

The Botanic Garden

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**A Newsletter for the Botanic Gardens of Australia and New Zealand
Issue no. 8 – March 2004**

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Editorial

Expectation versus Necessity

Over the past decade botanic gardens have increasingly been required to re-evaluate their role in society even though traditionally Botanic Gardens have been and are placed in a very special place by the communities they serve.

This is not a bad thing and is fundamental to ongoing community and political support. However, gardens also need at times to challenge community perceptions of their role. Increasingly there is a need for Botanic Gardens to go beyond the “safe zone” if they are to be a key voice for plant conservation and sustainable horticulture.

The role of Botanic Gardens to provide the public with beautiful well maintained gardens as safe, peaceful and relaxing environments is a given, but as our planet and our communities face an every increasing array of environmental and social challenges, the opportunity and necessity for Botanic Gardens to engage in much broader community debate regarding our environment is critical.

The challenge is to stay connected to the community through the delivery of “traditional” and “politically acceptable” activities while at the same time using this connection to engage and foster debate on a range of significant, culturally relevant and contemporary environmental issues that may not be traditionally associated with Botanic Gardens. Education programs, in particular, should promote and address significant issues beyond



our boundaries or issues that have significant community impact rather than merely being self-serving to justify our own existence.

Water, for example, is or should be a major management and educational issue for Botanic Gardens. Even though largely driven by the need to comply with restrictions or tight budgets, gardens' water conservation programs have achieved some outstanding outcomes. Botanic Gardens now need to go beyond the "compliance" notion and see the issue as an educational opportunity offering demonstrable and realistic options for water application in the broader community.

We need to actively engage the public and lead by example in the water debate. It is not just about the obeying of water restrictions but education in the area of application technology, plant selection, soil conditioning, use of mulches, alternatives to lawn and importantly changing the communities expectation itself.

Communities are increasingly aware of the need to conserve water yet often want lush, verdant green, water hungry vistas when they visit our gardens. On one hand community does not want our beautiful gardens to change and any effort to change them can be met with stern rebuff, while on the other hand the community needs these same gardens to be informing and even challenging the communities own behaviour.

We need to bridge the divide and transform thinking with botanic gardens that maintain the charm and magic of landscape but also demonstrate excellence in sustainable horticultural practices. If we get it right, we can have it both ways.

The real challenge is getting the balance right by defining a new role for Botanic Gardens, after all Botanic Gardens have been changing the face of the planet and leading change for hundreds of years, why should we stop now at a time the planet needs us more than ever before.

John Schutz
Head of Gardens
Botanic Gardens of Adelaide

News Items

People

New Executive Director of the Botanic Gardens Trust, Department of Environment and Conservation (NSW)

On 19 February Lisa Corbyn, Director General of the Department of Environment and Conservation (NSW) and the Chair of the Botanic Gardens Trust, Greg Martin announced the appointment of Dr **Tim Entwisle** as **Executive Director of the Botanic Gardens Trust**.

Tim was previously Director of Plant Sciences at the Botanic Gardens Trust and has most recently been acting as Executive Director. The Director General of the Department, Lisa Corbyn noted: "He brings strong scientific credentials and we welcome his collaborative approach in working with the Trust and across the Department of Environment and Conservation."

Congratulations to Frank Howarth

The last Newsletter offered congratulations to Frank Howarth, former Director and Chief Executive of the Botanic Gardens Trust, on his appointment to a new role as Executive Director of the Policy and Science Division in the reorganized NSW Environment portfolio. Now further congratulations are due. Frank has been appointed **Director of the Australian Museum** in Sydney and took up this appointment at the beginning of March.

Meetings and Conferences

Association of Friends of Botanic Gardens – 2004 Conference

Gardens for Pleasure, Plants for Survival

Friday 16 April – Sunday 18 April

Australian National Botanic Gardens

Presentations by highly qualified speakers will encompass a diversity of topical subject matter, covering the decline of biodiversity and how it might be halted, attitudes to indigenous people and the environment in Australia, name changes of plants, plant finders, volunteers in regional botanic gardens and fire recovery. Also planned are special walks to explore the autumn beauty of the ANBG and garden visits to Boxford, a unique local garden, and the beautiful

Sculpture Garden at the Australian National Gallery. Social events will provide valuable opportunities for networking. The Conference Dinner will be held in the Great Hall of University House, ANU with guest speaker Jennie Churchill from the ABC's 'Gardening Australia'.

Further information is available from the Friends' Office:

GPO Box 1777
Canberra ACT 2601
Telephone: (02) 6250 9548
Email: friendbg@ozemail.com.au
Web site: www.anbg.gov.au/friends

2nd N.S.W. Regional Botanic Garden Conference

Design, Education and Community

Friday 14 May – Sunday 16 May 2004

Clover Hill Function Centre, Orange Botanic Gardens, Kearney's Drive, Orange

The Conference has been planned around the themes – Design, Education and Community to reflect the multiple functions of a public garden. The program

combines formal presentations from highly qualified speakers with informal periods to give time to meet other delegates in a relaxed atmosphere.

All enquiries can be made to the Conference Secretariat:

Jane Arnott – Colour Conferences and Events:
PO Box 808 Orange 2800
Ph: (02) 6362 0276
Fax: (02) 6361 7237
Email: jarnott@netconnect.com.au

Items of Interest

HortTech

Following on from the very successful BGANZ conference, Peter Symes is keen to introduce or remind subscribers of a service that can be freely used to gain support, information or expertise from others in Botanic Gardens across Australasia.

This HortTech List server is operated on

behalf of Australasian Botanic Gardens by RBG Melbourne. It is intended to be a forum to improve our communication within Australasian Botanic Gardens and Arboreta in the management and curation of Living Collections. It is hoped that we may learn and assist each other to improve our knowledge and understanding of plant environments in order to promote excellence in plant curation.

Examples of some subject areas include soil science and hydrology, irrigation, pest pathogen and weed management, plant nutrition, plant selection, pruning and other techniques in plant curation. It can also include arboricultural, nursery, general land management and general environmental topics relating to Botanic Gardens.

It costs nothing to subscribe and is open to anyone interested in this area.

It is hoped that this forum will encourage more networking and regular communication of a horticultural and technical nature amongst horticulturists, curators, etc. It is anticipated that this service would be of benefit to people in planning projects, solving site problems, improving plant curation and accessing contacts and information from the broad Botanic Gardens network.

General information about the mailing list and how to subscribe is at:

<http://lists.rbg.vic.gov.au/mailman/listinfo/horttech>

Peter Symes

Yahoo! Group

Amanda King has also started a Botanic Gardens electronic contact group. "Yahoo! Group" will be a forum for people interested in Botanic Gardens. It will be a place where information is shared, questions asked and networking will take place. Ideally this site will have a group of members with a wide knowledge base and will be a useful place to exchange information.

For further information about the way "Yahoo! Group" works, or if you would like to register, please contact Amanda King: amandaking@datafast.net.au

Council of Heads of Australian Botanic Gardens

2004 Career Development Grants

The Council of Heads of Australian Botanic Gardens (CHABG) will again offer two grants for career development to staff of all public botanic gardens in Australia. The Career Development Grants are offered annually and are made to assist in developing enhanced skills, experience or qualifications of individual staff in ways that will bring clear benefits to both the recipient and the recipient's botanic garden.

This year CHABG is offering two grants (maximum \$3,000 each), with the goal of supporting staff professional development through working for a short time at another botanic garden, or by enabling a staff exchange between gardens. Whilst this will be a priority goal, other ideas will be considered.

Eligibility and Conditions:

All staff of regional botanic gardens, city botanic gardens and CHABG member gardens are eligible to apply. Eligible staff shall include, but are not restricted to, horticulturists, scientists, visitor and education program officers. The grants may be used in Australia or overseas, and may be used with other grants. In general, grants may not be used to pay the recipient's salary except in cases where payment of a temporary replacement's salary would cause undue hardship for the employer. Grant recipients are expected to remain at the sponsoring garden for a reasonable period of time after the award (e.g. 12 months) so that the benefits can flow to that garden.

Application:

Applications for a CHABG Career Development Grant must contain the following information:

- A description of how the grant will be used (max. 250 words)
- The size of the grant being sought (max. \$3,000) and a breakdown of the proposed expenditure.

- What benefits are expected for the applicant's botanic garden and how the benefits will be disseminated.
- A career résumé for the applicant (max. 250 words)
- The amounts and sources of any other grants being sought by the applicant for the same project.
- A timetable for the proposed use of the grant.
- A letter of endorsement of the application from the Director of the sponsoring botanic garden.
- The names, titles, contact addresses and phone numbers of two professional referees for the applicant.

Selection Criteria:

Applications will be judged chiefly on the following criteria (listed in order of importance):

- Expected benefits in career development for the applicant.
- Expected benefits to the sponsoring botanic garden.
- Relevance to CHABG's Statement of Purpose (see below).
- Value for money

Report:

Recipients of grants must submit a report (including a Statement of Expenditure) to CHABG within three months of completing the project describing the activities undertaken and the individual and institutional benefits gained.

Closing date for application:

Applications must be received no later than Monday 7th June 2004.

They should be addressed to:

CHABG Career Development Grants
CHABG Secretariat
GPO Box 1777
Canberra ACT 2601

Council of Heads of Australian Botanic Gardens

Statement of Purpose

Botanic gardens are among the most frequently visited cultural institutions in Australia. They inspire the appreciation and conservation of plants. They also provide valuable space for recreation and relaxation, and are sites of considerable scientific, educational and cultural significance.

The Council of Heads of Australian Botanic Gardens (CHABG) consists of the Directors of the Australian capital-city botanic gardens, but offers a broader forum for promoting the interests and activities of Australian public gardens generally. CHABG seeks to enhance the stature of botanic and public gardens for the benefit of the Australian community.

The purposes of CHABG are to:

- Provide a national forum for information exchange and coordinated planning, and to foster best-practice standards among Australian botanic gardens.
- Be an advocate for the interests of Australian botanic gardens and influence policy and legislation affecting botanic gardens nationally and internationally.
- Identify funding opportunities and seek increased resources for botanic gardens.
- Advocate plant conservation, and foster botanical and horticultural science.
- Facilitate career opportunities for, and provide grants to, botanic gardens' professionals to improve their skills and benefit their gardens.
- Coordinate national conferences, exhibitions and visitor programs related to public gardens, plant conservation and botanical science.
- Build and maintain links with relevant national bodies.

Paul Scannel, outlines the benefits received by both the Gardens and the community from his attendance in 1999 at a course specifically designed by CHABG to assist Regional Botanic Gardens develop programs and events with the constraints of limited resources.

Albury Botanic Gardens benefit from CHABG grant

The Albury Botanic Gardens have enjoyed a full and varied program of events over the last 4 years. "Cinema Under the Stars" featuring Grease, Rabbit Proof Fence and Crackerjack have attracted over 2,000 eager visitors. The "Boogie Woogies Live" children's show, the annual "Spring Festival" and "Songs and Music in the Gardens" have all been wonderful events.

The success of these programs can be attributed to the CHABG Staff Career Development Grants. In April 1999, 16 staff from Regional

Botanic Gardens, from Hamilton in Victoria to Coffs Harbour in N.S.W., attended the course at the A.N.B.G. Canberra. Following an intensive, 5 day course, valuable knowledge and skills were gained in event planning and review amongst others.

The 5 day course was designed to identify and investigate how Regional Botanic Gardens and their staff could develop events and programs with limited resources. The entire five days at the A.N.B.G., were highly stimulating and motivational. Thanks to Chris Perrers, the staff and the Friends of the A.N.B.G., for an excellent experience.



Career development grant group 1999

It has certainly been beneficial for our Gardens and the community.

The course was a fantastic opportunity for Regional Botanic Gardens staff and I am sure that CHABG will continue this support of Regional Gardens. I would certainly urge all Botanic Gardens employees to consider submitting an application for the CHABG Career Development Grants. Whatever your chosen field, it's well worth it.

Paul Scannell

Botanic Gardens & Natural Areas Co-ordinator
Albury City Parks & Recreation Business Unit



Spring Festival crowd



Children's show

The National Conference of Volunteer Guides in Botanic Gardens

29 September - 3 October 2003

The National Conference of Volunteer Guides in Botanic Gardens, the theme of which was *People, Plants and Parks*, was scheduled to coincide with the State's wildflower season. It was attended by 122 delegates from 12 Botanic Gardens throughout Australia and Wellington Botanic Garden in New Zealand.

The Conference keynote address, *Lifestyle of Plants*, was delivered by Dr Kingsley Dixon, Adjunct Professor of Plant Biology at the University of Western Australia, Vice President of Australian Network for Plant Conservation, and Director of Science of the Botanic Gardens & Parks Authority of Western Australia. More important than his official positions is his passion for plants and his ability to engender this in others.

After a day touring in the Darling Range, the speaker's program resumed with inspiring and informative talks by Mark Webb and Pat Barblett. The Workshop and Mini Presentation Program offered opportunities to increase one's basic practical skills, to enhance interpretive skills, and to explore the issues of guiding those with special needs or maintaining guiding standards through training and evaluation. There were also alternative short presentations offered.

The Walks Program was extensive with the opportunity to choose two walks on each of Day 2 and Day 4. During these walks, delegates had a chance to experience almost every area and program of Kings Park and Botanic Garden. Many of the walks were specially developed and led by Kings Park Guides, and delegates were stunned by the flora in the bushland and remarked on the knowledge and skill demonstrated by local guides.

The final half day program gave delegates a choice of a tour of Government House and Gardens or an extended walk in the Kings Park bushland prior to the farewell luncheon.

Meal times and three informal social occasions provided excellent opportunities for delegates

to mix and share information on their respective gardens, duties etc. At the formal Conference Dinner, held within a Kings Park restaurant, it was confirmed that Melbourne Botanic Garden would host the next National Conference in 2005.

The frequent contact with other gardens in the lead up to conference, and the opportunity for representatives to meet during their time in Perth, resulted in the formation of a secretariat as suggested during the 2001 Canberra Conference. This body should not only facilitate the organisation of future conferences but also provide an on-going link and means for sharing information between our organisations.

The Conference was an exhausting but most rewarding experience with an outstanding level of participation and enjoyment by delegates of all aspects of the conference program. Response from participants indicates that they acquired knowledge and skills directly related to their volunteer duties.

The coordinating Committee believes that the 2003 *National Conference of Volunteer Guides in Botanic Gardens* has again proved the value of this biennial event and shown that the cost to both delegates and the host garden is justified.

Ethel Lucas

Conference Convenor

Articles

North Coast Regional Botanic Garden

Fifteen months of planning came to fruition at a booked out twilight Opening Concert on Saturday 28th February at the Coffs Harbour Botanic Garden. Music enthusiasts were treated to the soprano, alto and tenor saxophones of the Regional Conservatorium's ensemble belting out favourites from George Gershwin and Carol King.

Booked out a week before the concert, those who attended were thrilled by the acoustics and beautiful setting, and their praise of the Botanic Garden as a major future cultural venue in the city.



Opening of pavilion

The spectacular acoustically designed multi functional Pavilion is a \$40,000 project of the Friends of the Botanic Garden, who have entered into a valuable partnership with the Regional Conservatorium to provide a wide range of entertainment in the Garden. Over the next three months eight afternoon and twilight concerts will feature local groups, choirs, and bands, and the visiting Australian Youth Strings.

Construction of the unique 75 square metre outdoor acoustic shell required a major effort by Botanic Garden Supervisor Ian Corbett, who worked with a local Work for the Dole service provider.

The beautiful amphitheatre setting, conveniently located close to the entrance, car park and facilities means that the community has a superb venue where they can bring their picnic baskets and a bottle of wine, sit on the grass and listen to great music.

The Pavilion is the latest addition to this fascinating regional Botanic Garden. Other special attractions include rare and endangered plants, a rainforest area, a unique mangrove boardwalk with bird hides, an orchid house, a sensory garden and a complex of glasshouses for plants that need specialized environments.

There is also plenty of local fauna.

Recent hot weather has had some visitors concerned about the native fauna in the Coffs Harbour Botanic Garden. On finding a black snake on a path, some are almost indignant to a very correct reply 'well it lives here'. At the other end of the scale we get asked 'where

are the koalas', with the obvious inference that we are not doing a very good job because the koalas are not easily visible at eye level, happily munching a midday snack of freshly cut gum leaves

Bounded on the east, north and west by the picturesque tidal Coffs Harbour Creek, over 12 hectares of the Botanic Garden retain the natural habitat. From the well-drained wet sclerophyll forest on the hillock, to the poorly drained swamp forest and the tidal mangroves, there exists a typical range of North Coast plant communities.

On the upper slopes the soil is a yellow podsolic derived from the older Coramba greywacke beds. The wet sclerophyll forest up to 25m tall, is largely intact. Blackbutt (*E.pilularis*) with occasional pink bloodwood (*Corymbia intermedia*), red mahogany (*E. resinifera*), turpentine (*Syncarpia glomulifera*) and black she-oak (*Allocasuarina littoralis*) is typical of the well-drained creek bank strip. There is a diverse under-storey of heathy shrubs such as golden candlesticks (*Banksia spinulosa* var *collina*), wild parsley (*Lomatia silaifolia*), geebung (*Persoonia stradbrokeensis*), yellow tea-tree (*Leptospermum polygalifolium*) and lance beardheath (*Leucopogon lanceolatus*). There are also many species of wattles (*Acacia* spp.), and bush peas (*Dillwynia*, *Hovea*, *Phyllota*, *Pultenaea*).

In the central section of the Garden and in the south-west there are low-lying poorly drained grey soils over white sand, and three associations of swamp sclerophyll forest can be recognized according to the duration of waterlogging and the degree of salinity. Swamp mahogany (*E robusta*) up to 24 m tall is at the toe of the hill, typically associated with the shrub narrow-leaved shaggy pea (*Oxylobium robustum*).

Broad-leaved paperbark (*Melaleuca quinquenervia*) may form a pure forest up to 10 m tall with a dense ground cover of feather plant (*Restio tetraphyllus*), and swamp water fern (*Blechnum indicum*) on areas of prolonged inundation. Swamp she-oak (*Casuarina glauca*) occupies a narrow band closer to the creek where there is some salt influence. There is

commonly a low ground cover of marine couch (*Sporobolus virginicus*) and bare twig rush (*Baumea iuncea*).

The Garden with its typical range of North Coast flora and fauna plant communities offers great educational opportunities on the Nature Trail and the Aboriginal Plants Walk. Brochures are available for both walks, and extensive interpretive signage has been provided.

However the comments sometime lead us to believe that the Australian as a 'bushie' is fast becoming a myth, and that the Botanic Garden with its over 275 species of naturally occurring flora, eleven frog species, nine reptile species, twelve mammal species and probably a few more yet to be fully identified, will continue to provide new and exciting experiences. Heaven help us when someone gets surprised by our Carpet Python.

Terry Monahan

President of the Friends
North Coast Regional Botanic Garden



School children watching red clawed crabs.

As the brackish tidal waters of the mangroves recede these conspicuous red critters frantically scavenge for any kind of food, alive or dead. They have no friends and can be aggressive towards their own kind, ripping off claws and

legs until their opponent is dead. This is a learning environment that excites kids!



Interpretive signs – boardwalk.

The Mangrove Boardwalk has been constructed in Coffs Harbour Creek as a learning resource, with interpretive information describing the plant and animal communities, and some of their unique adaptations to the estuarine environment. Another favourite place for all ages is the bird hide with its interpretive display of aerial hunters, sub surface divers, waders, and surface and foliage feeders. What could be more memorable than watching an Osprey and Sea Eagle patrol, then plunge feet first, skimming across the water to clasp a fish tightly in its talons, or watching a Kingfisher perch on a low branch and then dive in a blue flash for fish, crustaceans, or water insects?



Land mullet

Water conservation is currently a hot topic Australia wide and is likely to continue to be so. Three Botanic Gardens outline the approach they are taking to increased restrictions and reduced water use strategies.

Water conservation strategies at the Australian National Botanic Gardens

During the summer of 2001/02, many areas of Australia were drought declared. In many of these areas, including the ACT, water restrictions have been introduced. In December 2002, stage 1 restrictions were introduced. In April 2003, stage 2 restrictions were introduced and in October 2003, stage 3 restrictions were introduced. The stage 3 restrictions require large water users to achieve a 40% reduction in water use compared to the average usage for the same period of the year. Stage 3 restrictions are still in place today.

The need to use water and other resources in an environmentally responsible manner is embedded in the Australian National Botanic Gardens (ANBG) Management Plan 2002-08. A focus on efficient irrigation practice is captured in current performance agreements for horticultural managers and staff responsible for maintaining the living plant collections at the gardens so that it remains a significant recreational, cultural and research institution.

In line with these priorities, the ANBG has put in place a number of measures to conserve water during the current drought and into the next summer. These are:

- Horticultural managers have been conducting systematic audits of irrigation performance across the approximately 30 hectares of the developed site. This involves detailed analysis of water outputs for each irrigation station and refinement and coordination of the scheduling of all irrigation systems, both automatic and manual. In addition the two water meters on the site have been monitored weekly since December 2002 to give fairly immediate feedback on our collective and continuing water use.

- Irrigation systems are being reconfigured as necessary to realise water savings. In appropriate places, gear driven sprinklers (that cannot be readjusted by visiting children) are replacing impact sprinklers that inevitably spray areas around them that do not require irrigation, such as roadways. Irrigation systems that apply water to steeply sloping beds are being split into upper and lower systems that take into account the natural seepage of water down slopes. Rain sensors have been installed in some locations to automatically turn off the irrigation system when a preset level of rain has fallen.
- Wetting agents are being used on lawns and gardens to aid with water penetration into the soil profile rather than having water run off the surface and into storm water drains.
- The lawn areas have received less water during the last summer than usual. We have turned the water off to certain lawn areas with a requirement to program lawn irrigation on an as need basis. This has allowed us to reduce lawn watering to approximately once a fortnight and to only apply water when the turf is showing high levels of stress.
- Some of the ponds and water features have been turned off. We will still have two water features running. This is because these ponds have biological filters that can affect local pond life if they are turned off.
- We have identified areas that can have irrigation greatly reduced and even shut down with a list of some very important species within our collection that are held in these areas. We plan to monitor closely the soil moisture levels in these areas and apply irrigation when absolutely necessary, either by hand or programmed nightly irrigation, so that plant losses are minimal.

These strategies appear to be working as we are achieving the required 40% reduction with minimal impact on the collection. Lastly, I believe it is important to establish a strong

relationship with your local water authority so these issues can be worked through in a cooperative manner.

Paul Janssens

Curator, Living Collections
Australian National Botanic Gardens
Paul.janssens@deh.gov.au

Water restrictions and water conservation update

Royal Botanic Gardens Melbourne

Background

Melbourne City has experienced seven consecutive years of below average rainfall since January 1997.

In October 2002, the Royal Botanic Gardens Melbourne completed two management plans in preparation for imminent water restrictions, the Automatic Irrigation System Contingency Plan 2002-2003, and the Irrigation Management Plan 2002-2007, to guide water management and protection of the living collections (see also <http://www.rbg.vic.gov.au/about/water/>).

The Victorian Government introduced the first stage of water restrictions on 1 November 2002 stage. These remained in place, until the current second stage of restrictions was introduced on 1 August 2003.

For public Open Space, exemptions from the restrictions were only considered if a drought management plan was included in the submission. However, the expected water savings as outlined in the Drought Response Plans (prepared by each Water Retailer) were still required of the submitting organisation. These required savings over the summer months averaged about 10% for stage 1 and about 20% for stage 2.

The Royal Botanic Gardens were granted full exemptions relating to landscape irrigation from both the first and second stage of water restrictions, but were not required to demonstrate the additional water savings. This was due primarily to recognition by South East Water Ltd of the significance of the

Gardens, our track record in water conservation achievements over the previous several years, and the continuing commitments to water conservation as detailed in the management plans. There have been no complaints received by South East Water Ltd or RBG Melbourne concerning our irrigation practices or the Stage 1 and Stage 2 irrigation exemptions given during 2002 and 2003.

From 2001-02, the Royal Botanic Gardens had achieved annualised savings of 42% from improvements to irrigation management starting in 1994-95. This result was further improved during 2003 with savings of 51% (124,000 KL used) (426mm rainfall) compared to 1994-95 annual consumption (251,000 KL used) (over 600mm rainfall). Over 3.3 hectares have also been added to the coverage of the irrigation system during 1995-2003. The Irrigation Index, which indicates if the estimated water requirement was exceeded, has been consistently achieved at an ideal rating of 1 during 2000-2003.

Following an irrigation review in July 2003, a further 20% reduction in water use was set from that point as a water conservation target by 2007. This would achieve about 60% water savings since first improvements to irrigation management in 1994-95.

In early 2003, Royal Botanic Gardens was recognised for efficient water use as one of two finalists in the Efficiency in Government, Government agency category of the Savewater Awards and also won the Sustainable Garden, Garden Design Category of the Savewater Awards. In addition, the www.savewater.com.au website is using the Royal Botanic Gardens Melbourne for a case study of high water use efficiency.

How were the savings achieved?

According to our experience, the following programs were instrumental in delivering water savings, coping with drought conditions and would also provide greater resilience to water restrictions if imposed.

1. Staff Development

Of the many strategies employed to use water more efficiently, a strong focus on and commitment to staff training is the most vital. There is often a tendency to focus on training employees in the operation of an irrigation system and neglecting the fundamentals of applied science that underpin the reason for the system. Understanding soil hydrology, plant water use and influential factors such as climate variables are essential in improving water use efficiency. In 1995, the Royal Botanic Gardens introduced a water management training initiative to build staff expertise and develop a model for irrigation management of the site.

It would be reasonable to suggest that the resultant success in obtaining notable water savings, the community reputation of the Royal Botanic Gardens as an efficient water user, and the development of water-related educational programs were significantly influenced by this staff training initiative in 1995. Internal water management training is now regularly undertaken to further develop staff expertise.

2. Warm-season Grasses

Turf areas are steadily being converted from cool-season grasses to warm-season grasses (which use 25-30% less water than cool-season turf) through management techniques such as regulated deficit irrigation (RDI) from October to December and also direct propagation into selected areas. The application of wetting agents over the warmer months has also provided a noticeable improvement in application uniformity of irrigation.

3. Irrigation Scheduling Model

The Water Budget Model continues to be refined and developed to objectively assess plant needs in conjunction with staff expertise. Efficient irrigation scheduling means that the right amount of water is applied at the right time. The Automatic Weather Station and soil moisture sensors have been valuable tools in providing reference data for evapotranspiration rates and root extraction of soil moisture.

4. Hydraulic Efficiency

Improving the previously restrictive supply flow rate of 35L/s to 50 L/s in 1999 provided greater scheduling flexibility and more opportunities to utilise rainfall effectively. This is in perhaps seeming contrast to notions that reducing flow and pressure decreases water consumption. The experience of RBG Melbourne suggests that an increase in effective flow rate by 43% improved the efficiency of water use with consequential savings. A high level of hydraulic efficiency also provides a greater capability to manage the water needs of a large landscape under drought conditions and/or water restrictions.

5. Irrigation System Maintenance and Auditing Programs

Regular maintenance and auditing programs ensure a high level of irrigation efficiency. RBG Melbourne aims to maintain all sprinkler-irrigated turf areas with a Distribution Uniformity (DU) value greater than 75%.

6. Living Collections

Curation of specific water-conserving plant collections such as the indigenous landscape at Long Island, the Water Conservation Garden and the California Collection enhances water savings.

7. Mulch

About 700-800 cubic metres of mulch produced from RBG Melbourne green-waste are applied per annum to reduce evaporation losses.

8. Reporting and accountability

Water use is recorded and reported monthly. This has assisted the development of 'water-saving consciousness' in the culture of the Royal Botanic Gardens. The Irrigation Action Team also meets regularly to resolve issues, recommend irrigation strategies and identify water conservation improvements.

Community and Industry Outreach

It is important that Botanic Gardens look beyond their *in situ* water concerns to develop relationships with other agencies and also provide technical support for the community. Botanic Gardens generally manage large

diverse landscapes. Any effective reduction of water consumption in such challenging sites builds water management expertise and highlights educational opportunities for both professional and home horticulturists. For example, the Royal Botanic Gardens enjoys a strong partnership with our Water Retailer – South East Water, particularly through the development of the Water Conservation Garden as a specific platform for a variety of environmental and water management education programs for visitors.

An immensely valuable relationship with The University of Melbourne, Burnley College, has also been essential in the development of irrigation expertise and growth in educational programs. Royal Botanic Gardens' horticulturists are actively involved in assisting students with irrigation studies, including co-supervision of tertiary projects. In 2002-2003, Royal Botanic Gardens co-supervised a student project with this institution to develop a guide for preparing Water Management Plans. This project won the Australian Water Association Undergraduate Water Prize for a student project in both the state and national categories in February and March 2003 respectively. The partnership also includes educating both professional and home horticulturists about low water use gardening and irrigation management by presentations in courses such as 'Discovering Horticulture'. Burnley College and the Royal Botanic Gardens have also co-authored an accepted submission for a paper at the IAA National Conference in May 2004 - "Achieving high irrigation efficiency in public gardens – a case study Royal Botanic Gardens".

Contributions to water conservation matters in the irrigation industry occur through active representation in the Victorian Regional Committee of the Irrigation Association Australia. Horticulturists also regularly correspond with irrigation designers, manufacturers and suppliers in matters relating to efficient water use. Other support for the general community on effective water conservation techniques is provided through the Royal Botanic Gardens website, fact sheets, and *in situ* presentations.

Outlook

From an operational perspective, the Royal Botanic Gardens will continue to refine and implement a number of programs including a strong focus on staff training, effective maintenance and auditing of the Automatic Irrigation System, fine-tuning of the Water Budget Model, water sensitive landscape planning, turf renovation and in-situ irrigation research.

Strategically, it has been identified that a significant reduction of, and reliance on, consumption of potable water will require viable and cost-effective alternative water supplies. This is also consistent with Victorian Government objectives to reduce water use per capita by 15% and increase recycling of waste water by 20% by 2010. It was also considered that the existing potable water supply is not likely to remain as available or accessible in the future due to cost increases, higher demand and climatic variability. Implementation of environmentally acceptable and horticulturally suitable alternative water supplies for irrigation would provide improved protection for the heritage landscape of Royal Botanic Gardens in the future via a 'guaranteed' source of water.

In November 2003, the Royal Botanic Gardens commissioned a project brief (see also <http://www.rbg.vic.gov.au/tenders/>) and sought **Expressions of Interest for a Feasibility Study of Alternative Water Supplies for Irrigation in RBG Melbourne. This has received detailed submissions and implementation awaits the outcomes of a funding submission in 2004.**

Peter Symes

Senior Curator, Horticulture

Whilst noting a decline in rainfall, Mt Tomah Botanic Garden in the Blue Mountains of NSW is not suffering the effects of drought to the degree of many other Gardens. It has, however, accepted voluntary water restrictions, in keeping with a commitment to sustainable horticulture, water conservation and good water saving practices.

Mt Tomah – Dealing with voluntary water restrictions

Mount Tomah Botanic Garden is located in the Blue Mountains of New South Wales, 105 kilometres west of the Sydney CBD. Elevation of the site is just over 1,000 metres, and the average annual rainfall is approximately 1,500 mm. Botanic Garden records show that January, February and March are the wetter months of the year, which is of benefit to the garden as these months also have the highest temperatures. Also at this time of year it is common for the area to be covered in mist. Since the garden opened in 1987, rainfall has been at highest in 1989 at 2052 mm, and 1990 at 2062 mm, and lowest in 1994 at 938 mm. In 2003 rainfall was at 1214 mm. During years of high rainfall only minimal watering is required in drier winter months because of the many deciduous plantings that are dormant at this time of year. In contrast, during drought years when rainfall is low in the hotter months, maximum irrigation is required. In the last 4 years there has been a decline in rainfall, with only 1364 mm falling in 2000, 1325 mm in 2001, 1138 mm in 2002 and 1214 mm in 2003. 2004 has begun fitting in with this general decline, but our supply is looking healthy, as we have had reasonable falls in October, November and December in 2003. We are hoping for a wet year. The Garden is 28 hectares in size, and has a deep, well-drained basalt soil type.

Remnant tall Eucalyptus forest, dominated by *Eucalyptus fastigata*, and rainforest where *Doryphora sassafras* is the principal tree species, provide a backdrop to the cultivated areas, which is configured into interpreted displays of cool climate plants focussing on those of the southern hemisphere.



Photo – Jaime Plaza

Mount Tomah is 40 kms from the nearest source of reticulated water. To meet needs of the garden and 100,000 visitors received each year, potable water is captured from building roofs and stored in concrete water tanks. Irrigation water is stored in a 15 megalitre dam, and is captured from stormwater systems and ground runoff. This irrigation water supply is supplemented through a two kilometre, three stage pumping system, through a property known as the Mount Tomah Conservation Area, owned by the Botanic Gardens Trust. Water consumption used to irrigate Mount Tomah Botanic Garden is in the vicinity of approximately, 25 megalitres annually.

Mount Tomah Botanic Garden as the cool climate garden of the Botanic Gardens Trust, has accepted voluntary water restrictions similar to the compulsory restrictions placed upon the Royal Botanic Gardens, the Domain and Mount Annan Botanic Garden.

The restrictions in place at Mount Tomah Botanic Garden are:

- Limited use of watering systems – 6.00am to 9.00am and 5.00pm to 8.00pm
- Misting sprays for nursery propagation are automatically controlled
- Use of hand held hoses for a maximum of 4 hours per day in botanic garden and 1 hour in the nursery
- There will be no watering to more than 75% of turf areas

Initiatives in place to cope with water restrictions are:

- All irrigation controllers have been programmed to adhere to a water restriction timetable
- All turf has been grown longer than usual
- Turf has been cored and scarified to allow deeper water penetration, encouraging a deeper root system
- Compost has been used for top-dressing turf after coring and scarifying
- A drought resistant, Arid Fescue turf was laid as the Heath and Heather lawn
- A watering program has been put in place for established trees to be watered thoroughly and slowly

- New plantings have been avoided due to heat conditions, and lack of staff resources to carry out extra watering
- Programmed increase of organic matter (recycled on site) and mulch to prevent evaporative loss
- Automatic drip irrigation systems are being trialed for turf and garden beds
- Capillary matting irrigation is to be installed in the nursery

In New South Wales the drought we have been experiencing has been branded the “**Green Drought**”. This term is fitting for Mount Tomah Botanic Garden as the displays have shown minimal negative affects, which could be due to regular overnight dew’s and temperature drops from 8° C to 12° C. Although African Black Beetle larvae numbers rose in the fine turf areas, possibly due to the hot dry summer. The affect this produced was that currawongs peeled back the turf like a roll of carpet to feast on the larvae, which kept the turf team very busy.

The Botanic Gardens Trust is committed to sustainable horticulture and strongly supports the government’s initiatives to conserve water and encourage water saving practices. The impacts on the garden during this process have been minimal because of the water conservation initiatives put into place and the benefits of the local climate. We do not experience extremely hot days for long periods, and although minimal, we have received light rain and drizzle which has been beneficial. Some turf areas have struggled, but nonetheless survived through the summer period, and some plantings have also struggled due to the drought conditions, but minimal losses have been recorded

Lew Bezzina

Horticultural Supervisor – Technical Services
Mount Tomah Botanic Garden



Memories of the 2003 BGANZ Congress in Geelong

*Organising committee members Rosemary Noone and
Glenn Parathoine-Small with Geelong Botanic Gardens
Friends Rosemary Faris and Liz Moss*



Congress 2003 organisers: Rob Small and John Arnott



Geelong waterfront



Congress venue: Deakin University waterfront campus



Geelong waterfront



Geelong waterfront

