



Tree stock for landscape use



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- Institute of Australian Consulting Arboriculturists
- Local Government Tree Resources Association
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Preface

This Standard was prepared by the Standard Australia Committee EV-018, Arboriculture to supersede AS 2303:2015 *Tree stock for landscape use*.

The objective of this Standard is to provide criteria for those who grow, specify or purchase tree stock for landscape use. The use of such criteria enables quality tree stock to be identified, regardless of the production method used to grow them.

Referenced material and sourced information in this Standard has been collated from industry experts and 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 [1].

The terms “normative” and “informative” have been used in this Standard to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is for information and guidance only.

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Foreword

This Australian Standard is aimed at simplifying the tree stock specification process and describes the above-ground and below-ground characteristics that are necessary in determining quality tree stock for landscape use.

The recognition and selection of quality tree stock is an important first step in a series of events, which, combined, enable trees to fulfil their long-term landscape potential. In addition to the recognition and selection of quality tree stock, good landscape planning and design, correct planting and establishment techniques and ongoing maintenance are also required for trees to be a successful component of the landscape. 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 be likely to 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 tree stock in production nurseries takes great skill and care. The professional techniques applied to tree stock during their growth is very important, as is the nursery situation where the tree stock is grown.

Across Australia, many different production methods are utilized by production nurseries. While these techniques can vary greatly, the characteristics outlined in this Standard remain valid across all production methods.

It should be recognized that 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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Tree stock for landscape use

Section 1 Scope and general

1.1 Scope

This Standard specifies the criteria for the assessment of above-ground and below-ground characteristics of tree stock that are to be supplied for landscape use. It covers container-grown, containerized, bare-rooted and ex-ground tree stock, and can be applied to all stages of growth.

The specifications and criteria in this Standard apply to all methods of production systems and styles of containers.

NOTE Tree stock are not manufactured articles that can be produced to an exact specification. Variability between tree stock is expected, as trees are living organisms and individual differences are to be expected.

This Standard does not apply to palms, or tree stock that is specifically produced for topiary, espalier, bonsai, pollarding or coppicing. This Standard does not apply to tree stock that has been transplanted from a landscape situation (not a production nursery) to places other than a production nursery.

1.2 Application

This Standard is intended for use by suppliers and purchasers of tree stock for landscape use and for those who specify tree stock for landscape use.

NOTE This Standard is also suitable for use under a third-party auditable nursery production best management practice or quality assurance (QA) accreditation program. Certification is not a requirement of the Standard, and the Standard may equally well be applied on a self-assessment basis within a user organization.

Section 2 Normative References

The following document is referred to in the text in such a way that some or all of its content constitutes requirements of this document.

AS 4373, *Pruning of amenity trees*

Section 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

apical bud

terminal bud located at the tip of the stem and branches

3.2

apical dominance

dominance of the terminal bud over lateral buds of growth

3.3

balance

concerning the relationship between the above-ground and below-ground parts of tree stock

3.4

bare-rooted

tree stock grown in the ground that is dispatched without soil

3.5**bark graft**

graft in which a wedge-shaped scion is inserted under a loosened tongue of bark on the stock

3.6**batch**

quantity of tree stock of the same species, container size, type and age from the same origin

3.7**branch**

lateral shoot on a main axis such as a trunk or another branch

3.8**branch bark ridge**

raised or furrowed bark in the branch union that marks where the branch wood and trunk wood overlap

3.9**branch collar**

trunk tissue around the base of a branch

3.10**branch union**

place of common juncture for two or more branches

3.11**bud**

embryonic vegetative or reproductive tissue, which may be terminal, axillary or adventitious in origin

Note 1 to entry: Buds can be active or dormant.

3.12**calliper**

trunk diameter measured at 300 mm above the root crown, or 50 % of the overall height, whichever is the lower height, expressed in millimetres (mm)

3.13**central leader**

clearly defined single, relatively straight, trunk

3.14**circling root**

root at the rootball surface or in the rootball interior growing in a manner that is not growing radially away from the trunk but curves to encircle the rootball

3.15**clean stem height**

distance between the uppermost surface of the rootball and the first order branches of the trunk that is free from branches

3.16**cleft graft**

graft in which the scion is placed in a cleft or slit at the top of a stock

3.17**codominant stems**

two or more stems or trunks of similar dimensions arising from about the same position from a trunk or stem

3.18**container**

object such as a planter bag, woven bag, root control bag, rigid walled pot, air root pruning pot, punnet, tube or similar object that is used to contain the rootball of the tree stock

3.19**containerized**

process whereby tree stock grown in open ground are lifted and potted up into containers

3.20**container-grown**

process whereby tree stock spend all or most of their time in the production nursery in containers

3.21**crown**

portion of the tree stock consisting of branches and leaves and any part of the trunk from which the branches arise; also referred to as “canopy”

3.22**dieback**

progressive death of twigs and branches of some areas of the crown

3.23**disease**

any pathogen injurious to tree stock

3.24**dispatch**

point in the supply chain where tree stock leaves the production nursery

3.25**epicormic growth**

shoot growing from latent or adventitious bud, underneath the bark of a stem or branch

3.26**ex-ground tree stock**

tree stock grown in the ground, dug and delivered with soil

Note 1 to entry: Ex-ground tree stock include balled and burlapped (tree stock grown in the ground that are lifted with a ball of soil containing the roots, which is then tightly wrapped in hessian, twine or other fabrics such as geotextiles to hold it together during shipment) and in-ground container-grown tree stock.

3.27**formative pruning**

pruning tree stock with the aim of directing tree stock growth and/or developing a sound structure

3.28**girdled root**

circling roots around the base of a stem and above any lateral roots arising from the root crown

3.29**graft**

union of living parts (scion and rootstock) from different origins to form a structure physiologically acting as a single unit

3.30**graft union**

junction of scion and rootstock

3.31**health**

tree stock vigour for the time of year, location and stage of growth as exhibited by crown density, crown cover, crown form, leaf colour and size, absence of epicormic shoots and absence of dieback

3.32**included bark**

inwardly turned (concave) bark within the union of branches or codominant stems

3.33**in-ground container**

container made from fabric that is buried in the ground

Note 1 to entry: Fabric structure is designed to allow small roots to escape and sever them as they expand.

3.34**j-root**

seedling tap root with a sharp bend $\leq 90^\circ$

3.35**kinked root**

root with a sharp bend $\leq 90^\circ$

3.36**node**

raised point on a stem from where one or more leaves or buds arise, or have arisen

3.37**pest**

any insect, mite, snail or nematode injurious to tree stock

3.38**point of initiation (of roots)**

point at which the new root emerges, from either the base of the trunk or from a previously existing root

3.39**primary division (of roots)**

division of roots that takes place immediately behind the root cap, or at the severed root end following root pruning

3.40**rootball**

root system and the intact mass of growing media or soil associated with it

3.41**rootball diameter**

width of the rootball measured near the top from two opposite sides through its centre

3.42**rootstock**

part of a tree forming the root system of a grafted cultivar/variety

3.43**root crown**

junction between the above-ground and below-ground parts of the tree stock

3.44**scion**

shoot or bud from an external source for the purpose of grafting

Note 1 to entry: A scion forms the shoot system of a grafted cultivar/variety.

3.45**self-supporting**

tree stock supporting its above-ground parts in an upright approximately vertical position displaying no stem breakage, injury or loosening of roots in the growing media

Note 1 to entry: Where practical, one may be informed of the self-supporting nature of the tree by deflecting the tree side to side by up to 30 degrees, or as far as the flexibility of the tree allows, at 80 % of the trunk height, making sure the pressure is always at right angles to the stem, the rootball should not lift off the ground. After which the tree returns to an approximately vertical position (+/- 15 degrees) and displays no loosening or failure of roots in the growing media.

Note 2 to entry: Any artificial support used in tree production should allow flexing of the stem as much as possible without stem breakage or injury.

3.46**shall**

indicates that a statement is mandatory

3.47**should**

indicates a recommendation

3.48**significant injury**

damage that compromises the health and/or structure of the tree stock

Note 1 to entry: Practices or circumstances that may cause significant injury include damage caused by sunscald, wind burn, hail, water, heat, pesticides, fertilizers, pests, diseases, mechanical and physical handling and ties, stakes and labels.

3.49**size index**

numerical expression of the size or physical bulk of a tree stock above-ground

Note 1 to entry: Size index is the product of the height (in metres) of the tree stock, from the uppermost surface of the root crown to the top of the stem, and calliper.

3.50**stem**

structure that supports branches, leaves, flowers and fruit

3.51**stem bark ridge**

ridge of bark that forms in the union between codominant stems

3.52**stem taper**

increase in diameter down the stem

3.53**suckering**

shoots developed from a root or stem close to or below the root crown

3.54**tree**

long-lived woody perennial plant typically ≥ 3 m in height at maturity with one, or relatively few, stems

3.55**tree stock balance**

proportional relationship between the above-ground parts of a tree stock (size index) to the volume of the below-ground parts of the tree stock (container size or rootball diameter ex-ground)

3.56**true to type**

denotes correct cultivar identification

3.57**tubes or cells**

small containers or cell trays typically used in the propagation stage of tree production with a height:diameter ratio $\geq 3:2$ (typically ≤ 1.0 L)

3.58**trunk**

main stem of a tree

3.59**weed**

plant growing out of place or where it is not wanted

3.60**woody circling root**

lignified circling root

Section 4 Criteria for tree stock assessment

4.1 General

This Section specifies the above-ground and below-ground criteria for tree stock assessment, which are necessary for determining quality tree stock for landscape use.

Those involved in production, design, procurement, planting and management of trees should have a comprehensive understanding of this Standard. Specialist advice should be sought where necessary.

Above-ground and below-ground criteria should be considered part of nursery production systems. Alternatively, these criteria may be incorporated into QA accreditation programs or used to assess tree stock at dispatch (see [Section 6](#)).

4.2 Criteria for above-ground assessment of tree stock

4.2.1 True to type

Tree stock shall be true to type. Individual tree stock or batches of tree stock per variety shall be clearly labelled with correct botanical nomenclature.

Where common names are used, they should only be used as an adjunct to the botanic name of the tree.

NOTE The *National Plant Labelling Guidelines* contains information on determining correct botanic nomenclature [4].

4.2.2 Height and calliper

The height and calliper range shall be recorded.

NOTE 1 Height and calliper should be appropriate to the individual species.

NOTE 2 Further information on Tree Stock Balance Assessment is provided in [Section 5](#).