

TEXAS NURSERY & LANDSCAPE ASSOCIATION
SPECIFICATIONS

GRADES AND STANDARDS

FORWARD

Realizing the difference in the various climate and temperature zones together with the great variance of soil conditions in Texas, it is most difficult to write one set of grades and standards for the entire state of Texas, but we believe that the material contained in this book is the best available. The information contained herein is the result of many years of research. The information was gleaned from experiences of the Texas Department of Transportation in plantings, from landscape architects, and from nursery/landscape professionals. The standards are guidelines to be used for average plantings, whether you are an architect, a landscape contractor, or a retail nursery buying to sell to the general public.

Texas Nursery & Landscape Association
7730 South IH-35
Austin, TX 78745-6698
512.280.5182 Fax 512.280.3012
email: info@txnla.org
www.txnla.org

TNLA
SPECIFICATIONS

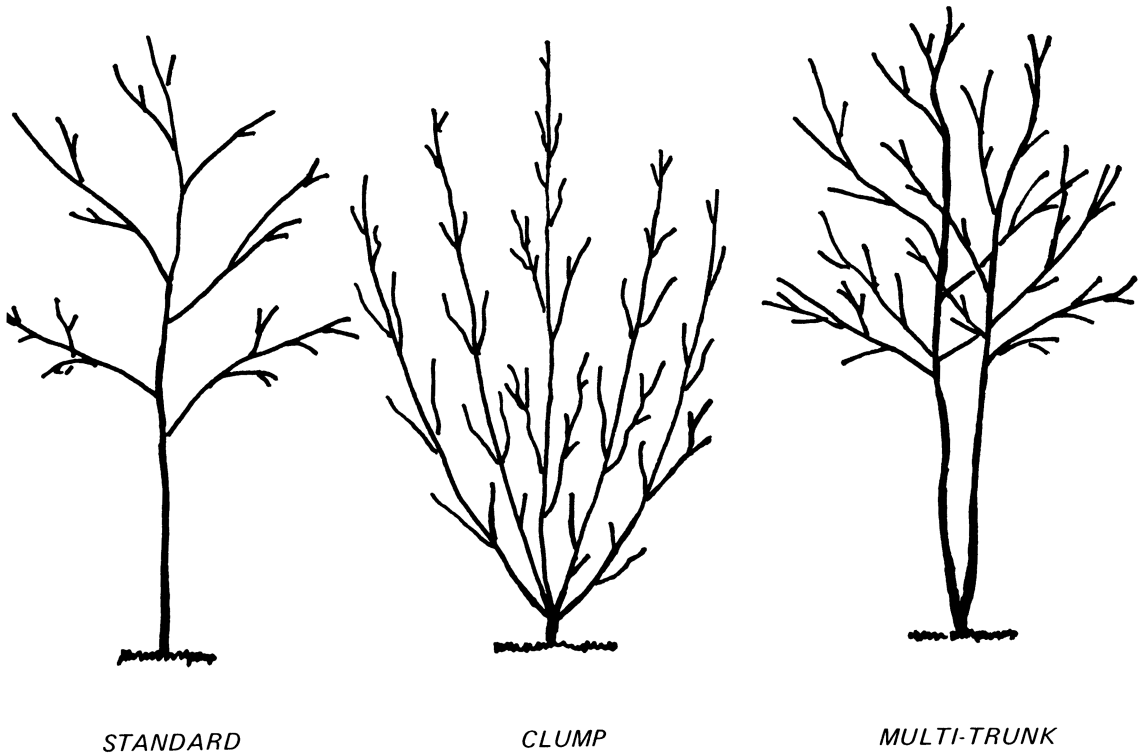
TNLA Balled & Burlapped Specification Chart - for use in determining the proper size ball for any tree or shrub.

GRADES AND
STANDARDS

Please note that this Specification Chart is divided into four classifications or groups. Each group contains a grade and ball size. The grades may be standard heights, spread or caliper as indicated. The ball size listed for each grade is the minimum diameter or width of ball permissible for the corresponding grade. The classification groups as listed: Group I, Group II, Group III, and Group IV are to be used in connection with the variety classification lists as printed within the pages of the specification booklet.

**Texas Nursery & Landscape Association Specification Chart
Balled and Burlapped (B&B) Classifications**

Group I		Group II		Group III		Group IV	
Grade	Ball Size	Grade	Ball Size	Grade	Ball Size	Grade	Ball Size
10-12 in	7"	10-12 in	7"	3/4-1" cal.	12"	12-15 in.	7"
12-15 in.	8"	12-15 in.	8"	1-1 1/4" cal	13"	15-18"	8"
15-18 in.	9"	15-18 in.	9"	1 1/4-1 1/2 cal.	14"	18-24 in.	8"
18-24 in.	10"	18-24 in.	10"	1 1/2- 1 3/4" cal.	16"	2-3 ft	9"
24-30 in.	12"	24-30 in.	11"	1 3/4-2" cal.	18"	3-4 ft.	9"
30-36 in.	14"	30-36 in.	12"	2" cal.	20"	4-5 ft.	10"
3-4 ft.	16"	3-4 ft.	13"	2 1/2" cal.	23"	5-6 ft.	11"
4-5 ft.	18"	4-5 ft.	14"	3" cal.	27"	6-7 ft.	12"
5-6 ft.	22"	5-6 ft.	15"	3 1/2" cal.	32"	7-8 ft.	12"
6-7 ft.	26"	6-7 ft.	16"	4" cal.	36"	6-8 ft.	12"
7-8 ft.	30"	7-8 ft.	18"	4 1/2" cal.	40"	1-1 1/4" c.	12"
8-9 ft.	32"	8-9 Ft	20"	5" cal.	45"	1 1/4-1 1/2" c	12"
9-10 ft.	34"	9-10 ft.	26"	5 1/2" cal.	50"	1 1/2-1 1/2" c	13"
10-12 ft.	36"	10-12 ft.	26"	6" cal	54"	1 1/2-1 13/4" c	14"
12-14 ft.	40"	12-14 ft.	26"			1 3/4-2" c	15"
14-16 ft.	44"	14-16 ft.	30"			2" c.	16"
16-18 ft.	48"	16-18 ft.	32"			2 1/2" c	18"
18-20 ft.	52"	18-20 ft.	35"			3" c.....	21"
						3 1/2" c	24"
						4" c	27"
						4 1/2" c	30"
						5" c	35"
						5 1/2" c	40"
						6" c	44"

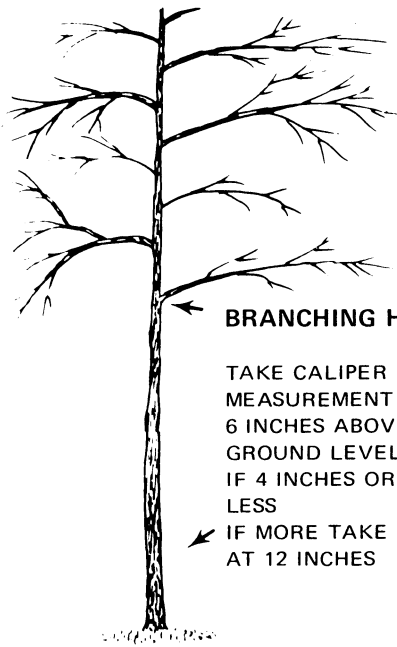


SHADE AND
ORNAMENTAL TREES

CALIPER: Caliper (trunk thickness or diameter) of all trees, shade or ornamental, shall be measured at a point on the trunk six (6) inches above ground level up to four (4) inch caliper. On size four (4) inch caliper and larger, the measurement shall be at a point 12 inches above ground level.

HEIGHT: Where height is more applicable than caliper, it shall be expressed in single foot divisions up to six (6) foot, and double foot units above six (6) feet. *Example: 4-5 ft.; 5-6 ft.; or 6-8 ft.; 8-10 ft.*

BRANCHING: Trees of single trunk configuration should be trimmed free of branches in balance with the overall height. A 5-6 ft. tree should have a clear trunk measurement of approximately four (4) feet. A 1 1/2 in. caliper tree should have a clear trunk measurement of five (5) to six (6) feet. Sometimes a single trunk tree is referred to as a "Standard". Other configurations (growing shapes) include "Multi-trunk" and "Clump." "Multi-Trunk" in its general usage is applied to any tree having two or more trunks which are trimmed free of branches in balance with its overall height. "Clump" generally means natural growth with several trunks or shoots from or near ground level which have not been trimmed free of branches. Albizzia, Cercis, and Chilopsis are examples of some trees on this list that are commonly grown and sold as "clumps."



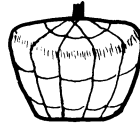
BRANCHING HEIGHT

TAKE CALIPER MEASUREMENT 6 INCHES ABOVE GROUND LEVEL IF 4 INCHES OR LESS
 IF MORE TAKE AT 12 INCHES

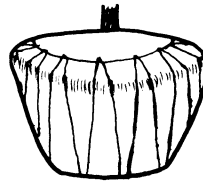


BALL DEPTH RATIO

DIAMETER LESS THAN 20 IN.
 DEPTH NOT LESS THAN 75% OF DIAMETER OR 3/4 OF WIDTH



DIAMETER 20 TO 30 IN.
 DEPTH NOT LESS THAN 66-2/3% OR 2/3 OF WIDTH



DIAMETER 31 IN. AND UP
 DEPTH NOT LESS THAN 60% OR 3/5 OF WIDTH
 BALLS WITH A DIAMETER OF 30 IN. OR MORE SHOULD BE DRUM-LACED

SHADE AND ORNAMENTAL TREES (CONTINUED)

BARE-ROOT SPECIFICATIONS: Many of the varieties listed in this group can be successfully transplanted during their dormancy period bare-root. It is recommended that bare-root specifications be established at a minimum of 40% wider root spread than the balled and burlapped (B&B) specifications.
Example: an Acacia of 1 3/4 - 2 in. caliper grade requires a ball size diameter of 15 inches. The bare-root minimum width would be 21 inches.

BALL WEIGHTS: A recommended ball size for any given tree can be specified but it is impossible to specify an average weight for that size. Different soil conditions with widely varying moisture holding capacities cause a wide disparity of weights in any size. Comparison of identical ball sizes from various parts of the state indicate that a differential of as much as 100% can be possible. It is recommended that ball weights not be considered in comparing or establishing criteria for ball sizes.

BALL DEPTHS: A ball of the proper diameter as specified herein must carry a minimum specified depth in order to encompass the necessary fibrous and feeder roots for successful transplanting. The following ratios are therefore specified:

1. Balls with diameters less than 20 inches – depth minimum at 75% of diameter.
2. Balls with diameters of 20-30 inches – depth minimum at 66 2/3% of diameter.
3. Balls with diameter over 30 inches – depth minimum at 60% of diameter.

SHADE AND
ORNAMENTAL TREES
(CONTINUED)

PRUNING: For the past several years, it has become more customary for dealers and nurserymen to stock, sell, and plant trees and other deciduous stocks unpruned. This is not the proper way to handle nursery stock. Greater livability and more vigorous growth can be had if all stock is properly pruned.

It is recommended that one-third to one-half of the **tops** of all **balled** deciduous trees and shrubs be removed by pruning. On **bare-root** stock it is recommended that the **tops** be pruned back one-half to two-thirds.

A properly pruned tree planted beside an unpruned tree of the same size will invariably develop into a larger and more symmetrical tree in a shorter period of time.

BALLED AND BURLAPPED (B&B) SPECIFICATIONS: The following table represents the recommended minimum size of balls for any shade or ornamental tree which has been grown in the field under favorable growing conditions receiving proper cultural and growing techniques to produce a quality tree. These recommendations are not applicable to native trees or to neglected nursery grown trees, particularly those grown without irrigation or cultivation. These ball recommendations are not applicable to "Bench-Balled" trees. These specifications are for nursery-grown trees that are dug with a ball of earth in which they are growing kept intact by covering with burlap or some other suitable material. In looser or sandier soils it is recommended that the ball be laced with twine or rope to help hold the soil in an unbroken, intact condition.

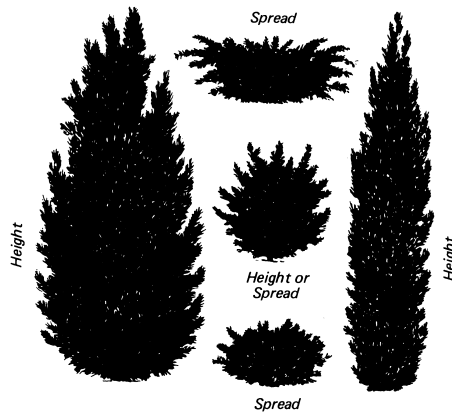
SPECIFICATION CHART USE: In order to determine the ball size for Southern Live Oak refer to *Quercus* under the Shade & Ornamental Tree Classification chart. Please note that it is classified as Group III. Now refer to the Group III classification chart as shown on page two. Please note that a 2 in. caliper tree has a recommended ball width of 20 inches; a 4 in. caliper tree is 36 inches.

For Sycamore check *Platanus* and find it is classified in Group IV. This group would indicate a 2 in. caliper Sycamore ball width at 16 inches; a 4 in. caliper Sycamore at 27 inches.

**Ball Size Classifications
For
Shade & Ornamental trees**

Refer the group classification for any variety listed in this section to the B&B classification chart on page 2 to find the proper ball size for any grade.

Specie	Ball Size Classification
Acacia	Group IV
Acer	Group IV
Albizzia	Group IV
Asimina	Group IV
Bauhinia	Group IV
Betula	Group IV
Carpinus	Group IV
Catalpa	Group IV
Ceratonia	Group IV
Cercis	Group IV
Celtis	Group IV
Chilopsis	Group IV
Cinnamomum	Group IV
Cornus	Group IV
Crataegus	Group IV
Cryptomeria	Group IV
Diospyros	Group IV
Elaeagnus	Group IV
Erythrina	Group IV
Eucalyptus	Group IV
Fraxinus	Group IV
Ginkgo	Group IV
Gleditsia	Group IV
Grevillea	Group IV
Jacaranda	Group IV
Laburnum	Group IV
Liquidambar	Group III
Liriodendron	Group IV
Koelreuteria	Group IV
Ligustrum	Group IV
Magnolia-Grandiflora	Group III
Melia	Group IV
Morus	Group IV
Nyssa	Group IV
Parkinsonia	Group IV
Pistacia	Group IV
Platanus	Group IV
Pinus	Group IV
Poinciana	Group IV
Populus	Group IV
Prunus	Group IV
Pyrus	Group IV
Quercus	Group III
Rhus	Group IV
Robinia	Group IV
Salix	Group IV
Sapindus	Group IV
Sapium	Group IV
Schinus	Group IV
Sophora	Group III
Sorbus	Group IV
Sterculia	Group IV
Tamarix	Group IV
Tilia	Group IV
Taxodium	Group IV
Ulmus	Group IV
Vitex	Group IV



Grading is by height on upright ornamentals; by spread on low growing or prostrate types. Some intermediate types may be by either height or spread.

Grading is by height on upright ornamentals; by spread on low growing or prostrate types. Some intermediate types may be by either height or spread.

ORNAMENTALS

Included in this classification are broadleaf evergreens, deciduous shrubs and coniferous evergreens. Some deciduous shrubs may also be used as flowering trees such as Lagerstroemia which is classified in this section.

GRADING: Because of the varying conditions of growth and types of plants covered in this section, grading must be given a rather broad scope. The four groups or classifications on page two contain generally accepted standard grade sizes as they are used in the trade. Most shrubs are usually graded by inch increments up to three feet. *Example: 10-12 inch or 18-24 inch.* On the other hand some vigorous growing shrubs may be graded in a 2-3 ft. grade instead of 24-30 inch and 30-36 inch either upright or spreading types of growth. *Examples: Dwarf Yaupon, California Privet, and Pfitzer Juniper.* The spread, height, and again spread respectively would be applicable to these varieties. A plant whose natural spreading habit of growth exceeds its height should be graded by spread.

BALL DEPTHS: Ball depths will carry the following minimum ratios:

Ball sizes with diameters less than 20 inches – depth not less than 75% of diameter.

Ball sizes with diameters 20 to 30 inches – depth not less than 66 2/3% of diameter.

Ball sizes with diameters over 30 inches – depth not less than 60% of diameter.

BARE-ROOT SPECIFICATIONS: Some of the deciduous species listed in this section may be handled quite readily and satisfactorily bare-root during their dormancy period. It is recommended that bare-root width be established at a minimum of 40% wider than the ball size specified for any given grade.

NURSERY GROWN: The ornamentals classification list and ball size specifications represent the recommended minimum ball sizes for all shrubs listed which are grown under favorable field growing conditions. It is not applicable to native or collected materials. It is not applicable to "Bench-Ball" sizes.

**Ball Size Classifications
For
Ornamentals**

Including Broadleaf, Coniferous and Deciduous varieties

Specie	Ball Size Classifications
Albelia	Group II
Agarita	Group I
Agave	Group I
Azalea	Group II
Bambusa	Group I
Berberis	Group II
Biota	Group II
Buddleia	Group IV
Buxus	Group II
Callistemon	Group I
Calycanthus	Group IV
Camellia	Group I
Cassia	Group II
Cedrus	Group II
Cestrum	Group II
Cleyera	Group I
Cofaderia	Group II
Cotoneaster, Spreading	Group I
Cotoneaster, Other	Group II
Cupressus	Group II
Cydonia	Group IV
Dasyliirion	Group I
Deutzia	Group IV
Duranta	Group II
Eleagnus	Group II
Eriobotrya	Group II
Euonymous, Dwarf	Group I
Euonymous, Other	Group II
Feijoa	Group II
Forsythia	Group IV
Gardenia	Group II
Gelsemium	Group I
Hibiscus - Althea	Group IV
Hibiscus - Chinese	Group II
Ilex, Spreading	Group I
Ilex, Upright	Group II
Ilex, Intermediate	Group I
Jasminum	Group II
Juniperus, Spreading	Group I
Juniperus, Columnar	Group II
Juniperus, Pyramidal	Group II
Juniperus, Intermediate	Group I
Kolkwitzia	Group IV
Lagerstroemia	Group IV
Lantana	Group I
Leucophyllum	Group II
Ligustrum	Group II
Lonicera	Group I
Magnolia	Group II
Magnolia, Deciduous	Group II

Mahonia	Group I
Malpighia	Group II
Musa	Group II
Myrtus	Group II
Nandina	Group II
Nerium	Group II
Osmanthus	Group II
Philadelphus	Group IV
Photinia	Group I
Pinus	Group II
Pittosporum	Group I
Plumbago	Group II
Podocarpus	Group II
Poncirus	Group II
Psidium	Group I
Prunus	Group II
Punica	Group II
Pyracantha	Group II
Raphiolepis	Group I
Salix, Dwarf	Group I
Salix, Other	Group IV
Santolina	Group I
Schefflera	Group II
Sophora	Group II
Spartium	Group IV
Spirea	Group IV
Syringa	Group IV
Tecoma	Group II
Ternstroemia	Group I
Thuja	Group II
Viburnum, Evergreen	Group I
Viburnum, Deciduous	Group IV
Weigela	Group IV
Wisteria	Group IV
Xylosma	Group I
Yucca	Group II

Refer the group classification for any variety listed in this section to the B&B classification chart on page 2 to find the proper ball size for any grade listed above.

FRUIT STOCKS It is becoming increasingly more common for various fruit stocks to be handled balled and burlapped. This chart is included for your convenience and to make this balled and burlapped (B&B) listing more complete and more useful.

Where small caliper is specified on small fruit trees, it may be translated to height specifications to fit the balled and burlapped (B&B) specification as follows:

5/16 to 7/16 in. caliper	2-3 ft.
7/16 to 9/16 in. caliper	3-4 ft.
9/16 to 11/16 in. caliper	4-5 ft.
11/16 to 3/4 in. caliper	5-6 ft.
3/4 in. to 1 in. caliper	6-8 ft.

BALL DEPTHS: Use the same specifications as other sections with the exception of Citrus and Persimmon, which must be as deep as the ball diameter.

NOTE: Refer to the following chart for specific group classifications of various fruit stocks.

**Ball Size Classifications
Fruit Stocks
Fruiting & Ornamental**

Specie	Ball Size Classifications
Almonds	Group IV
Apple	Group IV
Apples, Flowering Crab	Group IV
Apricot	Group IV
Cherry, reg.	Group IV
Cherry, Flowering	Group IV
Cherry, Bush	Group I
Citrus	Group II
Figs	Group IV
Peaches	Group IV
Peaches, Flowering	Group IV
Pears	Group IV
Persimmon	Group IV
Plums	Group IV
Pomegranate	Group IV

PALM SPECIFICATIONS

GRADING: Some varieties of Palm are dwarf and low growing while others grow substantial trunks in just a few years. Grading may be by over-all height in inches or feet or grading may be by trunk height, usually specified in feet. Trunk height shall be measured from ground level to the base of the heart leaf.

When specifying sizes of Palm, therefore, be sure to always indicate whether the size is over-all or trunk height.

BALL SIZES: Balls on all varieties shall be eight (8) inches diameter greater than trunk caliper, with the exception of Washingtonia varieties which shall be four (4) inches diameter greater than the trunk caliper. Trunk caliper in this instance means the trunk thickness or diameter at ground level.

Examples: A Phoenix Canariensis with an over-all height of 30 to 36 inches, with a trunk caliper of 8 inches at ground level would require a ball diameter of 16 inches.

A Washingtonia Robusta with a trunk height of 6 feet and a trunk caliper of 12 inches at ground level would require a ball diameter of 16 inches.

BALL DEPTH: Ball depths will be subject to the following minimum ratios:

Ball sizes with diameters less than 20 inches – the depth not to be less than 80% of the diameter.

Ball sizes with diameter greater than 20 inches – the depth not to be less than 70% of the diameter.

The growing of plant material cannot be rigidly standardized because of varying conditions of growth and methods of handling preferred or necessitated by climate, soil, and other conditions beyond the control of the grower. Judgment should therefore be exercised and allowances made in all schedules herein to agree with standard ball sizes which are recognized by the trade as typical of acceptable plants grown and successfully transplanted with minimum shock in that particular region.

**CONTAINER
SPECIFICATIONS**

All container grown trees, shrubs, etc. shall be healthy, vigorous, well rooted, and established in the container in which they are growing or sold.

Established container stock means stock that has been transplanted into a container and grown in that container long enough for new fibrous roots to have developed so that the root mass will retain its shape and hold together when removed from the container.

CONTAINER SIZE: Trade designation (of standard sizes).

1 Gallon: *Minimum of 5 1/2 inches across top and height of 6 inches or equivalent volume.*

2 Gallon: *Minimum of 7 inches across top and height of 7 1/2 inches or equivalent volume.*

5 Gallon: *(Including egg can and square can) Minimum of 9 inches across top and height of 10 inches or equivalent volume.*

Established container stock may be substituted for balled and burlapped material as long as other specification standards do not change. Container stock removed from the container and bench-balled is not an acceptable substitution for balled and burlapped (B&B) stock. All containers shall be strong enough to hold the soil mass intact during shipping and handling in order to ensure that the root system has not been unduly disturbed.

The table gives minimum sizes compatible with the standard container sizes listed above for certain general plant material.

Minimum Acceptable Grades

Plant Material	1 Gal.	2 Gal.	5 Gal.
Shade Trees	15-18 in.	24-30 in.	3-4 ft.
Ornamental trees	15-18 in.	18-24 in.	3-4 ft.
Deciduous Shrubs	9-12 in.	15-18 in.	2-3 ft.
Coniferous Evergreens	6-9 in.	12-15 in.	18-24 in.
Coniferous Evergreens, Dwf.	5-8 in.	10-12 in.	15-18 in.
Broadleaf Evergreens	6-9 in.	12-15 in.	18-24 in.
Broadleaf Evergreens, Dwf.	5-8 in.	10-12 in.	15-18 in.
Fruit Trees	15-18 in.	18-24 in.	2-3 ft.

Judgment must be exercised in interpreting and adapting these minimum acceptable grades in the various container sizes to any particular species or variety and consideration given to the normal growth habit under conditions existent to the region in which it is produced. The minimum sizes above may be one or two grades smaller than desired for many fast or strong growing varieties.