



A Resource List

THIRD THURSDAY WEBCAST SERIES

The Third Thursday Webcast Series is a monthly webcast held at the lunch hour and made possible through support from The Home Depot Foundation and USDA Forest Service. The goal is to provide training opportunities for local urban and community forestry practitioners. The trainings highlight successful programs and practices that you may want to adapt in your communities. Webcasts are open to all.

Correctly planting and protecting trees is a good thing to do. However, planting and protecting trees also requires coordinating time and resources. ACT minimizes such requirements by sharing the innovative ideas and organized approaches of successful projects and models for members to replicate. We invite you to join the Alliance for Community Trees for more ways to get involved. Together, we create a strong voice on behalf of the urban forest and make a great difference in the health, beauty, and livability of our communities. We strengthen communities by offering action-oriented approaches that bring people together around a common purpose.

TOPICS

Bare Root Planting

Bare root planting is a best management practice that is increasingly moving from research to the field is. Whether from a nursery field to the city street or just from one place in your yard to another, it's the roots that suffer when trees are transplanted. Consider this: Shade tree roots are found primarily in the top 12 inches of soil. Tiny absorbing roots- responsible for most of the tree's intake of water and nutrients- grow horizontally not only up to the dripline, but also beyond it. In fact, there is often a higher percentage of absorbing roots beyond the dripline than within it. An unbelievable 90% of tree roots are routinely left behind in the nursery at the time of harvest. In an industry where having a viable root system is the primary determining factor of whether trees survive and thrive in their new location, current practices must be reevaluated.

More information at: http://actrees.org/site/resources/events/urban_landscaping-_part_i_bareroot_trees.php

Tree Stock

Millions of dollars are spent each year designing, implementing, and maintaining urban landscapes. Urban landscaping presents unique challenges such as the physiological problem of plants growing in urban environments, working with municipalities to assess and manage their green infrastructure, developing technologies appropriate for city use, and caring for the environment through not only field work but also publications, websites, face-to-face meetings, and conferences. Yet the quality of life benefits of proper urban landscaping are dramatic. Problems can be avoided or reduced by utilizing sustainable landscape practices. By using BMPs, cities and towns can transform the urban forest into a rainwater mitigation asset and enable large tree growth. Tree stock selection goes a long way towards the long-term health and success of urban trees. Whether balled and burlap, containerized, or bareroot, it's the roots that suffer when trees are transplanted.

More information at: http://actrees.org/site/resources/events/urban_landscaping-_part_ii_tree_stock.php





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TRAINERS

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Nina Bassuk is a professor and program leader of the Urban Horticulture Institute at Cornell University, and co-author of *Trees in the Urban Landscape*. A native New Yorker, her current work focuses on the physiological problems of plants growing in urban environments, including improved plant selections for difficult sites, soil modification including the development of CU-Structural Soil and improved transplanting technology. Nina is a recipient of the Gold Medal of Horticulture from the New York State Nursery and Landscape Association.

Patrice Sheehan administers the street tree program for the City of Wilmington, coordinates annual Arbor Day activities, maintains a database of tree resources and helps communities secure funding for Tree Program Initiatives. Her favorite part of her job is working with volunteers planting trees. Patrice has worked as an ISA Certified Arborist for 12 years in New Jersey and Delaware. Originally from Australia, Patrice now lives in Pitman, New Jersey where she enjoys gardening, water gardening, camping, traveling and serving on the Pitman Environmental Commission. She holds a B.S. in Business Administration with a specialization in Management from Rowan University and an A.A.S. in Ornamental Horticulture from Cumberland County College.

Jim Urban specializes in the design of trees and soils in urban spaces. He has written and lectured extensively on the subject of urban tree planting and has been responsible for the introduction of many innovations including most of the current standards relating to urban tree plantings. He was instrumental in the development of structural cells and structural planting soils for use under sidewalk pavements, micro root paths, and macro soil trench techniques. Jim is credited with helping to re-awaken the profession of landscape architecture to the skills required to successfully plant trees in difficult urban soils. In 2007 he was awarded the ASLA medal of Excellence for his work.

Sue Probart is one of the founding members of Tree New Mexico and has served as the executive director since 1990. She has guided this community-based nonprofit on a shoestring budget into a nationally recognized environmental organization with outreach including 130 communities in New Mexico and Arizona, 22 Native American tribes, national and state forests and parks and 40 protected riparian areas. Among the boards she has served on are: the National Urban and Community Advisory Council, Alliance for Community Trees, New Mexico Tree Planting Advisory Committee, Holistic Management International, and the Albuquerque Energy Council.





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SUCCESS STORIES – BARE ROOT

About Bare Root

A young tree without soil weighs very little, is easy to move and plant, and is cheaper due to less labor and materials. This is a major advantage of bare root trees for use in volunteer planting. In addition to their light weight and well-preserved roots, bare root trees are easily stacked together and transported in great numbers, and they can cost half the price of balled and burlapped or containerized trees. Also, the easily visible root flare of bare root trees facilitates proper planting.

However, working with bare root stock requires careful coordination. Once they leave the nursery, bare root trees need to get in the ground within a week at the longest. With no soil, the roots can dry out and die if left exposed for any time. They must be transplanted while still dormant (spring) and are susceptible to wilting if exposed for any length of time out of the ground. The roots must be kept moist and out of the sunlight. Often they are delivered in bulk with roots covered in only a very moist medium or slurry hydrogel. While larger trees establish themselves more easily and survive better in neighborhood settings, they can be expensive and very heavy and hard to handle by volunteers if they are balled and in burlap. Few nurseries supply bare root trees due to the dependability of storing and shipping trees in the other two fashions.

Delaware Center for Horticulture (Wilmington, DE)

Since it started using bare root stock in 2007, the Delaware Center for Horticulture has found that bare root stock makes for easier plantings. For the first bare root tree planting in Wilmington, the Delaware Center for Horticulture joined nearly 100 volunteers from the Girl Scouts, Boys and Girls Club, University of Delaware Energy and Environmental Policy Student Association, Delaware Forest Service, and The Home Depot to plant 60 trees and beautify 7 sites in northeast Wilmington on March 24, 2007. The Home Depot Foundation funded the event through a NeighborWoods Grant awarded to the Delaware Center for Horticulture by the Alliance for Community Trees. This was also the largest volunteer-driven urban tree-planting event that the organization had conducted because bare root trees allow for greater volunteer mobility. This planting indicated for Delaware Center for Horticulture that the bare root method might be a more successful way to green yards and communities, and meet urban tree canopy goals. More information at: <http://urbanforest.dehort.org/help/bare-root-trees>

Pennsylvania Horticultural Society (Philadelphia, PA)

In Spring 2005, TreeVitalize volunteers and community groups adopted new methods to plant hundreds of trees throughout Bucks, Montgomery, and Philadelphia counties in Pennsylvania. Because of a statewide partnership to restore canopy cover in Pennsylvania and thanks to a new technique for bare root trees, volunteers were able to plant more than 430 large trees in those three Pennsylvania counties in just the first few days before spring. The project, organized by the Pennsylvania Horticultural Society and Penn State Cooperative Extension, employed a method developed by Nina Bassuk at Cornell University to dip bare root trees in a slurry hydrogel mix and bag them in plastic. This keeps the roots moist for a week so that they do not have to be planted quite as quickly. A week before the plantings, volunteers met a shipment of trees at two locations to dip and bag the trees. More information at: www.state.pa.us/papower/cwp/view.asp?A=11&Q=441584





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SUCCESS STORIES – BARE ROOT (continued)

New York State Urban and Community Forestry Council (Cold Brook, NY)

Based on the Southside of Syracuse, the Onondaga Earth Corps is a youth development program that employs teenagers, ages 15-17, to beautify their community and maintain the urban forest. A priority for Corps members is to monitor the growth and success of bare root trees. Since the program began, the youth have led workshops on the benefits of trees for children, trained volunteers to plant trees, and organized work days to plant 215 bare root trees on the streets, in the parks, and in the school yard of their neighborhood. In 2008, eleven Onondaga Earth Corps youth conducted a bare root tree inventory, assessing the growth of young trees and also performing needed maintenance, including mulching and pruning. During the summer Corps youth identify beautification needs in the community and go door-to-door to hundreds of homes to plan tree planting sites for fall plantings.

More information at: www.nysurbanforestrycouncil.com/fall2008.pdf

Providence Neighborhood Planting Program (Providence, RI)

In Spring 2007 the Providence Neighborhood Planting Program adopted the bare root tree planting method. Using a method prescribed by Nina Bassuk of Cornell University, Providence Neighborhood Planting Program participants dipped the root systems of their bare root trees into a soupy slurry of water and hydrogel to keep them moist for up to several weeks. In need of cool, dark storage until planting time, the Program creatively partnered with the Providence Parks Department to keep the trees in an empty tomb at the city's North Burial Grounds.

More information at: www.pnpp.org/treetalk2007.pdf

Northeast Pennsylvania Community Tree Association (La Plume, PA)

From 1999 through 2002 the Northeast Pennsylvania Community Tree Association organized a regional group tree purchase for community tree programs. It began with two communities purchasing hydrogel-dipped, bare root trees following a workshop held with Dr. Nina Bassuk from Cornell University. The second year, the tree purchase grew to eight communities ordering about 250 trees. In Spring 2002 15 communities, PennDot, and Keystone College purchased over 600 bare root trees. By ordering together the communities saved money on shipping costs, enjoyed reduced costs from balled and burlap trees, enjoyed lighter trees easily planted with volunteers, received trees with 200 percent more roots than B&B, and worked with an urban forester on plant selection.

More information at: www.na.fs.fed.us/urban/newsltr/2002/urban_nwsltr_jan02.pdf





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SUCCESS STORIES - CONTAINERIZED

About Containerized

A tree produced in an above-ground container has the advantage of being transplanted with all of its root system. The well-drained artificial media used in above-ground containers is considerably lighter than field soils found in B&B trees, making these trees less expensive to transport and easier to handle. This can be a major benefit in the planting process, especially at a volunteer event; a containerized tree can be moved and planted quickly and easily by just one or two volunteers. The use of inground fabric containers may reduce the weight of the treeball even more. Trees produced in above-ground containers are available for planting any time of year, as long as the soil is not frozen. The major disadvantage of above-ground container production is increased defects, such as girdling roots and lethal high root temperatures on the south and west sides of the container. Containerized trees are also subject to blowing over in winds at the nursery, causing wounds to the trees.

About Pole Planting

In this process, “poles” are cut and planted during the dormant winter season (Tree New Mexico typically uses cottonwood and willow trees). Poles are usually suckers that come up from the base of an older, established tree. The poles are fairly straight, stripped of most of their lateral branches (leaving the top 15-25 percent), and run from 10 to 18 feet long and from two to four inches in caliper. There are no roots. Holes six to ten feet deep (reaching the water table) are drilled along waterways and the poles are planted, and the holes backfilled by the volunteer groups. When spring hits, the poles send out new leaves along the remaining branches, and roots along the shaft of the buried part of the pole. As the tree establishes its new and more traditional root system, the buried part of the pole begins to rot away. This restoration method is cost effective, establishing a forest of six to twelve foot tall trees in a few years time with an estimated survival rate of about 85 percent.

Tree New Mexico (Albuquerque, NM)

Tree New Mexico operates one of the National Tree Trust’s Regional Grow-Out Sites. The program is a three-way partnership between the National Tree Trust, Tree New Mexico, and a municipality. Located in the Village of Los Lunas, about thirty minutes south of Albuquerque, and maintained by the Los Lunas Parks Department and a group of Youth Conservation Corps students, the nursery produces 3,000 to 5,000 two-gallon containerized trees and at least a dozen different species for distribution to communities, neighborhood associations, public housing units, highway plantings, and other public green spaces. In addition, Tree New Mexico distributes approximately 70,000 tree seedlings throughout New Mexico and parts of Arizona every spring. In general, these trees fill the “tree gap,” supplementing what is planted by city programs, private contractors, and homeowners. All the trees are planted in public spaces and for the public good. Also, early every year, Tree New Mexico and the City of Albuquerque Open Space Division coordinate the efforts of volunteer groups who work to restore the Bosque by pole planting. More information at: www.treenm.com/Programs.htm

Sacramento Tree Foundation (Sacramento, CA)

In 1998, the Sacramento Tree Foundation extended its partnership with the Sacramento Municipal Utility District to include the Community Shade Program. Under this program, free container trees are available for planting in public areas such as parks, playgrounds, and schools. The goal of this program is to mitigate the urban heat island effect. Interested schools or park districts contact SMUD or the Sacramento Tree Foundation, which then sends a Community Forester to the school or park site to determine where to plant trees for maximum benefits. Community members are expected to organize other residents to assist with the tree planting and must sign a tree care agreement promising long-term care for the trees. Typical projects involve twenty to two hundred 15-gallon container trees. The Sacramento Shade tree program offers more than 25 trees of varying sizes.

More information at: http://actrees.org/site/what_we_do/success_stories/sacramento_shade_program.php





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SUCCESS STORIES – BALLED & BURLAPPED

About Balled & Burlapped

Balled and burlapped (B&B) is the most traditional method of transplanting trees. These trees are available in a wide range of sizes and are commonly found in nurseries. Compared to bare-root transplants, B&B trees can be planted over a longer period of time and have less stringent handling and storage requirements. B&B trees can be hand dug or dug with mechanical tree spades. B&B trees can be transplanted anytime the ground is not frozen. The shape of the root ball can be easily altered to facilitate special planting conditions such as compacted or high water table soils. The need for staking following planting is less likely due to the weight of the soil in the root ball.

The primary disadvantage to B&B trees is that an estimated 95 percent of the original root system of the tree is left in the field. The weight of the soil on larger B&B trees results in increased shipping costs and the possible need for specialized equipment to handle and plant the trees.

UC Green (Philadelphia, PA)

Volunteers at UC Green's tree planting events have it easier than most when it comes to planting B&B trees, and it's all thanks to the ingenuity of one of their fellow volunteers. Longtime UC Green supporter Joseph Shapiro created a rope-based device that can be slipped around the wire cage of a B&B tree root ball and then attached to a wooden handle, making for much easier and more comfortable and efficient carrying. Because of the large size and weight of B&B trees, it often takes a number of volunteers a good deal of time to transport and transplant just one tree. Usually volunteers roll, push, and pull the tree to the desired location and into its pre-dug pit, grabbing onto the root ball's wire cage or to ropes attached to it. UC Green's volunteers have avoided blisters and saved time by using the Shapiro Root Tree Handle, as it has come to be known, and have planted many large, hearty B&B trees throughout Philadelphia. More information at: <http://www.ucgreen.org/howto.html>

City of Fort Worth (Fort Worth, TX)

The City of Fort Worth's Forestry department runs its own 71-acre tree farm called Rolling Hills Tree Farm, where the fields are planted with seeds collected throughout the city from hardy stock. Forestry produces both containerized and B&B trees at Rolling Hills. The large B&B trees grown there are used in the city's Tree Grant Program. This program makes available the Farm's field grown, 3-inch caliper B&B trees to be transplanted on public property within the City of Fort Worth. Tree may be planted along street medians, nonresidential parkways, public parks, Fort Worth Trinity Trails, and other public property including fire and police stations, libraries, and schools. The B&B trees are only available during the dormant season, usually December through March, while the container-grown trees may be planted throughout the spring.

More information at: www.fortworthgov.org/pacs/fwpcsd/forestry/service/TreeGrant/servmedian.htm





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TECHNOLOGY- SILVA CELLS

The Silva Cell is a subsurface integrated tree and stormwater system that holds unlimited amounts of soil while supporting traffic loads beneath paving and hardscapes. The healthy soil housed within the Silva Cell serves two important functions: growing large trees and treating stormwater onsite. The integration of green utilities like soil, trees and water into our urban areas substantially improves their design sustainability and helps alleviate some of our most pressing ecological challenges – including air and water quality, rising temperatures, flooding and erosion from daily rainfall events. The Silva Cell meets H-20 loading standards, and is ideal for most applications, including plazas, streetscapes, break-out zones, and parking lots.

More information at: www.deeproot.com/template.php?sec=products&nav=silva&content=sc_app&sub=1&lsl=1
<http://actrees.org/files/Research/deeprootsilvacell.pdf>

Lincoln Center (New York, NY)

When the Lincoln Center Development Project decided to renovate the beloved New York City landmark, a close analysis revealed that a substantial redesign was necessary in order to keep their design vision sustainable. Many of the trees on the site had not fared well due to years of inhospitable growing conditions. A complete landscape redesign would enhance the presence of trees on the site and ensure their long-term success. The design firms Diller, Scofidio + Renfro and FX FOWLE brought in the renowned landscape architecture firm Matthews Nielsen to collaborate with James Urban, FASLA, on the use of the Silva Cells to optimize soil volume for the trees while taking into account the characteristics and requirements of each site. The design was accepted and considered the most cost-effective way to provide the uncompacted soil volumes that the trees needed. Installation began in September 2008.

More information at: http://deeproot.com/silva_docs/LincolnCenterBosqueStreetscape.pdf

Friends of the Pittsburgh Urban Forest (Pittsburgh, PA)

The street trees outside of Pittsburgh's new August Wilson Center for African American Culture are among the first in the State of Pennsylvania to benefit from underground soil cell technology. With a grant from the R.K. Mellon Foundation and support from the City of Pittsburgh, Friends of the Pittsburgh Urban Forest partnered with the August Wilson Center and Terra Design Studios to develop a tree planting model that improves the longevity of the City of Pittsburgh's urban street tree population. The Silva cell system was installed for ten trees along Liberty Avenue, and has received praise from Pittsburgh Mayor Luke Ravenstahl: "The use of the Silva Cells is just one more example of how Pittsburgh is leading the way in adopting new technologies to become a greener city."

More information at: http://actrees.org/site/news/newsroom/underground_soil_cells_first_in_pennsylvania.php

Wal-Mart (Lakeland, FL)

Wal-Mart's plan to upgrade their existing Lakeland, FL, store into a super center required creating a plan for healthy trees. Many of the oaks flanking Wal-Mart's entrance were suffering and dying from little available soil – typical of many urban sites. The goal was to be able to grow large trees that provide at least 50% canopy coverage over the parking area while maintaining an adequate number of parking spaces. The project architects recalled a presentation given by James Urban and contacted him for an assessment. Since the size of the parking lot was non-negotiable, the only way to get the trees more soil was to find a way to put good soil underneath the pavement. Jim Urban recommended using Silva Cells, and put together some schematics. Wal-Mart, the architects, and the City of Lakeland all approved the designs, and since Fall 2008, 1600 Silva cells have been providing ample soil and growing space for 16 trees on the Wal-Mart property.

More information at: www.kestreldesigngroup.com/pdfs/08KDG020_Walmart.pdf





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TECHNOLOGY- STRUCTURAL SOIL

The major impediment to establishing trees in paved urban areas is the lack of an adequate volume of soil for tree root growth. Soils under pavements are highly compacted to meet load-bearing requirements and engineering standards. This often stops roots from growing, causing them to be contained within a very small useable volume of soil without adequate water, nutrients or oxygen. Subsequently, urban trees with most of their roots under pavement grow poorly and die prematurely. It is estimated that an urban tree in this type of setting lives for an average of only 7-10 years, where we could expect 50 or more years with better soil conditions. Those trees that do survive within such pavement designs often interfere with pavement integrity. Older established trees may cause pavement failure when roots grow directly below the pavement and expand with age. Displacement of pavement can create a tripping hazard.

Structural soils were developed to safely bear pavement loads after compaction and still allow root penetration and vigorous tree growth. It is a new tool for urban tree establishment, and it is about redesigning the entire pavement profile to meet the load-bearing requirement for structurally sound pavement installation while encouraging deep root growth away from the pavement surface. The new pavement substrate has been developed and tested so that it can be compacted to meet engineering requirements for paved surfaces, yet possess qualities that allow roots to grow freely, under and away from the pavement, thereby reducing sidewalk heaving from tree roots.

In a sidewalk pavement profile, a properly compacted subgrade of existing material often is largely impermeable to root growth and water infiltration and significantly reduces drainage if large percentages of sand are not present.

Structural soil is a designed medium which can meet or exceed pavement design and installation requirements while remaining root penetrable and supportive of tree growth. Cornell's Urban Horticulture Institute has been testing a series of materials focused on characterizing their engineering as well as horticultural properties. The materials tested are gap-graded gravels which are made up of crushed stone, clay loam, and a hydrogel stabilizing agent. The materials can be compacted to meet all relevant pavement design requirements yet allow for sustainable root growth. The new system essentially forms a rigid, load-bearing stone lattice and partially fills the lattice voids with soil. Structural soil provides a continuous base course under pavements while providing a material for tree root growth. This shifts designing away from individual tree pits to an integrated, root penetrable, high strength pavement system.

More information at: www.hort.cornell.edu/uhi/outreach/csc/article.html

Structural Soil: An Innovative Medium Under pavement that Improves Street Tree Vigor

By Nina Bassuk, Jason Grabosky, Peter Trowbridge, and James Urban

More information at: www-personal.umich.edu/~sarhaus/courses/NRE501_F2000/lloyd/strectsoil.htm

Urban Runoff Pollutants Removal of Three Engineered Soils

Engineered soils are a type of soil that integrates soil and stones to support runoff storage, increase infiltration, and promote deep rooting that reduces the heaving of sidewalks, curbs and gutters by tree roots. They are highly porous, and have been used to expand the soil volume for trees in small tree wells in plazas and parking lots. In this study, pollutant removal rates of contaminated storm runoff and runoff storage capacities were tested for three different types of engineered soils.

More information at: http://actrees.org/files/Research/psw_cufr754.pdf





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TECHNOLOGY- RUBBER SIDEWALKS

Non-concrete paving materials present creative alternatives that accommodate street tree root growth. Paving technologies like rubber sidewalks are interlocking, modular paving systems that are recycled, permeable, and tree-friendly. The original idea behind a rubber sidewalk was to achieve a flexible surface that would reduce cracking around tree roots, which, in turn, would reduce the need to cut or drastically trim trees with overgrown roots. The rubber surface may slow the growth of roots while providing the tree with sufficient water and oxygen, helping to mitigate the problem of root overgrowth at the source. The modular installation system also enables workers to remove sections of sidewalk to inspect tree roots, without the need for pavement-breaking equipment that could damage a tree.

More information at: www.rubbersidewalks.com/default.aspx
<http://cleantechnica.com/2009/07/19/rubber-sidewalks-give-the-bounce-to-concrete/>

District of Columbia (Washington, DC)

In 2006, Washington, DC joined the many communities across the country installing rubber sidewalks made of ground-up tires. "As our trees grow and mature sometimes the root systems begin to pull up the sidewalks," said Michelle L. Pourciau, acting director of the D.C. Transportation Department. "This is compromise between having a beautiful and healthy tree and having a safe and passable sidewalk."

More information at: www.washingtonpost.com/wp-dyn/content/article/2006/07/25/AR2006072501073.html

City of Los Angeles (Los Angeles, CA)

Leafy ficus trees have helped cool neighborhood roadsides in Los Angeles for decades. As they have grown, though, their stubborn roots have created safety hazards by pushing concrete sidewalk slabs out of the ground. That has prompted repair crews throughout the region to chop down rows of the dense, green-canopied trees. Replacement trees have generally been slower-growing and scrawnier-looking. But recently street maintenance workers in Southern California have been stretching the life expectancy of the ficus by using flexible sidewalks made from recycled automobile tires. The rubber sidewalk gently bends when pushed from below by tree roots. It's also soft enough to cushion the landing of anyone unlucky enough to trip and fall on it. When the roots need trimming, the rubber panels can be popped out and then reused.

More information at: <http://articles.latimes.com/2001/jul/14/local/me-22271>





A Resource List

PUBLICATIONS AND GUIDES

Bare Root

The Bare Root Method

Conventional wisdom says that B&B production is superior to bare root because a protective ball of soil surrounds the roots at harvest. However, studies suggest that for some species the positive attributes of bare root planting outweigh the perceived B&B edge. The three best arguments for the bare root method are that you can plant more trees more cheaply, you will take more roots along, and you'll avoid the deadly planting-too-deep syndrome.

More information at: http://actrees.org/files/Research/bareroot_method_bassuk.pdf

Transplanting Success of Balled-and-Burlapped versus Bare-root Trees in the Urban Landscape

This study by Michelle J. Buckstrup and Nina L. Bassuk suggests that bare root planting can be just as viable as B&B transplanting for species that tolerate being moved bare root, are of relatively small caliper, are root dipped, and are given proper early maintenance. This has many time- and money-saving implications for the field of urban forestry.

More information at: http://actrees.org/site/stories/transplanting_success_of_balled-and-burlapped.php

Bare Root to Bare Root: Coming Full Circle

An estimated 80 percent of all landscape tree problems originate below ground relating to quality and placement of the root system. Structural root defects and root planting depth issues can occur during all stages of tree production and establishment including nursery propagation and production, landscape specification development and planting, and post-planting and transplanting maintenance. A proposed technique for revealing tree roots prior to finishing the planting or transplanting process, so that root defects can be seen and if possible, corrected, and planting height can be properly adjusted, is bare rooting.

More information at: http://actrees.org/site/resources/research/transplanting_success_of_balled-and-burlapped.php

Tree Stock

Up By Roots: Healthy Soils and Trees in the Built Environment

James Urban, FASLA, distills his wisdom in this wide-ranging book. *Up By Roots* is a manual for landscape architects, architects, urban foresters, and planners who are designing, specifying, installing and managing trees in the built environment. Part One discusses basic soil science and tree biology and their relationship to healthy trees. Part Two explains the process of planning and implementing landscape designs to ensure healthy trees that can improve the quality of places where people live, work and play.

More information at: <http://secure.isa-arbor.com/webstore/Up-By-Roots-P353C49.aspx>

Selecting Quality Trees from the Nursery

Edward F. Gilman and Laura Sadowski provide an excellent guide to selecting high-quality tree stock from nurseries, including information on container, balled-in-burlap, and bare root trees. Nursery stock must be inspected carefully to pick high quality trees. Pay particular attention to roots. Trees of poor quality may be inexpensive, but might perform poorly in the landscape. Quality factors to evaluate include root ball defects, size, shape, and structure of the canopy, nursery planting depth, presence of included bark, trunk form and branch arrangement, pruning cuts, presence of pests and disease, leaf color, top die-back, clear trunk length, and canopy uniformity.

More information at: http://actrees.org/site/resources/research/selecting_quality_trees_from_the_nursery.php





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PUBLICATIONS AND GUIDES (continued)

ISA Recommendations for Selecting High-Quality Trees

The International Society of Arboriculture offers online guides for choosing appropriate types of trees and selecting good quality trees. These pages provide details on potential problems and other important considerations.

More information at: www.treesaregood.com/treecare/buying_highquality.aspx
www.treesaregood.com/treecare/tree_selection.aspx

Best Practices Manual for Urban Forestry and Planning

The American Planning Association, in close collaboration with the ISA and American Forests, and with the support of the USDA Forest Service, has prepared a state-of-the-art best practices manual about how urban and community forestry can best be integrated into long-range and current municipal planning activities in the U.S.

More information at: www.planning.org/research/forestry/index.htm

Planning for Landscape Success

Dr. Edward Gilman's website through the University of Florida provides a step-by-step plan for developing or managing successful urban landscaping, ranging from site design to species selection to proper planting.

More information at: <http://hort.ifas.ufl.edu/woody/plansuccess.shtml>

Trees in the Urban Landscape: Site Assessment, Design, and Installation

This hands-on guidebook by Cornell professors Nina Bassuk and Peter Trowbridge provides practical, applied information on design considerations, site planning and understanding, plant selection, installation, and maintenance of trees in challenging urban environments.

More information at: http://books.google.com/books?id=cHvuEQ-QAzMC&printsec=frontcover&source=gbs_v2_summary_r&cad=0

California Dept of Forestry and Fire Protection

The California Department of Forestry and Fire Protection has adopted standards for purchasing container-grown landscape trees. These guidelines were developed to assist landscape professionals in specifying high-quality, container-grown, landscape trees. They were developed by arboricultural and horticultural professionals in California comprised of municipal arborists, urban foresters, nurserymen, landscape architects and other landscape specialists.

More information at: www.ufe.org/standards&specs.html

Clemson University Extension (Clemson, SC)

This guide to tree stock selection was prepared by Bob Polomski and Debbie Shaughnessy. Trees must be selected for quality, which can be determined through thoughtful inspection. Quality factors to evaluate include root ball size and structure; trunk form and strength; branch structure; and evidence of injury, disease or poor cultivation methods.

More information at: www.clemson.edu/extension/hgic/plants/landscape/trees/hgic1004.html

