

Guideline Specifications for Nursery Tree Quality



Revision 2009

BACKGROUND

This document is a revision of a previous publication entitled *Guideline Specifications for Nursery Tree Quality*, published by the Urban Tree Foundation, which was developed by a committee of horticulture professionals from the nursery, landscape, municipal, consulting, and academic sectors. The original publication has been posted online at the Foundation's Web site (<http://www.urbantree.org/specs.asp>) since 2002 and has been used by public, private, and nonprofit groups to select and specify quality nursery trees. Recommendations for improvements to the document received in the past 5 years have been incorporated in this 2009 revision.

The following people worked on the original *Guideline Specifications for Nursery Tree Quality*:

David Burger, UC Davis Department of Plant Sciences
Barrie Coate, Consulting Arborist, Los Gatos
Larry Costello, UC Cooperative Extension, Half Moon Bay
Robert Crudup, Valley Crest Tree Company, Sunol
Jim Geiger, US Forest Service, Pacific South West Region
Bruce Hagen, California Department of Forestry and Fire Protection, Santa Rosa, Retired
Richard Harris, Professor Emeritus, UC Davis Department of Plant Sciences
Brian Kempf, Urban Tree Foundation, Visalia
Jerry Koch, City of Berkeley Division of Urban Forestry, Retired
Bob Ludekens, L. E. Cooke Company, Visalia
Greg McPherson, US Forest Service, PSW Research Station, Center for Urban Forest Research
Martha Ozonoff, California ReLeaf, Davis
Ed Perry, UC Cooperative Extension, Stanislaus County
Markio Robert, Caltrans LDA Maintenance Division, Oakland

Illustrations by Edward F. Gilman, Professor, Environmental Horticulture Department, IFAS, University of Florida. Adaptions from *Arboriculture: Integrated Management of Landscape Trees, Shrubs and Vines*, 4th ed., by R. W. Harris, J. R. Clark, and N. P. Matheny (Prentice Hall, 2003).

Copyright © 2009 Brian Kempf



Urban Tree Foundation
115 S. Dollner Ave.
Visalia, Ca 93291
www.urbantree.org
brian@urbantree.org

Introduction

This document provides specifications for selecting and specifying quality nursery trees in California, with a focus on container stock. Key traits of nursery trees are identified and described to provide growers and buyers with the information they need to distinguish good-quality stock from poor-quality stock. Structural and health characteristics are described, as well as labeling, compliance with laws and regulations, and inspection of nursery stock. If a particular defect or substandard element can be corrected easily, appropriate remedies should be applied as agreed upon by both parties.

I. GENERAL SPECIFICATIONS

A. Proper Identification: All trees shall be true to name as ordered or shown on planting plans and shall be labeled individually or in groups by species and cultivar (as appropriate).

B. Compliance: All trees shall comply with federal and state laws and regulations requiring inspection for plant disease, pests, and weeds. Inspection certificates required by law shall accompany each shipment of plants. Clearance from the local county agricultural commissioner, if required, shall be obtained before planting trees originating outside the county in which they are to be planted. Even though trees may conform to county, state, and federal laws, the buyer may impose additional requirements.

C. Inspection: The buyer reserves the right to reject trees that do not meet specifications as set forth in these guidelines or as adopted by the buyer. If a particular defect or substandard element can be corrected easily, appropriate remedies shall be applied. If destructive inspection of a root ball is to be done, the buyer and seller should have a prior agreement as to the time and place of inspection, number of trees to be inspected, and financial responsibility for the inspected trees.

D. Delivery: The buyer shall stipulate how many days prior to delivery that delivery notification is needed. Buyer shall stipulate any special considerations to the nursery prior to shipment.

II. HEALTH AND STRUCTURE SPECIFICATIONS

These specifications apply to deciduous, broadleaf evergreen, and coniferous species. They do not apply to palms. Note that leaf characteristics will not be evident on deciduous trees during the dormant season.

A. Tree Health

1. Crown: The form and density of the crown shall be typical for a young specimen of the species or cultivar. Changes in form caused by wind, pruning practices, pests, or other factors shall not substantially alter the form for the species or cultivar.

2. Leaves: The size, color, and appearance of leaves shall be typical for the time of year and stage of growth of the species or cultivar. Trees shall not show signs of prolonged moisture stress as indicated by wilted, shriveled, or dead leaves.

3. Branches: Shoot growth (length and diameter) throughout the crown should be appropriate for the age and size of the species or cultivar. Trees shall not have dead, diseased, broken, distorted, or otherwise injured branches.

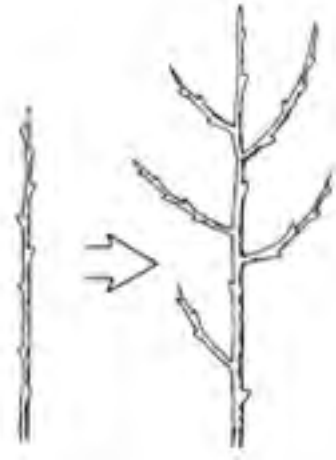
4. Trunk: The tree trunk shall be relatively straight, vertical, and free of wounds (except properly made pruning cuts), sunburned areas, conks (fungal fruiting bodies), wood cracks, bleeding areas, signs of boring insects, galls, cankers, girdling ties, or lesions (mechanical injury).

5. Roots: The root system shall be substantially free of injury from biotic (e.g., insects and pathogens) and abiotic (e.g., herbicide toxicity and salt injury) agents. Root distribution shall be uniform throughout the container substrate, and growth shall be appropriate for the species or cultivar. At time of inspection and delivery, the root ball shall be moist throughout. Roots shall not show signs of excess soil moisture conditions as indicated by stunted, discolored, distorted, or dead roots.

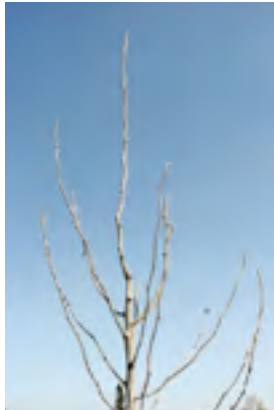
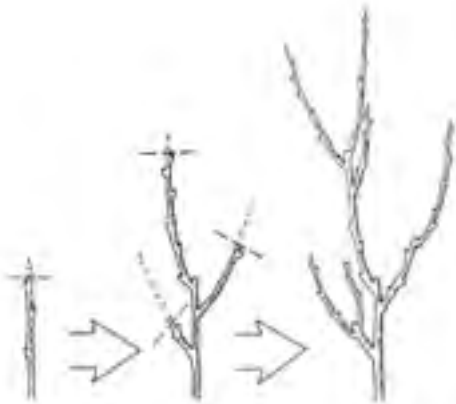
B. Tree Crown

Note: Crown specifications do not apply to plants that have been specifically trained in the nursery as topiary, espalier, multistem, clump, or unique selections such as contorted or weeping cultivars.

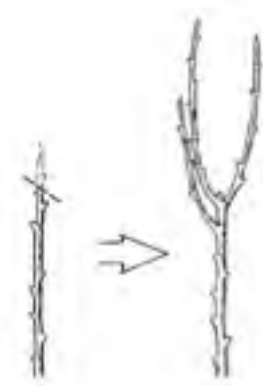
1. Trees shall have a single, relatively straight central leader. They shall be free of codominant stems and vigorous, upright branches that compete with the central leader. If the original leader has been headed, a new leader at least one-half of the diameter of the original leader shall be present.



Not topping is desirable.



Topping and retaining a leader is desirable.



Topping without retaining a leader is not desirable.

2. Main branches shall be well distributed along the central leader not clustered together. They shall form a balanced crown appropriate for the cultivar/species.



Desirable



Not Desirable

3. Branch diameter shall be no larger than two-thirds (one-half is preferred) the diameter of the central leader measured 1 inch above the branch.



Desirable



Not Desirable

4. The attachment of the largest branches (scaffold branches) shall be free of included bark.



Desirable



Not Desirable

5. Temporary branches, unless otherwise specified, should be present along the lower trunk below the lowest main (scaffold) branch, particularly for trees less than 1 inch in caliper. These branches should be no greater than 3/8 inch diameter. Clear trunk should be no more than 40% of the total height of the tree.



Desirable

Not Desirable

C. Trunk

1. The trunk shall be free of wounds (except properly-made pruning cuts), sunburned areas, conks (fungal fruiting-bodies), wood cracks, bleeding areas, signs of boring insects, galls, cankers and/or lesions.

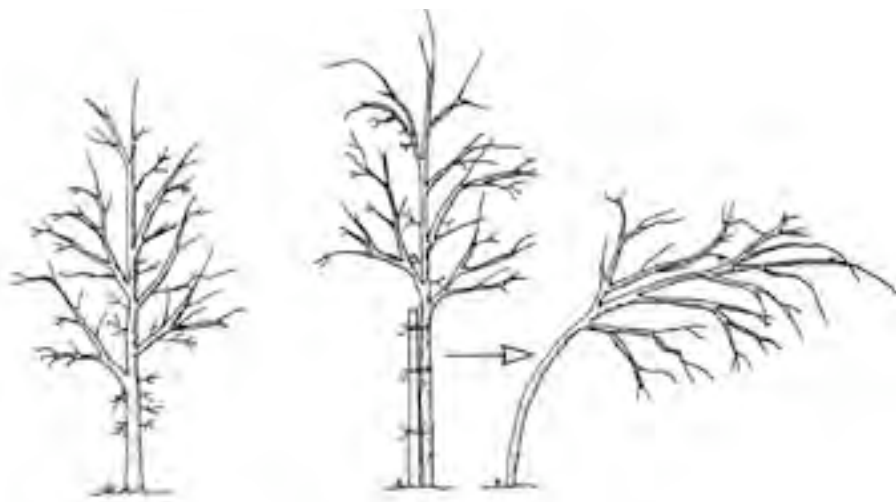
2. Trunk caliper and taper shall be sufficient so that the tree will remain vertical without a stake. Trunk caliper at 6 inches above the soil media (substrate) surface shall be within the diameter range shown for each container size below:

Container Size -----Trunk Diameter

5.....0.5" to 0.75"

15.....0.75" to 1.5"

24-inch box.....1.5" to 2.5"



Desirable

Not Desirable

D. Roots

1. The uppermost roots or root collar (root crown) shall be within the upper 2 inches of the soil media (substrate).
2. The root collar and the inside portion of the root ball shall be free of defects, including circling, kinked, and stem girdling roots. Soil removal near the root collar may be necessary to inspect the aforementioned root defects.



Desirable

Not Desirable

3. Roots on the periphery and bottom of the root ball shall be less than 1/4 inch in diameter (1/8 inch is preferred). The maximum acceptable root diameter on the periphery should be indicated.



Desirable



Not Desirable

4. The tree shall be well rooted in the soil media (substrate). Root distribution shall be uniform throughout the container media. Structure and growth shall be appropriate for the species/cultivar. When the container is removed, the root ball shall remain intact. When the trunk is lifted both the trunk and root system shall move as one.
5. At the time of inspection and delivery, the root ball shall be moist throughout. The crown shall show no signs of moisture stress as indicated by wilted, shriveled, or dead leaves or branch dieback. The roots shall show no signs of excess soil moisture as indicated by poor root growth, root discoloration, distortion, death, or foul odor.

III. INSPECTION

The buyer reserves the right to reject trees that do not meet specifications as set forth in these guidelines or as adopted by the buyer. If a particular defect or substandard element or characteristic can be easily corrected, appropriate remedies are encouraged. If destructive inspection of a root ball or balls is to be done, the buyer and seller should have a prior agreement as to the time and place of inspection, minimum number of trees to be inspected or percentage of a species or cultivar, and financial responsibility for the inspected trees.

VI. DELIVERY

The buyer should stipulate how many days prior to delivery that notification is needed.

GLOSSARY:

caliper. Trunk diameter measured 6 inches from the ground; if caliper is greater than 4 inches, the caliper measurement is taken at 12 inches from the ground.

central leader. A continuation of the main trunk located more or less in the center of the crown, beginning at the lowest main branch (scaffold) and extending to the top of the tree. Also referred to as the **dominant leader**.

circling roots. One or more roots whose diameter is greater than 10% of the trunk caliper circling more than one-third of the trunk.

clear trunk. The portion of the trunk below the crown lacking lateral branches; this includes the portion of the trunk with shortened temporary branches that are below the main crown.

codominant. Two or more vigorous, upright branches or stems of relatively equal size that originate from a common point, usually where the leader was lost or removed.

crown. The portion of a tree beginning at the lowest main (scaffold) branch extending to the top of the tree.

cultivar. A named plant selection from which identical or nearly identical plants can be produced, usually by vegetative propagation or cloning.

included bark. Bark embedded in the union between a branch and the trunk or between two or more stems that prevents the formation of a normal branch bark ridge.

kinked root. A main mother root that is sharply bent.

leader. The dominant stem that usually develops into the main trunk.

photosynthate. Sugar and other carbohydrates that are produced by the foliage and stems during photosynthesis.

root collar. The base of a tree where the main roots and trunk meet. Also referred to as the **root flare**.

scaffold branches. Large main branches that form the main structure of the crown.

stem-girdling root. A circling, bent, or straight root that touches or rests on the trunk or root flare that can become a permanent root.

temporary branch. A small branch that is temporarily retained along the lower trunk of young trees.

trunk. The main stem of a tree, beginning at the root collar and ending at the lowest main scaffold branch.

taper. The thickening of a trunk or branch toward its base.