

Specifying Trees

Two pieces originally published in a pamphlet about specifying trees.

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Is your worst nightmare about to happen?

Your best client has just called. The mature trees in his prestigious shopping centre development are all dying and he wants them replaced. They cost over \$50,000. Who is going to pay the bill?

Can you afford to take the risk?

By Paul Hardyman

With Clients more frequently taking the legal route when things go wrong and targeting Professional Indemnity Insurance Policies for outcomes, can you afford not to be specifying based on anything but industry standards such as NATSPEC's "Specifying Trees : a guide to assessment of tree quality"?

What is NATSPEC?

The book "Specifying Trees — a guide to assessment of tree quality" is an essential yet very under used part of the nursery, arboriculture and landscape architecture industries. It was written by urban forester, Ross Clark and published by NATSPEC / Construction Information. The current second edition was released in 2003 (reprinted in 2006) and was based upon the 1996 "Purchasing Landscape Trees" published by NATSPEC.

"Specifying Trees" was written to provide arborists and landscape architects with the tools for the selection of correctly grown nursery (container and ex-ground) trees which are free of flaws that may lead to premature death or failure of the trees when planted. It should also provide the basis for quality control and tree growing processes in all nurseries.

It is the only recognised code for nursery tree selection in Australia. It is the benchmark.

Why is it important?

Having an independent party certify the NATSPEC compliance of trees may be your last line of defence in a tree related legal dispute. As some of you may know, Clients are more inclined to involve their lawyers than ever before.

I know of several circumstances where Brisbane based Landscape Architectural firms have been involved in projects where a significant number of trees have died within a year or two of planting and a lot of "finger pointing" has resulted. Had the supplied trees been certified NATSPEC compliant that would have removed one of the many possible variables from the post mortem "blame game".

Trees

The new (and heavy handed) Workplace Health & Safety (WH&S) obligations for Designers in Queensland states that it is the responsibility of Designers to “guarantee” that what we design will be safe. It could possibly be said that under this legislation (effective from July 1, 2007) that if a tree falls over in the future due to root girdling for example that you, the Designer, will be criminally liable for the damage. (Note that this is not likely to be covered by existing Professional Indemnity or Public Liability Insurances.)

It is common to see DA Conditions from Brisbane City Council and others such as “Design and document a detailed Landscape Plan, and implement in accordance with ... Australian Standards and best trade practice”. In my view, this clearly would also mean that what is documented and installed is in accordance with NATSPEC’s “Specifying Trees”. If you don’t specify it then strictly speaking, you are in breach of the DA Conditions.

How are trees specified now?

Landscape Architects almost universally make the mistake of assessing the health and suitability of nursery grown trees by looking at the canopy and stem when in fact the majority of problems associated with future tree failures occur under the ground in the root system. NATSPEC’s “Specifying Trees” provides clear methods for inspecting tree root systems for flaws while the tree is still in the nursery.

It is likely that the majority of Landscape Architect’s height, spread and container size specifications for trees are not compliant with NATSPEC’s “Specifying Trees”. This exposes the Landscape Architect to significant liability issues should they fail.

How & where to specify it?

Landscape Architects should specify that “All trees supplied are to comply with NATSPEC’s “Specifying Trees : a guide to assessment of tree quality””. It should also be stated whether the nursery is required to supply written certification of compliance or that the Client’s agent will carry out an independent certification inspection. This should be clearly noted on the top of project plant schedules. It is important to put it on the plant schedule (and not hidden deep in a Specification) as the Contractor is likely to only fax the plant schedule to the nursery for pricing. It is the nursery that must see that they are required to supply NATSPEC compliant trees.

The Landscape Architect should also specify that the Landscape Contractor obtains an independent certification of the trees being supplied by an Arborist or at least that the nursery provide written certification that the trees are compliant.

This may “discharge the obligation” of the Designer in relation to the new WH&S requirements. In other words, you have done what you could to ensure the safety of this element of your design.

Remember, if it is not in the Specification you can’t enforce it.

Who can use it?

Some Landscape Architects are wisely specifying that the Landscape Contractor is to provide independent arboricultural certification that the supplied trees are NATSPEC compliant. This not only protects them but also, importantly, the Landscape Contractor from potential future legal exposure should the trees die or fail to perform adequately due to poor nursery practises. It would be in the interest of Landscape Contractors to get independent certification of trees to protect their own interests regardless of whether it has been specified by the Landscape Architect.

Some Arborists provide this specialist independent certification role to Landscape Architects and Landscape Contractors. Ensure you engage the services of an Arborist with a good working knowledge of NATSPEC's "Specifying Trees". A skilled person is also able to assess whether minor non-conformances may be acceptable in certain circumstances.

Experienced Landscape Architects and Landscape Contractors may be quite capable of applying the tests outlined in "Specifying Trees" however some Clients may perceive a conflict of interest if they are approving trees. This may also be the case where Nurseries are certifying / approving their own trees.

Independent certification may be impractical for small tree orders (say less than \$10,000) in which case you need to judge the quality yourself or buy from a reliable supplier.

Applying NATSPEC's Specifying Trees

It could be said that the above-ground requirements of "Specifying Trees" are open to more interpretation and should be assessed based on good species specific knowledge and a level of flexibility.

I believe it is unreasonable to make a blanket application of the above ground components of it to every tree as there are certain circumstances requiring leniency such as species specific canopy forms and branching characteristics. It is here that tree related expertise is necessary to make a correct assessment.

Assessment of the below-ground parts of the tree should, in my opinion, be done strictly in line with the requirements of "Specifying Trees" as they are reflective of nursery practises and rarely reflect species specific characteristics. Do not be afraid to carry out "partial destructive sampling" of trees. This involves the washing out of a wedge of the root ball exposing the internal root structure. "Destructive (complete) sampling" where all the soil is washed from the root ball and the tree is destroyed should generally only be done for trees in 200mm pots or smaller.

"Specifying Trees" is not just for large trees. In my experience the majority of problems occur when the tree is in 200mm or 45 L containers. Commonly they are held in these container sizes too long awaiting potential sale before potting up.

The rejection of poor quality non-compliant trees is typically an unpopular decision with the nursery however ensures the Client's interests are protected and hopefully encourages the nursery in question to modify and improve their tree growing processes. Trees that do not comply with "Specifying Trees" should be rejected

In my experience it is common that nurseries who refute the value and content of NATSPEC's "Specifying Trees" do not adhere to the processes outlined in it nor do they produce trees that are NATSPEC compliant. This often results in the supply of cheaper and poorer quality trees whose ability to develop into long term healthy and safe trees in a built landscape is significantly compromised.

In my rough estimate, approximately 30% of all nursery grown trees do not comply with NATSPEC's "Specifying Trees".

Who does it protect?

It protects Landscape Architects, Landscape Contractors and Nurseries from Clients. When things go wrong with trees on a site the impact is typically very visible. Clients will immediately work their way through each party seeking answers, rectification and typically remuneration for costs.

Nurseries and Landscape Contractors often say Clients won't pay for better quality trees but are you, the Designer, willing to specify and accept them and face the future liability. The nursery industry will respond once they know that the new benchmark is being set and more importantly, policed.

Protection from liability is especially important for Local Councils and other Government Departments requiring openness and accountability in all aspects of what they do. For this reason Council's should only be accepting and planting NATSPEC compliant trees on public land.

What are some of the most common non-compliances in nursery grown trees?

When inspecting and certifying nursery grown trees these are the following non-compliant items I see most often :

- 1. Soil over the root ball surface** — An International Society of Arboriculture article (Arboriculture & Urban Forestry 2006. 32 (6): 305–311) quoted a 1991 survey that found 93% of professionally planted trees had the root collars obscured by mulch or soil. Root collar burial leads to tree failure and girdling root development. Often it is done in the nursery and then again on the site. Deep planting leads to increased water stress and lower leaf chlorophyll and extremely limited root development in the upper soil layers in the early years after planting.
- 2. Root girdling** — typically in either 200mm or 45 L pots due to either poor potting up timing or the topping up of soil in the pot over the root ball and around the trunk
- 3. Staking** — leads to trees unable to support themselves which then often leads to them being planted too deeply by the Landscape Contractor to help stand the tree up (both in the nursery and on site). When removed, stakes leave gaps beside the trunk base that then leads to instability. Stakes also reduce the natural movement of trees and the physiological response of the tree to increase root growth for support. Finally, stakes often damage the trunk by rubbing on the trunk, especially the sharp top edges of round bamboo stakes



1-Planted too low & kinked root, early girdling



2-Tree-Girdling
Root



3-Roots reflecting tree in 140mm pot too long



4-Poor Tube stock & planted too low



5-Large root out bottom of 45L bag



6-Planted too low

Growing NATSPEC Compliant Trees

By Jeff Sinclair, Director Tango Trees and Grasses

Tango Trees and Grasses is a major tree and grasses nursery located in Loganholme, south east Queensland. In its various forms the nursery has been growing trees for over 20 years but it is only in the last 4 years that the nursery embraced NATSPEC guidelines and changed the way it grows trees.

Howard Windleborn, Operations Manager of Tango Trees and Grasses, was the architect of the change. As he explains, it was not an easy journey.

“We literally had to throw away the book and start afresh because growing NATSPEC compliant trees cannot be achieved by tweaking old methods – it requires top to bottom re-engineering of production processes”.

Ex Ground Trees

Howard follows a disciplined 5 step approach to grow thousands of new trees every year. These steps for ex ground stock are:

1. Careful Selection of Starter Stock
2. Thorough Preparation of Planting Beds
3. Thoughtful Feeding and Irrigation
4. Rigorous Pruning and Culling
5. Disciplined Attention to Harvesting Technique

Careful Selection of Starter Stock

Using handpicked suppliers of starter stock and examining every tree before it is purchased ensures quality begins at planting. Selected trees are 500–800mm high with even branch structure, good shape and strong root structure.

Thorough Preparation of Planting Beds

Preparing the planting beds is one of the most important steps because it encourages fast, even growth and the development of strong root systems.

The Tango team rips and ploughs the beds followed by levelling to give good drainage. A thick layer of light and fluffy soil similar to potting mix specially blended to its specification is laid and the soil mounded using a moulding plough. The young trees are planted by hand with the holes shaped to encourage good root growth. Spacing is 2 to 4 metres apart depending on species and the trees are not staked.

Thoughtful Feeding and Irrigation

Once the holes are backfilled, an individual sprinkler head is placed about 400mm from the centre of the tree in order to keep the area moist and encourage vigorous root growth. A slow release fertiliser is applied immediately and again later in the year. Pest and disease control chemicals are applied under the direction of a highly qualified consultant.

In year two the sprinkler heads are moved to about 700–800mm from the centre and in year three moved again to about 1000mm. Thus irrigation is scientifically applied to meet the needs of the tree.

Rigorous Pruning and Culling

After one year the trees are root pruned using a four bladed tree spade set to 800mm diameter. This is followed by another root prune in year two with an 1100mm cut and a

further prune one month before harvesting in year 3 typically with a 1400mm diameter cut. Root pruning encourages the roots to branch thus creating a dense root structure so it is a time consuming but essential process.

Canopy pruning takes place twice a year to keep the shape of the tree even and attractive. Culling takes place at the end of year two. At this time any unshapely or crooked trees are destroyed. The root structure of trees is also examined at this time using a sampling program and trees not meeting guidelines are destroyed. This rarely occurs due to the care taken in earlier stages of the process.

Disciplined Attention to Harvesting Technique

Harvesting takes place when the tree has reached the right balance of height and form, usually two or three years after planting.

A state of the art tree spade is used to cut and remove the trees from the ground whereupon they are immediately wrapped in Hessian or put in a steel cage. Harvesting takes place about one month before dispatch allowing the trees to rest and recover before shipping.

Tango Trees and Grasses encourages customers to examine the trees prior to shipping and supports examination of the root structure. They have little to fear — since it began employing the 5 step process rejects have been virtually eliminated.

Container Trees

The processes used by Tango Trees and Grasses to grow container stock are similar to those to grow ex ground trees. The main features of the methodology used to grow NATSPEC container trees at Tango and common practise in tree nurseries are outlined below.

Nutrition

General purpose fertiliser is applied regularly to encourage even growth of the stem, canopy and root ball. High hydrogen fertilisers that force the tree to grow fast are avoided because it results in an undeveloped root ball and thin stems.

Staking

Trees are not staked because it develops a stronger stem and better balanced root ball.

Root Pruning

The root ball is shaved at every time the trees are re-bagged (usually twice for a 200 litre tree) because it encourages the roots to divide and create a denser and stronger root ball.

Spacing

Trees are spaced well apart to encourage canopy growth. High density spacing increases yield but it produces a tree with a small canopy and this is not consistent with NATSPEC guidelines.

Canopy Pruning

Trees are pruned early and regularly to maintain a good canopy balance and attractive shape.

Where to buy the book?

It is available from NATSPEC (02) 9321 7200 and can be ordered from their web site at : http://www.natspec.com.au/Products_Services/publications.asp. Cost is \$38.50 + \$10 express post.