

# Onwards and outwards<sup>©</sup>

R. Clark<sup>a</sup>

Trees Impact Pty Limited, PO Box 94, Gerringong, NSW, Australia.

## INTRODUCTION

Trees are an important and very valuable component of our urban landscapes. In a civic sense, they:

- Help reduce air temperatures
- Reduce electricity consumption (which in turn reduces the use of coal and demands on water)
- Sequester carbon
- Prolong the life of asphalt
- Improve the amenity value of our streets
- Help reduce storm-water runoff and much more.

On a more personal level, trees can improve our streets, enhance the quality of life we enjoy in our houses and gardens and add significantly to the value of our homes. When you look at the cost of the tree itself, the percentage of the total costs of planting is very small while the return on investment is huge.

Climate change with its associated increases in temperatures means that the contribution trees make will become increasingly important and the predicted increase in storm activity means that the structural integrity of our trees becomes even more important. The quality of the trees we grow is a key component of the success of those trees in our urban landscapes. All tree growth, both above and below ground, is determined by extension – the tree we plant is the foundation of the tree in the landscape. This is recognized by our knowledgeable end users and more enlightened growers from whom there is a strong push to improve the standard of trees grown and used in Australia.

Our industry is plagued with tree quality problems that relate to a reluctance to change existing production practices and the financial constraints and mechanisms we work under.

In the same way that the trees supplied by our advanced tree growers are the foundation of the trees in the landscape, the trees produced by our propagators are the foundation of these more advanced trees.

## DISCUSSION

### The value of trees

It has long been understood that trees provide a range of benefits to our urban environments. The benefits to the community include; reduced air temperatures, reduced electricity consumption (and the associated reduction in the use of coal and water) carbon sequestration, the increase in the lifespan of asphalt in our streets, capture rainfall in storm events therefore reducing runoff and the costs associated with dealing with that water, improve the amenity of our streets and increase tourism.

In a recent paper by Greg Moore (2016) some of these values have been quantified (see Table 1). Moore suggests that based on data collected for a community of 100,000 trees (a city roughly the size of Newcastle) each tree contributes of the order of \$1400 per annum in measurable benefits – these do not include aesthetic and amenity values. Therefore, if we assume that these trees have a useful life of 40 years then each tree, in its lifetime, will contribute something of the order of \$56,000 in measurable benefits to that community.

---

<sup>a</sup>E-mail: rossclark@treesimpact.com.au

Table 1. Quantified savings based on a community with 100,000 trees [based on figures found in Moore (2016)].

Benefit	Quantified benefits from 100,000 trees
Savings in electricity (based on a rate of \$0.30 per kWh)	\$1,000,000 per annum
Savings in water – as used to produce electricity only (based on a rate of \$1.50 per kilolitre)	\$450,000 per annum
Value of extending life of bitumen by 20-30 years, assumes 30% shade from the trees and that asphalt re-sheeted. (If old asphalt also needs to be removed, this figure is doubled and if full road reconstruction is needed, multiply it by four.)	\$137,500,000
Value of sequestered carbon, based on a rate of \$23 per tonne (as per the carbon tax)	\$30,000,000

On a personal level, various real estate agents suggest that, for an average house worth around \$500,000; a single tree in the garden can add anything from \$5000-\$25,000 to the value of the property, a garden of trees will add \$25,000-\$50,000 and established trees in the street will add up to an extra \$150,000. While a Planet Ark survey found that 100% of buyers would pay an extra \$35,000 if there were established trees in the street and 35% of buyers would pay an extra \$100,000 (Table 2).

Table 2. Estimation of the value of trees and treed gardens [based on figures found in Moore (2016)].

Description of trees considered	Estimated increase in property value (For properties worth approx. \$500,000)
Value added by a single tree Real estate agent valuation	\$5000
Value added by a single tree [Real estate agent valuation]	5% of property value (or \$25,000)
Value of established tree in the nature strip	30% of property values (or \$150,000)
Value of a treed garden [Real estate agent valuation]	\$50,000
Value of a treed garden [Real estate agent valuation]	5% of property value (or \$25,000)
Value of a treed garden/street	\$35,000 - \$100,000

However, these amazing financial benefits are not gained by planting trees. They are gained through planting and establishing trees that succeed, in the longer term. Successful tree plantings are the result of a number of factors coming together – tree quality being one of them.

Planting substandard trees and therefore jeopardizing the tree planting in the process simply doesn't make sense. It is even more ridiculous when you consider the fact that the cost of the tree is typically a small percentage of the overall costs of the project and planting a poor tree is the same as planting a good tree.

For example, the recent removal of Hills Figs in Layman Street in Newcastle and replacement with new Hills Figs had a total cost of around \$2,100,000 while the cost of the trees themselves was around \$20,000 – less than 1%.

### Climate change and tree quality

Google "climate change" and you will get something like 140,000,000 results in around 0.25 of a second. It is safe to assume that the predictions made by the scientists are real. We will be getting warmer and we will experience increased storm activity.

Increasing temperatures will make the benefits trees offer all the more important and the calculated \$ values can only increase.

Perhaps more important will be the increased need for trees to be structurally stable so as to be able to withstand increased winds associated with increased storm activity

predicted.

As we better understand the importance of tree quality, as a component of success in the landscape and both The NATSPEC specification for trees (Clark, 2003) and the new draft Australian Standard AS 2303:2015 (2015) *Tree Stock for Landscape Use* (The Standard) now figure prominently in our industry, to continue to grow and supply trees that don't conform to these standards will be to leave yourself exposed to the possibility of legal action.

### **Stock quality as a component of success in the landscape**

Successful tree plantings are the result of the following five critical components coming together:

- 1) Planning and design
- 2) Species selection
- 3) Stock selection (Stock Quality)
- 4) Planting and establishment
- 5) Maintenance

There is also a sixth critical component of successful tree plantings – communication. Those involved with the various stages of planting and establishment need to communicate with each other, if all stages are to come together cohesively.

While it is true that tree quality is not a guarantee of success, using only high quality tree stock gives you your best possible chance.

### **Specifications and standards NATSPEC**

In 1996 the first NATSPEC specification for trees was published in a book called *Purchasing Landscape Trees* (Clark, 1996). This was immediately endorsed by the National Arborists Association of Australia, the people responsible for cleaning up the mess created when sub-standard trees are used and by the Olympic Coordination Authority, for trees supplied for the 2000 Olympic Games. However, growers found it variously; enlightening, confronting, confusing, and/or offensive.

Having benefitted from 7 years of use and significant contributions from senior arborists and landscape architects, the second version of NATSPEC was published in 2003 in *Specifying Trees* (Clark, 2003). The information was very much the same but the format had been simplified and de-mystified. This second version was endorsed by landscape architecture as well as the arborists.

The reaction from growers this time round was far more positive, with large numbers of growers now supporting it. However, there were still some objections to NATSPEC, falling into the following two broad categories:

- Misunderstandings
- A resistance to change

### **Misunderstandings**

The bulk of issues arising from a misunderstanding are linked to the misuse of some indicative tables.

The second version of NATSPEC includes tables that show indicative height/calliper/container volumes that comply. (These were added at the request of our landscape architects.) While these tables are very useful, providing sensible descriptions of trees for use in ordering and tendering, these suggested combinations do not form part of the specification. Unfortunately, these indicative height/calliper/container volumes have, on occasion, been seen as requirements and potentially conforming trees rejected as a result.

### **A resistance to change**

Many of the production practices we use in our industry, while firmly entrenched, are designed to benefit growers rather than trees. For example; growing trees at close spacings allows more trees to be grown in any given area (good for the grower). However, close spacing forces vertical growth, loss of lower foliage and often leads to trees being unable to support themselves and unable to add the necessary calliper and stem taper to ever be self

supporting (bad for the trees).

Objections to NATSPEC have resulted from grower's inability to produce complying trees, using their current production practices. The belief being that the specification must therefore be too tough.

NATSPEC remains our most stringent specification for trees and it is endorsed by the bodies representing our most knowledgeable end users – Arborists and Landscape Architects.

### **AS 2303:2015 — Tree stock for landscape use (The Standard)**

The Standard has just been released (2015). The Nursery and Garden Industry (NGIA) initiated its development and it is based on NATSPEC.

Creating a document through committees and based on consensus is always difficult. After quite an involved process, the resulting document still needs work but is a very creditable first draft.

Areas that need to be upgraded include:

- Replacing the “less than or equal to” signs on figures relating to the figure relating to stem taper.
- Upgrading the criteria for stem structure relating to the relationship between the size of stems and branches.
- Upgrading the section on tree stock balance assessment from “should” to “shall”.
- Revising and simplifying the inspection process.

While the current form of The Standard remains flawed it is a credit to both the NGIA and the Local Government Tree Resources Association. While “not quite there yet” The Standard is within striking distance of being a workable and effective document.

### **Conformance and litigation**

With NATSPEC and The Standard now “out there”, growers who choose to continue producing trees to lesser standards leave themselves open to the possibility of litigation.

Should trees fail in the landscape it is generally not difficult to conduct a post mortem to discover which fault, in the development of the tree, caused the problem. This fault can, in turn, be traced back through the stages of production to the grower responsible.

As a grower your best protection, against the possibility of legal action, is to grow conforming trees.

### **Quality problems — why do we have them?**

If you head to your local nursery and take a serious look at the standard of trees being sold, you will probably find some that are poor, some that are OK and some that are good.

Why aren't all trees grown and sold in Australia grown to high standards? The answer is twofold; a resistance to change and commercial pressures.

Many of our tree growing practices have evolved to make tree growing easier and more profitable. For example: Growing trees close together means we can fit more into our nurseries. This is good, financially, for the grower but typically results in trees with poor stem taper and calliper.

These practices are well entrenched and, perhaps even more importantly, the market place has evolved with these less than ideal trees and come to expect and accept them. While there is a market for such trees it is difficult for growers to afford the extra time, effort and space needed to grow genuinely great trees.

Sadly, not all tree sales are made to knowledgeable buyers. Sales to the general public are governed by size, presentation and cost, rather than actual quality. The decision about which trees to buy for major projects is often made by financial controllers or project managers. Understandably, these are not “tree people” and price will be the major consideration. It is only sales where the buyer is knowledgeable about tree quality issues (generally arborists or Landscape Architects) where quality will be the primary consideration. Sadly, these knowledgeable end users represent only a small part of the total market for trees.

The quality of trees grown by our industry remains variable because it is human nature to resist change and commercially difficult to implement it.

The adoption of rigorous specifications and standards raises the standard of demand. As a bigger and bigger proportion of the market place comes to demand a better product, the industry can then in turn justify producing a better product, safe in the knowledge that they can now do so and still be competitive.

### **Quality as it specifically relates to propagators**

- Good trees in the landscape come from good trees grown by our growers of more advanced stock.
- Good advanced trees result from growing-on good smaller stock.
- Good smaller stock is the result of potting-on and growing-on good propagation material.
- Therefore, good trees in the landscape come from good trees from our propagators.

The majority of problems with propagation material results from root deformities. NATSPEC sets out clear criteria for acceptable root direction and development in all sizes, including tubes and small propagating containers. The Standard actually takes this a step further and officially outlaws J-roots, circling roots, kinked roots and girdling roots.

As with tree quality in general, the publication and adoption of acceptable criteria for quality, especially of root systems, for tubestock etc. means that poor stock will no longer be acceptable and growers will be required to put extra rigor into their production practices to ensure trees conform. The market place must, in turn, be prepared to pay for this extra effort.

Propagating trees with great root systems involves:

- Understanding what is required (see Moore, 2016; AS 2303:2015, 2015)
- Devising propagation practices that address these requirements
- Building-in an ongoing inspection/QA programme to ensure that these practices are working.

### **CONCLUSION**

Trees are incredibly valuable components of our urban landscapes adding tens of thousands, or even hundreds of thousands, worth of calculable benefits to communities and individuals. These benefits are only realised if the trees succeed in our landscapes and this success is the result of key components of tree planting coming together – tree quality being one of them.

Given that the cost of the tree represents a small part of the total planting costs, cutting costs and quality of trees does not make practical, professional or financial sense.

With the increased temperatures associated with climate change, trees become even more important to us and, due to the increased storm activity predicted, their structural integrity more critical.

As our understanding for the need for quality increases and we have specifications and standards in place, we, as growers, have an increased responsibility to produce well grown, well structured trees.

The voice of knowledgeable tree users is getting louder and we, as an industry, must listen to that voice. With the NGIA now joining our arborists and landscape architects in the push for better trees, growers who don't take quality seriously will be left behind.

NATSPEC is widely used and respected, if at times misunderstood and The Standard has the potential to be a useful successor. Combined they help to define new benchmarks that the nursery industry can aspire to, competitively.

The quality of trees from our propagators is the beginning of the quality control process and quality, at this small starting point in tree production, is a key component of the success of all trees in our industry and in the landscape beyond.

## **Literature cited**

AS 2303:2015 (2015). Tree Stock for Landscape Use. Australian Standard (Paramus, New Jersey, USA: ILI Infodisk Inc.).

Clark, R. (1996). Purchasing Landscape Trees (Milsons Point, Australia: Construction Information Systems Pty Ltd).

Clark, R. (2003). Specifying trees (Milsons Point, Australia: Construction Information Systems Pty Ltd).

Moore, G.M. (2016). The economic value of trees in the urban forest as climate changes. *Acta Hort.* 1108, 1–12 <http://dx.doi.org/10.17660/ActaHortic.2016.1108.1>.

NATSPEC. [www.natspec.com.au/](http://www.natspec.com.au/).