

**WRITTEN FINDINGS OF THE
WASHINGTON STATE NOXIOUS WEED CONTROL BOARD
(Updated December 1999)**

Scientific Name: *Salvia aethiopsis* L.

Common Name: Mediterranean sage

Family: Lamiaceae

Legal Status: Class A

Description and Variation: Mediterranean sage (*Salvia aethiopsis*) is an erect, coarse biennial, or short-lived perennial, with a stout taproot. The squarish stem, opposite leaves and bilabiate flowers are typical of the mint family. When crushed, a sage-like odor is emitted. The mature plant can reach 3 feet tall. The overall plant is covered with dense, woolly hairs, especially when young. Leaves of mature plants lose this felt-like covering of hairs, and the leaves become wrinkled, showing the prominent venation. During the first year of growth, Mediterranean sage is a basal rosette of grayish green leaves. The second year rosette is leafier, and the leaves are somewhat fleshy, with an almost felt-like appearance due to the hairs. The overall rosette is about 1 foot in diameter, although it can reach 4 feet wide. Most leaves are basal, with irregular or indented margins, ranging from 4 to 12 inches long, and petiolate, with 1½ to 3½ inch long stalks. The upper leaves are opposite, they are smaller and they clasp the stem. The uppermost leaves are reduced to bracts with long tapering points, and they are often tinged purple. Flowering stems bolt as a single, squarish stalk, developing into a much-branched inflorescence, with many small white flowers. The whole inflorescence resembles a candelabra. Woolly clusters of four to six flowers are found in whorls at branch tips. The individual flowers are white to yellowish, about ½ inch long. The 2 upper petals form a lip resembling a hooked beak, and the 3 lower petals form 3 lobes, with outer lobes larger than the central. Each flower produces four smooth, egg-shaped seeds. The brown seeds are about 1/8 inch long, with dark veins.

The rosettes of common mullein (*Verbascum thapsus*), may be confused with Mediterranean sage rosettes. Mullein leaves are not stalked, the margins are entire, the overall leaf color has a yellow tint to it, and when the mullein leaves are crushed, they do not smell like sage.

Economic Importance:

Detrimental: Mediterranean sage is primarily a rangeland weed, although it does occur in alfalfa and grain crops. It is not palatable, and this lack of grazing by livestock helps with the spread and establishment in pastures and rangelands. The biology of this plant is well adapted to facilitate the spread in many western states – high seed production, the ability for summer dormancy to avoid drought, the tumbling dispersal of seeds, and the ability to adapt to a wide range of habitat and environmental conditions in rangeland. The rate of spread of Mediterranean sage in Oregon went from 42,000 acres to over 100,000 acres in 6 years.

Beneficial: Mediterranean sage was introduced to English gardens from Austria in 1570 (Lowden as cited by Bellue 1950); introduced as a garden ornamental to the United States. Herbal or medicinal uses include use as a wound dressing.

Habitat: In its native range, Mediterranean sage is associated in areas of dry soils and disturbed habitat, such as roadside banks and abandoned fields. It does not grow in crops, it is not associated with weedy vegetation and it does not reach dominance in a site (Bogavac 1972 as cited in Roche' and Wilson 1998). Outside of its native range, this species prefers soils 14-16 inches deep, with good drainage. It is often found on south-facing slopes in loose, gravelly soil, with 12-24 inches of annual precipitation. It is found in drained riparian areas and dry pastures. Mediterranean sage will initially inhabit disturbed areas, but it can spread to non-disturbed land, particularly sagebrush/cheatgrass communities and it can reach dominance. In Washington, this species is found in Ponderosa pine communities, and Douglas hawthorn floodplains. Associated species include: snowberry (*Symphoricarpos albus*), ninebark (*Physocarpus malvaceus*) and bluebunch wheatgrass (Roche' and Wilson 1998).

Geographic Distribution: Mediterranean sage is native to southern and southeastern Europe, with its northern range extending to (the former) Czechoslovakia and south central Russia, and east through Turkey into Iran (Davis 1975 and Tutin et al. 1972 as cited by Roche' and Wilson 1998). Mediterranean sage was introduced to the United States both as a garden ornamental (Bailey 1935) and as a contaminant in alfalfa seed (Dennis 1980). In the western United States, Mediterranean sage is known from Arizona, California, Colorado, Nevada, Oregon, Idaho, Texas and Washington.

History: Mediterranean sage is a Class A noxious weed in Washington, and it is currently known from Klickitat County, with an estimate of less than 10 acres (1999 Distribution map). This species was first identified in 1951 from Columbia County, with about 400 acres found along the Touchet River. Mediterranean sage is on the noxious weed lists for the following states: CA, CO, NV, OR, and WA.

Mediterranean sage was identified in 1892 in CA. It was known as a roadside plant for 60 years, when new highway construction contributed to wide spread distribution. In 1994, California reported 7,000 acres. In Oregon, Mediterranean sage was known since the 1920's, and it was considered established in that state by 1949, with an estimated 42,240 acres. By 1954, Oregon reported over 100,000 acres, and by 1995 Oregon estimates over 1,300,000 acres of Mediterranean sage. Idaho records indicate this species was identified in 1967, with 4,000 acres reported by 1994. Colorado reports Mediterranean sage remained a stable colony for about 40 years before it began to spread rapidly. (Roche' and Wilson 1998).

Growth and Development: Mediterranean sage seeds require moisture to germinate, so germination can occur in the spring or the fall. A taproot quickly develops during the seedling stage. During the first year of growth, Mediterranean sage is a basal rosette of light green to grayish green leaves. The basal leaves wither the first winter, and this mulch protects the crown. New leaves are produced the following spring. Plants that are mature enough for reproduction will bolt in May, and reach 3 feet tall. Flowers are produced from May to August, and seeds mature by the end of the summer. Most plants will die by late autumn.

Some plants remain as vegetative rosettes for 2 years, or longer, and it is thought that the size of the plant, not the age, determines reproductive maturity (Werner 1975, Klinkhamer and DeJong 1987, Thompson and Stout 1991 as cited in Roche' and Wilson 1998). The rosettes also have the ability to go through a summer and winter dormancy.

Reproduction: Mediterranean sage reproduces by seed. Each plant can produce 50 to 100,000 seeds (White 1955 as cited in Roche' and Wilson 1998). Each flower produces four smooth, egg-shaped

seeds. Seeds mature by late August, but they are not usually dispersed until September or October, when consistent moisture is available for germination. Mediterranean sage acts like a tumbleweed to disperse the seeds. The flowering stem has an abscission line 4-6 inches above the ground. The stem becomes brittle and light, and breaks off at this line. These stalks roll with the wind, often ending up in fence lines, or creek bottoms. When seeds get wet and imbibe water, they produce a mucilaginous cover within 5 minutes to protect them from desiccation

Mediterranean sage is spread longer distances by livestock, wildlife (including birds), roadside vehicles, contaminated gravel and as a contaminant in agricultural crops (hay) (Roche' and Wilson 1998).

Response to Herbicide: Herbicides are an effective control method. A surfactant is necessary for plants in the rosette stage. When applied to Mediterranean sage before it bolts, Picloram at a rate between 0.375 and 0.5 lb. active ingredient per acre (ai/acre) (0.42 to 0.56 kg ai/ha) kills existing plants and seedlings from late germinating seeds. Spring application has a longer residual effect on new seedlings, and fall application releases desirable vegetation from competition during earliest spring growth. Clopyralid will kill existing plants without residual effects (Roche' and Wilson 1998). Please refer to the annually updated Pacific Northwest Weed Control Handbook for site specific control recommendations.

Response to Cultural Methods: Long term maintenance includes an integrated approach for the management of rangelands to prevent overgrazing, and to promote forage plant establishment. Mediterranean sage populations fluctuate, with high seedling mortality associated with low moisture levels, and high seedling survival associated with higher moisture levels (Sheley 1998).

Response to Mechanical Methods: Individual plants can be dug out. When the plant begins to bolt, you can cut, or dig up, the taproot 2-3 inches below the crown, to prevent resprouting. Tillage does work, in accessible areas. Mowing several times during the growing season will prevent seed production, but the rosettes are low enough to escape any damage. Mowing will spread the seeds if done too late in the year.

Biocontrol Potentials: 142 species are associated with Mediterranean sage in Yugoslavia (Bogavac and Mitic-Muzina 1972 as cited in Johansen 1988). The European crown boring weevil, *Phrydiuchus tau*, was introduced in 1969, and populations are established in ID, OR and CA. Seed production was slowed, and population density of Mediterranean sage is reduced, but the weevil populations are slow to establish, and they alone will not control the spread of Mediterranean sage. Ant predation on the weevil larvae is a problem in some OR sites (Johansen 1988; Roche' and Wilson 1998). *P. spilmani* was introduced in 1971, but it did not establish (Rees and Coombs 1996 as cited in Roche' and Wilson). The caterpillar stage of the moth (*Stagmatophora pomposella*) is effective only on the first year rosette, and there is no impact on mature plants (Mitic-Muzina and Bogavac 1971).

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**References available from the Washington State Noxious Weed Control Board Office in Kent, WA.*

Rationale for Listing:

Mediterranean sage has the capability to invade and establish in dry pastures and rangeland throughout much of the eastern portion of our state. It is non-palatable, and it will outcompete beneficial forage plants. Mediterranean sage is listed as a noxious weed in CA, CO, NV, OR and WA. The history of Mediterranean sage in nearby western states tells us that this plant has the capability of starting on disturbed sites, and moving and establishing in more stable rangeland plant communities. In 100 years, Mediterranean went from a relatively stable roadside population to an invasive plant covering more than 1.3 million acres.

Mediterranean sage is a Class A noxious weed in Washington. At this time the distribution is limited, and eradication is required. Continued control and active monitoring for the presence of this species will prevent any further spread, and eradication is possible.