GROWING Points

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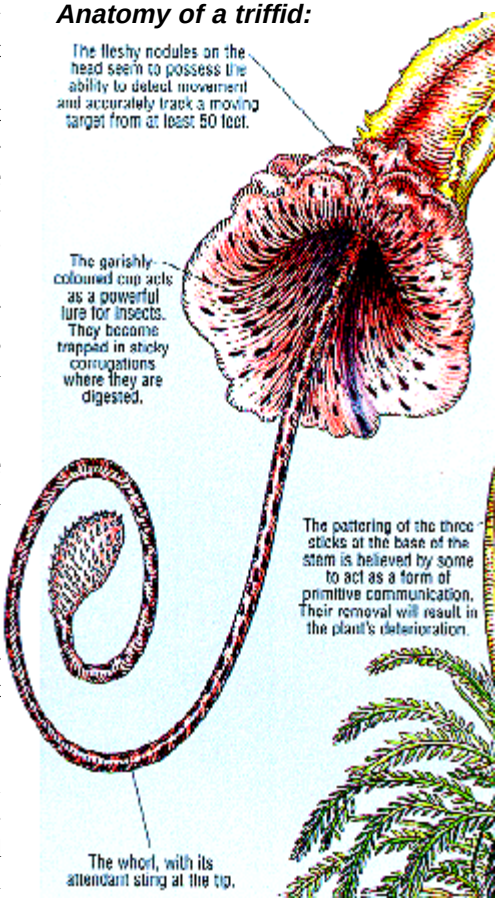
Exotic Pest Plants in California... Some Ornamentals get the "Red Alert"

by Linda Dodge

In his popular science fiction novel, *Day of the Triffids,* John Wyndham's hero, Bill, describes the British landscape overrun with poisonous, flesh-eating, ambulatory plants: "Triffids were at large. Sometimes I saw them crossing fields or noticed them inactive against hedges. In more than one farmyard they had found the middens to their liking and enthroned themselves there while they waited for the dead stock to attain the right stage of putrescence. I saw them now with a disgust that they had never roused in me before. Horrible alien things which some of us had somehow created and which the rest of us in our careless greed had cultured all over the world. One could not even blame nature for them. Somehow they had been bred- just as we bred ourselves beautiful flowers, or grotesque parodies of dogs..."

It may be surprising to learn that many people view some real-life ornamental plant species with the same degree of impassioned disgust. Those errant species that have escaped cultivation to spread aggressively in wildlands and riparian areas have lost the title of prized horticultural specimen and are now regarded in many regions as exotic pest plants. Often, the same traits that make a species desirable as an ornamental (e.g., fast growth, long flowering period, pest resistance and tolerance to soil or environmental extremes) also contribute to its success as an invasive weed. Many biologists and ecologists regard the phenomenon of weedy plant invasion as a more urgent threat to the well-being of the planet than that of global warming. Granted, the majority of species that have become established as weeds in areas beyond their native ranges have no horticultural value and were introduced by accident into the regions where they have become problematic. There are cases, however, where species from distant lands have been intentionally incorporated into the horticultural trade for some appealing trait and have later escaped the garden to run amok in wild areas to which they are aggressively adaptable. An awareness of those species with the potential for displacing native vegetation is the first step toward stemming the tide of weedy plant invasion.

Anatomy of a triffid:



Californians have had to become accustomed to a landscape riddled with exotic weeds since the establishment of the Spanish missions. The most notorious invaders are species such as yellow starthistle and cheat grass, accidentally introduced as contaminants of agricultural seed over one hundred years ago, which have displaced native vegetation over millions of acres in the state. The eucalyptus, pampas grass, broom, tree-of-heaven, arundo (giant reed) and tamarisk that now occupy many hundreds of wildland acres were once sought-after horticultural oddities. People in the late nineteenth century paid dearly to include these and other species in their gardens, and today county, state and federal agencies pay dearly to control their spread in parks, wildlands and riparian areas. Phrases such as "broom bashing" and "Team Arundo" have become part of the jargon of the developing science of weed ecology. Since 1992, the

California Exotic Pest Plant Council or CalEPPC (www.caleppc.org) has served as a forum for research and education concerning exotic plants in California's natural areas. They have developed a rated list of plant species that are problem weeds in the state, including some horticultural introductions that may seem surprising.

In the war on weeds, the most efficient strategy is, of course, to prevent the initial introduction of problem species into vulnerable natural areas. Species that are known to be invasive exotic weeds in other regions of the world can thereby be excluded from similar habitats in California. This is the basis for CalEPPC's "Red Alert" list, including species whose current infestations are limited in California but have the potential to spread explosively. Prompt attention to these small infestations coupled with efforts to prevent re-introduction may bring about complete eradication of the weedy species from the state thus avoiding costly long-term control programs. A few of the species on this list are of horticultural origin and it may be instructive to examine their case histories as weeds in other parts of the world in order to assess their potential for invasion in California.

Purple Loosestrife

Purple loosestrife (*Lythrum salicaria*) is often referred to as the "purple plague" by resource managers and estimated costs for its control can top $45 million annually. This European native is a perennial herb with a well-developed rootstock from which emerge branching, semi-woody stems growing from one to six feet high. The spike-type inflorescence can be almost one foot in length and bears many tubular, magenta flowers blooming from June to September. Each plant can produce up to 100,000 seeds resembling ground pepper that can be spread by wind, water and animals. Loosestrife prefers moist, disturbed habitats such as streambanks and marshes.

This species appears to have been introduced repeatedly into North America and was first documented on the northeastern coast in 1814 probably deriving from seeds contaminating ship ballast, which was often dumped after transatlantic voyages in wetland areas. By the 1850s, the attractive flowers of purple loosestrife caught the attention of horticulturists and it is believed to have

Purple loosestrife (*Lythrum salicaria*)

been introduced into the Great Lakes region and the Pacific Northwest as a landscape plant. During the latter part of the nineteenth century, European immigrants brought loosestrife with them as part of their traditional medicine and established it in herbal gardens. Rapid spread of loosestrife in natural areas began during the 1930s when many large public works projects and highway construction created habitat disturbance on a large scale. It is believed to have arrived in California during this time, spreading south from the Pacific Northwest and becoming established in some of the state's northern riparian areas. Beekeepers recognized loosestrife as a valuable nectar source for honey production during the 1940s, prompting some to deliberately spread seed over wide areas and they argue to this day for using no control measures against the species.

Today, loosestrife can be found in every state (except Florida) in wetland and riparian areas, some of our most vulnerable and fragile habitats. Its ability to produce large amounts of viable seed enables the formation of dense stands and the tall stature of mature plants crowds out native vegetation leading to large monospecific stands of loosestrife. The displacement of native plants in turn impacts wildlife and the result is the degradation of critical habitats. Loosestrife is still available as a landscape plant and some cultivars are touted as being "guaranteed sterile". These plants have been shown to cross freely with naturalized purple loosestrife and, in 24 states, regulations prohibit the sale, purchase and distribution of any form of loosestrife.

The California Department of Food and Agriculture (CDFA) lists loosestrife as a "B"-rated noxious weed, giving individual counties discretion in control or eradication decisions. The current distribution in the state consists of scattered populations in the North Coast Range, Modoc Plateau, Sierra Nevada Foothills, San Francisco Bay and Sacramento Valley. The CALFED Bay-Delta Program has recently funded a loosestrife prevention, detection and control program in the amount of $329,000 to be conducted by CDFA and several other agencies. Their efforts will be concentrated on the Sacramento-San Joaquin Delta to ensure that this important habitat does not fall prey to the "purple plague". More information can be found on the CALFED Bay-Delta Program Web site at:

http://wwwcalfed.water.ca.gov/

Chinese Tallow Tree

Chinese tallow tree (*Sapium sebiferum*) has been cultivated in its native China for 14 centuries as a seed oil crop (producing vegetable tallow) and an ornamental. It is a medium-sized tree (30-50 feet in 30 years) with deciduous, heart-shaped leaves that display brilliant fall color from yellow to scarlet. Three-year-old seedlings are capable of flowering and producing large

Leaves of Chinese tallow tree (*Sapium sebiferum*)

Scarlet wisteria tree (*Sesbania punicea)*

numbers of seed covered with a white waxy coating, giving the species its other common name of “popcorn tree”. Mature tallow trees can produce 100,000 seeds annually with 85% viability and are an attractive food source for many species of birds. Stumps are able to resprout if damaged and roots are able to produce adventitious shoots. Tallow trees prefer swamps or streamside habitats, but they can grow in upland areas, mainly limited by frigid or arid conditions.

Chinese tallow tree was reportedly introduced to the United States by Benjamin Franklin in 1776. He seemed to admire the species’ ornamental qualities as well as its potential as a seed oil crop. In the early 1900s, the USDA encouraged the planting of tallow trees in the Gulf Coast states to establish a local soap-making industry. The species is a valued street and ornamental tree and is propagated by the hundreds of thousands annually.

Today, Chinese tallow tree is naturalized from the Carolinas to Texas and thrives in wet prairies and bottomland forests. Large areas of coastal prairie in Texas have been transformed into tallow tree woodland. Being a member of the Spurge Family, broken twigs and leaves produce a milky latex and can cause contact dermatitis in humans. The leaves are also toxic to cattle if ingested and are said to contain toxins that alter soil chemistry and interfere with establishment of native vegetation. Tallow tree’s fast growth rate, short juvenile period and seed-producing capability lead to the establishment of monospecific stands of trees, causing large-scale habitat modification that impacts native plants and animals.

In California, Chinese tallow tree is just beginning to appear in natural areas. It was always assumed that our state’s low rainfall would prevent this species from becoming a pest. Perhaps because of the recent wet winters, tallow trees can now be found naturalized along the American River near Sacramento and in wetland areas in Yolo County. CalEPPC considers this a “red alert” situation, calling for eradication of these populations before tallow tree makes its way into the Sacramento-San Joaquin Delta. The Nature Conservancy (TNC) has gone so far as to include it in their “dirty dozen” of the most damaging plant and animal pests in the nation and encourages the use of alternative tree species in the landscape. More information on TNC’s "dirty dozen" can be found on the Web at:

http://consci.tnc.org/library/pubs/dd

Scarlet Wisteria Tree

Known by several common names including rattlebox and Chinese wisteria, scarlet wisteria tree (*Sesbania punicea*) also has several botanical synonyms, among which are *Sesbania tripetii* and *Daubentonia punicea*. This native of South America is a member of the Pea Family and has the ability to fix atmospheric nitrogen in its roots. The plant is a deciduous woody shrub or small tree with a maximum height of 12 feet. It forms an attractive canopy of compound leaves, a show-stopping display of red, pea-shaped flowers and characteristic longitudinally-winged seed pods.

Scarlet wisteria tree seems to be perfectly engineered for weedy invasion. It has a fast growth rate, reaches reproductive maturity in two years, produces seed prolifically with a high viability percentage, has buoyant seed pods that can be dispersed by water and has seeds that can remain dormant in the soil, thereby germinating over time. Last but not least, all the plant parts are toxic to many herbivores. Horticulturists value scarlet wisteria tree for its quick maturity, prolific bloom and adaptability to container culture.

Sesbania punicea is most notorious as an invasive weed of rivers and streams in South Africa. Since its introduction to that country in the early 1900s, scarlet wisteria tree escaped from cultivation and steadily built up populations until it was recognized as a serious weed threat in the 1970s. By 1979, it was declared a noxious weed and known to occur in several habitats, especially along rivers where it formed thick monocultures with dense canopies obstructing the flow of water, crowding out native vegetation and driving away insects and animals. Nearly $10 million dollars have been spent on control efforts.

In the United States, scarlet wisteria tree has escaped from cultivation and be-

CINWCC Subcommittee Recommends Some Ornamentals for State Noxious Weed Rating

In September 1999, a subcommittee of the California Interagency Noxious Weed Coordinating Committee (CINWCC) including agricultural commissioners, nursery industry representatives and others, developed a list of plants currently sold as ornamentals that, due to their invasive potential, should be considered for inclusion in the state's noxious weed list. The subcommittee submitted the following species for consideration by CDFA's Pest Rating Evaluation Committee. Stay tuned to this newsletter or the *Noxious Times* (http://www.cdfa.ca.gov/noxioustimes) for further developments.

Ailanthus altissima **(tree of heaven)**
Arundo donax **(giant reed)**
Centaurea melitensis **(tocalote)**
Cirsium vulgare **(bull thistle)**
Cortaderia jubata **(jubata grass)**
Cortaderia selloana **(pampas grass)**
Delairea odorata **(German ivy)**
Egeria densa **(Brazilian water weed)**
Eichhornia crassipes **(water hyacinth)**
Pueraria lobata **(kudzu)**
Spartium junceum **(Spanish broom)**
species to be determined (bamboo)
Tamarix spp. **(tamarisk, salt cedar)**

Ornamental Species on CalEPPC's Weed List (October 1999)

List A-1: Most Invasive, Widespread

Arundo donax (giant reed)
Cortaderia jubata (jubatagrass)
Cortaderia selloana (pampas grass)
Cytisus scoparius (Scotch broom)
Eucalyptus globulus (Tasmanian blue gum)
Genista monspessulana (French broom)
Myriophyllum spicatum (Eurasian watermilfoil)
Pennisetum setaceum (fountain grass)
Senecio mikanoides (=*Delairea odorata*) (Cape ivy, German ivy)
Tamarix spp. (tamarisk, salt cedar)

List A-2: Most Invasive, Regional

Ailanthus altissima (tree of heavan)
Cotoneaster pannosus (cotoneaster)
Eichhornia crassipes (water hyacinth)
Eleagnus angustifolia (Russian olive)
Ficus carica (edible fig)
Myoporum laetum (myoporum)
Saponaria officinalis (bouncing bet)

List B: Lesser Invasiveness

Ageratina adenophora (eupatory)
Crataegus monogyna (hawthorn)
Festuca arundinacea (tall fescue)
Hedera helix (English ivy)
Ilex aquifolium (English holly)
Iris pseudoacorus (yellow water iris)
Leucanthemum vulgare (ox-eye daisy)
Mesembryanthemum crystallinum (crystalline iceplant)
Myriophyllum aquaticum (parrot's feather)
Olea europaea (olive)
Robinia pseudoacacia (black locust)
Schinus molle (Peruvian pepper tree)
Schinus terebinthifolius (Brazilian pepper)
Vinca major (periwinkle)

Red Alert: explosive potential

Arctotheca calendula (fertile Capeweed)
Lythrum salicaria (purple loosestrife)
Retama monosperma (bridal broom)
Salvinia molesta (giant waterfern)
Sapium sebiferum (Chinese tallow tree)
Sesbania punicea (scarlet wisteria tree)

Need More Information

Cistus ladanifer (gum cistus)
Cotoneaster spp. (cotoneaster)
Dimorphotheca sinuata (African daisy)
Echium candicans (pride of Madeira)
Erica lusitanica (heath)
Gazania linearis (gazania)
Hedera canariensis (Algerian ivy)
Ligustrum lucidum (glossy privet)
Maytenus boaria (mayten)
Passiflora caerulea (passion flower)
Pennisetum clandestinum (Kikuyu grass)
Pistacia chinensis (Chinese pistache)
Pyracantha angustifolia (pyracantha)
Verbena bonariensis (tall vervain)

The entire list can be viewed on CalEPPC's Web site (www.caleppc.org) or write for a copy to:
California Exotic Pest Plant Council
32912 Calle del Tesoro
San Juan Capistrano, CA 92675-4427

come a problem weed of riparian areas in Florida, Texas and Georgia. Earlier this year, it was found naturalized along the American River in Sacramento, the first such report west of the Rocky Mountains. It also may be growing in Suisun Marsh in the Sacramento-San Joaquin Delta but this has not been documented. Because of our long, hot summers, this plant is mainly a threat to habitats along waterways and riparian areas. The fact that the seed pods can be carried great distances by water makes this newly-formed colony on the American River a potential threat to the Delta. Eradication efforts are underway and, along with preventing re-introduction, California may be spared the devastating effects of the scarlet wisteria tree. Find out more at the Nature Conservancy's World Wide Web weed site:

http://tncweeds.ucdavis.edu/

Giant Salvinia or Aquarium Watermoss

Giant salvinia (*Salvinia molesta*) is a free-floating aquatic fern that may look harmless in an aquarium or garden pond but, let loose into open water, can double in biomass every ten days and produce thick, floating mats of vegetation that shade out other water plants and deprive fish of oxygen. Native to southeastern Brazil, *Salvinia molesta* has both floating and submersed leaves along stems possessing many lateral buds. As a fern, this plant produces sporangia but, because it is a pentaploid (5n chromosome number), the resulting spores are mostly infertile. That doesn't seem to slow it down, however, because it can reproduce vegetatively from small stem fragments, each node possessing up to five lateral buds.

Introduced during the 1950s to Australia and South Africa as an aquarium or fish pond plant, giant salvinia escaped into waterways and earned the title of noxious weed by the 1970s. Brought to New Guinea, Indonesia and Singapore in the 1970s for the same purpose, giant salvinia found its way to rivers where its floating mats impeded river transport, fishing and access to drinking water. Irrigation and drainage canals became clogged and this aggressive waterfern invaded rice fields. The dense floating mats cut off light to submerged native plants, reduced oxygen to fish and altered habitats for wildlife that depend on open water.

Giant salvinia (*Salvinia molesta*)

With such a track record, it's no wonder this species is listed as a Federal Noxious Weed in the United States. Importation and transportation across state lines is prohibited by law, but within states that have not listed it as a state noxious weed, giant salvinia can still be grown. This plant began to show up in natural waterways in southern states in the mid-1990s and infestations in Texas and Louisiana are becoming problems.

In California, giant salvinia (along with other species of *Salvinia*) is designated a "Q"-rated noxious weed by CDFA, meaning shipments within which it is found must be rejected anywhere in the state. A survey conducted from May to September of 1999 found 56 nurseries in 12 counties offering giant salvinia for sale as a water garden plant. In August 1999, giant salvinia was found in the lower Colorado River, within the Imperial National Wildlife Refuge along the California/Arizona border. A small patch was found in September 1999 in the San Diego River. A task force of several land management agencies has already been formed to deal with these infestations. Public awareness about the potential environmental damage giant salvinia populations can inflict is the best defense against the establishment of this exotic ornamental weed in our state. Great information about giant salvinia is on the

Web at:

http://nas.er.usgs.gov/ferns/.

State agencies fighting the weed war

Many agencies are coordinating efforts in California to prevent introduction as well as eradicate or control existing infestations of invasive weeds. The "Red Alert" list of the California Exotic Pest Plant Council (CalEPPC) heightens awareness of the invasive potential of some plants, including the four horticultural species detailed above. Their complete list of exotic pest plants includes five other categories of invasiveness and quite a few plants of horticultural origin can be found among the thistles and bromes (see page 4).

The California Interagency Noxious Weed Coordinating Committee (CINWCC) is comprised of 14 federal, state, and county agencies with land management and/or regulatory responsibility associated with the introduction, spread and impact of noxious weeds. As an active stakeholder associated with this group, the California Association of Nurserymen is working with county agricultural commissioners to develop a list of invasive plants currently being sold in the nursery and cut flower industry that should be considered for designation as noxious weeds in the state (see page 3). CINWCC's informative newsletter, *Noxious Times* can be found on the World Wide Web at:

http://www.cdfa.ca.gov/noxioustimes

Another great resource for weed information is UC's Weed Research and Information Center (WeedRIC) found on-line at:

http://wric.ucdavis.edu

This site contains information on current weed research at UC and also has up-to-date information on specific weeds and methods of control.

Through agency and industry cooperation and public awareness of the impact of invasive weeds on our lives, perhaps we can avoid the fate envisioned in Wyndham's *Day of the Triffids*, where people must "spend all their lives in human reservations only kept free of triffids by unending toil".

City of Davis Tests Structural Soil Mix

by Linda Dodge

Trees are essential to the urban environment, moderating temperature by shading paved surfaces, absorbing pollutants and providing aesthetic beauty. Unfortunately, most trees in urban settings do not live up to this potential, growing poorly and dying prematurely in 7-10 years after planting.

This is primarily due to lack of access to an adequate volume of soil to support healthy root growth. Most soil beneath pavement must be highly compacted to meet the load-bearing requirements of vehicular traffic. Tree roots cannot penetrate this compacted soil so they are usually confined to the volume of soil into which they were originally planted. The water, nutrients and oxygen in these confined spaces are not adequate to sustain optimum growth for very long, resulting in stunted trees that tend to die prematurely. In addition, those trees that manage to expand their roots in such circumstances can only go up, causing significant pavement damage in the process.

Two factors have recently come into play that have prompted the city of Davis and the Western Center for Urban Forest Research and Education (WCUFRE), a unit of the US Forest Service based at UC Davis, to combine forces and address this issue of inadequate urban tree growth. First, recent studies by the WCUFRE have revealed that, during the summer months, parked cars in direct sunlight can heat up to temperatures causing significant evaporation of gasoline from the fuel tank and engine compartment, accounting for nearly 20% of hydrocarbon emissions. The fuel in shaded cars, however, can be 4-8 degrees (Fahrenheit) cooler, thereby reducing the amount of evaporating gasoline. In the Sacramento area alone, providing more shade in parking lots could reduce emissions by one ton per day in the summertime. The second factor prompting an interest in improved urban tree growth is perhaps a result of these research findings. The city of Davis is in the process of amending its zoning ordinance to require that tree planting in parking lots provide shade over 50% of the pavement within fifteen years of initial construction. The task now becomes finding a way to promote optimum tree growth through better rooting conditions without compromising the engineering requirements necessary for pavement integrity.

The answer lies, perhaps, in research originally conducted in the early 1990s at the Urban Horticulture Institute located at Cornell University in Ithaca, New York. Researchers there developed and patented what they called a “structural soil mix”, combining the ability to bear heavy loads of vehicular traffic with the provision of space and a medium in which tree roots can grow and obtain nutrients and water. The main component of this mix is angular crushed stone graded from 0.75-1.25 inches which, when compressed, can withstand the weight of traffic but can also form a three-dimensional lattice with space between individual stones. To this is added soil of a clay loam texture and hydrogel material which acts to adhere the soil to the crushed stone. The soil occupies some, but not all, of the spaces between the stones, creating a me-

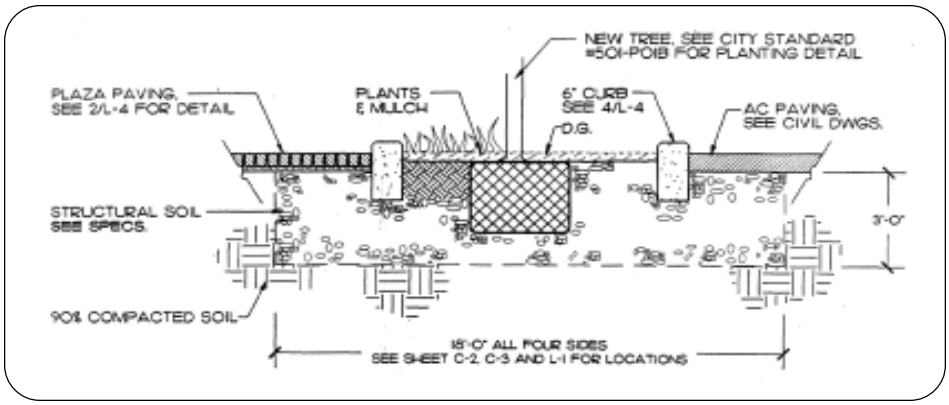


Diagram of tree well with structural soil mix used for the Davis E Street Plaza Project

dium which growing tree roots can penetrate and obtain water, nutrients and oxygen. This structural soil mix can be used under large areas of pavement, giving trees a much greater volume in which to develop roots and a better chance of reaching their full potential for growth and longevity. Studies at Cornell have shown increases of up to two feet of growth per year for trees in structural soil mix over trees in conventional planting situations.

To date, the city of Davis has planted trees in structural soil mix in several parking lots and a paved plaza. The logistics of obtaining and installing the mix are challenging. Cornell University maintains a patent for structural soil mix under the name "CU soil" to insure quality control. Companies must be licensed in order to produce the mix and currently only one such supplier exists in California. The components must be mixed according to rigid specifications and tested to insure compliance. Moisture content of the mix is important to maintain its structure and must be held as constant as possible between mixing and installation. The components must not be allowed to separate during transport due to vibration. Timing is therefore critical to get the mix to the site in optimum condition for installation and planting.

One such site in Davis where most of these factors came together smoothly was the renovated E Street Plaza. This downtown parking lot needed more trees to be in compliance with the city's shade ordinance. Part of the lot was converted into a plaza for increased pedestrian space. This project provided an opportunity to test the performance of structural soil mix under relatively controlled conditions. Four pairs of tree wells were selected among those to be installed in the lot and adjacent plaza. One well of each pair was prepared in the conventional manner with a six feet square planter backfilled with on-site soil providing 108 cubic feet of uncompacted soil for tree root growth. The other well was excavated 18 feet square, three feet deep, filled with structural soil mix and partially paved over, providing 972 cubic feet of potential space for root growth. Identical landscape trees of four varieties were planted in each pair of tree wells. The varieties chosen were 'Bloodgood' London plane tree, Chinese pistache, 'Chanticleer' ornamental pear and 'Purple Robe' hybrid locust. Students affiliated with the WCUFRE will monitor the trees periodically and collect data on growth and health of the trees for several years. If successful, the structural soil mix may enable urban trees to achieve their potential as both functional and design elements in the city landscape.

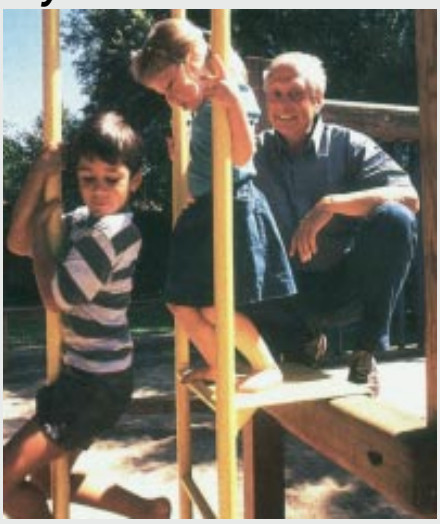
More information on structural soil mix can be found on Cornell's Urban Horticulture Institute Web site at:

http://www.cals.cornell.edu/dept/flori/uhi/

More information on tree shade and air quality can be found on the WCUFRE Web site located at:

http://wcufre.ucdavis.edu/

Seymour M. Gold Retires



Professor Seymour (Sy) Gold announced his retirement in November 1999 after an illustrious career of 30 years with the University of California, Davis. As a professor in the Department of Environmental Horticulture, Sy taught classes in urban and regional planning and recreation planning. He has authored over 250 journal articles in his research field of environmental planning. In addition, he has written two books, *Recreation Planning and Design* and *Urban Recreation Planning*. As a national and world-renowned authority on park and recreation planning and management, Sy has contributed his expertise to many professional groups and recreation agencies. He has also been deeply involved over the years in issues and projects at the community level in Davis and beyond.

Dr. Gold earned graduate degrees from Michigan State University in park administration and from Detroit's Wayne State University in urban planning. He completed his Ph.D. at the University of Michigan in urban and regional planning and joined the faculty at UC Davis in 1969. Since then his research interests have included park and recreation management, playground safety, the phenomenon of nonuse of neighborhood parks, open space preservation and community development. One of Sy's colleagues summed up the driving force for his research by writing: "He chooses research topics on the basis of their social significance and policy relevance and includes in his personal job definition the translation of research information into knowledge usable by society."

In 1981, Sy helped develop playground safety standards for the US Consumer Products Safety Commission and served as a consultant for this group on many other issues. He is a Founding Fellow of the Academy of Leisure Sciences, a Regent of the Pacific Risk Management School and a member of the Recreational Safety Committee of the National Safety Council. In 1995, Sy received the Professional Honor Award from the National Recreation and Park Association for "outstanding contributions to the park and recreation movement in America". In that same year, he was recognized by the University of California with the Distinguished Public Service Award. Sy served as a consultant on California's Playground Safety Law (SB2733) that was implemented in 1996 and was the first bill of its kind in the nation.

Playground safety has always been a topic of prime importance to Sy. Among the accomplishments of which he is most proud is his participation as technical advisor in the production of several instructional videos on playground hazards and inspection made for younger audiences. His ten-point checklist for playground safety can be found on the Web at: http://envhort.ucdavis.edu/gold/gold.htm

We thank Sy for his significant contributions to the field of environmental planning and management. We wish Sy the best during his retirement.

-Dave Burger, Chair

Notes From the Chair... By Dave Burger

The EH department held its First Annual Fall Orientation for new students in early October. The purpose of the event was to acquaint students with the people and resources available to help them during their studies at UCD. We have 60 undergraduate students in the EHUF (Environmental Horticulture and Urban Forestry) major and 36 graduate students representing various graduate groups including Horticulture and Agronomy, Plant Biology, Ecology and Genetics. Department faculty members gave brief overviews of their research programs and staff members were introduced. We intend to make this orientation an annual event. Later in October was the department's Fall Pot Luck Dinner. This year we held the event at Putah Creek Lodge in the Arboretum. Lasagna was the main course supplemented by a delicious selection of salads and enough desserts to feed the entire population of Yolo County. The event was well-attended and gave families a chance to socialize and get re-acquainted.

Several visiting scholars are spending the California autumn with us. **Dr. Mimoun Mokhtari** from the Institut Agronomique et Veterinaire Hassan II in Agadir, Morocco is visiting Michael Reid for a few months to finish writing his Ph.D. dissertation. **Dr. Art Cameron and his wife, Marlene**, are spending a short sabbatic from Michigan State University with Michael Reid to shed light on the mysterious behavior of 1-MCP. You may remember Art and Marlene (formerly Marlene Weiss) were graduate students in this department in the early 1980's and have been together ever since. Michael Reid is hosting yet another visitor, **Kathryn Szlapak** from Kenya, who is enrolled in a certificate program in postharvest technology of cut flowers. **Dr. Svetlana Dobritsa** from the Institute of Biochemistry and Physiology of Microorganisms near Moscow, Russia has extended her stay with Alison Berry to carry on her experiments with *Frankia* nodulation. **John Church**, a doctoral student in Agricultural and Environmental Chemistry, found a home in my lab when his major professor recently retired. He will be finishing his Ph.D. doing experiments in tree microcalorimetry.

The recent reorganization of some important entities of the University has had an impact on faculty members associated with EH. **Dr. Michael Reid** is now the Program Leader for Agricultural Productivity in the Division of Agriculture and Natural Resources, a statewide post with responsibility for coordinating the activities of workgroups involved in agricultural research. **Dr. Jim MacDonald** is now Executive Associate Dean in the revamped College of Agricultural and Environmental Sciences and **Dr. Michael Parrella** is Associate Dean of the Division of Agricultural Sciences within the College. We wish them success in their new endeavors.

We welcome **Carol Mills** to EH as our new receptionist/ purchasing agent. Carol comes to us from the UCD Medical Center where she worked as an administrative assistant. Also new to EH is **Lorianne Stehouwer** who, as Michael Reid's assistant, has the formidable task of keeping him in perpetual motion. At the same time we must say good-bye to **Edie Cances**, our grants and personnel guru, who is leaving EH to take a job closer to her family's 400-acre ranch near Vacaville. We'll miss you, Edie!

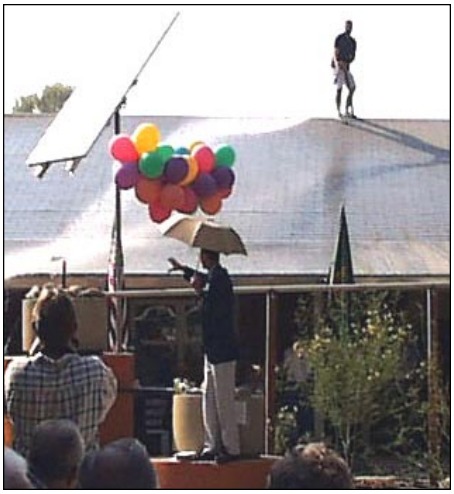
Ryan Deering, a graduate student working with Dr. Truman Young, is the recipient of a Jastro-Shields Graduate Research Award in the amount of $1000. This award is given to outstanding graduate students in recognition of their potential to carry out research projects related to the mission of the College of Agricultural and Environmental Sciences.

EH hosted a dedication ceremony for the Sustainable Garden at the Western Center for Urban Forest Research and Education (WCUFRE) on October 20. Various dignitaries representing UCD, state agencies, USDA and the Teichert Foundation gave the fledgling garden their blessings. The UCD Fire Department gave a demonstration of harvesting runoff from the roof of the Center's building provided by their hoses manned by EH's capable **Mitch Bunch** (see the photo). More information about the dedication ceremony is available on the Center's Web site at:

http://wcufre.ucdavis.edu

More news from the WCUFRE: **Dr. Greg McPherson** received the 1999 Award of Research from the Western Chapter of the International Society of Arboriculture. The award recognized the important contribution that his research has made to quantifying the benefits and costs of urban forests and their impacts on quality of life in communities. **Dr. Thomas Randrup**, a Fullbright Fellow from the Danish Forest and Landscape Research Institute, is collaborating with Center scientists during a six month sabbatical stay in Davis (Dec-May). Dr Randrup has led the effort to coordinate urban forest research among the European community and is sharing this experience with us. While here his research focuses on tree root conflicts with the infrastructure and plant appraisal.

Dr. Richard Evans was recently awarded a grant in the amount of $28,000 from CDFA's Fertilizer Research and Education Program to investigate nitrogen use during production of landscape plants in large containers. Richard will be joining **Gary Hickman**, UCCE Horticulture Advisor in San Joaquin County, on a Winrock-sponsored trip to Uzbekistan in January to consult on the development of greenhouse industries there. In addition, Richard has been awarded a Fulbright grant to investigate landscape water use in Barcelona, Spain next year.



No, that's not Gene Kelly "singin' in the rain", that's Greg McPherson demonstrating rain harvesting with the help of Mitch Bunch.

WCUFRE's New Publications

Scientists at the US Forest Service's Western Center for Urban Forest Research and Education have produced two new publications.

Carbon Dioxide Reduction Through Urban Forestry: Guidelines for Professional and Volunteer Tree Planters is an analysis tool that utilities and other organizations can use to calculate net carbon dioxide emissions avoided and sequestered by urban forestry programs throughout the U.S. It is being used to 1) project future CO_2 reductions from proposed programs, 2) report CO_2 reductions from existing programs, and 3) design cost-effective urban forestry programs. Copies are available at no cost by requesting PSW-GTR-171 from: PSW Publications Distribution, 240 W. Prospect Rd., Fort Collins, CO, 80526-2098 or call (970) 498-1392.

Tree Guidelines for Coastal Southern California Communities quantifies benefits and costs of "green infrastructure" in a region that extends from Santa Barbara to San Diego and contains 10 million people. The Guidelines also describe optimal configurations of trees, recommend tree species for different situations, and identify sources of funding and technical assistance. The publication is being distributed to local elected officials, planners, landscape architects, and non-profit groups throughout the coastal Southern California region by its publisher, the Local Government Commission (LGC). Copies are available from LGC, Attn. Steve Hoyt, 1414 K St., Suite 250, Sacramento, CA, 95814-3929 or call (916) 448-1198.

-Greg McPherson

The eXtension Files *Recent inquiries to the EH Department...*

From S. G. via email: A residential client in San Rafael was told by an arborist that her oaks and many others in the Bay Area have a fungal disease spread by "Asian Ambrosia Beetle" and that many of her trees "would be dead by Christmas". Some trees are dead and tan color; others have no foliar symptoms but all have evidence of beetle activity with hard dark ooze near the bottom of the trunk. She was told the disease is extremely contagious and that there is no treatment. What do you know?

Pavel Svihra, UCCE Horticulture Advisor in Marin County, has become an expert on this problem since 1995, when large numbers of tanbark oaks (*Lithocarpus densiflorus*) began dying of unknown causes in natural areas near Mill Valley and Mt. Tamalpais. These dead and dying trees may have attracted western oak bark beetles and two species of oak ambrosia beetles which are native to California. Over time, these beetles have reproduced to epidemic proportions and are now attacking tanbark oaks and coast live oaks (*Quercus agrifolia*) in natural areas and landscapes in many coastal counties.

The western oak bark beetle bores into a stressed or dead tree's bark to lay eggs in galleries in the sapwood, thereby plugging the tree's vascular system. At the same time, these beetles introduce a fungus that kills the inner bark and sapwood around the galleries. The first signs of infestation are dark brown to black granules and stained bark surfaces appearing below the entrance holes of the beetles followed by reddish brown boring dust at the base of the tree. These symptoms can appear from March to October.

The oak ambrosia beetles are attracted by the activities of the bark beetles. Ambrosia beetles penetrate deep into the heartwood of stressed or dead trees near ground level and a fine white dust appears on the trunk as a result of their boring. As the beetles excavate their egg galleries, they introduce a symbiotic fungus that grows to produce "ambrosia", a food source for the developing larvae. The foliage of an attacked live oak turns pale green changing rapidly to red and brown as the infestation progresses, ending in the death of the tree.

Svihra recommends proper management of oak health as the best defense against these destructive beetles. If healthy trees need pruning, it should be done from November to February when the insects are inactive. Avoid drought stress during the summer by irrigating every six weeks with a soaker hose placed within the tree's dripline. Overwatering must be avoided, however, to maintain good root health. Valuable trees and those disturbed by construction may benefit from a preventative spraying of the bark with permethrin in March and September. To be most effective, spray the bark to runoff and to a height of eight feet from the ground. This treatment may also prevent further infestation if applied at the first sign of bleeding or boring dust. Live oaks showing symptomatic brown foliage should be cut down and the wood should be covered with clear plastic for six months to prevent emergence of new beetles. The stump should also be ground up to discourage ambrosia beetles.

For free subscription, contact Linda Dodge, Managing Editor
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