

# THE FRIENDS OF THE WAITE ARBORETUM INC.



## NEWSLETTER

SPRING 2001

No 29

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### GENERAL MEETING

A general meeting was held on Monday, August 3 and was addressed by both Dr Jennifer Gardner and Dr David Symon. The topic was "The Pear Trees in the Waite Arboretum and their possible use as Street Trees." Each of the speakers has kindly given us a summary of his/her talk, so that all Friends may keep up with our happenings.

#### From David Symon

The Waite Arboretum has the best collection of ornamental pear species in Australia. "How did this come about?"

The choice of spring-flowering deciduous trees in Adelaide is limited - the double pink *Prunus blieriana*, the purple leaved *Prunus cerasifera*, a few flowering peaches and also almonds are sometimes grown as garden trees. Flowering apples and cherries have not proved successful on the plains.

We had one *Pyrus calleryana* in the arboretum that flowered well and looked promising. This inspired me to explore the genus further. Pears occur from Morocco, through north and south Europe, across Eurasia to Japan including many Mediterranean regions. The genus includes two important orchard pears, the European *P. communis*, our common pear and, from Asia, *P. pyrifolia*, the 'Nashi', a relatively recent introduction to Australian orchards.

For the Arboretum we were able to obtain various pears of both Europe and American origin. Importantly my wife and I collected wild pears in Greece and Crete in 1970 and later in Turkey. As these trees grew, records of their performances were kept. Details of flowering in spring and leaf colour in autumn were kept carefully - there were 167 records for one particular tree, *P. amygdaliformis* 481 from Phaistos, Crete.

The taxonomy of pears is confused. There does not appear to be a comprehensive up-to-date monograph. Part of the difficulty is the ready intercrossing between species but there is also the problem that a good specimen needs details of flowers, leaves and fruits from the same tree at different times in the year. "Hybrids" are common and as the history of cultivation of pears extends over 2000 years in both Eastern and Western Eurasia, the occurrence of feral forms and outcrossing blurs the picture.

I started doing some crosses amongst trees in the Arboretum. Early in 1979 a row of seedlings was planted where the Wine Lab. is now. They had just started to flower when we were told that they had to be removed because building was imminent! Luckily this was delayed a little and we managed to salvage one promising tree.

Jennifer then came on the scene and we were able to start a proper replicated trial of six of the best choices in the orchard. Unfortunately financial strictures within the University were such that funds were not available to provide the \$1000 per year needed for a 10 year trial so that work was lost and the collection was restricted to the small number of Arboretum trees.

In the period between 1970 and 1980 flowering Pears became popular in the USA lead by the cultivar 'Bradford'. This was introduced to Australia in 1985. Once we had planted Elm Avenues to salute our UK masters, now we planted an avenue of 'Bradford' pears in front of Parliament house in the ACT to acknowledge a changed relationship. The American trees were selected for resistance to cold and tolerance to snow loads - all highly irrelevant to Southern Australia.

About 35 seedling *P. calleryana* had been planted along Claremont Avenue and flowering records kept from 1974 to 1985. From these we selected a very early flowering tree, which was to become our 'Claremont' which I still think is the earliest flowering deciduous tree for the plains. The original superior *calleryana* became our 'Lynington' to be seen in the rose garden. We have published three papers on *Pyrus*.

#### From Jennifer Gardner

David has outlined his establishment of the Waite Arboretum pear collection. I am continuing to build this collection with the addition of new cultivars and wild collected material from homoclimes like the Mediterranean.

The specimens in the Arboretum include: *Pyrus amygdaliformis* from Europe and Asia Minor (#779a). This tree is spectacular in blossom, flowering from July to September, David produced an interesting hybrid (*P. amygdaliformis* x *P. calleryana*) which we have called "Prescott". This appears to flower consistently in autumn however, to my mind, this species does not have a lot of horticultural merit as during the rest of the year it is a dull green with dense, twiggy branches.

One specimen of *P. amygdaliformis* however, has demonstrated a very interesting phenomenon. It has shown an extreme case of alternating bearing of each half of the tree. Dr Bryan Coombe, a plant physiologist at the Waite (now retired, but still very active in research) noted, in the spring of 1996, the marked non-flowering of the eastern half of this tree. In 1997 it was the western half which failed to flower and the tree has been observed to alternate each year since then. He has postulated about the mechanism and cause as follows.

The terminal meristem in a number of fruit crops inclines to initiate flowers if it were vegetative the year before; alternatively, if it had flowered the year before, it tends to remain vegetative. Each spur independently displays the on-off cycle and a regular cropping tree will have half its spurs in one mode and half in another. If the majority are synchronously 'on' or 'off' then the whole tree crops biennially, with heavy crops of small fruits one year and light crops of large fruits the next. Growers try to avoid this cycle by thinning flowers in the 'on' year.

Dr Coombe postulated that when tree #473A was young, some agent or other caused the death of the flowers on one side (all originating from one main branch), thus initiating the cycle on that side. The 'on' crop half of the tree then influenced the meristems on the other half so that they remained vegetative. Bryan also noted that 1974 (the year after #473A was planted) was a severe drought, so perhaps that played a role.

[Post script: this phenomenon has not been as pronounced this year, with both sides producing flowers, but one side much more floriferous than the other.]

Other specimens include:

***Pyrus communis*** - common pear (#1150D) from southern Europe and western Asia. This flowers from September to October.

***Pyrus elaeagnifolia*** (#1150B) from Asia Minor also flowering Sept - Oct. but coming into leaf early which detracts somewhat from the display of blossom.

***Pyrus pyraeaster*** wild pear from southern Europe. flowering Sept - Oct. This is beautiful in flower (#202) and in some years has gorgeous autumn colour (#638B).

***Pyrus tadshikistanica*** Siberian pear from central Asia. This is an uncommon tree, flowering in October.

***Pyrus calleryana*** Callery pear from China. This is one of the Asian pear pears and so is more suitable as a street tree as the small hard fruits, only 15 cm diameter, tend to remain on the trees and are eaten by birds. Some Councils however, see the marble sized fruits as a slipping hazard when they do drop.

The trees along Claremont Avenue by the Waite Institute were planted in 1969 & 1970 by the Mitcham Council at the suggestion of David Symon. These trees have been observed for promise since then. The first thing to note is their wide variation in size and habit, which emphasises the need for clonal material to achieve uniformity when establishing an avenue. Another variable is the flowering times.

There are now many commercially available selections of *Pyrus calleryana*, the callery pear, some of which I have planted in the Arboretum including 'Bradford', 'Red Spire', 'Burgundy Snow' and 'Capital'. In addition we have an unnamed fastigiate form and several of our own hybrids.

'Lynington' is a selection from a well recognised clone called D6 commonly used in the pear industry as rootstock because of its vigour and uniformity. The original 'Lynington' specimen in the Arboretum is no longer there, but the four trees in the garden of Urrbrae House rose garden were budded from that tree. Each year the spring blossoms are breathtaking and in some years the autumn colour is a rich golden flame. I have distributed budwood from these four trees to several South Australian nurseries and Flemings Nurseries in Victoria. This cultivar is now being produced and trialed.

[Post script: During the TREENET Symposium a specimen of 'Lynington' was planted by David Symon in Claremont Avenue together with two other callery pears including cultivar 'Chanticleer' as a TREENET trial site.]

Ed's note: Jennifer's talk was liberally illustrated by some excellent slides. Unfortunately it is impossible to reproduce these for Friends who were unable to be present.

## TREENET

### Background of TREENET

TREENET is a not-for-profit organisation, based at the Waite Arboretum and founded in 1997 by David Lawry, the director of Lawry's Nursery, and myself. The inspiration for TREENET followed a seminar, hosted by the Royal Australian Institute of Parks and Recreation on 'Trees in the Urban Environment' held at the Waite Institute in 1995 and a 'Visions of the Future' workshop which I held in 1996 which brought together a cross-section of people who use the Waite Arboretum as a resource for research, teaching, training or as a reference collection for tree selection. At the same time the notion of forming cluster groups and partnerships with industry and government authorities was really taking hold in South Australia, supported by the SA Chamber of Commerce. In the earliest stages TREENET received strong support from Henry Polec at Transport SA and that Department provided start up funding.

### Purpose of TREENET

The purpose of TREENET (Tree and Roadway Experimental and Educational Network) is to improve our streetscapes through better production, selection, establishment and maintenance of street trees and to broaden the palette of suitable species available which have the best qualities without attendant problems.

TREENET aims to achieve this by providing a focal point for the exchange of information about street trees and facilitating the gathering and dissemination of useful data, by encouraging the establishment and monitoring of trial sites with publication of the results on the TREENET website.

### TREENET Advisory Board

The 17 members of the TREENET Advisory Board have between them a wide range of expertise and interests relating to street trees and represent nursery growers of street trees, Transport SA, local government, landscape architects, secondary, TAFE and university educational sectors, arborists, soil scientists, engineers, economists and horticulture media.

### TREENET trial sites

Monitored trial sites have now been established in the City of West Torrens, the City of Burnside, the City of Charles Sturt, the City of Onkaparinga, the City of Holdfast Bay and the District Councils of Streaky Bay and Alexandrina.

The City of West Torrens has been very active in the program, trialing 26 species in dozens of streets. 13 of the species have been selected for trialing based on their good performance in the Waite Arboretum eg. *Flindersia australis*, *Angophora costata*, *Acer pseudoplatanus*, *Geijera parviflora*, *Zelkova serrata*, *Quercus ilex*, *Pistacia chinensis*, *Sophora japonica* and *Harpulia pendula*.

TREENET recently established a website with the assistance of a volunteer Sean Donaghy. Councils will be able to register on-line to participate in TREENET trial sites. Eventually, the participating Councils will be able to enter on-line the measurements from the trees being monitored and the results will be summarised and posted on the web site. Internet users all over the world will be able to do a search by species, or by climatic or edaphic conditions, or by geographical information and find out the success or otherwise of a particular species growing under specific conditions in specific localities.

Last October we launched TREENET nationally with a promotional display at the International Society of Arboriculture (Australian Chapter) conference in Brisbane. There was considerable interest expressed by interstate delegates.

As soon as the web site on line registration is fully operational, I would expect a number of Councils interstate to participate in trials.

Financial support for TREENET has come from grants we have secured from Transport SA (\$15,000), the Local Government Association (\$10,000), and the Horticulture Research and Development Institute (\$22,000) and \$8,000 from individual nurseries, Councils and the Patawolonga Catchment Board. In addition, the 2000 Symposium made \$8,000 profit and we hope to make even more at this year's Symposium. [Post script: expect profit from 2001 Symposium to be over \$18,000].

The development of TREENET places the Waite Arboretum at the centre of a very exciting new venture to provide a network of information to everyone with an interest in selecting, producing, establishing and maintaining street trees. TREENET raises the profile of the Waite Arboretum and increases its value, as information resulting from decades of testing trees there becomes more widely available and put to use. TREENET provides a vehicle for the testing of recommendations from the Arboretum in urban streets, as well as trialing new cultivars as they become available.

We will be following with great interest the TREENET trials of our lovely *Pyrus calleryana* 'Lynington' and hope to see this offspring of the Waite Arboretum gracing streets throughout Australia.

Jennifer Gardner

## OF NOXIOUS SIGNIFICANCE — A WEED IN THE ARBORETUM

Weeds are one of the biggest threats to Australia's flora, fauna and agricultural production. Under the *Animal and Plant Control (Agricultural Protection and Other Purposes) Act 1986*, the weeds posing the greatest threat have been proclaimed noxious weeds. The list of noxious plants includes such bushland weeds as blackberry, olive and bridal creeper. This month a group of South American tussock grasses will also be proclaimed noxious. Of these, three occur in South Australia and one of them, *Jarava plumosa*, occurs in the Waite Arboretum.

*Jarava plumosa*, formerly *Stipa plumosa*, was brought to the Waite in 1941 as seed sent to Prof. H. C. Trumble by Prof. B. Madson, University of California, Davis, at a time when there was considerable interest in pasture plants from overseas. It was grown in a small demonstration plot in the grass garden until possibly the late 1950s, when it was removed. In 1968 several patches were noticed in the Arboretum close to the grass garden. These plants were destroyed and their position was noted. As it was hoped to eradicate this grass, a watch was kept for it. In the 33 years since *Jarava* was first recognised in the Arboretum, small groups of plants have been removed from some 38 locations. In South Australia, *Jarava plumosa* has been recorded from only one other location - the South Parklands in 1994.

*Jarava plumosa* is a small, fine-leaved plant, which flowers in late summer in response to summer rains. At first sight it is not unlike a wallaby grass. This makes recognition difficult, unless it is flowering and then the extra-fluffy look of the flower heads distinguishes it from the wallaby grasses.

Until this year, *Jarava plumosa* was kept under surveillance by the Arboretum Curator and groundsmen, but staff are no longer available to do this work. *It is still feasible to eradicate this grass, but help is needed.* If you would be interested to join a working bee to walk the Arboretum, December to February depending on the weather, please Email (jennifer.gardner@adelaide.edu.au) or speak to Dr Jennifer Gardner (8303 7405). It will also be an opportunity to learn something of the native grasses now making up an increasing proportion of the Arboretum's grassy understorey.

Ellen Bennett, Native Grasses Group

## IN THE ARBORETUM

### CHRISTMAS BUSH *Bursaria spinosa*

*Bursaria* belongs to the Pittosporaceae, a southern family, and most readers will be familiar with Sweet pittosporum (*P. undulatum*), an evergreen tree from Eastern Australia with beautifully scented flowers, once used for large hedges. Several New Zealand species are popular shrubs in our gardens,

A recent revision of *Bursaria* describes it as "an endemic Australian genus of mostly spinescent, scruffy shrubs and trees, found in all but the most arid or alpine areas." This does not quite do justice to a showy, free-flowering, sweet-scented tree. The recent revision describes seven species, four of which reach small tree size and of which *B. spinosa* is the most widespread and most variable. It occurs from Eyre Peninsula round SE Australia to the Cook District in Queensland and is the only species found in South Australia.

*B. spinosa* is variable and as its juvenile phases often differ from the adult plant, this species has some dozen synonyms including the one subspecies, *lasiophylla* now recognised. One of the few records of this subspecies is from Mt. Searle in the northern Flinders.

The wood of *Bursaria* is mostly too small to be of economic use. The harvesting of foliage for the drug aesculin is recorded and several species are reported as being used for street trees – *B. spinosa* in Victoria and *B. occidentalis* in Western Australia.

Our species is somewhat spiny when young and, maybe, is 'scruffy', with masses of small, white flowers. Yet it is hardy and flowers freely in summer, when the spring flush of flowers is over. As it is variable and widespread I believe it would respond to horticultural selection. Propagation is reported to be relatively easy so an improved selection can be maintained. "How about it, some keen grower of Australian plants?"

In Western Australia, *B. occidentalis* is reported to be a narrow canopied tree growing to a height of 8 m. It is the only species in the West and occurs from Shark Bay to Dongara along the coast and East to near Menzies, which is about 130 km North of Kalgoorlie. This is a geographic spread that would suggest that this tree might do well in settles South Australia.

The other larger species, *B. tenuifolia* and *B. incana* come from Queensland, the former from the north coast and the latter from north of Brisbane and a little further inland.

Colour and leaf-form catch the eye and the best known Australian plants display these characteristics. The leaves of *Bursaria* are, however, not impressive and added to that the young phases may be prickly, which is probably off-putting! Yet masses of white flowers in Summer is a substantial plus and the genus deserves more horticultural research.

David Symon

## UPDATE OF MUNDULLA YELLOWS RESEARCH

Mundulla Yellows (MY) is a newly recognised lethal disease of eucalypts occurring in an area exceeding 25 000km<sup>2</sup> in SA, as well as in other states, and it is spreading. It poses a threat to a wide range of eucalypts and other species of the native flora.

MY has been reported in trees of all ages from roadsides, paddocks, revegetation sites and in native vegetation. Once symptoms appear, there is reportedly no recovery and the tree dies within a few years.

It is potentially devastating to a number of industries and to other organisations. It jeopardises revegetation programmes, salinity and groundwater level control, input on the international carbon credits policy and quarantine practices. MY has led to considerable community concern. Symptoms have been described in a field guide for general distribution.

The cause of MY is unknown, but it is likely to be biotic and contagious. Work is in progress to identify a causal pathogen, and to establish molecular diagnostic techniques for the detection of MY. Symptom development can be influenced by environmental and host factors and is therefore an unreliable tool for disease diagnosis. Molecular methods are being used to compare nucleic acids (which would comprise both general components from host cells and possible pathogen genomic fractions) from healthy and MY trees. Some unusual nucleic acids (MY-RNAs) have been identified in MY trees which may represent a virus or viroid and are strongly associated with the disease. This is a strong lead which needs to be investigated further. Phytoplasmas have also been found in eucalypts, but a causal association with MY could not be shown.

A qualitative survey was conducted in the southern Australian states. It appears that MY-RNAs are present there, but that symptoms may vary. This could be due to environmental factors or variation in MY-RNA strains.

Research on the epidemiology and mode of spread of MY to complement the molecular work was also carried out. The wide and scattered distribution suggests that aerial transmission (possibly by insects) occurs. MY-RNAs were detected in previously healthy seedlings after sap-sucking insects collected in MY areas were fed on them. This supports the field observations that insect transmission may play a role in the spread of MY.

MY-RNAs could also be transmitted by grafting. This would indicate that there may be a risk of spreading MY by cutting instruments during tree pruning.

MY-RNAs could be detected in revegetation sites and nursery-grown seedlings suggesting they may be spread with nursery stock. The presence of MY-RNAs in green parts of MY trees indicates that symptoms may need some time to develop. Therefore normal appearance of seedlings cannot be considered proof of absence of MY-RNAs. This finding suggests that the currently widely used practice of raising seedlings in one area for planting in revegetation sites elsewhere may carry a risk of spreading MY.

Ground-breaking advances have been made in MY research during the past 18 months. Our identification of MY associated nucleic acids has opened the way towards characterising the potential MY pathogen(s) and towards identifying the disease cycle of MY. If the disease cycle can be identified, specific strategies can be designed to disrupt it and thus control the spread of MY. Until then, general plant hygiene guidelines are recommended to minimise the risk of spreading MY by human activities. MY must now be considered a threat of national significance to natural vegetation and revegetation programmes. A 5-year research plan towards nationwide control of the disease has been devised.

## NOTES FROM THE PRESIDENT

Life involving the Friends of the Arboretum has certainly been busy since our last newsletter.

Those of us able to attend the talk by Dr David Symon and Dr Jennifer Gardner on "Our ornamental pear collection in the Waite Arboretum – the potential uses of these trees" were treated to a fascinating address about our pear collection and those pear trees located elsewhere. The slides we viewed added to our enjoyment. Since then the Chinese pears in the lawn of the Rose Garden have blossomed and delighted us all

The TREENET Symposium was deemed a great success by the organisers. Our role was the provision of morning tea on the two days and afternoon tea on the Thursday. With the help of some volunteers from the Friends of Urrbrae House, we raised \$715 for the Arboretum funds and \$143 was forwarded to the FOUH. My thanks to all those who contributed their time to this event or baked cakes. It was an initial opportunity to forge closer links between our two Friends groups which we hope to foster through better communication.

The wonderful band of Tuesday volunteers have spent many hours over the past few months, planting, weeding and nurturing in the Rose garden and the Sensory garden. In addition to the very generous donation of roses by Maureen Ross, we have received a varied and colourful collection of salvia for the Urrbrae House gardens from Peter Love, from the Herb Society. We have a lot of fun on Tuesdays and would welcome anyone who would like to join us.

The most recent general meeting of the Friends of the Arboretum was at the Urrbrae Wetlands when we were guided on a walk through the planted areas by Karen Lane before the sun set. We shared a meal in the log cabin with several Friends of the Wetlands, before hearing from Dr Allin Hodson. It was all most informative as Mary Tester's article in our Winter Newsletter predicted. More than 40 Friends of the Waite Arboretum shared the evening. We were very pleased to hear the good news that Dr Hodson's contract has been extended so that he can continue his great work with students & community members.

The eagerly awaited art exhibition of Beryl Martin's latest collection of bright and colourful new works will have opened as you read this newsletter. We hope you will attend and promote it to all your friends. We have been pleased that we have a new frame for the banner located at the corner of Cross Rd & Fullarton Road. The Exhibition will be open each day from 11am to 4pm until 28<sup>th</sup> October. Friends and supporter who have helped with the roster for the Exhibition are invited to morning tea in Urrbrae House on 13<sup>th</sup> November to hear the outcome of the Exhibition. I hope to meet you there.

Warmest regards, Cicely Bungey

## NEW MEMBERS

A warm welcome to our new member:

Ms. Marilyn Gilbertson, Kingswood.



## FORTHCOMING EVENTS AND DIARY DATES FOR 2001

### October 14 to 28, "Colour, contrast and form"

This exhibition of new paintings, by **Beryl Martin**, will be open daily between 11 am and 4 pm in Urrbrae House.

### Saturday, November 10, 5pm to 7pm.

The Friends of Urrbrae House invite you to

#### ***Talk, Walk in the rose Garden at the Cocktail Hour***

A presentation on roses will be delivered by Mr Walter Duncan in Urrbrae House, followed by a short walk and refreshments in the Rose Garden.

Tickets are \$15 each and bookings are essential. Enquiries: Peggy, 8303 7497.

### Sunday, November 18 – The Salvia Society.

A show will be held in the gardens of Urrbrae house.

Admission is free.

Afternoon tea will be available at a small cost

### Monday, December, 6.00 pm – Christmas Gathering.

The gathering is open to Friends of the Arboretum, Friends of Urrbrae House, Friends of the Waite Reserve and associated volunteers.

For those who are interested, Jennifer will take a short walk through the Garden of Discovery in order that Friends will be able to see the new developments therein.

The walk will be followed by light refreshments in Urrbrae House.

## EDITORIAL PLEA

Please send me some material for the future newsletters. A few devotees such as David Symon, Mary Tester and Eric Sims have either personally written or provided me with many articles. Surely some of you have memories of the Arboretum in the past or else something you would like to say that would be of interest to our Friends.

Your struggling editor!

*We wish you all  
A Happy Christmas  
and  
A PEACEFUL Year in 2002.*