TREES

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TREES

GRADING SHADE TREES

INTRODUCTION

Since most trees have a life expectancy of many years, it is important to plant good quality trees. The quality or grade of a tree at planting can have a large impact on longevity in the landscape. Tree quality is based on trunk, branch, crown, leaf and root characteristics.

Large-maturing trees which are allowed to develop a double or multiple trunk should not be planted. These are sturdy when they are young but could become increasingly hazardous as they grow larger. Except for small-maturing trees normally grown with multiple trunks, such as crape-myrtle, buttonwood, Japanese ligustrum and others, nursery trees should have one trunk up through the center to the top of the tree. Live oak and some other trees can grow with a modified dominant leader as shown in Fig. 1 on page 10 (**Florida Fancy**). Branch diameter should not be larger than $^{2}/_{3}$ the diameter of the trunk measured directly above the branch. There should be no flush cuts anywhere on the tree and no open injuries on the trunk or major branches. The crown should be full of foliage and show little, if any, evidence of chlorosis, necrosis, disease or insect infestation. The root ball should be appropriately sized (see any matrix, e.g., page 14). Such a tree is given the top grade—**Florida Fancy**.

Trees graded **Florida #1** may require some corrective pruning so they develop good trunk and branch structure. They may have minor trunk injuries or could have other defects. Defects can be corrected by pruning the tree once or twice within a year or two after planting.

Florida #2 is a lesser grade. These trees require major corrective pruning to form a structurally strong tree, or are badly misshapen. Great skill and effort (two or more prunings) are required to develop a structure in these trees which will promote longevity. Defects may take several years to correct.

The lowest grade is a **Cull**. Defects are not correctable. These trees lack vigor and/or have poor trunk and branch structure or circling roots. They have other problems such as open wounds, flush cuts or loose root ball which may prevent them from becoming established in the landscape. If they become established, long life is unlikely.

The better grades of trees will require less pruning after planting, and they will establish more quickly. These have been properly trained and pruned in the nursery to develop a structure which will be resistant to damage from winds and other outside forces. Most tree maintenance budgets have not been developed to allow for pruning a tree after planting, so it makes sense to start with a tree which is healthy and well formed. If there is a large tree- pruning allocation in the landscape maintenance budget, trees with the poorer grades may be trained into sturdy trees in the landscape by skilled arborists.

Special Note: There is a specialty market for trees trained into forms which are not typical of their normal growth habit. Examples include standards, braided stems, poodles, espalier, topiary and bonsai, to name a few. When grading these trees, the height, spread and root-ball diameter-to-caliper relationships outlined in the matrices for these grades and standards do not apply. Therefore, when grading such trees, enter the grading process outlined below beginning at Step 6, skipping Steps 1 through 5. Large-maturing trees, such as oaks, are always graded beginning with Step 1 unless the planting specifications indicate that the trees will be maintained as topiaries or other small, clipped specimens throughout their lives in the landscape.

Grades established for trees (Florida Fancy, Florida #1, and Florida #2) do not apply to trees used in wetland mitigation. For trees used in wetland mitigation, refer to the wetland section of this manual.

STEPS FOR DETERMINING THE GRADE OF A TREE

Skip Steps 1, 2 and 4 (below) if you are grading crape-myrtle, cattleya guava, wax privet, yaupon holly, lignum-vitae, wax-myrtle or other, similar small-maturing ornamental trees. See Small Tree Apendix (page 57) for a partial list of these small maturing, ornamental trees.

Skip Steps 1 through 5 below if you are grading specialty plants like standards, braided stems, poodles, espalier, topiary and bonsai; and ignore Steps 9a, 9f, 9h, 9i and 9j. In addition, ignore Step 8a if grading espaliers. Skip Step 2 if you are grading conifers (e.g., pines), magnolias, hollies, loblolly bay, bald-cypress and other narrow, upright trees (see Narow, Upright Tree Appendix - page 57).

Step 1. Look inside the crown of the tree at the trunk form. Grade the tree according to the drawings and captions in Fig. 1 (page 10). Trees with one dominant trunk are graded Florida Fancy. Those with double or multiple trunks are given a lesser grade depending on the extent of the defect. Circle the appropriate grade below based on trunk form only.

Florida Fancy **Florida #1** **Florida #2** **Cull**

Step 2. Check branch arrangement. Grade the tree according to the drawings and captions in Fig. 2 (page 11). Trees with optimum branch arrangement are graded as Florida Fancy. Those with branch arrangement defects are given a lesser grade according to the extent of the defects. Circle the appropriate grade below based on branch arrangement only. **Note:** All conifers (e.g., pines), magnolias, hollies, loblolly bay, bald-cypress and other narrow, upright (see Narrow, Upright Tree Appendix - page 57) trees are exempt from Step 2.

Florida Fancy **Florida #1** **Florida #2** **Cull**

Step 3. Choose the appropriate tree matrix type based on the natural form of the tree as it should appear in the nursery (see Index of Trees on pages 37-44 for guidance).

Appropriate matrix type: _____

Refer to the appropriate matrix type for Step 5. Matrix 1 - page 14; Matrix 2 - page 20; Matrix 3 - page 26; Matrix 4 - page 30; Matrix 5 - page 34.

Step 4. Measure the caliper of the trunk.

Caliper: _____

Step 5. Locate the caliper of the tree in the left column of the appropriate matrix chart chosen in Step 3. (For multistemmed crape-myrtle, cattleya guava, wax privet, wax-myrtle or other similar trees (see Small, Ornamental Tree Appendix - Page 57), find the container size or root-ball diameter of the plant you are grading and ignore the caliper). Grade the tree according to the minimum crown spread diameter (see Fig. 5 on page 45). A tree must have a spread equal to or larger than the minimum for the grade. Circle the appropriate grade below based on minimum crown spread only.

Florida Fancy **Florida #1** **Florida #2** **Cull**

Step 6. Grade the tree according to structural uniformity of the crown (see Fig. 3 on page 12). Circle the appropriate grade below based on structural uniformity only. Skip Step 6 when grading weeping yaupon holly and other trees with a naturally irregular canopy.

Florida Fancy **Florida #1** **Florida #2** **Cull**

Step 7. What is the lowest grade determined in Steps 1, 2, 5 and 6?
Grade: _____

Step 8. If one or more of the following statements (a, b, c, d, e, f, or g) are true, reduce the grade determined in Step 7 by one.

T	F	
☐	☐	a) The tree with a trunk caliper larger than 1" requires a stake to hold it erect.
☐	☐	b) The root ball or container is undersized (consult any tree matrix).
☐	☐	c) The root ball on a B&B tree is not secured tightly with pins, twine or wire.
☐	☐	d) The tree is excessively root-bound.

T F

☐ ☐ e) There is evidence that one or more large roots (greater than 1/5 the diameter of the trunk) were growing out of the container

☐ ☐ or grow bag (see Fig. 9 on page 47).

☐ ☐ f) The crown is thin and sparsely foliated. Many evergreen oaks and other trees are thin and sparsely foliated in late winter/ early spring just prior to the spring growth flush. Recently dug field-grown trees might also be thin. Do not downgrade for this.

☐ ☐ g) More than 5% of branches have tip die-back.

Grade: _____

Step 9. If two of the following statements (a-j) are true, reduce the grade determined in Step 8 by one. If more than two of the statements (a-j) are true, reduce the grade by two. **Note:** It takes only one true statement to reduce a Florida Fancy to a Florida #1. Three true statements are required to reduce a Florida Fancy to a Florida #2.

T F

☐ ☐ a) Tree height (see Fig. 11 on page 47) is shorter than the minimum height or taller than the maximum height specified in the appropriate matrix chart. Plants such as wax privet and other small multistemmed specialty plants should not be downgraded if they are shorter than the minimum height.

☐ ☐ b) Flush cuts were made when pruning branches from the trunk (see Fig. 4 on page 13).

☐ ☐ c) Branch stubs are left beyond the branch collar (see Fig. 4 on page 13). A branch stub can be removed and not reduce the grade.

☐ ☐ d) Open trunk wounds or other bark injury is evident. (Open trunk wounds must be less than 10% of the trunk circumference and less than 2 inches tall on Florida #1 trees. An open pruning scar on the trunk resulting from removing a branch is not considered an open trunk wound.)

T F

☐ ☐ e) Graft unions are not complete.

☐ ☐ f) More than the lower 40% of the trunk is free of branches. (The portion of the lower trunk with shortened, temporary branches is not considered part of the clear trunk; it is considered part of the canopy.) *

☐ ☐ g) More than 5% of the leaves are chlorotic; or more than 5% of the canopy exhibits damage from pests and diseases. **Note:** A Florida #1 cannot have more than 10% of the leaves chlorotic or more than 10% of the canopy damaged from pests or diseases.

☐ ☐ h) Most leaves are smaller than normal.

☐ ☐ i) There is bark included between the trunk and a major lateral branch or between main trunks (Fig. 7a on page 46).

☐ ☐ j) Trunks and/or major branches are touching. Secondary branches on major branches may touch each other.

Final Grade: _____

Step 10. The tree is a Cull if it has a root greater than 1/10 the diameter of the trunk circling around more than 1/3 of the trunk in the top half of the root ball. Circling roots can be found on the periphery of the root ball or inside the root ball (Fig. 8 on page 46). Those inside the root ball result from being in a smaller container when the tree was younger. Circling roots less than 1/3 the trunk diameter can be cut at the point where they begin to circle. Following cutting, the tree is no longer a Cull.

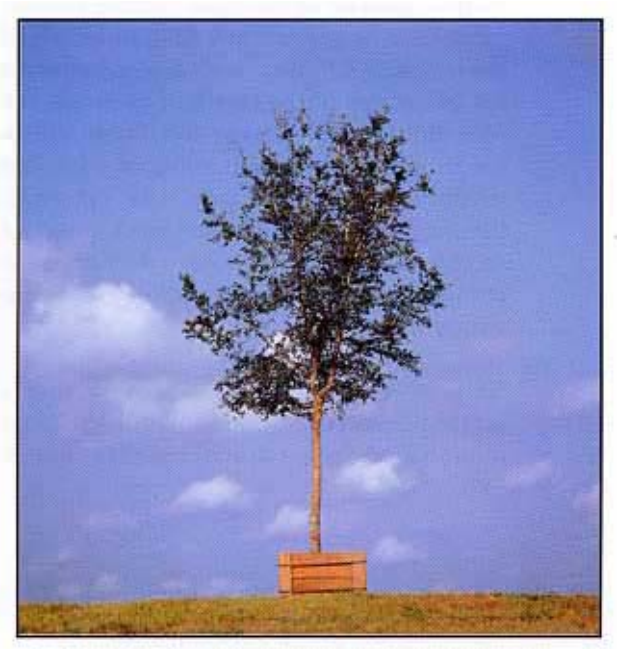
*If planting specifications require that a larger portion of the trunk should be clear of branches, do not downgrade for Step 9f.

EXAMPLE I

Grade a container-grown live oak (shown below) with a 3" diameter trunk, 6" above the ground. The tree is 14' tall with a 66" branch spread. The crown is full and the foliage is normal-sized and dark green. The root ball measures 34" in diameter and is tightly bound in wire. The bark is all intact and there are no flush cuts evident.

Step 1. Look inside the crown of the tree at the trunk form. Grade the tree according to the drawings and captions in Fig. 1 (page 10). Trees with one dominant trunk are graded Florida Fancy. Those with double or multiple trunks are given a lesser grade depending on the extent of the defect.

Grade: Florida #2
The drawings and description of a Florida #2 in Fig. 1 most closely match the condition of the example tree. That is, the trunk divides into 2 equal-sized trunks in the bottom 1/2 of the tree. (This is difficult to see in this photograph. Look carefully at the bottom of the canopy.)



Quercus virginiana - live oak
Florida #2

Step 2. Check branch arrangement. Grade the tree according to the drawings and captions in Fig. 2 (page 11). Trees with optimum branch arrangement are graded as Florida Fancy. Those with branch arrangement defects are given a lesser grade according to the extent of the defects.

Grade: Florida Fancy
Branches are well-spaced along the trunk of the example tree and none are growing in the vertical position.

Step 3. Choose the appropriate tree matrix type based on the natural form of the tree as it should appear in the nursery (see Index of Trees on pages 37-44 for guidance).

Appropriate matrix type: Matrix 1, Spreading and round trees. (The Index of Trees indicates Matrix 1 is appropriate for live oak.)

Step 4. Measure the caliper of the trunk.

Caliper: 3"
The caliper of the example tree is 3".

Step 5. Locate the caliper of the tree in the left column of the appropriate matrix chart chosen in Step 3. Grade the tree according to the minimum crown spread diameter (see Fig. 5 on page 45). A tree must have a spread equal to or larger than the minimum for the grade.

Grade: Florida Fancy

Find the three numbers in Matrix 1 indicating minimum crown spread diameter for the 3 " caliper example tree. The tree is a Florida Fancy because the crown spread is 66".

Step 6. Grade the tree according to structural uniformity (see Fig. 3 on page 12).

Grade: Florida Fancy
The example tree has a nearly uniform crown as shown in Fig. 3.

Step 7. What is the lowest grade determined in steps 1, 2, 5 and 6?

Grade: Florida #2
The grade determined in Step 1 = Florida #2, in Step 2 = Florida Fancy, in Step 5 = Florida Fancy and in Step 6 = Florida Fancy.

Step 8. If one or more of the following statements are true, reduce the grade determined in Step 7 by one.

T F
- ☐ ■ a) The tree requires a stake to hold it erect.
- ☐ ■ b) The root ball or container is undersized (consult any matrix).
- ☐ ■ c) The root ball is not secured tightly with pins, twine or wire.
- ☐ ■ d) Tree is excessively root-bound.
- ☐ ■ e) There is evidence that one or more large roots (greater than 1/5 the diameter of the trunk) were growing out of the container or grow bag (see Fig. 9 on page 47).
- ☐ ■ f) The crown is thin and sparsely foliated.
- ☐ ■ g) More than 5% of branches have tip die-back.

Grade: Florida #2
The grade determined in Step 7 is not reduced because all statements in Step 8 are false.

Step 9. If two of the following statements (a-j) are true, reduce the grade determined in Step 8 by one. If more than two of the statements (a-j) are true, reduce the grade by two. **Note:** It takes only one true statement to reduce a Florida Fancy to a Florida #1. Three true statements are required to reduce a Florida Fancy to a Florida #2.

T F
- ☐ ■ a) Tree height (see Fig. 11 on page 47) is shorter than the minimum height and taller than the maximum height specified in the appropriate matrix chart. Plants such as wax privet and other multistemmed specialty plants should not be downgraded if shorter than the minimum height.
- ☐ ■ b) Flush cuts were made when pruning branches from the trunk (see Fig. 4 on page 13).
- ☐ ■ c) Branch stubs are left beyond the branch collar (see Fig. 4 on page 13). A branch stub can be removed and not reduce the grade.
- ☐ ■ d) Open trunk wounds or other bark injury is evident. (Open trunk wounds must be less than 10% of the trunk circumference and less than 2 inches tall on the Florida #1 trees.)
- e) Graft unions are not complete.
- ☐ ■ f) The bottom 40% of the tree has no
- ☐ ■ branches.
- ☐ ■ g) More than 5% of the leaves are chlorotic, or more than 5% of the canopy exhibits damage from pests and diseases. **Note:** A Florida #1 cannot have more than 10% of the leaves chlorotic or more than 10% of the canopy damaged from pests or diseases.
- h) Most leaves are smaller than normal.
- ☐ ■ i) There is bark included between trunk and
- ☐ ■ a major lateral branch or between main trunks (see Fig. 6 on page 45).
- j) Trunks and/or major branches are
- ☐ ■ touching.

Step 10. The tree is a Cull if it has a root greater than 1/10 the diameter of the trunk circling around more than 1/3 of the trunk (see Fig. 8 on page 46). The tree has no such circling roots, so this step does not apply.

Final Grade: Florida #2
The grade determined in Step 8 is Florida #2. None of the statements in Steps 9 and 10 are true, so the grade remains Florida

EXAMPLE 2

Grade a wax privet 4 feet tall with a 6-foot crown spread grown in a 15-gallon container (shown below). There is a root circling around 1/5 the trunk just below the surface of the media 2 inches from the trunk. The tree stands erect by itself and is well-established in the container. There is chlorosis on 4% or 5% of the foliage, and the tree was topped in the nursery to create a denser crown. Most leaves are smaller than normal. There is bark included between the trunk and several major branches, but no trunks or major branches are touching one another.

Skip Steps 1, 2 and 4 because you are grading a multistemmed small-maturing tree. See Small Tree Appendix (Page 57) for a partial list of these small maturing, ornamental trees.

Step 3. Choose the appropriate tree matrix type based on the natural form of the tree as it appears in the nursery (see Index of Trees on pages 37-44 for guidance).

Appropriate tree matrix type: Matrix 4, vase shaped. (The Index of Trees indicates Matrix 4 is appropriate for wax privet.)

Step 5. Locate the caliper of the tree in the first column of the appropriate matrix type chosen in Step 3. (For multistemmed crape -myrtle, cattleya guava, wax privet, wax-myrtle or other similar trees (see Small, Ornamental Tree Appendix - Page 57) of small stature, find the container size or root ball diameter of the plant you are grading, and ignore the caliper.) Grade the tree according to the minimum crown spread diameter (see Fig. 5 on page 45). A tree must have a spread equal to or larger than the minimum for that grade.

Grade: Florida Fancy
Find the three numbers in Matrix 4 indicating minimum crown spread diameter for a 15-gallon tree. The tree is Florida Fancy because the crown spread diameter is 6 feet, above the 36-inch minimum for Florida Fancy.

Step 6. Grade the tree according to structural uniformity (see Fig. 3 on page 12).

Grade: Florida #1
The example tree has a portion of the crown missing and most closely matches the Florida #1 drawing in Figure 3.

Step 7. What is the lowest grade determined in Steps 1, 2, 5 and 6?

Grade: Florida #1
Steps 1 and 2 were skipped because the tree you are grading is a small, multi-stemmed tree, the grade determined in Step 5 was Florida Fancy, and the grade determined in Step 6 was Florida #1. The lowest grade is Florida #1.

Step 8. If one or more of the following are true, reduce the grade determined in Step 7 by one.

T	F	
☐	■	
☐	■	a) The tree requires a stake to hold it erect.
☐	■	b) The root ball or container is undersized (consult any tree matrix).
☐	■	

Ligustrum japonicum - wax privet
Florida #1

T F

☐ ■ c) The root ball is not secured tightly with pins, twine or wire.

d) The tree is excessively root bound.

e) There is evidence that one or more large

☐ ■ roots (greater than 1/5 the diameter of the

☐ ■ trunk) were growing out of the container or grow bag (see Fig. 9 on page 47).

f) The crown is thin and sparsely foliated.

g) More than 5% of branches have tip die-back.

Grade: <u>Florida #1</u>
There is no reason to reduce the grade from Step 7 since none of the above are true.

Step 9. If two of the following are true, reduce the grade determined in Step 8 by one. If more than two of statements a-j are true, reduce the grade by two. **Note:** It takes only one true statement to reduce a Florida Fancy to

☐ ■ a Florida #1. Three true statements are required to reduce a Florida Fancy to a Florida #2.

a) Tree height (see Fig. 11 on page 47) is shorter than the minimum height and taller than the maximum height specified in the appropriate matrix chart. Plants such as

☐ ■ wax privet and other small multistemmed specialty plants should not be downgraded if they are shorter than the minimum

☐ ■ height.

b) Flush cuts were made when pruning branches from the trunk (see Fig. 4 on page 13).

T F

☐ ■ c) Branch stubs are left beyond the branch collar (can remove a branch stub and not reduce the grade provided the stub is less than 2 inches long).

d) Open trunk wounds or other bark injury is

☐ ■ evident. (Open trunk wounds must be

☐ ■ less than 10% of the trunk circumference and less than 2 inches tall on Florida #1

☐ ■ trees.)

e) Graft unions are not complete.

f) The bottom 40% of the tree has no branches.

g) More than 5% of the leaves are chlorotic; or more than 5% of the canopy exhibits damage from pests and diseases. **Note:**

■ ☐ A Florida #1 cannot have more than 10%

■ ☐ of the leaves chlorotic or more than 10% of the canopy damaged from pests or diseases.

☐ ■ h) Most leaves are smaller than normal.

i) There is bark included between trunk and a major lateral branch or between main trunks (see Fig. 7 on page 46).

j) Trunks and/or major branches are touching.

Final Grade: <u>Florida #2</u>
Two of the above statements are true: (h) and (i). Therefore, the tree is downgraded from Step 8 to Florida #2. Two statements need to be true in order to downgrade a Florida #1 to Florida #2.

Step 10. The tree is a Cull if it has a root circling around more than 1/3 of the trunk in the top half of the root ball. There is a circling root but it only circles about 1/5 of the trunk so the grade is not reduced. If the root circled more than 1/3 of the trunk, the tree would be a Cull (see Fig. 8 on page 46).

STEP 1—Determining the Quality of Trunk Structure

Instructions: Locate the drawing, caption and associated text below that most closely represents the trunk structure of the tree you are grading. Circle the appropriate tree grade at the end of Step 1 on page 2.

(For photographic examples see Shade Tree Appendix pages 49-56.)

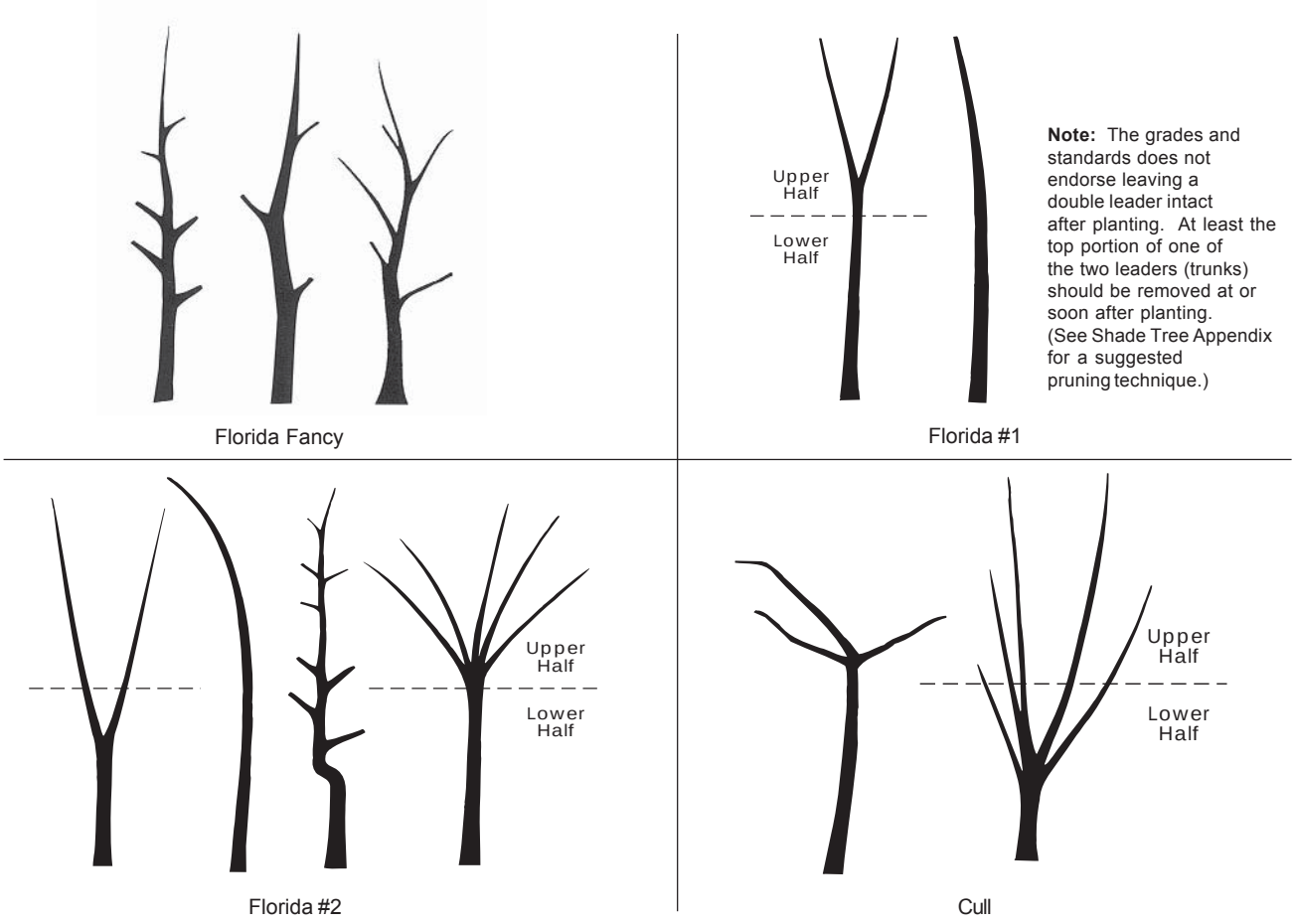


Figure 1.

Florida Fancy—There is one trunk, more or less in the center of the tree as shown above. It may be straight or have a very slight bow less than 5°. Some trees such as Chinese elm, live oak, royal poinciana, Jerusalem thorn, mahogany and some others can be grown with a modified (not straight) trunk as shown on the right and center. The tip of the leader on the main trunk must be intact and its terminal bud must be the highest part of the tree. No trunk or branch can have a diameter greater than 2/3 the trunk diameter measured directly above the branch crotch. If the trunk divides in two nearly equal-diameter stems in the upper 10% of the tree, the trunk is not downgraded to a Florida #1.

Florida #1—The trunk branches (forks) into two nearly equal-diameter trunks in the upper 1/2 of the tree. (If one trunk is 2/3 or less than the diameter of the other trunk, they do not have equal diameters, making the trunk Florida Fancy.) A noticeable but small void will be left in the crown after removing the top portion of one of the trunks. If there is one trunk, but it has a 5° to 15° bow, grade it Florida #1. The tip of the leader on the main trunk must be intact and its terminal bud must be the highest part of the tree.

Florida #2—The trunk branches into two nearly equal trunks along the lower 1/2 of the tree as shown on the left; or, the trunk branches into three or more nearly equal-diameter trunks in the upper 1/2 of the tree as shown on the right. (Do not downgrade the tree if competing trunks are 2/3 or less the diameter of one main trunk measured above the crotch.) Pruning to create only one trunk will leave a large void in the crown. If there is one trunk, but it has a bow greater than 15° or a dogleg (see Glossary), grade it Florida #2. A dogleg in the crown of the tree is not a downgrading factor.

Cull—The trunk branches into three or more nearly equal-diameter trunks along the lower 1/2 of the trunk.

STEP 2—Determining the Quality of Branch Arrangement

Instructions: Locate the drawing, caption and associated text below that most closely represents the branch structure of the tree you are grading. Circle the appropriate tree grade at the end of Step 2 on page 4. **Note:** All conifers, magnolias, hollies, loblolly bay and other narrow, upright trees (see Narrow, Upright Tree Appendix - Page 57) are exempt from Step 2. Major branches on trees less than 5 feet tall do not have to be 4" or 6" apart to meet Florida #1 or Florida Fancy standards, respectively.

(For photographic examples see Shade Tree Appendix pages 49-56.)

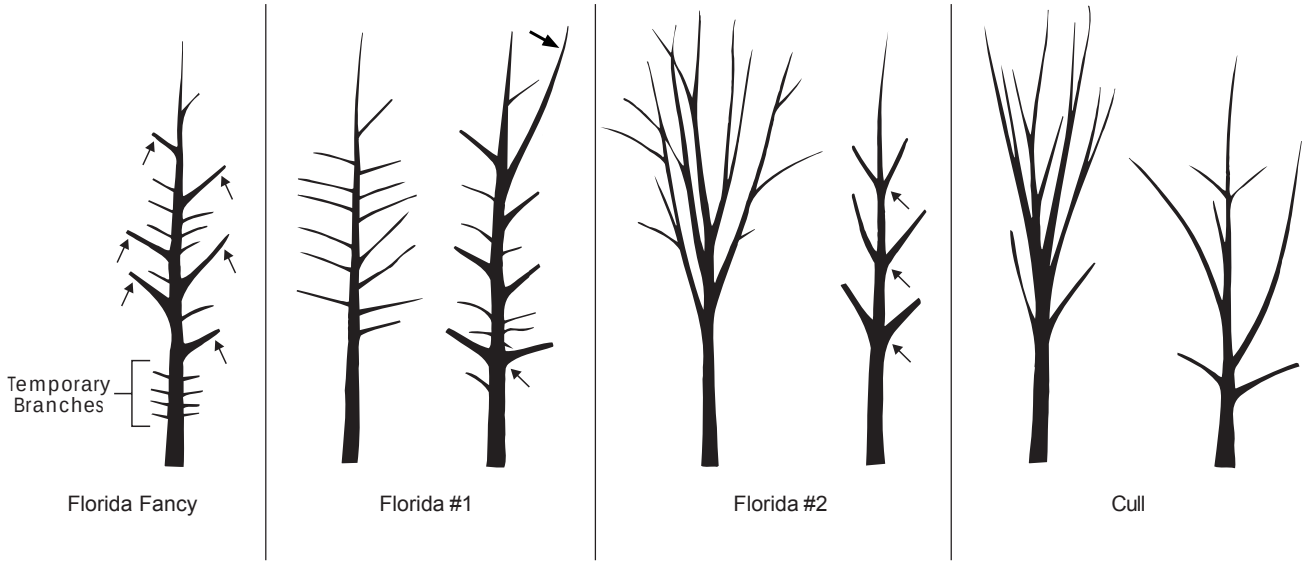


Figure 2.

Florida Fancy—Several branches are larger in diameter (and obviously more dominant) than others. These (indicated by arrows) should be spaced at least 6" apart along the trunk. No branches are greater than 2/3 the diameter of the trunk measured directly above the branch. No major branches are oriented nearly vertical with the trunk. There may be temporary branches on the lower trunk, but these should be no larger than 1/5 the diameter of the trunk.

Florida #1—All branches are more or less equally dominant as shown in the left illustration; or, as shown in the illustration on the right, there are several dominant major branches but two are nearly equal diameter and less than 4" apart (see arrow at bottom). Other major branches of nearly equal diameter are at least 4" apart. One branch in the upper half of the tree can be greater than 2¤3 the diameter of the trunk measured directly above the branch. No branch tips are taller than the trunk (see arrow). **Note:** A number of trees such as bald-cypress, and others with an excurrent (strong dominant leader) growth habit naturally have many lateral branches with a similar diameter. These trees should not be downgraded to Florida #1 due to this growth habit. (See page 4 for trees exempt from step 2.)

Florida #2—Most major branches are oriented vertically; and/or nearly equal-diameter major branches are located within 4" of each other at two or more positions on the trunk (see arrows); and/or one or more branches in the lower half of the tree are larger than 2/3 the diameter of the trunk measured directly above the branch.

Cull—All branches are growing vertically, and they are forming narrow angles with the trunk; or most major branches are growing from the same point on the trunk. Culls may have only a few large branches as in the illustration on the right. Some are less than 4' from the ground. Several branches of nearly equal diameter are opposite each other on the trunk.

STEP 6 - Determining the Structural Uniformity of the Crown

Instructions: Identify the drawing, caption and associated text below that most closely represents the structural uniformity of the tree you are grading. Circle the appropriate tree grade at the end of Step 6 on page 4.

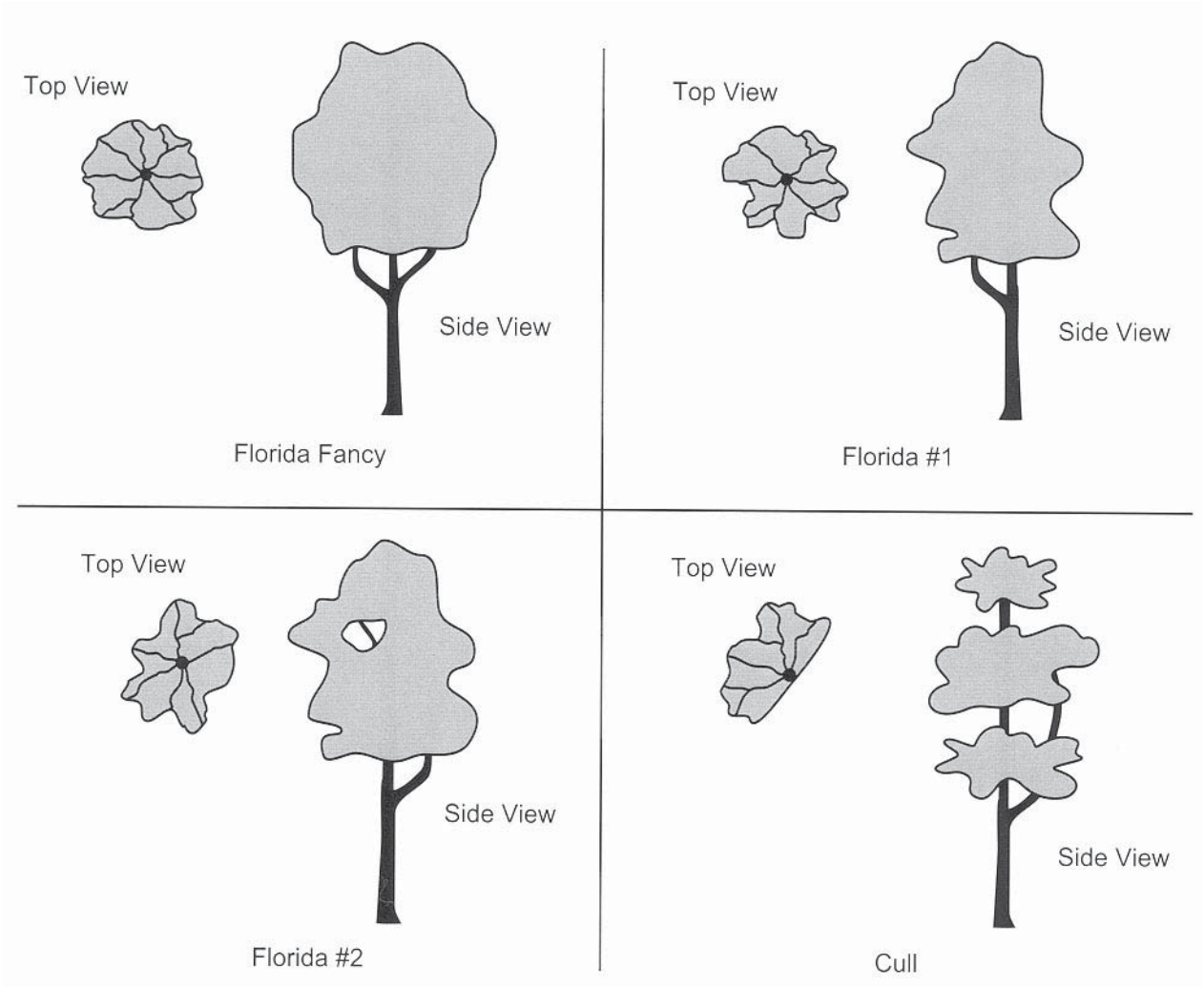


Figure 3.

Florida Fancy—Branches are evenly distributed around the trunk. No major branch is located directly above another. The crown is full of foliage which is evenly distributed around the tree.

Florida #1—One major branch may be located directly above another but the others are nearly evenly distributed around the trunk. The crown is not completely full of foliage and there may be some small voids.

Florida #2—Branches are not evenly distributed around the trunk. Several are growing from the same side of the trunk and two or more may be located directly above others. The crown has a large void.

Cull—The tree is one-sided or is flat-sided. Major branches are growing from only one or two sides of the trunk. There are large gaps in the crown.

Step 9 - Determining If Pruning Cuts Were Made Correctly

Instructions: Locate the photograph, drawing, caption and associated text below which most closely represents the condition of the pruning scars on the tree you are grading. Check the 'true' column in Step 9-b if incorrect pruning cuts were made. Check the 'false' column if correct pruning cuts were made, and if there are no trunk injuries.

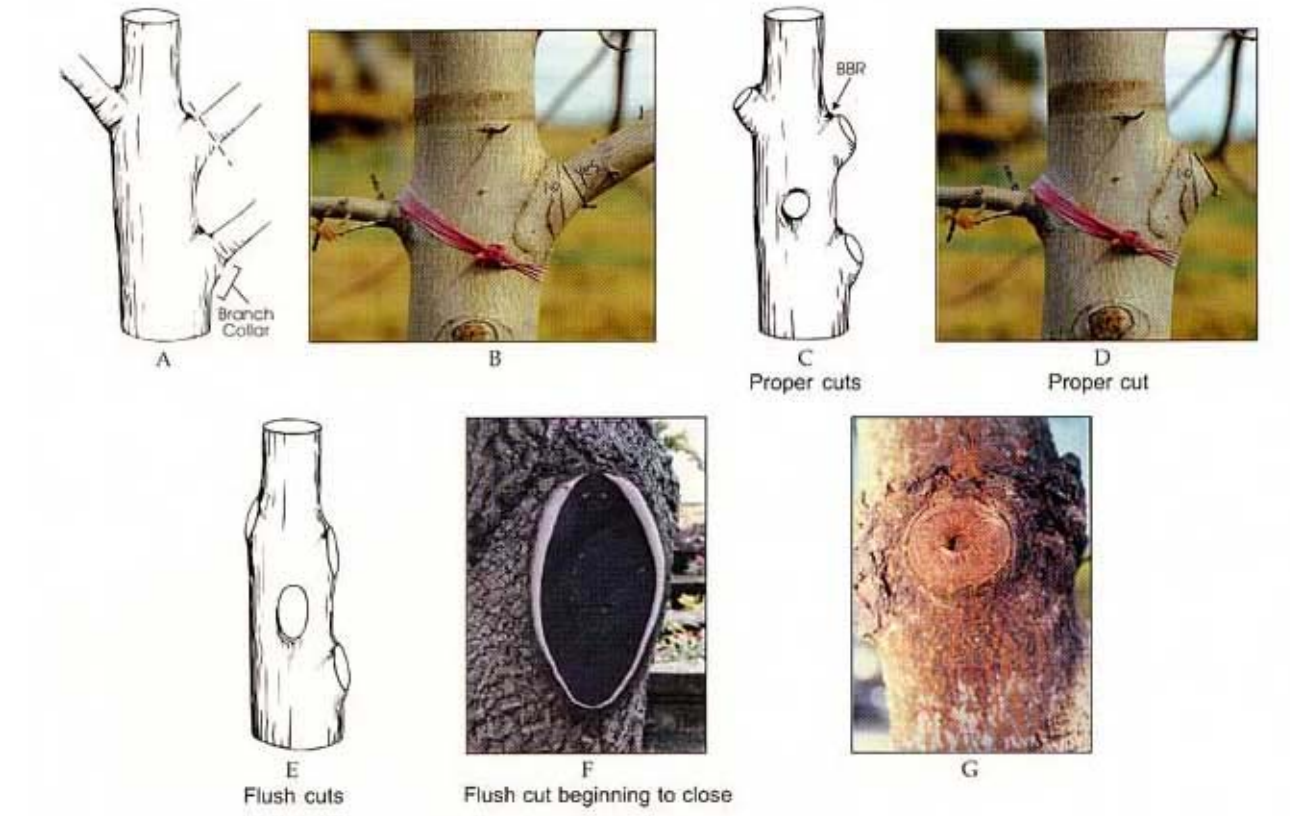


Figure 4.

Fig. 4A—Notice the swelling at the base of each branch. This is trunk tissue (called the branch collar) and helps hold the branch securely on the trunk. A proper cut is made along the dashed line.

Fig. 4B—Cut along the line just to the left of the word 'yes' to properly remove the branch. If the cut is made closer to the trunk, this is a flush cut. If it is made farther from the trunk, a stub will be left.

Fig. 4C—This shows how to properly remove branches from the trunk. Always cut to the outside of the branch collar and branch bark ridge (BBR). Notice that the branch bark ridge is still visible on top of the pruning cut and the pruning scar is nearly circular.

Fig. 4D—This shows a properly executed pruning cut (right hand side of photograph).

Fig. 4E—Never make a flush cut as shown here. Notice that the branch bark ridge is missing from the top of the pruning cut. This improper cut, usually oval, initiates trunk decay and can reduce growth in the nursery and landscape after planting.

Fig. 4F—The pruning scar and the woundwood or callus growth which begins to close over the pruning scar from an improperly executed pruning cut is often shaped like an oval. Callus is often missing from the top or bottom of the pruning scar on an improperly executed pruning cut.

Fig. 4G—Woundwood or callus growth around a proper pruning cut is circular.

Some species have no swelling at the base of branches, and it may be more difficult to determine exactly where to make a proper pruning cut. Always begin the cut to the outside of the branch bark ridge, and angle it away from the trunk.

EXAMPLES

apple, pitch-
bauhinia
bay, red-
camphor tree
carambola
citrus
dogwood, flowering
fig, fiddle-leaf
fig, rusty
fig, weeping
floss silk tree
goldenrain tree
gumbo limbo
holly, round
kapok
laurel, Cuban-
lychee
loquat

TYPE ONE MATRIX — SPREADING & ROUNDED SHAPES

CALIPER	MINIMUM TREE HEIGHT	MAXIMUM TREE HEIGHT	MINIMUM CROWN SPREAD DIAMETER			MINIMUM B&B ROOT-BALL DIAMETER	MINIMUM GROW BAG ROOT-BALL DIAMETER	MINIMUM CONTAINER VOLUME
			FL. FAN.	#1	#2			
1/4"	18"	30"	10"	8"	6"	6"	—	4" Sleeve
1/2"	24"	6'	14"	12"	8"	8"	—	1 Gal.
3/4"	4'	8'	30"	24"	18"	14"	—	3 Gal.
1"	5'	10'	36"	30"	24"	16"	12"	5 Gal.
1 1/4"	6'	11'	42"	36"	30"	18"	14"	7 Gal.
1 1/2"	7'	12'	48"	42"	34"	20"	16"	15 Gal.
2"	8'	15'	54"	48"	42"	24"	18"	15 Gal.
2 1/2"	9'	16'	60"	54"	48"	28"	18"	25 Gal.
3"	10'	18'	66"	60"	54"	32"	20"	45 Gal.
3 1/2"	11'	18'	6'	5 1/2'	5'	36"	24"	65 Gal.
4"	12'	22'	7'	6 1/2'	6'	40"	30"	95 Gal.
4 1/2"	14'	24'	8'	7 1/2'	7'	44"	36"	95 Gal.
5"	16'	26'	10'	9'	8'	48"	36"	95 Gal.
5 1/2"	17'	28'	11'	10'	9'	50"	—	200 Gal.

Notes:

1. Trees to be graded under this matrix are listed in the index of trees on pages 37-44.
2. Any liner less than 1/4" caliper shall be a minimum of 12" in height, well-rooted in its container which shall not be less than 2" in diameter. Bare-root trees shall be so noted.
3. Ball depth on B&B stock shall be at least 2/3 of the root-ball diameter shown. For trees larger than 5 1/2" caliper, root-ball diameter shall be 8.5" for each inch of tree caliper. Trees grown in soils with a high water table can have shallower root balls provided the root-ball diameter is increased to the next larger tree size in the table.
4. Red or black mangrove may be a minimum of 18" overall height in a 1-gallon container, 24" overall height in a 3-gallon container.
5. For the purpose of determining minimum root-ball size, cured trees can have a caliper up to 1" larger than indicated in the table.
6. ANZI Standards Z60.1 designations for container size (e.g. #3, #15, #30, etc.) can be substituted for minimum spread diameter

EXAMPLES

mahoe
mango
mangrove, black
oak, laurel
oak, live
oak, sand live
oak, water
oak, white
olive, black-
olive, spiny black-
pagoda tree, Japanese
rubber tree, Indian-
sausage tree
shaving brush tree
silk-cotton tree, red
sycamore
tamarind
weeping willow

TYPE ONE MATRIX

Scientific Name: ***Cinnamomum camphora* (L.) Sieb**
Common Name: **camphor tree**

Florida Fancy—Branches are well-distributed along the single trunk.

Florida #1—The trunk is straight and nicely formed but more than 5% of the leaves are chlorotic.

Florida #2—The crown is not uniform, making the tree, at most, a Florida #1. The tree is downgraded to a Florida #2 because there are no branches on the lower 40% of the trunk, and the tree is too tall for the caliper of the trunk.

Florida Fancy

Florida No. 1

Florida No. 2

Florida Fancy

TYPE ONE MATRIX

Scientific Name: ***Bucida buceras***
Common Name: **black-olive**

Florida Fancy—Branches are well-distributed along a dominant trunk, and the crown is uniform and full of foliage.

Florida #1—Branches are well-distributed along a straight dominant trunk, but the crown is not uniform and is thin.

Florida #2—The trunk forks in the bottom half of the tree and the canopy is sparse. There are few branches on the tree, and they are not well distributed along the trunk.

Florida No. 1

Florida No. 2

TYPE ONE MATRIX

Scientific Name: ***Citrus* sp.**
Common Name: **citrus**

Florida Fancy

Florida Fancy—The crown is well-formed and nearly symmetrical, and branches are distributed along one trunk.

Florida #1—A major branch is growing taller than the leader, and the crown is not full.

Florida #2—The trunk forks in the bottom half of the tree.

Florida No. 1

Florida No. 2

Florida Fancy

TYPE ONE MATRIX

Scientific Name: ***Platanus occidentalis* L .**
Common Name: **sycamore**

Florida Fancy—The trunk has a slight bend which is acceptable for a Florida Fancy on any species.

Florida #1—The trunk forks in the top half of the tree.

Florida #2—The trunk is nicely formed, but the crown is one-sided and not uniform.

Florida No. 1

Florida No. 2

TYPE ONE MATRIX

Scientific Name: ***Quercus virginiana* Mill.**
Common Name: **live oak**

Florida Fancy—There is one trunk up through the uniform crown.

Florida #1—The crown is uniform, but the trunk divides into two nearly equal-sized trunks in the upper half of the tree. (The foliage hides the divided trunk so you cannot see this in the photograph.)

Florida #2—The trunk divides into two nearly equal-sized trunks in the lower half of the tree.

Florida Fancy

Florida No. 1

Florida No. 2

EXAMPLES

almond, tropical-
avocado
birch, river
bunya-bunya
cedar, eastern red-
cedar, Japanese-
cedar, southern red-
cypress, bald-
cypress, Leyland
fir, China-
holly, American

TYPE TWO MATRIX — PYRAMIDAL SHAPES

CALIPER	MINIMUM TREE HEIGHT	MAXIMUM TREE HEIGHT	MINIMUM CROWN SPREAD DIAMETER			MINIMUM B&B ROOT-BALL DIAMETER	MINIMUM GROW BAG ROOT-BALL DIAMETER	MINIMUM CONTAINER VOLUME
			FL. FAN.	#1	#2			
1/4"	18"	36"	10"	8"	6"	6"	—	4" Sleeve
1/2"	18"	4'	14"	10"	8"	8"	—	1 Gal.
3/4"	3'	5'	15"	12"	10"	14"	—	3 Gal.
1"	4'	7'	20"	16"	12"	16"	12"	5 Gal.
1 1/4"	5'	9'	24"	20"	16"	18"	14"	7 Gal.
1 1/2"	6'	11'	30"	24"	20"	20"	16"	15 Gal.
2"	6'	14'	42"	36"	30"	24"	18"	15 Gal.
2 1/2"	8'	16'	48"	42"	36"	28"	18"	25 Gal.
3"	9'	18'	58"	48"	40"	32"	20"	45 Gal.
3 1/2"	10'	18'	65"	54"	44"	36"	24"	65 Gal.
4"	10'	22'	6'	5'	4'	40"	30"	95 Gal.
4 1/2"	12'	24'	7'	6'	5'	44"	36"	95 Gal.
5"	14'	26'	8'	7'	6'	48"	36"	95 Gal.
5 1/2"	15'	28'	9'	8'	7'	50"	—	200 Gal.

Notes:

1. Trees to be graded under this matrix are listed in the index of trees on pages 37-44.
2. Any liner less than 1/4" caliper shall be a minimum of 12" in height, well-rooted in its container which shall not be less than 2" in diameter. Bare-root trees shall be so noted.
3. Ball depth on B&B stock shall be at least 2/3 of the root-ball diameter shown. For trees larger than 5 1/2" caliper, root-ball diameter shall be 8.5" for each inch of tree caliper. Trees grown in soils with a high water table can have shallower root balls provided the root-ball diameter is increased to the next larger tree size in the table.
4. For the purpose of determining minimum root-ball size, cured trees can have a caliper up to 1" larger than indicated in the table.
5. ANZI Standards Z60.1 designations for container size (e.g. #3, #15, #30, etc.) can be substituted for minimum spread diameter

EXAMPLES

magnolia, southern
mimusops
oak, Darlington
oak, pin
oak, Shumard
pine
pine, Norfolk Island-
pine, screw-
silk-oak
sweetgum

TYPE TWO MATRIX

Scientific Name: **X *Cupressocyparis leylandii* (Dallim. & A. B. Jackson) Dallim.**
Common Name: **Leyland cypress**

Florida Fancy

Florida Fancy—Branches are well-distributed along the single trunk, and the crown is uniform.

Florida #1—The crown is not uniform because the lower left side is missing.

Florida #2—The trunk divides into three trunks in the upper half of the tree, and the canopy is very one-sided.

Florida No. 1

Florida No. 2

TYPE TWO MATRIX

Scientific Name: ***Liquidambar styraciflua* L . & cvs.**
Common Name: **sweetgum**

Florida Fancy—There is one straight trunk, branches are well distributed along it, and the crown is full and uniform.

Florida #1—The crown is very narrow for this species of tree.

Florida #2—There is one trunk, but it has a major dogleg at the bottom of the crown.

Florida Fancy

Florida No. 1

Florida No. 2

TYPE TWO MATRIX

Florida Fancy

Scientific Name: ***Magnolia grandiflora* L .**
Common Name: **southern magnolia**

Florida Fancy—Branches are well distributed along a single trunk.

Florida #1—Branches are well distributed along a single trunk, but the crown is too narrow to meet Florida Fancy specifications.

Florida #2—The trunk divides into two equal-sized trunks in the lower half of the tree.

Florida No. 1

Florida No. 2

TYPE TWO MATRIX

Scientific Name: ***Pinus elliottii* Engelm.**
Common Name: **slash pine**

Florida Fancy

Florida Fancy—There is one trunk, and the crown is full of foliage.

Florida #1—The trunk divides into two nearly equal-sized trunks in the upper half of the tree.

Florida #2—The tip of the leader is not the highest part of the tree.

Florida No. 1

Florida No. 2

TYPE TWO MATRIX

Florida Fancy

Scientific Name: ***Taxodium distichum (L .) L . Rich.***
Common Name: **bald-cypress**

Florida Fancy—Branches are well distributed along the single trunk. The crown is uniform and full of foliage.

Florida #1—The trunk has a moderate bend or bow, and the crown is not uniform. Either characteristic alone places this tree in the Florida #1 category. The crown is also sparsely foliated.

Florida #2—The trunk has a major bend or bow and is sparsely foliated.

Florida No. 1

Florida No. 2

EXAMPLES

bay, loblolly
cypress, Italian
garcinia
holly, East Palatka
holly, Foster
holly, Savannah

TYPE THREE MATRIX — COLUMNAR / UPRIGHT SHAPES

CALIPER	MINIMUM TREE HEIGHT	MAXIMUM TREE HEIGHT	MINUMUM CROWN SPREAD DIAMETER			MINIMUM B&B ROOT-BALL DIAMETER	MINIMUM GROW BAG ROOT-BALL DIAMETER	MINIMUM CONTAINER VOLUME
			FL. FAN.	#1	#2			
1/4"	18"	48"	8"	6"	4"	6"	—	4” Sleeve
1/2"	2'	5'	12"	9"	6"	8"	—	1 Gal.
3/4"	3'	6'	16"	12"	8"	14"	—	3 Gal.
1"	4'	7'	20"	14"	11"	16"	12"	5 Gal.
1 1/4"	4 1/2'	8'	24"	18"	16"	18"	14"	7 Gal.
1 1/2"	5'	10'	30"	22"	20"	20"	16"	15 Gal.
2"	6'	11'	36"	28"	22"	24"	18"	15 Gal.
2 1/2"	7'	12'	42"	34"	25"	28"	18"	25 Gal.
3"	8'	13'	48"	40"	28"	32"	20"	45 Gal.
3 1/2"	9'	14'	54"	44"	32"	36"	24"	65 Gal.
4"	10'	16'	54"	48"	36"	40"	30"	95 Gal.
4 1/2"	12'	18'	60"	54"	48"	44"	36"	95 Gal.
5"	14'	20'	6'	5'	54"	48"	36"	95 Gal.
5 1/2"	16'	22'	7'	6'	5'	50"	—	200 Gal.

Notes:

1. Trees to be graded under this matrix are listed in the index of plant materials on pages 37-44.
2. Any liner less than 1/4" caliper shall be a minimum of 12" in height, well-rooted in its container which shall not be less than 2" in diameter. Bare-root trees shall be so noted.
3. Ball depth on B&B stock shall be at least 2/3 of the root-ball diameter shown. For trees larger than 5 1/2" caliper, root-ball diameter shall be 8.5" for each inch of tree caliper. Trees grown in soils with a high water table can have shallower root balls provided the root-ball diameter is increased to the next larger tree size in the table.
4. For the purpose of determining minimum root-ball diameter, cured trees can have a caliper up to 1" larger than indicated in the table.
5. ANZI Standards Z60.1 designations for container size (e.g. #3, #15, #30, etc.) can be substituted for minimum spread diameter

EXAMPLES

holly, weeping yaupon
magnolia, 'Little Gem'
ponytail
schefflera
stopper

TYPE THREE MATRIX

Scientific Name: ***Gordonia lasianthus* (L .) Ellis**
Common Name: **loblolly bay**

Florida Fancy—There is a single trunk, and the crown is full and uniform.

Florida #1—There is a single trunk, and the crown is full but not uniform.

Florida #2—There is a single trunk, but the crown is thin and not well-balanced.

Florida Fancy

Florida No. 1

Florida No. 2

Florida Fancy

TYPE THREE MATRIX

Scientific Name: ***Ilex* x *attenuata* Ashe 'East Palatka'**
Common Name: **East Palatka holly**

Florida Fancy—There is one trunk, and the crown is uniform and full.

Florida #1—There is one trunk, and the crown is not uniform because parts of it are missing.

Florida #2—The crown is not uniform because large parts of it are missing. The trunk forks into three nearly equal sized trunks in the upper half of the tree.

Florida No. 1

Florida No. 2

TYPE THREE MATRIX

Scientific Name: ***Ilex* x *attenuata* Ashe 'Savannah'**
Common Name: **Savannah holly**

Florida Fancy—There is one trunk, and the crown is uniform.

Florida #1—There is one trunk, and there is a portion of the crown missing, forming an asymmetrical canopy.

Florida #2—The crown is very one-sided and asymmetrical.

Florida Fancy

Florida No. 1

Florida No. 2

EXAMPLES

acacia, sweet
apple, crab
bischofia
bottlebrush
buttonwood
cherry, Barbados-
crape-myrtle
crape-myrtle, queen's
dogwood, Jamaican-
elder, yellow-
elm, American
elm, Chinese
elm, Drake
elm, winged
frangipani
geiger tree
glorybush
hackberry
hawthorn
holly, yaupon
jacaranda
Jerusalem thorn

TYPE FOUR MATRIX — VASE SHAPES

CALIPER	MINIMUM TREE HEIGHT	MAXIMUM TREE HEIGHT	MINUMUM CROWN SPREAD DIAMETER			MINIMUM B&B ROOT-BALL DIAMETER	MINIMUM GROW BAG ROOT-BALL DIAMETER	MINIMUM CONTAINER VOLUME
			FL. FAN.	#1	#2			
1/4"	18"	30"	10"	8"	6"	6"	—	4” Sleeve
1/2"	2'	6'	10"	8"	6"	8"	—	1 Gal.
3/4"	3'	7'	18"	16"	10"	14"	—	3 Gal.
1"	4'	8'	24"	18"	14"	16"	12"	5 Gal.
1 1/4"	5'	9'	30"	25"	20"	18"	14"	7 Gal.
1 1/2"	6'	10'	36"	30"	24"	20"	16"	15 Gal.
2"	6'	12'	48"	42"	30"	24"	18"	15 Gal.
2 1/2"	7'	14'	60"	48"	36"	28"	18"	25 Gal.
3"	8'	15'	6'	5'	4'	32"	20"	45 Gal.
3 1/2"	8'	16'	7'	6'	5'	36"	24"	65 Gal.
4"	9'	17'	8'	7'	6'	40"	30"	95 Gal.
4 1/2"	10'	18'	9'	8'	7'	44"	36"	95 Gal.
5"	12'	19'	11'	10'	8'	48"	36"	95 Gal.
5 1/2"	14'	20'	14'	12'	10'	50"	—	200 Gal.

Notes:

1. Trees to be graded under this matrix are listed in the index of plant materials on pages 37-44.
2. Any liner less than 1/4" caliper shall be a minimum of 12" in height, well-rooted in its container which shall not be less than 2" in diameter. Bare-root trees shall be so noted.
3. Ball depth on B&B stock shall be at least 2/3 of the root-ball diameter shown. For trees larger than 5 1/2" caliper, root-ball diameter shall be 8.5" for each inch of tree caliper. Trees grown in soils with a high water table can have shallower root balls provided the root-ball diameter is increased to the next larger tree size in the table.
4. For the purpose of determining minimum root-ball diameter, cured trees can have a caliper up to 1" larger than indicated in the table.
5. ANZI Standards Z60.1 designations for container size (e.g. #3, #15, #30, etc.) can be substituted for minimum spread diameter

EXAMPLES

lignum-vitae
maple, Japanese
mimosa
myrtle, wax-
pencil tree
photinia, 'Red Top'
plum, Chickasaw
plum, hog-
plum, pigeon-
poinciana, dwarf
poinciana, royal
poinciana, yellow
privet, glossy
privet, wax
redbud
sea-grape
tamarind, wild-
women's-tongue tree

TYPE FOUR MATRIX

Scientific Name: ***Lagerstroemia indica* L . & tree cvs.**
Common Name: **crape-myrtle**

Florida Fancy—Trunks and major branches are not touching, and the crown is uniform and full.

Florida #1—The crown is full, but branches and trunks are touching.

Florida #2—The crown is thin and slightly one-sided. Flush cuts were made when removing branches, and bark is included in the crotches of main branches. This cannot be seen in the photograph (see Fig. 7a, page 46).

Florida Fancy

Florida No. 1

Florida No. 2

Scientific Name: ***Ligustrum japonicum Thunb.***
Common Name: **wax privet**

Florida Fancy—The crown is full and uniformly balanced.

Florida #1—The crown is full but slightly unbalanced.

Florida #2—The crown is open and not well balanced.

Florida Fancy

Florida No. 1

Florida No. 2

TYPE FOUR MATRIX

Florida Fancy

Scientific Name: ***Ulmus parvifolia* Jacq. & cvs.**
Common Name: **Chinese elm**

Florida Fancy—Branches are well-distributed along a single trunk, and the crown is uniform.

Florida #1—The crown is uniform, but two major branches in the crown are opposite each other.

Florida #2—The trunk divides into two nearly equal-sized trunks in the lower half of the tree.

Florida No. 1

Florida No. 2

EXAMPLES

acacia, earleaf
African-tulip tree
arborvitae, oriental
ash
basswood
bay, sweet-
Brazilian beautyleaf
Chinaberry
Chinese pistache
eucalyptus
eucalyptus, 'Silver Dollar'
fringetree
fringetree, oriental
ginkgo
guava
hickory
holly, dahoon
holly, lusterleaf
holly, 'Nellie Stevens'
hophornbeam, American
kopsia
locust, honey
magnolia, saucer
mahogany, West Indian
maple, Florida
maple, red

TYPE FIVE MATRIX — OVAL SHAPES

CALIPER	MINIMUM TREE HEIGHT	MAXIMUM TREE HEIGHT	MINIMUM CROWN SPREAD DIAMETER			MINIMUM B & B ROOT-BALL DIAMETER	MINIMUM GROW BAG ROOT-BALL DIAMETER	MINIMUM CONTAINER VOLUME
			FL. FAN.	#1	#2			
1/4"	12"	30"	8"	6"	4"	6"	—	4” Sleeve
1/2"	2'	6'	12"	9"	6"	8"	—	1 Gal.
3/4"	4'	8'	24"	18"	12"	14"	—	3 Gal.
1"	5'	10'	28"	21"	15"	16"	12"	5 Gal.
1 1/4"	5'	11'	30"	24"	18"	18"	14"	7 Gal.
1 1/2"	6'	12'	36"	30"	24"	20"	16"	15 Gal.
2"	6'	15'	42"	36"	30"	24"	18"	15 Gal.
2 1/2"	6'	16'	48"	36"	30"	28"	18"	25 Gal.
3"	7'	17'	60"	48"	42"	32"	20"	45 Gal.
3 1/2"	8'	19'	6'	5'	4'	36"	24"	65 Gal.
4"	9'	22'	7'	6'	5'	40"	30"	95 Gal.
4 1/2"	11'	24'	8'	7'	6'	44"	36"	95 Gal.
5"	13'	26'	8'	7'	6'	48"	36"	95 Gal.
5 1/2"	14'	28'	9'	8'	7'	50"	—	200 Gal.

Notes:

1. Trees to be graded under this matrix are listed in the index of trees on pages 37-44.
2. Any liner less than 1/4" caliper shall be a minimum of 12" in height, well-rooted in its container which shall not be less than 2" in diameter. Bare-root trees shall be so noted.
3. Ball depth on B&B stock shall be at least 2/3 of the root-ball diameter shown. For trees larger than 5 1/2" caliper, root-ball diameter shall be 8.5" for each inch of tree caliper. Trees grown in soils with a high water table can have shallower root balls provided the root-ball diameter is increased to the next larger tree size in the table.
4. For the purpose of determining minimum root-ball diameter, cured trees can have a caliper up to 1" larger than indicated in the table.
5. ANZI Standards Z60.1 designations for container size (e.g. #3, #15, #30, etc.) can be substituted for minimum spread diameter

EXAMPLES

maple, silver
mastwood
mulberry, red
noronhia
oak, blackjack
oak, bluff
oak, post
oak, sawtooth
oak, southern red
oak, swamp-chestnut
oak, willow
paradise tree
parasol tree
podocarpus, nagi
podocarpus, yew
podocarpus, weeping
poplar
rosewood
sapodilla
sassafras
satinleaf
senna
sourwood
syzygium
tabebuia
tupelo

TYPE FIVE MATRIX

Scientific Name: ***Acer rubrum* L . & cvs.**
Common Name: **red maple**

Florida Fancy—There is one straight trunk, and the crown is uniform.

Florida #1—The crown is uniform, but the trunk divides into two nearly equal-sized trunks in the top half of the tree.

Florida #2—The crown is uniform, but the trunk divides into two nearly equal-sized trunks in the lower half of the tree.

Florida Fancy

Florida No. 1

Florida No. 2

TYPE FIVE MATRIX

Scientific Name: ***Quercus laurifolia*** **Michaux**
Common Name: **laurel oak**

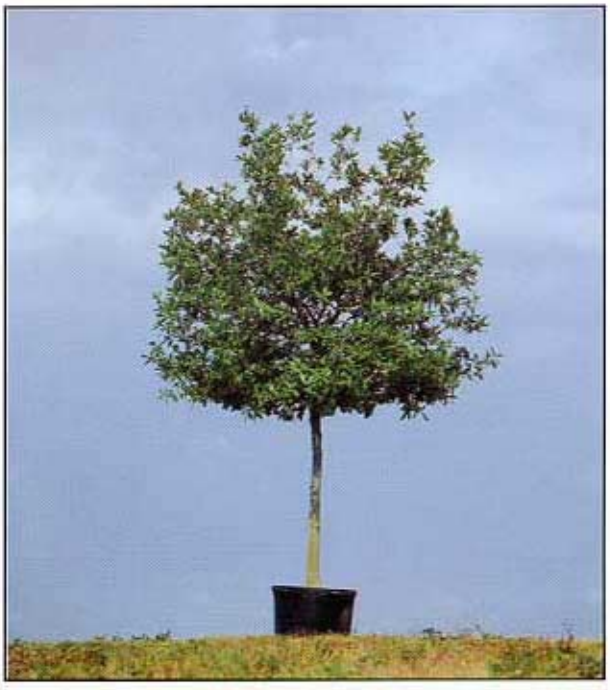
Florida Fancy—Branches are well-distributed along a single trunk, and the crown is full. The slight bend in the lower trunk is not severe enough to downgrade the tree.

Florida #1—Branches are well-distributed along a single trunk, but the crown is too narrow. The tree would have been a Florida Fancy if the crown was slightly wider.

Florida #2—The trunk divides into three nearly equal-sized trunks in the upper half of the tree.

Florida Fancy

Florida No. 1



Florida No. 2

INDEX OF TREES COMMONLY SOLD BY FLORIDA NURSERIES
LISTED BY COMMON NAME AND MATRIX TYPE

Instructions: Find the tree you are grading in the list below and note the matrix type in the left column. Return to Step 3 on page 4.

Matrix type	Common Name*	Genus/Species
5	acacia, earleaf	***Acacia auriculiformis***
4	acacia, sweet	***Acacia farnesiana***
5	African-tulip tree	***Spathodea campanulata***
2	almond, tropical-	***Terminalia catappa***
1	apple, pitch-	***Clusia rosea***
4	apple, crab	***Malus angustifolia***
5	arborvitae, oriental	***Platycladus orientalis***
5	ash	***Fraxinus*** spp.
2	avocado	***Persea americana***
2	bald-cypress	***Taxodium distichum***
4	Barbados-cherry	***Malpighia glabra***
5	basswood	***Tilia*** spp.
1	bauhinia	***Bauhinia*** spp.
3	bay, loblolly	***Gordonia lasianthus***
1	bay, red-	***Persea borbonia***
5	bay, sweet-	***Magnolia virginiana***
5	beech, blue-	***Carpinus caroliniana***
2	birch, river	***Betula nigra*** & cvs.
4	bischofia	***Bischofia javanica***
5	black-gum	***Nyssa*** spp.
1	black-olive	***Bucida buceras***
5	blue-beech	***Carpinus caroliniana***
4	bottlebrush	***Callistemon*** spp.
5	Brazilian beautyleaf	***Calophyllum brasiliense***
2	bunya-bunya	***Araucaria bidwillii***
4	buttonwood	***Conocarpus erectus*** & cvs. & vars.
1	camphor tree	***Cinnamomum camphora***
1	carambola	***Averrhoa carambola***
2	cedar, eastern red-	***Juniperus virginiana***
2	cedar, Japanese-	***Cryptomeria japonica***
2	cedar, southern red-	***Juniperus silicicola***
4	cherry, Barbados-	***Malpighia glabra***
2	China-fir	***Cunninghamia lanceolata***
5	chinaberry	***Melia azedarach***
5	Chinese pistache	***Pistacia chinensis***
1	citrus	***Citrus*** spp.
5	cottonwood	***Populus*** spp.
4	crape-myrtle	***Lagerstroemia indica*** & tree cvs.
4	crape-myrtle, queen's	***Lagerstroemia speciosa***
1	Cuban-laurel	***Ficus microcarpa***
2	cypress, bald-	***Taxodium distichum***
3	cypress, Italian	***Cupressus sempervirens***
2	cypress, Leyland	X ***Cupressocyparis leylandii***
1	dogwood, flowering	***Cornus florida*** & cvs.
4	dogwood, Jamaican-	***Piscidia piscipula***
4	elder, yellow-	***Tecoma stans***

*Hyphens in the common names indicate that the name used does not correspond to the name ordinarily given to that particular group of plants. For example: yellow-elder is not a true elder; China-fir is not a fir; etc.

Matrix type	Common Name	Genus/Species
4	elm, American	***Ulmus americana***
4	elm, Chinese	***Ulmus parvifolia***
4	elm, Drake	***Ulmus parvifolia*** 'Drake'
5	eucalyptus	***Eucalyptus*** spp.
5	eucalyptus, 'Silver Dollar'	***Eucalyptus cinerea***
1	fig, fiddleleaf	***Ficus lyrata***
1	fig, rusty	***Ficus rubiginosa***
1	fig, weeping	***Ficus benjamina***
2	fir, China-	***Cunninghamia lanceolata***
1	floss silk tree	***Chorisia speciosa***
4	frangipani	***Plumeria rubra***
5	fringetree	***Chionanthus virginicus***
5	fringetree, oriental	***Chionanthus retusus***
3	garcinia	***Garcinia speciosa***
4	geiger tree	***Cordia sebestena***
5	ginkgo	***Ginkgo biloba*** & cvs.
4	glorybush	***Tibouchina urvilleana***
1	goldenrain tree	***Koelreuteria*** spp.
5	guava	***Psidium guajava***
5	gum, black-	***Nyssa*** spp.
1	gumbo limbo	***Bursera simaruba***
4	hackberry	***Celtis laevigata***
4	hawthorn	***Crataegus*** spp.
5	hickory	***Carya*** spp.
2	holly, American	***Ilex opaca***
5	holly, dahoon	***Ilex cassine*** & vars. & cvs.
3	holly, East Palatka	***Ilex*** x ***attenuata*** 'East Palatka'
3	holly, Foster	***Ilex*** x ***attenuata*** 'Fosteri'
1	holly, round	***Ilex rotunda***
5	holly, lusterleaf	***Ilex latifolia***
5	holly, Nellie Stevens	***Ilex*** 'Nellie R. Stevens'
3	holly, Savannah	***Ilex*** x ***attenuata*** 'Savannah'
3	holly, weeping yaupon	***Ilex vomitoria*** 'Pendula'
4	holly, yaupon	***Ilex vomitoria***
5	hophornbeam, American	***Ostrya virginiana***
1	Indian-rubber tree	***Ficus elastica***
4	jacaranda	***Jacaranda mimosifolia***
4	Jamaican-dogwood	***Piscidia piscipula***
2	Japanese-cedar	***Cryptomeria japonica***
1	Japanese pagoda tree	***Sophora japonica***
4	Jerusalem thorn	***Parkinsonia aculeata***
1	kapok	***Ceiba pentandra***
5	kopsia	***Ochrosia elliptica***
1	laurel, Cuban-	***Ficus microcarpa*** & cvs.
4	lignum-vitae	***Guaiacum sanctum***
5	linden	***Tilia*** spp.
5	locust, honey	***Gleditsia triacanthos*** & cvs.
1	loquat	***Eriobotrya japonica***
1	lychee	***Litchi chinensis***
3	magnolia, 'Little Gem', 'Mainstreet', etc.	***Magnolia grandiflora*** cvs.
5	magnolia, saucer	***Magnolia*** x ***soulangeana***
2	magnolia, southern	***Magnolia grandiflora***

Matrix type	Common Name	Genus/Species
1	mahoe	***Hibiscus tiliaceus***
5	mahogany, West Indian	***Swietenia mahagoni***
1	mango	***Mangifera indica*** & cvs.
1	mangrove, black	***Avicennia germinans***
5	maple, Florida	***Acer floridanum***
4	maple, Japanese	***Acer palmatum***
5	maple, red	***Acer rubrum*** & cvs.
5	maple, silver	***Acer saccharinum***
5	mastwood	***Calophyllum inophyllum***
4	mimosa	***Albizia julibrissin***
2	mimusops	***Mimusops*** spp.
5	mulberry, red	***Morus rubra***
2	Norfolk Island-pine	***Araucaria heterophylla***
5	noronhia	***Noronhia emarginata***
5	oak, blackjack	***Quercus marilandica***
5	oak, bluff	***Quercus austrina***
2	oak, Darlington	***Quercus hemisphaerica***
5	oak, laurel	***Quercus laurifolia***
1	oak, live	***Quercus virginiana***
3	oak, Cathedral Oak™ live	***Quercus virginiana*** Cathedral Oak™
3	oak, Highrise™ PP#11219 live	***Quercus virginiana*** Highrise™ PP#11219
1	oak, Millenium™ live	***Quercus virginiana*** Millenium™
2	oak, pin	***Quercus palustris***
5	oak, post	***Quercus stellata***
1	oak, sand live	***Quercus geminata***
5	oak, sawtooth	***Quercus acutissima***
2	oak, Shumard	***Quercus shumardii***
2	oak, silk-	***Grevillea robusta***
5	oak, southern red	***Quercus falcata***
5	oak, swamp-chestnut	***Quercus michauxii***
1	oak, water	***Quercus nigra***
1	oak, white	***Quercus alba***
5	oak, willow	***Quercus phellos***
1	olive, black-	***Bucida buceras***
1	olive, spiny black-	***Bucida spinosa***
1	pagoda tree, Japanese	***Sophora japonica***
5	paradise tree	***Simarouba glauca***
5	parasol tree	***Firmiana simplex***
4	pencil tree	***Euphorbia tirucalli***
4	photinia, 'Red Top' & 'Red Tip'	***Photinia*** spp. & CVS.
4	pigeon-plum	***Coccoloba diversifolia***
2	pine	***Pinus*** spp.
2	pine, Norfolk Island-	***Araucaria heterophylla***
2	pine, screw-	***Pandanus utilis***
5	pistache, Chinese	***Pistacia chinensis***
1	pitch-apple	***Clusia rosea***
4	plum, Chickasaw	***Prunus angustifolia***
4	plum, pog	***Prunus umbellata***
4	plum, pigeon-	***Coccoloba diversifolia***
5	podocarpus, nagi	***Podocarpus nagi***
5	podocarpus, Japanese yew	***Podocarpus macrophyllus***
5	podocarpus, weeping,	***Podocarpus gracilior***
4	poinciana, dwarf	***Caesalpinia pulcherrima***
4	poinciana, royal	***Delonix regia***

Matrix Type	Common Name	Genus/Species
5	poplar	***Populus*** spp.
4	privet, glossy	***Ligustrum lucidum***
4	privet, wax	***Ligustrum japonicum***
4	redbud	***Cercis canadensis***
2	river birch	***Betula nigra*** & cvs.
5	rosewood, Indian	***Dalbergia sissoo***
1	rubber tree, Indian-	***Ficus elastica***
5	sapodilla	***Manilkara zapota***
5	sassafras	***Sassafras albidum***
5	satinleaf	***Chrysophyllum*** spp.
1	sausage tree	***Kigelia africana***
3	schefflera	***Schefflera actinophylla***
2	screw-pine	***Pandanus utilis***
4	sea-grape	***Coccoloba uvifera***
5	senna	***Cassia*** spp.
1	shaving brush tree	***Pseudobombax ellipticum***
1	silk-cotton tree, red	***Bombax ceiba***
2	silk-oak	***Grevillea robusta***
5	sourwood	***Oxydendrum arboreum***
1	spiny black-olive	***Bucida spinosa***
3	stopper	***Eugenia*** spp.
2	sweetgum	***Liquidambar styraciflua*** & cvs.
1	sycamore	***Platanus occidentalis***
5	syzygium	***Syzygium*** spp.
5	tabebuia	***Tabebuia*** spp.
1	tamarind	***Tamarindus indica***
4	tamarind, wild-	***Lysiloma latisiliqua***
2	tropical-almond	***Terminalia catappa***
5	tulip-poplar	***Liriodendron tulipifera***
5	tulip tree, African-	***Spathodea campanulata***
5	tupelo	***Nyssa*** spp.
5	walnut, black	***Juglans nigra***
4	wax-myrtle	***Myrica cerifera***
1	weeping willow	***Salix babylonica***
4	wild-tamarind	***Lysiloma latisiliqua***
4	women's-tongue tree	***Albizia lebbeck***
4	yellow-elder	***Tecoma stans***

INDEX OF TREES COMMONLY SOLD BY FLORIDA NURSERIES LISTED BY SCIENTIFIC NAME AND MATRIX TYPE

Matrix Type	Genus/Species	Common Name*
5	***Acacia auriculiformis*** Cunn. ex Benth.	earleaf acacia
4	***Acacia farnesiana*** (L.) Willd.	sweet acacia
5	***Acer floridanum*** (Chapman) Pax.	Florida maple
4	***Acer palmatum*** Thunb.	Japanese maple
5	***Acer saccharinum*** L.	silver maple
5	***Acer rubrum*** & cvs.	red maple
4	***Albizia julibrissin*** Durazz.	mimosa
4	***Albizia lebbeck*** (L.) Benth.	women's-tongue tree
2	***Araucaria bidwillii*** Hooker f.	bunya-bunya
2	***Araucaria heterophylla*** (Salisb.) Franco	Norfolk Island-pine
1	***Averrhoa carambola*** L.	carambola
1	***Avicennia germinans*** (L.) L.	black mangrove
1	***Bauhinia*** spp.	bauhinia
3	***Nolina recurvata (= Beaucarnea)***	ponytail
2	***Betula nigra*** & cvs.	river birch
1	***Bischofia javanica*** Blume	bischofia
1	***Bombax ceiba*** L.	red silk-cotton tree
1	***Bucida buceras***	black-olive
1	***Bucida spinosa*** (Northr.) Jennings	spiny black-olive
1	***Bursera simaruba*** (L.) Sarg.	gumbo limbo
4	***Caesalpinia pulcherrima*** (L.) Swartz	dwarf poinciana
4	***Callistemon*** spp.	bottlebrush
5	***Calophyllum brasiliense*** Camb.	Brazilian beautyleaf
5	***Calophyllum inophyllum*** L.	mastwood
5	***Carpinus caroliniana*** Walter	blue-beech
5	***Carya*** spp.	hickory
5	***Cassia*** spp.	senna
1	***Ceiba pentandra*** (L.) Gaertn.	kapok
4	***Celtis laevigata*** Willd.	hackberry
4	***Cercis canadensis*** L.	redbud
5	***Chionanthus retusus*** Lindl.	oriental fringetree
5	***Chionanthus virginicus*** L.	fringetree
1	***Chorisia speciosa*** St. Hil.	floss silk tree
5	***Chrysophyllum*** spp.	satinleaf
1	***Cinnamomum camphora***	camphor tree
1	***Citrus*** spp.	citrus
1	***Clusia rosea*** Jacq.	pitch-apple
4	***Coccoloba diversifolia*** Jacq.	pigeon-plum
4	***Coccoloba uvifera*** (L.) L.	sea-grape
4	***Conocarpus erectus*** L. & cvs.	buttonwood
4	***Cordia sebestena*** L.	geiger tree
1	***Cornus florida*** L. & cvs.	flowering dogwood
4	***Crataegus*** spp.	hawthorn
2	***Cryptomeria japonica*** D. Don	Japanese-cedar
2	***Cunninghamia lanceolata*** (Lamb.) Hook	China-fir
2	X ***Cupressocyparis leylandii***	Leyland cypress
3	***Cupressus sempervirens*** L.	Italian cypress
5	***Dalbergia sissoo*** DC.	Indian rosewood
4	***Delonix regia*** (Bojer ex Hook.) Raf.	royal poinciana

*Hyphens in the common names indicate that the name used does not correspond to the name ordinarily given to that particular group of plants. For example: yellow-elder is not a true elder; China-fir is not a fir, etc.

Matrix Type	Genus/Species	Common Name
1	***Eriobotrya japonica*** (Thunb.) Lindl.	loquat
5	***Eucalyptus*** spp.	eucalyptus
5	***Eucalyptus cinerea*** Benth.	silver dollar eucalyptus
3	***Eugenia*** spp.	stopper
4	***Euphorbia tirucalli*** L.	pencil tree
1	***Ficus benjamina*** L.	weeping fig
1	***Ficus elastica*** Hornem. & cvs.	Indian-rubber tree
1	***Ficus lyrata*** Warb.	fiddle leaf fig
1	***Ficus microcarpa*** L. Vent. & cvs.	Cuban-laurel
1	***Ficus rubiginosa*** & cvs.	rusty fig
5	***Firmiana simplex*** (L.) W.F. Wight	parasol tree
5	***Fraxinus*** spp.	ash
3	***Garcinia speciosa*** Wall.	garcinia
5	***Ginkgo biloba*** L. & cvs.	ginkgo
5	***Gleditsia triacanthos*** L. & cvs.	honey locust
3	***Gordonia lasianthus*** & cvs.	loblolly bay
2	***Grevillea robusta*** A. Cunn.	silk-oak
4	***Guaiacum sanctum*** L.	lignum-vitae
1	***Hibiscus tiliaceus*** L.	mahoe
5	***Ilex*** 'Nellie R. Stevens'	Nellie Stevens hybrid holly
3	***Ilex*** x ***attenuata*** Ashe 'East Palatka'	East Palatka holly
3	***Ilex*** x ***attenuata*** 'Fosteri'	Foster holly
3	***Ilex*** x ***attenuata*** 'Savannah'	Savannah holly
5	***Ilex cassine*** L. & vars. & cvs.	dahoon holly
5	***Ilex latifolia*** Thunb.	lusterleaf holly
2	***Ilex opaca*** Aiton	American holly
1	***Ilex rotunda*** Thunb.	round holly
4	***Ilex vomitoria*** Aiton	yaupon holly
3	***Ilex vomitoria*** Aiton 'Pendula'	weeping yaupon holly
4	***Jacaranda mimosifolia*** D. Don	jacaranda
5	***Juglans nigra*** L.	black walnut
2	***Juniperus silicicola*** (Small) L.H. Bailey	southern red-cedar
2	***Juniperus virginiana*** L.	eastern red-cedar
1	***Kigelia africana*** (Lam.) Benth.	sausage tree
1	***Koelreuteria*** spp.	goldenrain tree
4	***Lagerstroemia indica*** & tree cvs.	crape-myrtle
4	***Lagerstroemia speciosa*** (L.) Pers.	queen's crape-myrtle
4	***Ligustrum japonicum***	wax privet
4	***Ligustrum lucidum*** Aiton f.	glossy privet
2	***Liquidambar styraciflua*** & cvs.	sweetgum
5	***Liriodendron tulipifera*** L.	tulip-poplar
1	***Litchi chinensis*** Sonn.	lychee
4	***Lysiloma latisiliqua*** (L.) Benth.	wild-tamarind
2	***Magnolia grandiflora***	southern magnolia
3	***Magnolia grandiflora*** cvs.	'Little Gem','Mainstreet', etc.
5	***Magnolia*** x ***soulangeana*** Soul.-Bod.	saucer magnolia
5	***Magnolia virginiana*** L.	sweet-bay
4	***Malpighia glabra*** L.	Barbados-cherry
4	***Malus angustifolia*** (Aiton) Michaux	crab apple
1	***Mangifera indica*** L. & cvs.	mango
5	***Manilkara zapota*** (L.) Van Royen	sapodilla
5	***Melia azedarach*** L.	chinaberry
2	***Mimusops*** spp.	mimusops
5	***Morus rubra*** L.	red mulberry
4	***Myrica cerifera***	wax-myrtle

Matrix Type	Genus/Species	Common Name
3	***Nolina recurvata*** (Lem.) Hemsl.	ponytail
5	***Noronhia emarginata*** (Lam.) Hook.	noronhia
5	***Nyssa*** spp.	tupelo & black-gum
5	***Ochrosia elliptica*** Labill.	kopsia
5	***Ostrya virginiana*** (Mill.) K. Koch	American hophornbeam
5	***Oxydendrum arboreum*** (L.) DC.	sourwood
2	***Pandanus utilis*** Bory	screw-pine
4	***Parkinsonia aculeata*** L.	Jerusalem thorn
4	***Peltophorum pterocarpum*** (DC.) Heyne	yellow poinciana
2	***Persea americana*** Mill.	avocado
1	***Persea borbonia*** (L.) Spreng.	red-bay
4	***Photinia*** spp. & cvs.	'Red Top' & 'Red Tip' photinia
2	***Pinus*** spp.	pine
4	***Piscidia piscipula*** (L.) Sarg.	Jamaican-dogwood
5	***Pistacia chinensis*** Bunge	Chinese pistache
1	***Platanus occidentalis***	sycamore
5	***Platycladus orientalis*** (L.) Franco	oriental arborvitae
4	***Plumeria rubra*** L.	frangipani
5	***Podocarpus gracilior*** Pilg.	weeping podocarpus
5	***Podocarpus macrophyllus*** (Thunb.) D. Don & cvs.	Japanese yew podocarpus
5	***Podocarpus nagi*** (Thunb.) Mak.	nagi podocarpus
5	***Populus*** spp.	poplar & cottonwood
4	***Prunus angustifolia*** Marsh.	Chickasaw plum
4	***Prunus umbellata*** Elliot	hog plum
1	***Pseudobombax ellipticum*** (HBK) Dugand	shaving brush tree
5	***Psidium guajava*** L.	guava
5	***Quercus acutissima*** Carruth.	sawtooth oak
1	***Quercus alba*** L.	white oak
5	***Quercus austrina*** Small	bluff oak
5	***Quercus falcata*** Michaux	southern red oak
1	***Quercus geminata*** Small	sand live oak
2	***Quercus hemisphaerica*** Willd.	Darlington oak
5	***Quercus laurifolia***	laurel oak
5	***Quercus marilandica*** Muenchh.	blackjack oak
5	***Quercus michauxii*** Nutt.	swamp-chestnut oak
1	***Quercus nigra*** L.	water oak
2	***Quercus palustris*** Muenchh.	pin oak
5	***Quercus phellos*** L.	willow oak
2	***Quercus shumardii*** Buckl.	Shumard oak
5	***Quercus stellata*** Wangenh.	post oak
1	***Quercus virginiana***	live oak
3	***Quercus virginiana*** Cathedral Oak™	Cathedral Oak™ live oak
3	***Quercus virginiana*** Highrise™ PP#11219	Highrise™ live oak
1	***Quercus virginiana*** Millenium™	Millenium™ live oak
1	***Salix babylonica*** L.	weeping willow
5	***Sassafras albidum*** (Nutt.) Nees	sassafras
3	***Schefflera actinophylla*** (Endl.) Harms	schefflera
5	***Simarouba glauca*** DC.	paradise tree
1	***Sophora japonica*** L. & cvs.	Japanese pagoda tree
5	***Spathodea campanulata*** Beauv.	African-tulip tree
5	***Swietenia mahagoni*** (L.) Jacq.	West Indian mahogany
5	***Syzygium*** spp.	syzygium
5	***Tabebuia*** spp.	tabebuia

Matrix Type	Genus/Species	Common Name
1	***Tamarindus indica*** L.	tamarind
2	***Taxodium distichum***	bald-cypress
4	***Tecoma stans*** (L.) HBK.	yellow-elder
2	***Terminalia catappa*** L.	tropical-almond
5	***Tilia*** spp.	linden & basswood
4	***Ulmus alata*** Michaux	winged elm
4	***Ulmus americana*** L. & cvs.	American elm
4	***Ulmus parvifolia*** Jacq. & cvs.	Chinese elm
4	***Ulmus parvifolia*** 'Drake'	Drake elm

GLOSSARY OF TREE TERMS

Balled and burlapped (B & B): A soil ball containing roots of the plant wrapped and secured in synthetic, natural or treated burlap, and / or wire. All synthetic fabric (Lenomesh) should be removed from the root ball prior to planting. True biodegradable burlap can be left around the root ball.

Caliper: Trunk caliper (trunk diameter) is measured 6 inches from the ground on trees up to and including 4 inches in caliper, and 12 inches above the ground for larger trees. Since trunks are seldom round, the average of the largest diameter and that perpendicular to it is referred to as caliper. Any accurate device including a diameter tape may be used to measure caliper. Trees are placed in diameter classes in order to grade them. For example, trees in the 2-inch class include those calipering 2 inches up to but not including $2^1/_2$ inches; those in the $2^1/_2$-inch class include trees calipering $2^1/_2$ inches up to but not including 3 inches, and so forth.

Dominant leader: The trunk that grows up through the center of the tree and obviously dominates the rest of the branches. A dominant leader originates from a single dominant trunk and is the topmost part of a tree.

Chlorotic: A lightness or bleaching (typically yellowing) of green color in the foliage unlike the normal color. This indicates that the plant has not been maintained in the best of health. Chlorotic is not to be confused with normal yellowing of foliage common on many deciduous species late in the season. It is also not to be confused with yellowing of leaves on evergreens just prior to a new leaf flush.

Clear trunk: An industry term referring to that portion of the trunk maintained free of any branches. The clear trunk is the lower portion of the trunk measured from the soil line up to the first major branch. Temporary branches may exist on a clear trunk.

Conifer: Includes the genera ***Cryptomeria, Cuppressocyparis, Cunninghamia, Cupressus, Pinus.***

Corrective pruning: Pruning which removes one or more branches or trunks to create a stronger, well-structured tree framework.

Crown: The branches, twigs and leaves that make up the foliage portion of the tree.

Crown spread diameter: Crown spread diameter is the average of the widest branch spread and that perpendicular to it (see Fig. 5).

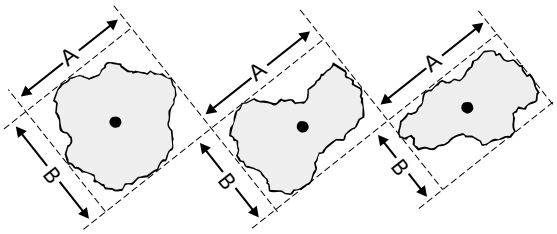


Fig. 5. Add A and B together and divide by two to obtain crown spread diameter.

Cured trees: Field-grown trees that are balled and burlapped in the nursery with visible roots growing through the burlap (Fig. 6).

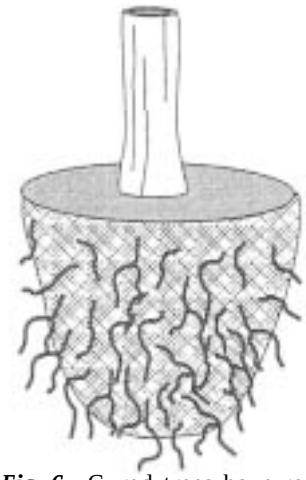


Fig. 6. Cured trees have roots growing through the burlap.

DBH:
Diameter at breast height. This is not an appropriate method for valuating nursery trees.

Fig. 7a. Example of a weak union illustrating embedded or included bark which is squeezed between the two trunks**.**

Fig. 7b. Example of strong branch union without embedded or included bark. Note the dark tissue on the trunk just above the branch crotch. This is the branch bark ridge. Its presence above the branch indicates there is no included bark.

Espalier: Any plant that is pruned, shaped and trained against a trellis, usually in a container.

Excessively root bound: A condition of container-grown trees where there are several roots larger than 1/4 inch diameter growing on the outside edge of the root ball (see Fig. 8).

Flush cut: A pruning cut made too close to, or flush with, the trunk. This type of cut is very detrimental to tree health and is not recommended (see Fig. 4 on page 13). It is often difficult to determine whether a flush cut was made 2 or more years after the cut was made on a young tree.

Fig. 8. Note the circling roots growing along the outside surface of the root ball.

Grade: A level of plant quality that meets minimum standards.

Grow bag: A fabric container used for growing trees in field soil. Synthetic fabric grow bags should be removed before planting.

Included bark: Also referred to as embedded bark. Bark between a branch and trunk or between trunks that is squeezed together in the crotch of the branch (see Fig. 7a). This typically happens on upright-growing, large-diameter branches which grow at a rate which is similar to the growth rate of the trunk. This branch will be poorly connected to the trunk and could easily break off from the trunk as the tree grows older.

Leader: That part of the trunk that extends into the top 1/4 of the tree.

Major branch: A branch that is among the largest in diameter on the tree.

Multiple leaders: Two or more trunks growing nearly parallel to each other, originating any place along the stem. The crotch angle between them is often very narrow. This tree defect is more serious when it occurs on the lower portion of the tree.

Nearly-equal diameter: One trunk or branch is at least 2/3 the diameter of the other. Measure the branch diameter several inches out from the crotch beyond any swelling at the branch base. Measure the larger branch or trunk just above the crotch.

Poodle: A plant that is pruned and trained into balls or other formal shapes.

Root-ball diameter: The average diameter of the widest portion of the root ball and that perpendicular to it. This shall be measured near the top of the root ball.

Roots growing out of the container: Trees can be downgraded if roots greater than $^1/_5$ the diameter of the trunk are growing out the bottom of the container or out of the grow bag (Fig. 9).

Fig. 9. Two roots greater than $^1/_5$ the diameter of the trunk growing out the bottom of the container.

Secondary branches: Branches originating from primary or major branches.

Sturdy in the root ball: When the trunk bends along its vertical length instead of pivoting at the base of the trunk, or moving in the root ball when the root ball of a container-grown plant can be slipped from the container with all or most of the media intact with the roots.

Temporary branches: Short branches meant to be pruned from the tree in the near future as the tree grows and produces major branches.

Topiary: A formal, man-manipulated plant form, either tree or shrub, developed and maintained by frequent clipping and shearing. Such forms include standards, sheared pyramids, espaliers, columns, animal topiaries, large bonsai and other special shapes. Enter the grading process at Step 6, skipping steps 1-5, when grading topiaries. Trees planted as topiaries are usually maintained in that form in the landscape by regular trimming of the branches. They are not meant to be grown out in the landscape to the natural shape or size of the plant. The natural form is not allowed to develop (see Fig. 10).

Fig. 10. A topiary is sheared or trimmed to a variety of shapes, including a pyramid.

Tree height: Tree height is measured from the ground to the topmost portion of the tree (see Fig. 11). Height must be measured before pruning the tree. On small, multitrunked trees such as crape-myrtle, Japanese ligustrum and wax-myrtle, tree height is measured to the top of the main body of the crown.

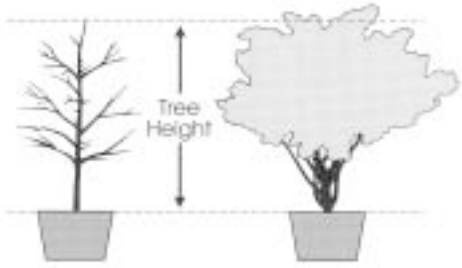


Fig. 11. Measuring tree height.

Trunk dogleg: A significant 's' - shaped deformation in the trunk (see Fig. 12). A dogleg in the crown is not a downgrading factor.

Fig. 12. The angle 'A' can be no more than 30°. The distance 'B' can be no more than the trunk diameter.

Trunk wound: A trunk injury that is open and not sealed over, or closed. A properly executed pruning cut that is not closed over is not considered a trunk wound.

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SHADE TREE APPENDIX

1. Florida Fancy live oak in winter. There is one dominant leader.

2. Florida Fancy live oak in late spring. The dominant leader curves slightly up through the canopy. This is perfectly acceptable for a Florida Fancy.

3. Florida Fancy live oak recently transplanted. Major branches are spaced apart nicely along a dominant trunk.

4. Florida Fancy live oak in spring. Dominant leader curves up through the canopy of this 9-inch diameter tree.

5. Florida Fancy live oak in spring. Major branches are all less than 2/3 the trunk diameter so none are considered competing leaders.

6. Florida Fancy live oak. Major branches are all less than 2/3 the trunk diameter and are spaced at least 6" apart along the trunk. Several small-diameter branches are growing upright at the top of the tree. These can be removed, or preferably cut back to a more horizontal branch, to ensure the leader remains dominant.

7. After two or three of the small-diameter upright branches at the very top of the tree are removed or cut back to a more horizontal branch, this tree becomes a Florida Fancy.

8. Looking up the trunk of a Florida Fancy tree.

9. Florida Fancy southern magnolia in spring. One leader dominates the tree.

10. Florida #1 live oak. There is one dominant trunk in the lower half of the tree, but the trunk forks in the top half. If one of the two small trunks at the top of the tree were removed, the tree would probably grade to a Florida Fancy. Another alternative which takes less foliage out of the tree is to cut one of the two trunks back to a more horizontally oriented branch. As the tree grows in the months after pruning, the trunk will grow faster than the cut branch. As a result, the branch will become less than 2/3 the diameter of the trunk which makes the tree a Florida Fancy.

11. Florida #1 live oak. Diameter on all branches is less than 2/3 the trunk diameter but the trunk has a 10 to 15 degree bow in it making the tree Florida #1.

12. Florida #2 live oak. The large branch on the right is larger than 2/3 the trunk diameter and is in the lower half of the tree making it a Florida #2. Prune the top of the branch back about half way to the small, more horizontally-oriented branch. Next year the tree will grade a Florida Fancy or #1 because the trunk will grow at a faster rate than the branch. This will make the branch diameter less than 2/3 the trunk diameter.

13. The tree has a double leader in the top half of the tree about four feet from the top making it a Florida #1. Reduce the height of the smaller leader on the left by pruning it back to a more horizontal branch or removing the leader altogether. This will make the tree a Florida Fancy next year.

14. Take out the right hand fork at the top of the tree and this Florida #1 becomes a Florida Fancy trunk and branch structure. However, the canopy is not full and is a bit one-sided which will keep this a Florida #1.

15. The large branch in the upper half of the tree on the right side is larger than 2/3 the diameter of the trunk making this a Florida #1.

16. Florida #2 live oak. There is one central trunk and no branches have a diameter larger than 2/3 the trunk diameter. This would make the tree a Florida Fancy except for the two major branches that are within 4" of each other four and eight feet off the ground.

17. The large branch at left in the bottom half of the tree is greater than 2/3 the trunk diameter. This makes the tree Florida #2. Remove the upper half of this branch now by pruning back to a more horizontal branch. This allows the tree to fill in the void space with foliage from branches above. The rest of the large lower branch can be removed next year. This process will upgrade the tree.

18. Two equally sized trunks originate from the lower half of the tree making this a Florida #2. Remove the left trunk now and in about 18 months the canopy will probably be upgraded to at least a Florida #1.

19. The diameter of the large branch in the lower half of the tree on the right is larger than 2/3 the trunk diameter. This makes the tree a Florida #2. Remove the top half of this branch by pruning back to a more horizontal branch. Remove all secondary branches growing in toward the main trunk. Six months later, remove the rest of the branch back to the main trunk. The tree that remains has one trunk to the top of the tree. About 12 months later the tree will be filled in on the right and could be a Florida Fancy.

20. The diameter of a branch relative to the trunk is an important comparison that is made in the tree grades and standards. Measure the branch diameter just beyond the crotch and beyond any swelling that may be present at the base of the branch. Measure the trunk diameter just above the branch crotch. The tree is downgraded if the branch diameter is greater than 2/3 the trunk diameter.

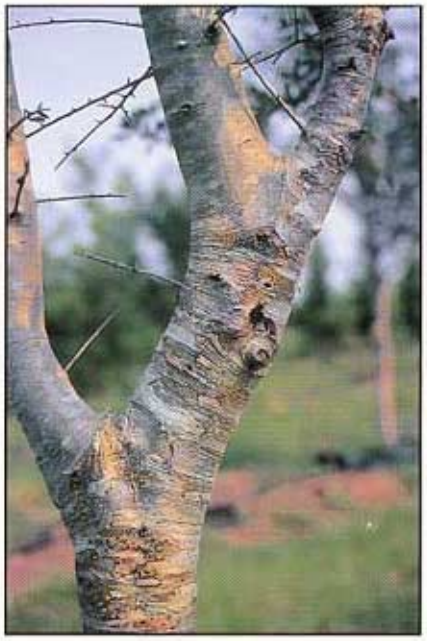
21. Two major branches of nearly equal size originating from within 6" (Florida Fancy) or 4" (Florida #1) of each other is a downgrading factor.

22. Two major branches of nearly equal size originating from within 6" (Florida Fancy) or 4" (Florida #1) of each other is a downgrading factor.

23. This is a double leader because one is at least 2/3 the diameter of the other.

24. This is a Florida Fancy trunk because branches are spaced apart and none are larger than 2/3 the diameter of the trunk. Note that the trunk does not have to be straight on a Florida Fancy.

25. This trunk has a slight dogleg but not enough to downgrade it to a lower grade.



26. This trunk has a dogleg nearly bad enough to downgrade the tree. If the dogleg was any worse, the tree would be downgraded.

27. Note the included bark in the branch crotch. The branch bark ridge is not visible because it is included inside the crotch. The crotch is shaped like the letter 'V'.

28. Note the included bark in the branch crotch. The branch bark ridge is not visible because it is included inside the crotch. The crotch is shaped like the letter 'V'.

29. There is no included bark in this crotch. The branch bark ridge is clearly visible in the crotch as a raised area of bark tissue.

30. There is no included bark in this crotch. The branch bark ridge is clearly visible in the crotch as a raised line of bark tissue. The crotch is more or less shaped like the letter 'U'.

31. This is a properly executed pruning cut leaving the branch bark ridge intact on the trunk.

NARROW, UPRIGHT TREE APPENDIX

Araucaria spp.
Betula nigra and cultivars
Cryptomeria spp.
Cunninghamia
X *Cupressocyparis leylandii* and cultivars
Cupressus spp.
Gordonia lasianthus and cultivars
Ilex spp.
Juniperus virginiana and *J. silicicola*
Liquidambar spp. and cultivars
Magnolia grandiflora and cultivars
Magnolia virginiana and cultivars
Nyssa spp.
Pinus spp.
Pyrus calleryana cultivars
Taxodium spp.

SMALL, ORNAMENTAL TREE APPENDIX

Acacia farnesiana
Acer palmatum and cultivars
Caesalpinea pulcherrima
Callistemon spp. and cultivars
Cassia bicapsularis
Chionanthus retusus
Chionanthus virginicus
Citrus spp.
Guaiacum spp.
Ilex vomitoria and cultivars
Lagerstroemia cultivars
Ligustrum japonicum
Magnolia x *soulangiana*
Malphigia glabra
Malus spp. and cultivars
Myrica cerifera
Parkinsonia aculeata
Photinia spp. and cultivars
Platycladus orientalis
Plumeria spp.
Prunus spp. and cultivars
Psidium spp.
Tecoma stans

Grades and Standards for Nursery Plants
Updates May 2005

Florida Division of Plant Industry

The following updates have been made to the Grades and Standards Publications available on the Division of Plant Industry internet website.

Tree section

Page 4, Step 2, first sentence in note: Added the following after the words narrow, upright trees: (see Narrow, Upright Tree Appendix). [the Narrow, Upright Tree Appendix is listed below].

Page 4, Step 8: Replaced "If any of the following …." with "If one or more of the following …." Also replaced same in Step 8 on pages 7 and 8.

Page 4, top paragraph: Added the following sentence to the end of the first paragraph. "See Small Tree Appendix for a partial list of these small maturing, ornamental trees." [The Small Tree Appendix is listed below]

Page 4, second paragraph in top: Replaced the last sentence with the following: "Skip Step 2 if you are grading conifers, (e.g. pines), magnolias, hollies, loblolly bay, bald-cypress and other narrow, upright trees (see Narrow, Upright Tree Appendix). [Narrow Upright Tree Appendix is listed below]

Page 4, Step 5, first sentence in parenthesis: Added the following after the phrase other similar trees: (see Small, Ornamental Tree Appendix).

Page 8, Step 5, first sentence in parenthesis: Added the following after the phrase other similar trees: (see Small, Ornamental Tree Appendix).

Page 8, second paragraph: Added the following as the second sentence - "See Small Tree Appendix for a partial list of these small maturing, ornamental trees." [The Small Tree Appendix is listed below]

Page 10: Added the following to the end of the Florida Fancy paragraph. "If the trunk divides in two nearly equal-diameter stems in the upper 10% of the tree, the trunk is not downgraded to a Florida #1."

Page 10, Florida#2 paragraph: Added the following sentence to the end of the paragraph – "A dogleg in the crown of the tree is not a downgrading factor."

Page 11, first paragraph first sentence in the Note: Added "(see Narrow, Upright Tree Appendix) after the words narrow, upright trees.

Page 11, Florida #1 paragraph, second sentence: After the first word in the sentence, inserted the word “major”. The sentence now reads “Other major branches of nearly equal……”

Page 14, 20, 26, 30, 34: Added note to the bottom of each matrix: “ANZI standards Z60.1 designations for container size (e.g. #3, #15, #30, etc.) can be substituted for minimum container volume.”

Page 20, 26, 30: “Maximum crown spread diameter” now reads “Minimum crown spread diameter”

Page 26: Minimum height for ½” caliper trees now reads 2’instead of 2”.

Page 39 and 43: Quercus laurifolia is changed to Matrix 5 instead of 1.

Page 47, Trunk dogleg: Added the following to the end of the definition. “A dogleg in the crown of the tree is not a downgrading factor.”

Page 41, Added the following to the “Index of trees commonly sold by Florida nurseries listed by common name and matrix type” on page 37 and to “Index of trees commonly sold by Florida nurseries listed by scientific name and matrix type”:

Matrix type three	Quercus virginiana Highrise™ PP#11219	Highrise™ live oak
Matrix type three	Quercus virginiana Cathedral Oak™	Cathedral Oak™ live oak
Matrix type one	Quercus virginiana Millenium™	Millenium™ live oak

Narrow, Upright Tree Appendix

Araucaria spp.
Betula nigra and cultivars
Cryptomeria spp.
Cunninghamia
X *Cupressocyparis leylandii* and cultivars
Cupressus spp.
Gordonia lasianthus and cultivars
Ilex spp.
Juniperus virginiana and *J. silicicola*
Liquidambar spp. and cultivars
Magnolia grandiflora and cultivars
Magnolia virginiana and cultivars
Nyssa spp.
Pinus spp.
Pyrus calleryana cultivars
Taxodium spp.

Small, Ornamental Tree Appendix

Acacia farnesiana
Acer palmatum and cultivars
Caesalpinea pulcherrima
Callistemon spp. and cultivars
Cassia bicapsularis
Chionanthus retusus
Chionanthus virginicus
Citrus spp.
Guaiacum spp.
Ilex vomitoria and cultivars
Lagerstroemia cultivars
Ligustrum japonicum
Magnolia x *soulangiana*
Malphigia glabra
Malus spp. and cultivars
Myrica cerifera
Parkinsonia aculeata
Photinia spp. and cultivars
Platycladus orientalis
Plumeria spp.
Prunus spp. and cultivars
Psidium spp.
Tecoma stans

Palm section

Added to end of page 24 – "Note: If specifications call for clustered palms with no stems of intermediate height, then that should not be a downgrading factor."

Page 10, note #2 below Table 2: Added the following to the end of the sentence - "to the edge of the ball."

Page 13: "Matrix A single trunk, palmate palms" now reads "Matrix A single trunk, pinnate palms."

Page 14, #2 and e: Chlorosis is now correctly spelled.

Page 14, #4 now reads: "Holes, cavities or gouges exceeding ¼" deep and either 1" wide or 3" long."

Page 14, #5 now reads: "Root ball width under-sized by 10% or more."

Page 14, b now reads: For each hole, cavity, gouge or depression either less than 1” wide or less than 3” long.

Page 14, h now reads: “Root ball under-sized, but not by more than 10%.”

Page 18, Table 4, left column second row: Changed B1 to B-2.

Page 19: Added new paragraph after the third paragraph: Boot scars must be intact on Sabal palm trunks that have had their leaf bases removed. Sanding of the trunk to remove mechanical damage or fire damage shall render the trunk a cull.

Page 20, added to one-grade deductions as i: “Root ball under-sized, but not by more than 30% of the width.”

Page 20, #4: now reads “Holes, cavities or gouges exceeding ¼” deep and either 1” wide or 3” long”

Page 20, #5. Changed wording to read “Root ball undersized by 10% or more.”

Page 25, #5: Changed wording to read “Root ball undersized by 10% or more.”

Page 25, added to one-grade deductions as j: “Root ball under-sized, but not by more than 30% of the width.”

Page 25, #4 now reads: “Holes, cavities or gouges exceeding ¼” deep and either 1” wide or 3” long”

Page 25, c: Now reads “For each mechanical scrap, hole, cavity, gouge or depression in a main or intermediate trunk less than 1” wide or 3” long.

Page 25, added to after i: “Note: For clustering palms, the final grade shall be the lowest grade determined for each of the intermediate and main trunks.”

Page 30 fourth line from bottom: Matrix type for *Phoenix dactylifera* changed to A-2, and minimum height is 12-14’.

Page 32, *Phoenix dactylifera*: same changes as above as above