



Blue Oak

Blue oak (*Quercus douglassii*) is an ideal specimen tree on dry slopes of interior valleys throughout California. This low branching, wide spreading tree reaches heights in excess of 50 feet with a nearly equal branch spread. It provides multi-seasonal interest with bluish leaves in the summer and attractive fall colors of yellow and pastel oranges and pinks. The bark is a finely textured to smooth light gray.

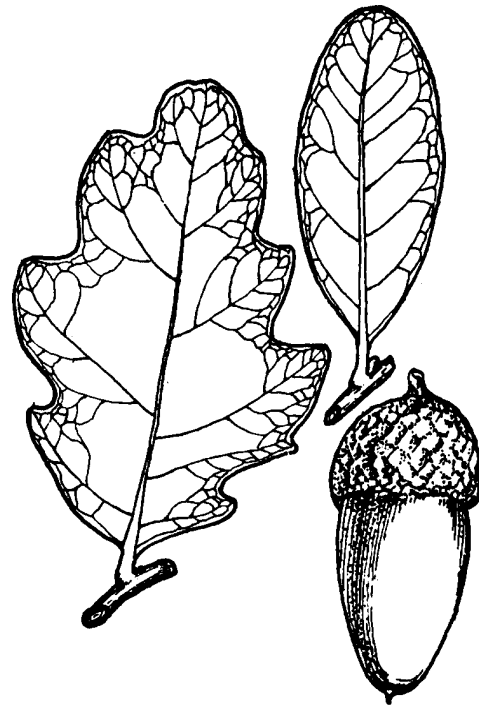
Blue oak is well adapted to dry grassland sites. It resists the effects of drought by several means including the production of a waxy layer on the top surface of the leaf. This layer reduces water loss and provides the bluish color. In extremely hot and dry years, leaves may be dropped while the tree goes into dormancy. This dormancy usually lasts until the next spring.

Excess irrigation is the leading killer of established blue oak in the landscape. This species is well adapted to receive only 15-30" of rain per year with little of it coming during the summer. When irrigation is provided in the summer it activates a large array of soil borne fungi which attacks the roots and root collar of the tree.

In extreme drought years irrigation can be beneficial in reducing early dormancy, however, water must be applied away from the trunk with at least four weeks between moderate drenchings. Young or newly planted trees may need more frequent watering. Planting high water demanding species such as turf grass, azaleas or impatiens may bring in *Phytophthora* or other root rots as well as creating a moisture regime which will enhance disease development. Therefore it is best to grow blue oaks with only native grasses or mulch below the canopy.

Soil disturbances within the dripline may reduce tree vigor by damaging the food storing root system as well as providing conditions for infection of decay fungi. Soil or mulch against the lower trunk or root collar of the tree provides an environment favorable for the development of *Armillaria*, the oak root fungus. *Armillaria* may also infect roots damaged by machinery near the tree.

Another decay fungus which kills blue oak is *Inonotus andersonii*. This disease infects both the bark of the tree causing a canker, and the wood on the inside of the trunk. Maintaining the tree in a vigorous



condition through fertilization, correcting other soil problems and irrigation only when necessary prevents this disease. Often trees with severe internal decay need to be removed for safety reasons before they die.

Anthrachnose is a disease of the foliage that can cause premature defoliation. Spores of the fungus are spread when leaves are tender and expanding. They move from tree to tree and within a tree by splashing water. Powdery mildew is a disease of leaves, which, if extensive, will reduce the tree's ability to produce food. Mildew infects leaves on rapidly growing twigs especially during the summer.

In the spring various leaf-feeding insects attack blue oak. Vigorous trees can withstand several defoliations from these insects, however weakened trees can be killed by one severe defoliation. The California oakworm (*Phryganidia californica*) is the most serious defoliator.

Fifty gall-forming insects make their home in blue oaks. Twenty-five of these insect species have been found in a single tree. They form galls of many shapes, sizes and colors. Some of the galls cut off the nutrient flow to leaves thus causing dieback of twigs and branches. Many of these galls are caused by a group of small wasps - the *Cynipids*.

Aphids, mites, mealybugs, scale insects and whiteflies all attack blue oak. A common symptom is the production of honeydew that forms a sticky layer on anything below the insect. This honeydew is often colonized by "sooty mold" fungus that turns the surfaces black.

Blue oak is generally considered a low maintenance tree. It typically requires only occasional pruning to correct structural problems and remove deadwood. With proper care of the root system including regular fertilization, and avoiding injury, specimens can live well over 100 years.

Recommended Monitoring for Blue Oak

Timing	Treatment
Winter	Fertilize* as needed. Treat with soil applied insecticide if damaging levels of insects were present last year. Inspect root collar, mulch and for other soil problems. Correct as needed.
Spring	Inspect for oakworm, scale, twig blight and other pests. Treat as needed. In wet years or with a history of foliar diseases, at least three applications of fungicide are required.
Summer	Prune* as needed to correct structural problems and remove any deadwood. Avoid over thinning to reduce development of powdery mildew. Monitor soil moisture. Irrigate infrequently if needed. Treat foliar insects and powdery mildew as needed. In wet years fungicides need to be reapplied for anthracnose and powdery mildew.
Fall	Monitor insect and disease populations. Treat as needed. Evaluate pest management from previous season to assist in modifying the program for next year.

*Treatments can be done during other seasons if necessary.