

Tapping Our Biodiversity: The Future of Native Plants in Horticulture in Queensland®

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INTRODUCTION

Because Australian native plants originate from the Australian bush, they are inextricably tied to the Australian landscape, and so the growing of Australian native plants has always been about not only propagating and growing Australian plants in gardens, but also about getting out into the bush collecting propagating material and understanding the plants in their natural habitats.

Historically the plants most extensively collected, studied, and grown in gardens and landscapes have tended to focus on eight main genera in the “big 3” Australian plant families: Mimosaceae (acacias), Proteaceae (grevilleas, banksias, and hakeas), and Myrtaceae (callistemons, melaleucas, leptospermums, and eucalypts). This is no doubt because these are the genera and families that, more than any others, put that particular Australian stamp on the Australian landscape and that most Australians identify with typifying all things Australian. So, if you want to create a garden that looks Australian and that reminds you of the bush, these are the obvious genera to use.

By the end of the 1970s the native flora surrounding the major cities and regional centres (which are located in the southern part of the continent) was pretty well explored, and to a large extent most of the species had been tried and tested in cultivation, while the much more sparsely populated tropics remained largely unexplored botanically. Only a handful of north Queensland rainforest plants, such as *Buckinghamia celsissima* (the ivory curl) and *Syzygium luehmannii* (small-leafed lilly-pilly), had entered cultivation.

So during the 1980s and 1990s the focus finally shifted further afield into the more remote regions of the continent. Thus began a very exciting era for native plants in Queensland — the exploration of the north Queensland Wet Tropics rainforests and the wilderness of Cape York Peninsula — and what a wonderland of new and exciting species was revealed.

THE PRESENT

By the year 2000 over 1,000 new tropical Australian native species had been introduced into cultivation by my nursery (Yuruga), and native plant lovers were starting to get their tongues around seemingly unpronounceable names like *Syzygium*, *Geissois*, *Opisthiolepis*, and *Blepharocarya*. What a long way from acacias, banksias, callistemons, and eucalypts!

Certainly in my part of Australia (that is, north Queensland), there is a tremendous underlying feeling for the habitat and landscape from which the natives grown in gardens originate. People grow native plants for the multitude of benefits they bring: not only for the beauty of the plants themselves and their magnificent flowers, foliage, and fruit; but also for the birds, butterflies, and other wildlife they attract and harbour. People grow natives because they care about the environment.

As well as their role in gardens, landscapes and revegetation, there is also an emerging and very important role for tropical Australian native plants in other areas such as the cut flower and foliage industry, bush foods, and timber production.

BREEDING AND SELECTION

In the global forestry industry, eucalypts are a very important timber. In Australia, eucalypts have traditionally been harvested from native forests, but this is now recognised as unsustainable and is no longer palatable to the Australian public, and the industry is rapidly moving to plantation establishment. Selection and breeding of superior trees to enable increased yield from the existing plantation estate is already occurring, and plantations of elite clones of eucalypt hybrids are already established. Clonal forestry is the way of the future.

The bush food industry is rapidly developing, and it is well recognised that plantation establishment, as opposed to wild harvest, is essential for a viable, sustainable, and profitable industry, especially since for some species tonnes of fruit are harvested annually. Hand in hand with plantation establishment comes the selection of superior individuals for clonal propagation and plantation improvement.

Similarly, there is a growing cut foliage industry based on some of our stunning native foliage, but the quantities currently harvested from the wild are in the hundreds of tonnes annually in southeast Queensland alone, and so there is increasing pressure for plantation establishment and the development of improved selections in response to market pressure. The beautiful new foliage selections *Stenocarpus* 'Forest Lace' and 'Forest Gem' are stand-out examples of the role of breeding and selection in our native flora.

ACCESS TO SEED

It is easy to forget that the huge range of native plants so readily available today is totally dependent on the access we have enjoyed to the bush in the past for our source of seed and propagating material. Such access is essential since it not only results in native plants being available for gardens, landscapes, revegetation, etc., but also has the additional benefits of accumulating vast amounts of knowledge about our native flora and its habitats and distribution patterns, maintaining the genetic vigour of our cultivated plants, and allowing that essential connection between the land and the plants, the habitat and the landscape. The conservation outcomes from access to the wild are immense.

Unfortunately, with expanding cities and agriculture, the pressure on our bush has never been greater. The response in recent years has been to declare more and more National Parks in an endeavour to protect what remains, and this is desirable and admirable. However, there is a down-side that urgently needs to be acknowledged, discussed, and addressed.

THE IMPACT OF LEGISLATION

Current legislation in Queensland restricts access to and prevents the removal of anything from National Parks, and that includes seeds and cuttings even though the quantities required for propagation are small and invariably inconsequential to the conservation status of the species being collected. In addition, the collection of any propagating material from the wild in Queensland (outside of National Parks) is currently so grossly over-regulated that there is very little collection from the

wild any more at all. To put this in context, for my nursery (Yuruga Nursery) to collect propagating material from the wild, I am currently required to have five (yes, five!) permits. The compliance costs in terms of money, time, and effort are enormous. From both an Australian and a global perspective, this ranks with some of the most restrictive management legislation in the world. Needless to say, most commercial operators, when faced with this absurd degree of bureaucratic red tape, take the easy way out and grow exotics instead, and that is exactly what has been happening in Queensland over the last 12 years or so. The quantity and range of native plants now offered for sale in commercial nurseries across Queensland has declined dramatically, with enormous implications for conservation.

In my part of the world, we are surrounded by wonderful National Parks, State Forests, and World Heritage rainforests. Landholders in the region need to plant gardens, windbreaks and screens, and they need to stabilise creek banks, plant shade trees for cattle, and create corridors for wildlife. It is crucial that they can readily obtain suitable native plants so that the genetic integrity of the surrounding native forests is not inadvertently placed at risk by seedling recruitment from, or cross-breeding with, nearby plantings.

This means that it is essential that local forests be accessible for the collection of propagating material. For instance, the flame tree, *Brachychiton acerifolius*, occurs over a huge geographical range right down the east coast of Australia, and obviously there are genetic differences between populations over such an extensive range. It is therefore very important that trees planted in north Queensland are grown from seed obtained in the region and not from seed of southern stock or from assorted garden collections of unknown origin. However, without access to local forests for seed collection, this is exactly what will happen. Or even worse, nurseries will take the easy way out and sell exotic substitutes such as the African tulip tree with its enormous potential to invade the precious forests.

WEEDS

This brings me to weeds. If landholders cannot obtain native plants, they will plant exotics instead if that is all that is available. The threat to our forests from exotic species becoming weeds is extremely serious, and once a plant has become a weed it is too late.

It is now widely accepted that a large proportion of our serious weeds in Australia are garden escapes, i.e., exotic plants that have been introduced into the country for their ornamental value. While quantity of seed produced and method of seed dispersal are useful indicators of potential weediness, as are hardiness and speed of growth, the weed potential of a plant is not always all that easy to evaluate in advance, since it may take years of natural selection over multiple generations before a plant suddenly is able to escape and create havoc on the environment. Thus a serious side-effect of the current Queensland legislation is that there is likely to be a huge weed problem in the future as a result of the current decline in native plants sold in nurseries and the increase in numbers and variety of exotics.

GENETIC VIGOUR AND IN-BREEDING

But why is it so important to have continuing access to native forests for seed when there are so many plants in cultivation from which seed could readily (and more easily) be harvested? The answer lies in an understanding of genetic diversity and vigour and of inbreeding, and the ivory curl (*B. celsissima*) is a text-book example.

Buckinghamia celsissima has been in cultivation for decades. It was one of the earliest collections from north Queensland's rainforests, and it is grown extensively in gardens and landscapes virtually right around Australia. It can be propagated from cuttings, but it flowers and seeds prolifically and so most propagation is by seed, which germinates readily. And therein lies the problem. All the hundreds of thousands of plants in cultivation around Australia can be traced back to the original couple of wild collections, and with no further wild collections to re-invigorate the genetic base, the cultivated plants have become more and more inbred over the years. The deterioration in the vigour of cultivated plants has become a serious issue. At Yuruga Nursery, on the other hand, we collect our propagating material from the wild, and of course we collect *B. celsissima* as well. The vigour, colour, and general appearance of our wild-sourced plants compared to cultivated material is so stunning and remarkable that for quite a while many people were convinced that Yuruga's plants were actually a different species!

In our work at Yuruga we have noticed the effects of inbreeding and genetic decline on many occasions and across a wide range of species. The valuable cabinet timber species Queensland maple *Flindersia brayleyana*, for instance, is another text-book example where inbreeding in isolated seed-trees is resulting in a rapidly decreasing germination rate and an alarming increase in deformities in germinants. This species is an important commercial timber, so maintaining genetic vigour is essential not only for broader environmental reasons as discussed above, but for the health and prosperity of emerging industries as well.

Because the effects of inbreeding often develop slowly or over many generations, it is easy not to notice or recognise that it is happening. But happen it does, and this is why continuing access to wild seed from native forests is so important, to keep our cultivated populations re-invigorated and genetically healthy. Maybe it does not matter so much if we were only growing the plants as street trees in the city centre, but it is significant when the plants are being used in broader landscapes across our countryside, and especially in sensitive locations adjoining, abutting, buffering, and extending our precious native forest estate.

CONCLUSION

The future of native plants in horticulture in Queensland will be bleak indeed unless the current legislation, which so severely, and unnecessarily, restricts access to propagating material in the wild, is substantially revised.