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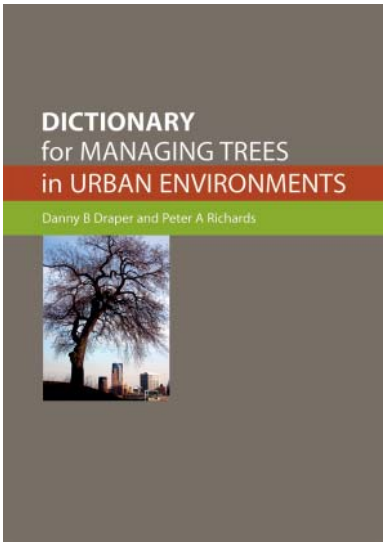

Dictionary for Managing Trees in Urban Environments

Danny B Draper and Peter A Richards

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HOW THIS DICTIONARY WORKS

For each entry the subject word/phrase is listed in bold followed by the definition, for example:

Branch stub A section of branch remaining beyond the branch collar and usually evident after a *lopping* episode or as a result of *branch failure*, or *natural pruning*.

Where possible, each definition provides a primary definition – a simple and concise meaning. However, in some entries the primary definition is followed by a more detailed description where this is considered appropriate to explain complex concepts. Where a word/phrase has more than one meaning, those meanings are listed.

Where a word/phrase within a definition appears in italics, this indicates that a separate definition for that term is listed within the dictionary. This will assist readers with cross-referencing and they can also consult the index of topics. Where a word/phrase is defined elsewhere in the dictionary, but not italicised within a definition, its connection is not considered significant or is peripheral to the word/phrase being defined.

Where a word/phrase is considered synonymous with another term in the dictionary, 'See' plus the primary term is given, for example:

Lop See *Lopping*.

The main term or phrase is the one most commonly used or which most accurately represents the concept. Where a closely related word/phrase or its antonym is listed, the term/phrase will be followed by 'See also' plus the appropriate term/phrase, for example:

Acoustic resonance Auditory reverberation within an object and the air after an object has been struck. See also *Sounding*.

Where a word/phrase is used often and is known by its acronym, this has been included wherever possible, for example:

Leaf area index (LAI), First order structural branch (FOSB).

Diagrams, sketches, tables and photographs are provided to further demonstrate and complement the meaning of the word/phrase located nearby. Many diagrams are labelled simply and must be considered in conjunction with the definition of the association word/phrase. This will give the reader a better understanding of the concept.

All references are cited to enable and encourage further research by the reader.

To help the reader locate all the words or phrases commonly associated with a particular subject area, an index of topics has been created. The index has been further enhanced in that, where sets of words are connected to a quantitative or qualitative description, they have been grouped in ascending order following the primary definition rather than being in alphabetical order, for example:

Deadwood, *Small deadwood* and *Large deadwood*.

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A

Abatement law Law/s developed to avert or remedy *nuisance.*

Aberrant Not representative of normal *form*, *atypical*, unusual and not indicative.

Abiotic Not living, e.g. wind, rain, fire, light, snow, temperature and moisture extremes. See also *Biotic.*

Abiotic factors Non-living influences. 1. Environmental factors, e.g. wind, rain, fire, light, snow, temperature and moisture extremes. 2. Mechanical factors, e.g. root severance. 3. Chemical factors, e.g. high soil salinity and *phytotoxic* pesticides (Costello *et al.* 2003).

Abnormal vigour See *High vigour.*

Abrasion wound *Mechanical wound* causing *laceration* of tissue by an abrasive impact *episode,* e.g. grazed by a motor vehicle or the continuous action of the rubbing of *crossed branches* or stems where no graft has formed.

Abrupt changes Sudden changes rather than those occurring gradually, e.g. broken water pipes saturating soil, gas leaks.

Abscise To throw off or to shed.

Abscission Shedding of plant organs, e.g. fruit, leaves or branches, usually when the organ is mature or aged, by the formation of a corky layer across its base. This may be influenced by stress, drought (to prevent moisture loss), senescence, declining condition, reduced vigour and also occurs annually in deciduous trees.

Absorbing roots See *Fine roots.*

Acaulescent A *trunkless* tree or a tree supported by a very short *trunk*. See also *Caulescent.*

Accelerated growth The concept where large *xylem* formed at *wound margins* of wounded *sapwood* develops at a rate faster than *growth rings* especially in *mature* or *senescent* trees (NSW Dept. Environment & Conservation 2005, p. 76). Note: this concept appears contrary to CODIT Wall 4 which is laid down at a constant rate in seasonal *growth rings* except where a *wound margin* is stimulated by *tropic* responses to *loading,* e.g. *torsion*, *compression* or *tension*.

Accelerated growth callus The concept where *xylem* develops by *accelerated growth* at the *wound margins* of wounded *sapwood* (NSW Dept. Environment & Conservation 2005, p. 76). Note: this concept appears confused between the initially formed undifferentiated *wood* as *callus wood* and the later forming differentiated wood as *wound wood.* See also *Wound margin*, *Wound wood*, *Callus wood* and *Compartmentalisation of decay in trees (CODIT*).

Accessory bud Lateral bud associated with a main bud such as in a leaf *axil* and usually develops after damage to the main bud.

Accessory roots The *lateral roots* as with palms, which develop from the base of the trunk different to those arising from the *radicle* of the seed root system.

Accessory trunk *Aerial root* mass differentiated once it reaches the ground forming a vertical woody structure to support a trunk or branch, a *columnar root* or *stilt root*. Here the supported branch is able to extend further and tends to horizontal with the overall *crown spread* covering a considerable area, e.g. *Ficus columnaris.*

Acid sulphate soil Very acidic soil layers or horizons – the result of aeration of soil materials abundant in iron sulphides, mainly pyrite and the result

of drying and aeration of previously saturated anaerobic soil material. Usually with a pH of <4.0 when measured in dry seasons conditions and overlying potential acid sulphate soils or soils with more than 0.05% oxidisable sulphur.

Acoustic resonance Auditory reverberation within an object and the air after the object has been struck. See also *Sounding.*

Active maintenance See *Planned maintenance.*

Acute branch crotch A branch crotch where the angle on the inner side of the union is less than <90°. See also *Obtuse branch crotch*.

Acutely convergent A branch growing in a direction towards its point of attachment where the angle in the crotch is less than <90°.

Acutely divergent A branch growing in a direction away from its point of attachment where the angle in the crotch is less than <90°.

Adaptive growth See *Adaptive wood.*

Adaptive wood Additional load-bearing wood formed in response to mechanical stresses and gravitational force upon the *vascular cambium* to provide a uniform distribution of loading. Examples are *Ribs*, *Round-edged rib* or *Sharp-edged rib* and *Buttresses.* See also *Reaction wood*, *Compression wood* and *Tension wood.*

Adaxial The side of a leaf, branch or other organ which anatomically faces towards the *axis* of the parent shoot (i.e. usually the upperside) (Lonsdale 1999, p. 309).

Adventitious A bud arising from points other than terminals or axils, e.g. from a root or at an *internodal* region (Harris *et al*. 2004, p. 15).

Adventitious bud A bud formed within the *cambial zone* and *callus wood* after wounding (Shigo 1989a, p. 134).

Adventitious shoot A branch from a bud arising in an unusual location, e.g. *sucker.*

Adventitious root mass Palms and other monocotyledons may form masses of *fine roots* or *adventitious roots* as *primary growth* where the *radicle* is

replaced by branching many times and this may extend above ground and be evident at the base of the trunk. The extent of the root mass above ground may be extensive in some palms and increases with age giving the appearance of lifting the trunk, e.g. *Phoenix canariensis.*

Adventitious roots 1. Roots that may arise in an unusual location and may develop a structural function, e.g. (a) from a branch into a *pocket crotch* where accumulated *leaf litter* and moisture has formed humus, (b) into the *hollow* section of a branch or trunk often where *humus* has accumulated, (c) *aerial roots*, *column roots, fibrous roots.* 2. Roots that may arise where the *radicle* is replaced by lateral branching many times as with *palms* or grasses.

Advocate An individual or party acting as a representative in support of an issue.

Aerial inspection Assessment of the crown of a tree by climbing within the *crown* or by the use of an *elevating work platform*, often to examine a particular *defect,* e.g. *cavity* or *hollow.* See also *Visual tree assessment* (VTA).

Aerial roots Adventitious roots growing into the air from any above ground part of a tree which may eventually develop a structural function.

Aerobic Living in the presence of oxygen or conditions where oxygen is freely available.

Aerophore See *Pneumatophore.*

Aerotropism Growth direction of a plant or plant part responding to the presence of air.

Age Most trees have a stable biomass for the major proportion of their life. The estimation of the age of a tree is based on the knowledge of the expected lifespan of the taxa *in situ* divided into three distinct stages of measurable biomass, when the exact age of the tree from its date of cultivation or planting is unknown and can be categorised as *young*, *mature* and *over-mature* (British Standards 1991, p. 13; Harris *et al*. 2004, p. 262).

Air gaps Barriers to root growth formed by load-bearing stone matrices with large voids, e.g. broken bricks, gravel >20 mm; not filled in, that drain well

allowing the air to desiccate new roots (Coder 1998, p. 62), e.g. under pavements and behind walls.

Air knife A pneumatic device that uses a fine stream of compressed air with sufficient pressure to displace soil or cut roots. At lower pressure, soil may be displaced allowing woody roots to be exposed for examination or *root mapping.* See also *Water knife.*

Air spade See *Air knife.*

Allelopathy The release of chemicals from a plant that are detrimental to other plants to inhibit the growth of nearby plants, including its own progeny, to reduce competition, e.g. from *Pinus* spp., *Casuarina* spp., *Cinnamomum camphora*, *Eucalyptus* spp.

Alternation of generation Staged replacement planting of an avenue or stand of trees, e.g. by a roadside or park, where new plantings are setback from the originals, ultimately to replace them in a similar configuration. Such an undertaking may be utilised for road widening or to reduce the hazard of vehicular collisions with trees or reduce the impact of removing prominent senescent trees.

Amendment The changing of a *planning provision* controlling land use and development.

Amenity A positive element or elements which contribute to the overall character and pleasantness of an area, e.g. trees, old buildings their *curtilage* and interrelated elements within the environment.

Amenity tree A tree with recreational, functional, environmental, ecological, social, health or aesthetic value rather than for production purposes (Australian Standard 2007, p. 5), and may be synonymous with *shade tree* in the USA.

Anaerobic Living in the absence of oxygen, e.g. anaerobic bacteria.

Anastomosing A plant part subject to the process of *anastomosis,* e.g. roots and stems.

Anastomosis Cross-linking of branching parts, e.g. roots or branches in woody plants where such growth usually forms a *graft,* e.g. 1. Aerial roots of *Ficus* spp., especially in a parasitic situation where a strangler fig germinates in the crown of a host sending *aerial roots* to the ground and around the trunk of the host eventually encasing it, constricting its growth as they enlarge and merge forming a *hollow* trunk structure killing the host. 2. Aerial roots on *Ficus* spp., differentiating to form *column roots* once they reach the ground, providing support for lateral branches. 3. Artificially where *Ficus* spp., are plaited together when young to form a standard potted specimen. 4. Artificially when *pleaching* to form an arbour of intertwined branches.

Anchorage Where sufficient cohesion between roots and soil exists for a tree to maintain *stability.* Stimulus for such root growth results from the flow of forces through the branches along the trunk to the root system.

Anchor roots See *Structural roots.*

Angiosperms Plants where the ovule is fully enclosed within the fruit i.e. container seed. These are the flowering plants and generally referred to as hardwood trees although some have soft non-durable wood. See also *Gymnosperms.*

Anion A negatively charged *ion* (Handreck & Black 2002, p. 16).

Annual growth rings See *Growth rings.*

Annual ring See *Growth rings.*

Annular Ring scars prominent on the trunk of some palms after leaf fall, e.g. *Archontophoenix* spp. (Jones 1996, p. 266).

Anti-transpirant Substance applied to plants to block stomata temporarily to reduce moisture loss by preventing *transpiration*. Often used when *transplanting* trees.

Apedal *Soil horizons* formed without *peds* as part of the *soil structure.*

Apex The tip or furthest point, or the highest point, or the distal end of a leaf, stem or wound.

Aphototropic Growth direction taken showing no response to the stimulus of light, e.g. roots.

Apical Forming at the *apex*.

Apical bud A bud formed at the apex – usually at the end of a branch and is terminal, dominant at the highest point on a tree at the tip of a branch or stem and at the ends of lateral branches.

Apical dominance Suppression of the development of lateral buds by plant growth regulator chemicals produced in the *apical meristem* to promote stem elongation in preference to branching, further stimulated by competition for space and light.

Apical meristem Meristematic tissue at the tips of roots or stems giving rise to primary tissues that are responsible for increasing length rather than girth of the axis. See also *Apical bud* and *Apical dominance*.

Apoplast Interconnected non-living portion of plant tissue including spaces within and between cells and cell walls.

Applicant 1. The property owner or their authorised agent that lodges an application for *development* works requiring approval from a *consent authority.* 2. Individual or party petitioning a court to hear a matter of disputation to seek resolution.

Appropriate tree management The management of trees as a resource based on sound professional judgement and a competent understanding of what tree to plant where and when, or when to remove or retain a tree. Examples: 1. The planting or retention of a tree in a position that causes minimal or no conflict with people or property or disturbance of the built environment, or services or infrastructure, due to such a decision having been founded upon a competent knowledge of the characteristics of the tree's growth pattern and ultimate dimensions above and below ground at maturity, and the suitability of the space available into which it will develop. 2. The removal of a tree that will grow to be in conflict with the constraints of its growing *environment* either above or below ground at its ultimate dimensions at maturity, and especially where replanting could be undertaken with an advanced specimen

of a species of more suitable growth characteristics and mature dimensions. 3. The removal of a vigorous tree in a *poor condition*, in a prominent position where its potential failure in full or part poses a risk of hazard to the safety of people, or damage to property. See also *Inappropriate tree management* and *Tree management.*

Arbour A walkway covered by the growth of vines or the branches of trees usually cultivated for that purpose.

Arbor Day A day set aside for planting trees. Julius Sterling Morton (1832–1902) introduced the concept on 4 January, 1872, in Nebraska, USA, to promote the benefits of tree planting in areas with no trees or where trees had been removed. The first tree planting day was held on 10 April, 1872 and the day itself was observed after state proclamation on 10 April, 1874. In 1885, Arbor Day was named a legal holiday in Nebraska and 22 April, Morton's birthday, was selected as the date for its permanent observance. The tradition soon spread around the world and is celebrated in most countries at different times of the year. Table 1 details some Arbor Day celebrations around the world (The National Arbor Day Foundation 2005).

Arboreal Living in or connected with trees.

Arborescent Developing to appear like a tree, especially with branching form.

Arboretum An area planted with a variety of trees, woody shrubs and vines for purposes of research, conservation and display.

Arboricultural Pertaining to *Arboriculture.*

Arboricultural consultant See *Consulting arboriculturist.*

Arboriculture The science and culture of the growth, planning, management, care and maintenance of trees primarily for amenity and utility purposes. See also *Tree management*, *Tree preservation* and *Urban forestry.*

Arboriculturist 1. An individual with competence in the science of Arboriculture with skills specialised in practices for the planning and management of trees, usually in urban environments, primarily for *amenity* and utility purposes. 2. Synonymous with *Arborist*, especially in the USA.

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Table 1 Details of some Arbor Day celebrations around the world (The National Arbor Day Foundation 2005). Dates in individual countries may change over time.

COUNTRY OR STATE	TITLE OF CELEBRATION	DATE CELEBRATED
Australia Western Australia Northern Territory Queensland South Australia New South Wales Victoria Australian Capital Territory Tasmania	Arbor Day	 June Nov May June Monday of last week in July Arbor Week last week in July Last week in June 27 July Oct
Brazil Araras, Sao Paulo	Festa das 'Arvores	June 7
Canada: Ontario Nova Scotia	Arbor Day	Last Friday in April to Sunday in May. First full week in May
China	Arbor Day	March
Commonwealth of the Northern Mariana	Arbor Day	Oct 1
Germany	Arbor Day, Tag des Baumes	April 25
Guam	Arbor Day	first Tuesday of October
Iceland	Students' Afforestation Day	Not Listed
India	National Festival of Tree Planting	Not Listed
Israel	New Year of the Trees	15th day of the Hebrew month of Shevat
Japan	Greenery Day or Greening Week, (midori noni)	late April
Korea	Tree-Loving Week	early April
Mexico	Dia del Arboles (Day of the Trees)	a day in July
New Zealand	Arbor Day (Also World Environment Day)	June 5
Puerto Rico	Arbor Day	last Friday in September
United Kingdom	National Tree Week National Tree Dressing Day	November first weekend in December
United States of America	National Arbor Day	Last Friday in April

Arborist 1. An individual with competence to cultivate, care and maintain trees for *amenity* or utility purposes. 2. Synonymous with *arboriculturist*, especially in the USA.

Arborsonic Decay Detector® See *Sonic detectors.*

Arborvitae See *Arbor vitae.*

Arbor vitae 'Tree of Life', a reference to the genus *Thuja*, the bark from which was once used by sailors to make a tea rich in vitamin C to prevent scurvy (Spencer 1995, p. 212).

Arbor Week In some countries this is a week-long celebration as an extension of *Arbor Day.*

Architect An expert in the consultation design and documentation of buildings and supervision of their construction.

Architecture Description of branching patterns in the crown or root system (Lonsdale 1999, p. 310).

Area within dripline See *Crown projection.*

Arrangement of first order branches within a crown The pattern formed by the first order branches at the point of their attachment to the trunk. (See Figure 1.)

Ascending hollow A *hollow* that develops upwards in a trunk or branch usually in a *distal* direction. See also *Descending hollow* and *Hollow.*

Aspect ratio The diameter of a branch compared to the diameter of the trunk. The diameter of the branch measured at its base is divided by the diameter of the trunk measured immediately above the branch bark ridge and the branch diameter measured immediately above the branch bark ridge and branch collar (Gilman 2003, pp. 291–292).

Asserted dominance 1. In a grafted tree, branches arising from the *understock* below the *graft* union become more vigorous than the *scion* rendering it inferior. 2. Branches previously inferior or codominant as dual-leader branches or a *lateral* becoming erect or corrected to upright through *photo-*