

GREENING THE CITY OF WEST TORRENS

Tim Johnson

The following notes summarize the presentation given at the TREENET Symposium in September 2000. The presentation summary included:

- the current state of established street trees in the City of West Torrens
- the City's historical approach to greening
- issues and problems in greening a highly urbanized area with a culturally diverse population
- recent greening works
- trials of a range of relatively unknown tree species to determine their local suitability for street use

The northern boundary of West Torrens follows the River Torrens, the Glenelg tramline forms part of the southern boundary. Soils range from heavy clay to loam & sand. Average annual rainfall recorded at the airport is 450mm

- ***Agonis flexuosa***

Halifax Street Hilton & Henry Street Plympton are examples of typical streetscapes occurring throughout West Torrens. Many streets have narrow nature strips, severely restricting the range of tree species which can be planted.

Many existing street trees were planted in response to publication of the schedules included in Regulation 12 of the Sewerage Act of 1929-1977. The *Agonis flexuosa* in Goldfinch Avenue at Cowandilla are one example, they were removed during autumn 2000 and replaced with *Acer buergerianum*

- ***Eucalyptus tessellaris* and *Eucalyptus cneorifolia***

Eucalyptus tessellaris in Selby Street Kurralta Park is an example of an inappropriate species for street use. Structural hazards & infrastructure impacts at 20 years of age required that they be removed.

Eucalyptus cneorifolia and some other species planted following preparation of the Sewerage Act regulations and schedules remain quite healthy but their contribution to the amenity of streetscapes is frequently questioned. They are generally unpopular with residents.

- ***Eucalyptus diversifolia* and *Eucalyptus stricklandii***

Many of the species approved by service providers have very limited suitability to the West Torrens built environment, *Eucalyptus diversifolia* and *Eucalyptus stricklandii* being two examples. *Eucalyptus nicholii* & *Eucalyptus stricklandii* have very limited suitability to the majority of sites in West Torrens, though both were widely planted in the 1970's.

- ***E. spathulata* and *M. armillaris***

Eucalyptus spathulata and *Melaleuca armillaris* are both listed in schedule B of regulation 12 of the Sewerage Act, approving their planting no closer than 3.5 meters from sewers.

Both species are responsible for many problems with sewers. *Prunus* sp. deteriorate rapidly beyond 20 years of age, hundreds have been removed from Plympton over recent years.

- ***Ceratonia siliqua* and *Ficus hillii***

While Council has statutory authority to control planting in streets, problems arise when plants set seed or when residents undertake unauthorized works. Carob, Ficus and olives are common problem trees in streets.

Deliberate and malicious vandalism hinders our greening work, as does inappropriate arboricultural practices employed by some well-meaning residents.

Council has established avenues throughout the City, many with *Eucalyptus leucoxylon* ssp. *megalocarpa* and *Koelreuteria paniculata*. The amenity & longevity of these species ensure they will remain popular though Council frequently receives complaints about the litter they produce.

- **Queensland box**

There are over 150 mature avenues of Queensland box trees in West Torrens. Council receives hundreds of complaints concerning this species every year, the majority of them relating to litter.

Our experience and familiarity with these species tells us we're going to have problems due to the size of the Ficus, but the size of the Queensland box isn't an issue in western Adelaide. It is this familiarity with trees growing under local street conditions which we aim to increase through our involvement with TREENET.

Would we have ever contemplated planting Queensland box trees if our experience of them was derived from specimens growing under natural conditions reaching up to 50m tall? Unless we plant & monitor the performance of tree species under our environmental conditions we'll never be sure of how they perform locally and we may unnecessarily limit our urban forest's diversity.

The amalgamation of the Town of Thebarton and the City of West Torrens in 1997, subsequent restructuring including the merging of workforces, and the implementation of a Continuous Improvement Policy brought a change of direction to the Greening of West Torrens. While the quality and scale of works was maintained, a focus on research was also included. Much of the innovation in the greening programs since 1997 has resulted directly from the research and ideas of Council's horticulture staff, primarily the team leaders of the Landscape Development and Arboriculture teams.

Initially research commenced at the University of Adelaide's Waite Arboretum. Local libraries and the internet also proved to be valuable resources. Nursery stock lists were studied closely for species which had potential but had not been tried locally as street trees. Our experience with Queensland box and their potential size

under natural conditions suggested it may be worth planting small numbers of other rainforest species to see how they perform locally.

- *Flindersia australis*

The Crow's ash at the Adelaide Botanic Gardens has a trunk almost two meters in diameter. The species would normally be considered too large for street planting.

The mature Crow's ash at Plympton Primary School is about 7 meters tall & has a trunk caliper of about 300mm. It has no obvious problems or negative impacts on its surroundings, this specimen would make an ideal street tree in some situations.

59 Crow's ash were planted in three streets in 1998, sites include loam & clay, pH 5.5 to 7.5. Stock ranged in size from , in 500mm and 330mm spring ring containers.

TREENET sites: Allchurch Avenue North Plympton
Howden Road Fulham
Tennyson Street Kurralta Park

- *Acer buergerianum*

One of the goals of our research is to determine a greater number of species which will thrive under local conditions, provide good amenity and mature at a height below overhead powerlines. Research suggested the Trident maple would be a useful species- being the right size, growing on limestone & probably surviving on our rainfall.

The City of Prospect has had success with establishing the Trident maple in some fairly harsh areas. On Prospect Road they are thriving in red earth over limestone, with reflected heat and moderate levels of pollution from traffic.

Initially 156 trees were planted in the six streets selected as trial sites in 1998. Stock was bare rooted, 1meter tall with 10mm caliper. Sites range from sand to heavy clay, pH range from 6.0 to 7.5. All have performed well to date except those in sandy soils of pH 6 at West Beach, these died over a two year period and have since been replaced with *Acer pseudoplatanus*. (*Acer pseudoplatanus* were planted as a trial in 1998 on the opposite side of the road, they have thrived.)

TREENET sites: Berrima Street Glenelg North
Byron Avenue Netley
Garfield Avenue Kurralta Park
Goldfinch Avenue Cowandilla
North Parade Torrensville
Woodhead Street West Beach (trees replaced winter 2000)

- *Acer campestre* "Evelyn"

166 *Acer campestre* "Evelyn" were planted in four streets in winter 2000. All stock was advanced bare-rooted supplied by Flemings Nurseries.

TREENET sites: Brook Street Plympton
Halifax Street Hilton

Henry Street Plympton
Raffles Crescent Plympton

- *Acer pseudoplatanus*

Texts may suggest the Sycamore maple will grow to a massive size and will sucker and set seed prolifically. The species is known to be an invasive weed in areas of Europe and the U.S.A.

The specimen of *Acer pseudoplatanus* at the Waite Arboretum is about 5m tall and looks like a small plane tree. It was planted in 1941 and survives to this day. A second and very similar specimen planted in 1929 died and was removed recently. A third mature specimen can be seen at Lockleys Garden Center on Henley Beach Road near Airport Road, it has developed to a size similar to the examples at the Waite Arboretum. None of the established examples show any signs of the problems mentioned in texts.

117 trees were planted in 6 streets in 1998. Stock was bare rooted 1.8-2meters tall x 20mm caliper, it was supplied by Freshfords Nurseries. Sites range from sandy to heavy clay, pH range 6 to 7.5. The species appears hardy but growth has been slow and steady at all sites.

TREENET sites: Berrima Street Glenelg North
 Castlebar Road Lockleys
 Daringa Street Mile End
 Garfield Avenue Kurralta Park
 Pine Avenue Novar Gardens
 Woodhead Street West Beach

- *Acer monspessulanum*

The example of the Montpellier maple at the Waite Arboretum, and research through a number of texts, suggests this species will suit our local conditions and be useful for planting in relatively small areas and beneath powerlines. The species appears to be rarely propagated and difficult to source, though seed is readily available from the specimen at the arboretum.

10 *Acer monspessulanum* were planted in 2000 in Lily Street at Hilton. Stock was supplied in 10 liter bags by Freshfords Nurseries.

- *Acer x freemanii*

Anyone seeing the “Jeffersred” hybrid maple in full autumn color can’t fail to be impressed, but local experience with many of the North American maples suggests it is unlikely to survive on the Adelaide plains. As Fleming’s Nurseries product information described the variety as the most “drought resistant” of the hybrids we planted some on a trial basis though we weren’t confident it would suit our conditions.

10 trees were planted in 3 locations (sites selected were relatively “soft” with ample space and a good cover of mulch), stock was advanced bare-rooted at 3 meters tall x 30mm caliper, Stock was supplied by Fleming’s Nurseries.

TREENET sites: Marion Rd Plympton, near Elizabeth Avenue
 Autumn Avenue Lockleys, traffic island at terminus

Also two trees planted at Thebarton Neighbourhood House, 10 Falcon Avenue Mile End

At the Marion Road site the *Acer* was closely planted between *Pyrus calleryana* "Bradford" (45 liter bagged stock) as the *Acer*s were not expected survive the summer. Following a typically hot January the "Jeffersred" appeared in better condition than both the *Pyrus* and the advanced *Platanus x acerifolia* which had been planted on the opposite side of the road. Following this result trials of this variety will be extended.

- ***Backhousia citriodora***

Council planted 12 *Backhousia* in winter 2000. Stock was supplied by Lawry's Nursery in 330mm spring ring containers.

TREENET sites: Craig Street Richmond
 Carlisle Street Camden Park

- ***Buckinghamia celsissima***

Buckinghamias make good street trees in Brisbane & Sydney but we expected frost, drought & alkalinity problems in Adelaide. 40 trees were planted in 3 streets in 1998. Stock was supplied by Lawry's Nursery in 200mm pot & 500mm spring ring containers. Sites ranging from sand to heavy clay, pH range 6.5 to 8.

TREENET Sites Allchurch Avenue Plympton
 Concord Avenue Netley
 Wyatt Street Plympton

The results after 2 years in Wyatt Avenue are surprising, as *Agonis flexuosa* struggled and died in this location 7 years earlier. The larger stock has nearly doubled in size and has flowered twice each year while smaller stock performs poorly. Small stock is more susceptible to frost damage, vandalism and herbicide spraydrift.

The 200mm potted stock looked healthier at planting time but struggled during winter.

The view along Wyatt Street in February 2000 shows larger stock flowering in the distance while smaller stock is dead in the foreground. The smaller stock was severely burnt by frost but died following contact with Roundup spray drift.

- ***Caesalpinia ferrea***

The example of *Caesalpinia ferrea* at the Waite Arboretum suggests it will develop into a graceful small tree with ascending branches and fine bipinnate foliage. 26 trees were planted in 3 streets in winter 2000. Stock was supplied in 330mm spring ring containers and was provided by Lawry's Nurseries.

TREENET sites: David Court Lockleys
 Edward Davies Street North Plympton
 Muirfield Street Novar Gardens

- ***Castanospermum australe***

The specimen of *Castanospermum australe* at the Adelaide Botanic Garden is broader & shorter than the specimen in the above photograph, suggesting that under local conditions the species may meet the requirements of a street tree.

29 trees were planted in the 1998 program. Stock was supplied in 200mm pots by Lawry's Nurseries. Soil is clay, pH 6.5-7. Growth has been slow, better in bare earth or dolomite verges. This species responds well to regular fertiliser application.

Treenet site: Talbot Avenue North Plympton

- ***Corymbia ptychocarpa x ficifolia* "Summer Red."**

65 trees were planted in 3 streets in 1999. Stock was supplied by Heyne's Wholesale nursery in 150mm pots. Additional trees were planted in 2000 to determine suitability to sandy soils in Netley.

TREENET Sites: Burbridge Road Brooklyn Park (1999)
Elsie Street Netley (2000)
Florence Street Netley (2000)
Lancaster Street Lockleys (2000)
Lorraine Avenue Lockleys (2000)

- ***Cupaniopsis anacardioides***

Research suggested the Cupania may be a suitable small evergreen native suitable for planting under powerlines. 41 trees were planted in 1998. The species appears suited to local conditions, with good average growth rates recorded.

TREENET sites: Hayward Avenue Torrensville
Lorraine Avenue Lockleys
Rawlings Avenue Torrensville

- ***Elaeocarpus reticulatus***

Research suggested the Blueberry ash may be another small evergreen native suitable for planting under powerlines. 17 trees have been planted at two sites. Stock was supplied by Lawry's Nurseries in 330mm spring ring containers.

TREENET sites: Selby Street Kurrulta Park
Carlisle Street Camden Park

- ***Eucalyptus leucoxylon* "Austraflora Euky Dwarf"**

The Euky dwarf is apparently unpopular with residents, it has been subjected to vandalism. Few of the 50 trees planted remain.

TREENET site: Myzantha Street Lockleys, single specimen

- ***Flindersia xanthoxyla***

Due to the species' potential size at maturity, the site selected for trial of *Flindersia xanthoxyla* is spacious and far from private property. 31 trees were planted in 1998. Stock was supplied in 200mm pots. The species appears to be slow growing & therefore prone to vandalism.

TREENET site: Airport Road median, Brooklyn Park

- ***Fraxinus velutina***

Research suggests a hardy species which may grow well under local conditions. 101 trees planted in 4 streets in 1998, all have clay soils in pH range 6 – 7

TREENET sites: Allen Avenue Brooklyn Park
Chatswood Grove Underdale
Lewis Street Brooklyn Park
Talbot Street North Plympton

- ***Geijera parviflora***

The wilga is a small evergreen native from northern New South Wales, it is approved by ETSA for planting beneath powerlines. It looks like being an excellent street tree but is slow growing & prone to vandalism. Examples at the Waite Arboretum and Adelaide Botanic Garden have had minimal pruning and consequently are quite bushy. The specimen growing to the northeast of the rotunda at the Adelaide Zoological Gardens may be a better example of how the species will mature if given additional water and formative pruning.

64 trees were planted in 4 streets in 1998. Stock was supplied in 200mm spring ring containers by Lawry's Nurseries. Soils range from sandy loam to clay, pH 6.5 – 7. Additional trees have been ordered to extend our trial of this species but they will not be planted until at least 1.5 meters in height, thus requiring several years in the nursery.

TREENET Sites: Argyle Avenue Marleston
Carlisle Street Camden Park
Lasscock Avenue Lockleys
Garfield Avenue Kurralta Park

At Lasscock Avenue as elsewhere the best growth rates were recorded where trees were planted in bare earth verges. Trees planted in lawn performed poorly & many have been replaced (with *Cupaniopsis*) in response to pressure from residents.

Many wilgas were planted in kikuyu lawns in Lasscock Avenue and Argyle Avenue. In all cases wilgas have performed poorly under such conditions.

- ***Harpullia pendula***

In the texts *Harpullia pendula* is described as a tall rainforest species, but it appeared to have potential as another small to medium evergreen native suitable for street planting under our conditions. The specific name suggests possible problems or maintenance issues relating to a pendulous growth habit. 17 trees were planted in Wyatt Street Plympton in 1998. Stock was supplied in 330mm spring ring containers by Lawry's Nurseries.

Harpullia pendula has suffered badly from frost & cold during winter. Greatest growth rate was observed in January/February 2000 during 2 weeks of high relative humidity & 50mm rainfall.

- ***Harpullia hillii***

37 *Harpullia hillii* were planted in Basnett Street in 1998. Stock was supplied by Lawry's Nurseries in 200mm pots & 330mm spring rings. Soil is sandy loam with a pH of 8.0. Growth rates have been variable, with larger the stock performing better. Smaller stock appeared to be less tolerant of frost & cold.

- ***Lagerstroemia indica* x *fauriei*, "Indian Summer" varieties.**

20 "Tuscarora," 20 "Biloxi" and 3 Natchez varieties were planted in 1999 & 2000. All appear to thrive under local conditions. Growth rates are reasonable, much quicker than *L. indica*. "Tuscarora" and "Biloxi" varieties were selected for their upright form, they flower in their first or second year & consequently are popular with residents. Trials of these varieties will be extended.

TREENET Sites: Samuel St Fulham
Cygnet St Novar Gardens
Basnett Street Kurralta Park
Stonehouse Avenue Camden Park, near Anzac Highway

- ***Pistachia chinensis***

The *Pistachia chinensis* shown in Herbert Road Ashford appears ideal as a small street tree. It was planted by residents in 1964, is of good size & shape & has no observable impacts on infrastructure. There are several examples planted in local gardens, where they appear to mature at about 8-10 meters in height.

285 trees have been planted in 8 streets in 2000, a representative sample will be monitored for inclusion in TREENET.

Pistachia chinensis planted in: Avon Street Kurralta Park
Bignell Street Richmond
Devon Street West Richmond
Glenburnie Terrace Plympton
Murdoch Avenue Plympton
Neston Avenue North Plympton
Selby Street Kurralta Park
Talbot Street Hilton

The example of *Pistachia chinensis* in the Waite Arboretum was planted in 1929, showing that the species can become quite large under local conditions.

- ***Pyrus calleryana* cultivars**

Council has planted "Redspire," "Bradford" & "Winterglow" varieties over the past 6 years & more recently "Capitol" & "Chanticleer." All appear reliable & well suited to local conditions. Monitoring through TREENET will be of use to determine long term impacts related to fruit, litter and structural integrity with age. *Pyrus calleryana* is approved by ETSA for planting beneath powerlines. Ash white fly problems have been observed & all cultivars appear to suffer form aphid infestations in some years.

- ***Sapium sebiferum***

Sapium sebiferum is occasionally seen growing in domestic gardens. As it is a small species it may be useful for planting beneath powerlines. 45 trees were planted in Dudley Avenue Plympton in 1999. Stock was supplied in 25 liter bags by Freshfords Nurseries.

- ***Toona ciliata***

The Toonas at the Adelaide Botanic Garden are massive specimens but are grown under moist conditions in enriched soils. The specimens at the Waite Arboretum are much smaller, some show signs of stress toward the end of a typical Adelaide summer.

35 *Toona ciliata* have been planted in West Torrens in 1999-2000. Stock was supplied in 10 liter bags by Lawry's Nurseries and has been planted in Airport Road median at Brooklyn Park and in various parks & reserves.

- ***Zelkova serrata***

The two specimens of *Zelkova serrata* were planted in the Waite Arboretum in 1938 and 1944. They are an excellent shade tree, similar in size and habit to *Celtis occidentalis*.

51 trees were planted in 3 streets in 1998. Stock was bare rooted seedling variety and was 1.2 meters tall when planted. The species has shown to be surprisingly hardy and vigorous.

TREENET Sites: Washington Street Hilton
 Sarah Street Marleston
 Wakefield Place Brooklyn Park

Similarities between *Zelkova* & *Celtis* are obvious & both have similarly high maintenance requirements in their early years.

- **TREENET**

As well as being a valuable opportunity to be involved in vital research, TREENET has provided West Torrens with a valuable opportunity to promote developments in Council's horticultural practices & goals. Council has freely presented information about its involvement in TREENET to residents & positive feedback from the community is quite common.

- **Fact Sheets**

Council provides information on tree species in the form of factsheets, they are made available on request or can be downloaded from the website. Where possible, factsheets are provided to all householders in each street involved in Council's annual greening program. Providing such information and initiating discussion during the planning stages of Council's greening programs has been effective in increasing community support for greening works and for the care of street trees.

Many of the greening programs of previous decades have been ineffective, frequently utilizing inappropriate species with have obvious impacts and major maintenance

concerns whilst providing limited benefit to the community. Consequently, many members of the community have a low opinion of local government's horticultural knowledge and ability.

Including a short note about the TREENET Program on the relevant factsheets immediately raises Council's horticultural credibility through the link with the University of Adelaide. Many residents appreciate the fact that Council is affiliated with such an organization and is making use of resources like the Waite Arboretum.

Residents have occasionally raised concerns with respect to Council's involvement in TREENET trial planting. Their concerns fall into two main categories:

1. Trees may fail to perform & may require replacement within a few years.

Many of the Wilgas in Lasscock Avenue at Lockleys for example were replaced after two years. Residents frequently take a short-term view, often demanding trees which improve amenity quickly.

2. Trees may grow more than expected and may become too large.

Both of the above risks can be minimized by planting an appropriate number of trees and through careful selection of trial sites. For example: *Pyrus* generally perform reliably so extensive trials of new varieties could be planned. If there is considerable doubt about the suitability of a particular species only a small number of trees should be planted.

If there is reasonable concern that a species may develop into a large tree under local conditions its trial site must be carefully selected. A reserve frontage may provide a suitable site for trials of potentially large species. Trees could be planted on the reserve toward the road frontage to approximate street tree conditions, but they could be grown to maturity without the adverse impacts from limb reduction, root pruning etc. which arise when such trees are grown in close proximity to private properties.

There will always be some risk in dealing with unknowns and in time it may be shown that some species have been planted inappropriately through our TREENET trials. Few people would consider planting *Melia azedarach* as a street tree, but even fewer would consider removing established avenues. Planting a melia avenue would be considered irresponsible by today's standards, but the amenity that mature avenues currently provide is exactly what many people want from a greening program.

The mature melia avenues in West Torrens are sixty to seventy years old, they will not survive beyond a few more decades. We have a good understanding of issues relating to melias as street trees because we are so familiar with them, but we risk losing this familiarity in future. To ensure we retain this familiarity, melias should continue to be planted but in appropriate numbers and locations.