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CANOPY

TREES FOR PALO ALTO

Canopy is a non-profit advocate for Palo Alto's community trees and works to educate, inspire and engage Palo Altans as stewards of new and existing trees.

FALL 2003
 3921 East Bayshore Road
 Palo Alto, CA 94303
 phone 650 964-6110
 fax 650 964-6173
 email info@canopy.org
www.canopy.org



Structural Soils:

Finding Room for Roots Between Rocks and a Hard Place

By Michael Tanner

Downtown promenades, sun-scorched parking lots, asphalt-covered playgrounds, and residential sidewalks—the places that most need the shade and beauty of trees—are often the sites where trees are the least likely to thrive. They end up hemmed into a cube of soil surrounded by dirt compressed to a rock-hard consistency in order to support the surface cover of concrete or asphalt surrounding the tree well.

As Dr. Nina Bassuk of the Urban Horticulture Institute at Cornell University explains, “trees can’t just be sitting in a pot and getting watered every day; the roots have to grow.” Otherwise, she says, you basically get a Bonsai. Her studies show that a tree with a canopy of 20 feet needs about 10-by-20 feet of permeable soil at a three-foot depth. Most trees surrounded by hardscape must make do with a significantly smaller cutout—in some cases as little as 3-by-3 feet—with nothing but compacted soil beyond the tree pit.

Crammed into such narrow spaces, roots in search of water and nutrients have nowhere to go but up. Aside from stunted growth, this means a shallow, drought-sensitive root base, and in many cases, eventual buckling of the surrounding hardscape. Crews repairing the damage to sidewalks often prune the roots as well, further traumatizing the tree. It’s not surprising then that street trees only live an average of seven years.

Looking for Solutions

To rectify the significant discrepancy between the space that roots need and the space that is generally available, Bassuk and former graduate student Jason Grabosky (now a professor of environmental horticulture at the University of Florida) have spent the last decade developing a planting medium called structural soil—a mix of topsoil and jagged (“angular”) rocks. The rocks mesh together to form a latticework; as the spaces in the lattice fill with soil, the resulting mix can be compacted enough to support pavement

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Contributors to this newsletter are:

Writing/Editing

Michael Tanner
 Ann Bilodeau
 Forest Preston, III
 Chris Holstrom
 Jana Dilley

Photography

Marty Deggeller
 Dave Dockett
 Forest Preston, III

Design and Layout

1185 Design

STRUCTURAL SOILS, continued from cover

while still allowing roots and water to penetrate easily. Thus, planting pits can extend well beyond the concrete's edge, below the concrete itself. Though the technology is still proving itself, the special dirt is already in use in over 50 cities in the U.S..

Developing the Mix

The problem of finding more space for tree roots eventually led Bassuk and her team at Cornell into the area of gap-graded soil. In use for 40 years on golf courses, gap-grading techniques mix sand into soil to produce a water-permeable foundation for turf-based applications.

Bassuk's crew took the same approach but "blew that all up," using 3/4- to 1 1/2-inch rock instead of sand, and adding a hydrogel polymer to bind the mix together. Nothing more than the absorptive jell used in diapers and available in garden stores for use with plants, the polymer inhibits the soil's tendency to sift to the bottom of the stony sieve.

Bassuk knew the mix was correct when a batch was compacted so hard "you could land an airplane on it" and yet "roots shot through it like Swiss cheese." The final mix was designed to be adaptable to local stone and soil, says Bassuk, but it depends on getting the ratio right—around 70- to 80-percent rock. If there's too much soil the stones can't touch and the lattice that makes it all hang together never forms.

Field Testing

Dr. Greg McPherson, who is analyzing structural soils at the USDA Forest Service Center for Urban Forest Research at UC Davis, says that urban planners and arborists are doing much of the research themselves just by applying the technique. Dave Dockter, planning arborist for the City of Palo Alto, is one of those unofficial field testers, with eight sidewalk and parking lot projects already

installed. These include an office building where the parking garage extends beneath the sidewalk to the curb, and another garage where the use of structural soil allowed an s-shaped row of ginkgos to have a growing trough 15 feet wide.



A tree growing in structural soil on Lytton Ave. in downtown Palo Alto.

This sort of root room, Dockter says, really gives the trees a jumpstart. His first attempts in 1999 got off to a bumpy start, however. The truck transporting an early version of the soil blended by a local contractor shook the mix apart, dumping a pile of rocks followed by a pile of soil. But after adding water to increase its clinginess, he immediately discovered that his root-friendly dirt compacted for paving much more easily even than normal soil.

Benefits versus Costs

Community Forester Walt Warriner of Santa Monica is convinced that structural soils "will be the standard for the next generation of arborists and urban foresters." In the meantime, widespread adoption of the technology lags in part because of its novelty, its unfamiliarity to construction engineers and planning departments, and a lack of knowledge about the long-term effects on the trees.

But the single greatest hurdle, all agree, is the cost. The mixes themselves can run from \$30 to \$75 per cubic yard, whereas using the existing soil for backfill and compaction is basically free. The final cost is two or three times that of conventional plantings mainly because of the expense of excavating a larger planting area and carting in the new soil.

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“You really have to sell the product,” says Warriner, before contractors and municipalities accept these costs. Then again, with so much earth already being moved around a new construction site, it’s often an insignificant addition. As Bassuk says, “it’s like lunch money compared to what other things in a building cost.”

And the expense, they say, can’t outweigh the manifold benefits the soils deliver. McPherson, with the Center for Urban Forest Research, estimates that by failing to meet shade requirements in all of its parking lots (because of improper planting and maintenance, as well as inadequate soil volume), Sacramento is forgoing \$2 million a year in benefits. These include pollution uptake, air-conditioning savings, stormwater run-off reduction, CO₂ sequestration, and increased property values.

Buckling sidewalks also result in major expenses for repair, replacement, and pedestrian liability. While city planners seem resigned to seeing root-hardscape conflict within seven years, McPherson expects trees planted in structural soil to grow maybe 30 years without surface damage.

Consider the Options

“It’s one tool among a lot of other things,” says Bruce Hagen, an urban forester with the California Department of Forestry and Fire Protection. Along with properly sizing tree wells and scoring the concrete around them for easy removal of broken paving, structural soils help insure that “you get your tree growth, which can be critical to the success of your project.” He advises local arborists to look into the technique, involve their city engineers, and form their own opinions.

Because of its strength and ease of compaction, the soil can be used in any site that requires compacted soil. But it isn’t appropriate everywhere. It would be a pointless expense in open spaces, for instance, where roots have plenty of room anyway.

It’s also impractical for retrofitting the planting pits of mature trees, because it’s nearly impossible to re-spread soil among their roots. In fact, re-digging most existing projects would prove prohibitively expensive. But alternative uses for the soil are already becoming apparent.

Palo Alto’s Dockter, for instance, sees it as a boon for future roof gardens, bringing green space to dense, high-rise areas. Just light enough per cubic yard to meet roofing specifications, it also resists the shrinkage and instability inherent to the loamy soils currently in use. For the future of structural soils, the sky may be the limit. ■

Reprinted with permission from “California Trees,” newsletter of California ReLeaf. Michael Tanner is a freelance writer based in San Francisco.

Volunteer Spotlight

Our featured volunteer is Glenn Rennels who has been an active participant in Canopy activities since 1998. He has performed many of Canopy’s volunteer positions – first as a planter, then as a planting leader, and lately as a tree care surveyor. Recently, Glenn was looking for even more ways to participate in Canopy activities, and we are now pleased to welcome him as our newest member of Canopy’s Board of Directors.



Glenn says his commitment to Canopy is so strong because “Canopy’s mission appeals to me, the work is enjoyable and I like the people of Canopy.”

Glenn is an anesthesiologist with the Permanente Medical Group and serves a dual role as Chief Technology Officer. A Palo Alto resident since 1981, Glenn and his wife Peggy, and their twin 11-year old daughters live in the community center neighborhood of Palo Alto.

Glenn’s enthusiasm and willing support of Canopy makes him a very positive addition to our Board. ■

Trees As Food

By Ann Bilodeau

In our previous Newsletter Ann Bilodeau gave us some advice on how trees can feed the body as well as the soul ("Trees as Food"—appeared in the Spring 2003 Canopy Newsletter). Here's another recipe from Ann's collection.

Elderberry wine—this term conjures up images of Old Lavender and Lace. The blue elderberry or *Sambucus mexicana*, a California native, can grow as a shrub or tree up to fifty feet tall. The clusters of blue to nearly black berries are a rich source of vitamin C and are often used in jams, jellies, pies, and wine—if the birds don't get them first, as the Sunset Western Garden Book notes. (But stay away from red elderberries, which agree with birds but not with humans.)

ELDERBERRY SYRUP

1 qt elderberries
juice of 1 lemon
3 cups water
1 Tbsp cornstarch
1/4 cup sugar or honey
dissolved in water

Crush elderberries. Add sugar or honey and 1 cup water. Simmer 15 minutes. Strain. Add 2 cups water to the seeds and pulp; strain again. Add lemon juice and adjust sugar if desired. Bring to a boil and thicken by stirring cornstarch mixture into simmering syrup. Makes 5 cups. Use over pancakes or ice cream. ■

Donors List

BUSINESSES, CORPORATIONS & FUNDS

\$10,000 or more
P. G. & E. - SafeTree

\$7,500 to \$9,999
Roche

\$5,000 to \$7,499
California ReLeaf - FY 2002

\$1000 to \$5,000
Stoecker & Northway Architects

Sequoia Level -- \$500 to \$999
Comerica Bank-California
Safe & Beautiful Trees
Watercourse Way

Tree level -- \$250 to \$499
Davey Tree Service
Kiwanis Club Of Palo Alto

Branch Level -- \$100 to \$249
Garden Club of Palo Alto

INDIVIDUALS

Oak Level -- \$1000.00 or more

Anonymous
Marty & Judy Deggeller
Cynthia & John Gunn
Joseph & Bette Hirsch
Mary McCullough
Billy Prior
Glenn Rennels & Margaret Forsyth
Jane & Bill Stocklin

Sequoia Level -- \$500 to \$999
Anonymous
Ann S. Bowers
John & Nancy Cassidy Family Foundation
Dalton Realty/Brad Denson
Leonard & Shirley Ely donor directed Fund
Forest Preston III
Dave & Lanie Wheeler

Tree level -- \$250 to \$499
Richard & Nancy Alexander
Ann & Ken Bilodeau
Peter & Arline Dehlinger
Whit & Sally Heaton
Robert & Joan Jack
James & Laurie Jarrett
Roger Klein
Kenneth & Marilyn Lavezzo
Kay R. Leibrand
James & Margaret McClenahan
John & Cynthia McClenahan
Gail Schubert
Liz Schwerer-Duffie & Kingston Duffie
Matthew Sorgenfrei & Evangeline Uribe
Madeline & Isaac Stein Family Fund

Hong Ja & Rick Stern
Kathryn & Eric Verwillow
Susan J. Wilson

Branch Level -- \$100 to \$249
Dudley & Elaine Andersen
Anonymous
Anonymous
Mr. & Mrs. Robert O. Appleton
France Bark
Bern Beechum & Cheryl Lathrop
David & Patricia Bubenik
Drian D. Carilli & Mary P. Dougherty
William (Bill) Courington
Constance Crawford
Yogen K. Dalal & Margaret J. Dalal
Gordon & Carolyn Davidson
John Dawson
Nancy & Dale Denson
Dave & Eileen Dockter
Sandy Eakins
Ellis Foundation
John & Kristine Erving
John Gachina
Roy L. Glauz
Pria Graves & George Koerner
Mark & Renee Greenstein
Elizabeth Hayden-Kniss
Elinor G. Heath
Randolph & Kelly Hicks
Jane B. Holland
John T. & Marilyn (Sue) Howe
Jeff Justice
Jeannette (Jeanne) D. Kennedy
Robert Kennelly
Carl R. King
Richard & Ruth Lacey
Betsy and Bill Meehan
Merrill & Lee Newman
Thomas Parrish
David & Nancy Petrone
Paul & Joanne Pinsky
Kenneth Powell
Christine Quinn Kurihara
Roxy Rapp
William & Carolyn Reller
Jack R. Rominger
Charles G. Schultz
Assemblyman Joe Simitian
Virginia Smedberg
Clint & Marilyn Smith
Steve & Luana Staiger
Jan Strohecker
Jared & Mae Tinklenberg
Suzanne & Peter Voll
Ed & Gee Gee Williams
Marcus C. Wood
Thomas & Ellen Wyman

El Palo Alto Inspires the City that Loves Trees

By Chris Holstrom

The lofty branches of El Palo Alto have served as a landmark in the Santa Clara Valley for centuries. The native Ohlones and Costanoans were the first to live near the formidable tree. They could see the coast redwood (*sequoia sempervirens*) from miles around, and used the landmark to guide their travels and mark a meeting spot. In 1769, Spanish explorer Don Gaspar de Portolá's expedition entered the Santa Clara Valley by following the San Francisquito Creek to the large twin-trunked redwood. They camped near the 100-foot tall tree, and many explorers and settlers followed them to the area. As explorers and immigrants came to the valley, word of the exceptionally tall tree spread. The tree came to be known as El Palo Alto, or "the big stick."

Today El Palo Alto boasts but a single trunk and serves more as a symbolic landmark than a practical landmark. We no longer need to see the top branches to find our way around the valley; instead we look to El Palo Alto's thousand-year legacy to



steer us. El Palo Alto reminds us of the importance, beauty, and amazing longevity of trees. It reminds us that we must respect and care for trees in order to enjoy their beauty.



left: El Palo Alto as seen from the north in 1875. Photo courtesy of Stanford University Archives right: El Palo Alto as seen from the north in 2003.

Perhaps inspired by El Palo Alto, the people of Palo Alto take seriously their commitment to the city's namesake and all of the city's trees. The city has named El Palo Alto its number one heritage tree and nursed it to better health over the past decade. The 90-inch diameter tree is healthier today than it was 100 years ago. And four years ago the city added redwood trees to the list of trees protected by its "Tree Preservation Ordinance." ■

SOFA Tree Has a Moving Experience

By Forest Preston

For nearly five years Canopy and the City of Palo Alto have worked together on the “Right Tree in the Right Place” program. The objective of RTRP is to ensure that trees planted in utility and other rights-of-way are of a size appropriate for their environment. The most typical concern is that trees planted under power lines will grow to a mature height significantly lower than that of the power lines – thus avoiding one of the common causes of power outages. Right Tree- Right Place, it’s a philosophy we like to promote. But, as it turns out, a recent example of that philosophy was unrelated to the program itself. On Thursday morning, August 28, a



Dave Dockter explains the tree moving process to NPR reporter Cindy Carpien.

mature coast live oak (*Quercus agrifolia*) living at 819 Ramona Street, Palo Alto (next to the old Zion Church-between Homer and Channing) was moved to a new home in the 300 block of Homer.

The oak is a healthy specimen at least half a century old. There are no power

lines in danger of interference. The interference comes from the fact that the site at 819 Ramona is part of the SummerHill Homes development and is slated for below-market-rate housing. Although it might have been possible to build around the oak in its old setting, it would have presented some significant difficulties. The move was an obvious solution to two problems – so the right tree was moved to the right place.

About one and one-half blocks away is that “right place.” Also in the SummerHill development, it is in the future Homer Park, next to the Roth Building and across from the Museum of American Heritage.



The moving tree gently embraces several liquidambers as it passes them on Channing.

A centuries-old oak recently died very close to where the younger oak now resides.

The move itself was quite an interesting spectacle. This mature oak is quite a large tree - over 35-feet tall and weighing nearly 35-tons (including the dirt in the box). Actually, the move really started nearly three months ago when a crew dug under the tree and placed a box around it. The tree sat in its moving box for the next three months acclimating itself while workers prepared the new site. On moving day it was lifted onto a truck and transported to its new home.

From all appearances, the move was a success. The tree was planted in its new hole with the same north-south orientation it had at 819 Ramona. Since this is the time of year when oak (and other tree) roots are at their lowest activity level, it is hoped that the move was accomplished with minimum shock to the tree. The tree will provide the new park designers with an outstanding feature to work with. And it is expected to provide Palo Altans with increasing shade for at least another century to come. ■

Oak tree briefly “gets air” before being gently lowered into its new surroundings.



Tree care Gifts

From:

Marty & Judy Deggeller
in honor of Ellen Levitas for airport transportation services
Leonard & Shirley Ely, Jr.
in memory of Jessica W. Ely
Joe & Bette Hirsch
in memory of Kenneth Hirsch for planting a tree and Tree care
Joe & Bette Hirsch
in memory of Brianna Sadina Hirsch
Joe & Bette Hirsch
in honor of the birth of Ethan Fox Young
Joe & Bette Hirsch
in honor of Kent Stormer
Joe & Bette Hirsch
in honor of the 30th wedding anniversary of Tod & Jacqui Gross
Joe & Bette Hirsch
in honor of the 50th wedding anniversary of Lorraine and Jerry Seelig
Jeanne Kennedy
in honor of Susan Wilson
Carl & Joanie King
in honor of Nancy Peterson
Kay Leibrand
in honor of Charles J. Smith

Tree Gifts

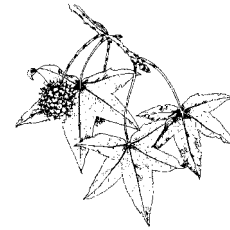
From:

Amy Antonelli
to Jeremy Behr from Amy Antonelli
Rachel & Elton Bell
in memory of Florence (Lency) Watterud
Pat Blumenthal
in honor of Pam Haunschild
Carolyn Caddes & Robin Robinson
in honor of the 80th birthday of Chris Roden

Henry & Dorothy Chung
in memory of Lency Watterud
Carole & Stephen Eittrreim
in memory of Hazel Frantz
Keith & Samantha Elliott
in honor of Trish and Jim Mulvey
Barry & Alice Fasbender
tree gift for Sam and Ruth Fok
Jerry Hearn
in honor of Keith Hearn
Joe & Bette Hirsch
in honor of Michelle & Michael Donovan's 3rd Wedding Anniversary
Joe & Bette Hirsch
in honor of Sam & Sylvia Grosshandler's 60th Wedding Anniversary
Joe & Bette Hirsch
in honor of Adam Silverblatt & Heather Dudley's 4th Wedding Anniversary
Margaret Holland
in honor of the Community Service League
Marilyn Keller
in honor of Amy Elyce Malzbender, 2/27/96 - 1/28/03,
Robert & Isabelle Leon
to Susan Wilson for all she has done for us
Rebecca Leon & Mike Kast
in honor of Isabelle Leon
Leland Levy
in honor of the birthday of Richard Schwartz
Patricia Marriott
in memory of Thomas Paul Yool
J.R. & Robbie Prohaska
in honor of Alice Colthurst's 80th birthday, May 27, 2003
Joe Simitian
in honor of Honorable Fred Keeley's receipt of the Legislator of the Year Award from the League of Conservation Voters of Santa Clara County

Joe Simitian

in honor of Jim Comton's receipt of the Lifetime Achievement Award from the League of Conservation Voters of Santa Clara County
Joe Simitian
in honor of Lilyann Brannan's receipt of the Environmentalist of the Year Award from the League of Conservation Voters of Santa Clara County
Virginia Smedberg
in honor of Jeffrey, Toni & Cedic on the occasion of your birthday for Tree care
Virginia Smedberg
in honor of Elizabeth, Hart, and Justin on the occasion of your birthday for Tree care
Marjorie Smith
for Bev Merrill, Merry Christmas from Marjorie Smith,
Ruth Soforenko
in honor of Lydia Pugliese's special birthday
Megan & Michael Swezey Fogarty
in honor of Charles Lawrence Swezey
Jerry & Mae Tinklenberg
in honor of Leif Tinklenberg Jurvetson
Jerry & Mae Tinklenberg
in honor of Kylie DeBruyn Callan
Jerry & Mae Tinklenberg
in honor of Ashlyn Alissa Callan
Jerry & Mae Tinklenberg
in honor of Ericka Jurevton



Tree Care Survey a Rousing Success!

Over the summer months Canopy completed its third-annual tree care survey. Over 800 recently planted (no more than 4 years ago) street trees were surveyed, and information on proper tree care was left with homeowners. Volunteers gathered at Rinconada Park to go through a brief training, then headed out into neighborhoods. The biggest problem encountered was trees that weren't getting enough water. The first 4 years after being planted is a critical time for young trees, and getting proper water when young will help ensure the trees health years down the road.

Overall, this year's tree care survey was a tremendous success, and could not have been accomplished without the help of our wonderful, talented, dedicated volunteers. Two volunteers in particular, Julie Luu and Talia Bender, went the extra mile by taking on 5 survey routes. Julie and Talia are both seniors at Gunn High School, and their hard work deserves a round of applause! Other stupendous volunteers (who took on 2 or more routes) include Marty Deggeller, Kristine Chan Lizardo, Mary McCullough, Glenn Rennels, Charlie Ridley, Susan Rosenberg, and Jane Stocklin. Thanks, folks - we couldn't have done it without you! ■

Canopy Announces New Officers and Board Members

Officers and board members have been selected to guide the organization in Canopy's new fiscal year that began on July 1, 2003. The new board consists of the following members:

Marty Deggeller, Board Chair – Marty begins his third year as Canopy's chair.

Lanie Wheeler, Vice-Chair and Treasurer – Lanie has assumed the treasurer's responsibility in addition to her role as Vice-Chair.

Gail Schubert, Secretary – Gail continues as Canopy's Secretary.

Jane Stocklin – Jane also serves as chair of the Program Committee.

Kent Stormer – Kent is the new chair of the Finance and Fund Development Committee.

Nancy Peterson – Nancy leads the Marketing and Public Relations Committee.

Forest Preston – Forest rejoins the Board after a one year hiatus and also serves as the chair of the Personnel Committee.

Joe Hirsch – Joe begins his sixth year on Canopy's board.

Kate Feinstein – Kate begins her fifth year on the board.

John McClenahan – John will be completing his first three-year term on the board in 2004.

Glenn Rennels – Glenn is starting his first term on the board. *(See accompanying story).*

Canopy's Leadership

Staff

Hal Lovell,
Executive Director

Jana Dilley,
Program Director

Advisory Committee
Ron Bracewell

Herb Fong

Paul Garrett

Leannah Hunt

Jeanne Kennedy

Larry Klein

Mary McCullough

Carolyn Reller

Susan Rosenberg

John Warren

Board of Directors

Marty Deggeller,
Chair

Lanie Wheeler,
Vice-Chair and Treasurer

Gail Schubert,
Secretary

Kate Feinstein

Joe Hirsch

John McClenahan

Nancy Peterson

Forest Preston, III

Glenn Rennels

Jane Stocklin

Kent Stormer

Calendar of Events

Nov 1 – Memorial Planting

Dec 6 – Mayor's Tree Planting

TBA – Planting Leader Training

TBA – Cubberley Planting

TBA – SummerHill Homes Planting

Canopy will soon be embarking on a structural soils project. In cooperation with

Summerhill Homes, Canopy will be planting Frontier Elms in front of homes in the new development. These trees will be planted in spaces constructed with structural soils. Look for these new trees to be planted this fall.

CANOPY

3921 East Bayshore Road
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