

# DEVELOPMENT

## AROUND

## OAK TREES

ONE of the major challenges of land development in California is how to develop around oaks and still preserve them as an integral part of the landscape. Substantial changes to existing conditions are likely to weaken a healthy tree and may eventually result in accelerating its death. In locating structures, driveways, patios, etc., innovative design is often necessary to save or prolong the life of the existing oaks.

Avoiding any disturbance within and around the oak dripline will have the least impact on the oak. If this is unavoidable, the following summarizes development scenarios and ways to reduce impacts.

**GRADING, CUTTING, FILLING, TRENCHING AND SOIL COMPACTION.** Coast live oak trees have a very sensitive root system that consists of both shallow and deep roots. The extensive shallow (feeder) roots usually extend  $\frac{1}{3}$  to  $\frac{1}{2}$  again the dripline-to-trunk distance beyond the dripline of the tree. Grading, cutting, or trenching around oak trees is often detrimental due mainly to the shallow feeder roots being cut or damaged by machinery, or exposed by scraping away the topsoil. This may weaken the tree by reducing its ability to take up water and nutrients from the soil.

During development, if trenching is necessary (e.g., for utilities) under oak trees, substantial portions of the root system can be severed, reducing the tree's ability to take up water and nutrients.

### TREE PROTECTION MEASURES

- ♣ Where possible, grading/trenching should be restricted to areas outside the drip line and root zone of the trees.
- ♣ A sturdy, temporary barrier should be placed around the tree dripline until construction activities are done.
- ♣ If trenches must be dug under oak trees, every effort should be made to put all utilities, etc. in one trench rather than digging many trenches. Tunnels and hand trenches are less destructive alternatives to machine trenching. Sometimes conduits can be bored through the soil for utility lines.
- ♣ Any roots permanently exposed from grading or scraping of topsoil should be cleanly cut just below the new soil grade.

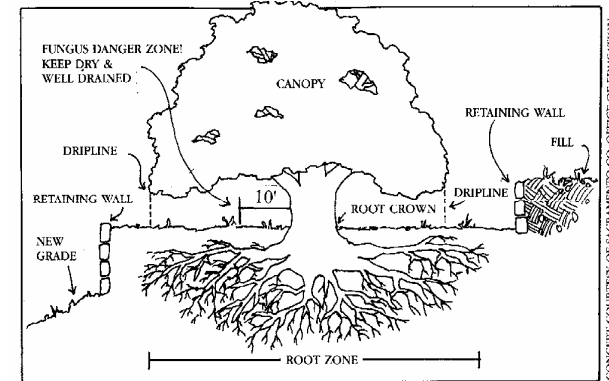
**Filling** (adding soil) and/or compaction under the drip line of oaks is also harmful because it impairs the ability of roots to “breathe”. Oxygen is essential to root respiration and is directly related to the processes of active water absorption and nutrient uptake. Filling covers the extensive feeder root system and reduces soil aeration and gas exchange to the roots. Compaction eliminates “pockets” of oxygen and/or water within the soil. When deprived of oxygen, the roots of oak trees can suffocate, resulting in premature death of the tree.

While grade-changes outside the drip line and root zone of the oaks may not directly injure the tree, there are some indirect effects to consider. For example, if fill material outside the tree canopy results in change of drainage or water movement patterns so that soil under the tree is saturated, it may result in a weakening of the tree and susceptibility to crown or root rot. Also, substantial cuts away from trees may change drainage patterns and cause the soil to dry more rapidly in the summer. This could result in insufficient moisture available to the trees; in turn, they may die of a lack of water, or weaken with a greater exposure to disease.

- ♣ Retaining walls could be used outside of the root zone to retain the natural grade to protect existing root zones.

**Paving** under oaks or in their root zone will have similar impacts as would the previously described compaction impacts. If paving is unavoidable, the developer should strive to:

- ♣ keep paving out of the drip line of the tree and no closer than about 15 feet from the tree trunk.
- ♣ use a porous paving material, such as brick with sand joints, open bricks, bark, gravel, cobbles, redwood planks, etc.(this will allow some water penetration and gas exchange). Even with porous paving, the area around the trunk (at least a 10-ft radius) should be left natural and uncovered;
- ♣ maintain historic drainage and not create any pooling of water around the tree.



**MAINTENANCE OF OAKS AROUND HOMES AFTER DEVELOPMENT.** The best advice for maintaining oaks is to leave the environment around them as natural as possible. Anything done to modify the environment will have an impact on oak trees. However, when modification is necessary there are certain measures that will reduce the impact. Landscaping within the oak drip line is okay with the following restrictions:

- ♣ Plants should be chosen which do not: require summer irrigation; produce allelopathic substances (toxins that would poison the oak trees); or develop such a thick root and foliage mat that would not allow sufficient water

permeability and gas exchange [see following list of native species plantable under oaks].

- ♣ It is best to landscape away from the trunk.
- ♣ Vines should not grow up the tree trunk.

**PRUNING** of oak trees is normally not necessary and should typically be limited to the removal of dead, weakened, dangerous, or diseased branches with no heavy pruning at any time. Light pruning can be done just about any time of year; however, heavier pruning of coast live oaks should occur during July-August. Excessive pruning may stimulate rapid new growth subject to mildew or other related diseases and should be avoided.

**WEED-WHACKING** around oaks should be done only if absolutely necessary for fire safety purposes, and if done, care should be taken to clearly identify and protect volunteer seedlings to avoid harm during this process.

**SUPPLEMENTAL WATERING** of new oaks may be needed to get them established over the first few years; however, once established they should be weaned from this supplemental water so they may rely exclusively on rainfall.

**SUDDEN OAK DEATH (SOD)** is a disease caused by *Phytophthora ramorum* that is currently spreading throughout California. It is not currently found in SLO county. This pathogen affects several native coastal trees and shrubs, but is most well known for its impacts on the “red” oak family (coast live oak, black oak and tan “oak”). The most useful diagnostic symptom for *P. ramorum* is the development of cankers on the trunk. Cankers have red-brown to black discoloration and seep dark black to red or amber sap. They usually develop 3 to 6 ft off of the ground, although they can be at soil level, or as high as 20 ft. or greater. Other oak-related diseases that exist in the county may emulate some of these conditions.

*Phytophthora ramorum* canker disease of oak has been called “Sudden Oak Death” due to the rapid (2 to 4 weeks) and complete browning of the crown observed on numerous trees at their death. While this

sudden browning may occur, death of the tree due to *P. ramorum* infection usually takes place after an extended period, and perhaps more than two years from the onset of infection.

When trimming or removing infected areas, the best option is to leave infested material on site and use it for firewood. Composting can also successfully kill the pathogen, but the compost must reach a high temperature of 130 degrees F for 2 weeks, which may not be possible or practical in a home composting site that may not have the proper mix of woody and green materials and be turned regularly. Chipping and leaving the chips on site is also recommended in generally infested areas. Because infestation levels are already thought to be high, the additional infested material will not worsen the local disease conditions. If chipping is not acceptable to the individual for aesthetic or other reasons, burning the materials on-site, where permitted, should be considered. Since there is no known cure for this problem, any material

taken off-site has a high potential for infecting other areas and should be avoided.

Additional information on SOD can be obtained at the UC Co-Op Extension, Master Gardener group (SLO 781-5939, AG 473-7190, and PR 237- 3100)

#### USEFUL INTERNET SITES

California Oak Mortality Task Force -

<http://suddenoakdeath.org/>

California Oak Foundation -

<http://www.californiaoaks.org/>

Integrated Hardwood Range Management Program -

<http://danr.ucop.edu/ihrmp/>

#### INFORMATIVE PUBLICATIONS

Pavlik, B. M., P.C. Muick, S. Johnson and M. Popper (1991) “Oaks of California”; Cachuma Press

University of California Co-op Extension, Natural Resources Program (undated); “Living Among the Oaks—A Management Guide for Landowners” ♣

#### Compatible landscaping plants around oaks

##### Shrubs-Partial Shade

*Carpenteria californica*, Carpenteria  
*Ceanothus* species: *C. griseus*, *C. thyrsiflorus*, *C. maritimus*; plus cultivars: *C. Joyce Coulter*, *C. Ray Hartman*  
*Cercis occidentalis*, Western redbud  
*Cercocarpus betuloides*, var. *blancheae*, Mountain mahogany  
*Eriogonum arborescens*, Santa Cruz Island wild buckwheat  
*Garrya elliptica*, Silk-tassel bush  
*Heteromeles arbutifolia*, Toyon  
*Mahonia* species (Barberries & Mahonias): *M. amplexans*, *M. dictyota*, *M. fremontii*, *M. Haematocarpa*, *M. bigginsiae*, *M. pinnata*  
*Prunus ilicifolia*, Holly-leaf cherry  
*Rhamnus californica*, Coffeeberry  
*Ribes* species (Gooseberries): *R. aureum* var. *gracillimum*, *R. malvaceum*, *R. speciosum*, *R. sanguineum*, *R. viburnifolium*  
*Rosa californica*, California wild rose  
*Rosa californica*, “Plena” double California rose  
*Salvia clevelandii*, San Diego wild sage  
*Salvia leucophylla*, Coastal white sage

##### Shrubs-Full Sun

*Fremontodendron californicum mexicanum* and cultivars, *Fremontia*, Flannel bush, “California Glory”, Pacific sunset”  
*Galvesia speciosa*, Island snapdragon  
*Lupinus albifrons*, Silver bush lupine  
*Lupinus chamissonis*, Chamisso bush lupine  
*Mimulus aurantiacus*, Bush monkeyflower  
*Mimulus puniceus*, Red monkeyflower  
*Penstemon clevelandii*, Cleveland’s penstemon & other species  
*Romneya coulteri*, Matilija poppy

##### Ground Covers

*Baccharis pilularis* subsp. *pilularis*, Dwarf coyote bush  
*Ceanothus griseus*, var. *horizontalis*, Carmel creeper  
*Ceanothus maritimus*, Hoover ceanothus  
*Ribes viburnifolium*, Catalina currant

##### Evergreen Herbaceous Plants

*Dryopteris arguta*, Wood fern  
*Eriogonum umbellatum* var. *polyanthum*, Buckwheat  
*Heuchera maxima*, Giant alum root  
*Iris douglasiana* and hybrids  
*Viguiera deltoidea* var. *parishii*

##### Deciduous or Annual Herbaceous Plants

*Clarkia* species  
*Collinsia* species, Chinese houses  
*Dodecatheon clevelandii*, Shooting stars  
*Eschscholzia* species, Poppies  
*Montia perfoliata*, miner’s lettuce  
*Oenothera* species, Evening primroses  
*Sisyrinchium bellum*, Blue-eyed grass  
*Viola pedunculata*, Yellow pansy  
*Zauschneria californica*, California wild fuchsia

##### Bulbs

*Brodiaea* species and related genera: *Dichelostemma pulchellum*, *Tritileta laxa*  
*Calochortus* species, Mariposa lilies  
*Lilium pardalinum*, Leopard lily  
*Trillium chloropetalum*, Common trillium