



DEPARTMENT OF FORESTRY AND FIRE PROTECTION

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GUIDELINES FOR PLANTING NATIVE OAKS

Oaks dominate the natural landscape throughout much of California's Central Valley, Coast Ranges, and the Cascade and Sierra foothills. In many stands, there appear to be few saplings or young trees. Many observers are concerned that in certain areas valley, blue, and Engelmann oaks may not be regenerating adequately to perpetuate these species. A number of factors have been identified that may be contributing to poor regeneration, including changes in land use, absence of fires and floods, predation by rodents, deer and livestock, soil compaction, and introduced annual grasses.

Natural oak regeneration may require that several environmental factors coincide, such as a summer ground fire followed by a heavy acorn crop, a rainy winter, and a decline in the deer population. Natural regeneration can be supplemented or enhanced by oak revegetation projects utilizing any combination of three techniques:

- collecting and planting acorns
- transplanting oak seedlings
- protecting oak seedlings found growing on the site

The following recommendations are based primarily on studies performed by University of California Cooperative Extension. They should maximize successful germination, growth, and survival of oaks in most planting situations.

ACORN PLANTING: Acorn planting has the advantages of maintaining local gene pools and costing little or nothing, and is an ideal activity for children. However, it is more labor-intensive and less reliable than planting seedlings.

- To reflect the local range of genetic variability, collect from as many healthy oaks near the planting site as possible (ideally from a minimum of 15 trees). Pick large, heavy acorns after they begin to ripen in the fall. (Ripeness can be determined by golden color and an easily-removed cap.) Acorns picked from the branch are less likely to be damaged by insects than those picked off the ground; discard acorns with holes or cracks. Acorns can also be tested for soundness by submersion in water; discard acorns that float.
- Black oak acorns (black, interior and coast live oaks) should be soaked in water overnight, then surface dried and stored in a cool location such as a refrigerator for two to three months before planting. White oak acorns (blue, valley, Oregon and Engelmann oaks) do not require special handling; if storage is needed, they will keep best if stored in a cool location. Ziplock-style bags, with the tops left open, are ideal for storage.
- **Important note regarding Sudden Oak Death:** The black oaks (especially black and coast live oak) are susceptible to Sudden Oak Death. It is not recommended that they be planted in or near active disease centers or in areas near bay or tanoak trees. White oaks (valley, blue, and Oregon white oak) will have a better chance of surviving in these locations.

CONSERVATION IS WISE—KEEP CALIFORNIA GREEN AND GOLDEN

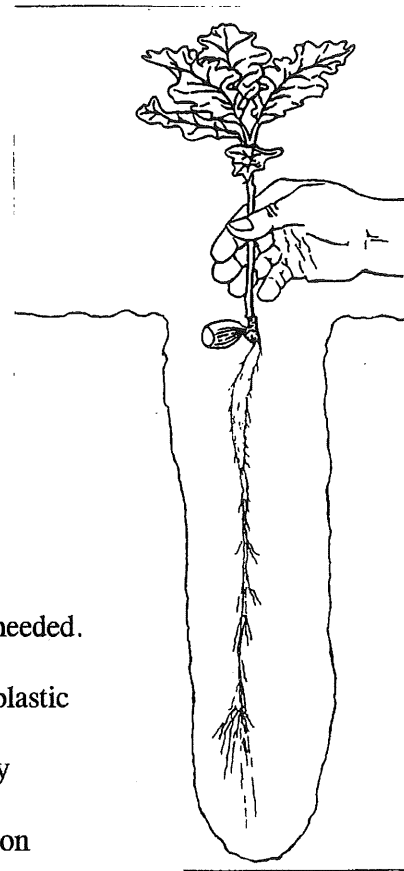
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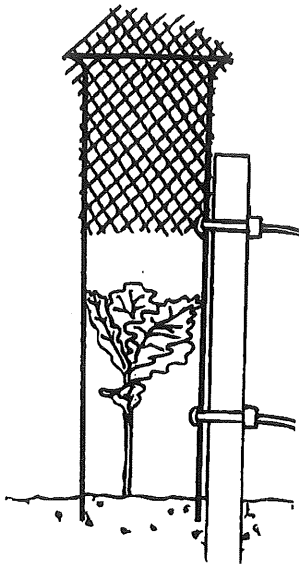
- Germination and growth are best when acorns are planted between November and January 31. In general, plant as soon as enough rain has fallen to soak the soil.
- Plant acorns near the drip lines of any mature oaks on the site. Natural oak seedlings appear to grow best in partial shade. Soil under mature trees also contains mycorrhizae, soil-borne fungi that grow on the roots of trees, increasing their ability to absorb water and nutrients. In the absence of existing oaks, plant in the most sheltered locations, favoring sites with deep, well-drained soils, and a north or east aspect. If possible, add soil from beneath mature oaks to the planting holes, to introduce mycorrhizal fungi. Plant acorns in clusters of three or four, leaving 30 - 40 feet between clusters; (aim for about 40 trees per acre at maturity).
- Prepare the planting site by clearing all vegetation from an area of one square yard. If the soil is compacted, growth may be improved by loosening the soil about one foot deep (a post-hole digger or auger works well for this). Fertilizer has been demonstrated to increase growth in oak seedlings, though opinions vary regarding long-term benefits of use. If fertilizer is tried, use a slow-release compound placed near the bottom of the hole (to encourage seedling top growth and root development without generating a flush of grass). Plant the acorn on its side, no more than two inches deep. If the acorn has sprouted, direct the roots downward. After planting, tamp the soil down firmly. Apply water, if available. If soil in the planting hole settles, add soil as needed.

PLANTING SEEDLINGS: Planting seedlings is more expensive than acorn planting and collection, but also less time consuming and survival rates are generally higher. Make every effort to obtain seedlings from local seed sources. Planting in late fall or early winter, soon after the first good rains, produces optimum growth and survival. "Leggy" seedlings with shoots much longer than the length of the roots may benefit from top pruning.

Planting site selection, preparation, and fertilization recommendations listed for acorn plantings should be followed for planting seedlings. Dig the planting hole a few inches deeper than the length of the roots. Seedlings that are "root-bound" may need the root mass loosened, straightened or trimmed to prevent twining roots from girdling the tree. Take care to keep all roots in a vertical position as the hole is filled. After the soil has been tamped down, place the root crown at or just above ground level. Apply water, if available. If soil in the planting hole settles, add soil and adjust the location of the crown line as needed.

TREE SHELTERS: Tree shelters are tubes made of translucent plastic that enhance tree growth and survival by acting as a miniature greenhouse. Tree shelters reduce water demand, especially on dry sites. Tree shelters also provide protection from herbicide drift, mowing damage, and browsing; they are recommended if predation by meadow mice, gophers, deer or livestock is anticipated.





Install tree shelters over acorns, planted seedlings, or naturally occurring seedlings. Tree growth is optimal when a four-foot shelter is used. Brown-colored shelters are recommended for areas with high summer temperatures. Press shelters three to four inches into the soil; this provides shelter from desiccating winds and some protection from gophers

Stake shelters securely; re-bar is more durable than bamboo or grape stakes. Use metal T-posts if livestock have access to the area. Plastic mesh placed over the top of the shelter will prevent birds and grasshoppers from becoming trapped inside (Note: remove mesh when the tree reaches the top of the tube).

Leave shelters in place two to three years after the tree grows out the top. To reduce the risk of sunburning the bark, remove shelters in the fall. On removal, the lower six inches of the shelter may be cut off and left in place if gopher or vole predation is anticipated.

WEED CONTROL: The acorns or oak seedlings you plant will have a much better chance of surviving if you control the growth of weeds around them. Effective weed control reduces competition for water, and eliminates habitat for a variety of herbivores that prey on oak seedlings, including grasshoppers, meadow mice, and gophers. Weed control options include mowing, mulching, grazing, and herbicide use.

- Mow to provide a minimum clearance of three to four-foot around each seedling. Mulching seedlings with bark chips, straw, compost, or similar materials will also reduce weed growth. Landscape fabric, an artificial form of mulch, can be installed around the seedlings or acorns at planting time and stapled to the ground to provide long-term weed control with a minimal investment of time. However, its use may stimulate tunneling by voles and gophers.
- Seasonal grazing can provide effective weed control in areas where seedlings are fenced or protected by tree shelters staked with T-posts. This is the preferred weed control method where meadow mice populations are high. (Note: hand-weeding the area immediately surrounding each seedling may still be required.)
- Herbicides can also be used to control weeds. A single application at the time of planting is the most cost-effective of all weed-control options. Note that oak seedlings will also be burned or killed if contacted by herbicides. If tree shelters are used, they will protect seedlings from herbicide spray or drift; other materials, such as stove or plastic pipe, can also be used for this purpose.

WATER: Monthly irrigation during the first summer following planting will improve oak growth and survival. In areas where water is not available, good survival can be obtained by utilizing tree shelters. Again, controlling weeds to reduce competition for water is the most critical factor in seedling survival.