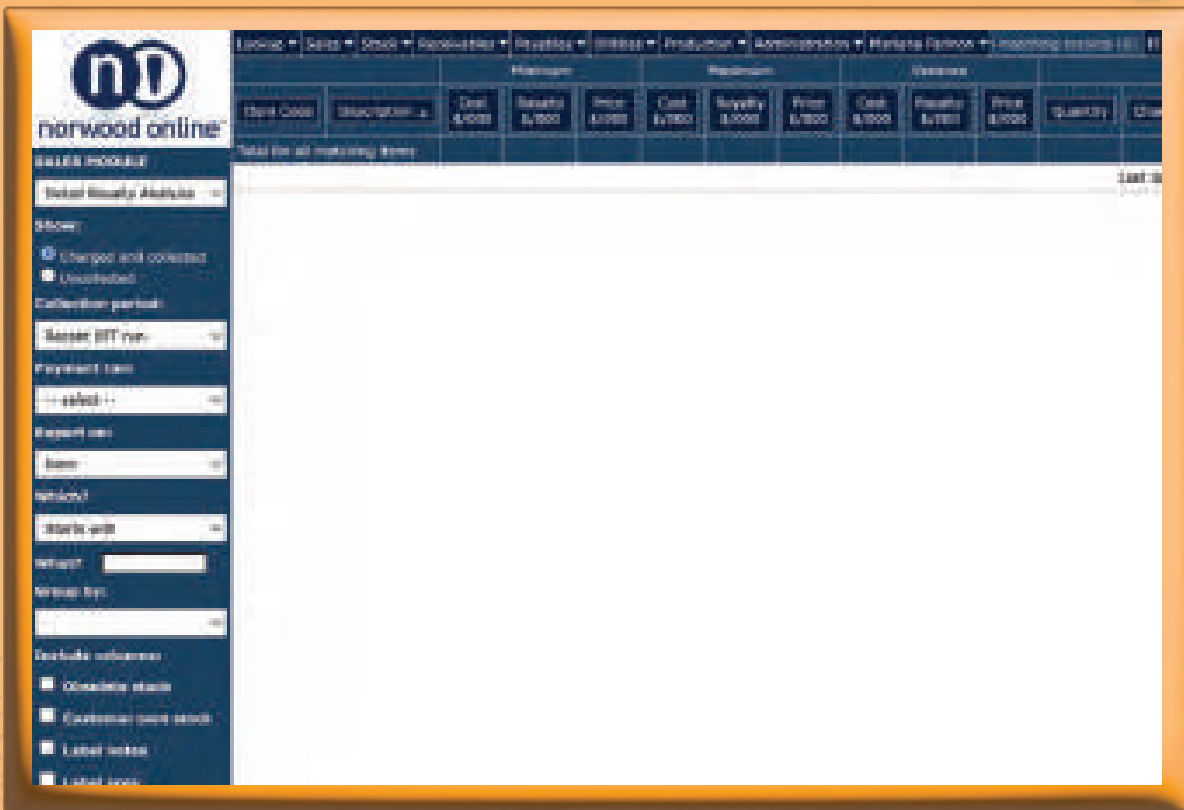
President:	Bruce Higgs	bruce.higgs@bigpond.com
1st Vice President:	Clive Larkman	larkman@larkmannurseries.com.au
2nd Vice President:	Ray Parker	ray@parkersplace.com.au
International Director	John Messina	johnmessina30@gmail.com
Alt. International Director:	Tony VanderStaay	tvanders@westlandnurseries.com.au
Treasurer	James Burnett	jab342000@gmail.com
Awards Committee	Ray Doherty	ray@azaleagrove.com.au
Area Meetings	Puthiyarambil Josekutty	josekutty964@gmail.com
Membership Committee	David Hancock	david@naturalarea.com.au
	Karen Weger	karenw1979@bigpond.com
	Dermot Molloy	Dermot.molloy@rbg.vic.gov.au
	Peter Waugh	peterwaugh1841@gmail.com
CEO	Pam Berryman (07) 38299767	pam@ipps.org.au

2022 Sponsors



royalties online™

40HP



Manage Royalties Online stress free.



Royalties Online

10

Patented online royalty collection system displays the details of any royalties charged and collected for you for any given period.

Let us help you manage your plant royalties.

Detailed analysis of label sales, royalties collected and charged over any given period.

Update your own label restrictions online.

Check stock on hand, work ongoing in production, and label print runs.