

CANADIAN NURSERY STOCK STANDARD

ninth edition 



Canadian Nursery Stock Standard Ninth Edition

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Introduction

This is the ninth edition of the Canadian Nursery Stock Standard. It was first published in 1967 as a standardized system for sizing and describing plants produced by the nursery industry to facilitate trade in nursery stock. Today it serves the same purpose, providing growers, distributors, specifiers, and purchasers of nursery stock with a comprehensive and consistent set of minimum measurements and specifications so that commercial transactions can occur in a common language. Measurement techniques include such things as specifying 1) plant size, 2) relationships between caliper and height or height and width, and 3) root ball or container size in relation to plant size.

Growers and distributors of nursery stock should ensure that catalogue and contract documents conform to this Standard. Those who specify or purchase nursery stock should ensure that they provide growers and distributors with specifications that conform to this Standard. Compliance with this Standard is voluntary. The parties in a commercial transaction should agree that this Standard applies. Any transactions that are not compliant with this Standard may result in conflict between the parties.

This Standard is for use by professional horticulturists, landscape architects, and landscape designers who understand nursery stock attributes, plant nomenclature and terms commonly used in horticulture. It is not intended to be used in transactions with retail customers.

Nursery stock production in Canada and the United States share many similarities. As a result, and to facilitate trade between the two countries, this Standard maintains reasonable conformity with the American Standard for Nursery Stock (ANSI Z60.1-2014) published by AmericanHort. One difference between the two Standards is the use of metric (Canada) and imperial (United States) measurements.

The revisions included in this 2017 edition were developed by the Nursery Stock Standard Committee of the Canadian Nursery Landscape Association (CNLA). Prior to publication, the document was submitted to nursery/landscape associations, municipalities, and horticultural professionals across Canada for review and endorsement in order to develop industry consensus. It reflects the best practices of the nursery industry.

This Standard is subject to periodic review and may be updated at any time. Users are urged to obtain the most recent update from the Canadian Nursery Landscape Association website (www.cnla-acpp.ca).

Comments and suggestions for improvement of this Standard are welcome. All recommendations should be in writing. They should be concise but complete, stating the issue and providing possible solutions. Provide references to resources that CNLA should use in making its decision regarding your recommendations.

Nursery Stock Standard Committee

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Section 1: General Requirements

1.1 Scope

This Standard applies to all plant material designated as nursery stock produced and/or offered for sale. Throughout this Standard, 'shall' signifies that the sentence in which the word appears is a mandatory requirement and 'should' signifies that the sentence in which the word appears is recommended.

1.2 Measurement units

All measurements shall be in metric units. The unit cm (centimetre) shall be used to define all heights and spreads. The unit mm (millimetre) shall be used to define all caliper measurements. Measurements shall be considered the minimum to be compliant with this Standard.

1.3 Age

When height, spread or caliper are specified, age of the plant is usually not required. However, age may be used in listings and shall be available on request.

1.4 Correct identification

All nursery stock shall be correctly identified by botanical name (genus, species and, if applicable, variety or cultivar). Botanical nomenclature shall follow currently accepted usage.

See www.internationalplantnames.com for a source of currently accepted plant names.

Nursery stock shall be true to name and of the size or grade stated.

1.5 Minimum quality

Quality shall be typical for the species in each region of the country when grown under proper, currently accepted, cultural practices. Fertile soil, ample spacing, weed control, pest control, adequate moisture, pruning, and transplanting or root pruning are all necessary requirements for normal quality nursery stock. All nursery stock shall be healthy, viable, undamaged, and substantially free from all pests, including pernicious weeds, insects and diseases. Between digging and delivery, roots shall not be exposed to drying winds, sun or frost.

1.6 Roots

All nursery stock shall have a healthy, adequately fibrous root system that has been developed by proper, currently accepted cultural practices, particularly transplanting or root pruning. Pertinent facts as to when large nursery stock was transplanted or root pruned shall be available on request. Roots shall be free of physical defects that could jeopardize future growth and establishment.

1.7 Grading

Because of varying conditions of growth and methods of production preferred or necessitated by climate, soil and other conditions beyond the control of the grower as well as established pruning practices, it is difficult to rigidly standardize plant material. Therefore, judgement should be exercised and allowances made for plant material of a designated size being at the smaller end of the size range.

1.8 Labelling

Sufficient labels or markings shall be used to clearly indicate plant name and grade or size of each specimen or bundle.

1.9 Packaging or wrapping

Packaging or wrapping shall be adequate for the protection of the stock and sufficient to prevent heating, drying out, and breakage during storage and/or transportation.

Section 2: Definitions

Balled and Burlapped (B&B): Plants established in the ground that have been harvested by digging with a soil ball so that the soil within the ball remains undisturbed. As part of the harvesting process, the soil ball is bound in burlap or similar mesh material.

Bare Root (BR): Plants harvested while dormant without a ball of soil or from which the growing medium has been removed.

Branch: A major lateral shoot originating from a main stem or trunk, as compared to twigs or spurs, which are minor shoots originating from a trunk or branch. On large trees, not nursery stock, branches are referred to as limbs.

Budded: Referring to a method of asexual propagation, where a bud from one plant has been grafted onto another plant (typically an understock).

Caliper: The above ground diameter of a distinct part of a nursery stock stem, measured in accordance with this Standard. The location of measurement depends on the type and size of plant. Measurement height begins at the ground level, soil line or root flare, as appropriate. The word may be abbreviated as cal.

Cane: The major stem originating directly from the basal area of a shrub.

Collar: See Root Collar.

Collected: Material dug from native stands, established woodlots or other non-cultivated areas; not grown in a nursery. Collected plants must be designated as such and have a larger root system than nursery grown stock.

Container: The pot in which nursery stock is grown or sold. Containers are manufactured of different materials such as plastic, wood, paper, cloth, natural fiber, etc. and may vary greatly in size, shape, and quality. However, in the context of nursery stock, containers are not used as a final installation for growing, as for example, in a landscape planter

Container Grown Plant: A plant grown and marketed in a container.

Crown: That part of a plant directly above where branching begins, thus the portion of the plant comprising the main system of branches and foliage.

Cultivar: Cultivated plants that are specifically named, whose unique characteristics are retained during propagation, and populations are maintained by human efforts. They are distinguished from botanical varieties which also are distinct populations of plants in a species, but are naturally occurring.

Eye: The dormant bud of a corm, root division or tuber that will produce a stem. A term used to describe a division of certain herbaceous perennial plants such as *Astilbe* and *Hosta*.

Fabric Bag Container: A type of container used above ground or below ground (in-ground) for the purpose of developing a fibrous root system within the bag without manual root pruning.

Fan: A term used to describe a division of certain herbaceous perennial plants such as *Hemerocallis* and *Iris* that lack a vertical stem since the leaves arise from the rhizome.

Field Potted (FP): Plants established in the ground that have been dug with soil balls and placed in containers in lieu of burlapping.

Grade, Nursery Stock Grade: Any and all designations associated with a plant group signifying sizes, number of stems, historical details, etc. of a nursery stock item. Grade does not describe quality except for roses.

Graft: A product of asexual propagation where two plants or plant parts are joined together so that they will unite and continue their growth as one.

Habit: The manner of natural or nursery formed growth of a tree, shrub, or herbaceous perennial consistent with specific species; e.g. broad, dwarf, columnar, slender, spreading, upright.

Height: Unless otherwise specified, the vertical distance between the collar or ground line and the top of the stem of nursery stock, measured in its natural position. Depending on the plant type, measurement may not extend to the tip of the stem.

Liners: Young, immature plants intended for growing-on to mature sizes in nurseries, either by lining-out in the field or in containers. Typically, they are one or two years old and often sold bare root or in small containers.

Medium: A mixture of ingredients such as soil, organic or inorganic materials, etc. in which container plants are grown; also referred to as a potting mix.

Micropropagation (M): Propagation of plants from very small plant parts, tissues or cells grown in a test tube or container where the environment and nutrition are rigidly controlled.

Nursery Stock: Plants grown in or obtained from a nursery that have been grown to promote shoot growth and root development to enable full recovery after transplanting.

Plug (PL): A cylinder of medium in which a plant is grown. The term is generally used for seedlings and rooted cuttings that have been removed from the container with the medium held intact by the roots.

Processed Ball: Plants dug bare root while dormant to which a moist medium is added around the roots to form a ball designed to sustain plant growth.

Root Ball: The intact ball of earth or growing medium containing the roots of a nursery plant.

Root Bound: A condition of container grown plants in which the root system occupies most of the available space and has grown in a crowded, intertwined, and circling manner.

Root Collar: The region of the plant where roots and stem or trunk meet, generally at the ground level or soil line.

Root Flare (Trunk Flare): The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

Root Pruning: The systematic pruning of roots of nursery stock in order to stimulate branching of roots and the production of fibrous roots.

Rootstock: See Understock.

Rooted Cutting (RC): A vegetative portion, either hardwood (HWC) or softwood (SWC), removed from a parent plant that has been induced to form roots and eventually new leaves and shoots.

Spurs: Branches with restricted longitudinal growth and shortened internodes typically appearing on fruit plants and some whips.

Trunk: That portion of a stem or stems of a tree below the lowest branch.

Understock: A term used to describe a plant or that part of a plant including collar and roots, on which another cultivar or species will be or has been budded or grafted.

Whip: A young tree without branches; in some species and grades spurs may be present.

Whorl: A group of three or more buds, leaves, flowers or twigs at the same node.

Young Plants: See Liners.

Section 3: Container Grown Stock

3.1 General specifications

Container grown plants are those grown and marketed in a container. All nursery stock specification requirements shall apply to container grown stock, i.e. grading, size, type, spread, and height.

Root circling and other root deformities can occur in container grown plants. These misdirected roots should be avoided by using currently accepted nursery practices such as specialized containers, root pruning, and upsizing.

Roots of all container grown plants shall be healthy and vigorous. The root mass of the plant shall be adequate to hold the potting medium together as a unit when removed from the container. Roots shall not circle the root ball in the container (become root bound) or be adversely misdirected to an extent that future growth and establishment could be jeopardized. Such roots shall be corrected before upsizing or planting-out to encourage proper development of root structure.

The container shall be sufficiently rigid to hold the root ball shape intact during handling and shipping. Weight shall not be used as a specification for container-grown plants.

3.2 Minimum time required

Plants shall be grown in the container for a minimum of three months or have a well-established root system reaching the sides of the container to maintain a firm ball. In the case of dormant roses, it is generally accepted that plants may be potted and forced to be ready for sale in less than three months.

3.3 Alternative containers

It is recognized that containers with holes or made of fabric as a method of aeration to prune roots, or with coatings to prevent roots from reaching the sides of the container, or shaped to train roots not to circle the root ball, are acceptable and encouraged in the trade.

3.4 Container sizes

Container sizes listed for specific plant sizes throughout this Standard shall be the minimum acceptable in order to be compliant with this Standard. The size class of the container shall be specified in addition to the size of the plant. Containers marketed and sold by a class # designation must have volumes within the ranges shown in Table 3.4 to be compliant with this Standard. For sizes smaller than #1, see Section 14.

Table 3.4 Container class volume ranges*

Container class (#)	Container volume (cubic cm)**
1	2,492 – 4,115
2	5,246 – 7,770
3	10,285 – 12,164
5	12,860 – 20,360
7	21,913 – 29,343
10	34,090 – 43,376
15	45,376 – 60,586
20	74,096 – 84,457
25	94,669 – 112,472

*Container classes and volume ranges are consistent with the American Standard for Nursery Stock (ANSI Z60.1-2014).

**cubic cm x .001 = litres; 1,000 cubic cm = 1 litre

3.5 In-ground fabric bag containers

These containers may be used by growers to increase root density and enable digging and transplanting with smaller root balls than for conventional field dug plants. Users unfamiliar with specifying and handling plants produced in these containers should consult the grower. Table 3.5 states recommended fabric bag sizes.

Table 3.5 In-ground fabric bag dimensions*

Diameter (cm)	Minimum depth (cm)	Minimum volume (cubic cm)**
13	10	1,278
20	18	5,768
25	23	11,586
30	25	18,534
36	30	30,431
40	30	39,542
46	36	58,387
50	36	72,086
56	40	99,666
60	40	118,609

*Adapted from the American Standard for Nursery Stock (ANSI Z60.1-2014) with approximate imperial to metric conversions.

**cubic cm x .001 = litres; 1,000 cubic cm = 1 litre

Section 4: Lining-Out Stock

4.1 Definition

Lining-out stock includes all plant material suitable to transplant for growing on to a desired size. For fruit trees and/or understock, see Sections 10 and 12.

4.2 Designation of size grades for lining out stock

Height measurements are taken from the soil line, while caliper measurements are taken at the root collar.

4.2.1 Height

in 5 cm increments from 0 cm to 30 cm
in 10 cm increments from 30 cm to 60 cm
in 20 cm increments from 60 cm to 100 cm
in 25 cm increments from 100 cm to 200 cm
in 50 cm increments from 200 cm and above

4.2.2 Caliper

in 1 mm increments from 0 mm to 10 mm
in 2 mm increments from 10 mm to 20 mm
in 5 mm increments from 20 mm and above

4.3 Seedlings, Hardwood cuttings, Softwood cuttings, Layers, Grafts, and Whips

Bare root:

Bare root liners shall have a well branched, healthy root system free of deformities and be capable of sustaining vigorous growth. Tops shall be characteristic of the species, healthy and free from diseases and pests.

Container grown liners:

Root circling and other root deformities can occur in container grown plants. These misdirected roots should be avoided by using currently accepted nursery practices such as specialized containers, root pruning, and upsizing.

Roots shall be healthy, reaching the sides of the container and be well enough developed to keep the root ball intact until transplanting. Roots shall not circle the root ball in the container (become root bound) or be adversely misdirected to an extent that future growth and establishment could be jeopardized. Such roots shall be corrected before upsizing or planting-out to encourage proper development of root structure.

Whips:

Whips are immature trees that are traditionally used for growing either in open field plantings or grown to a larger size in containers. The term whip refers to the fact that there is little or no lateral branching. Whips are normally one-year-old when grown from hardwood cuttings, two years when grown from softwood cuttings or seedlings and, in the case of budded selections, they normally have a one-year top and a two-year root system. Tree whips shall have straight, sturdy trunks and a well-developed root system free of physical deformities and be capable of sustaining vigorous growth. Height and caliper measurements of whips in Table 4.3 may vary according to species, height, and climatic/cultural conditions.

Table 4.3 Height and caliper measurements for whips

Height (cm)	Approximate caliper (mm)
60 - 80	10
80 - 100	10
100 - 125	15
125 - 150	15
150 - 175	20
175 - 200	20
200 - 250	20+

4.4 Age

Age in years shall be stated. One year may equal one growing season or one propagation cycle (e.g., softwood cuttings). If grown for less than one season, state age in months. For tree whips, age refers to the number of growing seasons of the bud or main stem if on its own roots.

4.4.1 Specifications abbreviations

The following designations shall be used for lining out stock.

Seedlings

- 1/0 1 year in seedbed
- 2/0 2 years in seedbed
- 1/1 2 years, 1 year in seedbed, transplanted once for 1 year
- 1/2 3 years, 1 year in seedbed, transplanted once for 2 years
- 2/1 3 years, 2 years in seedbed, transplanted once for 1 year
- 2/2 4 years, 2 years in seedbed, transplanted once for 2 years

Hardwood cuttings

- 0/1 1 year (propagation cycle) in cutting bench
- 0/2 2 years, 1 year (cycle) in bench, transplanted once for 1 year

Softwood cuttings

- 0/1/0 1 year (propagation cycle) in cutting bench
- 0/2/0 2 years (cycles) in cutting bench
- 0/1/1 2 years, 1 year (cycle) in bench, transplanted once for 1 year
- 0/1/2 3 years, 1 year (cycle) in bench, transplanted once for 2 years

Layers

- L/1/0 1 year (cycle) in propagation
- L/1/1 2 years, 1 year (cycle) in propagation, transplanted once for 1 year

Grafts

- X/1/0 1 year (propagation cycle) in bench
- X/1/1 2 years, 1 year (cycle) in bench, transplanted once for 1 year

There are additional abbreviations that may be used to further describe the product or production method.

- RC = Rooted cutting
- HWC = Hardwood cutting
- SWC = Softwood cutting
- RP = Root pruned
- Wh = Tree whips, either budded or own root
- PL = Plug
- M = Micropropagated

4.5 Height relationship to caliper by height

It is recognized that climatic conditions in different sections of the country produce plants of different caliper by height proportions. There is also variance in caliper by height proportion from species to species. These facts shall be taken into account.

4.5.1 Deciduous trees and shrubs bare root

When caliper governs, the measurements in Table 4.5.1.1 are taken at or from the root collar. When height governs, the measurements in Table 4.5.1.2 are taken at or from the soil line.

Table 4.5.1.1 Height and root length based on caliper

Caliper (mm)	Height (cm)	Root length (cm)
2	15	15
4	20	20
6	25	25
8	30	25

Table 4.5.1.2 Caliper and root length based on height

Height (cm)	Caliper (mm)	Root length (cm)
15	2	15
30	4	20
50	6	25
60	8	25

4.6 Recommendations - evergreen lining-out stock

Evergreens should be transplanted or root pruned frequently enough to create a healthy root system and to help ensure a minimum of transplanting loss. Frequent enough transplanting is recommended to give the top sufficient space to develop a properly branched framework.

In order to produce a fibrous root system, genera such as *Abies* and *Pinus*, which normally make a few coarse roots, should be transplanted every two or three years. Genera such as *Chamaecyparis* and *Thuja* should be transplanted every three to four years, as they naturally have a more fibrous root system.

Broad leaved evergreen genera such as *Pyracantha*, which normally make a few coarse roots, should be transplanted every year, while those producing more fibrous roots may be transplanted every second year.

Trimming is also necessary to ensure a proper foundation for good shape in the finished plant. Frequent transplanting will usually avoid the necessity of severe trimming.

4.7 Conifer plantation and reforestation plants

Conifer liners for Christmas tree plantations and reforestation uses are graded only by height unless caliper is also specified.

The plug must be sufficiently rooted so that it holds together upon removal from the container or tray. Roots shall not circle the plug in the container (become root bound) or be adversely misdirected to an extent that future growth and establishment could be jeopardized. Such roots shall be corrected before transplanting to encourage proper development of root structure.

Specifications for plugs shall include the number of plants per tray. The size or volume of the cell should be available on request.

If the seedling is grown bare root, Section 4.3 applies.

Refer to:

Canadian Christmas Tree Growers Association
www.canadianchristmastrees.ca

Section 5: Evergreen and Deciduous Conifers

5.1 Evergreens and deciduous conifers may be:

- Balled and burlapped
- Balled and field potted
- Container grown
- In-ground fabric bag containers

5.2 Designation of size grades

Height or spread measurements shall be stated as follows:

in 5 cm increments from	0	to	30 cm
in 10 cm increments from	30	to	60 cm
in 20 cm increments from	60	to	100 cm
in 25 cm increments from	100	to	300 cm
in 50 cm increments from	300	to	500 cm
in 100 cm increments from	500 cm and over		

5.3 Descriptions

Four types of evergreen and deciduous conifers are considered separately as follows:

5.3.1 Dwarf

This group includes ground cover, flat, and small globe types usually not exceeding 100 cm in height at maturity. Measurement shall refer to spread (height not considered). The main body of the plant shall be no less than the size stated.

Examples:

- Juniperus communis* 'Repanda'
- Juniperus horizontalis* cultivars
- Juniperus sabina* 'Tamariscifolia'
- Juniperus sabina* 'Arcadia'
- Picea abies* 'Nidiformis'
- Thuja occidentalis* 'Little Giant'

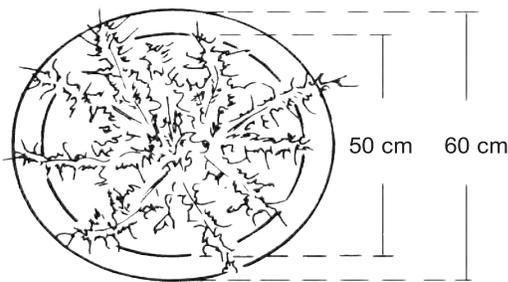


Fig. 5.3.1.1 Typical measurement for a 50 cm spreading conifer

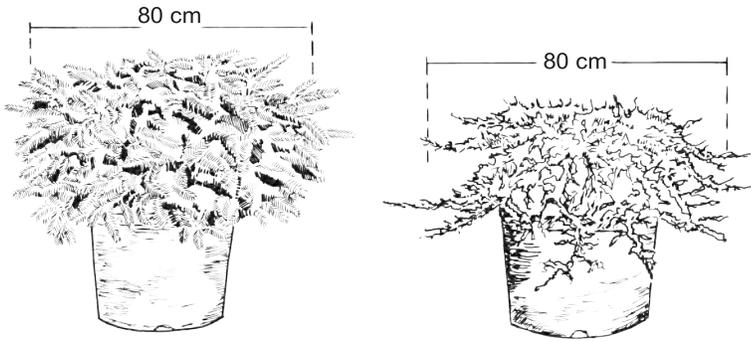


Fig. 5.3.1.2 Typical measurements for Dwarf type conifers

5.3.2 Medium

This group includes plants usually not exceeding 200 cm in height or spread at maturity including semi-spreading, globes, and compact upright types, commonly used in foundation planting. Measurements shall refer to height or spread.

Examples:

Juniperus chinensis 'Pfitzeriana'

Juniperus sabina

Picea glauca 'Conica'

Pinus mugo var. *mugo*

Taxus media 'Brownii'

Taxus cuspidata (spreading types)

Thuja occidentalis 'Woodwardii'

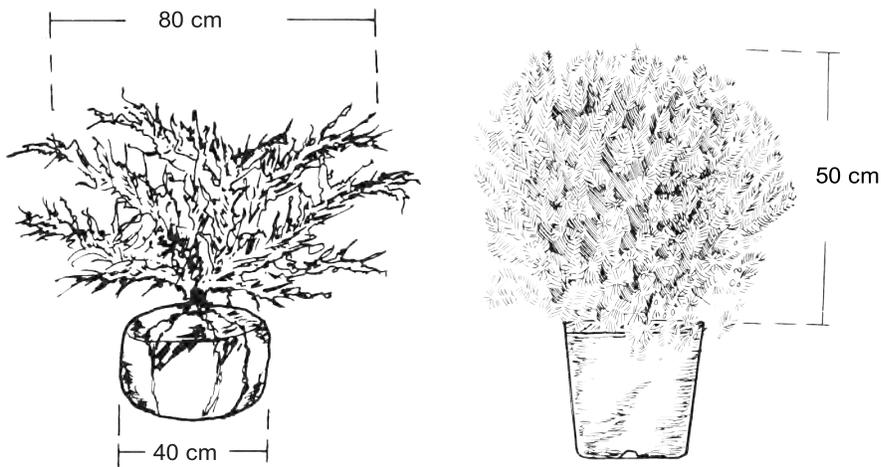


Fig. 5.3.2 Typical measurements for Medium type conifers

5.3.3 Tall and Columnar

This group includes plants frequently used as accents in foundation or other plantings. Measurement shall refer to height.

Examples:

- Juniperus chinensis* 'Mountbatten'
- Juniperus scopulorum* 'Skyrocket'
- Juniperus scopulorum* 'Wichita Blue'
- Taxus media* 'Hicksii'

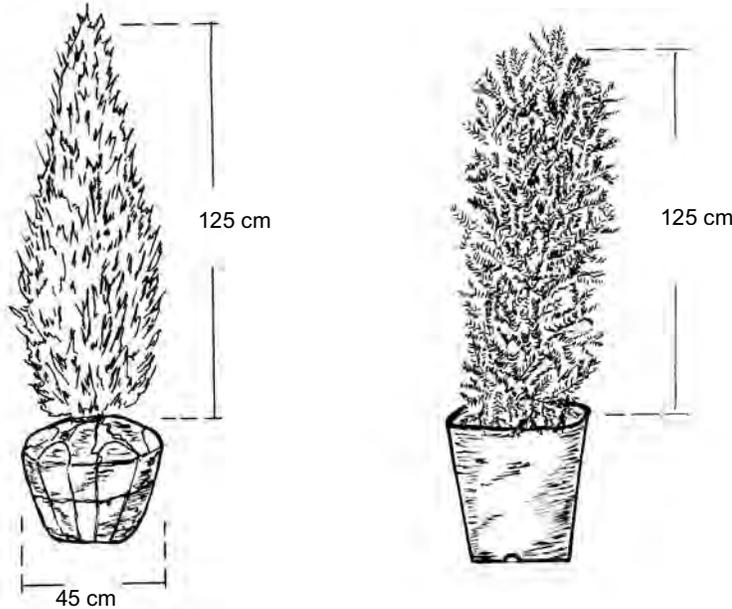


Fig. 5.3.3 Typical measurements for Tall and Columnar type conifers

5.3.3.1 Width at mid-height

A plant's width at mid-height in relation to its height may vary with growing locations in Canada and amount of pruning. Table 5.3.3 gives some indication of the height/spread relationship. Width shall not be less than 20% of the overall height of the plant. Any deviations shall be indicated by the supplier or be in accordance with the purchaser's requirement.

Table 5.3.3 Mid-height width in relation to height for Tall and Columnar type conifers

Height (cm)	Width at mid-height (cm)
40 - 50	10
50 - 60	10
60 - 80	15
80 - 100	20
100 - 125	20
125 - 150	25
150 - 175	30
175 - 200	35
200 - 225	40
225 - 250	40
250 - 275	50
275- 300	50

5.3.4 Tall and Broad

This group includes large trees frequently used as landscape specimens or for shelterbelts or screen plantings. Measurements shall refer to height.

Examples:

Picea species

Pinus species

Pseudotsuga menziesii var. *glauca*

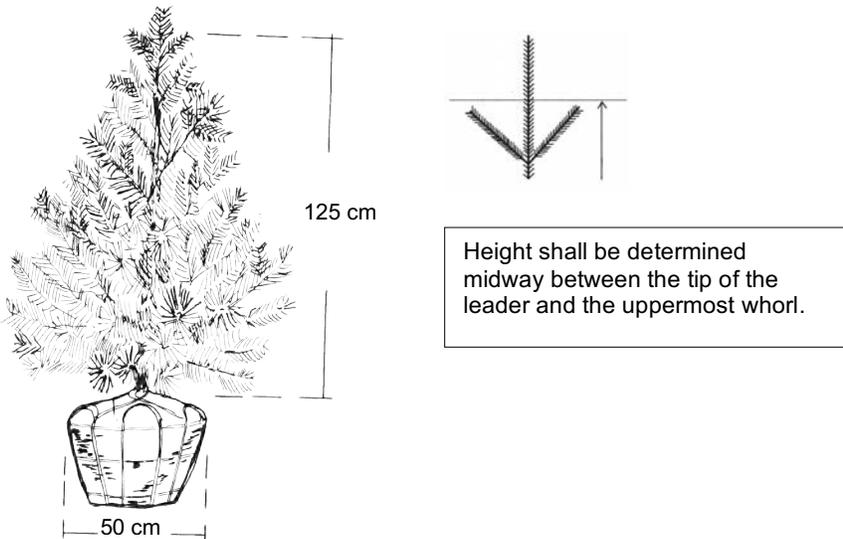


Fig. 5.3.4 Typical measurements for Tall and Broad type conifers

Saleable stock shall have a central leader. The width at the base in relation to height may vary with growing location in Canada and amount of pruning. Table 5.3.4 states height-spread relationships. Width at the base shall not be less than 40% of height. Any deviations shall be indicated by the supplier or be in accordance with purchaser's requirements.

Table 5.3.4 Basal width in relation to height for Tall and Broad type conifers

Height (cm)	Base width (cm)
80 - 100	35
100 - 125	40
125 - 150	50
150 - 175	60
175 - 200	70
200 - 225	75
225 - 250	80
250 - 275	90
275 - 300	100

5.4 Digging specifications

These specifications include balled and burlapped, balled and field potted, and machine dug into wire baskets.

Root ball sizes shall always be of a width and depth to encompass enough of the fibrous and absorptive root system to enable full recovery of the plant. All roots shall be healthy and vigorous and shall be free of physical abnormalities that could jeopardize future growth and establishment.

Plant trunks shall be centered in the root ball with a deviation not exceeding 10% of the root ball diameter.

5.4.1 Balled and burlapped

Balls shall be solid, remain intact until transplanted and be tied tightly with burlap and rope. Using 140g jute burlap, balls may be dug up to 40 cm in diameter without the support of heavy twine or rope.

5.4.2 Balled and field potted

Plants shall be dug with intact root balls and placed in containers in lieu of burlap. The containers shall be sufficiently rigid to hold the root ball shape intact during handling and shipping. Root ball sizes shall conform to tables in Section 5.4.

5.4.3 Machine dug into wire basket

Plants with intact root balls are mechanically dug and placed in burlap lined wire baskets. The burlap shall be secured tightly over the top of the ball and the wire basket cross-laced securely. The basket shall fit the ball tightly; crimping can ensure a secure fit. The top horizontal wire of the basket shall be lower than the top of the root ball.

5.4.4 Root ball diameters (Dwarf, Medium, Tall and Columnar types)

Table 5.4.4 states minimum root ball diameters for field dug plants, including those in in-ground fabric bag containers.

Root balls larger than those stated in Table 5.4.4 shall be required when the plants have not been transplanted or root pruned for four or more years or when plants are dug out of season. Collected or native material dug from woodlots or fencerows shall have a root ball 30% greater than stated in Table 5.4.4

Root balls one size smaller than those recommended in Table 5.4.4 shall be acceptable for plants frequently transplanted or root pruned.

Table 5.4.4 Root ball size in relation to spread or height for Dwarf, Medium, and Tall and Columnar type conifers

Spread or height (whichever is greater) (cm)	Minimum root ball diameter (cm)	Minimum in-ground fabric bag diameter* (cm)
30	20	13
40	25	13
50	30	13
60	35	20
80	40	20
100	45	25
125	50	25
150	50	30
175	60	30
200	70	36
225	75	40
250	80	50

* Adapted from the American Standard for Nursery Stock (ANSI Z60.1-2014) with approximate imperial to metric conversions

Root ball measurements of plants larger than those shown in Table 5.4.4 shall be determined by the grower and be adequately sized to enable full recovery of the plant.

5.4.5 Root ball diameters (Tall and Broad types)

Table 5.4.5 states minimum root ball diameters for field dug plants, including those in in-ground fabric bag containers.

Root balls larger than those in Table 5.4.5 shall be required when the plants have not been transplanted or root pruned for four or more years or when plants are dug out of season.

Collected or native material dug from woodlots or fencerows shall have a root ball 30% greater than stated in Table 5.4.5

Root balls one size smaller than those recommended Table 5.4.5 shall be acceptable for plants frequently transplanted or root pruned.

Where it is an accepted nursery cultural practice to shear, prune or otherwise impede the natural growth rate of plants other than by root pruning, caliper shall be used to determine root ball and wire basket size.

The caliper of larger evergreens shall be taken into account for root ball size and basket size selection since in some locations evergreens will caliper quickly. Height and spread may not be the proper way to determine either root ball or basket size. In that case refer to Table 7.3.4.

Table 5.4.5 Root ball size in relation to height for Tall and Broad type conifers

Height (cm)	Minimum root ball diameter (cm)	Minimum in-ground fabric bag diameter* (cm)
30	20	13
40	25	13
50	30	20
60	35	20
80	40	25
100	45	25
125	50	30
150	60	30
175	70	40
200	80	45
225	80	50
250	80	50
275	90	55
300	90	55
350	100	60
400	120	75

*Adapted from the American Standard for Nursery Stock (ANSI Z60.1-2014) with approximate imperial to metric conversions.

Root ball measurements of plants larger than those shown in Table 5.4.5 shall be determined by the grower and be adequately sized to enable full recovery of the plant.

5.4.6 Root ball depth

Balls of a specified diameter, as well as having sufficient depth to encompass the fibrous and absorptive root systems, shall be deep enough to withstand the handling and transportation necessary in the transplanting operation without breaking.

5.5 Container grown specifications

All specifications of nursery stock, including Section 3, apply to container grown conifers.

An established container grown conifer shall be one transplanted into a container and grown in that container for a sufficient length of time for new fibrous roots to have developed so that the root mass will retain its shape and hold together when removed from the container.

Root circling and other root abnormalities can occur in container grown plants. These misdirected roots should be avoided by using currently accepted nursery practices such as specialized containers, root pruning, and upsizing.

Roots shall be healthy and vigorous. Roots shall not circle the root ball in the container (become root bound) or be adversely misdirected to an extent that future growth and establishment could be jeopardized. Such roots shall be corrected before upsizing or planting-out to encourage proper development of root structure.

The centre of the trunk shall be as close to the centre of the container as possible. A tolerance of 10% of the diameter of the container is the maximum deviation allowed for conifers planted and rooted in containers.

Plants shall be transplanted into larger containers within a maximum of three growing seasons. Faster rooting plants shall be transplanted earlier to avoid root circling and root deformities.

The container shall be sufficiently rigid to hold the root ball shape intact during handling and shipping.

5.5.1 Container size

Container size shall be adequate to provide sufficient space for growing medium and root growth without deformities. Tables 5.5.1.1 and 5.5.1.2 provide a guide to container sizes.

Container size in relation to plant size will vary among the diverse number of genera, species, and cultivars of conifers as well as with geographic location and established nursery practice.

Table 5.5.1.1 Guidelines for container size in relation to spread or height for Dwarf and Medium type conifers

Spread or height (cm)	Minimum container size (#)
10 - 25	1
25 - 40	2
30 - 50	3
40 - 60	5
50 - 90	7
60 - 110	10

Table 5.5.1.2 Guidelines for container size in relation to height for Tall and Columnar and for Tall and Broad type conifers

Height (cm)	Minimum container size (#)
15 - 40	1
25 - 50	2
40 - 75	3
50 - 90	5
60 - 150	7
80 - 180	10
120 - 210	15
150 - 250	25

5.6 In-ground fabric bag containers

These containers may be used by growers to increase root density and enable digging and transplanting with smaller root balls than for conventional field dug plants. Users unfamiliar with specifying and handling plants produced in these containers should consult the grower.

Tables 5.4.4 and 5.4.5 state the recommended minimum sizes for plants grown in in-ground fabric bag containers. Plants shall be grown for a minimum of two seasons in the fabric container. Coniferous trees should be grown in the same container for a maximum of six years depending on the plant size and container size at planting.

Section 6: Broadleaf Evergreens

6.1 Broadleaf evergreens may be:

Balled and burlapped
Balled and field potted
Container grown
In-ground fabric bag containers

6.2 Designation of size grades

Height or spread measurements shall be as follows:
in 10 cm increments from 30 to 60 cm
in 20 cm increments from 60 to 100 cm
in 25 cm increments from 100 to 300 cm
in 50 cm increments from 300 and over

6.3 Descriptions

Plant age is usually not important but may be requested by the purchaser. Four types of broadleaf evergreens are considered separately as follows:

6.3.1 Spreading

This group includes mainly flat types used as ground covers. Measurements shall refer to spread. Height, seldom greater than 30 cm, shall not be considered.

Examples:

Andromeda polifolia 'Blue Ice'
Cotoneaster dammeri
Erica cultivars
Genista pilosa 'Vancouver Gold'
Paxistima canbyi

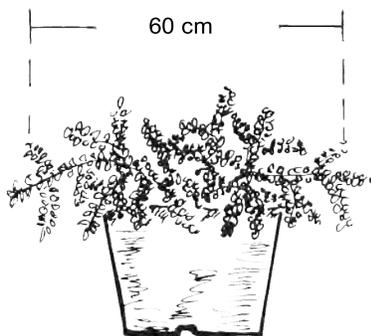


Fig. 6.3.1 Typical measurement for a Spreading type broadleaf evergreen

6.3.2 Semi-spreading

This group includes moderately spreading types. Height should be approximately 1/2 the spread. Measurements shall refer to spread.

Examples:

Buxus sinica var. *insularis* (*B. microphylla* var. *koreana*)

Euonymus fortunei cultivars

Prunus laurocerasus 'Zabeliana'

Rhododendron (such as 'Elizabeth' or 'Scarlet Wonder')

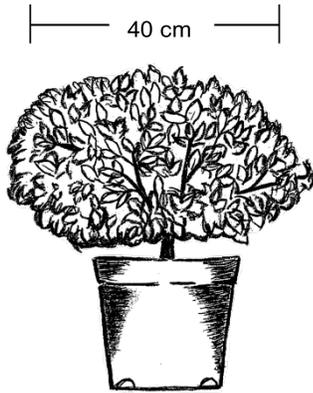


Fig. 6.3.2 Typical measurement for a Semi-spreading type broadleaf evergreen

6.3.3 Globe and Dwarf

Plants in this group should have a spread not less than 2/3 of the height. Measurements shall refer to height.

Examples:

Berberis buxifolia 'Nana'

Berberis verruculosa

Buxus sempervirens 'Suffruticosa'

Ilex x meserveae 'Blue Boy'

Pieris japonica cultivars

Rhododendron (such as 'Unique' or 'Bow Bells')

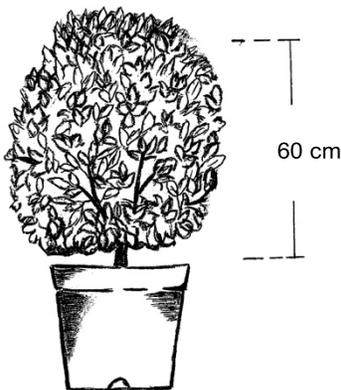


Fig. 6.3.3 Typical measurement for a Globe and Dwarf type broadleaf evergreen

6.3.4 Upright Forms

Plants in this group should have a spread not less than 1/3 of the height. Measurements shall refer to height.

Examples:

Berberis julianae

Ilex aquifolium

Pyracantha (tall types)

Rhododendron (tall types)

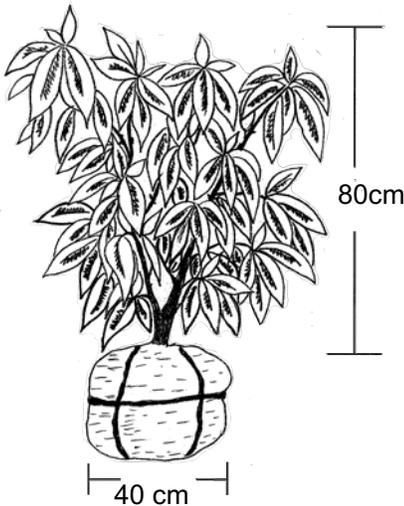


Fig. 6.3.4 Typical measurements for an Upright type broadleaf evergreen

6.4 Yucca

Yuccas shall be specified and sold by container size and by age if field grown.

6.5 Digging specifications

These specifications include balled and burlapped as well as balled and field potted.

Root ball sizes shall always be of a width and depth to encompass enough of the fibrous and absorptive root system to enable full recovery of the plant. All roots shall be healthy and vigorous and shall be free of abnormalities that could jeopardize future growth and establishment.

Plant trunks shall be centered in the root ball with a deviation not exceeding 10% of the root ball diameter.

6.5.1 Balled and burlapped

Balls shall be solid, remain intact until transplanted and be tied tightly with burlap and twine or rope. Using 140g jute burlap, balls may be dug up to 40 cm in diameter without the support of heavy twine or rope.

6.5.2 Balled and field potted

Plants shall be dug with intact root balls and placed in containers in lieu of burlap. The containers shall be sufficiently rigid to hold the root ball shape intact during handling and shipping. Root ball sizes shall conform to Table 6.5.3.

6.5.3 Root Ball Diameters

Table 6.5.3 states the minimum root ball diameters for field dug plants, including those in in-ground fabric bag containers.

Larger root balls than those stated in Table 6.5.3 are required when the plants have not been transplanted or root pruned for four or more years or when plants are dug out of season.

Collected or native material dug from woodlots or fencerows shall have a root ball 30% greater than stated in Table 6.5.3.

Root balls one size smaller than those in Table 6.5.3 shall be acceptable for plants frequently transplanted or root pruned.

Root ball measurements of plants larger than those in Table 6.5.3 shall be determined by the grower and be adequately sized to enable full recovery of the plant.

Table 6.5.3 Root ball diameter in relation to plant spread or height for broadleaf evergreens.

Plant spread or height (whichever is greater) (cm)	Minimum root ball diameter (cm)	Minimum in-ground fabric bag diameter* (cm)
30	20	13
40	25	13
50	30	20
60	35	20
80	40	25
100	50	30
125	60	30
150	70	36

*Adapted from the American Standard for Nursery Stock (ANSI Z60.1-2014) with approximate imperial to metric conversions.

6.5.4 Root Ball Depth

Balls of a specified diameter, as well as having sufficient depth to encompass the fibrous and absorptive root system, shall be deep enough to withstand the handling and transportation necessary in the transplanting operation without breaking.

6.6 Container grown specifications

All specifications of nursery stock, including Section 3, shall be applicable to container grown broadleaf evergreens.

An established container grown broadleaf evergreen shall be one transplanted into a container and grown in that container for a sufficient length of time for new fibrous roots to have developed so that the root mass will retain its shape and hold together when removed from the container. Roots shall be healthy and vigorous.

Root circling and other root abnormalities can occur in container grown plants. These misdirected roots should be avoided by using currently accepted nursery practices such as specialized containers, root pruning, and upsizing.

Roots shall not circle the root ball in the container (become root bound) or be adversely misdirected to an extent that future growth and establishment could be jeopardized. Such roots shall be corrected before upsizing or planting-out to encourage proper development of root structure.

The centre of the trunk shall be as close to the centre of the container as possible. A tolerance of 10% of the diameter of the container is the maximum deviation allowed.

Plants shall be transplanted into larger containers within a maximum of three growing seasons. Plants in containers smaller than #5 shall be transplanted into a larger container after two growing seasons. Those in #5 containers and larger shall be transplanted into a larger container after three growing seasons. Faster rooting plants shall be transplanted earlier to avoid root circling and root deformities.

The container shall be sufficiently rigid to hold the root ball shape intact during handling and shipping.

6.6.1 Container Size

Container size shall be adequate to provide sufficient space for growing medium and root growth without deformities. Table 6.6.1 provides a guide to container sizes.

Container size in relation to plant size will vary among the genera, species, and cultivars of broadleaf evergreens as well as with geographic location and established nursery practice.

Table 6.6.1 Guidelines for container size in relation to plant size for broadleaf evergreens.

Spread or height (cm)	Minimum container size (#)
15 - 30	1
25 - 50	2
40 - 80	3
60 - 100	5
80 - 120	7
80 - 150	10
90 - 200	15

6.7 In-ground fabric bag containers

These containers may be used by growers to increase root density and enable digging and transplanting with smaller root balls than for conventional field dug plants. Users unfamiliar with specifying and handling plants produced in these containers should consult the grower.

Table 6.5.3 states the recommended minimum sizes for plants grown in in-ground fabric bag containers. Plants shall be grown for a minimum of two seasons in the fabric container. Plants should be grown in the same container for a maximum of six years depending on the plant size and container size at planting.

Section 7: Deciduous Shade and Flowering Trees

7.1 Deciduous shade and flowering trees may be:

- Bare root
- Machine dug into wire baskets
- Processed ball
- Container grown
- In-ground fabric bag containers

7.2 Descriptions

Three types of deciduous shade and flowering trees are considered separately as follows:

7.2.1 Dwarf, Formal, and Top-worked (grafted) trees

This group includes many small trees grown as 'standards' (top-worked or grafted). The maximum height at maturity for this group is usually 600 cm.

Specify the following:

- Height of the stem in appropriate cm increments
- Size and/or age of the head
- Caliper of the stem, when the caliper exceeds 40 mm

Examples:

- Acer platanoides* 'Globosum' 200 cm stem, 60 cm head
- Catalpa bignonioides* 'Nana' 200 cm stem, 50 mm caliper, 60 cm head
- Caragana arborescens* 'Pendula' 125 cm stem, 40 cm/2yr. head

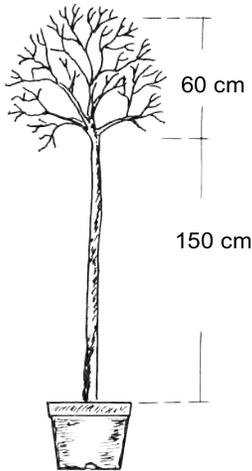


Fig. 7.2.1 Typical measurements for a Top-worked (grafted) type tree

7.2.1.1 Measuring caliper

Caliper shall be the determining measurement when the caliper exceeds 40 mm. It shall be measured at 15 cm above the soil line for trees with a caliper up to and including 100 mm. Trees greater than 100 mm caliper shall be measured 30 cm above the soil line. Soil line measurements shall be taken at or close to the root flare.

7.2.2 Standard trees

This group includes large growing shade and flowering trees which may be suitable for streets, boulevards, parks, residential or industrial use. They may also be used as screens and shelterbelts.

Examples:

Acer rubrum

Acer saccharum

Fraxinus pennsylvanica

Gleditsia triacanthos cultivars

Quercus species

Tilia species

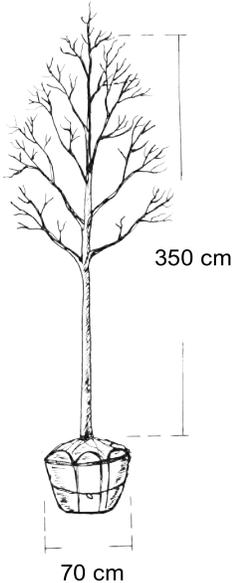


Fig. 7.2.2 Typical measurements for a Standard type tree

Standard type trees shall have straight sturdy trunks, with a well branched and balanced crown. Branching structure of the crown will vary according to species, height, age, and climatic/cultural conditions. A dominant, central leader should be developed in species and cultivars for which it is characteristic but will not necessarily be evident or expected at a certain age of a tree's maturity or be typical of its natural growth habit. Indeterminate or diffuse branching shall be recognized and considered acceptable provided it is characteristic for the species/cultivar and does not create crossing branches, included bark or other flaws that could affect the tree's long term health and stability. Co-dominant stems (leaders) in the lower half of the crown do not meet recognized quality requirements.

Height shall be as follows:

in 25 cm increments from	100 cm to 200 cm
in 50 cm increments from	200 cm to 500 cm
in 100 cm increments above	500 cm

Height of branching

Bid specifications for trees for street plantings shall specify the height to which the tree shall be free of branching. Height of branching shall bear a relationship to the size and kind of tree.

Table 7.2.2.1 Caliper and branch number in relation to height for Standard type trees

Overall height (cm)	Caliper (mm)	Minimum number of branches in crown
200 - 250	20	3
250 - 300	25	5
250 - 300	30	6
300 - 350	35	7

Caliper shall be as follows:

in 2mm increments from 0mm to 10 mm
in 5 mm increments from 10mm to 50mm
in 10 mm increments from 50mm to 150mm
in 25 mm increments above 150mm

Height relationship to caliper

It is recognized that climatic conditions in different sections of the country produce Standard type trees of different caliper-height proportions. Trees from one region of the country may have less caliper in proportion to height while trees from another region may have greater caliper in proportion to height than shown in Table 7.2.2.2.

Table 7.2.2.2 Height and branch number in relation to caliper for Standard type trees

Caliper (mm)	Overall height (cm)	Minimum number of branches in crown
40	250 - 300	8
45	300 - 350	9
50	350 - 400	10

7.2.3 Other forms of trees

7.2.3.1 Small Spreading

This group includes small trees which may have a stem 30 cm to 80 cm high and a well-balanced crown.

Examples:

Acer palmatum
Amelanchier laevis
Caragana arborescens 'Sutherland'
Malus cultivars

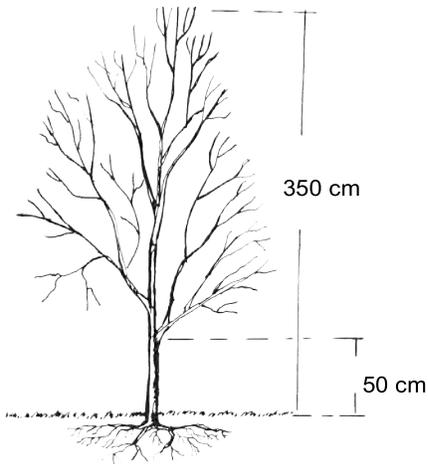


Fig. 7.2.3.1 Typical measurements for a Small Spreading type tree

7.2.3.2 Columnar and Fastigate

This group includes tall growing trees with one main stem usually branched from ground level. If not branched from the ground, state height of branching.

Examples:

Carpinus betulus 'Fastigiata'

Fagus sylvatica 'Fastigiata'

Populus canescens 'Tower'

Quercus robur 'Fastigiata'

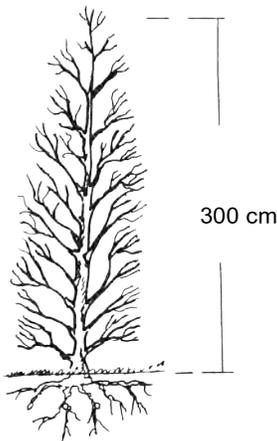


Fig. 7.2.3.2 Typical measurement for a Columnar and Fastigate type tree

7.2.3.3 Multi-stemmed

This group includes tall growing trees with two or more main stems, the number of stems shall be specified as follows:

2 stems

3 or more stems

More stems may be specified if desired. The largest stem shall determine the grade of the clump. No stem shall be counted if it is more than two sizes smaller than the size specified. For example, a specified *Betula* 80 mm clump 3 stems, could have two stems 60 mm, one 80 mm and still be acceptable as an 80 mm clump. Multi-stemmed trees may be specified based on height rather than by caliper.

Examples:

Acer ginnala (*A. tataricum* subsp. *ginnala*)

Betula papyrifera

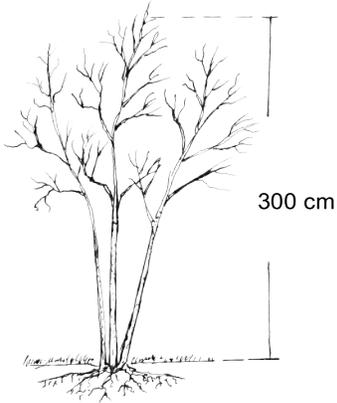


Fig. 7.2.3.3 Typical measurement for a Multi-stemmed type tree

7.3 Digging specifications

These specifications include bare root, balled and burlapped, machine dug into wire baskets, and processed ball.

Root and ball sizes shall always be of a width and depth to encompass enough of the fibrous and absorptive root system to enable full recovery of the plant. All roots shall be healthy and vigorous and shall be free of deformities that could jeopardize future growth and establishment.

Plant trunks shall be centered in the root ball with a deviation not exceeding 10% of the root ball diameter.

7.3.1 Bare root

All bare root trees shall have a well branched, healthy root system characteristic of the species. Root size shall conform to the tables in Section 4.5.1 and Table 7.3.4.

7.3.2 Balled and burlapped

Balls shall be solid, remain intact until planted and be tied tightly with burlap and rope. Using 140 g jute burlap, trees with a caliper of 20 mm or smaller may be dug without the support of heavy twine or rope. Root ball sizes shall conform to Table 7.3.4.

7.3.3 Machine dug into wire basket

Plants with intact root balls are dug mechanically and placed in burlap lined wire baskets. The burlap shall be secured tightly over the top of the ball and the wire basket cross-laced securely. The basket shall fit the ball tightly; crimping to ensure a secure fit. The top horizontal wire of the basket shall be lower than the top of the root ball.

7.3.4 Root ball diameter

Table 7.3.4 states minimum root ball diameters for field dug plants, including those in in-ground fabric bag containers.

Root balls larger than those stated in Table 7.3.4 shall be required when the plants have not been transplanted or root pruned for four or more years or when plants are dug out of season. If the trees have been in ground longer than four years, it is recommended to use the ball size for the next size larger.

Root balls one size smaller than those in Table 7.3.4 shall be acceptable for plants frequently transplanted or root pruned.

The minimum root ball size for multi-stemmed trees shall be one size larger than the sizes specified for single-stemmed trees of equivalent caliper as shown in Table 7.3.4.

Collected or native material dug from woodlots or fencerows shall have a root ball 30% greater than stated in Table 7.3.4.

Table 7.3.4 Root ball size in relation to caliper for field grown Standard type trees

Caliper (mm)	Minimum root ball diameter (cm)	Approximate root ball depth (cm)	Minimum in-ground fabric bag diameter* (cm)
20	40	20	20
25	45	23	25
30	50	25	30
35	55	27	36
40	60	30	40
45	65	33	40
50	70	40	46
60	75	38	46
70	80	40	50
80	85	43	50
90	95	48	56
100	105	53	60
110	115	58	80
120	125	63	
130	135	68	
140	145	73	
150	155	78	
175	175	88	
200	200	100	

* Adapted from the American Standard for Nursery Stock (ANSI Z60.1-2014) with approximate imperial to metric conversions.

7.4 Container grown specifications

All specifications of nursery stock, including Section 3, shall be applicable to container grown deciduous shade and flowering trees.

An established container grown tree shall be one transplanted into a container and grown in that container for a sufficient length of time for new fibrous roots to have developed so that the root mass will retain its shape and hold together when removed from the container. Roots shall be healthy and vigorous.

Root circling and other root abnormalities can occur in container grown plants. These misdirected roots should be avoided by using currently accepted nursery practices such as specialized containers, root pruning, and upsizing.

Roots shall not circle the root ball in the container (become root bound) or be adversely misdirected to the extent that future growth and establishment could be jeopardized. Such roots shall be corrected before upsizing or planting-out to encourage proper development of root structure.

The centre of the trunk shall be as close to the centre of the container as possible. A tolerance of 10% of the diameter of the container is the maximum deviation allowed for trees planted and rooted in containers.

Trees shall be transplanted into larger containers within a maximum of three growing seasons. Faster rooting trees shall be transplanted earlier to avoid root circling and root deformities.

The container shall be sufficiently rigid to hold its shape intact and to protect the root mass during handling and shipping. The trunk shall be protected during shipping and the top shall be protected if necessary to prevent excess branch breakage.

7.4.1 Container size

Container size shall be adequate to provide sufficient space for growing medium and root growth without deformities that could jeopardize future growth and establishment. Table 7.4.1 provides a guide to container sizes.

Container size in relation to plant size will vary among the genera, species, and cultivars of shade and flowering trees as well as with geographical location and established nursery practice.

Dwarf and light growing trees may be one or two container sizes smaller than shown in Table 7.4.1 provided excessive root circling and deformities do not exist.

Table 7.4.1 Guidelines for container size in relation to tree height and caliper for shade and flowering trees

Height range (cm)	Approximate caliper (mm)	Minimum container size (#)
50 - 80	8	1
80 - 125	10	2
100 - 150	15	3
150 - 250	20 - 30	5
200 - 300	30 - 35	7
250 - 350	35 - 40	10
300 - 400	40 - 45	15
350 - 450	45 - 50	20
400 - 500	50 - 60	25

7.5 In-ground fabric bag containers

These containers may be used by growers to increase root density and enable a smaller root ball than for conventional field dug plants. Users unfamiliar with specifying and handling plants produced in these containers should consult the grower.

Table 7.3.4 states the recommended minimum root ball and bag sizes for in-ground fabric bag containers. Trees shall be grown for a minimum of two seasons in the fabric container. Trees should be grown in the same container for a maximum of four years depending on the plant size and container size at planting.

Section 8: Deciduous Shrubs

8.1 Deciduous shrubs may be:

- Bare root
- Balled and burlapped
- Balled and field potted
- Machine dug into wire baskets
- Container grown

8.2 Descriptions

Four types of deciduous shrubs are considered separately as follows:

8.2.1 Dwarf

This group includes small shrubs that seldom exceed 100 cm at maturity.

Examples:

- Berberis thunbergii* 'Rose Glow'
- Cotoneaster adpressus* var. *praecox* (*C. nanshan*)
- Hypericum kalmianum*
- Potentilla fruticosa*
- Spiraea japonica* cultivars
- Symphoricarpos chenaultii* 'Hancock'
- Viburnum opulus* 'Nanum'

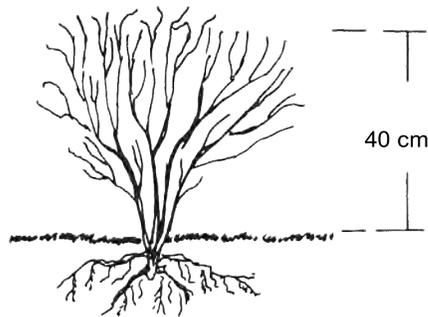


Fig. 8.2.1 Typical measurement for a Dwarf type deciduous shrub

Table 8.2.1 Cane number and root spread in relation to height for Dwarf type deciduous shrubs

Height (cm)	Minimum number of canes	Minimum root spread (cm)
20 - 30	3	15
30 - 40	4	20
40 - 50	4	25
50 - 60	5	25
60 - 80	5	30
80 - 100	6	35

8.2.2 Medium

This group includes compact shrubs that seldom exceed 200 cm at maturity.

Examples:

Chaenomeles speciosa

Euonymus alatus 'Compactus'

Hydrangea paniculata cultivars

Philadelphus coronarius 'Aureus'

Rosa rugosa

Spiraea x vanhouttei

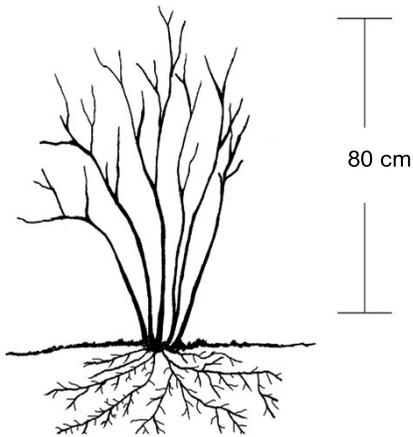


Figure 8.2.2 Typical measurement for a Medium type deciduous shrub

Table 8.2.2 Cane number and root spread in relation to height for Medium type deciduous shrubs

Height (cm)	Minimum number of canes	Minimum root spread (cm)
20 - 30	3	15
30 - 40	4	20
40 - 50	4	25
50 - 60	4	30
60 - 80	5	35
80 - 100	5	40
100 - 125	5	50
125 - 150	6	60
150 - 175	6	60
175 - 200	7	65

8.2.3 Tall – Substantial

This group includes tall growing shrubs that generally grow to 200 cm or more at maturity.

Examples:

Acanthopanax sieboldianus

Lonicera (tall types)

Philadelphus (tall types)

Prunus triloba 'Multiplex'

Ribes sanguineum

Sambucus nigra 'Aurea'

Viburnum opulus

Viburnum lantana

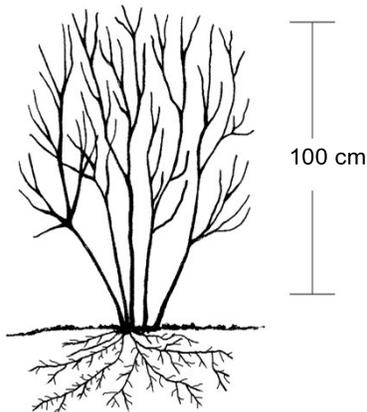


Figure 8.2.3 Typical measurement for a Tall – Substantial type deciduous shrub

Table 8.2.3 Cane number and root spread in relation to height for Tall – Substantial type deciduous shrubs

Height (cm)	Minimum number of canes	Minimum root spread (cm)
20 - 30	3	15
30 - 40	4	20
40 - 50	4	25
50 - 60	4	30
60 - 80	5	35
80 - 100	5	40
100 - 125	5	50
125 - 150	6	60
150 - 175	6	60
175 - 200	7	65

8.2.4 Tall – Slender

This group includes tall, slender shrubs growing to 200 cm or more at maturity.

Examples:

- Caragana arborescens*
- Cornus alternifolia*
- Euonymus europaeus*
- Syringa vulgaris* cultivars
- Tamarix ramosissima*
- Viburnum lentago*

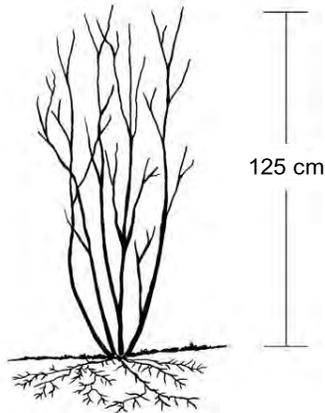


Fig. 8.2.4 Typical measurement for a Tall - Slender type deciduous shrub

Table 8.2.4 Cane number and root spread in relation to height for Tall – Slender type deciduous shrubs

Height (cm)	Minimum number of canes	Minimum root spread (cm)
40 - 50	3	25
50 - 60	3	25
60 - 80	3	30
80 - 100	3	30
100 - 125	4	40
125 - 150	4	45
150 - 175	4	50
175 - 200	4	55
200 - 250	4	60
250 - 300	5	65

8.3 Digging specifications

These specifications include bare root, balled and burlapped, balled and field potted, and machine dug into wire baskets.

Roots and ball sizes shall always be of a width and depth to encompass enough of the fibrous and absorptive root system to enable full recovery of the plant. All roots shall be healthy and vigorous and shall be free of deformities that could jeopardize future growth and establishment.

Larger root balls than those stated in Section 8.2 are required when plants have not been transplanted or root pruned for four or more years or when plants are dug out of season.

Plant trunks shall be centered in the root ball with a deviation not exceeding 10% of the root ball diameter.

8.3.1 Bare root

All bare root shrubs shall have a well branched root system characteristic of the species. Root sizes shall conform to the tables in Section 8.2.

8.3.2 Balled and burlapped

Balls shall be solid, remain intact until planted and be tied tightly with burlap and twine or rope. Using 140 g jute burlap, balls may be dug up to 40 cm diameter without the support of heavy twine or rope. Root ball sizes shall conform to the tables in Section 8.2.

8.3.3 Balled and field potted

Plants shall be dug with intact soil balls and placed in containers in lieu of burlap. The containers shall be sufficiently rigid to hold the root ball shape intact during handling and shipping. Root ball sizes shall conform to the tables in Section 8.2.

8.3.4 Machine dug into wire baskets

Plants with intact root balls are mechanically dug and placed in burlap lined wire baskets. The burlap shall be secured tightly over the top of the ball and the wire basket cross-laced securely. The basket shall fit the ball tightly; crimping can ensure a secure fit. The top horizontal wire of the basket shall be lower than the top of the root ball. Root ball sizes shall conform to the tables in Section 8.2.

8.4 Container grown specifications

All specifications of nursery stock, including Section 3, shall be applicable to container grown deciduous shrubs.

An established container grown shrub shall be one transplanted into a container and grown in that container for a sufficient length of time for new fibrous roots to have reached the sides of the container so that the root mass will retain its shape and hold together when removed from the container. Roots shall be healthy and vigorous.

Root circling and other root abnormalities can occur in container grown plants. These misdirected roots should be avoided by using currently accepted nursery practices such as specialized containers, root pruning, and upsizing.

Roots shall not circle the root ball in the container (become root bound) or be adversely misdirected to an extent that future growth and establishment could be jeopardized. Such roots shall be corrected before upsizing or planting-out to encourage proper development of root structure.

The container shall be sufficiently rigid to hold the root shape intact during handling and shipping. The top of the plant shall be protected during shipping if necessary to prevent excessive breakage.

All plants shall be specified by both plant size and container size. Plant size shall conform to the requirements in Section 8.2. Plant age is usually not listed or specified but should be available on request.

Shrubs shall be transplanted into larger containers within a maximum of two growing seasons. Faster growing shrubs shall be transplanted earlier to avoid root circling and root deformities.

Cultural pruning methods shall be practiced to develop the maximum number of canes typical of the plant species' growth habit and consistent with the requirements in Section 8.2.

The minimum number of canes listed in Table 8.4.1 compared to those listed in Section 8.2 may vary based on differences among plant types and on established nursery practice.

8.4.1 Container size

Container size shall be adequate to provide sufficient space for the growing medium and root growth without deformities that could jeopardize future growth and establishment.

Table 8.4.1 provides a guide to container size in relation to plant height and cane number. Container size in relation to plant size will vary among the diverse number of genera, species, and cultivars of deciduous shrubs as well as with geographic location and established nursery practice.

Table 8.4.1 Guidelines for container size in relation to plant height and cane number for deciduous shrubs

Height (cm)	Minimum number of canes	Minimum container size (#)
15 - 30	3	1
25 - 50	3	2
30 - 60	4	3
40 - 80	5	5
60 - 100	5	7
80 - 125	6	10
100 - 150	6	15

Section 9: Roses

9.1 General specifications

There are numerous cultivars of roses available in today's marketplace. Due to the similarity of the plants, special care shall be taken in labelling bare root plants. All bundles shall be labelled and securely tied.

Long storage periods are frequently required. Special care shall be taken to ensure that these plants are kept free of disease, damaged roots or branches. A well developed, fibrous root system without deformities is essential.

Roses are produced by either budding the cultivars onto a rootstock or by rooting cuttings. Plants shall be identified as either 'Budded' or 'Own Root'. Information regarding the understock type shall be available on request.

If wax is applied to prevent desiccation during storage, clear wax or light coloured wax shall be used.

After roses are graded, canes are generally cut back for storage and shipping. The length shall not be less than 20 cm. Illustrations in Section 9.3 are shown as field height.

The term 'ground level', as used in rose grades, applies only to field grown plants on their own roots. It is defined as the area on the stem above the root flare where there is a colour change created by the original planting depth when the plant was in the field.

9.2 Grading

Roses shall be graded as number 1, 1-1/2 or 2, according to the type, and the number, caliper, and length of strong canes. A strong cane is one that is healthy, vigorous and fully developed. All canes shall be sturdy, in good condition, and free of pests and diseases.

9.3 Descriptions

Grading for roses shall be as follows:

9.3.1 Climbing roses

Examples:

Improved Blaze
William Baffin

Grade No. 1 - Three or more strong canes, minimum 8 mm in caliper, measuring a minimum of 50 cm in length and branched no higher than 10 cm above the bud union or ground level.

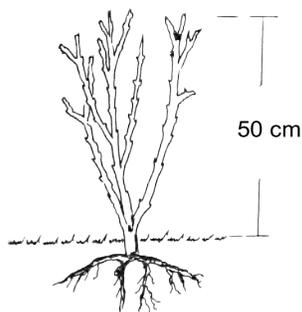


Fig. 9.3.1.1 Typical measurement for a Grade No. 1 climbing rose

Grade No. 1-1/2 - Two or more strong canes, minimum 8 mm in caliper, measuring a minimum of 40 cm in length and branched no higher than 10 cm above the bud union or ground level.

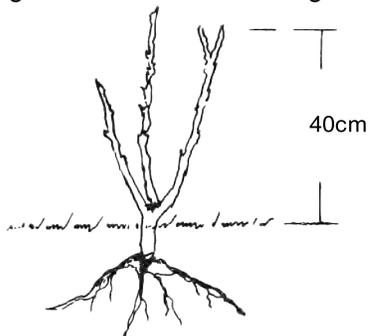


Fig. 9.3.1.2 Typical measurement for a Grade No. 1-1/2 climbing rose

Grade No. 2 - At least two canes, one of which shall be a strong cane, minimum 8 mm in caliper. The second cane shall be a minimum of 6 mm in caliper. All canes shall be branched no higher than 10 cm above the bud union or ground level.

9.3.2 Vigorous roses: hybrid tea, grandiflora, larger shrubs, *rugosa*

Examples:

Hansa
Peace
Queen Elizabeth

Grade No. 1 - Three or more strong canes, minimum 8 mm in caliper, measuring a minimum of 40 cm in length and branched no higher than 10 cm above the bud union or ground level.

Grade No. 1-1/2 - Two or more strong canes, minimum 8 mm in caliper, measuring a minimum of 30 cm in length and branched no higher than 10 cm above the bud union or ground level.

Grade No. 2 - At least two canes, one of which shall be a strong cane, minimum 8 mm in caliper. The second cane shall be a minimum of 6 mm in caliper. All canes shall be branched no higher than 10 cm above the bud union or ground level.

9.3.3 Floribunda, small shrub, and landscape roses

Examples:

Champlain
The Fairy

Grade No. 1 - Three or more strong canes, minimum 5 mm in caliper, measuring a minimum of 25 cm in length and branched no higher than 8 cm above the bud union or ground level.

Grade No. 1-1/2 - Two or more strong canes, minimum 5 mm in caliper, measuring a minimum of 20 cm in length and branched no higher than 8 cm above the bud union or ground level.

Grade No. 2 - At least two canes, one of which shall be a strong cane, minimum 5 mm in caliper.

Section 10: Fruit Trees

10.1 General specifications

Fruit trees are grown by many Canadian nurseries to satisfy the requirements of the commercial fruit growing industry. As the age/size requirements for the commercial fruit growing industry are somewhat different than those of the retail market, standards have been designed primarily for the needs of the commercial fruit grower. Some nurseries may choose to apply the standards for shade trees in Section 7.2.3 to fruit trees sold to the retail market.

All trees shall be well rooted, without root abnormalities that could jeopardize future growth and establishment. They shall be free of diseases and insects and be reasonably straight. Age of trees is stated as one year, two year, etc.

All trees shall have one label per bundle, be tied securely, and colour coded. The understock shall also be noted on the label. Example: Apple Ambrosia (B9), 16 mm

All trees shall be measured by caliper only. Caliper shall govern over height. Caliper shall be taken 3 cm above the bud union. Growers who have traditionally listed one year pome fruit by height only may list height along with caliper.

Trees listed as whips are unbranched. Trees listed as branched shall have a minimum of three branches 30 cm long. All trees grown two year or more shall be branched.

Section 11: Small Fruits

11.1 General specifications

Special care shall be taken with small fruit, especially raspberries and strawberries, to ensure that stock is free of disease and insect pests. All stock used for propagation purposes should be certified where such plant material is available.

All plants shall be well rooted. No grade shall include injured, stunted or odd shaped plants.

11.2 Raspberries

Grading:

No. 1 - Suckers, root cuttings, and tip plants shall be 5 mm and up in caliper at the collar and have 20 cm or more of live tops.

No. 2 - Suckers, root cuttings, and tip plants, shall be 3 mm and up in caliper at the collar; suckers and root cuttings shall have 20 cm of live tops; tip plants shall have 15 cm or more of live tops, all plants shall be proportionately rooted.

11.3 Transplanted Raspberries

Grading:

No. 1 - Transplants shall be 6 mm and up in caliper at the collar and have 30 cm or more of live tops.

No. 2 - Transplants shall be 5 mm and up in caliper at the collar and have 30 cm or more of live tops. There should be at least one cross root below the crown.

11.4 Dewberries, Blackberries, Boysenberries

Grading:

No. 1 - Root cuttings shall be 3 mm and up in caliper at the collar. Sucker plants require a caliper 5 mm and up at the collar. All plants shall have 30 cm or more of live tops and be well rooted.

No. 2 - Root cuttings shall be 2 mm and up in caliper at the collar. Sucker plants require a caliper 3 mm and up at the collar. All plants shall have 20 cm or more of live tops.

11.5 Transplanted Blackberries

Grading:

No. 1 - All transplanted blackberries shall be 6 mm and up in caliper at the collar and have 30 cm or more of live tops.

11.6 Currants and Gooseberries

Grading:

1 yr. No. 1 - Plants shall measure 20 cm in height with one or more canes or equivalent side branches and be well rooted.

2 yr. No. 1 - Plants shall measure 30 cm in height with two or more canes or equivalent side branches and be well rooted.

2 yr. No.2 - Plants shall measure 20 cm in height with one or more canes or equivalent side branches and be well rooted.

11.7 Blueberries

All measurements of height shall be taken from the crown to the tip of the plant. Plants shall be well rooted and well branched in proportion to height. Sizing shall be in accordance with Table 11.7 and with Section 8.2 and 8.4. Low bush blueberries, because of their growth habit, will be smaller.

Table 11.7 Grade number and/or age and height for blueberries

Plant grade and/ or age	Minimum height (cm)
1 yr. rooted cuttings	7.5
2 yr. No.1	23
3 yr. No.1	30
4 yr. No.1	45

11.8 Saskatoon Berries (*Amelanchier alnifolia*)

Propagation method of cultivar shall be stated as seedling, rooted cutting or micropropagated. Sizing shall be in accordance with Section 8.2 and 8.4.

11.9 Grape Vines

Grading:

Grape vines shall have healthy and proportionally developed roots. Plants may be trimmed back to three buds.

1 yr. No.1 - Light growing varieties/cultivars shall have 15 cm or more of live top at harvest. Strong growing varieties/cultivars shall be proportionately larger. Plants shall be well rooted.

2 yr. No.1 - Light growing varieties/cultivars shall have 30 cm or more of live top at harvest. Strong growing varieties/cultivars shall be proportionately larger. Plants shall be well rooted.

2 yr. No.2 - same specification as 1 yr. No. 1

11.10 Strawberries

The internal crown shall be white and healthy with no signs of discolouration. There shall be at least ten main roots, not less than 7.5 cm long, and a minimum crown diameter of 8 mm measured at the base.

11.11 Asparagus Crowns

The internal crown shall be white and fleshy with no signs of discolouration.

Grading:

1 yr. No. 1 - Crowns shall not weigh less than 25 kg per thousand plants. Fifty per cent of the root system shall exceed 13 cm in length.

2 yr. No. 1 - Crowns shall not weigh less than 50 kg per thousand plants. Fifty per cent of the root system shall exceed 18 cm in length.

2 yr. No. 2 - same specification as 1 yr. No. 1

Section 12: Understock

12.1 General specifications

This section covers young plants, graded by caliper, generally used for growing on to larger sizes. These plants may be used in grafting and budding production. For plants graded by height, see Section 4.5. Caliper shall be taken at the root collar or ground line. If a purchaser requests height, the request must indicate height only or height and caliper.

The understock (rootstock) on which a plant is grafted or budded shall be indicated when it has an altering effect on the resulting plant, such as dwarfing rootstock, and when requested by the purchaser. The quality of all understock shall be normal for the species or variety/cultivar unless otherwise designated. It is essential that the stem be reasonably straight.

12.2 Grading increments and measurements

Specialized abbreviations related to age shall apply (see Section 4.4.1) followed by the caliper in millimeters. Caliper increments shall be those listed in Section 4.2.1. Example: 1/0 5mm

12.3 Types of plants

12.3.1 Seedlings with limbs

There shall be no limbs on one side of the seedling for at least 5 cm above the root collar to ensure a budding or grafting area. The plants must be sufficiently straight. The root system and the plant shall be free of mechanical, chemical, and climatological damage as well as be free of root deformities that could jeopardize future growth and establishment.

12.3.1.1 Root descriptions

In the case of apple and pear seedlings, where the root description is given as branched or straight, the following shall apply:

Branched root: The seedling shall have not less than three root branches present within 13 cm of the root collar.

Straight root: The root shall have the minimum caliper of the grade for not less than 15 cm from the collar.

12.3.2 Vegetatively propagated plants

12.3.2.1 Layering

Caliper shall be taken at the root collar or ground level. If the collar or ground level cannot be determined, stem caliper shall be taken 25 cm above the bottom of the layer (basal cut). Layers shall have a minimum of three root nodes, each node containing at least one root.

12.3.2.2 Hardwood, softwood, and/or micropropagated cuttings

Caliper shall be taken at the root collar or ground level.

12.3.3 Unclassified

Any understock not meeting the above specifications shall be labelled 'unclassified'.

12.4 Shade and flowering tree seedlings

When used for understock, they shall be graded by caliper as per this section.

Section 13: Vines and Ground Covers

13.1 Vines

Specifications for vines shall state the container class and indicate if the plants are staked or trellised. Unless otherwise stated or specified, it is generally expected that one or more stems/runners will be at or close to the top of the stake or trellis. Stake or trellis height may be stated and shall be available on request. If plants are not staked stem/runner length should be stated.

Plant age and propagation method are not usually specified but shall be available on request. Growers may include other characteristics peculiar to a particular species or cultivar.

Roots shall be healthy and vigorous. The root mass of the plant shall be adequate to hold the potting medium together as a unit when removed from the container. Roots shall not circle the root ball in the container (become root bound) or be adversely misdirected to an extent that future growth and establishment could be jeopardized. Such roots shall be corrected before upsizing or planting-out to encourage proper development of root structure.

Examples:

Campsis

Clematis

Parthenocissus

Wisteria

13.2 Ground Covers

Specifications for ground covers shall state the container class. If grown in flats or plug trays, the number of plants per tray shall be stated and the size or volume of the cell shall be available on request.

Plant size may be stated and shall be available on request. Plant age and propagation method are not usually specified but shall be available on request. If plants are grown bare root the clump size shall be stated. Growers may include other characteristics peculiar to a particular species or cultivar.

Roots shall be healthy and vigorous. The root mass of the plant shall be adequate to hold the potting medium together as a unit when removed from the container. Roots shall not circle the root ball in the container (become root bound) or be adversely misdirected to an extent that future growth and establishment could be jeopardized. Such roots shall be corrected before upsizing or planting-out to encourage proper development of root structure.

Examples:

Ajuga reptans

Arctostaphylos uva-ursi

Gaultheria procumbens

Pachysandra terminalis

Section 14: Herbaceous Perennials and Ornamental Grasses

14.1 General specifications

The specifications for container grown plants in this section shall use both plant size and container size. For some container grown plants, the specifications may include only container size. In such cases, specifiers are encouraged to also use plant size. The propagation method in Section 14.2 may also be specified.

Container sizes listed for plants in Section 14.4 are the minimum in order to be compliant with this Standard.

Roots shall be healthy and vigorous. The root mass of the plant shall be adequate to hold the potting medium together as a unit when removed from the container.

Root circling and other root abnormalities can occur in container grown plants. These misdirected roots should be avoided by using currently accepted nursery practices such as specialized containers, root pruning, and upsizing.

Roots shall not circle the root ball in the container (become root bound) or be adversely misdirected to an extent that future growth and establishment could be jeopardized. Such roots shall be corrected before upsizing or planting-out to encourage proper development of root structure.

14.2 Propagation methods

The following codes shall be used to specify propagation methods:

- C = cutting
- D = division
- G = graft
- M = micropropagated
- RC = rooted cutting
- S = seed

14.3 Herbaceous perennial types (form in which marketed)

Container grown - are grown in a container to the specified size. Specify container size as per Table 14.7.

Bare root - are free or substantially free of soil or growing medium. Specify 'BR'.

Field potted - are field grown plants dug from the field and potted for delivery. Specify 'FP'.

14.4 Specific information for certain perennials sold by eye divisions, fans or rhizomes

The term 'eye' is the correct word to describe *Astilbe*, *Dicentra*, *Hosta*, and *Paeonia* divisions. The term 'fan' is the correct word to describe *Hemerocallis*, *Iris ensata*, and *Iris sibirica* divisions. The term 'rhizome' is the correct word to describe bearded iris divisions.

14.4.1 Astilbe

- 1-2 eye division – 10 cm container
- 2-3 eye division – 11 cm container or BR or FP
- 3-5 eye division – #1 container or BR or FP
- 5 eye and larger – #2 container or BR or FP

14.4.2 Dicentra – bleeding heart

- 1-2 eye division – 10 cm container
- 2-3 eye division – 11 cm container or BR or FP
- 3-5 eye division – #1 container or BR or FP
- 5 eye and larger – #2 container or BR or FP

14.4.3 Hemerocallis – daylily

- 1-fan division (small liner for growing-on) - 10 cm container
- 1-fan division (blooming size) - 10 cm container
- 1-2 fan division, heavy (husky, strong, large blooming size) - 11 cm container

Dwarf and miniature cultivars usually make smaller fans. Tetraploid cultivars usually make larger fans.

There are many *Hemerocallis* classifications. These types vary greatly in their ability to thrive well in various climatic zones. Therefore, it is important to consider the particular climate when selecting cultivars.

14.4.4 Hosta

- 1-eye, light grade (for growing-on) - 10 cm container
- 1-eye, heavy grade (well rooted) - 11 cm container or BR or FP
- 1-2 eye, heavy grade (also known as extra-large) - 15 cm container or BR or FP

14.4.5 Iris

Iris ensata (Japanese iris) and *Iris sibirica* (Siberian iris)

- 1-fan division (liner for growing-on) - 10 cm container
- 1-2 fan division (at least 1 fan blooming size) - 11 cm container or BR or FP
- 2-3 fan, heavy blooming size - #1 container or BR or FP

Bearded iris – dwarf, intermediate and tall classifications

- Small, non-blooming size rhizome (for growing-on) - 10 cm container
- Large, blooming size rhizome - 11 cm container

14.4.6 Paeonia – peony

- 2-3 eye division - 13 cm container or BR or FP
- 3-5 eye division (standard) - #1 container or BR or FP
- 5 eye and larger - #2 container or BR or FP

All eyes counted must be flowering eyes, and/or large non-flowering eyes on heavy roots. Small eye buds shall not be counted.

14.4.7 Papaver orientale – Oriental poppy

- Liner - 15 cm container or BR or FP
- Heavy, one-year plant - #1 container or BR or FP

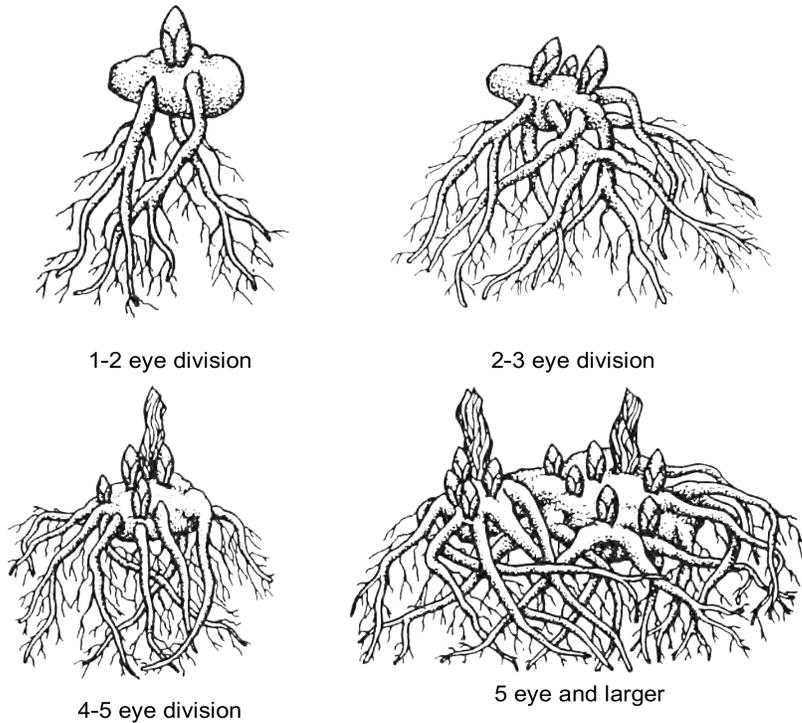


Fig. 14.4.1 Typical example grades for eye divisions of genera such as *Astilbe*, *Dicentra*, *Hosta*, and *Paeonia*

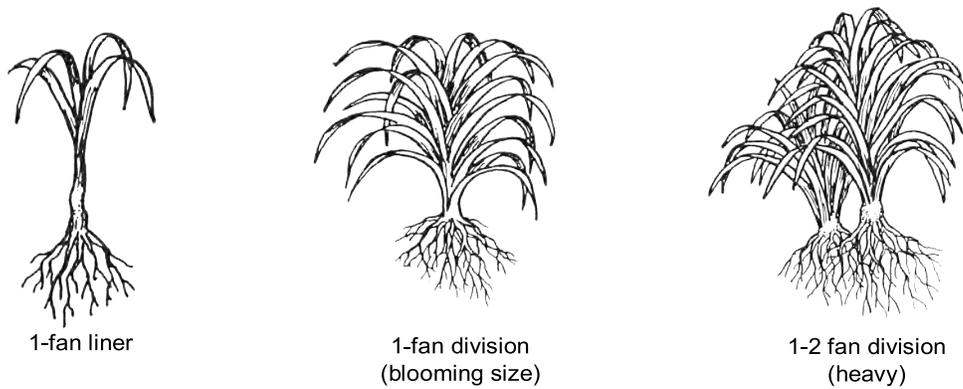


Fig. 14.4.2 Typical example grades for fan divisions of genera such as *Hemerocallis* and *Iris*

14.5 Other herbaceous perennials

Herbaceous perennials not specified in Section 14.4 shall be specified and sold by container size and division size.

Examples:

Anemone
Campanula
Rudbeckia
Salvia
Veronica

14.6 Ornamental grasses and sedges

Ornamental grasses and sedges shall be specified and sold by container size. The root mass of the plant shall comply with requirements in Sections 14.1 and 14.3.

Examples:

Andropogon

Carex

Festuca

Miscanthus

Panicum

Pennisetum

14.7 Container size

Perennials are often grown in smaller containers than woody plants. Table 14.7 list applicable classes and dimensions. For larger containers, refer to Table 3.4. For smaller containers such as plug trays, the number of plants per tray shall be given. The plug size or volume shall be available on request.

Because of the extensive diversity of containers within the classes in Table 14.7 (square, round, squat, tall, etc.), plants supplied to meet a size specification shall meet the minimum volume. Volume shall supersede class.

Table 14.7 Common container classes and volume ranges for herbaceous perennials

Container class (cm)*	Container volume (cubic cm)**
6	200 - 300
7.5	300 - 450
9	450 - 600
10	500 - 750
11	800 - 1100
13	1400 - 2000
15	2300 - 3500

* Numbers are only approximately equal to actual container dimensions.

**cubic cm x .001 = litres; 1,000 cubic cm = 1 litre

14.8 Unclassified container

Any container for which volume does not fall within the limits in Table 14.7.

Section 15: Bulbs, Corms, and Tubers

15.1 General specifications

This section is generally consistent with a similar section in the American Standard for Nursery Stock (ANSI Z60.1-2014). For plants not listed here, the Standard listed above is applicable. Refer to: www.americanhort.org.

Bulbs and corms are generally sold under grade names such as 'forcing size', 'top size', 'large', etc. In the case of narcissus and daffodils, the designations of 'double nose', to indicate a split bulb, and 'round', are used. With some groups, such as hyacinths, the grade names indicate use; for example, 'forcing' or 'exhibition', and garden 'bedding' sizes.

The following grades conform in substance to generally accepted trade usage. Both grade names and sizes in centimetres should be given; size (centimetres in circumference or diameter) shall be required. In some instances, such as dahlias and daffodils, measures such as weight and number per unit volume are used.

Bulbs, corms, and tubers which cannot reasonably be expected to bloom in the season after planting should not be sold to the public. If they are, they should be clearly indicated as "non-blooming" sizes for naturalization or planting in situations where non-blooming sizes may be appropriate.

15.2 Amaryllis

The size of the bulb will determine the quantity of flower stalks produced. A Jumbo 36 cm can produce three stalks, a Fancy 30 cm bulb can produce two stalks and a Small 20 cm bulb will only produce one stalk. Each stalk produces between four and six flowers.

Designated by centimetres of circumference.

Jumbo	36 cm and up
Exhibition	32 cm
Fancy	30 cm
Large	26 cm
Medium	22 cm
Small	20 cm

15.3 Begonias (tuberous)

Designated by centimetres of diameter.

Giant	6 cm and up
Extra Large	5 cm
Large	4 cm
Medium	3 cm
Small	2 cm

15.4 Crocus (large flowering)

Designated by centimetres of circumference.

Top	9 cm and up
Large	8 cm
Medium	7 cm
Small	6 cm

15.5 Dahlias

Designated by weight in grams.

The tuberous root of Dahlia is available as:

A division, with one small to large tuberous root with a portion of live crown with at least one 'eye' or 'bud'.

A clump, with a number of small to large tuberous roots with a common live crown with at least one 'eye' or 'bud'.

No. 1 100 grams and up

No. 2 80 grams

15.6 Gladiolus

Designated by centimetres of circumference.

Jumbo 14 cm and up

Large No.1 12 cm

Large No.2 10 cm

Medium No.3 8 cm

Medium No.4 6 cm

15.7 Grape Hyacinths (Muscari)

Designated by centimetres of circumference.

Top Size 9 and up

Large Size 8 cm

Medium Size 7 cm

Small Size 6 cm

15.8 Hyacinths

Designated by centimetres of circumference.

Top Forcing (Exhibition) 19 cm and up

Large Forcing (Exhibition) 18 cm

Medium Forcing (Exhibition) 17 cm

Top Bedding 16 cm

Large Bedding 15 cm

Medium Bedding and Miniature 14 cm

15.9 Lilies

Designated by centimetres in circumference.

Various types of lilies produce different size bulbs. These generally fall into two groups: the large bulb types such as 'Easter' and 'Regal', and the smaller bulb types such as 'Midcentury' and 'Tigrinum'

Large bulb types	Small bulb types
24 cm	18 cm
22 cm	16 cm
20 cm	14 cm
18 cm	10 - 12 cm

15.10 Narcissus and Daffodils

Narcissus bulbs are designated either as 'double nose' (DN) or 'round' (RN) and should be size graded using the appropriate terms.

'Double Nose' means bulbs that show evidence of producing two or more flowers. Due to the double character of the bulbs, circumference measurement is not used. The size designation of DN bulbs is determined by the number of bulbs that fill a 50-litre basket.

DN I Top
DN II Large
DN III Medium

'Round' means single-nosed bulbs which are reasonable circular in cross-section and which show evidence of producing one flower. Slabs are not permitted in this grade. Bulb size will vary from the norm for some cultivars. Circumferences are generally as shown below.

RN I Top 14 cm and up
RN II Large 12 cm
RN III Medium 10 cm

15.11 Narcissus (Paper White)

Paper White is a type of bulb that is normally smaller than other narcissus and consequently is listed separately.

Designated by centimetres of circumference.

Top 16 cm and up
Large 15 - 16 cm
Medium 14 - 15 cm
Small 13 - 14 cm

15.12 Tulips

Designated by centimetres of circumference.

Top 12 cm and up
Large 11 cm
Medium 10 cm
Small 9 cm

Some botanical and other species of tulips are smaller than the above sizes. Bulbs of these species must be identified and sizes given.

Section 16: Christmas Trees

Although the production of Christmas Trees is not within the scope of this Standard, it deserves mention.

Conifers grown for the Christmas tree market are not generally suitable for the landscape market for several reasons. Very sandy soils typical of some plantations generally result in unstable soil balls for transplanting. Root systems are often coarse when grown in non-cultivated situations. Tight shearing is generally not appropriate for open-branched conifers for landscape purposes.

Refer to:

Canadian Christmas Tree Growers Association

www.canadianchristmastrees.ca

Section 17: Nursery Turfgrass Sod

Although the production of nursery turfgrass sod is not within the scope of this Standard, it deserves mention.

Nursery turfgrass sod is typically defined as a grass that has been seeded and cultivated in nursery sod fields as a turfgrass sod. It is usually classified by a grade designation which may specify things like the limited number of weeds per square metre, the amount of native grasses, shoot density, and mowing height.

Growers and specifiers of nursery turfgrass sod should consult and comply with national, regional or provincial documents for current and updated requirements.

Refer to:

Canadian Landscape Standard: www.cnla-acpp.ca

Nursery Sod Growers Association of Ontario: www.nsgao.com

Turfgrass Producers International, "Guideline Specifications to Turfgrass Sodding":
www.turfgrasssod.org

Section 18: Compost

Although the production of compost is not within the scope of this Standard, it deserves mention.

Compost is one of the materials that is beneficial for the production of nursery stock as a soil amendment for field production and for use in soilless mixes. Compost quality is dependent on the feedstock from which it is derived and the parameters used to determine its applicability in particular situations.

The production of compost is regulated provincially in Canada, typically by provincial Ministries of the Environment, with oversight in some instances by the Canadian Food Inspection Agency.

Those who produce, purchase, and specify compost should be familiar and comply with all applicable regulations. Nurseries that do on-farm composting should be in compliance. Some local or regional government bylaws may require permits or approval for the construction or operation of on-farm composting.

Refer to:

The Compost Council of Canada (www.compost.org) is a non-profit, member driven organization that can provide regulations and standard documents for jurisdictions across Canada for its members.

Ontario, as an example, has published quality standards for compost. At the time this Standard was published, it was found at: www.ontario.ca/page/ontario-compost-quality-standards

Appendix A: Metric/Imperial Equivalents

This table has been prepared in cooperation with AmericanHort and the American Standard for Nursery Stock (ANSI Z60.1-2014) to assist in trade between Canada and the United States. The equivalents are suggested to be used for nursery stock and are not intended as actual mathematical equivalents.

For plants sized by caliper		For plants sized by height or spread	
Metric measure (mm)	Imperial measure (in)	Metric measure (cm)	Imperial measure (in/ft)
1.5	1/16	10	4 in
3	1/8	15	6 in
5	3/16	20	8 in
6	1/4	25	10 in
8	5/16	30	12 in
10	3/8	40	16 in
11	7/16	50	20 in
13	1/2	60	2 ft
14	9/16	80	2.5 ft
16	5/8	90	3 ft
17	11/16	100	3.5 ft
19	3/4	125	4 ft
22	7/8	135	4.5 ft
25	1	150	5 ft
30	1.25	175	6 ft
40	1.5	200	6.5 ft
45	1.75	225	7 ft
50	2	250	8 ft
60	2.5	300	10 ft
80	3	360	12 ft
90	3.5		
100	4		
110	4.5		
130	5		
140	5.5		
150	6		
200	8		

Mathematical conversions

Convert from	Into	Multiply by
mm	inches	0.03937
cm	inches	0.3937
cm	feet	0.03281
inches	mm	25.4
inches	cm	2.54
feet	cm	30.48
cubic cm	litres	0.001