

Urban & Community Forestry: Green Trees For The Golden State Grant Program

A tree planting grant program.

**2012/2013
Request for Proposals**



**State of California
Department of Forestry and Fire Protection
(CAL FIRE)
Urban & Community Forestry Program**



Grant program made Pursuant to the California Urban Forestry Act of 1978 (Public Resources Code 4799.06 – 4799.12), a copy of which can be found at: http://www.fire.ca.gov/resource_mgt/resource_mgt_urbanforestry.php.

Grant Funds made available from:

Proposition 84, Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006

Concept Proposals Due: September 19, 2012

Urban & Community Forestry: *Green Trees For The Golden State* 2012-2013

IMPORTANT NOTE:

Please also see and refer to the *Urban & Community Forestry Grant Programs Procedural Guide for 2012/2013*. This document is available at:

<http://www.ufej.org/grantinfo.lasso>

or

http://www.fire.ca.gov/resource_mgt/resource_mgt_urbanforestry.php.

Grant applicants are responsible to meet the requirements of both documents. This RFP document takes precedence in the case of a conflict between the two documents.

Introduction:

The California Department of Forestry and Fire Protection (*CAL FIRE*) will set aside funds to provide grants to organizations that wish to create or implement an urban tree planting project. The funding level of each *CAL FIRE* Urban & Community Forestry grant program may be adjusted based on the applications received and funds available to *CAL FIRE* for these purposes.

The *CAL FIRE* Urban & Community Forestry Program works to optimize the benefits of trees and related vegetation through multiple-objective projects that provide environmental services and cost-effective solutions to the needs of urban communities and local agencies, including, but not limited to, increased water supply, clean air and water, reduced energy use, flood and storm water management, recreation, urban revitalization, improved public health, and producing useful products such as bio-fuel, clean energy, and high quality wood. Such efforts play a significant role in meeting the state's greenhouse gas emission reduction targets. We encourage citizen participation in the development and implementation of state and local agency and non-profit organization urban forestry programs and projects.

Eligible applicants include cities, counties, qualifying districts, or nonprofit organizations qualified under Section 501(c)(3) of the Internal Revenue Code (IRC 5096.605). Districts include, but are not limited to, school, park, recreation, water, and local taxing districts.

Purpose:

The purpose of the *Green Trees for the Golden State* grant program is to provide funding for tree planting projects in urban areas and up to two years of initial maintenance. Preference will be given to tree planting projects that provide multiple benefits, with an emphasis on greater air quality benefits and greater energy conservation benefits. Additional benefits that may be taken into consideration include: storm water runoff reduction, storm water quality improvement, improvement of public health, creation of "green jobs", social benefits, and environmental justice.

Conditions:

All of the following conditions must be met for a proposed project to be eligible for a grant:

- Grant requests must be for the creation, development, and implementation of tree planting projects that maintain and/or expand healthy urban forests.
- The amount requested must be between \$30,000 and \$75,000. (There is a separate program, “*Leafing Out*”, for all Urban & Community Forestry Grant Projects of \$2,500 - \$30,000).
- The project must be located in, or immediately adjacent to, an “urban area” or “urban cluster” as defined by the U.S. Census Bureau.
(<http://www.census.gov/geo/www/ua/2010urbanruralclass.html>)
- The project must have a commitment for active participation from one or more of the following: local residents, local business, local nonprofit group or local government.
- The project must display a sign with the logos and names of all organizations participating in the project, including *CAL FIRE Urban & Community Forestry Program*. The sign must also cite the funding proposition.
- The applicant has complied (and will comply) in all respects with all applicable local and county ordinances, and all applicable state and federal laws and regulations, including the California Environmental Quality Act (CEQA).
- Projects shall include an educational component. Not more than 10% of grant funds may be used for this educational component. The educational component as part of the overall project can be shown as project match dollars by the applicant.
- Any trees paid for as part of the project must be alive and healthy upon project completion or they will need to be replaced at the grantee’s expense.
- The applicant must agree to provide maintenance on all trees planted (including replacement) for at least three years after project completion. Evidence of long term care for the trees must also be shown.
- **The project shall adhere to the *CAL FIRE Standards and Specifications For Purchasing, Planting, and Maintaining Trees*, see ATTACHMENT A (and as listed at the following web site: <http://www.ufe.org/Standards&Specs.html>).**

Ineligible Projects:

The following practices will not be funded by this grant program.

- Planting trees that require excessive maintenance such as: excessive long-term watering, fertilizing, exterminating, or controlling plant pests and diseases in order to survive.
- Projects that plant trees that will eventually conflict with overhead or underground utilities or ground-located infrastructure.
- Invasive species as determined by referencing the California Invasive Plant Council website (<http://www.cal-ipc.org/>) or similar reference.

Eligible Costs (refer to sample budget, Procedural Guide APPENDIX B):

Trees and planting materials

- Trees in the #15 (gallon) container size are eligible. Other sizes will be considered on a case-by-case basis. Balled and burlapped and bare root trees may also be utilized if the sizes are equivalent (refer to specifications document). Other sizes and types of trees must be approved by a *CAL FIRE* Regional Urban Forester prior to submission of the final proposal.
- Planting materials may be: Stakes, ties, and root collar protectors proportional to number of trees being planted; wood chip surface mulch to conserve soil moisture and inhibit weed growth, soil amendments in areas of hard clay soil or sandy soil; soil where needed to complete backfill; watering tools, including minor irrigation system supplies; and hand tools.
- Limited labor directed to tree planting.
- Young tree maintenance costs such as: structural pruning, stake adjustment and removal, and irrigation.
- **Administration and overhead costs (for non-profit applicants only):**
 - A maximum not to exceed 5% of total State reimbursement. Administrative costs include items such as payroll administration, human resources, computer support, financing, and office support.
- **Education and signage:**
 - Purchase, development and distribution of project-specific education materials may be funded pending relevance to the scope of the proposed project. A maximum not to exceed 10% of grant request.
 - Proposition 84 sign construction and materials. Cost to State not to exceed \$1,000.00.
 - For sign requirement details, please contact your Regional Urban Forester (see Procedural Guide APPENDIX E).
- **Concrete removal and other special concerns:**

In projects where the planting of trees involves the removal of asphalt, concrete paving, or another special concern, reimbursement cost may be available. Applicant must demonstrate that no alternative exists to plant trees in another nearby location(s) that may be more suitable, or that there is an overwhelming need at the location. If concrete cuts are to be made, they must be 16 square feet at minimum. Larger is preferred.

Ineligible Costs:

This grant cannot finance any undertaking or complete any practice designed to supplant rather than supplement existing local agency activities. Such ineligible practices shall consist of any request that *CAL FIRE* furnish grants to take the place of a regular or ongoing fiscal commitment to a program or project by a local government. Any practices that are required as mitigation of any kind may not be financed by this grant program. Additionally, the following are ineligible costs:

- Tree grates and decorative tree guards
- Disposal costs of woody debris
- Tree removal
- Irrigation valves, pumps, sprinkler control timers or elaborate irrigation systems
- Root barriers (linear and chemical barriers may be approved for use by a *CAL FIRE* Regional Urban Forester prior to final proposal submission, but will not be paid for with grant funds).

Cost share:

These grants are to share the cost of eligible urban forestry projects. The proportion of the project’s cost funded by *CAL FIRE* Urban & Community Forestry shall not be greater than **75%**. Matching contributions (**25%**) required as a condition of grants made pursuant to this section may be made in the form of material, services, or equipment, as well as funds from any non-state source. For example:

Total Project = \$100,000.00
CAL FIRE Maximum Request = \$75,000.00
 Minimum match required = \$25,000.00

Important Note: *Disadvantaged or severely disadvantaged communities as defined in the Urban Forestry Act are eligible to have increased cost share of up to 90% of project costs with a 10% matching contribution in the form of material, services, equipment, or funds from any non-state source. Such communities must be able to prove they meet this criteria. Please see Procedural Guide for further details.*

Application:

The first step is to complete a Concept Proposal Application. If your Concept Proposal Application is selected, you will be asked to complete a Full Proposal. The Concept Proposal Application can be found at:

<http://www.ufe.org/grantinfo.lasso> or
http://www.fire.ca.gov/resource_mgt/resource_mgt_urbanforestry.php

Concept proposals must be submitted electronically in the provided format by September 19, 2012. Email or electronic submissions other than in the provided format will not be accepted unless alternative arrangements are made with Urban & Community Forestry Program staff ahead of the deadline. Do not send unsolicited materials. Doing so will result in rejection of the application. In the case of technical difficulties or an inability to utilize the online format, please contact your *CAL FIRE* Regional Urban Forester for authorization to use alternative grant submittal procedures at least two weeks prior to the due date (see Procedural Guide APPENDIX E).

Using the submit button at the end of the form field will submit the concept application electronically. Before clicking to submit your concept application, please print a copy for your records and go to the

file menu in your current version of Adobe Acrobat Reader (<http://get.adobe.com/reader/>) and select the “save a copy” option. This will allow applicants to retain a copy of the application for their records.

Information required on concept application shall include:

Complete the online application and follow the format, directions about size limitations etc. Failure to fully complete the form will result in rejection of the application.

The project description should include a description of the project, the number and job nature of the people involved in the project and the source of funds, materials, equipment or services to be provided by the applicant. Also include the number of trees to be planted within the project. Provide your proposed budget following the format provided in the concept proposal form.

Desirable Concept Proposal Attributes

- The project provides urban forest resources to areas where such resources are absent, or replenishes such resources where they are badly depleted.
- The project uses trees or other vegetation to reduce consumption of finite energy resources, reduce urban heat island effects, or to produce energy and other products from urban forests.
- The project uses trees or other vegetation to help reduce air pollution or improve air quality.
- The project is located in an area with an unemployment rate in the relevant census tract that exceeds the average unemployment rate for urban areas in California and provides jobs for currently unemployed persons. Documentation will be required for full proposal if successful in the concept proposal process.
- The project has an educational component and develops public awareness of the need for expanding and managing urban forest resources.
- The project will plant trees in an area that will have high public health related benefits.
- The number of trees to be planted is high in relation to the budget requested.
- The project utilizes the largest canopied tree possible for the selected planting sites and shows a preference for planting sites that can support large canopied trees.
- The project involves the public in planting of trees.
- The project will be in a disadvantaged community or a severely disadvantaged community as defined in the Urban Forestry Act. Severely disadvantaged or disadvantaged status instructions can be found in: *Urban & Community Forestry Grant Programs Procedural Guide for 2012/2013*.

Project Rating Criteria:

Any conditions, attributes, or requirements of this RFP and the accompanying Procedural Guidelines document may be utilized for rating purposes.

- | |
|--|
| <p>1. Best Management Practices</p> <ul style="list-style-type: none">• Project maximizes the multiple benefits of urban trees.• Project follows urban forestry and nursery stock best management practices. |
|--|

- Project is consistent with local ordinances, policies, and management plans.
- Project has adequate planting sites for tree species selected.
- Project shows a preference for tree species that will grow large at maturity (30+ feet tall with equal spread at maturity).
- Project adequately takes species diversity of the urban forest into account.
- Project uses climatically well-adapted, non-invasive tree species for the proposed project area.
- Project takes site related challenges into consideration (soil, vandalism, pollution, etc.).

2. Program Priorities (Must meet one or more)

- Interagency Cooperation and Integration (partnerships)
- Maximizes public participation/involvement.
- Project is proposed by a Severely Disadvantaged or Disadvantaged Community.
- Project is ready to move forward immediately.
- Applying organization has adequate capacity to carry out the project.
- Application quality (thoroughness, clarity, focus, accuracy).

Note: In addition to the above criteria, application completeness, degree of community need, project value and project reflection of Urban Forestry Act goals will be evaluated.

Project Timeline:

Projects Completed By	March 30, 2015
Projects Closed By	June 1, 2015
No Reimbursement Possible After this date	

Note: Please see Urban & Community Forestry Grant Programs Procedural Guide for 2012/2013 for reporting requirements for this grant program.

What happens after submitting an application?

(Please see APPENDIX F of the *Urban & Community Forestry Grant Programs Procedural Guide for 2012/2013* for a CAL FIRE Urban & Community Forestry Program Grant Process Flow Chart).

Application Review and Filing

Upon receipt of an application for an urban forestry project grant, *CAL FIRE* Urban & Community

Forestry staff or a designee of the *CAL FIRE* Urban & Community Forestry Program Manager shall review it for conformance with the California Urban Forestry Act of 1978 (Public Resource Code 4799.06 to 4799.12), The California Code of Regulations (Title 14, Division 1.5, Chapter 9.7), this Request For Proposals, and the *Urban & Community Forestry Grant Programs Procedural Guide*. Such review may include an inspection of the project area, if applicable.

If the application is found incomplete in a material way or the proposed project is not eligible for a grant, the applicant will be informed that the proposed project is ineligible. Only when an application is complete and the project is deemed eligible for a grant, will *CAL FIRE* Urban & Community Forestry staff file the application.

Notification of Application Status

CAL FIRE Urban & Community Forestry staff shall notify each applicant whose application has been filed and reviewed of the status of its application within ten working days of the completion of review.

(1) For those applications that have ranked high enough in the initial review, *CAL FIRE* shall notify the applicant and invite them to submit a full proposal for a grant for the project. Invitation for a full proposal is NOT a guarantee of funding. Once a full proposal is submitted, *CAL FIRE* Urban & Community Forestry staff will notify the applicant if a grant will be awarded as the circumstances allow. The applicant may then either withdraw their application or complete the negotiations and execute a grant agreement. When the grant agreement is executed, the Director of *CAL FIRE* will make the grant funds available to the recipient in the manner and at the times specified in the agreement. DO NOT BEGIN WORK ON A PROJECT PRIOR TO RECEIVING A FULLY EXECUTED GRANT AGREEMENT. Doing so may result in the project being ineligible for reimbursement.

(2) For those applications that are eligible but for which there are no existing funds due to ranking, *CAL FIRE*, shall notify the applicant that they will be invited to submit a full proposal if funds become available during the fiscal year. If no funds become available during the fiscal year, *CAL FIRE* shall notify the applicant of this and shall encourage him/her to apply for funds during the next period in which *CAL FIRE* requests proposals for urban & community forestry projects.

Administration: To receive a grant, successful applicants must enter into a grant agreement with *CAL FIRE*. Grant recipients must agree to complete their project and allow for periodic inspections. In return, *CAL FIRE* agrees to share the cost of the project.

Technical Assistance: For technical assistance in preparing the concept proposal, the applicant should contact the *CAL FIRE* Regional Urban Forester located in the area nearest to the proposed project (see Procedural Guide APPENDIX E):

Request for Record Review.

Within ten days of the receipt of notice that the application has been denied the applicant may request that the Director of ***CAL FIRE*** personally reconsider the decision of rejection. The request shall identify the applicant and the proposed project, and shall briefly state the applicant's reasons for

requesting reconsideration. The Director shall consider the application and all of the correspondence from interested parties in reviewing the decision.

Final Decision by the Director.

If the Director finds that the decision to reject the application conforms to these guidelines and the Act, the Director shall uphold the decision. If the Director finds that the decision to reject the application does not conform to these guidelines or the Act, the Director may approve the application.

FEDERAL AFFILIATION

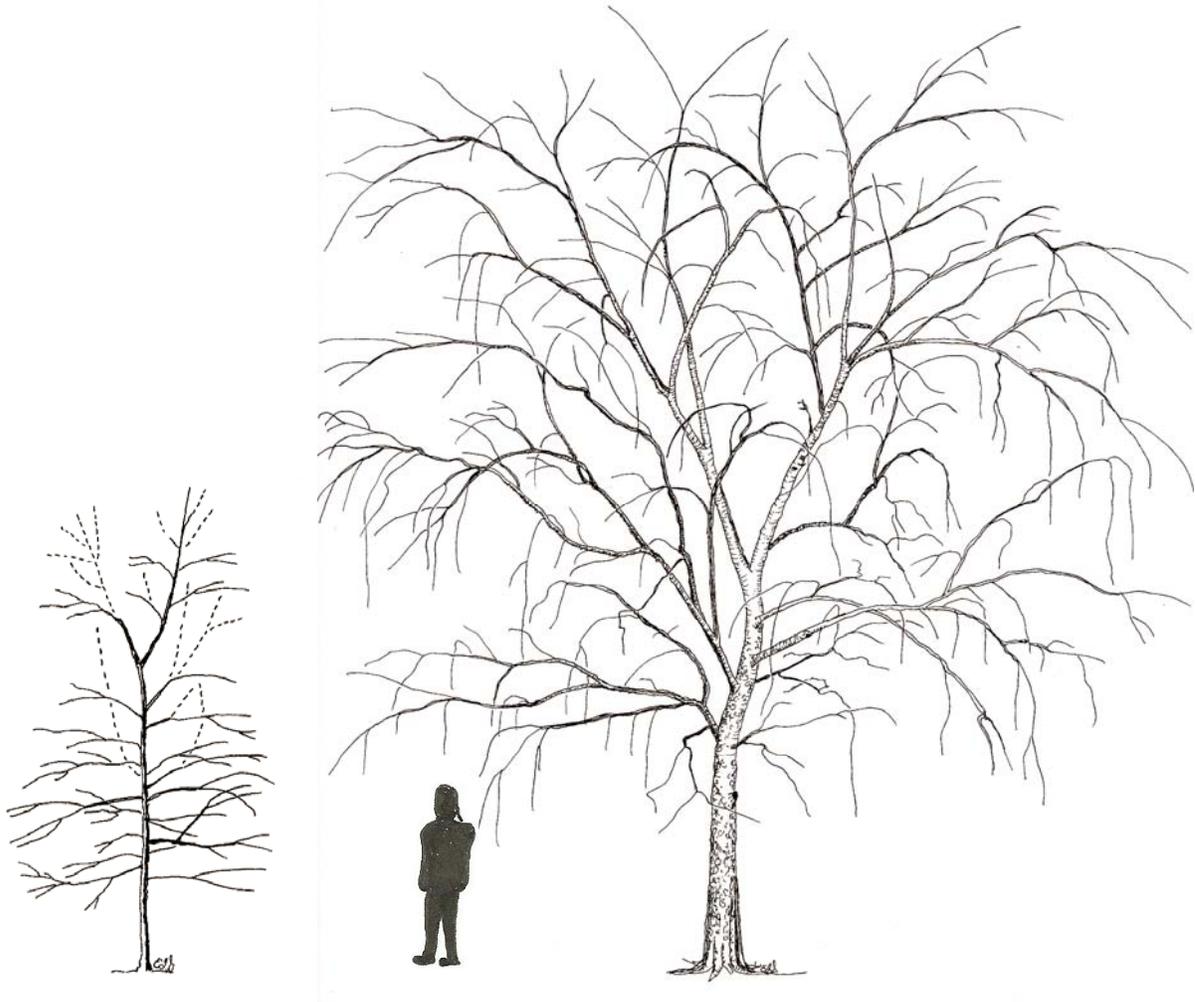
This program is made possible through a cooperative relationship with the USDA Forest Service.

In accordance with Federal law and U.S. Department of Agriculture policy, this institution is prohibited from discriminating on the basis of race, color, national origin, sex, age or disability. (Not all prohibited bases apply to all programs.)

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Attachment A

Guideline Specifications for Selecting, Planting, and Early Care of Young Trees



This document is a compilation of the *Guideline Specification for Nursery Tree Quality: Strategies for Growing a High-Quality Root System, Trunk, and Crown in a Container Nursery*, and the *Tree Care Cue Cards*. It has been prepared to help green industry professionals in the efforts to select, plant, and care for young trees.

Illustrations by Edward F. Gilman, Professor, Environmental Horticulture Department, IFAS, University of Florida; adaptations 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).



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Nursery Tree Quality

I. GENERAL SPECIFICATIONS

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).

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.

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 shall 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.

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.

Crown: The form and density of the crown shall be typical for a young specimen of the species or cultivar. The leader shall be intact to the very top of the tree.

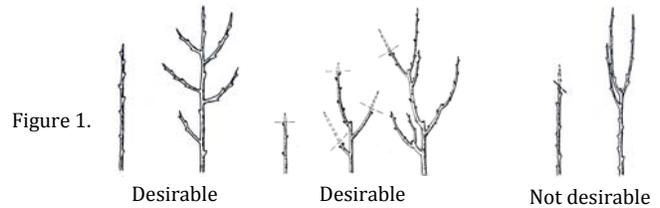
Leaves: The size, color, and appearance of leaves shall be typical for the time of year and stage of growth of the species or cultivar. Trees shall not show signs of moisture stress as indicated by wilted, shriveled, or dead leaves.

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

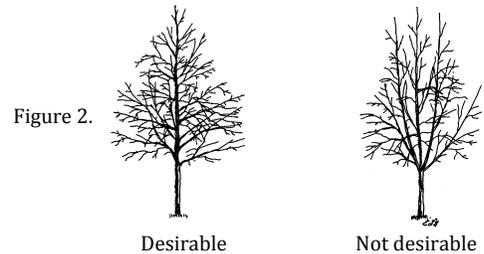
Trunk: The tree trunk shall be relatively straight, vertical, and free of wounds (except properly made pruning cuts), sunburned areas, conks (fungal fruiting bodies), wood cracks, bleeding areas, signs of boring insects, cankers, girdling ties, or lesions (mechanical injury). The terminal bud on the leader shall be intact to the very top of the tree, and it shall be the highest point on the tree.

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 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.

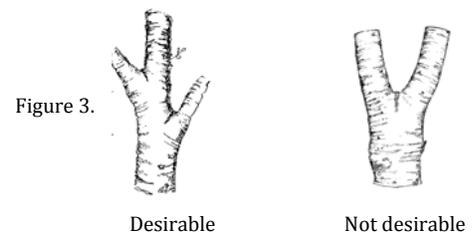
Shade trees that grow to be large shall have one relatively straight central leader (Figure 1). Heading the tree is acceptable provided the central leader is reestablished in the



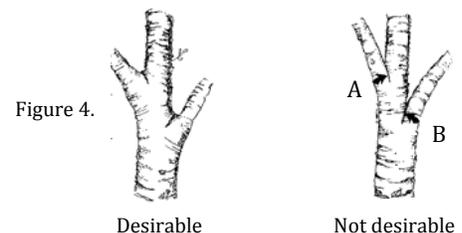
Main branches (Figure 2) shall be well distributed along the central leader, not clustered together. They shall form a balanced crown appropriate for the cultivar or species.



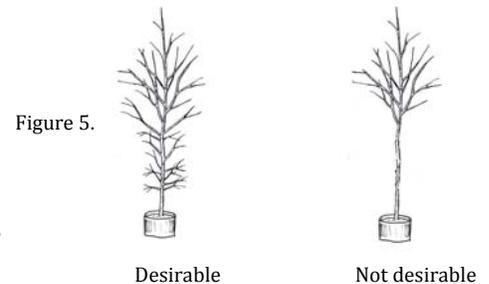
The diameter of branches (Figure 3) that grow from the central leader, or trunk, shall be no larger than two-thirds (one-half is preferred) the diameter of the trunk measured just above the branch.



The largest branches shall be free of bark inclusions that extend into the branch union (Figure 4 A and B).



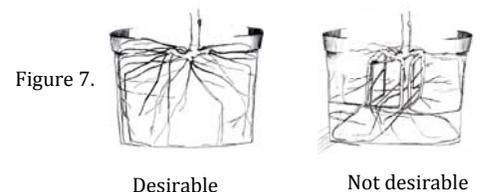
Small-diameter branches (Figure 5, left), particularly on trees less than 1 inch caliper, should be present along the lower trunk below the lowest main branch. These branches shall be no larger than 3/8 inch in diameter.



The trunk shall be free of wounds, sunburned areas, conks (fungal fruiting bodies), wood cracks, bleeding areas, signs of boring insects, cankers, or lesions. Properly made recent or closed pruning cuts are acceptable.

The trunk caliper (diameter) and taper (Figure 6) shall be sufficient so that the tree remains vertical without a stake.

The root collar (the uppermost roots) (Figure 7) shall be within the upper 2 inches of the soil media (substrate). The root collar and the inside portion of the root ball shall be free of defects, including circling, kinked, and stem-girdling roots.



Roots at the surface should grow mostly straight to the side of the container. You may need to remove soil near the root collar to inspect for root defects. The tree shall be well rooted in the soil media. Roots shall be uniformly distributed throughout the container, meaning that roots should not be concentrated at the bottom of the root ball. Some roots should contact the container wall in the top half of the root ball (Figure 7, left). 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. The imprint of the liner or smaller container shall not be visible (Figure 7, left).

The root ball shall be moist throughout at the time of inspection and delivery. The roots shall show no signs of excess soil moisture as indicated by poor root growth, root discoloration, distortion, death, or foul odor. The crown shall show no signs of moisture stress as indicated by wilted, shriveled, or dead leaves or branch dieback.

Tree Planting

Selecting quality trees: Planting quality trees begins by selecting the right tree for the right location and choosing vigorous, structurally sound trees from the nursery.

Digging the hole: A firm, flat-bottomed hole will prevent trees from sinking. Dig the hole only deep enough to position the root collar even with the landscape soil surface (Figure 8). Use a rototiller or shovel to loosen soil in an area three times the size of the root ball. This loose soil promotes rapid root growth and quick establishment.

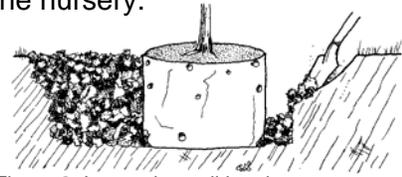


Figure 8. Loosening soil in a large area around the root ball allows for rapid root growth and quick establishment.

Installing the tree: Remove soil and roots from the top of the root ball to expose the root collar; cut away any roots that grow over the collar (Figure 9). Also cut any roots that circle or mat along the sides and bottom of the root ball (Figure 10). The root collar shall be even with the landscape soil after planting (see Figure 9). Backfill with soil removed from the hole. Minimize air pockets by packing gently and applying water. Build a berm 4 inches tall around the root ball to help force water through the root ball. Enlarge the berm as the tree establishes.

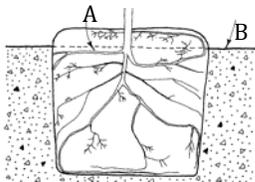


Figure 9. Remove soil and roots growing over the root collar (A) and place collar level with soil surface (B).

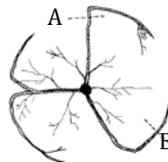


Figure 10. Cut roots at (A) to form new roots that grow away from the trunk. Do not cut roots at (B), since the root defects will re-grow.

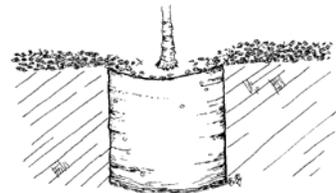


Figure 11. Mulch shall taper to a slightly thinner layer on top of the root ball.

Mulching: A layer of organic mulch, such as leaf litter, shredded bark, or wood chips, helps protect tree roots from temperature extremes and conserves soil moisture. Mulch also helps prevent grass from competing with the tree for water and nutrients. The mulched area makes it easier to operate mowers and weed eaters without hitting the trunk and compacting soil. Apply mulch to a depth of 3 to 4 inches (slightly thinner on top of the root ball) (Figure 11).

Staking: The method of staking is dependent on a tree's ability to stand on its own and the location of the planting site. Staking is used to hold trees erect, allow the root ball to anchor, and protect the trunk from damage by equipment. Stakes should be removed when the tree can stand on its own and the root ball is anchored. Stakes should be positioned away from the tree and secured to the trunk at the point where the tree stands straight. Do not use wire or any strap that will girdle the tree or damage the bark. If a tree cannot stand straight on its own after staking, a splint stake tied directly to the trunk made of bamboo, spring steel, or a fiberglass rod may be used to straighten the upper trunk and/or leader. Avoid using square wood secondary stakes.



Figure 12. Double staked

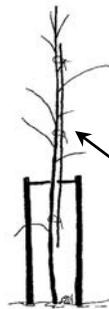


Figure 13. Double staked with splint stake.

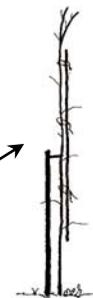


Figure 14. Single staked with splint stake.

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Tree Training at Planting and in the Early Years

Trees that grow to be large are more structurally sound and cost-effective to maintain when trained with a central dominant leader that extends 30 feet or more into the crown (Figure 15, left). Vigorous, upright branches and stems that compete with the central leader can become weakly attached (Figure 15, right).

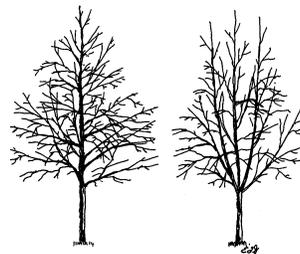


Figure 15. Good tree structure (left); poor structure (right).

Trees with branches spaced along the central leader, or trunk (Figure 15, left) are stronger than trees with branches clustered together (Figure 15, right). Prune trees at planting to one central leader by removing or shortening (shown) competing stems (Figure 16). All branches and stems shall be considerably shorter than the central leader after pruning is completed (Figure 16, right).

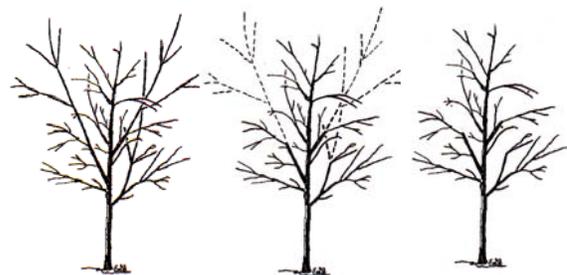


Figure 16. Shorten competing stems to improve structure.

Remove or shorten branches that are larger than half the trunk diameter at planting and every few years thereafter. Shorten them by cutting back to a live lateral branch (Figure 17, right). This lateral branch shall be pointed away from the trunk and it should not be growing upright. The central leader shall be more visible in the crown center after pruning. Only large-diameter branches need to be pruned because they compete with the leader and could be weakly attached (Figure 17, L). Small branches (Figure 17, S) do not need pruning because they will not compete with the leader.

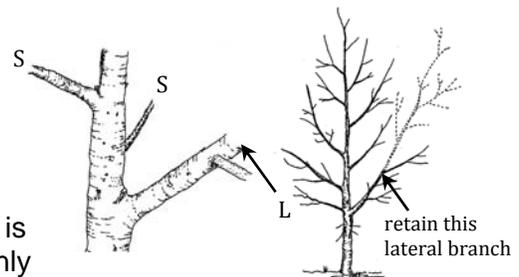


Figure 17. Only large branches need pruning (L). Small branches (S) do not need to be

Shorten or remove the largest low branches when the tree is young to keep them small (Figure 18). This ensures that only a small wound is created when they are eventually removed from the trunk.

The best way to shorten large or long stems and branches is to cut them back to a live lateral branch (Figure 19). This slows growth on the pruned parts and encourages growth in the dominant leader creating sound structure.

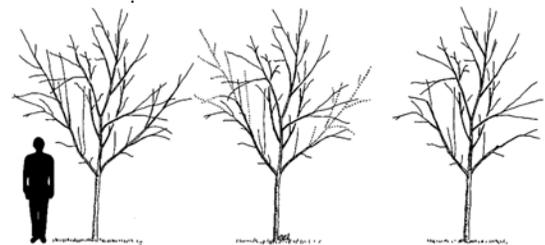


Figure 18. Shortening larger low branches concentrates growth in the leader and improves tree structure.

Remove larger branches by making three cuts. This prevents the bark from peeling or splitting off the trunk below the cut. Make the final cut back to the branch collar (enlarged area around union of branch where it joins the trunk).

Structural Pruning Checklist

- Develop and maintain a central leader.
- Identify the lowest branch in what will become the permanent crown.
- Space main branches along the central leader.
- Reduce vigorous upright stems back to lateral branches or remove entirely (Figure 20).

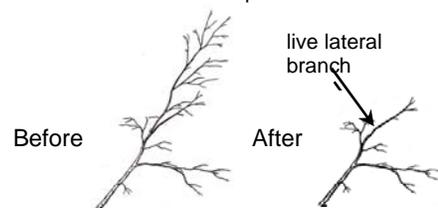


Figure 19. Reduce a stem back to a live lateral branch to slow its growth.

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Reduction cuts can be used on trees at planting to subordinate branches that are codominant (Figure 20). Some upright stems and branches can be removed entirely back to the trunk. Heading cuts may have to be used occasionally.

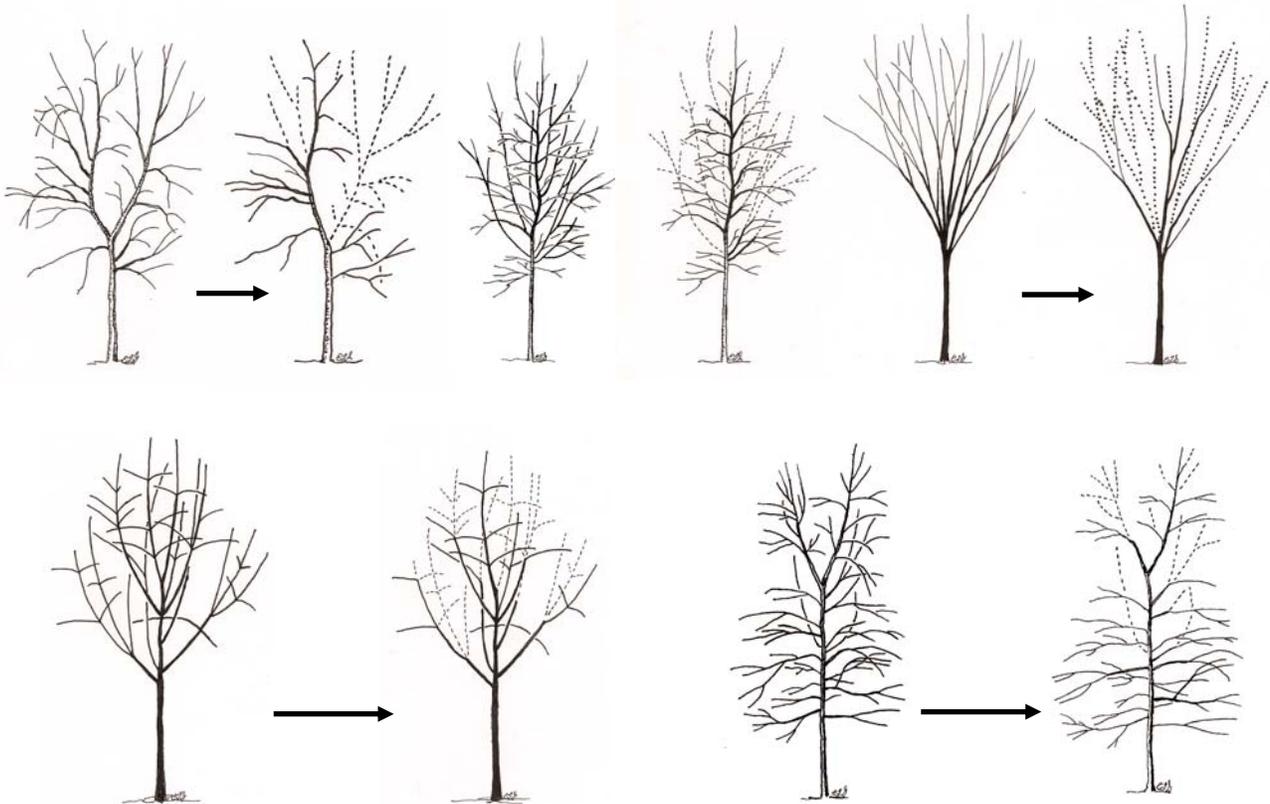


Figure 20. Before and after pruning at planting for

Irrigation

Consistent irrigation is critical for establishment.

1. Apply about 3 gallons of water per inch of trunk diameter to the root ball 2 or 3 times per week for the first growing season.
2. Increase volume and decrease frequency as the tree becomes established.
3. Weekly irrigation the second year and bimonthly irrigation the third year should be sufficient for establishment.
4. Once established, irrigation requirements depend on species, planting site, climate, and soil conditions.
5. Irrigation devices should be regularly checked for breaks and leaks.

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