



*Sunday work morning at the end of June, with planting happening in the Sensory Garden. As the sun emerged from a very heavy fog there was a complete transformation.*

### President's Message

Peter Bundock is overseas at present so this message is from me in my role of Vice President. There is a lot happening at the Gardens this year. The rather wet summer and autumn has meant that there has been wonderful growth in our plants. Just from week to week there is visible change. The very generous donations from Andrew and Jeni Binns, both last year and this, have given us the means of manifesting a lot of our long held dreams. We will be forever grateful to them.

Work in the Sensory Garden is proceeding well with the mosaic path installed and the old fence post curved entry wall in position. Small trees and shrubs of interesting shapes, sizes and textures are being planted around the path and central area of the garden. Don from our Wednesday group has made some beautiful seats and the team are starting work on a small Japanese style bridge at the western end of

the Wilson Park planting, linking it up with the Sensory Garden. The surrounds of the pond are being planted and our first water lilies are in position.

In the Hoop Pine Forest plans are afoot for a second walking path going deep into the forest and right up to the top of the hill - with very gentle grading.

The education group is very busy with ongoing school groups and other activities. Later this month they will be taking a very active part in the Art/Science cum Big Scrub Day at the City Hall.

A group of high school students from Yamato Takada, in Japan, came at the end of July. Two groups of Aboriginal visitors, had a look around the Garden earlier in the year, both were particularly interested in our Useful Plants Garden. Following on from that, a series of courses is being run at the Gardens, teaching the ancient skills of making fibre articles from local plants.

A big group of U3A people spent one day at the Garden during Senior's Week in March and obviously had a wonderful time.

In late February we had a very successful planning workshop run by Heather Gillard which helped us sort out our priorities for the future. In this coming year we want to complete the structural and planting work in the Sensory Garden, establish the new track in the Hoop Pine Forest, get more of our tracks sealed, and that is just a start. The Wednesday work group is growing and evolving and are so efficient at getting work done. And the propagation team produce miracles, working in less than ideal conditions but still raising beautiful healthy plants. Our committee is firing on in the background. The amount of work that happens behind the scenes is often breathtaking! This is an exciting, if at times exhausting, period to be involved with the Gardens.

*Marie Matthews*

## Species profile *Castanospermum australe* Black Bean

Familj FABACEAE, subfamilj FABOIDEAE

from **Peter Gould**



The flower



The foliage



The seed pod

### DESCRIPTION:

Black Bean or *Castanospermum australe*, is a large tree growing to 40 m tall with a trunk diameter up to 1.5 m. The trunk is not prominently buttressed. The crown is very dense, consisting of abundant dark green glossy foliage. The bark is slightly rough with very small pustules and is coloured grey to brown.

Leaves are compound, 30–60 cm long, with between 9 and 17 oblong-elliptic leaflets measuring from 7–20 cm long and 3–5 cm wide. The leaf apex is acuminate, margins are entire, glabrous, upper surface

glossy, lower surface paler and dull. The petiole is 3–6 cm long and lateral petiolules are 2–5 mm long. The showy orange to red flowers appear in racemes about 5 to 15 cm long, in the spring. They are highly attractive to nectar eating birds including the Little Wattle Bird, Rainbow and Scaly-breasted Lorikeets, Friar Birds and Honeyeaters. It is a host plant for the caterpillars of the Common Pencilled-blue Butterfly.

The large pendant bean-like fruit measure up to 20cm. These pods split in two, revealing 3-5 large seeds.

### DISTRIBUTION:

It is widespread in warmer rainforest from the Orara River in the south to North Queensland, New Caledonia and Vanuatu. Although still fairly common in NSW, Blackbean was once significantly more widespread. It was an important element in both the 'Gallery rainforests' found growing along river banks and overhanging streams and Subtropical Rainforest on Sediment (now an endangered ecological community) - two communities heavily impacted by clearing for agriculture. The toxicity of its seeds and seedlings to cattle led farmers to cut out trees and persecute regrowth.

### SEEDS:

The toxic seeds were used as a food by Aboriginal people but only after lengthy processing including slicing finely, leeching in creeks for weeks, pounding or grating and finally, roasting. An alkaloid extract from the seeds, Castanospermine, has been shown to possess anti-cancer and anti-viral properties and is a potent inhibitor of the mosquito borne Dengue Virus.

### TIMBER:

The dark brown to chocolate timber is moderately hard and coarse grained with some figure. As well as use in general house framing and,

more commonly as flooring, lining, mouldings and joinery, it has been used for the production of veneer, plywood, furniture, shop and office fixtures, joinery, turnery, carving, inlay work, vehicle and carriage building.

In cultivation Black Bean is quite hardy though fairly slow to establish. Its dense glossy foliage and tolerance of low light conditions have seen it utilised as an indoor plant.

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- The effect of castanospermine on the metastatic properties of prostate cancer cells. <http://www.ncbi.nlm.nih.gov/pubmed/9413219>
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## Mental health and contact with nature

The benefits of nature in relation to the mental health of individuals has been much discussed in recent years. In a report which appeared in the Sydney Morning Herald late last year Ross Gittins referred to a Canadian study which notes various benefits that could be experienced from contact with nature. These included restoration of a person's ability to pay attention, improvement in concentration in children with attention-deficit hyperactivity disorder, and speedier recovery from illness.

Yet another study from Norway reported that the first hospitals in Europe were in monastic communities where a garden was considered an essential part of the environment – because of its importance in the healing process. A key element of this positive health effect of nature is its stress-reducing effect. Chronic stress disrupts nearly every system in the body, playing a role in the development, for example, of cardiovascular diseases, anxiety disorders and depression.

The benefit of contact with nature may simply be that nature can be a beautiful place to be in. Office employees seem to compensate for lack of a window view by introducing indoor plants or pictures of nature into their office space. On his blog site British psychologist Dr Jeremy Dean, reports that there is evidence that taking group walks in nature is associated with better mental wellbeing and lower stress and depression. A study, evaluated in a British program called Walking for Health, involved nearly 2000 participants over a three month period. Its results indicated benefits to those involved especially those who had been through a recent stressful life event.

Extracted from [www.smh.com.au/.../for-your-mental-health-get-back-in-touch-with-nature](http://www.smh.com.au/.../for-your-mental-health-get-back-in-touch-with-nature)

## Plans for Hoop Pine Forest



*One of our members, Beth Minnis, took these photos of the Hoop Pine Forest from Lismore Heights - we don't often see this easterly aspect of this planting of *Araucaria cunninghamii* from such a distance.*

The Hoop Pine Forest is becoming more and more important in the overall scheme of our Botanic Gardens. The idea of putting a loop path into this area and taking it right up to the top of the hill was suggested by Greg Buckler, from Northern Rivers Waste, as a possible project for a visiting work training team. A suggested path was marked out, but the team ran out of time before they were able to get onto this project.

More recently a visit from a local Landscape Architect, Nick Alderson, put it back on the agenda. He has helped us mark out a more detailed path, stopping at several points of interest, and we are now developing ideas for this scheme and hope to get moving on it in the very near future.

One of our aims for this area is that it will be a place for anyone who enjoys to exercise, or just be, in

nature. However, it could be of particular benefit for the mental health of specific individuals and the community as a whole. With that in mind we have approached the local Mental Health support group and are working in conjunction with them on preparing a grant application, as well as drawing on their knowledge and experience about possible features to include in this project.

This walk will be an asset to the whole local community, and for any visiting individuals or groups.

*'The art of healing comes from nature not from the physician. Therefore the physician must start from nature, with an open mind.'*

Paracelsus sixteenth century physician and botanist

## Aboriginal basket making techniques relearned using info from Mary Bundock diaries

A series of five basket making workshops are being held at the Gardens between July and November. The course is being presented by the Gulibal Living Culture Group and participants will learn about the natural fibres growing in our region and how they can be prepared and used to create objects, using traditional Bundjalung basket making techniques.

Gulibal Living Culture group, with experienced local basket weaver Janet Wilson, have studied the detailed diaries of Mary Bundock, the daughter of an early white settler in the Kyogle district. Mary had an avid interest in the traditional weaving techniques. She worked with the local people and collected baskets made from local fibre. She was concerned about the possible loss of local Aboriginal culture during the late 1800s. Eventually her collection of baskets and diaries went to the British Museum. However, in November this year the original baskets will be returning to Australia as part of the Encounter Project at the Australian National Museum in Canberra.

Earlier this year Janet Wilson, with local indigenous women Ben Radic and Lauren Jarret, visited the Gardens and were thrilled about the plants growing in the Useful Plants Garden – plants that had been used by the local Aboriginal people for fibre making, food and medicines etc. It was after that visit that the decision was made to hold this series of workshops at the Gardens. The traditional methods of preparing fibre and making baskets, as described by Mary Bundock, will be the basis of the workshops.



"[This] bag of the stiffer grass is a 'dilly bag' and the native name of the plant is 'boombi'. The plant grows on the ridges round here and is not uncommon."

From a letter sent to Prof A Liversidge by Mary Bundock, written at the Wyangarie Station in the Richmond River District, dated 8 October 1879.

*From British Museum web site*



Artist Ben Radic with Jan de Nardi and Margaret Hildebrand in Useful Plants Garden earlier this year

## Aboriginal Elders visit

On 2 March we had a visit from five aboriginal elders. Ken Morgan, Kamilaroi, Carol Morgan his wife, Thelma James, Bundjalung elder and her partner Mick Roberts, and Ros Sten, a Bundjalung elder, who is attached to the NSW Police with the rank of sergeant

After a yarn over a cuppa in the EEC we headed out through the Useful Plants Garden, through the Grandis Creek picnic area, along the Discovery Trail to Rainforest Walk. We didn't make it as far as the Hoop Pine Forest. The visitors were all excited at being there, especially in the Useful Plants Garden, calling out and reminding each other of the uses of many of the plants they found growing there.

It is hoped that there will be more of these gatherings in the future.

*Denis Matthews*

### **Some Snippets from our Aboriginal visitors**

- Ben Radic stated that until the white mob introduced 'boiling water', dyeing could only be done with cold water. The white man introduced pans and saucepans and so the process of 'fixing' in boiling water was eventually adopted.
- The bark of the native rosella (hibiscus) and the leaves from bull rushes were used to make fibre.
- Cordial was made by infusing nectar rich flowers in water
- Midgenberry fruit were called lollies and eaten as a treat
- Plaiting can be done with palm fronds, flowers/grasses etc
- Roslyn Sten says the Widjbul people sought the flammable seed cones of their Hoop Pines to carry fire from place to place to start a camp fire.



## Fruit eating rainforest birds and weed trees

*'When I see white-headed pigeons feeding on the fruits of camphor laurel (Cinnamomum camphora), I am not concerned about the seed being dispersed and spreading the weed tree. White-headed pigeons and brown cuckoo-doves have small stones in their gizzard which grind the seeds before digestion. On the other hand, top-knot pigeons never feed on the ground so do not have stones in their gizzard and certainly disperse seeds far and wide as they fly from feeding site to roosting site each afternoon.'* Quote from Hugh Nicholson on Facebook May 2015. Later Hugh added: *'I remembered the fact from talking to our mentor, Alex Floyd, many years ago. To check that I had it right, I read the relevant sections on the ground-feeding pigeons - white-headed pigeon, brown pigeon and green-winged pigeon - in Pigeons and Doves of Australia by H.J. Frith, published in 1982. Further reading indicated that native birds feed (and rely) on weed species. Tim Low alluded to this in his book 'The New Nature' - pages 94-96. Nothing is simple or straight forward. Dealing with exotic weed trees is not a case of removing all camphors or privets on sight. By doing that we would then risk starving many of the native pigeons.'*

**In an essay written as part of an MA course with South Queensland University** on the Conservation for Sustainable Futures, Peter Gould gives further information on this topic.

'Many of the rainforest trees occurring in the Big Scrub have fleshy fruits, which are brightly coloured and displayed so as to attract frugivorous birds (Floyd 1990 and Gould, P. 2010).

Where invasive plants comprise part of the diet of native frugivores, there may be a conservation conflict between control of the invasive and maintaining populations of the native frugivore, especially where other threats such as habitat destruction have reduced

populations of native fruit species (Buckley, Y.M., et al. 2006).

The ways in which frugivores process seeds, the size of seed they are able to consume and whether they destroy, regurgitate or excrete seeds determines the fate of seeds they ingest. Several authors (Holmes 1987, Floyd 1990, Moran et al. 2004 and Neilan et al. 2006) recognise three modes of processing of seeds by frugivorous birds:

**Predators** are those birds, which grind and destroy seeds. These include the Wompoo Fruit-Dove (*Ptilonus superba*), Brown Pigeon (*Macropygia amboinensis*), Australian King Parrot (*Alisterus scapularis*), and Australian Brush Turkey (*Alectura lathami*).

**Regurgitators** swallow fruits whole, digest the edible flesh and regurgitate the seed e.g. the Pied Currawong (*Strepera graculina*).

**Excreters** swallow fruit whole and digest the pulp with the seed passing through the gut and being excreted in faeces. Examples include the Silver Eye (*Zosterops lateralis*), Channel-Billed Cuckoo (*Scythrops novaehollandiae*), Fig Bird (*Sphecotheres viridis*) and Satin Bower Bird (*Ptilonorhynchus violaceus*).

Gape size in birds determines the size of seeds they are able to swallow and process (Holmes, 1987, Floyd 1990 and Neilan et al. 2006). Camphor fruit are round, 10 mm in diameter, and able to be ingested by



White headed pigeon and Camphor Laurel berries. Photos Hugh Nicholson

all of the frugivorous birds identified in surveys of the Big Scrub remnants and regrowth (Holmes, 1987, Neilan et al. 2006 and Kanowski and Catterall 2007).

A number of important rainforest trees produce seeds that can only be swallowed by larger birds with a large gape. For instance, the Wompoo Fruit-Dove is the only bird in the area capable of swallowing and processing the 2.5 cm seeds of the Blue Quandong (*Elaeocarpus grandis*) a dominant species of riparian vegetation in the Big Scrub (Holmes 1987).'



Geoff and some of his crew surveying an undeveloped gully south west of The Glen where they have since planted a local species of Paperbark as windbreak and shelter trees for a future palm and fern garden

## Saprophytic Orchids from John Moye - author of our recently updated 'The Blooming Orchid' book

It is certainly exciting for any enthusiast to find a new plant, but more so when one is discovered growing in Lismore's young Rainforest Botanic Gardens by a sharp-eyed volunteer. The plant described in the February Newsletter is just one of several saprophytic orchids which could easily pop up within the Gardens precincts. However, the plant described there was unfortunately named incorrectly. The plant is actually *Cheirostylis ovata*.



*Cheirostylis ovata*

This is one of several saprophytic orchids which are known to grow in the Lismore area. The distinguishing feature of this species is the 'caterpillar-like' rhizome. This plant is a deciduous one with a growth period during the spring months and has been seen in numerous areas within the North Coast including Rotary Park, Lismore.

A similar cryptic species is *Zeuxine oblonga*, found in similar environments and flowering about the same time. It is also a deciduous plant. The rhizome lies buried in decaying plant material and is quite slender. Plants may grow to 50 cms

but are generally much shorter. They have several ovate leaves, the lower of which may wither as the stem elongates. Flowers are short-lived and quite small. This orchid is also common in Rotary Park.

*Epipogium roseum* is a further orchid in this group. Moist, humus enriched and rotting timber areas within rainforests and other damp forested areas appear to be the preferred environments. Plants are usually seen in early to late summer during high rainfall periods, but are easily missed because of a very short growth period. The unusual whitish flowering stem, pale pinkish flowers and swollen ovary are key indicators of the species. Large numbers of densely-packed plants may be found on some occasions. Plants have been seen in Lumley Park at Alstonville as well as in the Kyogle area.



*Epipogium roseum*

Another saprophyte is the 'Giant Climbing Orchid' *Pseudovannilla foliata*. Unlike the above, this is a large plant is a vigorous climber with a growth form which is unmistakable. Plants are short-lived and have a flowering period in the summer months, particularly December- January. These plants are mostly seen growing on decaying, sometimes fallen trees, dying as the nutrient supply diminishes, and as the name implies, the growth form may be quite large. Flowers are numerous but individual flowers are short-lived. The species has been seen growing in the vicinity of Minyon Falls as well as in local coastal lowlands and nearby hills.

The genus *Dipodium* may also deserve a mention. These too are terrestrials, but plants show a preference for eucalypt environments rather than that of rainforests. The species may not be a true saprophyte although plants are leafless and lack chlorophyll. Rather there could be an element of parasitism in their growth. Plants are not uncommon in moist and dry sclerophyll forests throughout the area, and flower throughout the summer months. They are sometimes referred to as 'hyacinth orchids'.

*Cheirostylis ovata* plants have come up in abundance beside Discovery Trail One. We look forward to them flowering soon.

## The Blooming Orchid

A YEAR OF ORCHIDS ON THE FAR NORTH COAST OF NSW

Text and photos by John Moye

3<sup>rd</sup> Edition – updated and beautifully illustrated in full colour

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## Planting out steep slope of Anniversary Path



We are about to start planting out the southern slope beside Anniversary Path. In the lower section, near the creek, will be rainforest trees such as Quandongs, Bangalow Palms, and other tall rainforest trees, with interesting shapes and foliage. Higher up the slope will be rainforest shrubs, small trees and understory plants. Along the level section at the top we are going to install a display of native grasses and ground covers that grow naturally in this area.

Because this planting is part of the southern boundary of the Sensory Garden we want extend the idea of stimulating the senses and so are choosing plants that have a great variety of textures, leaf shape and size, colour and also different heights and density

### Chief Guide's visit

The Chief Guide from Sydney's Royal Botanic Garden, Lyn Cusack, visited our Gardens recently.

Rosemary Blakeney took her into the Hoop Pine Forest to explain our programme for the pre-schoolers and primary school children. Lyn was very impressed that we had an established mature forest as part of our Gardens. She also went on a short walk along Rainforest Walk and the Useful Plant Gardens. Lyn has agreed to return to Lismore later in the year – after Sydney's Australasian Conference of Volunteer Guides in Botanic Gardens – to run a basic training workshop for our current and future guides. The date and format are still to be decided.

## Commemorative Garden

Our grant application for this project, in conjunction with the local Legacy group, to the Department of Veterans Affairs, was unsuccessful. However, we are currently working on an amended plan and further grant applications. Special thanks to Hazel Bridgett for all the work she put into this grant application, and to the local Legacy group and individual professional people who gave so willingly of their time and expertise. We are very grateful.

### WORK MORNINGS

**Sunday Group** usually last Sunday of each month starting at 8 in winter 7.30 in summer  
Contact Denis 0431 223340

**Wednesday Group** meet every Wednesday starting 8am  
Contact Ros 6628 2909

**Propagation Group** every Tuesday at the nursery, starting 8am

Contact Rose 0402 789122  
*Wear protective clothing and bring insect repellent, sunscreen ... and something for morning tea.*

### Birdwing Butterfly Vine

We are starting to grow the *Parastalochia pravenosa* - Birdwing Butterfly Vine. We have recently joined The Birdwing Butterfly Conservation Network and they will be supplying us with seed. The first vines should be available for sale around this time next year.

### Smaller rainforest plants for the home garden

*Tripladenia cunninghamii* is a plant in the family UVULARIACEAE. It is a perennial erect herb to 40 cm high with simple stems arising from a knotty rhizome. The roots are fibrous. The alternate leaves are a dark green with parallel veins and grow on either side of the stem. Flowers are a pink or mauve colour and form in the upper leaf axils and are followed by fruits which form in a green capsule on a long stem which splits to reveal an orange aril enclosing the numerous dark seeds.

*Tripladenia* grows as an under story plant from the Myall Lakes in NSW to North Queensland, in wet sclerophyll forest and rain forest. It is widespread in these habitats but not common, however it can be locally abundant. This species is an attractive plant and does best in shade with thick mulch. It also makes a good indoor pot plant.



**Mike Fulloon**



## Planning for future market stalls



*Beautiful setting for plant stall in Magellan St Lismore in April*

We realised, by the end of our recent market stall that, in order to avoid burnout of our workers we need, in the future, more helpers on such days. We have a group of regulars but we need also a pool of others who we can call on to relieve people during the day and to be on hand in case of sickness or unavoidable absence key helpers. And we need to organise ahead the timing of their attendance so as to get greatest benefit for all involved. For most stalls we need several people for about an hour very early in the day to help deliver the boxes of plants, tables and other gear from cars to stall – and we need to ensure that we have a trolley. On days

when we put up our gazebo, we need four tall, reasonably strong people, to get it up quickly and easily. Also to help setting up the display board. Similarly, at the end of the day we need people for about an hour to help dismantle the gazebo and photo display, and get left over boxes of plants etc to the cars. And to unload at the other end. For stalls at smaller sites such as Lismore Central, fewer people are needed but it is still important to have that pool of people to draw from - who will come if available when asked for one or two hours at an agreed time. Except for setting up and dismantling, we mostly need

help from folk who have a reasonable basic knowledge of our plants and the Gardens, and can answer questions well. However, we do have brochures briefly describing the plants we have for sale and also rainforest plant reference books on hand – so we don't expect you to be a plant expert.

Sale of plants is our biggest money raiser outside donations and grants. Any members who feel they could help at future markets please contact Rose. Ph. 0402 789122

### Plant sale stall

Our market stall in April was a great day for the Nursery and the Gardens. We had a steady stream of interested people and even while we were trying to set up we had people wanting to buy plants and asking questions about rainforest plants and their garden needs. We took \$823 for plant sales, cards and donations.

It was a really great situation to have our plants and information. The outdoor setting beneath the spreading Poinciana and the Eleaocarpus trees was delightful. Many of the customers were on their way to work so wanted small plants to take with them. This is different from other situations where more advanced plants are the most popular. We had new people wanting to be members and some who wanted to work at the Gardens and a few who would like a guided tour.

However, we were all exhausted by the end of the day as we had started at 8am and didn't get back home till around 6pm. But it was a very satisfying day. Huge thanks to Jill Campbell for her tireless work towards this event. To Jean Johns, Geoff Walker and Neil Walker for all their help getting this day to come to fruition. And Marie who designs and prints us our brochure for the plants for sale on the day. Thanks also to Hazel, Jan, Rosemary and granddaughter and Nancy for helping with plant sales.

Rose Hand Propagation Officer



*Will, John and Don putting finished touches to old fence post wall and mosaic pathway. We are now looking forward to the growth of the plants in this area*



## Holiday activity for young children in July



On a day full of sunshine in early July children spent a morning of their holidays enjoying nature at our Gardens.

In the first of what we hope will be a regular school holiday event, the education team gave children as young as three the opportunity to pot their own seedling, make artworks with leaves, seeds and flowers, complete a spotto hunt in the rainforest and sing and play musical instruments made from

plants.

The educational guides talked to the children about the rainforest stories, pointed out the local koalas and talked about the useful plants in the gardens. Armed with magnifying sheets, clip boards and their natural curiosity, the children quickly discovered the wonderful things there are to see in the Gardens. The Friends are planning another day for the next school holidays – date to be confirmed.

### Finding Plants in the Gardens

One of the items that came up for discussion at our Planning Workshop in February, was the problem of easily locating specific trees at the Gardens. Although we have GPS records of the plantings of our main trees over the years, because birds have taken temporary labels and some trees have died, and some other trees have self seeded, trying to locate a specific plant can be difficult. We have two detailed data bases – one with GPS readings and provenance, and the other with history of each planting. However, we need to refine all this information and make it more readily accessible.

Another aspect is the difficulty our volunteer workers have of identifying a location within the Gardens... particularly is they are new. It is not always easy for long term volunteers to identify the boundaries of the Walker Estate, or to clarify exactly where Room 2 extends to, but for a newcomer or visitor it can be impossible.

We still haven't come up with a satisfying system but the committee who have taken on this job have done a lot of work and web searching and experimenting, to work out a system which will work best for workers, visitors and researchers. Numbered pegs in conjunction with compass readings along the paths is one thought, an online system using smart phone to a scan Qtags is another. Applying a grid over detailed map is a possibility and many other ideas have come up – none perfect, but gradually practical ideas are being consolidated.

### What is lichen?

As we wandered around the Gardens with a group children recently I was asked about lichen. Although I had basic information about it I realised I needed more. So I Googled 'lichen' and found an informative, well researched article in Wikipedia. An extract is below. The link is

<https://en.wikipedia.org/wiki/Lichen>

*'A lichen is a composite organism that arises from algae or cyanobacteria (or both) living among filaments of a fungus in a mutually beneficial relationship (symbiotic relationship). The combined life form has properties that are very different from the properties of its component organisms.*



*Lichens come in many colors, sizes, and forms. The properties are sometimes plant-like, but lichens are not plants. Lichens may have tiny, leafless branches (fruticose), flat leaf-like structures (foliose), flakes that lie on the surface like peeling paint (crustose), or other growth forms. A macrolichen is a lichen that is either bush-like or leafy; all other lichens are termed microlichens. Here, "macro" and "micro" do not refer to size, but to the growth form. Common names for lichens may contain the word "moss" (e.g., "Reindeer moss", "Iceland moss"), and lichens may superficially look like and grow with mosses, but lichens are not related to mosses or any plant. Lichens do not have roots that absorb water and nutrients as plants do but like plants they produce their own food by photosynthesis using sunlight energy, carbon dioxide, water and minerals from their environment. When they grow on plants, they do not live as parasites and only use the plants as a substrate.*

Rose Hand

## World Environment Day



Envite photo of children using Big Scrub maps at the Gardens on World Environment Day

World Environment Day in June was a most interesting day at the Gardens. Seven schools were visiting and each school was able to choose four activities from a choice of eight - two activities before lunch and two after lunch.

We guided children through the Rainforest Areas looking at the structure of the rainforest (canopy, understory and floor), how plants have adapted to survive (epiphytes, vines, understory plants etc) and we stopped at the bridge over Grandis Creek to consider why this is dry rainforest –to develop their understanding and appreciation of the rainforest that previously covered much of this area.

Afterwards we looked at road maps to find where each child lived, in relation to the original Big Scrub Area and then studied maps of

remaining Big Scrub remnants. We then looked through photo cards of Bush Tucker and endangered animals, birds and insects to consider the Biodiversity of our rainforests and then to consider the future of this Biodiversity.

The large A3 laminated maps of the Big Scrub Remnants were provided by ENVITE

and were organised by Georgina Jones via our contact through local Science HUB meetings.

With increasing activity with visiting preschool and primary school children we desperately need more people to help in the education area. Experience would be good but we can train people, show them what to do - and they would always work with at least two other adults. This can be a very rewarding activity as the kids just love being at the Gardens.

*Margaret Hildebrand*



### Sick plants can reveal landmines in old war zones

Land mines are not only explosive. By leaking toxins into the soil they can seriously affect the health of many plants. Identifying these sick plants could be a way of finding otherwise undetectable landmines. At the experimental mine field, Virginia Commonwealth University researchers found woody plants were less affected than herbaceous ones with soft stems. On the other hand, common weeds like the nut sedge seemed completely unaffected. The makeup and health of an area with dense vegetation - where traditional mine detection methods might be difficult - could be a clue to land mines underneath. To that end, the researchers envision an entire "Explosive Specific Index" cataloguing how buried explosives affect different plants. That could mean using hyper-spectral imaging from aeroplanes or from the ground. Hyperspectral imaging can reveal light outside of the visible spectrum, which is helpful because infrared, for example, can reveal damage that doesn't show up in visible light. Plants could one day reveal secrets long buried underground, if we just know what to look for.

*Adapted from article on [www.spectrum.vcu.edu/](http://www.spectrum.vcu.edu/)*

## Study of Big Scrub RF trees uses specimens from the Gardens

Leaves from a number of trees in Lismore Rainforest Botanic Gardens have been sampled recently for the extraction of DNA. The selected plants are candidate species for a survey of genetic diversity being undertaken by Southern Cross University Honours student Maximo Bottaro. The Botanic Gardens' specimens will provide the reference DNA sequences for Maximo to design DNA genotyping assays which would enable any selected individual from that species to be genotyped. One application of genotyping, when applied to a number of individuals from a population, is the estimation of genetic diversity in that population. Genetic diversity is an often neglected aspect of biodiversity and there is little information for rainforest trees.

The Botanic Gardens is a useful resource for reference specimens as the trees are accessible, are present in known locations and at present are small enough to obtain leaf samples without relying on extreme sampling methods.

Almost all of the large area of rainforest around Lismore, known as the Big Scrub, was cleared after European settlement and only small remnants, scattered trees and regrowth now remain. Maximo will be sampling trees from at least one Big Scrub remnant for genotyping. His estimates of genetic diversity within this remnant will provide a baseline that can be used to compare with the same species elsewhere, for example in areas of revegetation or intact forest in the Border Ranges region to the North or the Dorrigo region to the South.

Watch this space for results of this study when they start coming in about this time next year!

*Peter Bundock Southern Cross Plant Science, Southern Cross University*



## Japanese visitors from our sister city



Our most recent visitors were a group of high school girls from Yamato Takada. Geoff did his usual gracious hosting of their visit. They planted several Wattle trees beside the path into the Environment Education Centre and were presented with springs of wattle flowers we have in abundance in our Wattle Grove.

## Friends Committee

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Margaret Hildebrand  
**Botanical Consultants:** Pat Offord  
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**Website:** www.friendslrbg.com.au

## New Greeting Cards

One of a new series of greeting cards that are being produced at present. This image is by Ros Little and the other two images in the series are the Black Bean seed and the purple fruit of the Callicarpa. Two other beautiful Gardens' images are by artist Coco Atkinson.



**AGM 15 August**  
**9.15am**  
**EEC at the Gardens**

## Friends of the Gardens' extended family will be missed

There have recently been three deaths amongst Friends of the Gardens. **Carlo de Nardi**, husband of Jan our previous president, Vice-President and now Botanical Consultant, and native grasses specialist.

**Tony Blakeney**, husband of Rosemary, who with botanical and teaching experience, is on both our Education and Guiding teams.

And **Garth Kindred**, who lead several Green Corps teams in the Gardens, who built the BBQ shelter single handed and was very involved in the construction of what we now call the Garth Kindred Bridge.

Our thoughts and sympathy go out to all their families. They will be missed, but will be honoured in the Gardens in special ways.



Carlo and Jan de Nardi



Tony Blakeney with Geoff



Garth Kindred at opening of bridge



## Proposed night walks at Gardens

In June we had a trial night walk in the Gardens. The night was cold and everything was wet after a rainy day but still six members of our committee came along. Although we didn't see a lot of wildlife – just one lone Tawny Frogmouth - in terms of practicalities it went well.



*Not our bird... but from <http://www.birdsinbackyards.net>*

We met at the main gate and all came in together. Lack of light wasn't a problem. There was background light from the Waste Facility and as we drove into the second car park we had headlights to illuminate the way and then we moved immediately into Rainforest Walk using torches.

We want to try again and, subject to an OK from Council, we are planning two exploratory walks on moonless nights later in the year. The first would just be for Friends of the Gardens - adults only. This initial walk will commence at 9.00pm Friday 20 November (Daylight Saving Time), assembling at 8.45pm outside the main gate on Wyrallah Road. Then we will open the gate briefly to enter.

Providing that that walk works well we are tentatively planning a second walk for Friends and their children-

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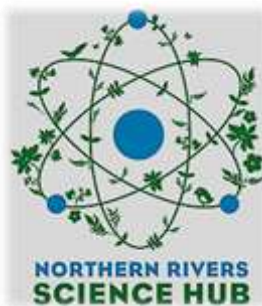
We would like acknowledge local firms Armsign, Versacom, Bunning, Yates, Lismore Timber and Plywood and Nick Alderson who are all supporting us in various ways. We are very grateful to them and to all who help in any way at the Gardens

date to be decided – but with the same assembling and starting times. Both walks will proceed, be it wet or fine, so bring appropriate weather protection.

Please wear long pants and long-sleeved tops and covered footwear. No sandals. Bring insect repellent and torch with fresh batteries. Depending on the weather, the walk of about one and a half hours could be on the bitumen path and/or the bush tracks.

For reasons of safety, an Attendance Register will be provided by the organiser on both night walks. It is important that everyone sign in and out so that at departure, so all heads can be accounted for. We don't want to have to send out search parties for missing people! Any changes to these arrangements will be posted on the website of the Friends, from 7 days beforehand [www.friendslrbg.com.au](http://www.friendslrbg.com.au) We will also send out a reminder email to all members the week before each walk.

For further information: Geoff Walker 6624 2963 (after 7.30pm) or [friendslrbg@bigpond.com](mailto:friendslrbg@bigpond.com)



The Friends are very involved in the **ART VERSUS SCIENCE EVENT** at Lismore City Hall

**Saturday 22 August - 10am to 4pm.**

It is being run by The Northern Rivers Science Hub with which we are affiliated. We are giving a Power Point presentation about rainforest plants for the home garden, selling plants, kids activities, art demonstrations... and more. Costa from Gardening Australia will be there and there will a host of other attractions.



Bonsai Hoop Pine Tree at the Australian National Botanic Gardens, ACT. Photo by Andrew Binns



Another interesting Hoop Pine image – this time a quilted image from Jan de Nardi – part of a larger piece.



Our Hoop Pines – sunrise in winter