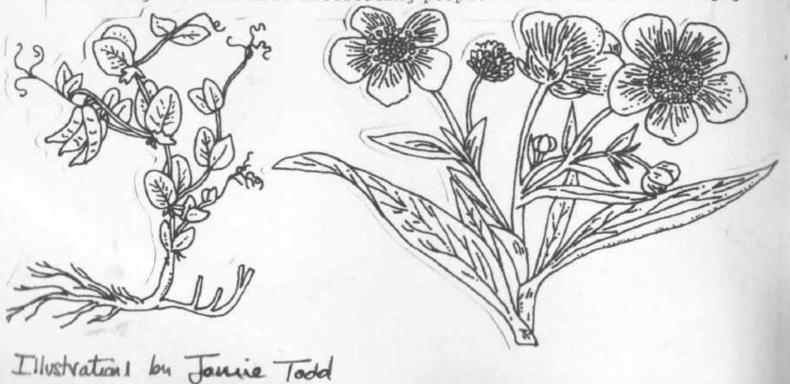


Working abroad and observing the outdoors occupied my early twenties, until I began a BSc in Environmental Science focussing on ecology and soil microbiology. This was the beginning of almost a decade of perpetual studentship, pursuing scientific fact behind the everyday, moving between ecology, biochemistry, horticulture, propagation and sustainability. I am now Assistant Nursery Manager at Great Dixter Nursery where I continue to observe and learn from all that surrounds me. Follow me @sophiecharlottecook

Ellie

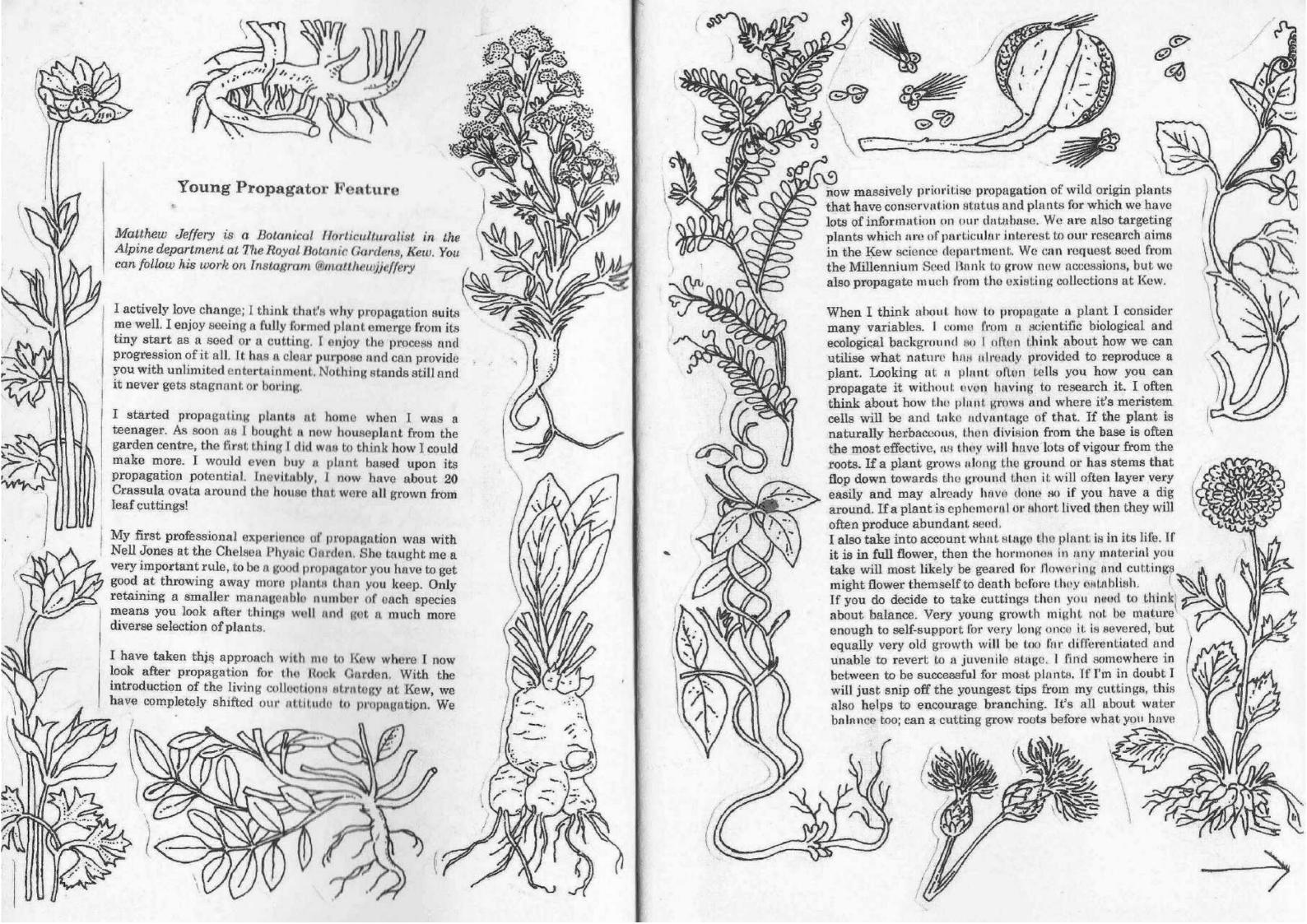
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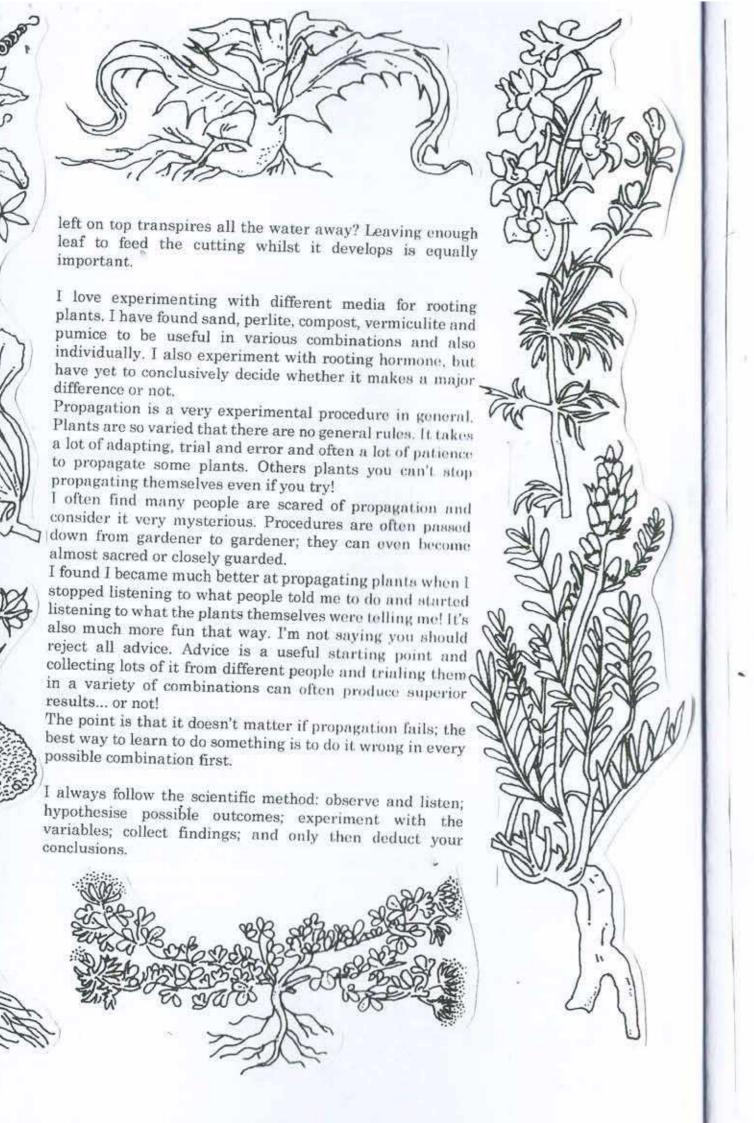
I started my professional career in nursery work when I got the position of Nursery trainee at Great Dixter. I then went on to work at De Hessenhof, got a studentship at RBG Kew and now work at Crûg Farm. These have been some of the best years of my life as I am constantly learning everyday and meeting the most interesting people. It's why I'm excited about YPS so I can keep learning and meet more interesting people. Follow me @elliekatepay



Young Propagators Society Manifesto

This Society was formed with three intentions; to aid the dissemination of propagation knowledge through the generations; to encourage more young horticulturalists into propagation and nursery manship roles; and to inspire learning of all areas of the natural Our focus is on smaller soale but special: and Scientific knowledge of propagation Along Side the YPS Zire, we will also have a Facebook group for discussions on propagation, and we hope to have an annual Symposium of workshops 8 talks





Propagation Basics

Every issue, I will be explaining some of the basics of propagation and plant science, to encourage readers to gain a greater understanding of the processes involved.

Internodal vs nodal cuttings

The point at which each leaf joins the stem is a node. The length of stem in-between each of these nodes is the internode (fig 1).

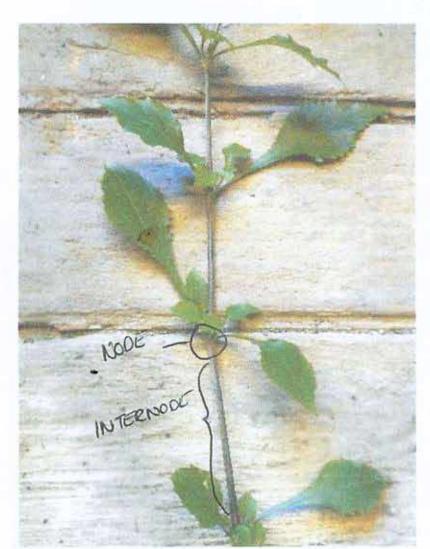
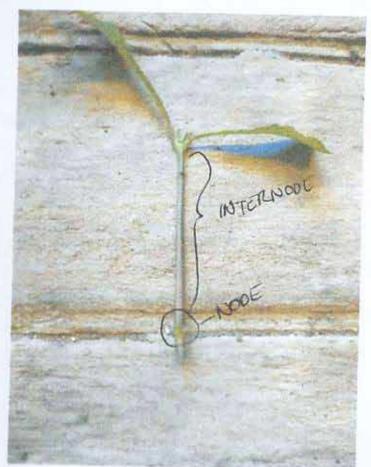


Figure 1: Node and internode on Strobilanthes flexicaulis.

At each node, there is a greater amount of plant growth regulators which aid rooting, such as auxin. So for many plants it is recommended that 'nodal' cutting is taken to ensure greater success.





This means that a cut is made above a node at the top of the cutting which will carry the foliage for photosynthesis, and the bottom cut is made below a node (with as many nodes and internodes in-between these points as it needed for the correct length of the cutting) (fig 2).

Figure 2: Nodal cutting.

If cuttings are being taken of a plant that is very easy to root, such as Salvia or Fuchsia, they can be rooted from the internode. This involves making the bottom cut of the cutting above a node (fig 3).

This is particularly useful when there is a shortage of material, so you can get more cuttings from the material available. However if lots of material is available, it's usually best to take nodal cuttings to ensure a greater success.

Happy cuttings!

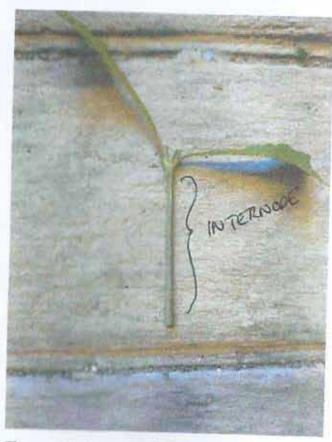


Figure 3: Internodal cutting.

This exciting article is an extract from Graeme Sait's blog on the Nutri-tech Solutions website who are world leaders in discovering a viable alternative to extractive, chemical agriculture. Many of the approaches he writes about are applicable to horticulture and propagation.

Trichoderma - the Multi-Tasking Marvel

When you understand the profound importance of each member of the subterranean workforce, it is hard to choose a favourite. However, there is one problem-solving organism that offers so many benefits, it is hard not to get excited. Trichoderma is a versatile activist that can improve multiple processes in your growing enterprise. In fact, these organisms have such powerhouse potential in food production, informed Governments are encouraging their inclusion in planting programs, Universities have rallied to research their benefits and farmers have relished the impressive field results. Let's find out what all the fuss is about.

The Top Ten Roles of Trichoderma

There are many species and strains of this commonly-occurring, filamentous fungi and although there can be some variation in focus amongst the family members, they all provide similar services to the soil, our crops and to other members of the microbe community. Trichoderma offer ten standout contributions, including:

Humus creation – Trichoderma is a voracious cellulose-digesting fungi, which means that it can efficiently convert fibrous organic matter (like crop residues or potting mix) into stable humus. This is the form of organic matter that can remain in the soil (and keep carbon out of the atmosphere) for over 35 years. Most soils are seriously lacking cellulose-digesting fungi and this is of tremendous importance. When we understand that humus creation is effectively carbon sequestration, the game changes. If we can build rather than burn organic matter, then we can effectively reverse global warming. This is the essence of the French "4 in 1000" initiative. Their scientists have demonstrated that if we incentivise farmers to strive to build 0.4% organic matter (4 in 1000) each year, then farmers can literally save the day. All strains of Trichoderma are of value in this planet saving service.

Parasitising disease organisms – Trichoderma attack and feed upon a wide range of destructive disease organisms. These include, but are not limited to, Rhizoctonia, Phytophthora, Pythium, Xanthomonas, Fusarium, Verticillium, Botrytis, Alternaria, Sclerotinia, and Pseudomonas syringae. Trichoderma can use remote sensing to locate the pathogen. It then coils around the disease organism and releases chitinase to ensure ease of hyphal penetration, before consuming the host.

Out-competing pathogens - Trichoderma have proven to be one of the most successful rhizosphere (root zone) inhabitants. For example, there can be as



many as 10,000 culturable propagules of Trichoderma in a single gram of healthy, tropical soil. The reasons for the success of this species is related to their high reproductive capacity, their resilience in unfavourable conditions, their capacity to modify their surrounds, their efficiency in nutrient utilisation and their antagonism to pathogenic fungi. Part of their competitive advantage relates to their capacity to chelate and utilise available iron in the root zone. Pathogens also have a strong requirement for iron and are much less effective in securing this mineral. They die off when Trichoderma gobble limited iron reserves. There are several papers quantifying the control of Pythium in this manner.

Stimulating root and shoot growth – Trichoderma initially release cellulase and proteolytic enzymes to break down the outer cells of the root and enable root colonisation. When effectively inhabiting that plant root, Trichoderma has easy access to the flood of glucose exuding from those roots. However, it is not a free lunch. These friendly fungi release a suite of secondary metabolites to support their host. These include auxin-like hormones that provide a profound effect upon both root and shoot growth. Astute nursery operators have realised that the addition of Trichoderma to potting mix will boost both growth and resilience in their plant products.

Boosting plant immunity – in the face of the initial root invasion by Trichoderma, the plant responds by walling off the perceived attack site. This response limits the invader to the outer few layers of root cells, but it also triggers a measurable increase in phytoalexins within the plant. Phytoalexins are equivalent in plants to antibodies in the human immune system. The higher their number, the greater the capacity of the plant to protect itself. The good news here is that anything that boosts immunity also boosts yield and, hence, Trichoderma inocula are renowned yield builders.

Solubilising phosphate – the acidic exudates of this beneficial fungi break the bond between locked-up calcium and phosphate and deliver both minerals to the host plant. The fungal hyphae also provide more surface area to access phosphorus, the most immobile of all minerals. This biological release of locked-up phosphorus partly explains the yield response following the use of a stubble-digesting inoculum. Trichoderma are typically included in these cellulose-digesting blends.

Improving plant nutrient uptake – there is a marked and easily measurable increase in nutrient uptake that is also associated with these acidic exudates. The pH of the root zone seriously impacts nutrient availability. Minerals are most available at a pH of 6.4 and this productive acidity is ensured when Trichoderma are flourishing on the roots. Research has revealed increased uptake of copper, iron and manganese, along with calcium and phosphorus. There is also a little-understood link to improved nitrogen efficiency. This is the

reason that the Philippine Department of Agriculture has recently begun promoting the inclusion of Trichoderma with NPK starter fertilisers.

Facilitating signaling – this is a dynamic and fascinating field of research where we are rapidly realising that there is much more happening between microbes and plants than was ever envisaged. The exchange and perception of signals drives a dynamic ongoing communication between plant roots and microorganisms. Many plant processes, including immune responses are impacted by signaling. There is also evidence that some of the secondary metabolites produced by Trichoderma may serve as signaling molecules.

Production of secondary metabolites – Trichoderma is a prolific producer of these substances. In fact, over 300 have been identified to date. The secondary metabolites released by Trichoderma in this symbiotic relationship include peptides, terpenoids, pyrones and indolic-derived compounds. These metabolites boost multiple plant processes, including immunity and vigour.

Producing antibiotics – Trichoderma has a three-pronged impact on pathogens. The organism can switch its enzyme production depending on the available food. It can produce cellulase if there is an abundance of fibrous organic matter. When pathogens are present, the enzyme exudates become chitinase, which is used to breakdown the hyphae of disease organisms. This fast-growing fungi competes with disease organisms and triggers an immune response in the plant, which also make life more difficult for the undesirables. Trichoderma can also produce antibiotics to further challenge the invaders.

Trichoderma is also a great additive when propagating cuttings. When rooting cuttings in water, the addition of Trichoderma powder can sponsor an explosion of new roots that can be much more pronounced than that seen with the use of rooting hormones.

Trichoderma is also an ideal seed dressing. There is some evidence of increased germination but, more importantly, the new seedling can be protected from damping off diseases like Pythium. The ongoing synergistic relation between the plant and this protective fungi can then help you achieve a problem-free season.

Many thanks to Graeme Sait for granting us permission to publish excerpts of his blog more can be found on the Nutrition Matter's website at blog.nutri-tech.com.au

a fine country fox you are full fattish scarlet what evolutionary folly fired your fur / a klaxon in the green

my lumbering gait |
sets you off |
a flare |
on sheep-gnawed hills too
bare for refuge |
you can't resist to urn and look
if I had a gun you'd be

gone

you come back later
to the farmer's field |
sloping away from my garden
to tug at the rook-pecked ewe
by the fence |
raise my binoculars
to the flickering red

look at me square and run to the scrub gone again

I've cost you a meal

I wish I could invite you in for supper to apologise serve you meat at my table ask you to teach me the lore of the land

but surely you would laugh at me your teeth and tongue wolfishly

quivering-

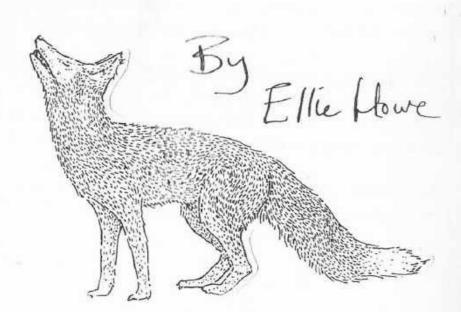
at my soft belly weak nose my pots and pans blankets and my books

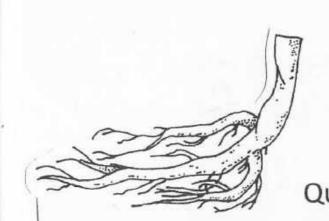
you'd want your meat raw | still bloody-warm with | hard-won life

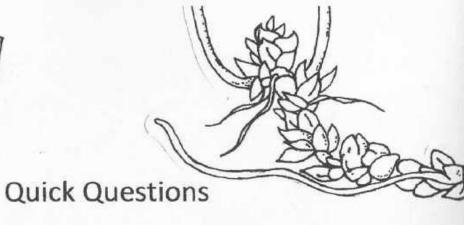
you would wink past waggling your brush sassily all the way to the door

and step into the dark new-mooned lane bay your eldritch bark

belonging to it







Ed Brown runs Cotswold Garden Nursery alongside his father and mother Bob and Diana. Based in the Cotswolds, this nursery has a reputation for reliable and unusual perennials.

What is your most useful tool?

Ed: Any sharp instrument - scissors, spade, axe, marlinspike, chainsaw.

What is your most important piece of advice for successful cuttings?

Ed – For a cutting to be successful, it has to say 'take me, take me, take me', be that semi-ripe or hardwood.

Name your technique for cleaning seeds.

Ed – The best technique for cleaning seeds 15 winnowing. We also fester them in containers of water to rot off the seed coating to imitate birds' intestines. Never, never dry seed; you might as well not bother collecting it.

What medium do you use for cuttings?

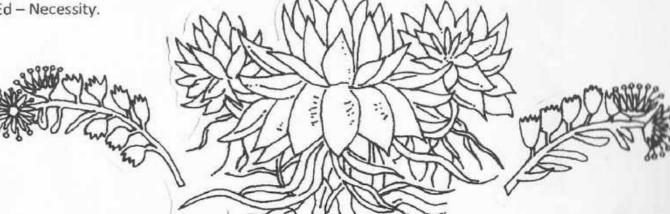
Ed – We use peat as our growing medium for cuttings with added vermiculite. This is a natural product from mining which is very good for holding water and nutrients while still allowing drainage and is environmentally friendly. We sterilise our cutting compost using a microwave oven.

Your most proud moment as a propagator.

Ed – Building a specific building for propagating plants in. It has a heated floor and a computer controlled mist unit with quadruple glazed walls and ceiling. It's a Keder barn.

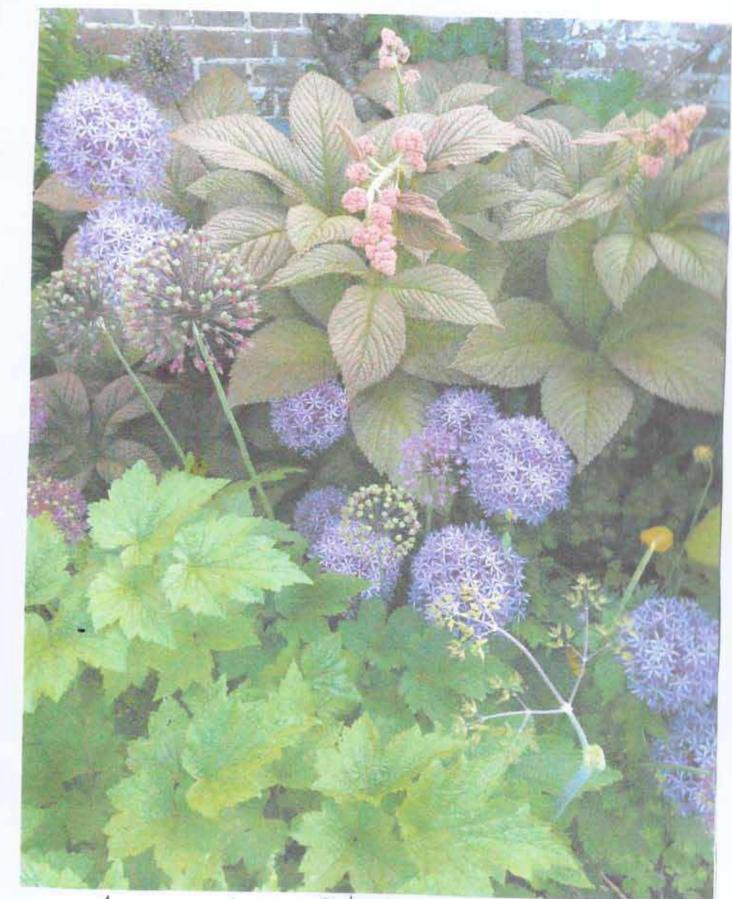
How did you get in to propagation?

Ed – Necessity.



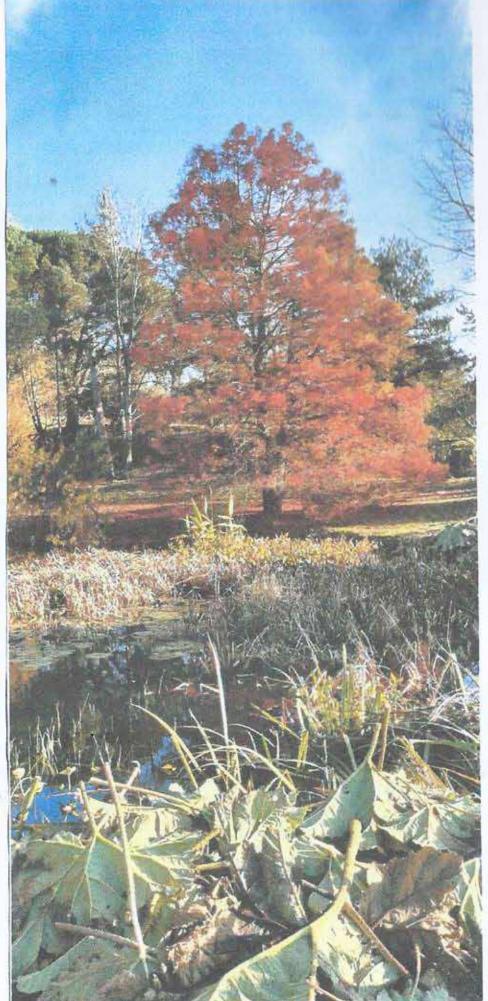


Tetrapanoor papyrifer



Aneurone, Allin, Rodgersia





Taxodiun & Gunnera



An Interview By Ellie Pay



Marina Christopher is a propagator and nurserywoman running Phoenix Perennials nursery in Hampshire. After 30 years in the industry she has a wealth of knowledge to share. Marina trained as a botanist at Bangor university which has influenced her propagation skills and interest in native plants for pollinators. At the moment she works closely with Hortus Loci producing plants for Chelsea flower show gardens where her plants have won multiple awards.



I met Marina at Great Dixter plant fair where I heard her talk about pollinators and umbellifers; I learnt so much from that 15 minute talk and have done every time I speak with her.

So I decided to organise a visit to Phoenix perennials to walk around the nursery and chat about how she does things.

"This is my seed compost; it's one third of my grit and you know I'm completely fussy about my grit. It's a 1-3 mm without fine, a lot of sand is less than 1-3 mm so it can actually stick your compost together. So with this it opens it out because it's quite rounded - it means that water is round every side of the stone so that the roots can take the water from the surface area of this.

Then I have one third of a loam based

compost and one third of a proprietary seed compost, which I find if you use that on it's own you get a kind of skin on it - the roots just don't go down. There's also no weight and you can get loads of algae growing on it, rather than with my mix it's very well drained, so the roots go down.

"I use 9cm pots for all my seeds, aiming for a minimum of 100 seeds germinating. I fill up to nursery line then use a plonker to gently tamp down the compost so you have a flat surface, it's very important as if you use your hands you get little rows where your fingers have made indents for the seed to fall into. So if you have a flat surface your likely to get an even distribution of seedlings. With label stuck in and seed sown I then put about one quarter of an inch of my grit on top. It doesn't matter what seed it is, even with fine seed the light will go through, it also holds the seed in place so you can water from

top and gives you an interface which is always damp, holding that humidity. It's also sterile ensuring less weed growth. I use another 9cm pots to sift the grit through the drainage holes which means I get a very even coverage. Usually I get 300-500 seedlings in a pot, everything germinates fine in this grit.

"I prick out my seedlings when they are very small, they take off much quicker and I prick them out up to their necks, as they are perennials you can place them in soil right up to the first true leaves.

"I use a pot with a flat bottom because you can slip your seedlings neatly out of the pot, where the roots have run straight to the bottom. Lying on its side, I then get a knife and chop one third from the top so the seedlings roots are the size I want. It may sound odd to cut the new roots of a young plant, but compared to what usually happens, where the roots are wriggled round to fit into the plug which causes most of the roots to die as they've been broken or bruised and whilst they are dying the plant is not able to take up water. But if you cut them, which does seem very unkind to cut, then the plant is able to take up water immediately and seem to 'take' much quicker.

"One of the reasons I do everything so small is because they haven't got a lot of top growth to look after, and so you can chop the bottom off to allow it to grow more roots. As I think about it as a botanist you want to have an iceberg, you want to have % underground and % above. Unfortunately the public want it all on top, that's why I'm picky about who I sell to because I care that my plants survive.

"When I give Hortus Loci my plants in 9cm pots and they pot them into a 5ltr pot, the plants will take to it in a week because of the amount of roots my plants will have. They have a warm climate with good polytunnels which aids in this so that can be done all year round - but the main growing time for plants is March-end of July/August. But I find sowing seeds in July and August is really good, you tend to get almost instant germination.

"I used to do a lot of autumn sowing, but do a lot less now as in my climate it's very damp so can be hit and miss. And I can't do it in January and February as it's usually freezing so the poor things just freeze.

"I collect seeds in situ, so I walk up to the plant in seed with a dry, clean glass bowl with a written label already in it as glass doesn't get static electricity like plastic does. I like to use glass instead of ceramic so I can see through it. I only collect as many seeds as I think I should need to keep the rest on the plant for the birds. I clean the seeds by holding the bowl in my hand and waiting until the wind is behind me, then tip the bowl rather like you're swilling some brandy and blow gently but enough. In theory the chaff should be lighter so it should be taken away with the wind. Usually you can clean on site more or less as much as you need to. "I then pour the seed into little labelled envelopes, standing them up with their seals open and leave them in my shed overnight so that any little bugs and beasties can crawl out safely.

"Most of my seed is collected on site. Berried seeds are different, you have to clean the pulp off the seed as it will have inhibitors in them, especially red berries as they are seen by birds; birds see red, blue and green, bees see ultraviolet, blue and green. A lot of berries are red so the bird swallows it, then it goes through the gut - the inhibitors stop

the bird from digesting the seed, just the flesh on the outside - so it then is left in a nice little package of fertilizer, poo.

"Grasses are the only occasion where I touch the seed, as you know they are ripe when you tug them and they come off easily. More prickly things like Eryngium or hooked seeds like Orlaya I sometimes use tweezers. With Lamiaceae they have little nutlets, you can squash the calyx and 4 little nutlets pop out, so it's a joy to collect them.

"The seed need to be kept in paper as if they are in plastic they will sweat. But once the seed are dry and move easily in the envelope then I put them in a glassine bag which has a wax coating to keep some moisture, or a grip seal bag which also keeps moisture, and keep them in the dark. They are never kept in the light - if they are they'll sweat.

"The main reason seeds that you buy don't germinate is because they have been dried out too much. Commercially they tend to use a machine like the lottery balls which blows air through them so the chaff that's lighter goes up and the seed drops down, but if you dry too much the embryo will die. So I tell people if they have bought seed and don't succeed it may be due to that."

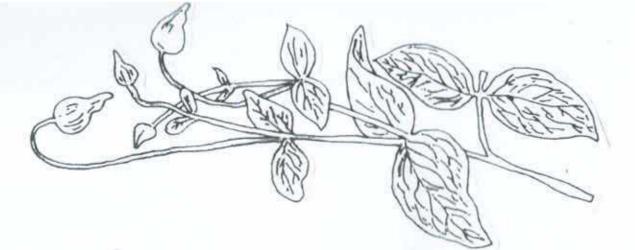
"Where my plants stand is on four inches of grit. Though it is well draining the surface will dry out meaning the necks of the plant isn't sitting wet but just below that surface will be damp. I have Silphiums that are 8-10 foot in four inches of grit perfectly happily. They don't need soil as such, they do need nutrients but mainly they need something to anchor themselves. I find it odd that us Brits love feeding our plants, most plants don't need it as much as we give it. I don't feel that we necessarily need to feed, most groundwaters should have enough nutrients and minerals and essentially roots are for stabilising the plant so it doesn't fall over. I don't feed my plants after they've been potted.



"I do very small cuttings; when I'm taking cuttings I always try to get down to the node so I leave the plant looking okay. If you leave a bit jutting out then it's going to rot, always leave a plant looking good. I grab a grip seal bag, put a label in, take the cuttings, throw them in then sprinkle with water You can put them in the fridge; one time when I was very busy I left cuttings in the fridge for

three weeks, so they definitely last longer than you might suspect. I use a safety razor blade because they are cheap and for sterile reasons if you go from one plant to another, especially bulbs, it's easy to transfer virus'. I take them inside and using a chopping

>



board cut across the node. I know people tend to do the cut under the node but I think there's more chance of rot going up to the node, and the nodes are the most important bit because the nodes have the highest amount of hormone for root and shoot development. So cutting straight through the node is what makes sense to me. I would then take two leaves off and the flower if you've got one if I can I just pull off the leaves. If they don't want to then I cut them using little



snips, if you're quite firm about it then they can just pluck off. I do tend to reduce highly on the tops as I'm in a really gritty mix. I bring it right up to the second node so I have very small cuttings, I find they root easier than more woody ones. If your cuttings look fine but haven't rooted then you find they have callused, take a bit of sandpaper to the callus and it should root within a week."

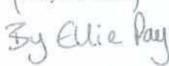
I want to thank Marina for giving me the time and us the information to produce this. I'm always very inspired by her as I think it's very important to look after the natural balance in commercial horticulture and her willingness to teach, she is a very special person and is key in the gardening world today.





Naturalis Historia

(Pliny the Elder)





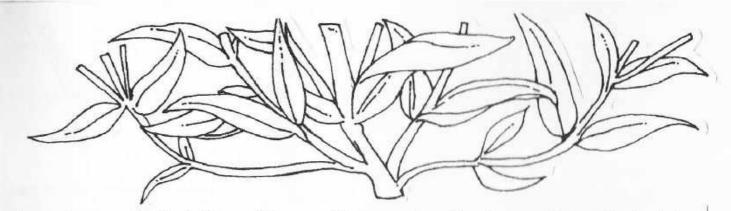
From 1769-1859 there was a man called Alexander von Humboldt who we may know by the numerous plants and animals named after him as humboldtii. He was an extraordinary polymath, who shaped the way humans thought about nature as a whole.

His time in the jungles of South America and peaks of the Andes brought him to the idea that across the world there are isomthermes, bands across the globe connected by the same climatic temperatures. His ideas created biogeography as we now know it. He was able to connect everything he had witnessed as he travelled all around Europe studying zoology, botany, geochemistry, astronomy, and the latter disproved animal electricity (galvanism) which historically led to Alessandro Volta to make the battery and Mary Shelley to write Frankenstein. Humboldt was influenced by Erasmus Darwin's poems (Charles' grandad), his professor Johann Friedrich Blumenbach, Captain James Cook's and Louis Antoine de Bougainville's adventures, and he himself also influenced many people. Charles Darwin read Humboldt's published papers and books which aided in his gathering of evidence for natural selection, Samuel Taylor Coleridge was influenced in his poetry, John Muir "Father of the national parks" and Ernst

Haeckel, who came up with the term ecology were both influenced by Humboldt.

This was a very important time for the infusion of science and art, it being during the enlightenment era. Humboldt worked alongside great names like Johann Wolfgang von Goethe, which some believe the main character of his famous play 'Faust' may be based on Humboldt.

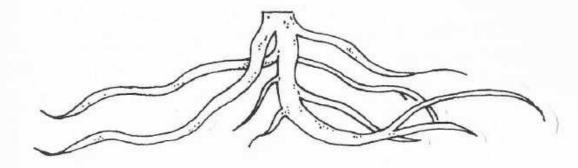
When he was in Los Llanos in northwestern South America, he heard from the locals that there were electric eels in the shallow pools which excited him very much, as after he'd been experimenting with galvanism he had not had a chance to experiment with an actual electric animal. So Humboldt told the village that he wanted some to experiment on. The locals were scared of the powerful electric shocks that could travel up the wet fishing line and probably kill the men if fished normally. So they came up with an idea to gather wild horses from the plains and drive them into the pool using up the eels strength on the horses. The men encircled the pool to keep the horses from fleeing as the eels, scared from the upchurning of the mud they were resting in, rose up and electrified the horses bellies. It was a horrible scene of two amazing forces writhing, splashing and screaming until two horses drowned and the rest were let out when the men could see the eels had tired. They were able to then fish them out safely as the eels had used up their strength and could not shock anymore. This experience served as half the experiment for Humboldt, to watch the full strength of these animals and



how they used it in defence. He was able to retrieve five large eels to take back to dissect. This experience came many years after he was so obsessed by the idea of animal electricity that he experimented every evening as he travelled as a mining surveyor. During these times he would set out his instruments and prod the veins and muscles of dead frogs with different metals and chemicals. He then wanted to see how it affected live beings so he experimented on himself; cutting incisions in his arms he would drip different chemicals into the wounds and note every detail of reaction.

The effort he put into all of his studies are very admirable even if equally gruesome. With all of his writings and discussions with other scientists, we as humans were able to jump into an understanding of the world and how it is so very interlinked much faster than without him I'm sure.

This is just one story of his adventures our 50 years of striving for knowledge. If you are interested in reading more about Humboldt and his scientific findings then I highly recommend 'The Invention of Nature' by Andrea Wulf.



An introduction to propagation by established nursery- and plantsman Joe Sharman

Propagation is essentially making more of any plant you have by whatever means possible. There are several reasons why we would want to do this. As a nurseryman I want to increase a plant in order to sell it, after all, I have to make a living. As a gardener with a large garden I often want to increase something before planting it to get a large an area as possible and make a better show. These first two work together when it becomes obvious that my garden doubles as an ornamental stock bed. I add a third element when I claim that a lot of the plants I grow are rare, scare or unusual and often (too often) I find that I'm given the last plant of something to rescue. I don't always succeed but at least I try to photograph it before it departs! The aim when I get a very rare plant is to increase it to ensure its survival before returning some to the donor, sharing it with other plantsmen and then, of course, selling it. Some plants are initially unique to me due my continuous breeding and selecting of new plants. They need to be bulked up and assessed to see if they are worth continuing with.

Propagation is working with the plant's natural ability to reproduce itself. Nothing you try to propagate wants to die, it wants to live, and all you are doing is understanding exactly what the plant needs and then providing that to the best of your abilities to help the plant live. Each plant is subtly different in what it requires but fortunately for us they are fairly tolerant of slightly less than perfect conditions. This allows us to divide plants up into groups based on the propagation methods that will work for that species or cultivar. The more you understand, the more you become able to look at a plant you have never seen before and know how and when to propagate it. A good propagator observes what a plant does and how it grows, they then experiment with different methods to work out exactly what the plant needs. Good record keeping is essential to know what you did that either worked or didn't work. In the process you learn and gain experience to help you in the future.

I can appear to be either casual or brutal in the way that I handle or treat plants but I know what the plant will tolerate and have confidence in my ability to grow. Sometimes people use the term green-fingered to describe gardeners who

seem to succeed with everything, but it takes years of practise and a big compost heap to get there. I always claim to have killed more plants than anyone else, but I did start early! I like nothing more than someone telling me 'you can't' propagate a plant in a particular way to spur me on to prove them wrong. Sometimes I can't figure out to do it but persist until I have to admit defeat. If you start to understand all the essentials and get them in place then you will succeed. One of the key things to understand is the concept of water balance within the plant. A plant strives to be in balance and will do what it takes to regain its sense of balance. There is a balance between the amount of root in proportion to leaf and top. The plant has to be able to take in enough water to support the leaves, stems, flowers and storage organs. If we reduce the top then there is more root in proportion to shoot and the plant will grow fast to restore its balance. If we repeatedly remove the top, then the root system will reduce in size to be in balance. If we remove or damage the roots by digging up and moving then there will be too much top for the plant to support. It will wilt and die if we don't either remove some top to restore the balance or water it. Generally, we should do both. Understanding exactly how much top to remove is critical. When we propagate something, we are deliberately changing the balance of the plant, the plant then compensates by growing new roots or shoots to make up what is missing.

What are the essential factors to consider? I would list them as principally; timing, air, water, compost/medium, humidity, light, temperature, gravity, nutrients and hormones. No one of them takes precedence and all of them are necessary to varying degrees. Understanding for which plant which of the factors is more important is one of the things you will come to learn. Always choose the best, healthiest, most true to type stock to propagate.

The methods are very variable in detail, but break down as;

Cuttings – hardwood, softwood, semi-ripe, ripe, mallet, basal, nodal, internodal, tip, leaf, and root. All modified by varying degrees of drying out, wounding, and hormones where necessary.

Division - scales, twinscales, bulbils.

Seeds/spores

Grafting - root grating, budding, T-chip or patch.

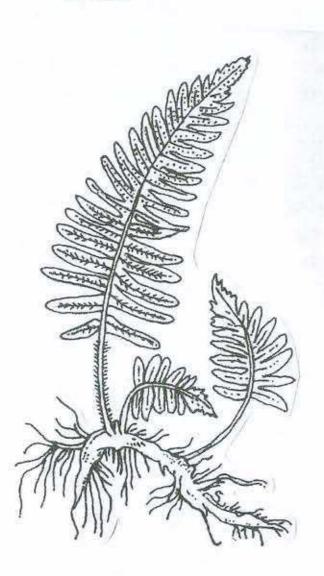
Layering - air layering, stooling, stolons, Irishman's cuttings.

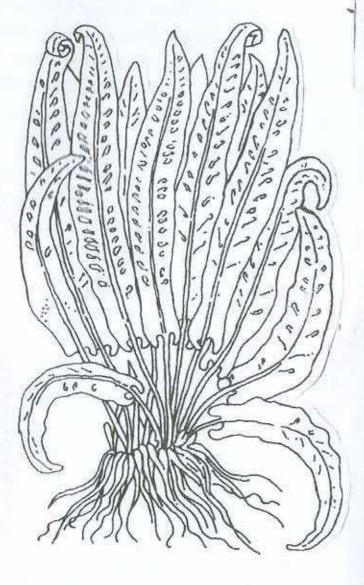
Coring, scooping, cross-cutting. Micropropagation.

Other essentials are a reasonably sized, dedicated, tidy, clean work space. A good selection of tools and equipment, but always a knife, secateurs, pencil, labels, notebook.

Propagation is a huge subject and hopefully the articles in this publication will start to cover some of the methods and plant varieties in detail and build up into an invaluable resource.

Joe Sharman





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