
POISON OAK

Integrated Pest Management for Home Gardeners and Landscape Professionals

Poison oak or western poison oak, *Toxicodendron diversilobum*, is native to western North America, with a distribution extending from British Columbia south to the Baja California peninsula. In Washington and Oregon, poison oak is found mainly in the western regions of the states. In California it is widespread and grows in a wide range of habitats from sea level to the 5000 foot elevation, including open woodland, grassy hillsides, coniferous forests, and open chaparral.

IDENTIFICATION

Poison oak (Fig. 1) is a deciduous (loses leaves in winter), woody plant that can have a shrub or vine form. In open areas under full sunlight, poison oak forms a dense leafy shrub usually 1 to 6 feet in height. In shaded areas, such as in coastal redwoods and oak woodlands, it becomes a much taller climbing vine, supporting itself on other vegetation or upright objects by means of aerial roots.

Leaves normally consist of three leaflets with the stalk of the central leaflet being longer than those of the other two; however, occasionally leaves are composed of five, seven, or nine leaflets. Leaves of true oaks, which are superficially similar, grow singly, not in groups. Poison oak leaves are alternate on the stem. Each leaflet is 1 to 4 inches long and smooth with toothed or somewhat lobed edges. The diversity in leaf size and shape accounts for the Latin term *diversilobum* in the species name. The surface of the leaves can be glossy or dull, sometimes even somewhat hairy, especially on the lower surface. In spring, poison oak produces small, white-green flowers (Fig. 2) at the point where leaves attach to the stem. Whitish-green, round fruit

(Fig. 3) form in late summer. In early spring the young leaves are green or sometimes light red. In late spring and summer the foliage is glossy green, and later turns attractive shades of orange and red.

IMPACT

Although a native, poison oak can be found in great abundance where established vegetation is disturbed, particularly along roadsides, in uncultivated fields, and on abandoned land. It is also a problem in wood lots, Christmas tree plantations, rangeland, and recreation areas. While it can reduce optimal grazing area in rangeland or pastures, the primary concern associated with poison oak is the allergic reaction it causes in many people.

All members of the genus *Toxicodendron*, including poison oak, poison ivy, and poison sumac, cause allergic contact dermatitis. About two million cases of skin poisoning are reported in the United States each year, primarily caused by these three species. In California, the number of working hours lost as a result of dermatitis caused by poison oak makes it the most hazardous plant in the state.

Contact with poison oak leaves or stems at any time of the year can cause an allergic response. When the allergen contacts the skin surface in sensitive individuals, it is rapidly absorbed into the surrounding cells. Within 1 to 6 days, skin irritation and itching will be followed by water blisters, which can exude serum. Contrary to popular belief, the exuded serum does not contain the allergen and does not transmit the rash to other regions of the body or to other individuals. The dermatitis rarely lasts more than 10 days.

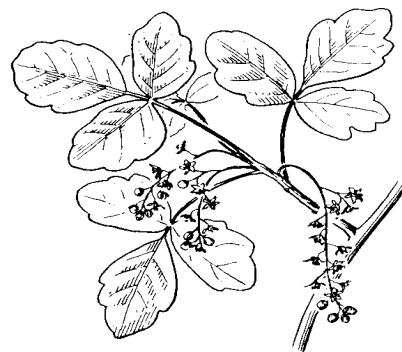


Figure 1. Poison oak in bloom.

Although 50% of the population is clinically sensitive to poison oak and poison ivy, about 75 to 85% can potentially develop an allergy if exposed to a sufficiently high concentration of the toxin. Once a reaction to the toxin has occurred, the body responds with a cell-mediated immunity, which is a delayed hypersensitivity. Those individuals who have developed delayed hypersensitivity are sensitive to the toxin and repeated exposures further increase sensitivity. Conversely, long periods with no exposure will reduce an individual's susceptibility to the allergen. There is no known difference in sensitivity to poison oak among races or between sexes. Animals do not usually suffer skin irritation from contact with poison oak because they are protected by fur; dogs, however, can contact poison oak on their nose or underbelly. On the other hand, livestock may graze on the tender foliage with no adverse effects.

In addition to direct contact with the plant, transmission of the allergen can occur from a number of other sources

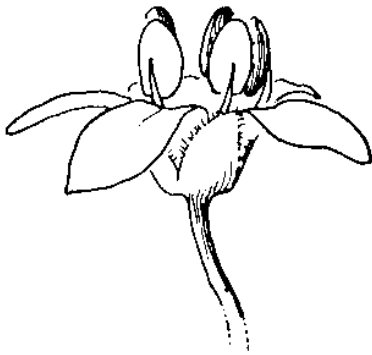


Figure 2. Poison oak flower.

including smoke particles, contact with objects such as clothing, gloves, and tools, or contact with animals, particularly pets. When poison oak is burned, the oils can be transported on the smoke particles. Breathing this smoke can cause severe respiratory irritation.

After coming in contact with the allergen, the best way to prevent skin irritation is to pour a mild solvent, such as isopropyl alcohol (rubbing alcohol), over the exposed area and then follow this with plenty of cold water (warm water enhances penetration of the oil) within a few minutes of exposure. If isopropyl alcohol is not available, just wash with *lots* of cold water. But you need to wash within 5 minutes of exposure to prevent a rash. Even if it is too late to prevent the rash, washing the skin to remove excess plant oil will keep the rash from spreading. The poison oak toxin is an oil, so it does not dissolve in water. Sufficient quantities of water, however, will dilute the oil to the point where it is no longer harmful.

Using only a small amount of water or disposable hand wipes is more likely to spread the toxin than remove it. Soaps can be used to wash, but only if used with copious amounts of water; otherwise, they too will spread the toxin.

An important point to remember when washing with isopropyl alcohol or

soaps following exposure to poison oak is that they will remove the skin's protective oils. These oils help the skin repel the plant toxin and will not regenerate for 3 to 6 hours following washing with these solvents. Therefore, wash with them only if you are done working outside for the day. If there is a possibility of reexposure to poison oak within 6 hours, just wash with lots of water. Be sure to thoroughly wash the hands as they serve as the major route for transfer of the allergen to other parts of the body, especially the face.

If a rash develops after exposure to poison oak, the use of a product called Tecnu, which is sold at most drug stores, will relieve the itch and reduce the rash. When applied once a day, it stops the itching for most of the day and clears up the rash in about 7 days.

BIOLOGY

Initial establishment of poison oak is generally by seed that is transported by birds. The single-seeded fruit are eaten by a variety of birds. The passage of the hard-seeded fruit through the bird's digestive tract facilitates germination by reducing the period of dormancy. Birds serve to disperse the seeds to new locations. Once established, the plant spreads by slow vegetative growth of underground horizontal rootstalks (actually stem tissue). A single root system can cover a very large area.

Poison oak can survive under a wide range of temperatures, elevations, soil types, moisture conditions, and light intensities. However, it is most commonly found on hillsides with shallow soils. The flowers of poison oak are usually pollinated by insects.

MANAGEMENT

The primary ways of managing poison oak are mechanical removal by hand-pulling (not recommended for individuals who are sensitive to poison oak) and treatment with herbicides. Maintaining a healthy cover of desirable vegetation will reduce the potential for invasion by poison oak. This is

easiest where irrigation is available and the soil is regularly cultivated.

Poison oak is a native species with its natural control agents already present. Consequently, biocontrol is not an option for the control of poison oak. Burning is not recommended for the control of poison oak. It not only creates a serious health hazard, but does not effectively reduce infestations. Grazing by sheep and goats can be effective in small areas. Deer or horses will also graze poison oak when the foliage is young, before the plant flowers.

Mechanical

Hand-pulling or mechanical grubbing (using a shovel, pick, etc.) can be used to physically remove plants located in a yard or near houses. Remove plants in early spring or late fall when the soil is moist and the rootstalks are easily dislodged. Grubbing when the soil is dry and hard will usually break off the stems, leaving the rootstalks to vigorously resprout. Detached and dried brush can still cause dermatitis, so bury or stack the plant material in an out-of-the-way location, or take it to a disposal site. Never burn poison oak.

Ideally, persons engaged in hand-pulling poison oak should have a high degree of immunity to the allergen. Whether the individual is sensitive or believed to be immune, he or she should wear appropriate protective clothing, including washable cotton

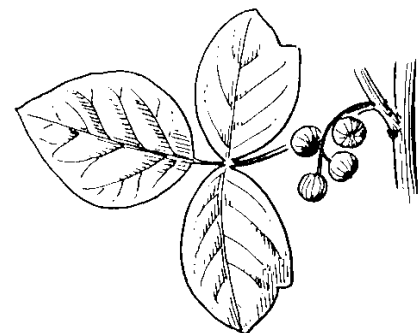


Figure 3. Poison oak fruit.

gloves over plastic gloves, when handling the plants. Wash all clothing thoroughly, including shoes, after exposure.

Other forms of mechanical control have not proven to be successful. Brushrakes and bulldozers often leave pieces of rootstalks that can readily resprout. In some cases, brush removal late in summer, when plants are experiencing moisture stress, can slow their ability to recover. Mowing has little effect in poison oak control, unless it is performed repeatedly (at least four times during the growing season). Within 2 months of germination, young plants have usually produced underground rootstalks large enough to recover from mowing damage. A single plowing is of no value and often serves to propagate the shrub. However, good seedbed preparation and planting cultivated crops for a year or more will control poison oak infestations.

Chemical Control

Herbicides used to control poison oak in California include glyphosate (Roundup, etc.) and the auxinic herbicides triclopyr (Garlon, Ortho Brush-B-Gon, etc.), 2,4-D (Spurge & Oxalis Killer, etc.), and dicamba (Banvel, Spurge & Oxalis Killer, etc.). These herbicides can be applied as stump or basal applications, or as a foliar spray.

Glyphosate is one of the most effective herbicides for the control of poison oak. However, effective control depends upon proper timing of the application. Apply glyphosate late in the growth cycle, after fruit have formed but before leaves lose their green color. In hand-held equipment, glyphosate can be applied as a 2% solution in water. (Products or spray mixtures containing less than 2% glyphosate may not effectively control poison oak.) It is important to note that glyphosate is a nonselective compound and will damage or kill other vegetation it contacts.

Auxinic herbicides, such as triclopyr, 2,4-D, dicamba, and combinations of

these herbicides, are also used to control poison oak. The application timing with auxinic herbicides is somewhat different than for glyphosate: applications can be made earlier than with glyphosate, when plants are growing rapidly from spring to midsummer.

Triclopyr is the most effective auxinic herbicide for control of poison oak. It has a wider treatment window than glyphosate and it often gives more consistent control. Two formulations of triclopyr are available. Triclopyr amine is the least effective of the formulations and requires relatively high rates. Triclopyr ester or triclopyr ester plus 2,4-D ester gives better herbicide absorption into the foliage and is more effective.

When 2,4-D is combined with dicamba, it provides much better control than if it is used alone in a 1% solution. Premixed combinations of these herbicides are available. Dicamba applied at 0.5% gives better long-term control of poison oak than 2,4-D.

A new herbicide in California, imazapyr, is also very effective for the control of poison oak, but is only available for application by licensed pesticide applicators. In forestry, there are two formulations. The water soluble formulation (Arsenal) is effective as a foliar treatment at 1% plus a 0.25% surfactant. A similar treatment with an emulsifiable concentrate formulation (Chopper, Stalker) will control poison oak at a 2% solution in water or a 1% solution plus 5% of a methylated or ethylated seed oil. The best timing is in either spring after full leaf expansion or in late summer (mid-August through September).

Stump Application. Stump treatments are most effective during periods of active growth. Cut stems of poison oak 1 to 2 inches above the soil surface and immediately after cutting, treat the stump. A delay in treatment will result in poor control. Apply an herbicide such as glyphosate, triclopyr, or combinations of triclopyr with 2,4-D (or 2,4-

D and 2,4-DP) with a 1- to 2-inch-wide paint brush or with a plastic squeeze bottle that has a spout cap. Treatment solutions should contain either undiluted glyphosate (use a product that contains at least 20% glyphosate), triclopyr amine, or a 20 to 30% triclopyr ester solution mixed with 70 to 80% oil (methylated or ethylated seed oils).

Be sure to completely cover all surfaces of the stumps with the herbicide until it runs down the base of the stubs. Spray any regrowth from cut stumps with a foliar spray when the leaves fully expand.

Basal Application. Basal bark applications can be made almost any time of the year, even after leaves have discolored or dropped. Apply triclopyr to basal regions of poison oak by backpack sprayers using a solid cone, flat fan, or a straight-stream spray nozzle. Thoroughly cover a 6- to 12-inch basal section of the stem, but not to the point of runoff.

Foliar Sprays. The effectiveness of herbicides applied to poison oak foliage depends on three factors: (1) proper growth stage at time of application; (2) spray-to-wet coverage; and (3) proper concentration. To achieve spray-to-wet coverage, all leaves and stems should be glistening following herbicide application. However, coverage should not be to the point of runoff.

Foliar application of herbicides to poison oak is most effective after leaves are fully developed and when the plant is actively growing. This period is normally from April into June or July, when soil moisture is still adequate. The flowering stage is the optimum time to spray. Do not apply herbicides before plants begin growth in spring or after the leaves have begun to turn yellow or red in late summer or fall.

One application of a herbicide usually does not completely control poison oak. Re-treat when new, sprouting

leaves are fully expanded, generally when the plants are about 2 feet tall. Watch treated areas closely for at least a year and re-treat as necessary.

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Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

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