A Glimpse of Horticulture in Australia[1©]

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INTRODUCTION

G'Day Mate! No Worries! These two phrases capture the spirit of our host country's people as Fred Garret and I toured the nursery and horticulture industries across Australia as Southern Region of North America representatives. The conference and meetings were part of the International Plant Propagators annual board meeting, tours, and educational seminars held in Coffs Harbour in Australia during the last 2 weeks in May 2003. Their horticulture industry had many similarities to our own but a number of distinctions evolved as we sampled gardens, nurseries, and landscape projects. There was an obvious pride and dedication to conservation of Australia's natural resources incorporated into their businesses. Although we were in subtropical regions ranging from arid deserts to rain forest climates, there were many plants and nursery practices that stimulated ideas to use and share. Unfortunately, they also share many of our concerns and problems with government regulations, labor, invasive weeds, and a sometimes-uncooperative confrontation with the extremes of nature.

OBSERVATIONS OF THE AUSTRALIAN FLORA AND FAUNA

We began our tour in Alice Springs and Ayers Rock in the central Northern Territory of the Outback region of Australia. This area was presented to us through the eyes of the Aboriginal people who once inhabited all of Australia but suffered a similar fate as our Native American Indians. Very few people live the nomadic lifestyles, surviving in the desert like their ancestors. However, they do present the beauty of the desert through the renewed pride they retain from their ancestors.

Plant material was presented in terms of what it meant for survival in the desert. The area is described as a desert but actually is very lush and rich in plant and animal life. The region averages about 152 mm (6 inch) of rain per year. Water is life in this dry region and everything in the area was presented in light of the ecology and relationships needed for survival. Light blue, white, and silver are the predominant colors of plants, which reflect the intense sunshine. Leaves are needled or slender and often project upwards to minimize the angle of the sun's relentless attack and also serve to funnel limited water along the branches and bark to the roots. Books were available on the large number of species of *Eucalyptus* and *Acacia*, which I am sure, confuse even the best taxonomists. Red River gum (*E. camaldulensis*) and ghost gum (*Corymbia apparerinja* or *E. papuana*) were the predominant trees in the area. Colorful desert birds fly freely in the area.

An attractive spinafex grass (*Triodia pungens*) is the predominant groundcover in the desert. It is high in cellulose, which is great for termites but poor for cattle grazing. The termites, which devour all fallen wood in the area, are part of the lower food chain supported by this grass. Spinafex grass has been challenged by an introduced species, *Cenchrus ciliaris* that replicates some of our own ecological blunders. This grass has aggressively swept through many areas of Australia and is

[1]Author's note: It is sometimes difficult to put into words ideas that are easily seen in pictures. If you would like to see pictures and full text of the ideas presented, visit the web site: <http://www.ag.auburn.edu/landscape/STGOjune2003.html>.

choking out native plants. Other threats to the native plants and birds are rabbits, wild camels, horses, and feral cats.

The paperbark tree, tea oil tree or myrtle tree (*Melaleuca quinquenervia*), which was introduced and now later invaded the Florida Everglades, is a landscape plant on the coast of Australia. It is also commonly grown along with *M. alternifolia* by farmers/foresters in the millions and later extracted for pharmaceutical compounds. Tea tree oil is the essential oil distilled from the leaves and terminal branches of tea trees. The oils are reported to offer effective control of many viruses, fungi, and bacteria (see <http://farrer.riv.csu.edu.au/ASGAP/melaleuc.html#teatree>).

A tree that fascinated me and reminded me of our long leaf pine was the desert oak (*Acacia coriacea*). This is one of the most drought-tolerant tropical acacias of North and North West Australia, being able to survive years with little water. It is an erect shrub or a small tree. Desert oak grows in deep sandy soils and will stay in a "pencil" growth habit for 17 to 20 years until roots reach the water table. After water is found, the tree forms branches. It is a beautiful tree in the desert and would have great landscape appeal if it was hardy and put in the right environment.

Geologically, Australia separated from Antarctica 600 million years ago and drifted north becoming more arid and dry through time. Palm Valley was a site that survived the move and occupies a microclimate with an ancient water reservoir trapped in a sandstone sponge that provides the habitat for a Jurassic-Park-type region in the middle of the desert Australian Outback. Cycads and red cabbage palms proliferate in this lost gorge valley. The desert nights offered an incredible crystal clear view of the Southern Cross and other constellations, which are often lost in our smog and city lights.

After getting a feel for the history and culture of Australia, we left central Australia for the coast arriving at Brisbane and winding our way down the coast sampling nurseries and other horticulture activities. Rather than offer a stop-by-stop account, it is more appropriate to offer similarities and unique ideas experienced during our travels.

SHARING PRODUCTION INFORMATION

One surprising similarity in the nurseries we visited was the use of the same substrate components. All nurseries and greenhouses used varying combinations of pine bark as the major component with sphagnum peat moss, perlite, vermiculite, and sand providing different portions of the medium. Several nurseries made blends of short and long-term fertilizers for their container crops. The fertilizers were very familiar with Osmocote, Nutricote, as well as Green Jacket (a Polyon product) providing the major nutrients. Most nurseries were set up to supplement slow release fertilizers with liquid feed.

We saw no pot-in-pot production but did see greater use of plastic bags and fabric bags with handles for container tree production. A trend toward branding and utilizing smaller pots is similar to the trends in the U.S.A. Profit margins have continually been squeezed and expectations for service have increased over the past few years. One adjustment to cope with this trend is to try to get added value from branding or name recognition. Another adjustment has been to take plants that were normally sold as trade gallons and put them in 1- or 2-qt pots where quicker turnover and increased profit margins are possible.

Water quality and conservation were critical to most of the nurseries we visited. Most nurseries had collection ponds to capture all of their runoff and it was part of their certification program to achieve this best management practices. One nursery used a very elaborate program of chlorination for frequent clean-up of irrigation pipes while using UV light for killing undesirable pathogens in the water. This nursery also used a standard pan evaporation container to calculate the daily water loss and then factored in a plant coefficient to determine daily irrigation requirements. Sample emitters were placed in graduated measuring containers to keep tabs on the volume of water applied to each container. Over time, a number of irrigation programs were developed to handle most weather conditions and plant sizes. We found a great book that highlighted this area of production called *Managing Water in Plant Nurseries*. The authors are Chris Rolfe, William Yiasourmi, and Edda Keskala. It can be ordered through the Internet at <http://www.ngia.com.au/ordering.html>. It deserves a place among nursery reference books.

PROPAGATION

Propagation was very similar to our own nursery practices but a few ideas were new to me. A nursery at Queensland University in Brisbane had a self-contained commercial propagation bench that came complete with a heavy plastic bench with timers, plumbing, bottom heat, and electrical hook-ups — ready to go. Put the bench on a stand, fill the bottom with a layer of sand, plug it in and put your flats on the sand base ready for misting. A nursery that made their mark with a long history of grafting exotic tropical fruits offered a key tip to its success which was to reduce moisture levels of the understock and scion wood 2 days prior to grafting. They used a parafilm-type tie and white plastic bags to cover the graft.

NURSERY IDEAS

Nursery producers in Australia are master improvisers just like producers in our own industry. One nursery found a deal on out-of-style dune buggies called Mokes and turned them into some great plant movers. No one would ever find a stash of Mokes to use in the U.S.A., but the idea is to always have your eye open to someone's scrap/used material that could serve you well in the nursery and increase your bottom line. Another nursery found some surplus highway dividers and used them for media bin walls.

A product that I had not seen before was a bubble mat that was rolled out on greenhouse floors to keep flats out of the drainage water. Depending on cost, it appeared to be an easier solution than putting flats on another upside down flat. Australian nurseries face the same governmental regulations that frustrate our nurseries. An entrepreneur saw a niche to help nurseries meet the need for pesticide storage and produced a storage shed with the proper ventilation, showers, material safety data sheets storage area and all the required signs, overflow capture, and other items needed to meet regulations.

MARKETING

Marketing was a big part of many of the nurseries' business plans. Their marketing research showed women to be the primary buyers of their products and that women liked color. So, many nurseries looked like a patchwork quilt of some pleasing and some clashing color schemes to meet this need. Nursery Traders was a rewholesale

cooperative concept firm servicing wholesale multi-nursery markets located in the southern Brisbane suburbs. Wholesale purchasers of horticultural products are able to personally select or alternatively source horticultural products. Buyers can visit and purchase any quantity from over 120 independent firms that rent, stock, and maintain space at the Nursery Traders wholesale center. It offers a great outlet for small and large nurseries <http://www.nurserytraders.com.au>.

LANDSCAPE IDEAS AND THOUGHTS

In the landscape horticulture area, like other areas of horticulture, we saw many similarities. We did have to adjust to the time warp as we traveled from spring to fall in 19 h and stepped into landscapes with camellias in full flower. Camellias, little gem magnolias, and *Loropetalum* were very popular and were prevalent in many gardens and landscapes. In downtown Brisbane we had the opportunity to visit an old rail station that was converted into the Roma Street Parkland Garden. The project began in January 2000 and was completed in March 2001. It was funded by Queensland Government at a cost of 74 million dollars and is the largest subtropical garden in the world. The government has an "Art Build-in" policy, which requires 2% of the budget for all State Capitol work projects to be allocated to integrating art into the buildings and spaces. Our industry and communities could benefit from adopting this philosophy. When I saw the poinsettias and other tropical plants used as bedding plants and shrubs, it rekindled a thought that we should look at all these plants for use as annuals or possibly perennials in our landscapes.

RETAIL IDEAS

Retail marketing is an area of the green business that is constantly learning from retail sales groups from grocery stores to banks on how we can make retail garden shopping an entertaining, memorable experience. We visited Hawkins Garden Center that seemed to do everything right. From the number of late fall customers in the gardening complex their strategies were obviously very effective. This outdoor living center had all the qualities we look for in our garden centers including easy parking and checkout, carts, great signage, clean restrooms, pleasing music, and other gardening sounds, information centers, areas to keep the kids busy, well displayed diversity in plant materials and gardening items, certification of professionalism, guarantees of plant quality and survival, and many other ideas.

There were a number of ideas that were relatively new to me. The most noticeable was the sub-contracting of space to specialty niche stores that offered expertise and convenience of a total outdoor living and beyond gardening experience. Hawkins offered specialty sub-contractor shops for furniture, water features, restaurants, shade structures, irrigation, pottery, and even a travel service to help with gardening tours. Since the industry is now offering many small plants, a logical marketing tool was to place in the display a mature specimen plant so that the consumer could envision the future of these small plants in their home landscapes. Artistic rock engraved numbers was another small niche business that would have a tough time surviving on its own but did well when combined with the rest of the garden center niche businesses.

You can pick up many ideas visiting other nurseries. The International Plant Propagators' motto is "To Seek and Share". Every meeting in the U.S.A. and around the world offers similar experiences and great opportunities to share common

problems and successes. Although the world is continuing to get smaller and many production methods are the same, other countries' nurseries still operate detached from our daily nursery practices. Travel to these regions offers a great chance to load up on ideas. Each region has annual meetings similar to the Eastern, Southern, and Western regions in the U.S.A. You would be welcome and the members would be honored to have you attend their meetings. You can find dates and programs on the I.P.P.S. website: <www.ipps.org>.

Characterizing Invasiveness of Ornamental Species of Florida©

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INTRODUCTION

The State of Florida is the second largest producer of ornamental plants in the U.S.A. with an estimated $9.9 billion in total industry sales during 2000 (Hodges and Haydu, 2002). While most intentionally introduced species remain in their cultivated settings, some escape cultivation and invade natural areas. An invasive plant species is defined as a non-indigenous species that has the ability to establish self-sustaining, expanding populations, and may cause economic and/or environmental harm (National Invasive Species Council, 2001; Vitousek et al., 1995). Today, approximately 1.9 million acres of Florida's remaining natural areas have been invaded by exotic plant species and more than $240 million has been spent in Florida to control invasive, exotic plant species since 1980 (FLEPPC, 2003). The Florida Exotic Pest Plant Council (FLEPPC) maintains a list of plants considered invasive in the state, each designated as Category I or Category II. Category I species are defined as invasive exotic pants that are altering native plant communities by displacing native species, changing community structures or ecological functions, or hybridizing with natives. Category II species are defined as invasive exotics that have increased in abundance or frequency but have not altered Florida plant communities to a significant extent. Of the 124 plant species listed as invasive (Category I or II) by the FLEPPC, it is estimated that 67% were introduced as ornamentals (FLEPPC, 2003). While the FLEPPC list contains some plants that are regulated also by state law, the list does not have statutory authority, impart because there are many different interpretations of whether a plant is invasive. Fourteen of the plants listed as Category I by FLEPPC are still cultivated extensively by the Florida Nursery and Landscape Industry for their ornamental value (Wirth et al., 2003). Some of these species have numerous cultivars of which seed production and viability is largely unknown. In addition, some species or cultivars may only be capable of invading or surviving in certain geographical regions of the state.

To address these concerns, several researchers at the University of Florida have been funded through various sources (Florida Department of Environmental Protection, United States Department of Agriculture, IFAS Invasive Plant Working Group, and Florida Nursery and Growers Association) to characterize the potential invasiveness of some highly ornamental plants (Dehgan et al., 2002; Mecca et al., 2003; Wilson and Mecca, 2003). In addition, an Institute of Food and Agricultural