*Salvia aethiopis* L.

# Mediterranean sage

**Family:** Lamiaceae
**Range:** Northeastern California, Arizona, Idaho, Utah, Colorado, Oregon, and Washington
**Habitat:** Degraded big sagebrush communities, rangeland, disturbed sites, pastures, roadsides, and occasionally dryland crops. Often associated with sites dominated by annual grasses such as medusahead.
**Origin:** Native to Europe.
**Impacts:** Mediterranean sage has spread over 1.3 million acres in the western United States with new infestations occurring each year. It is unpalatable to livestock, but is not considered toxic. It can spread rapidly in degraded big sagebrush communities. Wind-blown plants can lodge in large masses along fencerows.
**Western states listed as Noxious Weed**: California, Colorado, Nevada, Oregon, Washington
**California Invasive Plant Council (Cal-IPC) Inventory**: Limited Invasiveness

Mediterranean sage is a biennial, sometimes a short-lived perennial. Mature plants grow to 2.5 ft tall with erect, square stems and opposite leaves. The stems and leaves are densely covered with fine, white woolly hairs. The leaves are ovate to triangular, wrinkled, irregularly lobed to deeply incised, blue-green, and 2 inches to 1 ft long. Leaves are pleasantly aromatic when crushed. The taproot is tough, sometimes woody, with fibrous lateral roots.

Flowering stems are highly branched near the top forming broad panicles with whorls of 5 to 10 yellow to white flowers. Each is encircled by silvery-haired bracts with pointed tips. Plants reproduce only by seed and large plants may produce 50,000 to 100,000 seeds. Seed dispersal occurs when mature plants break near the soil surface and tumble in the wind, spreading seed for long distances. When seeds become moist, a mucilaginous cover imbibes water to protect them from desiccation. Little is known about seed longevity in the soil, but it is expected that the seeds survive for several years.

### NON-CHEMICAL CONTROL

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| **Mechanical** (pulling, cutting, disking) | With small infestations, hand-pulling or digging is feasible and effective. When digging, sever the root below the soil surface.<br>Plants regrow after mowing. Repeated mowing in the bolting to early flowering stage can reduce seed production.<br>Tillage is effective at controlling existing plants, but it is impractical on most sites due to rocky, uneven terrain. |
| **Cultural** | Most livestock avoid grazing Mediterranean sage. Overgrazing promotes spread.<br>Fire is not an effective control.<br>Promoting competitive vegetation can slow spread and help prevent establishment. |
| **Biological** | The root-feeding biocontrol weevil, *Phrydiuchus tau*, is a promising long-term management strategy for Mediterranean sage. Successful establishment of *P. tau* has been documented in Oregon, Idaho, and northern California. Larval feeding damages flower shoot buds and root crowns. Adults can cause minor defoliation of rosette leaves. No non-target effects have been reported. |

## CHEMICAL CONTROL

The following specific use information is based on published papers and reports by researchers and land managers. Other trade names may be available, and other compounds also are labeled for this weed. Directions for use may vary between brands; see label before use. Herbicides are listed by mode of action and then alphabetically. The order of herbicide listing is not reflective of the order of efficacy or preference.

| **GROWTH REGULATORS** | |
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| 2,4-D<br>Several names | **Rate:** 1 to 2 qt product/acre (0.95 to 1.9 lb a.e./acre)<br>**Timing:** Postemergence from rosette to beginning of bolting stage. Most effective on small rosettes.<br>**Remarks:** 2,4-D is often tank-mixed with chlorsulfuron or dicamba. It does not control large bolting plants. 2,4-D is broadleaf-selective and safe on most grasses, but has minimal soil activity. Do not apply ester formulation when outside temperatures exceed 80°F. Add a surfactant. |
| Aminocyclopyrachlor + chlorsulfuron<br>*Perspective* | **Rate:** 4.75 to 8 oz product (*Perspective*)/acre<br>**Timing:** Postemergence or preemergence. Postemergence applications are most effective when applied to plants from the seedling to the mid-rosette stage.<br>**Remarks:** *Perspective* provides broad-spectrum control of many broadleaf species. Although generally safe for grasses, it may suppress or injure certain annual and perennial grass species. Do not treat in the root zone of desirable trees and shrubs. Do not apply more than 11 oz product/acre per year. At this high rate, cool-season grasses will be damaged, including bluebunch wheatgrass. Not yet labeled for grazing lands. Add an adjuvant to the spray solution. This product is not approved for use in California and some counties of Colorado (San Luis Valley). |
| Aminopyralid<br>*Milestone* | **Rate:** 5 to 7 oz product/acre (1.25 to 1.75 oz a.e./acre)<br>**Timing:** Postemergence from the rosette to young bolting stage.<br>**Remarks:** Aminopyralid has a longer soil residual activity than clopyralid. It is safe on most grasses, although preemergence application at high rates can greatly suppress some annual grasses, such as medusahead. Applications can decrease seed production in some annual and perennial grass species.<br>Other premix formulations of aminopyralid can also be used. These include *Opensight* (aminopyralid + metsulfuron; 1.5 to 2.5 oz product/acre) and *Forefront HL* (aminopyralid + 2,4-D; 1.5 to 2 pt product/acre); apply at the rosette to bolting stage. |
| Clopyralid<br>*Transline* | **Rate:** 0.67 to 1.33 pt product/acre (4 to 8 oz a.e./acre). Use higher rate for older plants or dense stands.<br>**Timing:** Postemergence from the rosette to young bolting stage. Most effective for young plants.<br>**Remarks:** Clopyralid is very safe on grasses, but will injure many members of the Asteraceae, particularly thistles, and legumes, including clovers. Most other broadleaf species and all grasses are not injured. |
| Clopyralid + 2,4-D<br>*Curtail* | **Rate:** 2 to 4 qt *Curtail*/acre<br>**Timing:** Same as for clopyralid.<br>**Remarks:** Add a non-ionic surfactant. |
| Dicamba<br>*Banvel*, *Clarity* | **Rate:** 0.5 to 2 pt product/acre (0.25 to 1 lb a.e./acre). Use higher rates for large rosettes and bolting plants.<br>**Timing:** Postemergence from rosette to beginning of bolting stage.<br>**Remarks:** Dicamba is a broadleaf-selective herbicide often combined with other active ingredients. Add a surfactant. |
| Picloram<br>*Tordon 22K* | **Rate:** 1 to 2 pt product/acre (4 to 8 oz a.e./acre).<br>**Timing:** Preemergence and postemergence. With postemergence application, treat at rosette to early bolting stage, when plants are growing rapidly.<br>**Remarks:** Picloram controls a wide range of broadleaf species and has relatively long soil residual activity. Although well-developed grasses are not usually injured by labeled use rates, some applicators have noted that young grass seedlings with fewer than four leaves may be killed. Do not apply near trees. *Tordon 22K* is a federally restricted use pesticide. Picloram is not registered for use |

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| | in California. |
| **AROMATIC AMINO ACID INHIBITORS** | |
| Glyphosate<br>*Roundup*, *Accord XRT II*, and others | **Rate:** 1 to 2 qt product (*Roundup ProMax*)/acre (1.1 to 2.25 lb a.e./acre). Spot treatment, 1.5% v/v solution.<br>**Timing:** Postemergence, to rapidly growing plants from the rosette to early bolting stage.<br>**Remarks:** Glyphosate will not kill seeds or inhibit germination the following season. Glyphosate has no soil activity. In addition, it is nonselective and may result in bare ground conditions that are susceptible to weed recruitment. In areas with desirable vegetation, use spot treatment. Glyphosate is a good control option if reseeding is planned shortly after application, as it will not injure seedlings emerging after application. Add a surfactant when using a formulation where it is not already included (e.g., *Rodeo*, *Aquamaster*). |
| **BRANCHED-CHAIN AMINO ACID INHIBITORS** | |
| Chlorsulfuron<br>*Telar* | **Rate:** 1 to 2.6 oz product/acre (0.75 to 1.95 oz a.i./acre)<br>**Timing:** Postemergence from the rosette to bolting stage.<br>**Remarks:** Always use a surfactant. Included with aminocyclopyrachlor in *Perspective*. |
| Metsulfuron<br>*Escort* | **Rate:** 1 oz product/acre (0.6 oz a.i./acre)<br>**Timing:** Postemergence from the rosette to bolting stage.<br>**Remarks:** Metsulfuron has similar activity to chlorsulfuron. Metsulfuron has some soil residual activity. Always use a surfactant. Metsulfuron can be tank-mixed with 2,4-D at 1 to 2 pt product/acre. Other premix formulations of metsulfuron can be used at similar application timing. These include *Cimarron Max* (metsulfuron + dicamba + 2,4-D) and *Cimarron X-tra* (metsulfuron + chlorsulfuron). Metsulfuron is not registered for use in California. |

**RECOMMENDED CITATION:** DiTomaso, J.M., G.B. Kyser et al. 2013. *Weed Control in Natural Areas in the Western United States*. Weed Research and Information Center, University of California. 544 pp.