Association of Societies for Growing Australian Plants

GREVILLEA STUDY GROUP

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Newsletter Nº 56

NW SOUTH WALES Chapter

Sunday August 13 - 9.30 a.m.

Venue: Grevillea Park, Bulli

Topic: Discussion of Study Group Aims and Goals. Or How to Spend Our Money. Peter Abel will address the meeting re proposed R&D Project with University of Sydney.

Sunday, September 10 - 9.30 a.m.

Venue: Home of Gordon & Carol Meiklejohn, 25 Wild Oaks Rd., The Oaks

Phone: 9657 1317

Topic: An exciting new Grevillea garden.

Sunday, October 15 9.30 a.m.

Venue: Home of Gloria and Gordon Brooks, 138 Ridgecrop Dr., Castle Hill

Phone: 9680 4951

Topic: Mulches for Successful Cultivation - Garden Visit.

November 4-10 Fred Rogers Seminar and Field Trips.

QUEENSLAND REGION

MEETINGS FOR 2000: *All meetings commence at 9.30 am unless otherwise notified. For further information contact Merv. Hodge on (07) 5546 3322.*

SATURDAY, 30th JULY

Venue: Home of Ray & Gwen Norris, 3 Timbertop Court, Capalaba, 4157.

Phone: (07) 3206 4226

Subject: Pruning

SUNDAY, 24th SEPTEMBER

Venue: Home of Denis Cox & Jan Glazebrook 87 Daintree Drive, Logan Village, 4207

Phone: (07) 5546 8590

Subject: Propagation by seed

SUNDAY, 29th OCTOBER

Venue: Home of Peter & Jill Turnbull 39 Jellicoe Street, Toowoomba, 4350

Phone: (07) 4632 0772

Subject: Grevilleas for different conditions

MORE DATES INSIDE

VICTORIAN CHAPTER

Sunday August 6th - Garden Visits
(note correction to address listed in Feb NL #55)

Visit two gardens east of Mt Dandenong and explore bushland in the area to look for Grevillea alpina. Meet 10 a.m. at "Cheveley Park" (Melway 308 F6) home of Merele Webb, 2425 Healesville-Koo-Wee-Rup Rd Yellingbo 5964 8288 - parking near stables 1 km along drive. (Travel 5.3 km south toward Cockatoo from Yellingbo Central at Parslows Rd corner - Melway 306 A8). Lunch at Silvan Dam, then proceed to Katandra Gardens of Bob and Dot O'Neill, 49 Hunter Rd, (correction) Wandin North 5964 4523 (Melway 121C3). Contact Max McDowall - (03) 9850 3411 if you intend participating.

November 4th-10th:

The FJC Rogers Seminar at Ararat (Nov 4-5), Grampians Grevillea Tour (November 6) and Grevillea Crawl in Central Victoria (Nov 7-10).

Details of Registration in February GSG Newsletter #55.

There are still 20 places available at the Saturday dinner venue, and 50 places available for the Seminar and Saturday night speaker. Alternative dinner arrangements are being made for the 30 places unable to be accommodated at the official venue.

Please contact Phil and Jane Williams (03) 5356 6250 in Pomonal - (Neil Marriott is on tour in the Great Victoria Desert till mid-August)

INSIDE

EVOLUTION

Grevillea and Hakea - the origins

Email from Max McDowall *14th August,1999*

Dear Peter,

I would be interested to know who is working on the DNA cladistic analysis of grevillea and hakea and what their current findings show - in particular which groups of grevilleas would have to be placed in other genera to make hakea and the remaining grevilleas monophyletic.

We have included these considerations as talking points for the grevillea workshop at Neil's in September, and it would be good to have some more recent and more specific information. I am aware that Andrew Douglas's findings suggested that the grevillea groups with regular perianth branch up the cladistic tree prior to the hakea-grevillea (s.s.) split.

Haegi and the Barkers in Flora of Australia consider Hakea to be a good monophyletic genus according to their cladistic analysis of anatomical characters. However, in their key, they do not use the dichotomy of regular vs zygomorphic perianth. The lissocarpha group of 4 spp corresponds to Bentham's Sectio Manglesioides and has regular (actinomorphic) flowers splitting to base to four distinct tepals, but so do many other groups, whereas the verrucosa group has an irregular (zygomorphic) perianth.

Thus it would seem likely that the regular perianth is a more primitive state, and the development of the zygomorphic perianth could then have occurred independently in Hakea and Grevillea after the split, in response to bird feeding/pollination.

I propose that the crucial event in the evolution of Hakea was a saltative change in which the seed capsule became lignified (woody) and delayed dehiscence until the plant/branch died or was burned. A plausible genetic mechanism is as follows.

Various specific transcription factors (protein molecules) are responsible for switching on expression of whole banks of genes in each kind of plant tissue at crucial times during development. Occasionally genes get duplicated and the duplicate can sometimes be transposed to other parts of the chromosome, where they can sometimes come under the control of other transcription factors.

Let us use the name Woody for the gene which codes for the transcription factor which switches on the "woodiness" genes for making enzymes which the plant cells use to lay down woody tissue. Suppose in our proposed mutant progenitor (i.e. a single individual plant) of Hakea lineage Woody became duplicated during spermatogenesis or oogenesis and, in a later generation in another individual plant, the duplicate copy of Woody became transposed to a section of chromosome among the genes which are normally switched on during seed capsule development. We shall call this transposed copy of Woody "WoodyFruit"

Woody itself is not expressed in the seed capsule - only in the older stems, but in the mutant progenitor with the duplicated transposed gene, Woodyfruit gets expressed when the seed capsule maturation genes get turned on (by their own specific transcription factor) and then switches on the woodiness genes which enable the capsule tissues to proliferate and produce lignin and other woody substances.

The effects of Woodyfruit would (!) be dominant, and the fixation of the gene would be dependent on the survival advantage that woody capsules might confer of the particular plant in which this gene emerged, or rather on the viability of its F1 progeny. The F2 generation would then include the Mendelian proportion (25%) of homozygous progeny of F1 with two copies of Woodyfruit per cell which would compete with the heterozygotes for survival, and ultimately displace them.

This is only one of a number of possible scenarios which one can envisage for the sudden emergence of woody capsules in a particular line of Proteaceae progenitors of grevillea-hakea. Gradual emergence makes no sense in this case.

Email from Max McDowall *16th August 1999*

Dear Peter,

The mind of Bolingbroke has changed about the likely origin of Hakea. The general mechanism of gene duplication and transposition is a well-recognised process of evolution - otherwise chromosome numbers and gene locations would be similar among different genera, families or even orders, but it is not the simplest or the most probable cause of the origin of Hakea.

On pondering the question of the ontogeny of woodiness in plant tissues, I realise that it lignification sometimes only begins several months after the tissue first formed. Thus it may only be necessary for a mutation to repress the abscission of the ripening follicle to provide sufficient time for lignification of the follicle to begin.

Maturation of the seed presumably depends on the dehydration processes initiated by closure of the vascular tissues linking the follicle to the stem of the plant.

If the expression of the enzymes responsible for the initiation of this abscission process is blocked by absence or inactivation of the abscission transcription factor, or of the loss or reduced activity of a key enzyme in the process, then abscission will not proceed in that individual plant bearing the responsible mutation. (Transcription factors are proteins which can bind to one or more specific sites on the chromosome(s) and initiate transcription of an adjacent suite of genes involved in a particular metabolic pathway, tissue or organ development They arise in cells and tissues in an orderly sequence during differentiation and development of those cells of tissues).

Bear in mind, heritable mutations always arise in the germ tissue, not in the somatic tissue. There are several kinds of mutations - point mutations which involve a substitution of a single nucleotide base in chromosomal DNA - deletion mutations where several-many consecutive nucleotide bases are deleted from DNA - gene duplication - full or partial contiguous insertion of a stretch of DNA which is a copy of an adjacent stretch - transposition of a stretch of DNA from one chromosome or locus to another

Chromosomal genes have various functions, acting as - structural genes coding for specific proteins e.g. an enzyme, a transcription factor or a structural protein. Point mutations generally lead to substitution of a single amino acid for another in the protein sequence. Certain point mutations can lead to premature termination of RNA transcription, leading to shorter protein chains lacking the wild-type terminal segment. - sites of initiation of messenger RNA transcription. (proteins are made on messenger RNA which is a sort of copy of the original gene) - sites for the binding of various repressors or activators of RNA transcription. - sites for chromosomal replication, pairing and mitosis preceding cell division.

EVOLUTION (continued)

In higher organisms, genes are separated by long stretches of DNA which may have none of these functions and may be evolutionary scaffolding, or the remnants of long defunct genes. There are also internal stretches of DNA which while transcribed into RNA do not get translated into protein structure.

Getting back to our protohakea which we last left sitting in the middle of the bush - we know that the original mutation left us with a plant which gave rise to viable offspring which had some survival advantage in its local habitat over its wild-type cousins.

A point mutation in a particular gene coding for a key enzyme in the abscission process could conceivably result in suppression of follicle abscission, but would be more likely just to retard it or be neutral in its effect. (Because of the considerable redundancy in the nucleotide code, some so-called 'neutral' mutations in DNA sequence of structural genes can leave the amino acid sequence of the resulting protein unchanged or lead to substitution by a closely related amino acid with little change in activity of the protein).

A point mutation in a gene coding for the transcription factor protein which is involved in activation and expression of the suite of genes involved in the abscission process, or a point mutation of the DNA-binding site for this transcription factor could also retard or block the expression of the suite of genes. Point mutations can occasionally be reversed in later generations, just as further point mutations can be accumulated resulting in further genetic variation.

Deletion mutations are generally irreversible, so that deletion of part or all of the gene coding for a crucial factor (transcription factor or enzyme) would set our protohakea on the pathway of speciation, without the prospect of turning back.

Sometimes in a viable evolutionary line, deletion mutations may follow point mutations in the same gene, stabilising the offspring, and increasing its viability relative to its sisters and cousins by suppressing the synthesis of unwanted enzymes, and so reducing the metabolic load on the tissues.

Thus, during evolution, primates have lost the ability to make vitamin C, because its abundance in their diet presumably allowed deletion of genes, controlling the vitamin C biosynthetic pathway, to be be inherited without disadvantage to the survival of the organism. Because genes are linked on chromosomes, other (advantageous) mutations nearby on the same chromosome can sometimes enable the fixation in the population of such 'quasi-neutral' deletions.

Thus it is likely that in our protohakea, whatever the initial cause of the loss of abscission of the follicle, the change was ultimately fixed by deletion of all or part of the genes involved in the abscission process.

I hope that these ideas are of interest to you and are reasonably comprehensible.

Regards, Max

Email from Dr. Peter Weston *March 2000*

Dear Peter,

Max seems to have swallowed a genetics textbook! He might be right about the genetics of "woody fruitedness" in Hakea, or he might not. But as far as reconstructing the phylogeny of the Grevilleeae is concerned, his explanation is unnecessary.

We know that Hakea is characterised by evolutionary novelties , or "synapomorphies" in cladistic jargon (secondary growth in the fruit wall, non-abscission of the fruit). We can say this as a result of comparing all members of the Grevilleeae (Grevillea, Hakea and Finschia) with their closest relatives ("outgroups" in cladistic jargon): Buckinghamia (their closest relative or "sister group" in cladistic jargon) and Opisthiolepis (the closest relative of Grevilleeae + Buckinghamia). Neither Buckinghamia nor Opisthiolepis have secondary growth in the fruit wall, nor non-abscission of the fruit, and in this respect they resemble Grevillea and Finschia.

Furthermore, there are no morphological characters that would group some but not all Hakea species to any "non Hakeas". Therefore, we can tentatively conclude that Hakea is monophyletic and that secondary growth in the fruit wall and non-abscission of the fruit evolved in Hakea's ancestral lineage. The genetic/developmental basis of the transformation from non-woody to woody fruit is irrelevant to this argument.

Grevillea, on the other hand, is not characterised by any evolutionary novelties not shared with Hakea and Finschia. There is thus no morphological evidence for Grevillea being monophyletic. Our very preliminary analyses based on chloroplast DNA sequences suggest that Finschia is most closely related to a particular subgroup in Grevillea. Furthermore, they also suggest the possibility that Hakea too may be nested within Grevillea. This would render Grevillea "polyphyletic", which would be a taxonomic problem.

A couple of other comments on Max's speculations:

"heritable mutations always arise in the germ tissue, not in the somatic tissue." That is so in animals but not in plants, in which there is no separate "germ cell lineage".

"Various specific transcription factors (protein molecules) are responsible for switching on expression of whole banks of genes in each kind of plant tissue at crucial times during development." But transcription factors are themselves gene products that are "turned on" by a variety of environmental cues, both internal and external. Talk of "the gene for woody fruits (or whatever)" is somewhat misleading, because development is a cascade of processes, involving genes, gene products, other cellular components AND other stimuli.

"Gradual emergence makes no sense in this case." I think he means "I have not yet thought of a scenario invoking gradual emergence".

Cheers, Peter

QUEENSLAND REGION DATES for 2000 (continued)

SUNDAY, 26th NOVEMBER

Venue: Home of Ralph & Margaret Hickling
16 Mary Smokes Creek, Kilcoy, 4515
Phone: (07) 5497 2056
Subject: fertilizers

Sunday, 28th JANUARY 2001

Venue: Home of Merv & Olwyn Hodge
81-89 Loganview Rd, Logan Reserve
Phone: (07) 5546 3322
Subject: Propagation by grafting

TOPICS FOR DISCUSSION

The Big Picture

Ray Brown

Some thoughts for the chapters to discuss at their meetings.

What we do well:

1. Collect, distribute, grow and botanically describe Grevillea species from the wild.
2. Produce a good newsletter.
3. Co-ordinate a good plant sale (NSW) that creates broad interest.
4. Hold educationally interesting and popular (esp. Queensland) meetings regularly and reliably.
5. Propagate by cutting and graft Grevillea species.
6. Organise productive field trips.

What we do not do well:

1. Do not involve sufficient members as active participants.
2. Do not produce or know how to produce hybrids in a planned breeding programme.
3. Have not resolved the problem of spontaneous abortion in some graft combinations.
4. Not involved in any recovery plans for Grevillea species.
5. Do not conduct trials on propagation by seed or test smoke germination methods.
6. Are not conducting a programme on the identification of species/hybrids suitable for small home gardens.
7. Trialling Grevillea species and hybrids for longevity and handling as cut flowers.
8. Not recognised by official Government institutions.
9. Not involved in identifying and doing something to preserve rare wild populations.
10. Do not insist on correct identification and labelling (especially from nurseries).
11. Slow to take up new information and communication technology (e.g. website, email chat etc).
12. Do not do public amenity plants with the aim of widening public appreciation of the genus.

General Questions:

1. What are we raising money for?
2. Should any members with vehicles be assisted with a token voucher to assist with fuel costs on Grevillea collecting trips if they request it?
3. Should the Study Group be donating money to the Grevillea Park for things like mulch and plant signage? Should individual chapters have individual projects?
4. Should the Study Group donate plants to the Grevillea Park or elsewhere?
5. Should the Study Group supply grevillea plants to members so that they can start doing hybridising?
   Who owns the results?

(Feedback on these issues is welcome.)

Mount Annan Plant Sale

Our annual plant sale was held again at Mount Annan. We received excellent publicity for the event including a one-minute prime time ad on Channel 9 the night before, thanks to Don Burke who gives us his unstinting support at every turn. However, without his presence at the opening, crowd numbers were down markedly to just over 2000.

Rain on the Sunday deterred the crowds undoubtedly. Surprisingly, all this did not seem to affect plant purchases which remained at more or less the same levels as last year, though profitability declined a little. Post-mortem discussions have suggested that the event be staged in July/August so that there might be more plants in flower. This is currently being considered.

There was a low turn-out of Study Group members to assist at the sale which I found personally disappointing considering a special appeal was made through the newsletter. However, the event was well supported by members of the Australian Plant Society generally.

Special thanks to Jenny Thompson who co-ordinated a team of superb flower arrangers (2 students as well as Margaret Olde). The floral arrangements generally looked marvellous and all were sold at the end of the show for a small profit, the best one receiving a price of over $70.

Other people who worked particularly hard were Betty Rymer on displays, Ian & Tamara Cox on money management, and Bruce Wallace/Gordon Meiklejohn/ Hess Saunders/ Anthony O'Halloran, Ken & Elaine Arnold on plant sales.

This was a team effort that involved many volunteers, especially from Sutherland and Macarthur Groups who also put up and supported the event with displays. David Bleakley looked after the raffle which added substantially to our revenues.

Special mention is made to Menai Group who devised, carried through and even enjoyed a stall selling biscuits and cakes all made from native produce. They did a marvellous job and then donated all their profits to the Study Group. They are an inspiration.

Gordon Meiklejohn spent many months making a new display for specimens and screen boards for other static displays, all of which are a wonderful asset to the Group. Well done, Gordon. Thanks to all those who assisted in the set-up and pull-down, including Tony Henderson, Doug Rickard and Christine Guthrie.

Thanks also to those who gave support through giving what were some truly expert talks and demonstrations, especially Neil Marriott and Paul Nixon who helped at the pull-down and Gordon Brooks who was an able and personable compere of events.

TECHNOLOGY

Grevillea Web Site

G'day Peter

Really sad to hear about Klaus; he was a wonderful person.

Re your recent emails.....

1. Grevillea SG Newsletter in PDF format

Alison has done a great job on this. It looks fantastic.

A couple of comments for you to mull over.

a) PDF files are great for distributing publications via the internet because they can be formatted attractively, incorporate graphics and can be read on Macs and PCs. That said, I think you need to decide how you want to distribute the newsletters.

- If you want to use the electronic PDF file as an alternative to posting a hard copy to members, the PDF is ideal as it can be attached to an email (Geoff Howes is already doing this with the North Shore Group's newsletter).
- If you want to use the PDF files to archive newsletters on the web site so that people can download them, again the PDF is ideal.
- If, however, you want to DISPLAY the newsletters on line then I think a standard HTML file is preferable. The problem is that PDF files need to load a browser "plug in", and then load the PDF file before the file gets displayed on screen. For a file the size of the Grevillea SG newsletter, this can take about half a minute before people see anything. It doesn't sound like much but internet surfers are an impatient breed.

An advantage of the HTML format is that you only need to have images stored on the site in one location...a single image can then be used in a number of places on the web site. This saves a lot of disk space. With the PDF file, the images are embedded in the file and are not available for use elsewhere. Disk space isn't an issue now but it could become an issue as more of the Society's material gets published on line and particularly if you want to put the Grevillea SG slide collection on line.

Disadvantages of the HTML format.....you don't have the same amount of control over publication layout so the on-screen version would look different to the hard copy and coding the HTML file may take a bit longer (although I've never produced a PDF file so I'm guessing a bit).

b) Another issue...do you want the newsletter made available to all comers and not just SG members? At the moment the web site has unrestricted access but I'm looking at options for restricting access to certain areas.

c) Printing. I had a few problems in printing the file. Not sure why....I regularly print larger PDFs than the SG newsletter without problems. On my home computer I wasn't able to print at all (kept getting a dialog box asking for the location of a "*.prn" file....which didn't mean a lot to me). (What was that last site you visited Brian?) At work, the file printed but only after several attempts and I had to print the last 4 pages individually.

2. Grevillea Study Group Website

Space exists on the Charles Sturt server and, as the Study Group is an ASGAP responsibility, that would be the appropriate place to put the Grevillea SG web site (rather than the NSW site).

I can help set it up but we'll need to discuss what you have in mind as far as the sort of info you want to present.

3. Digitising Images

If you want to go to Kodak Photo CD (which is what I use) it's just a matter of taking the slides to your closest Kodak Photo Express store and two weeks later you can pick up the CD. Cost is about $2.50 per image plus about $20 for each CD and each CD holds 100 images. The CD can be read by most graphics editing software programmes.

There are a few things we should talk about, however, as most images need some manipulation to adjust sharpness, contrast, brightness and colour balance....but I think any sort of scanning process would require some adjustment of the scanned images.

Best wishes Brian

[Brian Walters, Association of Societies for Growing Australian Plants (ASGAP) World Wide Web;
http://farrer.riv.csu.edu.au/ASGAP/
Email: brianwal@pnc.com.au (personal or SGAP)
sgap@ozemail.com.au (SGAP only)]

(Editor's Note: Producing the Acrobat Reader (.pdf) file takes 10 minutes, once newsletter is finished for printing. There have been varying degrees of success in reading the web version of the last newsletter. If you have trouble opening it, you may need to search for a copy of Acrobat Reader on the net and download it (this is perfectly legal and free. Please notify us if you are having trouble printing it)

newsletter revamp

This newsletter needs a face-lift.

What we need are some new illustrations for the different regular sections that appear. A little drawing that quickly identifies the topic makes a newsletter more readable. Perhaps budding artists out there could illustrate some line-drawings for "In the Wild", "In the Garden", Activity Reports, Propagation, Taxonomy etc

Drawings should be done to suit the size and space restrictions. These can then be posted to Peter Olde or emailed to: petero@gco.apana.org.au

IN THE GARDEN

Introduction of Grevilleas in Israel

by Vaune Wende (GSG member in Israel) from 4. I.P.P.S. April 1998

A large number of Grevillea varieties were brought to Israel with the aim of acclimatising them in this country. Those that were brought, came from Western Australia and from areas with a climate similar to that of Israel - a dry summer and a wet winter. The aim was to bring plants, which have relatively low water requirements, suited to a warm and semi-arid country, like Israel being convinced of the importance of saving water in gardens.

The two main objectives of our nursery were to bring plants for both public and private gardens.

In addition to bringing in these plants, we were involved with potted flowering plants and cut flowers - both for export to Europe. Upwards of 40 varieties of Grevilleas were selected during the years 1980 - 1988 by Les and Hannah Wende and brought in through quarantine stations to be grown in a nursery situation. About 15 varieties are still being grown. Of these, 4 or 5 are popular and successful.

Grevilleas as garden plants

The growing conditions are: medium to poor drainage, frequent waterings, generally with drip irrigation, high pH (above 7.4), medium to high humidity, long hot summer, winter of 3-4 months, rainfall: 400-650 mm per annum.

In public gardens

A number of experiments were undertaken to grow varieties of Grevilleas which were grown under suitable conditions and planted in the correct seasons. The experiments were very successful. Planting should be undertaken in autumn to enable the plants to establish themselves during the winter. In areas which receive 400-500mm of rain per year, it is possible to grow some Grevilleas without supplemental irrigation provided that sufficient rain falls during the initial phase of growth.

In irrigated public gardens it should be possible to either cease or reduce irrigation or to provide separate irrigation for other plants.

The following species grow well on the roadside without supplemental irrigation: ***G. brachystachya, G. olivacea***, ***G.*** "Winpara Gem" and ***G. obtusifolia***. Additional benefits are that they are evergreen, not cold-sensitive and flower during the winter when most other plants are not in flower. In addition, their appearance complements that of other native Israel plants.

G. olivacea (yellow flowered plant in cultivation Victoria) The Grevillea Book Vol 3, Peter Olde & Neil Marriott

In private gardens

We have a serious problem with regard to private gardens in Israel. There is a preference for tropical plants, particularly large-leafed types, which require large amounts of water. Most gardens have a large lawn relative to the size of the garden. As a result large quantities of water and fertiliser are given, as required for tropical plants. Thus it is difficult to introduce Grevilleas into private gardens, usually because they will suffer from excesses of water and fertiliser with the additional factor of high summer humidity. The resulting chlorosis, leaf fungal diseases and especially soil fungi do not give Grevilleas a long life in private gardens. In addition many garden soils are not well drained and this only exacerbates the problem.

The exception is the tropical Grevilleas such as ***G. pinnatifida***. These varieties are preferred in private gardens: ***G. thelemanniana*** "Ray", ***G.*** "Rondeau", ***G. crithmifolia*** (dwarf), ***G. stenomera***, ***G. obtusifolia***, ***G. thelemanniana*** "Red Rocket" and ***G. pinnatifida***.

Growing in the nursery

This is usually from cuttings. In some of the varieties the propagation is easy. This is mostly dependent on the freeness of the cuttings from fungi. The ideal material for propagation is young and semi-woody. The cuttings are rooted in a mixture of equal parts of coco-fibre and polystyrene balls of 2-4mm diameter, dipped in a solution of IBA at a concentration of 3000-5000 ppm, "deep quick" for 5 seconds.

They are then placed on heated rooting tables. The propagating room is equipped with a fogging device which gives improved rooting compared to the misting system previously used. It is preferable that the rooting trays have round holes. This makes it easier to remove the "plugs" and lessens the possibility of damaging the roots. The large-leafed varieties, which are usually more difficult to root, are rooted in 3cm plugs because of their more fragile root systems. These "plugs" are larger and this makes transplanting afterwards more efficient, with less damage.

Cut flower varieties can be planted with this system directly in the ground without prior transplanting.

In the nursery, growing Grevilleas in containers is problematical. In containers they are subjected to either excesses or shortages of water without a possible remedy. In a nursery with a large number of such type plants it is difficult to provide optimal conditions for each type separately. The growing medium should be well drained and slightly acidic. Varieties which responded well to an acidic growing medium were ***G.*** "Robyn Gordon", ***G.*** "Joe Mason", and ***G.*** *crithmifolia* (dwarf).

When transplanting the rooted cuttings into pots, it is important to minimise the disturbance of the roots. We use compressed air applied to the bottom of the tray to separate the plug from the tray. This enables us to remove the plug more easily.

It id difficult to keep Grevilleas for more than 3 or 4 months in a container. After this time it is important to increase the spacing between the containers otherwise the plants are attacked by various fungi.

IN THE GARDEN *(cont.)*

In the hot and humid Israeli summer, especially in the centre of the country, it is preferable to supply young plants for planting out. Older and well developed plants suffer more from various diseases. Some of the varieties degenerate after some years.

Sometimes it is possible to solve this problem by grafting these varieties onto a sturdy rootstock. Nowadays we mostly use ***G. robusta*** as a rootstock. ***G.* "Robyn Gordon"**, for example, grafted onto ***G. robusta*** rootstock shows almost no signs of degeneration even under not especially good growing conditions. This is in comparison to rooted cuttings which have less staying power.

Cut flowers

We grow the variety ***G. whiteana* "Spiderman"** commercially as a cut flower for export. There are a number of commercial areas of this variety which up to now are successful.

There are a number of varieties of ***G.* "Misty Pink"** which are undergoing trials. This will possibly succeed as a cut flower.

Conclusion

A number of Grevillea varieties have been "acclimatised" in Israel and have been successfully grown for a number of years.

It is still too early to conclude unequivocally and finally because of the time that these plants have been grown (10 - 20 years). Notwithstanding, at least some of the varieties show a promising potential to a successful introduction in the drier areas with drip irrigation.

Growing Grevilleas in SA

Werner Kutsche

My partner and I have two properties where we can try to grow Grevilleas. One is in metropolitan Adelaide with neutral to slightly alkaline heavy clay. We have introduced some sandy loam to improve the drainage.

Species (and cultivars) which are growing well include *G.* "Robyn Gordon", *G.*"Ned Kelly" (both on clay) *G. longistyla* (3-4m x 2m), *G.banksii* (1 .5mx l .5m), *G. lavandulacea* - Mt Lofty (0.5m x0.5m), *G. synaphae*, *G.* "Ellendale Pool", *G.* "stenomera" (probably a form of *G. pinaster*) *G. saccata* (struggling a bit)and *G. treuriana* (1 m x 1.5m).

G. treueriana
(The Grevillea Book Vol 3, Peter Olde & Neil Marriott)

Species that have grown for a while and then died include *G leucopteris*, *G. quinquinervis* , *G. baueri* and *G. jephcottii*.

G. leucopteris (plant in natural habitat, Kalbarri NP, WA) The Grevillea Book Vol 2, Peter Olde & Neil Marriott

The other property is at Ponde about 7km from Mannum in about 250mm rainfall Soil is an alkaline (pH>8.5) sandy loam with perfect drainage. Outstanding success has been had with ***G. leucopteris*** (2.5m x 2.5m).

Other species which are being trialled include *G. olivacea*, ***G. lavandulacea* - Monarto form**, *G. huegelii* (local species), ***G. pterosperma***, ***G. aquifolium*** (probably Carpenter Rocks form), *G. ilicifolia* var *lobulata*, ***G. ilicifolia* var *angustiloba***, *G ilicifolia* var *ilicifolia*, *G. triloba*, *G. plurijuga*, *G. robusta*, *G. rogersii*, ***G. arenaria***, *G longistyla* (slightly yellowish), *G albifiora*, *G. juncifolia* var *juncifolia* and *G. striata*. *G. stenobotrya* is due to be planted out this autumn.

(Species listed in bold are growing without supplementary watering. Many of the non-bold listed species are still in the establishment phase).

G. huegelli
(The Grevillea Book Vol 2, Peter Olde & Neil Marriott)

Thus we have some difficult conditions to try and grow Grevilleas (frost is another problem). I am hoping that grafting is one way in which I may grow some of the more acid loving species.

At present the only success I have had is with *G. treuriana* onto *G. robusta*.

I have some other grafts on the go but it is too early to see if any further success has been achieved. I am trying drought tolerant and alkaline tolerant rootstock as *G. robusta* does not tolerate the conditions at Ponde very well.

Looking at the species listed in the books there are some that I would like to try as rootstocks, but they are difficult to come by through the regular seed suppliers. I am hoping to be able to obtain some seed so that I can try the grafting and thus be able to grow a large variety of Grevilleas.

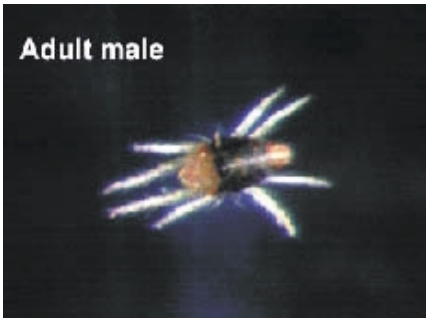
I am choosing an appropriate rootstock from a particular Group and then trying to graft some of the species in that group onto that rootstock.

Any assistance in this area would be much appreciated.

BACK PAGE

PEST WARNING

The Australian Quarantine Inspection Service advises that Southern Red Mite ***Oligonychus ilicis*** McGregor, has been found in a Sydney nursery. The mite is a serious pest in California, U.S.A. It seems to prefer azaleas, camellias and hollies but has been recorded on Grevillea.



The mite feeds on the lower leaf surface, causing mesophyll collapse. Infested leaves turn grey or brown and may fall from the shrub prematurely. If uncontrolled, death may follow a bad infestation. The mite is active in cool weather, reproducing strongly in spring and autumn, and should be sprayed for at the end of summer or winter for maximum effectiveness. Multiple foliar applications of proper miticides at two week intervals may be needed to obtain desired control.

Description: The adult female is c. 0.4 mm long and resembles a small spider. The abdomen is dark reddish or brown; the cephalothorax is pinkish or red. There is also a pale midstripe. The male resembles the female but is smaller (0.3 mm long) and usually dark. The egg is brownish or reddish and is depressed with a central stripe or hair.

Growers are asked to inspect their plants and advise what pests are growing on the leaves.

Editor's note: More information can be found on the web at www.nsw.gov.au/Hort/Insect/dpi238htm

OFFICE BEARERS

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FINANCIAL REPORT

JULY 2000

Income		Expenditure	
Subscriptions	$737.00	Newsletter Expenses	250.00
Donations	20.00	Postage	125.95
Interest	7.96	Stationery	20.35
		Printing costs for show	668.44
		Bank Charges	12.83
	$764.96		$1,077.57

$11,500 transferred to Interest Bearing Deposit for 6 months
Balance on Hand (current account) 30.6.00 **$975.95**

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If a cross appears in the box, your subscription of $5.00 is due.
Please send to the Treasurer, Christine Guthrie, PO Box 275, Penshurst 2222.
Please make all cheques payable to the Grevillea Study Group.

1999	2000

A Note from the Treasurer

Please ensure all cheques are made payable to Grevillea Study Group, not Peter Olde. Thanks