



**Tree stock for landscape use**  
Australian Standard® 2303. 2015

## ▶ **Appreciating the Standard**

- ▶ This Standard is based on the publication *Specifying Trees—A guide to assessment of tree quality* (2003), first published as *Purchasing landscape trees* (1996), reproduced with permission of Construction Information Systems Limited, trading as NATSPEC and Ross Clark.
- ▶ The Standard aims at simplifying the tree stock specification process and describes the above- and below-ground Features necessary in determining quality tree stock for landscape use. This Standard covers only the tree stock quality aspect of this entire process.
- ▶ A number of factors are important in determining the quality of a tree. At the time of planting, a tree should be free of faults that would cause the tree to fail at some point in the future, or that would require a greater input of resources to establish. It should be healthy, structurally sound, have well-developed roots, have a uniform habit and good balance between the canopy and the rootball.
- ▶ Growing quality trees takes skill and care. The production process is an important starting point in producing quality trees. The care and professional techniques used on trees during their growth is important, as is the nursery situation where the trees are grown.
- ▶ the Standard applies to all of the many different production methods utilized by nurseries, which can vary greatly
- ▶ The term 'tree' covers a range of highly variable living genera and species, which are influenced by their growing environment, including time of year and season. This Standard provides a method for determining tree stock quality that is flexible in application without compromising quality.

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- ▶ The Australian Standard for Tree stock for landscape use (AS2303) currently has 3 separate sections for quality assessments in containerized trees, including above ground testing, belowground testing and assessments of tree root to shoot balance. While inspection of above and below ground morphology are commonplace among international tree quality assessments, evaluation of tree root to shoot balance is unique in AS2303.

# Critical to this Standard is

- ▶ Trees are Living organisms and can and will be variable
- ▶ across species,
- ▶ growing methods,
- ▶ climatic zones and
- ▶ Trees respond uniquely to their growing
- ▶ environment, including that of a production nursery.



# This Standard

- ▶ describes above- and below-ground characteristics of tree
- ▶ aims to simplifying the tree stock specification process,
- ▶ give greater understanding of the tree stock quality parameters for stake holders



This Standard specifies the criteria for the assessment of above- and below-ground characteristics of tree stock that are to be supplied for landscape use. It covers containerized, bare rooted and ex-ground tree stock and applies to all stages of growth, from propagation through to dispatch.



▶ TREE STOCK ASSESSMENT

- CRITERIA FOR ABOVE GROUND ASSESSMENT OF TREE STOCK
- CRITERIA FOR BELOW GROUND ASSESSMENT OF TREE STOCK

▶ TREE STOCK BALANCE ASSESSMENT

- GENERAL
- DETERMINING SIZE INDEX
- REQUIREMENTS FOR ASSESSMENT



# Is the Tree Stock Standard For Landscape Use A Valid Test Of Australian Tree Quality?



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- ▶ 1. Conduct a literature review investigating the factors affecting root to shoot balance in containerized trees, and the importance of root to shoot balance for out-planting success.
  - ▶ 2. Create an extensive database of measured variables to assess root to shoot balance, via Size Index, in containerized Australian tree stock grown in each major climate region.

- 23 Wholesale Nurseries
- 3 from Western Australia
- 13,820 Trees Measured
- 18L TO 3000L Container Sizes
- 113 Species Measured
- Native
- Non Native Evergreen
- Deciduous



# Research Methodology

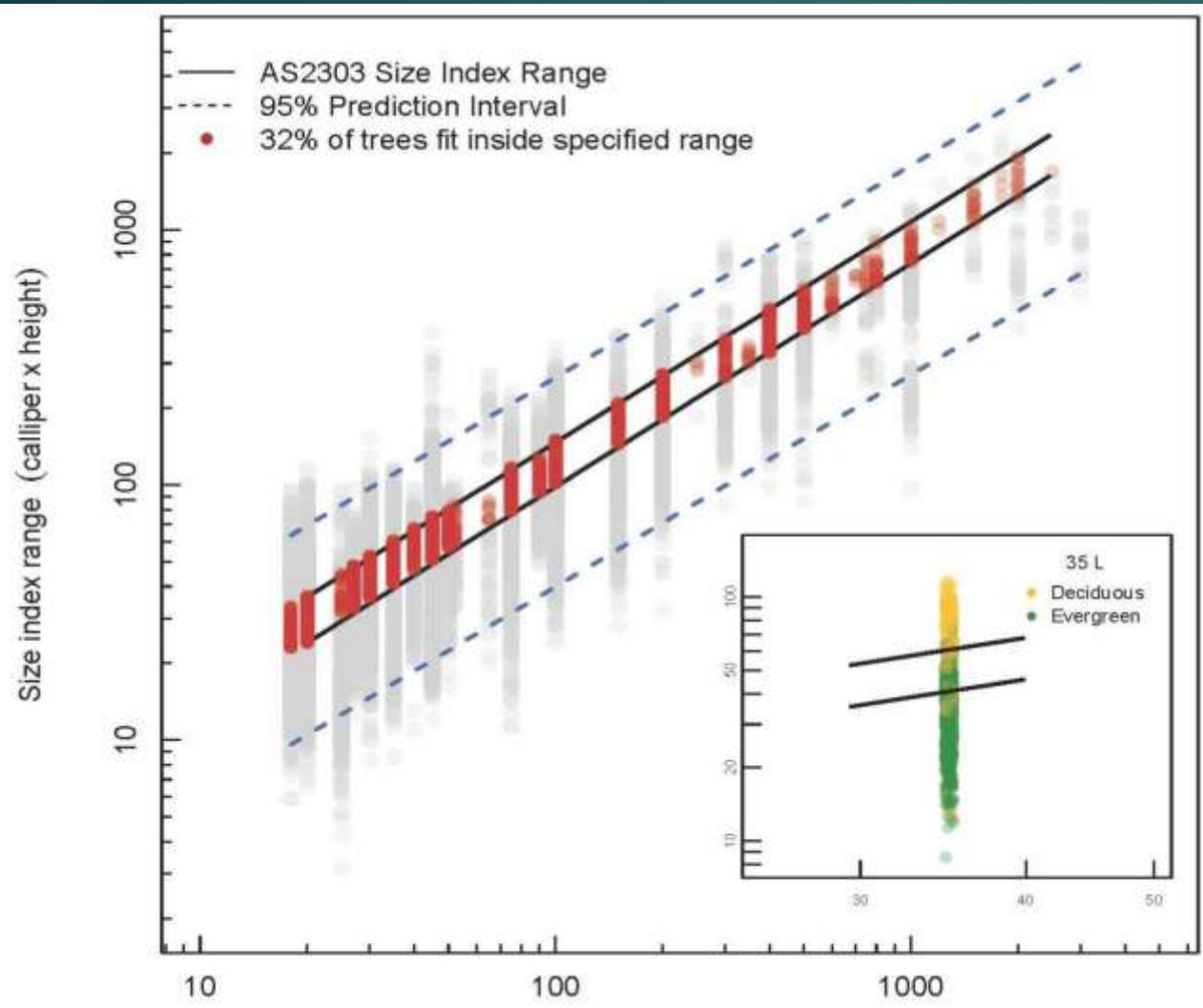
- ▶ 1 identify batches ready for sale by consultation with the nursery
- ▶ 2 Complete visual assessment of above and below ground morphological quality
- ▶ 3 measure height and calliper on a large selection of tree that have passed step 2
- ▶ 4 Measure additional factors such as canopy width and leaf size
- ▶ 5 collect climate production information from each nursery.

► Literature review

The 3 most common assessments are height, diameter and root system size. Evaluating combinations of above and belowground parameters (balance) may better represent tree quality and predict future success

However, each of these parameters is influenced by watering, nutrition, climate, species variation and nursery practices.





#### ► findings of field trials

- The specified range of *Size Index* in AS2303 does not adequately capture the natural variation across the large diversity of 'ready for dispatch' trees in Australian nurseries (Figure 1).
- Of the measured, standard-conforming trees, approximately 1/3 fit in the specified range of *Size Index* values across all container sizes (18 to 3000L). 45% of trees fell below the minimum range and 23 % fell above the maximum range.
- Measured *Size Index* of large container trees (> 500 L) is generally smaller than the range specified in AS2303.
- Small to medium container trees had the largest degree of variation in *Size Index* values, which was largely a result of species differences.
- For small containers (< 50L) non-native deciduous trees tended to have greater *Size Index* values than native evergreen trees (Figure 1 inset).
- Climatic region of production and differences among nurseries were less important than species differences in explaining the observed variation in *Size Index*.
- Of the components of *Size Index*, tree height was the most variable across the measured range of container sizes. In comparison, calliper was less variable.

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# What Next?

- Use the available dataset to determine the relative contributions of species, nursery practices and climate to observed variation in *Size Index*, and its components of height and calliper.
- Determine if categorization of tree stock into species groups is necessary, or appropriate, to effectively quantify and assess tree balance in Australian nursery stock using the current criteria.
- Analyse the degree to which the current criteria would have to be adjusted to capture a larger percentage of the entire range of conforming nursery-produced trees.
- Mine the complete data set to investigate the utility of alternate quantitative metrics to assess tree balance.
- Report complete findings to the industry bodies by late April, 2017.

## NOTE:

It should be understood that the tree stock are not manufactured articles that can be produced to an exact specification. Variability between tree stocks is expected as they are living organisms and there is nothing exact in their nature.

