



International Plant Propagators' Society Australian Region - Newsletter Spring 2009 - No: 23

Sustainability

Sustainability is a word that we are often bombarded with. What is it about and what are the implications for horticulture and more specifically plant propagators?

One definition of sustainability from Wikipedia is ... "the ability of an ecosystem to maintain ecological processes, functions, biodiversity and productivity into the future". As human populations have increased natural ecosystems have declined, having a negative impact on everything. We are told that we are currently living unsustainably. So what can we as plant propagators do about this if we take it seriously?

You could investigate growing plants in biodegradable pots, as Ramm Botanicals showed at the recent NGINA Green Expo Sydney (GES) at Rosehill. Or we could try some of the soil improver displayed by Debco. So how do we put it into practice? You could enrol in a course, maybe at a nearby TAFE to learn more.

At the Tasmanian conference we heard how instead of slow release fertiliser a citrus grower in South America uses bird feathers as a form of slow release fertiliser. Perhaps farmers will be soon using that as well. I wonder what customers would think of feathers visible with their pot plants.

Again for potted plants I wonder about transporting large quantities of pine bark / potting mix across the nation. Maybe we should switch to smaller pots. I really don't like the sound of that, as it would dramatically change how things are done - is not that what this is about.

Perhaps we could be growing hydroponically more like the large tomato and berry growers. Of course there are many more things for us to try such as honey, compost teas, and "organics" and biological controls for pests. Interesting times ...

- Bruce Higgs



Ramm Botanicals display of plants was tremendous for the Spring GES exhibition at Rosehill NSW organised by NGINA. John Nadalutti from Debco showed visitors a different way of selling soil and additives at GES.



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President's Comment

As your President I would advise all members that I aim to ensure that we continue the good work that has been happening in recent years. My predecessors have laid some solid groundwork, which I believe will hold the Australian region in good stead for the foreseeable future, regardless of any global/local downturn.



Many members do not see the work of the board in action but suffice to say that in my time as a board member we have been blessed with some outstanding contributions from the likes of David Cliffe, Greg McPhee and Clive Larkman both in the Australian region and internationally that have seen initiatives such as the 6 pack and the SA exchange come to fruition and become a staple part of IPPS. Encouraging younger members is a key to our future.

Every year there is outstanding contributions done by conference convenors and having organised Brisbane 2006 I know how much work that involves. Fortunately, IPPS Australian region contains many outstanding individuals, which makes it a real honour for me to serve.

The board continues looking into closer relationships with other allied organisations. We have identified that in 2019 potentially there is a clash with hosting the international meeting and joint conference with New Zealand. The board is also considering future conference venues and convenors.

During my Presidency I aim to keep it as business as usual, and continue ensuring that IPPS has a long term future. Notable undertakings will include providing as much support to all board members and their respective portfolios, as well as ensuring that we maintain an excellent ground for mentoring and developing the current and future generations of IPPS members.

I have always been open to advice, so if anyone has any issues/ideas that they believe can be of benefit to members then feel free to contact me on lionelsach@hotmail.com or 0439 401446.

Wishing you all prosperous times ahead.

- Lionel Sach

Executive Comment

Officer's

IPPS Office

Even though the IPPS Office slows down at this time of the year, I have



been busy winding up final reports/outcomes from the Tasmania conference.

Subscriptions

It is very reassuring to see that the Australian Region of IPPS is maintaining their membership numbers as other Regions are experiencing a static or declining membership and are struggling to attract younger members. The Australian Region of IPPS currently has 254 Members.

Members who have joined since the Tasmania conference are:

Mr. Jamieson Alcock	The Diggers Club2 May Street, Shoreman VIC 3916
Mr. Gavin Brown	Norwood Industries 6 Wedgewood Road, Hallam VIC 3803
Mr. Anthony Curnow	N&GIV 24 Maxwell Cres, Bendigo VIC 3550
Mr. David Lullfitz	Plantrite PO Box 944, Hillarys WA 6923
Mr. Nathan Morrison	Maple Grove Nursery 41Twin Rivers Lane, Grove Tasmania 7109
Mr. Gabe Mostafa	Greener Publishing &Media POBox 3153, Eltham VIC 3095
Ms. Robyn Powell	Tupelo Grove Nursery Bradbury Road, Mylor SA 5153
Ms. Cali Salzmann	Royal Botanic Gardens 1000 Ballarto Road, Cranbourne VIC 3977
Mr. Ian Shimmen	Bushland Flora 11 Cormilio Drive, Wandin Nth VIC 3139
Ms. Karen Smith	Hort Journal Australia POBox 422, South Hurstville NSW 2221
Mr. Charles Sweeney	TyTags PO Box 488 Morisset NSW 2264
Mr. Andrew Tayler	Horticultural Creations 1692 Devenish-Wangaratta Rd, Mt. Bruno VIC 3675

Members who have resigned so far in 2009 are;

Sue Alderwood	Business too slow
Robert Bateman	No longer involved in the Industry
Margaret Cooper	No reason listed
John Ellis	Involved with wine industry now
Vic Hartney	No longer active in plant propagation
Kim Menzies	Looking for employment in another industry
Ian Paananen	No reason given
Julie Rowles	No reason given
Danielle Ryan- Gledhill	On maternity leave, might renew next year
Carole & David Scholes	No reason given
Ben Scotts	No longer in Industry
Roger Starling	No longer active, getting past it
Jessica VanderWerff	No longer involved in the Industry
John Zeaiter	Unable to renew membership

Western Australia Conference – 13th to 16th May 2010 *Make a note of this date in your diary.*

Next years conference will be held at the Esplanade Hotel – Marine Terrace, Fremantle.

Theme will be: **'CRADLE OF CREATION'**

Financial

As at 31st July Bank Balance in Cheque Account was: \$109,881.04 (\$620.45 belongs to Editors Account)

Term Deposit – Account No. 9872-20115 - \$10,000 matures December'09 (reinvested at 4.25% pa)

As you can see IPPS is in a solid position despite the global financial crisis.

BAS Statement

BAS Statement for the April to June period was lodged by the appropriate time and payment of \$682 was forwarded.

- Pam Berryman

SOUTH AFRICAN EXCHANGE

Hi, it is 3 months already since our conference and what a great time was had by one and all. Rose, Tony and Sandra did a great job of organizing and entertaining us in Hobart and we now look forward to Perth.

Now I would like to remind you that I have taken on the role of organizing our South African Exchangees. Firstly, I think we should thank Greg McPhee for his initiative in starting this program, and thank him and David Cliffe for their sponsorship over the last three years.

It was a bit hectic leading up to and after the conference with organizing and entertaining the South African Exchangee, Iain Thompson, who you should have met in Hobart. I must say it was a rewarding experience, as Iain was a very nice young man and very appreciative of what we did for him. It was a pleasure to include him in our family for a few days and we learnt a lot about South Africa from Iain. Whilst showing him around our country I saw some territory and nurseries I had not seen before. I would also like to thank Michael Gleeson (Sydney), Sandra Hetherington (Tasmania), Andrew Mathews (Melbourne) and David Cliffe (Narromine) for their help in organizing and entertaining Iain in their areas.

I am now asking for other member's help in the future to show the Exchangees part of our Country and Nurseries. I feel that if we can all participate in different areas, depending where the conference is and what the Exchangees interests are, it will make it a lot easier than it would be for one person. This should cut the costs of accommodation, travel and individual sponsorship and allow the Exchangee to see different parts of our country as well as spend time in a variety of Nurseries. If you think you are able to help in any way you can give me a call or email me at: glendale@selectplants.com.au or expect a phone call from me anyway when the time comes, remembering the conference will be centered in Western Australia next year.

GREAT OPPORTUNITY - FOR YOUNG PROPAGATOR

For the opportunity of a lifetime, it is time to apply for the **South African Exchange Program**.

This was established by Australian IPPS and South Africa IPPS to give young propagators, at the start of their career, the opportunity to gain experience of each others industry and to build a better understanding of each country.

In early 2010 the young propagator chosen will spend approximately 3 weeks in South Africa, hosted by local Nurserymen, where he/she will work and visit other nurseries and places of interest in South Africa, including tourist venues, plus attend their IPPS Conference.

The program as usual is sponsored by Australia and South Africa IPPS. After the trip the chosen propagator will be expected to attend the Australian IPPS Conference in May 2010 to talk about his/her wonderful experience.

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

- You must be over the age of 18 years and just starting your career of propagating and growing plants.
- You must be able to travel to South Africa in March 2010 and attend our May Conference in 2010.
- 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 to Australian IPPS Conference in 2010.

If all of the above suits you and you would like to be hosted (at no cost to you, except spending money) in South Africa to gain great knowledge, experience the lifestyle and great sights of South Africa. Then tell us about your background in Horticulture, including training and work experience and send the application form which is available on the IPPS website www.ipps.org.au by the end of November 2009.

As you read his newsletter Daniel Austin, our Exchangee from T.A.F.E. South Australia has only just arrived home from South Africa. I know he was excited about his 3 week adventure before he left, and I guess now that he has returned he has some stories to tell us about their country, nurseries and conference.

This brings me to the point of reminding you that we need nominations for our 2010 South African

Exchange. Do you know anyone or are you are interested in nominating yourself? The South African Conference will be in Pretoria in March next year, so we need nominations in by November 2009. This is a lifetime experience for you to think about, and we can send you a nomination form if required.

Yours in IPPS, David Ponman.

IPPS on Facebook!

You've probably heard about the Facebook phenomenon. For those who have not, Facebook is a website that lets you connect with friends, co-workers, and others who share similar interests or who have common backgrounds. It's a great way to stay in touch with family, friends and colleagues that you don't see every day.

A couple of IPPS members have been proactive in setting up discussion groups for propagators on Facebook. Brian Maynard (from the Eastern Region) has set up an international group. And our own Dave Parlbly has set up a separate group just for young propagators. Well done Dave!

Both groups are ideal for asking questions to an international audience. And also for sharing your own knowledge with other propagators.

If you are not already a facebook user, becoming one is easy. Just go to www.facebook.com and fill out your name, email address and choose a password. This will allow you access to your own personal profile. To join the IPPS discussion groups, use the search function to look for:

“International Plant Propagator’s Society”

or: “IPPS – Young Propagators”

Once you find the group, click the “Join Group” link and you are ready to start seeking and sharing!



Area Meetings

Can't wait until next years conference?

IPPS is all about seeking and sharing. Not just at conferences but all the year long. Why not organise a meeting in your area. Get a group of your fellow propagators together to see some new technology, discuss current issues, or just get a handle on how your fellow propagators are getting along in these tough times.

IPPS can help you promote your meeting through industry journals and newsletters, get credit towards your ‘CNP certification’ and even provide seed-money to cover tea & biscuits!

If you're thinking about hosting a meeting, email john@sunraysianurseies.com.au to get the ball rolling.

- John Messina

Rod Tallis Award

It is that time of year again when our young propagators need to be nudged and encouraged to apply for this prestigious award.

It is not too late to undertake some short duration project or research that could see some worthy propagator at the start of their career gain an award that they can be proud of and mark the start of a successful career in horticulture.

Past editions of “the propagator” may give some ideas for projects, and help is available if you are unsure about designing an experiment.

All that needs to be done is do the work and submit an application. Contact details for Peter Lewis are on the IPPS website. Don't delay, or you will miss this great opportunity.

If you are a young horticulturalist and would like to be a **6 pack member at next years conference**, then Peter Lewis would also like you to contact him.



Questions and Answers from Hobart

Peter Ollerenshaw from Gavin Brown : What is the best method to get the best method to get high germination of seed in the Correa genus?

We've used the smoked seed method, but it depends on species. Half an hour smoking in a smoke tent has given the best result. Method: build a plastic tent with a rack in it one metre high. Put the seed trays on the rack, and put a five gallon drum with dampened smoking leaves inside and smoke them for half an hour.

Kees Tesselaar - In the flower industry for Dutch Iris bulbs you would have to heat them for a certain length of time to get a sufficient number of flowers for a given size of bulb and given size and planting density. Then they discovered using smoke (30 or 40 or more years ago) that reduced the amount of heat needed. Then they looked at why they used smoke and now they use ethylene gas instead. He was intrigued as why he had not heard of trials of ethylene for plant germination in this region. An IPPS paper was written by Terry Hatch on smoking "way back".

Many of you know that some of the smoke work came from the Kings Park gardens. The suggestion was for a review of smoke and ethylene for the next conference.

Regarding Lomatia sterility, has there been any work on inducing triploidy in other species that have proven weedy, but have desirable qualities in the horticultural industry i.e. to make them sterile?

Clive Larkman; Yes, we funded research at Charles Sturt University which studied lavender hybrid fertility. A tetraploid was produced and seed obtained from back crossing with a diploid to make a sterile triploid with a bigger flower. We are also doing some work with Italian lavender to make it haploid (sterile). A Dutch company guarantees to give you tetraploid and triploid forms of a plant for 1000euro.

What is the current practice in respect of post harvest disinfestation of plant material prior to cutting and sticking? John Lawrence

We use calcium hypochlorite (pool chlorine), and hose them down when cutting material is brought into the cool room.

Does anyone bench graft Pome fruit and grow in containers, why or why not.

Ian Tolley said it will become more the norm. Rotation in the ground appears to be ineffective in reducing pests.

Has any one experience in encouraging buds on rooted cuttings that break away? We can root Quisqualis (tropical creeper) about 60% but only 10% of them develop into plants. Ed Bunker

Quisqualis is a tropical creeper, highly fragrant, the flower is burgundy fading to pink. It grows to about 3

metres high & 4 metres wide, but it can be grown as a shrub. We have been given a white form. We can get 60 % of cuttings to root (two nodes under the ground and 3 above give the best result) using liquid hormone. These are potted on into 100 mm pots from tubes. The ones that break away sometimes come from below the soil and sometimes from the nodes above. We have looked at cuttings before we plant them to make sure the eyes are alive (green under the scale). They finally drop all their leaves and die.

Suggestions included using a high dose of a phosphorous based water soluble fertilizer while in the cutting tray. Or try honey as a nutrient source and stimulant. Ian said they had a problem like that with citrus where 1/3 shoot straight away, 1/3 in 6 to 8 weeks and 1/3 next autumn. There was no real solution, with the University of Adelaide they injected IAA and NAA into buds that did not shoot. It is very tedious. Hormone imbalance appears to be the cause. Ken Davey mentioned that in Palmerston North years ago they worked on getting grape seedlings to flower early. They changed a tendril to a flower with grapes by treating with IAA and NAA on cotton wool tied onto the stem over the bud.

We look forward to a brief report on Ed's trials next year.

Luke Dent from Ray Parker; Of the 170 mangroves that lived did you select the best 10 to grow on for future propagation?

It was just a trial out in the field so no material for motherstock was retained. I will try to get the rights to collect seed for future work.

Does James Wood use smoke as one of his pre-germination tests? Kees Tesselaar

James Wood What research have you undertaken with breaking dormancy using chemical initiation? Kingsley Dixon RBGP isolated butenylide as the chemical of 4,000 in smoke water that initiates germination, that research was sold to a large international company. Have you used this or do you have any further information on butenylide? John Downing

We do use smoke solutions in testing some of our collections.

This is most commonly used in testing of our native Ericaceae but has been trialed with other species from environments where we know fire is an important recruitment opportunity. At the Tasmanian Seed Conservation Centre we are using dilution's of the commercial product Regen 2000 for our smoke treatments.

So far we haven't found any species that has an absolute requirement for smoke. Some species show a slight improvement in germination with smoke, but others have shown inhibitory effects.

We talk briefly about what is currently understood about smoke treatments on our page on overcoming physiological dormancy <http://www.rtbg.tas.gov.au/index.aspx?base=329> - which is currently not a lot!

On this page we briefly mention the butenolide (aka karrikinolide) isolated by the science team at Kings Park. As far as I am aware there is no large scale commercial production of this compound as yet and it is very difficult and expensive to get hold of.

If or when this does become more widely available we will almost certainly adopt it as it will give our studies far more control and therefore reproducible results. The chemical composition of current smoke products is variable from one batch to another and that is widely recognised by seed scientists.

However it would be surprising to find that one compound is the “magic bullet” for smoke responsive species. The triggering of germination by butenolide has been shown in unrelated plant species suggesting that the trait has evolved several times. It is possible this response is similar to that shown by obligate root parasites like *Orobanche* and *Striga* that require complex organic compounds to stimulate germination (see- <http://www.rtbg.tas.gov.au/index.aspx?base=287>). If this is the case then other species may take their cue from other compounds produce in the combustion of green material, rather than butenolide, and the role of a standard smoke product may still be necessary.

All of this, of course, is just speculation. The identification of butenolide is important and will be crucial in bringing some light to this matter. Hopefully a better understanding of the scale and variation of the smoke response will emerge in the next few decades.

*James Wood Seed Bank Co-ordinator
Tasmanian Seed Conservation Centre
Royal Tasmanian Botanical Gardens
Queens Domain 7000 TASMANIA*

*How do plants take up nutrients through the foliage?
Jack Latti*

Ian Tolley: In the early days we started spraying micro-nutrients onto citrus leaves, but results were erratic. Plant physiologists suggested that the size of particles need to relate to the size of stomates. Once chelating became commonplace the uptake of nutrients through leaves became predictable and reliable. In citrus spraying “zinc” onto leaves at ½ to ¾ growth stage (while leaves are active and growing) is very effective.

Greg Neighbour: Leaves carry dust and colloidal material, and chelating works as they do not react as nutrients will in the soil. Uptake is through the higher salt concentration outside of the leaf and occurs across the cell wall, and not necessarily through stomates. In juvenile leaves there is a lot less waxy cuticle so there is a lot less problem accessing nutrients. Chelating works

by stopping ions binding to dusts. Urea does it the same way.

Some nutrients pass through osmosis and others by transpiration with the water. That is why calcium is hard to get into the plant. When the leaves are wet the stomates are open and nutrients can pass through. In hot weather when plants are dry then you are wasting your time.

Graeme Platt commented that foliar feeding of cuttings is a disaster, as it sucks the life out of a cutting through osmotic pressure. Once rooted they take off.

To Nicola Rochester from Bruce Higgs: I believe that incorporating a small amount of CRF in media provides nutrients for young rooted plants from cuttings to grow. How was the time to rooting observed, or were all plants removed at the same time and perhaps some species in the reported trials were on the propagation bench too long. Can you comment?

Each species was harvested separately at a time determined best by the experience of the propagator (Janice Houghton). It had to be a compromise between waiting for good establishment in both trays which consisted of lifting up trays looking underneath & digging out the odd cutting.

Clive Larkman: With sporadic rooting of plants you can get too much difference between rooted cuttings. With *Grevilleas* we use CRF to reduce transplant shock.

*Does anyone have recommendations and experience with preparation of a seedling mix (raising veggie plants) using organic products to deliver nutrients?
Eddie Welsh*

Kevin Handreck: It depends how organic you want to be, here iron sulphate and soluble inorganics cover the trace elements, for phosphorus a bit of chook manure will cover the remainder of nutrient needs. Potassium is then all right with a short term crop. You need a source of nitrogen, and blood or feather meal (hard to get in Australia) and guano extracts are good natural sources.

Ian Tolley: At the International Citrus Society Congress in China we were told that Klaus Pedesky in Peru uses chicken feathers to fertilise potted citrus trees for sale in nine months. Feathers on analysis are 10% nitrogen and little feathers break down quickly while others break down slowly.

Are there any Australian members who collect seed by being hung below a helicopter similar to Graeme Platt's collection method for Kauri seed?

This is one of the questions remaining unanswered, do you have a reply? This one brings some interesting images to my mind. What would Workcover think of this?

Q & A from Tasmania will be continued in the next issue of the newsletter



Profile

Lionel Sach

It is my pleasure to have been able to ask my regular questions to our new Australian President. Lionel has held many senior positions in the nursery industry. To have access to share with someone like Lionel is a privilege that all members have.

What are the things that you feel have created or made your standing in the industry?

I am passionate about our industry and am always keen to do my bit to help the industry and those working in it progress. Be it helping a new member learn the basics of growing plants to assisting in problem solving with an experienced colleague I enjoy the work I do. Over the years I have brought a few plants from overseas into the industry and I am currently working with some native flora - all of which has created challenges and opportunities! I would like to think that I have helped add to the professionalism within the industry but that is for others to judge.

What do you feel you have to share with others (particularly new members) of the IPPS regarding "the world of propagation".

I have been fortunate to have had a wide background in propagation and have been lucky enough to be involved with propagating a number of seed and cutting raised lines. I am a great believer in getting a good start and to this end I believe that sometimes not enough attention is given to stock plant management (particularly nutrition, environmental conditioning, plant health) prior to taking cuttings and seed storage and pre-sowing treatments. Within the IPPS there is a wealth of experience and knowledge and I would encourage all new members take advantage of this - many a good idea comes from a one off comment at conference on a field day or at the bar!

What are the significant things that you have personally gained through IPPS membership?

Mateship - discussing industry issues with like minded people. IPPS membership gives you the sense that you are not alone in all the challenges that faces the industry and that via the IPPS network there is a host of good

ideas that might help you progress further. Personally, I gain satisfaction from seeing how some of the members have progressed over a period of time and seeing the industry develop as a whole. I have a thirst for knowledge and IPPS is a good medium to tap into and helps keep you current with latest trends. That said, sometimes it helps you just confirm you are on track and helps eliminates any doubts. Every conference helps me think about the business and I can honestly say I normally have 3 or 4 points I take home with me - sometimes it is not what the speaker has directly said as it just leads you to think what if I try this. The success of IPPS is the network of "Seeking and sharing" and long may it last for the good of all who participate.

Controlled Release Fertilisers Today

I have been warned that growers are passionate about the controlled release fertiliser (CRF) that they use. How long is it since you looked at the label and material that you are currently using?

We really are fortunate to have a material such as controlled release fertiliser that releases more nutrient in warmer weather when plants are strongly growing and less in winter when demand is reduced. Blending materials allows rapid boost of nutrient or delayed release to prolong pot life to match climatic conditions. The nature of the coating to achieve this is interesting but it is the performance I want to focus on here.

Over the last few years there have been a number of changes to CRF's that you may not be aware of. Products that were not blends of prills years ago may now be so. These reformulated products are often more expensive to manufacture. Some of the changes are due to:

- Reformulated products to meet SSAN regulations concerning ammonium nitrate as a potential explosive. These required formulated products containing less than 45% ammonium nitrate. The result has been slightly lower nitrogen levels for some products, and more ammonium ion or urea in others potentially leading to higher soil acidity.
- There are some concerns about potassium nitrate also arising that may affect us in the future.



Top picture
Nutricote Total
17.6-2.9-6.9
below right
Osmocote Plus
16-1.3-9.1
below left
APEX Native
21-0.86-9.1

Certainly this is important if you are a hydroponics grower mixing your own fertiliser for fertigation.

- It seems more CRFs are also blends now with coated prills of different composition, so that the NPK ratio looks about the same as it used to be when it was a uniform product. Blended products may result in uneven growth due to separation and settling of different components. If all of the prills are not uniform in colour then it is probably a blend. There may however be colour variation due to coating thickness or “release activator”, and are blends of prills of differing longevity. New ranges of products with different and controlled release properties better suited to particular growing conditions e.g. Osmocote Exact, some Nutricote products and a new APEX range.
- New products to the Australian market such as Basacote.

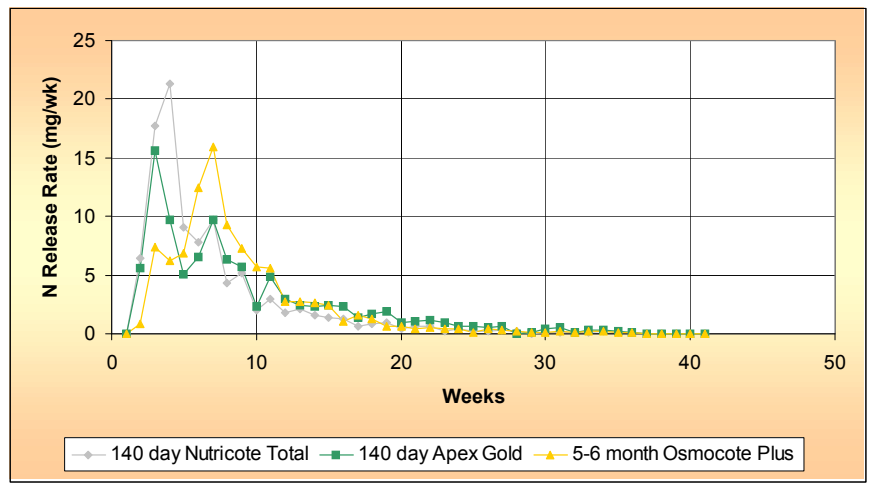
So how do you know which one to choose?

I prefer the approach of “here are the species that I grow and here are the climatic conditions / season that they grow in”, then select the fertiliser and trial it. This approach can be very confusing with the large number of CRFs available today, especially when you reach the decision that you need a different blend of some of these depending on the season you will be growing in. If intending using some in cutting media then you especially need to be aware of the pitfalls that some CRFs could produce.

Reference to the chapter on fertilizer practice in nurseries in Kevin Handreck and Neil Black’s book “Growing Media” is a good start. As a general rule the amount of nitrogen (N) coming from nitrate should be about the same or slightly less than that from ammonium salts (and urea if present). It is said that nitrates favour root development and ammonium stem development. Ammonium ions are acidic and resultant plants may have lower concentrations of calcium, magnesium and potassium compared with nitrate fed plants.

Treat nitrogen from urea as for ammonium ion. Urea is hydrolysed to ammonia (gas) over a few days by the enzyme urease present in many soil microorganisms. This becomes ammonium ion which can be absorbed by plants. You may be wasting your money if you use CRF with large amounts of urea as a top dress.

CRF is best added to the mix or dibbled into the pot a few centimetres down (as long as the plant has a well developed root system). Top dressing is the least desirable method as you often do not have good contact with soil for optimum moisture contact, it encourages weeds and losses may result if the container falls over.



Nitrogen release rate of different CRFs incubated at 40 °C from D.O. Huett and B. J. Cogel Commun. Soil Sc. Plant Anal. 31:959, 2000

In “Growing Media” the reported P/N ratios for a number of species determined from elemental leaf analysis range from around 0.03 for Protea to up to 0.28 for Phalaenopsis orchids. Commonly the P/N ratio is in the range of 6 to 15%, so you really don’t need a high P fertilizer. The K/N ratios also range from 0.5 to 1.5 with an average of 1. Allowing for some nitrogen draw-down of our potting mix, that means the ideal NPK ratio for a CRF suited to particular species would be something like: Protea 16:0.5:10, Cyclamens and Carnations 16:1.2:10, Grevilleas and Cymbidium orchids 16:1.5:10, Bostern Fern 16:2:10. Values for micronutrients can also be similarly determined. Values for a number of species are available on the internet, otherwise you may want to have an assay done at a laboratory.

You may need to blend your CRF to achieve this as the supplier may not have the correct elemental ratio. A further complication is that the P/N ratio from leaf analysis may not directly translate to a fertiliser composition. A plant may have much lower efficiency in P uptake which can also be immobilised in the soil more than nitrogen.

So we know what roughly our hypothetical CRF should look like, what happens when we put it in a pot? From the figure from D. Huett and B. Cogels work you can see that there are differences between different products, but the rate of N release gradually increased to a peak over the first weeks to month or so and then gradually decreased. Potassium (K) is released at a similar to slightly lower rate and P is very slowly released at first and only reaches a rate of about 60% to eventually 80% of N when nutrients are nearly depleted. This may now be different with reformulated products using mono ammonium phosphate.

The amount released depends the type of prill, soil / media temperature in the pot, and available moisture (soil needs to be at least damp). Of course irrigation needs to be controlled so you are not leaching nutrient

from the media before the plant can access it. Temperature appears to affect durability by about 5% per degree Celsius. So it comes down to knowing what the temperature is in our soil during the growing period. This can be readily daily checked by recording readings with a thermometer.

So how much of our hypothetical fertiliser should we use? A 6 month CRF product should release about 80% of nutrient over 6 months (about 26 weeks) at 21 °C. If we assume that the temperature does not change much over 6 months, and that we grow a plant for 5 months with about 1 month of residual fertiliser. From “Growing Media” most small plants in pots need 50 to 100 mg N per week. Assuming a woody shrub requiring 50 mg per week, the total N needed is 1300 mg (50 x 26). For our hypothetical CRF with 16% N used in a pot holding 1.4 litres; for each 1 g/L (kg/m³) of dosage there is:

$$1.4 \times 16/100 \times 1000 = 224 \text{ mg N per pot}$$

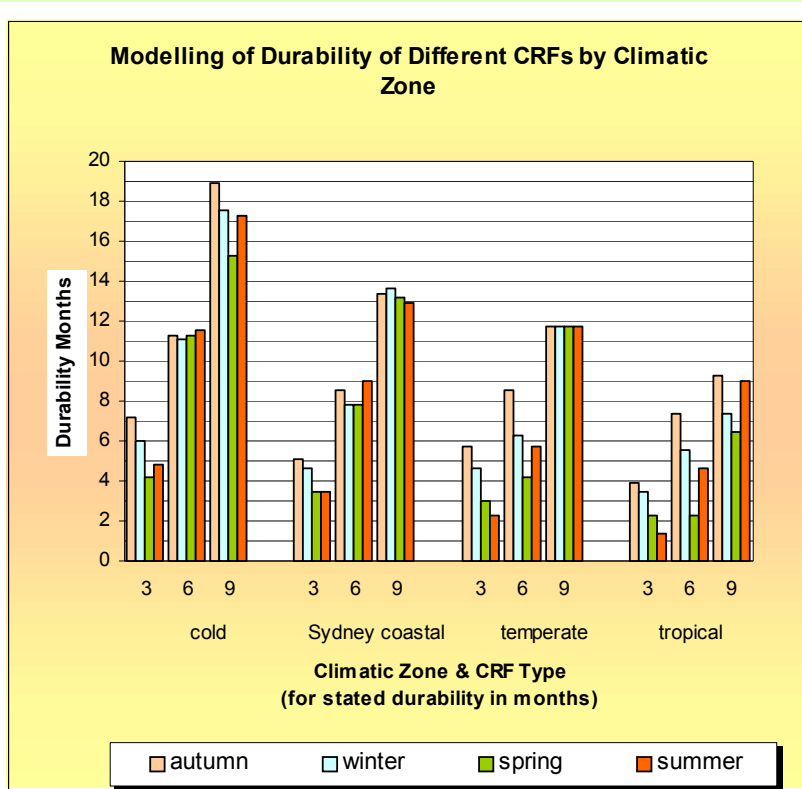
The total released over 26 weeks is $224 \times 80\% = 179\text{mg N}$

Assuming 11mg N is used by the mix and 10% in drainage water then for each gram of CRF there is 150mg available, but we need 1300mg of N. Therefore we need $1300/150 = 8.7 \text{ g}$ of the CRF in each 1.4 litre pot (6.2kg/m³). If the average temperature was 10 °C hotter you probably should consider using a 12 month slow release product. Without proper control of irrigation you could also be flushing out nutrients.

The problem is of course that temperature varies with the season. So how much and what fertiliser do you use to achieve optimum growing conditions? Some growers in cool climates use a 3 month slow release blend in winter and a 6 or 9 month fertiliser package in spring - summer. But how long will the fertiliser last under these conditions and how much to use per cubic metre of soil?

A simple approach is to model mean temperatures for your area as in the figure above. This yields some surprising but understandable results. Three month fertilisers may release up to 6 months if mixed into soil in autumn in cold climates, but last little more than a month if incorporated in summer in the tropics. Spring would seem to be a bad time to use a 6 month slow release fertiliser in temperate areas, you may need to look at a slower release fertiliser. Otherwise in a temperate zone you could dose at a lower rate and be prepared to dibble / top-dress in four months time.

Of course you would need to validate this for your area with studies of soil nutrient leachate and plant growth rate - perhaps something we will hear about at a future conference.



Check when reading specifications that you are comparing products on a like basis. Some NPK ratios are not the metric (elemental) value. Nutricote fertiliser durability is based on 25 °C instead of 21 °C used by many other manufacturers, so you could adjust the Nutricote durability figures by about 20% more to compare them (e.g. 140 day product should be similar to a 5-6 month slow release from others).

If all of this looks too complicated then probably the simple way of selecting a fertiliser for use is to ask your supplier for advice. Depending on their experience, training and background, and the resources of their company they may suggest the best product for your application without you undertaking long trials. Be careful of the approach of “here is a bag of fertiliser, now this is how you could use it”.

Cut flower growers and others fertigate. I hope this article makes nutrient selection easier for you, I know I had to think about it and learnt some things. What is your experience? Please share it by sending me a brief note.

- Bruce Higgs

I would like to acknowledge conversations and contributions from Kevin Handreck, Greg Neighbour, David Jakobs, Brad Howell and David Ponman and publications of Scotts Australia Pty Ltd, Yates Australia and BASF Australia Ltd. that have assisted in the writing of this article.



Challenge

Are you technologically challenged? Does that computer on the desk in the office have you baffled?

Well I would like to offer another challenge. Do you know about Facebook the social network site?

Well it would appear that IPPS does and there are now, not one, but two Facebook pages. One has been set up by the Eastern Region stalwart Brian Maynard and the second by our own young Australian region member David Parlby.

I believe these pages offer a new way of getting out and doing a bit of "Seeking and Sharing". So get in front your computer and type one or both of these addresses into the address bar on your Internet Explorer page, have a look and make a contribution.

www.facebook.com/home.php#/group.php?gid=66437703938&ref=ts

www.facebook.com/ext/share.php?sid=101199387956&h=DnlW_&u=cWvGJ

- Michael Gleeson

Coming Events and News

IPPS Regional Meetings (in case you are travelling)

- **Western Region (USA and Canada)** Sept. 30 - Oct. 4 San Diego
- **Eastern Region, North America** October 14 - 17 Cleveland, OH
- **Southern Region of North America** Oct. 25 - 27 Biloxi, Mississippi

Newsletter Editors Comment

So far this year the feature articles have looked at materials that allied traders bring to horticulture. For the next few issues I would like to focus on plants and propagation.

If you have something to do with tissue culture in Australia then please drop me a note, as I would like to cover this in the next newsletter. It does not matter if you are a specialist laboratory supplying plants, a user, a training facility or have a laboratory as part of your business. There are many things that we all can learn from those practising micro propagation.

For those of you who are waiting on answers, the remainder of questions from the Q&A forum at conference will be published in the next edition of the newsletter. Some answers to your questions are proving difficult to obtain and there are some questions that I will be asking everyone to consider and supply an answer to.

Don't forget that this newsletter and most past copies are also available on the IPPS website at www.ipps.org.au, and pass your extra copy of the newsletter around at work

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