



COOPERATIVE EXTENSION

Bringing the University to You

Fact Sheet-04-27

Managing Mediterranean Sage

Jessica Graham, Undergraduate Research Assistant, University of Nevada, Reno
Wayne S Johnson; Associate Professor, Applied Economics and Statistics, College of Agriculture
Biotechnology and Natural Resources; IPM Specialist, University of Nevada Cooperative Extension

Mediterranean sage (*Salvia aethiopsis* L.) is a biennial that is rapidly spreading in many parts of the west, particularly high and low deserts. Dense infestations of this plant decrease forage production on rangeland and pasture. Because it breaks off and rolls away with wind in a tumbleweed-like manner, the plant scatters seed widely, which makes it difficult to control.

Identification

This member of the mint (Lamiaceae) family is an aromatic biennial that grows two to three feet tall. It appears as a large grayish to blue-green rosette with woolly leaves during the first season of growth (Fig. 1), and then it matures into a multi-branched plant during the second season (Fig. 2).

The opposite, gray to blue-green leaves are woolly with white hairs that make them felt-like. The lower leaves are large, have petioles, and are lobed with coarsely-toothed



Figure 1. Rosettes have woolly, blue-green leaves.



Figure 2. Mature plants grow 2 to 3 feet tall.

blades. The second year, the leaves are smaller and the upper leaves clasp the stem. In time the leaves may shed some of the felt-like covering of hairs on the upper surface and expose a green, wrinkled leaf.

Yellowish white flowers are borne in clusters of four to six on the branched stems in late spring. Each is encircled by silvery-haired bracts with pointed tips (Fig. 3). Each flower develops four smooth nutlets with dark



Figure 3. White to yellowish white flowers are borne in clusters on the ends of the branched stems.

brown veins that form an irregular pattern. A single plant may produce tens of thousands of seeds that are spread with ease when the mature plant breaks off at the ground and tumbles across the landscape in the wind. Meadow sage (*S. pratensis* L.) is similar to Mediterranean sage, but usually has blue flowers and is more coarsely hairy.

Habitat

Mediterranean sage is native to Mediterranean North Africa. In the western United States it invades pastures, meadows, rangeland, and other open areas. It grows on moderate or deeper soils with good drainage. Its white hairiness, wrinkled leaf surface, thick cuticle, mucilaginous (gummy or sticky) seeds, and summer dormancy to avoid drought make this plant well adapted to warm, dry environments and desert regions.

Mediterranean sage is seldom the dominant plant in an area. Sites disturbed by livestock grazing, trampling, vehicles, and logging allow Mediterranean sage to invade more rapidly. Once established, this plant is able to spread into non-disturbed land, but fortunately to date, it is unusual to find this weed widely distributed.

Impact

Large Mediterranean sage plants may produce between 50,000 to 100,000 seeds that scatter as they tumble in the wind. Seeds are also spread longer distances through

human activities and by animals. Though it is not toxic, this plant is unpalatable and is generally avoided by most livestock. Consequently, its presence on grazing lands diminishes the value of the land.

In Serbia, Mediterranean Sage is regarded as a medicinal herb, and the leaves are applied as a wound dressing. Volatile oils, mostly terpenes, are given off by the epidermal hairs and roots of this plant. It has been suggested that these and other chemicals produced by several species of *Salvia* prevent other plants from growing nearby, but it has not been confirmed as a cause for the competitive nature or the expansion of Mediterranean sage.

Weed Management Options

Prevention: Preventing seed dispersal and eradicating small, scattered infestations is the most important control method. In addition to spreading tumbleweed fashion, this aggressive plant may move with contaminated soil, hay, agricultural equipment, livestock, wildlife, and vehicles.

Monitor both private and public lands annually for invasions. Eliminate plants where they are found and then revisit the site each year to make sure there are no escapes. Before leaving an infested area, check for seeds on clothing, shoes, animals, equipment, and vehicles.

Mechanical Control: Digging and removing plants of small or scattered infestations of Mediterranean sage is effective if they have not produced seed. Cutting the taproot two to three inches below the crown when the plants are beginning to bolt prevents most resprouting.

Frequent mowing during the growing season can prevent or reduce seed production. This must be repeated several times because plants may regrow and continue flowering after they have been mown. Rosettes do not produce seed and are too low to the ground to be affected by mowing. Mowing the plants too late in the season after they have produced seed will be ineffective and may even distribute the seed.

Cultural Control: Tillage is effective in accessible pastures and abandoned fields, but is rarely an option in rough terrain.

Mediterranean sage is generally unpalatable and livestock will usually avoid it. Grazing that favors growth of desired grasses and maintenance of existing desirable vegetation will help control the spread of this weed. Do not overgraze infested lands. Overgrazing contributes to the spread of this and other invasive weeds. In order to obtain long-term control of Mediterranean sage, preferred vegetation should be established following eradication.

Biological Control: The aromatic chemicals of this plant combined with dense, fine hairs on the leaves are thought to discourage attack by most plant-feeding insects. Mediterranean sage does not harbor any known crop insect or disease pests.

The root-feeding weevil *Phrydiuchus tau* was introduced for Mediterranean sage control in 1969. This weevil is now widespread in Oregon and Idaho and providing good control of Mediterranean sage. There has also been success in other areas, particularly where perennial grasses are well managed. The weevil does best at warm, dry sites such as south-facing slopes.

The larvae damage plants by feeding inside the crown, thus destroying buds and roots. This damage may reduce or prevent flowering. The adults feed externally on foliage and flowering shoots. Some states have successfully reduced the density of Mediterranean sage by combining the weevil with competitive vegetation. Long-term reduction of this weed will not be obtained using the weevil without introducing competitive grasses and maintaining a dense stand with well managed grazing.

Chemical Control: There are several herbicides available that control this plant. These herbicides are more effective applied with a surfactant when the plant is in the rosette stage. Aerial applications can be used for steep, rugged, or inaccessible rangeland infestations. Selective herbicides are particularly useful in control programs

along roadsides and other rights-of-way, and for reseeding programs. Applying picloram before the plant bolts at a rate between 0.375 and 0.5 lb active ingredient per acre will destroy existing plants and seedlings from seeds that germinate later. Clopyralid at a rate of 0.5 lb active ingredient per acre and 2,4-D at a rate between 1.5 and 2 lb acid equivalent per acre will also eradicate existing plants, but are not effective as preemergent herbicides.

References

1. Sheley, R.L., and J.K. Petroff, eds., *Biology and Management of Noxious Rangeland Weeds*. Corvallis, OR: Oregon State University Press, 1999. pp. 261-270.
2. Whitson, T.D., ed., L.C. Burrill, S.A. Dewey, D.W. Cudney, B.E. Nelson, R.D. Lee, and R. Parker. *Weeds of the West*. Jackson, Wyoming: Pioneer of Jackson Hole, 1992. pp. 368-369.
3. *Wanted Dead: Mediterranean Sage*. Oregon Noxious Weed Web. 26 June 2003 <oregonweeds.org/weeds/weed_message.html>.
4. Moser, L. and D. Crisp. *Mediterranean Sage*. San Francisco Peaks Weed Management Area fact sheet. Coconino National Forest. 1 April 2004 <http://www.usgs.nau.edu/swepic/factsheets/saa_esf_info.pdf>.

Photographs are courtesy of *Weeds of the West*.

Information herein is offered with no discrimination. Listing a product does not imply endorsement by the authors, University of Nevada Cooperative Extension (UNCE) or its personnel. Likewise criticism of products or equipment not listed is neither implied nor intended. UNCE and its authorized agents do not assume liability for suggested use(s) of chemical or other pest control measures suggested herein. Pesticides must be applied according to the label directions to be lawfully and effectively applied.

Cooperative Extension Office Locations

Battle Mountain

815 N. 2nd St., 89820
(775) 635-5565, FAX (775) 635-8309

Caliente

360 Lincoln St., P.O. Box 728, 89008-0728
(775) 726-3109, FAX (775) 726-3332

Carson City/Storey County

2621 Northgate Ln., Ste. 15, 89706
(775) 887-2252, FAX (775) 887-2065

Elko

701 Walnut Street, 89801
(775) 738-7291, FAX (775) 753-7843

Ely

995 Campton St., 89301
(775) 289-4459, FAX (775) 289-1462

Eureka

701 S. Main St., P.O. Box 613, 89316
(775) 237-5326, FAX (775) 237-5164

Fallon

111 Sheckler Rd., 89406
(775) 423-5121, FAX (775) 423-7594

Hawthorne

(775) 945-3444

Incline Village

865 Tahoe Blvd., Ste. 110
P.O. Box 8208, 89452
(775) 832-4150, FAX (775) 832-4139

Las Vegas

2345 Red Rock St., Ste. 100, 89146
(702) 222-3130, FAX (702) 222-3100

Logandale

1897 N. Moapa Valley Blvd.,
P.O. Box 126, 89021
(702) 397-2604, FAX (702) 397-8301

Lovelock

810 6th St., P.O. Box 239, 89419
(775) 273-2923, FAX (775) 273-7647

Administration:

Karen Hinton
Dean & Director
hinton@scs.unr.edu

Central/Northeast Area

Jerry Buk, Area Director
40 E. Center Street #14, Fallon 89406
(775) 426-2844
FAX (775) 423-1901

Minden/Gardnerville

1329 Waterloo Lane, P.O. Box 338, 89423
(775) 782-9960, FAX (775) 782-9968

Pahrump

1651 E. Calvada Blvd., 89041-1090
(775) 727-5532, FAX (775) 727-6199

Reno

5305 Mill St., P.O. Box 11130, 89520
(775) 784-4848, FAX (775) 784-4881

Campus Office

National Judicial College, Suite 118
UNR/404, Reno 89557
(775) 784-7070
FAX (775) 784-7079

Southern Area

Dixie Allsbrook, Area Director
2345 Red Rock St., Ste. 100, Las Vegas 89146
(702) 222-3130
FAX (702) 222-3101

Tonopah

1 Frankee St., P.O. Box 231, 89049
(775) 482-6794, FAX (775) 482-5396

Winnemucca

1085 Fairgrounds Rd., 89445
(775) 623-6304, FAX (775) 623-6307

Yerington

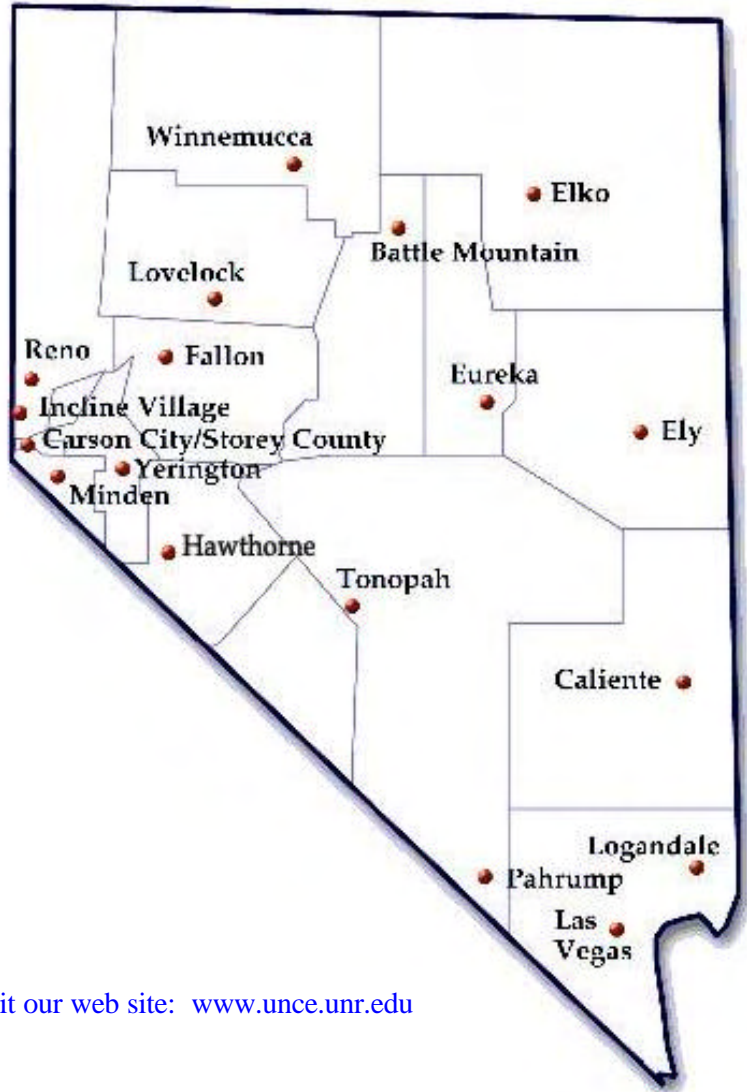
504 S. Main St., P.O. Box 811, 89447
(775) 463-6541, FAX (775) 463-6545

Las Vegas Office

2345 Red Rock St., Ste. 330
Las Vegas 89146
(702) 251-7531
FAX (702) 251-7536

Western Area

Mary Spoon, Acting Area Director
5305 Mill St., P.O. Box 11130, Reno 89520
(775) 784-4848
FAX (775) 784-4881



Visit our web site: www.unce.unr.edu