

NEWSLETTER
SUMMER 2014
NUMBER 78

FRIENDS OF THE WAITE ARBORETUM INC.

www.waite.adelaide.edu.au/arboretum

FORTHCOMING EVENTS

IN THE ARBORETUM

Free Guided Arboretum walks

The first Sunday of every month
at 11.00 am.

Special walks:

Theme: *Living plants in basketry*

Time: 11.00 am

Dates: Sunday 16 & 23 February

Thursday 20 February

Theme: *Rare and Endangered*

Time: 11.00 am

Dates: Sun 16 & Fri 21 March

Walks meet at Urrbrae House stairs

More details at:

<https://waite.adelaide.edu.au/arboretum/walks/>

WHAT'S ON AT URRBRAE HOUSE

"Waste Not..." an exhibition of creative basketry presented by presented by The Friends of the Waite Arboretum and Basketry SA.

Open daily 10.30 am – 4 pm:

Saturday 15 February to

Sunday 23 February.

Official opening: 2 – 4 pm

Saturday 15 Feb.

More details at:

www.waite.adelaide.edu.au/urrbraehouse/whatson/

FRIENDS OF



**WAITE
ARBORETUM**

President: Henry Krichauff, **Vice-President:** Marilyn Gilbertson

Secretary: Norma Lee, **Treasurer:** Peter Nicholls

Editor: Eileen Harvey, **email:** eileengarden@y7mail.com

Committee: Beth Johnstone, Ron Allen, Andrew Walters, Robert Boardman, Dr Wayne Harvey, Dr Jennifer Gardner (ex officio)

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Photography: Eileen Harvey



Brachychiton rupestris, Bottle Tree

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FROM THE PRESIDENT

Since the last Newsletter, which was the Spring edition we successfully hosted The 14th National Treenet Symposium on Friday 6th September with approximately 120 attending especially from local councils and from interstate. David Lawry OAM, the previous director of Treenet has become fully involved with his directorship of the 2015 "Avenues of Honour" project. His position has been capably filled by Glenn Williams, who took over earlier in the year. "Trees of the Mediterranean Tour" was the Arboretum Guides' involvement featuring suitable trees for our conditions for street or landscape planting. Other sessions during the morning segment included professional arborists demonstrating "Veteran Tree Management" and the sculptor, Silvio Apponyi's theme "Working with the essence of trees", featured carving demonstrations.

The Arboretum responded well to the soaking rains during the winter also unfortunately did a spreading infestation of Three-cornered Jack, *Emex australis*. The areas are confined and groundsman, Andrew Walters feels he is getting them under control through careful removal by hand of entire plants together with their extensive loads of jacks.

On the 11th of December Arboretum guide Ron Allen conducted a tour of the various Rare and Endangered Trees in the Arboretum. He will repeat this tour on Sunday March 16 at 11am and on Friday March 21 at 11am for the International Day of Forests and the Tree. The following website has information about this day. www.un.org/en/events/forestsday Friends are invited to join us for these informative free walks.



The Combined Friends' Christmas celebration was on Monday 2nd December in Urrbrae House with more attending than last year. The venue does seem the best place for this event, as the weather

can be so variable at this time of year. We sadly farewelled Joe Bennink, who for the past six years has been our voice as Manager of Community Engagement with the University and has now retired. As a member of FWA he assures us he will still be about.



Photo Joe Bennink

On Monday 9th December, the launch of Anne Latreille's magnificent book, "Garden Voices" took place. Among the beautiful roses, with a marquee on the croquet lawn and a musical accompaniment with drinks and nibbles, the venue couldn't have been more ideal. A good few copies were sold with each sale giving a commission to the FWA. We especially thank garden designer and consultant Viesturs Cielens, who was the driving force behind this event.

We are appreciative once again to Mitcham Council for their grant to assist us in staging this year's Basketry SA Fringe Festival Exhibition, "Waste Not" which will run from Saturday 15th Feb (election day) to Sunday 23rd February. All are invited to attend what promises to be another outstanding exhibition of fine craft work and also view Pat Hagan's hand crafted silver jewellery, which will be on sale.

Our AGM is scheduled for Monday evening, the 14th April when our guest speaker will be Professor Hans Griesser, Director Mawson Institute, University of SA, who will speak on his ground breaking research involving Emu Bush, *Eremophila spp.* This concerns the use of components from their leaves to produce a biofilm to coat prostheses in bone surgery to prevent infection by golden staph and other antibiotic resistant bacteria. The potential future importance of this work could be of huge significance once the final stages of development are completed. I look forward to a good attendance.

The Committee have recently produced an updated and more colourful Membership Invitation brochure, which we hope will be put to good use.

In closing, I wish everyone a healthy and happy New Year.

Henry Krichauff

IN THE ARBORETUM

FROM THE DIRECTOR

University Engagement

Last year the University of Adelaide underwent a restructure of its engagement activities and the Office of Community Engagement (which included Waite Arboretum, Urrbrae House and Waite Conservation Reserve) merged with Development and Alumni to form the new University Engagement Branch within the Office of the Vice-Chancellor. Our unit is now called Partnerships and Projects and our new Director is Leah Grantham. In December Joe Bennink, Manager of Community Engagement announced that he will be retiring mid February. Joe has been a very strong advocate for and supporter of the Waite Historic Precinct over the last six years, championing the Arboretum, Reserve and Urrbrae House at senior levels, visiting at every opportunity, attending our events and getting to know many of the Friends and volunteers. Joe will be greatly missed by the staff at the Precinct but we look forward to working with Leah, Chief Engagement Officer Kate Robertson and our new colleagues in University Engagement. We wish Joe all the best in his retirement and hope he will continue to visit us often to enjoy the Arboretum, gardens and Urrbrae House.

Arboretum seats

Two new teak bench seats were donated to the Arboretum in 2013, the first in memory of Hon. Dr Sam Jacobs AO, QC and Patron of the Friends of the Waite Arboretum and the second in memory of Dr John Fisher, the first nematologist appointed in any Australian University whose internationally recognised pioneering research was done at the Waite Institute from 1956 to 1994. A total of 53 seats have been donated to the Arboretum and gardens and create welcome places for rest and contemplation. Generous donations of \$1,000 were received from Judith Symon



John Fisher seat (above) and Sam and Mary Jacobs seats (below)



and Dr Barbara Hardy AO in addition to the many welcome donations that Friends made when renewing their annual subscriptions. The support of all Friends is gratefully acknowledged, as is the dedicated efforts of the Friends Committee, garden and Arboretum volunteers and Arboretum Guides.

Possum Guards



Tree Technique installing the possum guards



A recent activity in the Arboretum has been the installation of UV-resistant polycarbonate possum guards around the five remnant Grey Box *Eucalyptus microcarpa* in the northwest corner. Severe herbivory by possums was affecting the ability of these trees to maintain sufficient canopy for good health. Some under-

canopy planted sheoaks and acacias which provided access for the possums needed to be removed along with some

selective pruning of adjacent trees. The veteran Grey Box are being given good soakings and have been mulched to assist in their recovery.

Native Grasses Update

Last winter we embarked on a project to establish native Windmill Grass *Chloris truncata* in the Arboretum (see FWA Newsletter #76). The goal is to replace introduced grasses like barley grass and wild oats which require a lot of mowing, have sharp seed heads and die back in summer to create a thick thatch fuel load with this attractive, summer growing grass which requires little if any mowing. A number of patches were scalped to remove the weeds and the seed bank and *Chloris* scattered and watered in. The results in The Mallee section are very encouraging. If kept moist, *Chloris* germinates in a few days and already many new plants have set seed. Volunteer help to water and weed the plots over summer would be greatly appreciated.

Elm Leaf Beetle update

Elm Leaf Beetle (ELB) was first discovered in SA in January 2011 and first detected in our Elm Avenue on 19 March 2013. Accordingly Russell Cook, Andrew Walters and myself have been monitoring Elm Avenue and the first eggs for this summer season were detected on 12th November 2013. The damage is light though more widespread this year and the elms still look in good condition. Exponential growth of the ELB population is to be expected as the number of life cycles builds, but recent heatwaves seem to have caused a significant reduction in numbers in all stages.

Strategies for treatment were discussed in my report in the Autumn 2013 FWA newsletter. My preferred option is soil treatment with the systemic insecticide imidocloprid (e.g. Confidor) and I have been investigating the most efficient and effective way to introduce the treatment via the existing drip irrigation. Another technique to interrupt the reproductive cycle is to intercept the larvae as they descend to the ground to pupate, so we are raking back the mulch and leaf litter to a distance of 3 m to bare the soil and expose the larvae to desiccation and predation. More helpers are needed with this simple and rewarding task.

Mapping progress

Working with Marian McDuie over the last year I have now completed the task of converting the Arboretum map of the 2,240 trees from a CAD drawing to ArcGIS geospatial information which can be readily updated as trees are planted or removed and the canopy diameter 'grown' over time. The next task after ground-truthing the map is to integrate this spatial data with the Arboretum database containing the scientific and common names, source of material, images and much more information. The final goal is to make all this information readily available to the public through a smart phone application.

Show success

Every year, under the watchful eye of teacher Peter Murphy, students from Urrbrae Agricultural High School collect banksias and eucalypts from the Waite Arboretum for exhibition in the Royal



Class 367 No784
Max McGregor
3 distinct *Eucalyptus* cuts
First Prize
Exhibit photos A & B
Peter Murphy

Adelaide Show. At the last show they were successful in obtaining a number of prizes including "Most Successful Novice Australian Exhibitor". It

is a great learning experience for the students and it is pleasing to have Arboretum material on display to a large audience. Congratulations to all the participants!

Thanks

I would like to acknowledge Arboretum groundsperson Andrew Walters for his tireless work in the Arboretum, boundless enthusiasm and good humour.



Andrew, Jennifer and new, more robust mower

The Tuesday morning garden and Arboretum volunteers have been outstanding again this past year and the beautiful, flourishing gardens are a testament to their dedication. I thank the Arboretum guides and all the volunteers who helped make Treenet Day 2 at the Arboretum a great success. The Friends of the Arboretum Committee have been a great support and we look forward to welcoming Dr Wayne Harvey to the committee this year.

Volunteering opportunities

If you would like to volunteer in the Arboretum especially in Elm Avenue or the native grass projects please contact me on 8313 7405 or 0428 379 110.

Jennifer Gardner, Photos Jennifer Gardner



Class 365 Exhibit No 780
Joshua McKinnon

Banksia ashbyi (large, very orange)

First Prize Novice
Australian Native Exhibitor

Most successful Novice
Australian Native Exhibitor

Overall Novice Champion
Australian Tree or Shrub

FRIENDS OF THE WAITE ARBORETUM NEWS

NEW MEMBERS:

We warmly welcome the following new members:

Mrs Fiona O'Connor, Belair
Mr Terry Langham & Ms Sylvia Piddington, Myrtle Bank
Ms Helen Seamark, Willunga
Miss Laurel Crouch, Oaklands Park
Mr Nick Pincombe, Bridgewater
Kym Knight, Tree Environs
Maggie Jackson, Belair
Deidre McKay, Highgate
Ms Alison Rayner, Vale Park.
Mrs Judi Denton, Mt George
John Sheeny, Koroit, Vic.
Prof. Nick & Mrs Robyn Costa, Karindya, WA

Basketry SA Exhibition, Urrbrae House, Feb. 2014

"Waste Not ..." This exhibition takes a bold approach to contemporary basketry. It showcases the works of a number of fibre artists who create beautiful objects from discarded materials, both natural and manmade.

This Exhibition is presented by The Friends of the Waite Arboretum and Basketry SA. It is a Fringe visual arts event. Entry is FREE and works are for SALE.

Official opening: 2 – 4 pm Saturday 15 Feb.

Open daily 10.30 am – 4 pm: Saturday 15 February to Sunday 23 February.

Location: Urrbrae House, University of Adelaide, Waite Campus (enter from Fullarton Road, just south of Cross Road. Free parking at the end of the driveway).

The event will be opened by Evette Sunset who is an environmental sculptor from South Australia. She works with place, local materials, plants and people to create site-responsive, large-scale installations and sculptural landscape designs. Her background is in ceramics, basketry, Biodynamic gardening, energy efficient building and landscape design.

Marilyn 8271 6112 needs a few more people for the roster and to promote the event by distributing the invitations / postcards to local libraries etc.

The Arboretum guides will be leading walks with a 'Living plants in basketry' theme on Sunday 16 and 23 and Thursday 20 of February.

Let's all try and make this first fundraising activity of the year a success!

Exhibition

Friends please note this upcoming Exhibition of watercolours by long-time FWA member Beryl Martin.

Beryl Martin Watercolours

Opening 1st February 2pm

by Elizabeth Raupach OAM



At Magpie Springs, 1870 Brookman Road, Hope Forest, SA 5172. Tel: 85567351

Open Fridays, Saturdays, Sundays 11am to 5pm

Exhibition concludes: 16th March

Membership Payments

Please note that membership renewals for the calendar year 2014 are now due.

I thank the twenty five persons who are either New Members or Renewing Members and have paid their subscriptions in the past couple of months. Your receipts should be enclosed.

Please note the new brochure which you received before Christmas shows the new membership fees, adopted by the committee in October 2013. Please do not use the OLD GREEN Forms as they are out of date. If you need a new form please phone Jennifer 8313 7405.

Individual Membership subscriptions are now \$20.00 per year; Family Membership subscriptions are now \$25.00 per year; Corporate Membership subscriptions are now \$50.00 per year.

When paying your subscription fee, please make cheques payable to "The Friends of the Waite Arboretum Inc." Donations are Tax Deductible.

If you wish to pay by Electronic Funds Transfer directly from your personal bank account please ensure that you identify yourself at least by your surname and include the type of membership, e.g. Bloggs K Family or Jones W Individual in the

reference line on your bank internet screen.

Our bank details are BSB 065 120; Account # 1000 1946 which identifies us as The Friends of the Waite Arboretum account at the Commonwealth Bank of Australia Mitcham SA Branch. These details should come up when you enter the BSB and Account number."

Peter Nicholls, Honorary Treasurer.

Combined Friends Christmas Party

The Party on 2nd December was a very enjoyable occasion and an opportunity for us to chat with Friends from other groups whom we rarely see.



Recognition of Volunteers

On 17 October 2013 members of the staff held a ceremony for volunteers in Urrbrae House. They provided all those present with a lavish spread of goodies to eat and then each staff member thanked all of the volunteers for their continued dedication.

One of the highlights of the morning was a performance by Emma Horwood, who both sang and played harp music with her usual high degree of skill. The experience was a delightful one for all present because Emma's pure vocals sounded very good in the Urrbrae House Drawing Room.

A presentation of a Certificate of Service was made to several volunteers who were present. One who was absent from the occasion was the President of the Friends of the Waite Arboretum, Henry Krichauff. He had his certificate presented to him at a later stage by the Director, Dr Jennifer Gardner.

Present at the morning occasion was the newly appointed Director, Partnerships & Projects, Leah Grantham, who took the opportunity to speak briefly to the assembled group.

Beth Johnstone

Captain Torben Angus Nicolai Davidson

March 1922 to October 2013



Torben (front) and brother John (back) on a horse in front of Urrbrae House on the way to school.

Torben's father, James Davidson, emigrated with his wife and children to Adelaide from England to take

up the James' Professorship of Entomology at the Waite Institute, Urrbrae, Adelaide, SA in 1927, when Torben was 5 years old. Torben remembered his early life playing in the fields around the Arboretum. This was the foundation of his connection to the land.

With bust of his father in the Garden of Discovery.

Torben spent most of his working life at sea and then retired to a small property. And later to a house near the Waite Arboretum.

In latter years Torben and his wife Nettie devoted their spare time to volunteer work, nurturing their own home gardens, and also those in the nearby evolving gardens and trees in the Waite Arboretum. Torben's love of and connection to this Urrbrae land, and the wonderful friendships he formed with other volunteers remained and flourished until he died in October 2013.



With Nettie in the Rose Garden.

He even picnicked quietly in the gardens with Nettie and daughter Lindy a few weeks before he died.

Photos Lindy Davidson

A quiet and modest man, dedicated to hard work and a life of integrity, respected by all he met, he was an inspiration to his family and everyone who knew him.

AUSTRALIAN ROSEWOOD *Dysoxylum fraserianum*
Tree 782 C6 Planted 1929



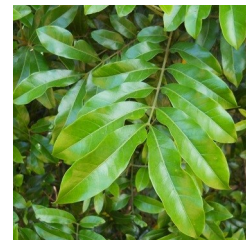
Close to the pedestrian entrance at gate 14 is a very green, attractive Rosewood which was planted in 1929. This tree has performed very well in the Arboretum considering its natural habitat and Adelaide's annual rainfall. It is a tree of the sub tropical rainforests, ranging from Wyong south of Newcastle to the Queensland border area around Killarney. Although this is a large distance the distribution is scattered. The best specimens are found in the forests on the Dorrigo Plateau in northern coastal New South Wales. These are very different conditions from those in Adelaide.

Dysoxylum is from the Greek *dys* (ill smelling) and *xylon* (wood), referring to some species which have an unpleasant aroma. One of these is Rusty Mahogany (*D. rufum*) a specimen also growing in the Arboretum. Another important commercial timber from the genus is Miva Mahogany or Red Bean (*D. muelleri*). Both these Australian species are sometimes called Onionwood because of the strong onion aroma in the freshly cut bark. Miva Mahogany is listed amongst Australia's most toxic timbers, the dust of which can cause congestion of lungs, eye and mucosal irritation, headache, nosebleeds and loss of appetite. There are about 80 species of the genus growing across the botanical region of Malesia, and south to Australia and New Zealand. There are 9 native to Australia, limited to sub tropical and tropical regions.

The common names of *Dysoxylum fraserianum* are Rosewood or Australian Rosewood and the standard trade name of the timber is Rose Mahogany. Unlike the ill smelling derivation described above, Rose Mahogany gets its name from the pleasant rose fragrance emitted from the freshly cut bark. This is also experienced when working the wood, and although it is vague it is permanent. The true Rosewoods belong to the Genus *Dalbergia* many of which have and retain a

strong rose fragrance. Australian Rosewood also gets its common name from the fragrance and not the colour of the wood.

At its best, when growing in forests it is a tall tree growing to 57 metres with a trunk up to 1.5 metres in diameter, but is much smaller and denser when grown in the open. Certainly the specimen in the arboretum is shorter with a beautiful dark green and dense rounded crown, in fact the branches start at ground level. The leaves are bright green and pinnate with up to 12 leaflets. The flowers are fragrant and cream to mauve in colour, up to 8mm and in panicles. The fruit is a pink to reddish brown capsule which is globular or pear shaped. When ripe the fruits dehisce into four longitudinal slits revealing several lustrous red seeds.



The wood is closer in appearance to Mahogany than Rosewood, often having interlocking grain showing fine zig-zag patterns. Rose Mahogany is a desired timber for furniture construction, although dust created when sanding can cause irritation to the nostrils. The sapwood is pale and the heartwood varies from pale to dark reddish brown. The wood is reasonably hard and heavy – about 720 Kg per cubic metre (c.f. Jarrah about 820 Kg per cubic metre). The wood often has an oil which tends to sweat and make finishing difficult.

References

- Forest Trees of Australia, D.J. Boland et al, CSIRO Publishing, 1992
- The Timber and Forest Products of Queensland, E.H.F. Swain, Queensland Forest Service, 1928
- Australian Rain-forest Trees, W.D. Francis, Australian Government Publishing Service, 1981
- Wood in Australia, Keith R. Bootle, McGraw Hill, 2002

Ron Allen
Photos Ron Allen

Launch of *Garden Voices* December 9, 2013

Around 250 people attended the launch of the book, *Garden Voices*, on the lawn at Urrbrae House on the evening of Monday 9 December. Neither the rain which had fallen earlier in the day nor the brisk wind could quell the enthusiasm of the garden lovers. They milled in the lovely rose garden enjoying wines generously donated by Coriole Vinyards and nibbled on sandwiches while being treated to music and poems from the house balcony prior to the official proceedings. It was the first visit to Urrbrae House for many of the guests. FWA volunteers helped serve the food and drink with others assisting on the book table.



Anne Latreille, Jennifer Gardner, Dr Lewis O'Brien, Richard Heathcote, Viesturs Cielens.

Dr Lewis O'Brien, Kaurna Elder, gave the Welcome to Country followed by Dr Jennifer Gardner who spoke briefly about the history of the Urrbrae House Gardens which are featured in the book.



Author Anne Latreille talked about her research and of her admiration of the garden designers who are reported in her book. In particular she

spoke of the work of Viesturs Cielens who designed some of the gardens at the Waite Campus: the Mallee Paddock, the Garden of Discovery, the Twentieth Century Rose Garden and Garden of Sensory Delights. Anne said that "The author said "Viesturs' work, private gardens and public spaces, not only in Adelaide but around so much of South Australia, is inspiring, alluring,



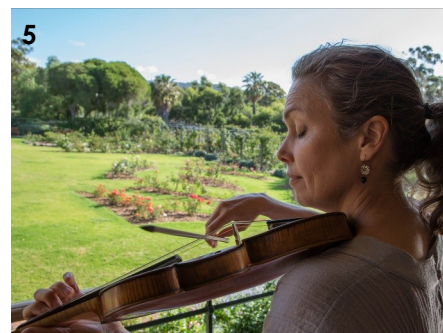
Garden volunteers Tomai Martin and Laurel Crouch

uncomplicated and practical. I relish the way he involves artists and craftsmen so that the spaces, especially the grounds that he designed here at Urrbrae House, are not just collections of plants, but creations



that make you stop and think and look around. He sticks to his mantra, "keep it cheap, sweet and simple'...."

Regarding her book Anne said "Australia is a wonderfully varied place where we can make wonderfully varied gardens using designs and plants that are fitted to their place, soil and climate, to their era and to their users. This is what the 19 garden and landscape designers and design firms in my book have



Lucinda Moon.

done. They are drawn from every state of Australia, from far north Queensland to Tasmania and across to Western Australia so that assembled, they paint a picture of our continent. Finding out about them has been a voyage of discovery; sharing their life stories, their design talent and their practical advice has taught me heaps. If it can do the same for anyone who reads "Garden Voices" then I'll be very happy."

The books sold like hot cakes with the author being kept very busy signing. More books have been sold since the launch and six books are still available from the Arboretum Office. Phone Jennifer 8313 7405. To date 94 books have sold for a profit of \$732. which will go towards the development and maintenance of the Urrbrae House Gardens. Viesturs Cielens organised the launch and is to be congratulated on putting on such a splendid show at quite short notice. The Friends of the Waite Arboretum were pleased to host the successful event.

Marilyn Gilbertson

Photos: 1, 2, 3, 5, 6 Bob Photo: 4 Joe Bennink



Lynn Elzinga-Henry, Anne Latreille

RARE AND ENDANGERED TREES IN THE ARBORETUM

IUCN Red List

The International Union for Conservation of Nature was founded in 1964 and is the world's most comprehensive inventory of the global conservation status of biological species. Often shortened to the IUCN Red List, it is an important organisation dedicated to the protection of the flora and fauna species of our world.

Species are classified into nine major groups:

Not Evaluated (NE) species which have not yet been evaluated against the criteria.

Data Deficient (DD) where there is not enough data to make an assessment of its risk of extinction.

Least Concern (LC) is assigned to species which have been evaluated but do not qualify for any other category.

Near Threatened (NT) is assigned to species that may be considered threatened with extinction in the near future, although they do not currently qualify for the threatened status. This includes the species which are dependent on conservation efforts to prevent them from becoming threatened with extinction. (Previously separated into the **Conservation Dependent** group).

Vulnerable (VU) species are those which have been categorized as likely to become Endangered unless the circumstances threatening their survival and reproduction improve.

Endangered species (EN) are those facing a very high risk of extinction. This is the second most severe conservation status for wild populations, following Critically Endangered.

Critically Endangered (CR) is the highest risk category assigned for wild species. Critically Endangered species are those that are facing a very high risk of extinction in the wild.

Extinct in the Wild (EW) is a conservation status assigned to species the only known living members of which are being kept in captivity or as a naturalized population outside its historic range.

Extinct (EX) applies when there is no reasonable doubt that the last individual has died.

For the purposes of discussing endangered species, the official term 'threatened' can be restricted to the three most threatened groups: Critically Endangered, Endangered and Vulnerable. This article is about threatened trees in the Arboretum. In all there are 17 species which are included on the IUCN Red List as threatened. My interest in this area was aroused when doing some research about the Alerce (*Tetraclinis articulata*) which died last year and discussions with Jennifer which

revealed the number of precious and endangered trees within the Arboretum.

I was surprised that I could find little from the IUCN web pages about listed Australian trees, in particular Waddy (*Acacia peuce*). However, after some searching I found a Department of the Environment site which has a comprehensive list of Australian flora including species profiles and the threats data base (and lists the Waddy amongst many other acacias). It is: <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>

Near Threatened and Threatened trees growing in the Arboretum include:

Near Threatened

<i>Juniperus procera</i>	African Juniper
<i>Phoenix theophrasti</i>	Cretan Date Palm

Vulnerable

<i>Arbutus canariensis</i>	Canary Madrona
<i>Quercus engelmannii</i>	Engelmann Oak, Mesa Oak
<i>Quercus alnifolia</i>	Golden Oak
<i>Quercus arkansana</i>	Arkansas Oak, Water Oak
<i>Sterculia alexandri</i>	Cape Sterculia
<i>Dracaena draco</i>	Dragon Tree, Dragons
Blood Tree	

Endangered

<i>Quercus georgiana</i>	Georgia Oak, Stone Mountain Oak
<i>Pinus torreyana</i>	Soledad pine, Torrey pine

Critically Endangered

<i>Cupressus dupreziana</i>	Saharan Cypress or Tarout
<i>Pyrus tadshikistanica</i>	Pear
<i>Pyrus korshinskyi</i>	Pear

This impressive list highlights the value of Botanic Gardens and Arboreta in helping to highlight the plight of these endangered species and to aid in providing a safe haven to assist in their future security.

I have prepared a special walk to look at and to discuss some of these precious trees. The first of these walks will take place on Sunday March 16 and will be followed by another on Friday March 21 which is the International Day of Forests and the Tree. The walks start at 11 am, and I invite you as Friends of the Arboretum to join me and other guides on one of these walks.

Ron Allen

***Emex australis* Steinh. Family Polygonaceae.**

The name *Emex* is derived from *Rumex* a closely related genus and *australis* is Latin for southern referring to its origin in Southern Africa.

Emex australis was intentionally imported into Western Australia in 1830 as a vegetable and was commonly known there as Cape spinach or doublegee from the Afrikaans name dubbeltjie or dubeltge doorn (Devil's Thorn). In S A and the Eastern States it is more often called three-cornered jack, spiny emex, or bindii. Other common names include cat-head, prickly jack, giant bull head and Tanner's curse. The name Tanner's Curse came into use soon after it naturalised in Australia.

Emex australis, three-cornered jack, is native to southern Africa. Once in Australia, it spread rapidly and now is a very widely naturalised species that is particularly common in the sub-coastal districts of temperate Australia. It is most abundant in the western and southern parts of Western Australia and is also common in parts of New South Wales, Victoria, South Australia and south-eastern Queensland. It is present in parts of the Northern Territory and Tasmania. It is a significant weed of agriculture in temperate Australia and it is estimated that it causes a loss of about \$40 million annually in crop losses and production costs in WA alone. It is also regarded as a weed in the USA, Taiwan and New Zealand.



Emex australis is a vigorous annual herb with a strong tap root and a long, fleshy, hairless stem. Leaves are alternate, hairless and triangular with undulating margins. Ovate leaves form a

prostrate rosette at early stages of growth but can assume a semi-erect habit in crops or pasture. Round, ribbed stems branching from the centre of the rosette may grow up to 600 mm in length.

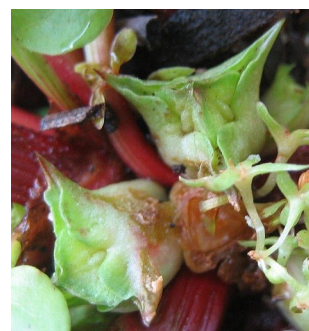


The inconspicuous greenish flowers are in small clusters and are unisexual, but both male and female flowers occur on the same plant and are self compatible.

In warm weather long, running stems grow rapidly from the central rosette and progressively set fruit in the leaf axils. The fruits mature in order of formation so ripe fruits may be shedding near the crown while

flowers and fruits are still being produced near the ends of the stems.

The single-seeded fruit (achene) is woody, green turning red brown on maturity and dull black with age, 7-11 mm long with 3 rigid sharp spines radiating from the apex. Two types of fruits are formed, one underground at the base of the stem and the other above ground in leaf axils. The underground fruits are initially white, somewhat flattened and tend to remain attached to the crown whereas the aerial fruits are initially green, radially symmetric, detach readily from the crown or stems and also have longer spines. The aerial fruits are usually larger. All fruits turn brown on maturing. Viable seed is produced about 6 weeks after flowering.



Green fruit

Photo Jennifer Gardner

Emex australis can grow on a wide range of soil types from loam to clay loam. Seeds germinate in response to water availability, relatively independently of the temperature. Seedlings quickly form deep taproots which give them greater drought tolerance than surrounding herbs. With prolonged heat and lack of moisture the leaves may wither but the plant will reshoot from the rootstock when conditions improve. Germination occurs at any time of the year with a flush in autumn and winter and there can be up to six waves of germination. A single plant growing under ideal conditions in the absence of competition may spread up to one metre in diameter and produce as many as 1,100 seeds. *Emex australis* achenes can remain viable in soil for up to 8 years.

The germination rate is related to depth of burial. Seeds buried at >100 mm rarely germinate. Seeds on the soil surface have a low germination rate. Seeds buried 10 mm deep have a greater germination than those on the surface or deeper. Seeds buried 10-50 mm deep are the most likely to establish. If seed-infested sites are left undisturbed, little germination occurs after 2 years but if the soil is cultivated once again many more seeds will germinate.

Spiny emex is a common weed of disturbed habitats such as roadsides, tracks, firebreaks, picnic sites, old homesteads and clearings. It is often present in disturbed sites in conservation reserves and invades natural areas including creek banks, river floodplains, clay pans, the edges of saline lakes and granite rock areas.

In South Australia three-cornered jack is present in a variety of habitats: semi-arid vegetation, coastal

dunes, offshore islands and along roadsides. It is found within conservation areas including the Aldinga Scrub Conservation Park, Coorong National Park, Flinders Ranges National Park and Black Hill Conservation Park.



6 *Emex australis* in 1 m² Photo Jennifer Gardner

Last winter *Emex australis* was discovered to be widespread in the Arboretum. Groundsperson Andrew Walters removed as many of the plants as possible before their fruits detached but many fruits remain and will germinate with the first rains this year.



Andrew's dense foam kneeling pad with its load of jacks shows how easily the dried fruits may accidentally be spread on the tyres of vehicles or the shoes of people entering the Arboretum. The spiny fruits can injure animals and are robust enough to puncture bicycle tyres. Many of you will no doubt have painful childhood memories of stepping barefoot on three corner jacks lurking in the backyard.



Image www.csiro.au/...
Emex australis

E. australis can be controlled if stable, undisturbed perennial grass cover is established. Because of seed dormancy and longevity, spiny emex is difficult to eradicate. Isolated plants can be pulled up and destroyed. Where possible spraying the area around them with a suitable herbicide will reduce the number of seeds germinating later. Ideally, people, animals and vehicles should be kept out of seed-infested areas to prevent further seed spreading.

E. australis seedlings can be selectively and effectively killed by broadleaf herbicides but these

herbicides also damage other beneficial broadleaf species. Use of herbicides can be costly or undesirable for a variety of reasons. In WA spiny emex has become resistant to a widely used group of herbicides. These problems led to CSIRO Entomology, in 1974, to begin investigating the possible biological control of *E. australis*.

The first agent released on *Emex* was the South African weevil, *Perapion antiquum*. *E. australis* plants are abundant in the western Cape Province of South Africa and this weevil attacks the plant after seeds have formed. The weevil also successfully controls *Emex* spp. in Hawaii. It did not establish in Australia and it is thought that our harsher summer conditions were the reason for the failure. Another weevil, *Lixus cribricollis*, which was collected from *Emex spinosa* in Morocco and released in Western Australia in 1981 also failed to establish.

The summer conditions in Israel are similar to those in Australia. Studies of the *E. spinosa* populations in Israel identified an apionid weevil, *Apion minutum*. The larvae tunnel in stems, crowns, and roots and the adults feed on leaves and lay eggs into stems and petioles of *E. spinosa* plants. The weevil was imported into Australia and approved by Australian regulatory bodies for field release in 1998. There have been extensive releases but little evidence of sufficient population build up. Other potential biological control agents such as fungi and weevils, are known from north Africa, but have not been studied to determine their potential for use in Australia.

In Australia a native sawfly, *Lophyrotoma analis*, attacks leaves and *Rhinoncus australis*, a native weevil, attacks leaves and stems. Seed may be eaten by mice if they are present and native birds such as Major Mitchell Cockatoos, Inland Red-tailed Black Cockatoos, Galahs, Little Billed Corellas and Long Billed Corellas feed on the seed. Two exotic organisms that attack *Emex* have been found in Australia: the dock aphid, *Brachycaudus rumexicolens* and the fungus, *Phomopsis emicis*. Laboratory and field studies showed these reduced the amount of dormant seed produced by *E. australis*.

References

<http://grains.agric.wa.gov.au/node/doublegee-emex-australis-identification-and-attributes>

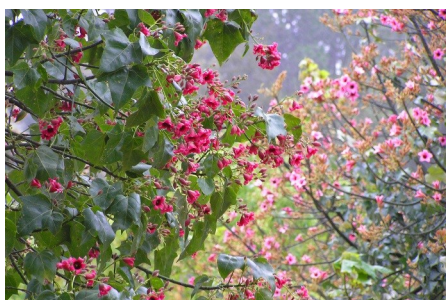
<http://www.weeds.org.au>

http://www.herbiguide.com.au/Descriptions/hg_Spiny_Emex.htm

<http://www.csiro.au/Outcomes/Food-and-Agriculture/Biological-control-of-Emex-the-weed-and-potential-agents.aspx>

Eileen Harvey

WHAT TO SEE IN THE ARBORETUM IN SUMMER



The large pink bell-shaped flowers of *Brachychiton x excellens* (L) and *B. discolour* (R) make a spectacular show in summer. *Brachychiton* hybrids are bred for flower colour and size. Origin Australia.



Eucalyptus macrandra, the Long-flowered Marlock or River Yate, is a small, slender mallee native to SW Western Australia. It is noted for its large clusters of flowers and fruit. Flowers are yellow to cream and form long lasting displays during November to April. Origin WA.



A beetle feeds on the flowers of the Catalina ironwood, *Lyonothamnus floribundus*. The species is endemic to Santa Catalina Island and is listed as 'Vulnerable' on the IUCN Red List. Origin California Islands.



Caesalpinia ferrea, Brazilian Ironwood is used in guitar making and fine furniture. Origin Brazil. Photo Jennifer Gardner



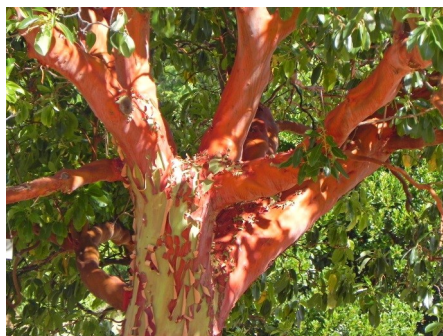
Backhousea citriodora, Lemon-scented Myrtle has strongly lemon-scented leaves and attractive white flowers. The dried leaves can be used in cooking and for tea. Origin Qld. Photo Jennifer Gardner



Eucalyptus pterocarpa is a small tree (to 15 m) with smooth grey bark and attractive ridged gum nuts. It is restricted to an area around Coolgardie. Origin WA.



Decorative acorns, fruit of the evergreen Mesa Oak, *Quercus engelmannii*. Origin California. Photo Jennifer Gardner



Arbutus andrachne, the Oriental Strawberry tree, has colourful tan bark which is shed in summer to reveal the smooth, pale under bark. Birds eat the small strawberry-like fruit. Origin E. Mediterranean.



Eucalyptus erythronema var. *marginata* is an ornamental mallee with pale smooth bark, red flowers and fruit with an expanded rim. Origin WA. Photo Terry Harvey



Banksia lanata (above) and *B. lemanniana* (below) are woody shrubs of the Family Proteaceae. Each banksia flower is tiny but they are arranged in dense clusters forming the inflorescence. Origin WA. Photos Jennifer Gardner

