How to Grow California Oaks

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Native oaks are a vital and important component of the vegetation of California. They grow in a wide variety of habitats and help provide a distinctive character to the landscape. Not only are they beautiful to look at, but they also provide food and shelter for many wildlife species, they stabilize soil, and they help counteract the "greenhouse effect" by taking up carbon dioxide and producing oxygen.

It is estimated that one or more species of oaks grow on over 20 percent of the state's 100 million acres of land. Unfortunately, there are also reports that some native oaks may not be regenerating very well in some locations. Poor natural regeneration raises concerns about the long term fate of these species. To assist Mother Nature in establishing new oak trees, efforts are underway to plant acorns and small seedlings. Such regeneration efforts will ensure that our magnificent oaks, which have graced California valleys and foothills for thousands of years, will be around for future generations to enjoy also. The following guidelines provide successful techniques for growing oak trees. While there are many ways to get an oak tree started, the procedures described have proved successful for a variety of species and environments.

ACORNS OR SEEDLINGS?

Oak trees can be started by either directly planting acorns or transplanting small seedlings. However, since relatively few native oak seedlings are produced in the state, it may be difficult to purchase them. Those that are produced are generally grown in containers ranging in size from a few cubic inches to 5 or 15 gallons. Seedlings grown in the smaller containers should be no more than one year old before transplanting since they quickly outgrow small pots. Even with large containers, it is important that seedlings be transplanted within a couple of years since oaks tend to produce massive root systems and can easily become "pot-bound."

Some bareroot oak seedlings are also available. For the past several years the California Department of Forestry Nursery at Magalia has been growing, and making available to the public, several species of oaks. The supply of both container and bareroot oak seedlings should increase in future years as techniques for rearing them are developed and perfected, and more people express an interest in planting native oaks.

The choice of whether to plant acorns or seedlings depends on a whole host of factors including availability of planting material and conditions at the planting site. Generally, acorns are easier to plant, but the survival of seedlings may be greater if they are planted correctly at the right time of the year. Another factor that may influence the choice is what kinds of animals are present at the planting site. If there are high populations of acorn-eating rodents (ground squirrels or deer mice), it may be easier to plant seedlings than trying to protect the acorns.

MAINTAIN LOCAL SEED SOURCES

Since most tree species have adapted to the specific environments where they grow, it is important to only plant a given oak species in areas where it naturally occurs or where it may have grown in the past. Even within a species, you must be careful to only plant acorns or seedlings that come from a parent tree growing in the same general environment. If you took an

acorn from a blue oak tree growing on the coast and planted it in the foothills of the Sierra Nevada, for instance, it would probably grow poorly, or die, even though blue oaks grow in both locations. Since coastal trees are genetically adapted to more temperate, moister conditions, they would be subject to injury from the colder, drier conditions of the interior. If you collect acorns yourself, you can be sure where they come from, and know that they are also handled and stored properly. If you buy from a nursery, make sure you find out the location and elevation of the acorns collected, and insist on seed sources from as near your planting site as possible.

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Collecting Acorns

Acorns can be collected either directly from the trees or from the ground beneath. However, the healthiest acorns are generally those picked from the trees. Those that fall to the ground often dry out and are damaged—especially if they lie exposed for more than a few days during hot and dry weather. If you do collect acorns from the ground, leave behind those that are very small, cracked or feel light and hollow. Acorns collected directly from trees can be hand-picked or knocked to the ground using long poles or pieces of plastic pipe. It's easy to pick them up if tarps are placed under the trees first.

The best time to collect acorns is generally in the early fall, when they are just starting to turn from green to brown and some are falling to the ground. It's probably too early to collect them if they are all dark green and it is difficult to remove their caps (the cup covering the rounded end). Wait a couple of weeks and check them again.

If left unprotected, oak seedlings are vulnerable to attack from grasshoppers and other animals.

Storing Acorns

Prior to storage, the caps on all acorns should be taken off. They should come off easily when twisted. Acorns collected directly from the trees should be put in plastic bags and immediately placed in a refrigerator. Refrigeration slows the metabolic activity and helps prevent them from heating up or drying out — both of which can be damaging. A recent study indicated that storing acorns in a refrigerator for a month or so before planting resulted in faster and more complete germination than planting acorns immediately.

Acorns picked up off the ground should be soaked for a day before they are placed in cold storage. Those that float should be discarded. "Floaters" are generally acorns that have been damaged by insects or have dried out while they were on the ground. "Sinkers" should be saved. Remove the acorns from the water and place them on cloth or paper towels for a half hour to dry their surface. Then place the acorns in plastic bags in the refrigerator. Check them occasionally for molds. If molds do develop, take the acorns out and rinse them, and then put them back in the refrigerator. Leaving the plastic bag partially open at the end seems to reduce the tendency for molds to develop.

Another problem that can develop in cold storage is premature germination. Blue oak acorns are especially prone to this. The white tip emerging from the pointed end of the acorn is actually the start of the new root system. Once these roots have grown for a few weeks, they can start to go bad and turn dark brown or grey and mushy. Therefore, if you see the acorns starting to germinate in storage, it's best to plant them as soon as possible.

Acorn and Seedling Planting

Acorns can be planted from early November (after the first rains have soaked the soil) until early March. However, it's generally better to plant acorns early in the season since the earlier they are placed in the ground, the earlier they start to grow. Early planting also reduces the problems associated with premature germination during storage.

Plant the acorns one-half to one inch below the soil surface. Dig a hole using a hand trowel, hoe, or shovel. It's best to dig the hole several inches deeper than the acorn is actually planted, and then partially fill the hole back up with loose soil. This gives the new root a chance to get a good start in soft, easy to penetrate soil. If the acorns have germinated, try not to break the root tip, and position it in such a way that the root is pointing down. Even if the tip of the root has begun to turn brown, the acorns should still be okay as long as some of the root is white and fleshy. Place ungerminated acorns on their side in the hole and cover with soil.

Planting seedlings requires a little more care since there is greater risk of transplant shock and root injury. Seedlings should be planted between December and February, when the soil is wet but not frozen. When planting potted seedlings, try to keep the soil from falling off the roots when the seedling is removed from the container. Place the seedlings in the ground such that the top of the soil from the container is even with the ground line. It is especially important not to plant the seedlings so shallow that the potting mix sticks up in the air, since this can cause moisture to "wick-out" and the seedlings to dry up. If you are planting bareroot seedlings, be sure not to "J-root" them (planting in too shallow a hole so the root bends up). Also, tamp the soil down in the planting hole so that air pockets are removed. If possible, water the transplants when they are planted. This settles the soil, ensures there is adequate moisture, and helps eliminate air pockets.

Recent studies have indicated that augering holes 1-2 feet below planting spots and backfilling with the broken-up soil can promote deep root development and stimulate vigorous growth. This is especially beneficial if you are planting in hard, compacted ground. Deep root development provides seedlings with greater access to moisture, thus reducing the ill effects of summer drought. Placing a fertilizer tablet a few inches below and to the side of the bottom of the root can also help ensure that the developing seedling will have plenty of nutrients for its initial growth.

The site where you choose to plant acorns or seedlings may also be critical for their success. Choose a sunny spot that has loose, well-drained soil and is fairly free of weeds. Also, avoid areas where there are lots of pocket gopher mounds or ground squirrel activity. If you do feel that the acorns may be threatened by rodents such as squirrels or mice, plant them a little deeper—say, two inches below the surface. If they are planted deeper, it will be harder for these animals to dig them up. However, if they are planted too deep, they may rot or not be able to grow up to the soil surface.

Planting Layout

The number of acorns or seedlings to plant in a given area will depend on how many oaks you eventually want to grow there. Unfortunately, it is very difficult to predict how many trees will be produced from plantings, since a whole host of uncertain factors including weather, animals and competing vegetation can influence this. When laying out the planting area, consider spacing seedlings or acorns in a naturalistic manner, rather than in straight rows, using surrounding oak trees as a model. On open rangeland, it is recommended that trees be established in small clumps or clusters, with the goal of about 40 planting spots per acre. This comes out to an average of one cluster every 30-40 feet. Within each cluster, plant 3-4 seedlings. In restoration projects

Tree shelters protect oak seedlings from animals and stimulate growth.

in riparian zones, a greater density is usually desirable, so have the clusters closer together—say 15-20 feet apart.

Seedling Maintenance and Protection

Another critical factor affecting young oak seedlings is competing vegetation. Adjacent plants—especially grasses—can use up so much of the available soil moisture that little is left for the seedlings. It is therefore recommended that a 2-3 foot radius circle around the planting spots be cleared of other vegetation. This can be done by hand weeding, hoeing, scalping, or by spraying a contact herbicide. However, with any of these methods, be sure to check back in the spring and early summer to remove any additional weeds that may have come up. It is generally best to keep the weeds away for at least 2 years after planting.

Another way of reducing weeds near seedlings is to place some type of mulch around the planting spots. Bark chips, straw, compost, mulching paper, or even black plastic can be used. Mulches have an added benefit in that they also help conserve moisture by reducing evaporation from the soil surface. In areas where water is accessible, several deep irrigations (2 gallons per seedling) during the late spring and early summer can also help ensure that the seedlings are not damaged by drought.

Since acorns are an important food source for a whole host of animals, there is always a risk some of them will be dug up and eaten. As the seedlings start to grow in the spring, there is a also a chance that their tender young shoots will be eaten by livestock, rabbits, grasshoppers, or other animals. The risk of such injury to both acorns and seedlings can be reduced by placing protective cages around the planting spots. One type of cage that has worked well in research plots consists of an 18x18-inch aluminum screen that is formed into a 5-inch diameter cylinder and stapled to a 1x2x24-inch wooden stake. The cylinder is folded closed at the top. The stake is driven into the ground so that the screen cage covers the spot where the acorn or seedling is planted. This cage will keep out rodents, insects, and browsing animals.

A new type of protector is a rigid translucent tube. These "tree shelters" vary in height from one to six feet. These shelters not only keep away insects and browsers, but appear to stimulate height growth as well. Recent research indicates that tree shelters secured with metal fence posts can even protect seedlings from cattle and sheep. These protectors also facilitate chemical weed control around planting spots.

Another cage protector consists of a screen cylinder placed around a 1-quart yogurt or cottage cheese container that is open at both ends. Place the quart container in the soil so that the top is at the soil surface. This protective cage will not only prevent shoot damage, but will also help keep away burrowing animals such as gophers which can damage roots.

When the seedlings grow to the top of the screen cages, open the cages up so the seedlings can continue to grow. You're now well on your way to establishing an oak tree!

(continued on next page)

Nurseries Producing Native California Oaks

Below is a partial list of both wholesale and retail nurseries in California that produce native oaks in various sizes ranging from liners to specimen tre
The species of oaks grown at each nursery are not identified since this depends on acorn availability, demand, etc., and can vary from year to year.
Please call the nursery for a current list of species and stock sizes available.

ALL SEASONS NURSERY
10656 Sheldon Woods Way
Elk Grove, CA 95624
(916) 689-6943

ARROWHEAD GROWERS
990 Rutherford Cross Road
P.O. Box 398
Rutherford, CA 94573
(707) 963-5800

BLUE OAK NURSERY
2731 Mountain Oak Lane
Rescue, CA 95672
(916) 677-2111

CALIFLORA NURSERY
P.O. Box 515
Oregon House, CA 95962-0515
(916) 692-2565

CALIFORNIA CONSERVATION CORPS
Napa Satellite Center
P.O. Box 7199
Napa, CA 94558
(707) 253-7783

CALIFORNIA DEPT. OF FORESTRY
L.A. Moran Reforestation Center
5800 Chiles Road
Davis, CA 95616
(916) 322-2299

CALIFORNIA FLORA NURSERY
Somers and D Streets
P.O. Box 3
Fulton, CA 95439
(707) 528-8813

CALAVERAS NURSERY
1622 Highway 12
Valley Springs, CA 95252
(209) 772-1823

CHRISTENSEN NURSERY
1600 Sanborn Road
Saratoga, CA 95070
(408) 867-4181

CIRCUIT RIDER PRODUCTIONS
Native Plant Nursery
9619 Old Redwood Highway
Windsor, CA 95492
(707) 838-6641

CORNFLOWER FARMS
P.O. Box 896
Elk Grove, CA 95759
(916) 689-1015

DAVIS NATIVE PLANT RESOURCES
P.O. Box 317
North San Juan, CA 95960
(916) 478-0503

KING ISLAND WHOLESALE NURSERY
8458 W. Eight Mile Road
Stockton, CA 95219
(209) 957-6212

LAS PILITAS NURSERY
Las Pilitas Road
Santa Margarita, CA 93453
(805) 438-5992

MATSUDA NURSERY
P.O. Box 276547
Sacramento, CA 95827-6547
(916) 381-1625

MONROVIA NURSERY COMPANY
18331 E. Foothill Blvd.
P.O. Box Q
Azusa, CA 91702
(818) 334-9321

NATIVE OAK NURSERY
20316 Fallen Leaf Drive
Tehachapi, CA 93561
(805) 822-8970

NATIVE SONS WHOLESALE NURSERY
379 W. El Campo Road
Arroyo Grande, CA 93420
(805) 481-5996

PACIFIC SOUTHWEST NURSERY
P.O. Box 985
National City, CA 91951-0985
(619) 477-5333

SKYLARK WHOLESALE NURSERY
6735 Sonoma Hwy.
Santa Rosa, CA 95409
(707) 539-1565

SPECIALTY OAKS, INC.
12552 Highway 29
Lower Lake, CA 95457
(707) 995-2275

STRIBLINGS NURSERIES, INC.
P.O. Box 793
6529 Mariposa Way
Merced, CA 95340
(209) 722-4106

SWEETLAND FARM
27443 Sweetland Road
North San Juan, CA 95960
(916) 292-3141

TREE OF LIFE
P.O. Box 736
San Juan Capistrano, CA 92693
(714) 728-0685

WILDWOOD FARM
10300 Highway 12
Kenwood, CA 95452
(707) 833-1161

YA-KA-AMA NATIVE PLANT NURSERY
6215 Eastside Road
Forestville, CA 95436
(707) 887-1541

YERBA BUENA NURSERY
19500 Skyline Blvd.
Woodside, CA 94062
(415) 851-1668

Publication of the Integrated Hardwood Range management Program
Printing Provided Through Renewable Resources Extension Act

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Publication 21540

An electronic copy of this publication can be found at the ANR Communication Services catalog website, http://anrcatalog.ucanr.edu/.

web-11/18-DM/WS