

# THE FRIENDS OF THE WAITE ARBORETUM INC.



WAITE  
ARBORETUM

NEWSLETTER NO. 50  
Summer 2007

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## FROM THE PRESIDENT

Apart from preparations for our combined Christmas function at Urrbrae House [which I trust everyone enjoyed] the major item for discussion at our November 06 meeting was the fire in the arboretum and the damage it caused. Dr Jennifer Gardner will provide more information in this newsletter.

Suffice to say the outcome could have been far worse and fortunately did not occur on the day of the successful Waite Festival. We will know more about the survival of trees by next spring.

Jennifer also tabled a copy of a speech by the Hon. Bob Such to Parliament on Nov. 16 2006 in which he praised TREENET and described its establishment and current activities.

Dr Such attended the 7<sup>th</sup> National Tree Symposium in September and came away with an enthusiasm for the organization and the role played by our Arboretum. A full copy of his address is available on request and makes interesting reading.

We continue to be indebted to Dr Gardner for her tireless devotion to the Arboretum and to our many volunteers.

Vice-president Cicely has written to Mark Ziersch thanking him for his work supporting Jennifer in the Arboretum, especially in the weeks following the fire.

This is our 50<sup>th</sup> Newsletter and we thank Jean Bird for the present high standard.

We look forward to a resourceful 2007 and your continued support.

Bryan Milligan

## IN THE ARBORETUM

### FROM THE DIRECTOR

#### Fire in the Arboretum

On 20 November, a grass fire started at 3.30 pm in the central section of the Waite Arboretum and within a short time had burnt about 3 hectares. It was the first significant fire in 20 years and only the second in the last 50 years. The fire was low intensity as the grass was very short, due in part to the drought, but also to the diligent mowing by contractors and brushcutting around trees by volunteers. The fire was contained by 3 MFS and 3 CFS units as well as a water bomber plane. Despite most of the area being thoroughly doused with water, trunks, mulch and roots continued to smoulder for three days and required constant vigilance by 24-hour security staff as well as volunteers. 60 flare-ups were extinguished on the first night alone. The fire is believed to have started at a seat where marijuana and other smoking paraphernalia were found.

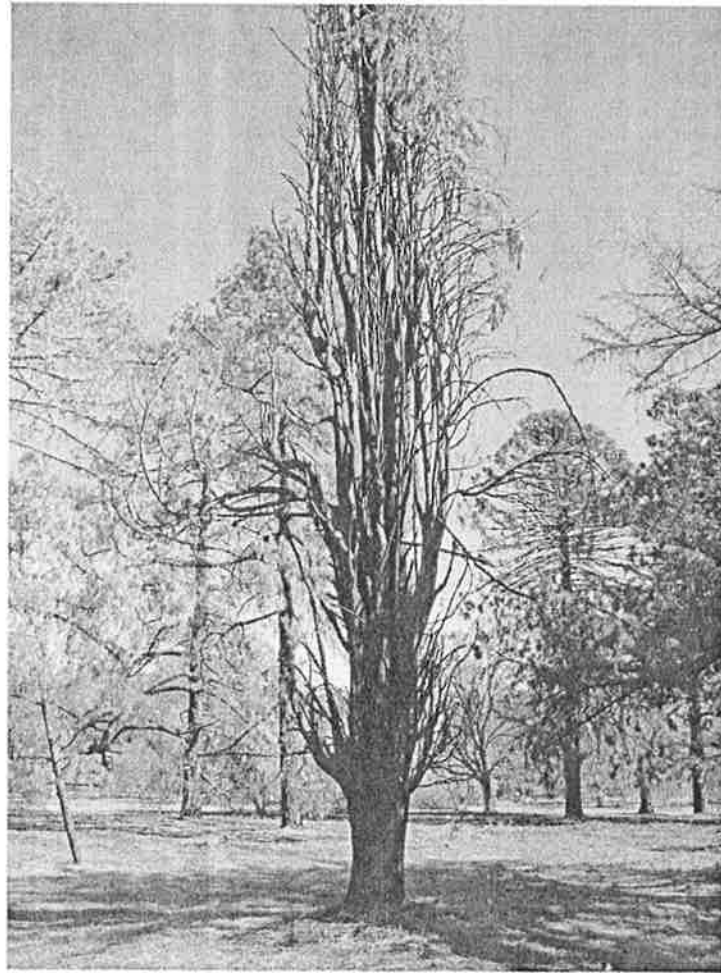
I have now completed an inventory, including a photograph, of each of the 178 trees in the burnt area. 19 (11%) were unaffected or scarcely damaged; 24 (13%) look to have a very good chance of complete recovery; 85 (48%) sustained damage but are expected to recover; 39 (22%) sustained more serious damage and satisfactory recovery is doubtful; and 11 (6%) were destroyed.

Mark Ziersch has worked tirelessly to maximize the survival and recovery of affected trees by giving them thorough weekly soakings, feeding them with a dilute molasses solution and mulching. Many specimens have responded to Mark's TLC with vigorous new growth and even flowers out of season. It is the first time the mature trees have received supplementary summer watering in 45 years!

One of the specimens lost was a seedling of the rare *Cupressus dupreziana*, native to the central Saharan desert. There are only 153 trees of this species left in the wild and they are over 100 years old. Despite the population being closely monitored for many years there are only two recorded seedlings in the wild – so there is virtually no natural regeneration. Three specimens of this species were planted in the Arboretum in 1985 but one has since died. The burnt seedling was propagated from one of these Arboretum specimens. The Arboretum is important for ex situ conservation of rare and endangered species. Like other collections in Australia, isolated from the pests and pathogens of other continents, the Waite Arboretum is a valuable repository for genetic stock. We will try again to grow more specimens from seed.

Nearly all the trees in the burnt area were exotic, so many of the species are not adapted to fire like our natives. It will be some time before a final assessment can be made, but some interesting data about fire tolerance will probably emerge.

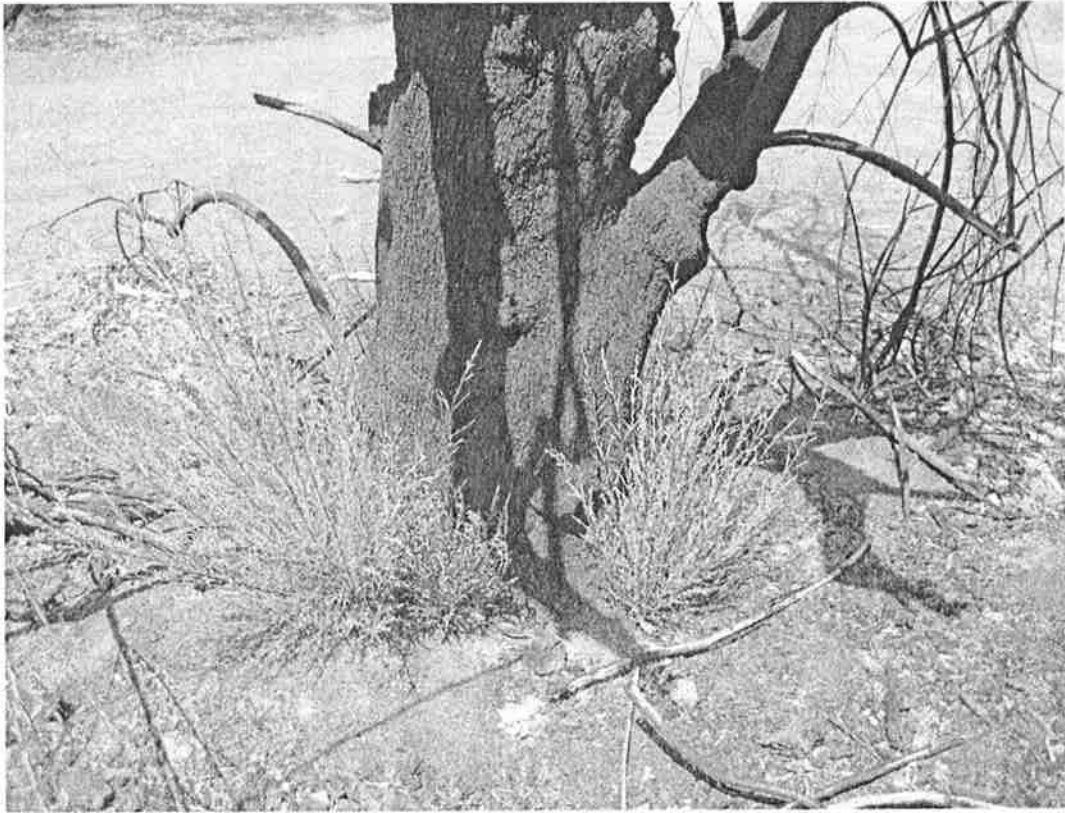
Four images of trees after the fire follow.



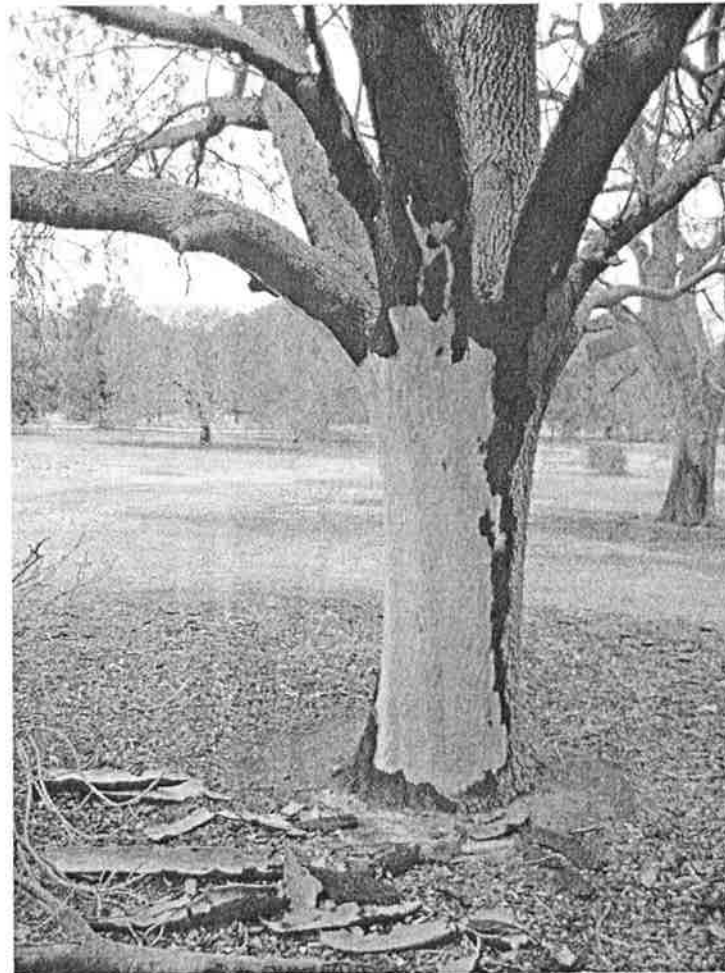
*Cupressus sempervirens*



*Cupressus glabra*



*Tamarix parviflora* - blackened trunk with new shoots at base



*Fraxinus rotundifolia*

### Palm & Cycad Collection

On 5th November the Palm and Cycad Society (SA) held their end of year working bee, planting more specimens, watering, fertilizing and pruning others. The collection is thriving and now contains many uncommon species. Congratulations and a big thank you to members of the society for their efforts and enthusiasm.

### Waite Festival

On 19th November, the Waite Arboretum participated in the Waite Festival with guided tours and a promotional booth shared with Treenet. The Hon. Michael O'Brien MP, representing the Premier, planted a Wollemi pine by the watercourse. Thank you to the guides and everyone who came along and supported the event.

### Workshop

Also in November, QRTS Ltd from the UK conducted the first of a series of Australia wide workshops on Quantified Tree Risk Assessment & Visual Tree Assessment in the Coachhouse. The two day session was well attended by arboriculturalists and landscape architects and practical sessions took place in the Arboretum. It is gratifying to see the Arboretum being used this way.

### Interpretive signs

In December four handsome new interpretive signs, funded by the Friends were installed: Bronze Loquat *Eriobotrya deflexa*, Vlier *Nuxia floribunda*, Small-leaved Rock Fig *Ficus brachypoda* & Red Saffronwood *Elaeodendron croceum*. They enhance visitors' enjoyment and are much appreciated.

### Waddy

How dismayed we all were when our magnificent specimen of the rare waddy *Acacia peuce*, planted in 1983, snapped off at the base in a storm on 1 September 2005. I left the interpretive sign there, hopeful that we might replant it one day. Imagine my astonishment a couple of weeks ago to observe vigorous new shoots emerging on the spot after all this time. This confirms the waddy's reputation of being extremely hardy!

### Restructure

As of 1 January 2007, Yvonne and I are positioned in the new office of Community Engagement. Our reporting line will be through the (yet to be appointed) Pro Vice-Chancellor (CE) to the Deputy Vice-Chancellor & Vice-President (Research). Prof. Alan Johnson AM, DVC & VP (R) has already visited the Waite Arboretum and Urrbrae House to meet with us, and we have been made to feel very welcome by him and other staff in his portfolio.

Jennifer Gardner

## EUCALYPTUS PLEUROCARPA (SCHAUER)

*Eucalyptus pleurocarpa* (formerly *E. tetragona*), Family Myrtaceae, derives its specific name from the Greek *pleura* (rib) and *carpos* (fruit) referring to the ribbed fruits. *Eucalyptus pleurocarpa* has the common names Tallerack, White marlock, mealy gum, white-leaved marlock and silver marlock, although the first is the most common. It is a native of Western Australia and is found along the sand plains north of Perth and in the Pingaring/Esperance area. *Eucalyptus pleurocarpa* is usually a small mallee, 2-3m tall but, occasionally, grows as a small tree 6-8m tall. It has attractive foliage, does well in poor soils because of its low nutrient requirements, requires little moisture and is easy to maintain. The bark is white or grey in the lower parts of the tree and is shed in large strips. The branchlets, leaves and flower buds are covered with white material. The mature leaves are oval, opposite, 7-15 cm long and 2.5-7 cm wide on a thick (1-2 cm) petiole and have prominent veins. The flowers occur in clusters of 3 on a flat stalk (peduncle), the buds have four ribs and the calyx four teeth. The operculum (bud cap) is usually hemispherical, smooth and white, the stamens are white to cream coloured and are arranged in four bundles which alternate with the small teeth which are visible when the operculum is shed. The fruits are four-ribbed and globular to urn-shaped. Both dark brown fertile seeds (4-6 mm long and surrounded by a thin, membranous wing) and red-brown infertile seeds (1-2 mm and with a fine, net-like pattern) are produced. *Eucalyptus pleurocarpa* flowers from November to January.

There are two *E. pleurocarpa* specimens in the Arboretum - #1922 A (K13) planted in 1961 and # 2514 B (E5) planted in 1994.

In general, *E. pleurocarpa* is a useful garden plant. The greyish colour on the stems and leaves is due to their being coated with wax which, when viewed under the scanning electron microscope, appears to be composed of branched rods (Jones & Sedgley, 1993). The wax is easily rubbed off by handling. Jones & Sedgley (1993) have shown experimentally, that seedlings of *E. pleurocarpa* take about three months to develop the wax layer, both under controlled glass house conditions and out of doors (the young seedlings have hairy, green leaves).

Various species of *Eucalyptus* have been investigated for their potential as "fillers" in the floriculture industry. *Eucalyptus pleurocarpa* is one such species. The grey bloom imparted by the wax rods is an important criterion in the cut flower industry although large leaves, such as those of *E. pleurocarpa*, are not popular with florists. However, the appealing stem shape and the thick wax layer, outweigh the disadvantage of large leaves and *E. pleurocarpa* is considered to have potential in the cut flower industry, even though the wax layer is rather labile and the foliage needs to be handled carefully so that the wax remains more or less intact.

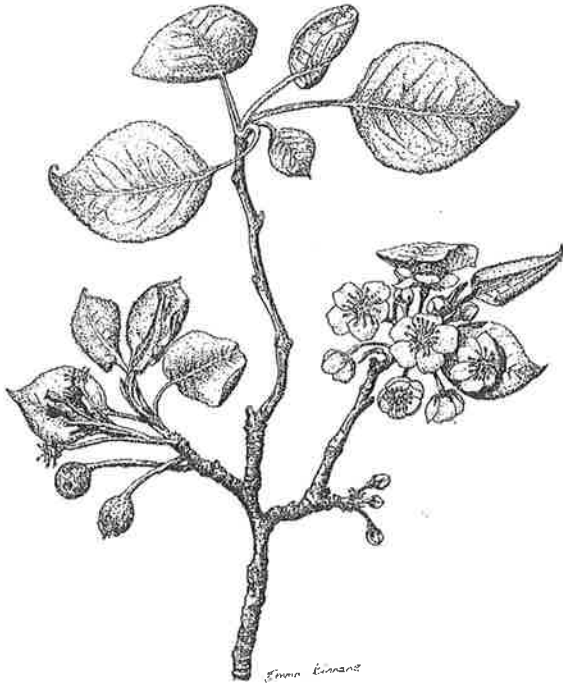
References: Brooker, M.I.H. & Kleinig, D. A. (1990). Field Guide to Eucalypts Vol. 2. South-western and Southern Australia (Inkata Press, Melbourne & Sydney); Chippendale, G.M.(1973). Eucalypts of the Western Australian Goldfields (& the adjacent wheatbelt). (Australian Government Publishing Service, Canberra); Eucalypts of Western Australia (WA Department of Agriculture Bulletin 4013); [www.australiaplants.com](http://www.australiaplants.com)

Jean Bird

The interpretive sign for the pear collection follows

## Pyrus Collection

### Pears



Pears include long-lived, moderate-sized deciduous trees which are hardy on poor, stony, alkaline soils. The Waite Arboretum ornamental pear collection contains over 100 specimens representing 23 species and 14 cultivars.

One of the most successful species is callery pear *Pyrus calleryana* from China. This species is widely used as a rootstock for commercial pear production. Many cultivars have been developed overseas where they are widely planted as street trees. Its hard, pea-sized fruits tend to remain on the tree and are eaten by birds, so are not a nuisance.

The illustration is of a selection of callery pear, made in the Waite Arboretum by Dr David Symon, which we call 'Lynington'. A fine row can be seen in the gardens of Urbrae House where their early spring flowering is always breath-takingly beautiful. Commercial production from these is now underway in several nurseries, and trees have been supplied to Councils for TREENET street tree trials.

Another floriferous species is the very drought tolerant *Pyrus amygdaliformis* from southern Europe and Asia Minor. Our trees are almost evergreen with small, dense, dull green foliage. They flower in profusion from July to October.

The Waite Arboretum also has a unique hybrid created by David Symon, *Pyrus calleryana* x *P. amygdaliformis*, which we call 'Prescott'.

Drawing by Emma Kinnane, text by Jennifer Gardner. Sign donated by The Friends of the Waite Arboretum Inc.

## POT – POURRI

### THE WAY TO THE STARS

Have you ever thought how tall woody plants gain in height, their growth often so visually dramatic when young? Leaving aside that we know the potential of trees often to gain great height (the world record has recently been lifted to over 130m) and that it is programmed in their genes and monitored by priority in the production of auxins (plant hormones), it is the way that they gain in height, or length of the main branches, that this note is concerned with. The ability to gain height is attained through a process called *circumnutation of the tip*. That many people are not aware of this came out in discussion at a recent meeting of the Arboretum guides.

Some of you whose youth was spent in the 1960s will probably remember the duo entertainers, Flanders and Swann. Michael Flanders wrote most of their songs and Donald Swann was pianist and accompanist. Today they can be heard frequently on ABC Classics FM in listeners' requests for their rendition of words to accompany Mozart's *Horn Concerto*, typical of the novelty and erudition of their repertoire. They wrote a piece called a 'Misalliance'. This is a

romantic tale of two climbing plants growing each side of a doorway. One was the honeysuckle and the other the *Convolvulus* or bindweed. The drama arises from the fact that the honeysuckle wound upwards to the right and the bindweed wound to the left. This is a clear example of circumnutation of the tip that is especially noticeable in tall climbing plants with stems of very small diameter relative to the height.

However, the phenomenon is also present in free-standing, normal trees, in which diameter growth is proportional to the height attained, or length in the case of branches, to provide the support necessary to withstand forces acting from wind and gravity. In these it is inconspicuous to casual viewing. There are, however, clues to the spiral nature of the upward or outward movement, despite its apparent verticality. For example, when I was first involved with the breeding of Monterey or radiata pine (*Pinus radiata*) in the early 1960s, the wood attributes of so-called *elite* trees, selected when mature as potential parents, were examined physically and microscopically. It was apparent that all the trees had their wood fibres (the basic tissue type in conifer species) laid down in the form of a spiral whose angle from the vertical varied between individuals from the first annual growth ring. The angular displacement decreased with increasing age of the stem. The parents preferred were those with fibres having no displacement after a few years and that trend continued for several decades. Other signs of spirality in many kinds of woody plant are the spiral arrangement of side shoots on primary twigs, of flowers in catkins, of the laying-down of scale leaves in the cypress family of conifers, and cone scales in the Pinaceae conifers, and going to more evolutionary-primitive plant orders, in leaf and cone development of the cycads.

Circumnutation of the tip does not appear in the index of several modern plant physiology texts. Nevertheless I first heard of it in Botany lectures at university and a search has shown that the term was used in a thorough study of the phenomenon by Charles Darwin. This was one of his principal botanical occupations. Darwin's paper was published in '*The power of movement in plants*', published by John Murray, London, 1880. The book has 573 pages in 12 chapters, the last one being a 'summary and concluding remarks', accessible on the Internet<sup>†</sup>.

Francis Darwin points out that his father had two primary interests, distinguished as evolutionary and physiological. The work cited above sits firmly in the second field. Francis produced a review of his father's work on movement in plants in a work called '*Darwin and Modern Science*' edited by A.C. Seward, 1909<sup>‡</sup>. In this he notes that work began on the study of climbing plants in the early 1860s. Darwin's view of circumnutation is concisely stated in his comment: 'In this universally present movement we have the basis or groundwork for the acquirement, according to the requirements of the plant, of the most diversified movements.' He goes on to point out 'that curvatures such as those towards the light or towards the centre of the earth can be shown to be exaggerations of circumnutation in the given directions . . .' We know that there is always movement in progress and its amplitude, or direction, or both, have only to be modified for the good of the plant in relation to internal or external stimuli.



Further literature search has produced very little recent research into this topic. Possibly it has been seen by generations of botany students as having 'creamed the field', a practice deplored by researchers keen to make a name for themselves through novel and innovative subjects. Be that as it may, the papers are being related to a new field called 'Plant Neurobiology' for which the first symposium was held in Florence, Italy in May 2005. The best modern definition I could locate is in French, and can be found at [www.snv.jussieu.fr/bmedia/mouvements/nutation-analyse.html](http://www.snv.jussieu.fr/bmedia/mouvements/nutation-analyse.html).  
December, 2006.

\* Currently available on CD under the EMI Comedy label, 7243 5 28596 2 7 at \$9.95.

† <http://www.britishlibrary.net/charles.darwin3/movem...>

‡ <http://www.stephenjaygould.org/library/modern-science/chapter19.html>

Robert Boardman

The following snippet was kindly provided by Anna Cox.

#### THE FIBONACCI SERIES

My aunt "would take me for long botanizing walks in the forest, where she had me look at fallen pinecones, to see that they [ like sunflowers ] had spirals based on the golden section. She showed me horsetails, growing near a stream, had me feel their stiff, jointed stems, and suggested that I measure these and plot the lengths of the successive segments as a graph. When I did so and saw that the curve flattened out, she explained that the increments were "exponential" and that this was the way growth usually occurred. These ratios, these geometric proportions, she told me, were to be found all over nature – numbers were the way the world was put together."

Oliver Sacks: *Uncle Tungsten: Memories of a Chemical Boyhood*. Picador, 2001.

#### THE PLEASURE OF BEING A GUIDE

The friends of the Waite Arboretum are looking for volunteer guides for the free guided tours in the arboretum held on the first Sunday of each month as well as for the tours which are booked by various groups.

As a guide with the Friends of the Botanic Gardens of Adelaide I can highly recommend the enjoyment and pleasure one derives from taking people on a walk where there can be so much interesting and fascinating information to share. People of wide ranging interests, local, interstate and overseas often make up a lively discussion group which makes an enjoyable and satisfying experience for all participants. Involvement in walks inspires one to further research various topics which help broaden one's knowledge base and appreciation of the wonders of nature. Guiding amongst grand trees and

interesting plants is a splendid way of combining one's love of trees, plants and people.

Henry Krichauff

## SUBSCRIPTIONS

You will have received your membership renewal with this Newsletter. Last financial year members were extremely generous with donations to the Friends and this generosity allowed much to be done in the Arboretum.

Again, the FWA Committee asks members to donate generously, particularly in the light of the fire that destroyed or damaged so many trees (see Director's report for details).

Our combined Christmas Party, held on Monday 4 December was very well attended and pronounced a resounding success. Prior to the party, Jennifer took a group of people for a walk in the Arboretum to inspect the fire damage and the new Interpretive Signs. Yvonne Routledge and the Presidents of each of the Friends groups addressed the gathering.

A very interesting CD of the development of the Waite Historical Precinct from 1990 was shown in the drawing room during the Christmas party.

## NEW MEMBERS

We warmly welcome the following new members:

Susan Milne, Verdun; Judy Telford, Highgate; Jeames Lind and Lesley Smith, Bridgewater.

## FORTHCOMING EVENTS

**GENERAL MEETING: Monday 26 February 2007 at 8 p.m.** Urrbrae House. Speaker: Mr David Harrison, President of the Rare Fruit Society who will give an illustrated talk entitled 'Growing Unusual Fruits in a Temperate Climate'.

**A.G.M. Monday 23 April 2007 at 8 p.m.** Urrbrae House. Speaker: to be advised.