Mentha pulegium L.

Pennyroyal

Family: Lamiaceae
Range: California, Oregon and Washington.
Habitat: Disturbed moist places, ditches, roadsides, pastures, seasonally flooded sites, seeps, vernal pools, marsh margins, stream and pond margins. Grows best in clay or silty soils where moisture is plentiful. Often grows in the partial shade of other vegetation. Tolerates some alkalinity and seasonal drought. In addition to pastures, roadsides, and various disturbed sites, pennyroyal is invading wetland habitats, including sensitive vernal pools and other wetland areas.
Origin: Native to Europe. Pennyroyal is cultivated as a garden ornamental and medicinal plant, but has escaped cultivation and appears to be rapidly spreading in some areas of the western states.
Impacts: Livestock generally avoid consuming pennyroyal, which can favor the expansion of pennyroyal in pastures and on rangeland, reducing the grazing capacity of these areas. Pennyroyal is sometimes used medicinally, but the foliage contains an essential oil that, when ingested as an extract, can be fatally toxic to humans. Handling the plants or the oil can cause contact dermatitis in sensitive individuals. The foliage has been used as an insect repellent.
California Invasive Plant Council (Cal-IPC) Inventory: Moderate Invasiveness

Pennyroyal is a low-growing, aromatic perennial to 2 ft tall. Rhizomes are short, and sometimes stolons are present. Plants have square stems, opposite leaves, and are covered with short, white hairs and glandular dots.

The flowers are lavender to violet, in clusters that are head-like in whorls around stems (verticillate). Each cluster sits just above a pair of small down-turned leaves or leaf-like bracts. The fruits consist of 4 nutlets enclosed by the calyx. Plants reproduce by seed and vegetatively from rhizomes and stolons. The nutlets and calyx disperse as a unit primarily by water or by clinging to the fur, feathers, and feet of animals. Seeds can germinate under water, and the seedlings continue to grow during an extended period of shallow inundation. Like other members of the mint family, it is expected that the seeds of pennyroyal are long-lived in the soil.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, disking)	Pennyroyal infestations can be suppressed by manual removal of individual plants and small patches before flowering, including the rhizomes and stolons, followed by the removal of seedlings as soon as discovered. Below-ground reproductive tissues should be severed approximately 3 inches below the soil surface when the plants are beginning to bolt. This can be difficult, however, because pennyroyal has brittle stems that make it hard to remove below-ground reproductive tissues. Late spring or early summer mowing, repeated over several years, may weaken plants by depleting photosynthetic reserves. However, it is often difficult to get mowing equipment into infested areas because these are generally in wetland sites. Cutting will generally result in crown resprouting. In addition, plants in the rosette stage and early stages of growth often have a prostrate growth habit that is not conducive to management by mowing. Tillage can be an effective control strategy for rosettes and bolting plants, but tillage is generally not an option in typical wetland infestations. Larger colonies on dry soils can be controlled by repeated cultivation. It is important to maintain a loose soil, because weeds are likely to survive in large clods and reestablish. Best results are obtained with offset discs or a rotary hoe. One-way discs and tined implements often lead to recovery of fragments that can increase the size of the colony.

Cultural	Prescribed burning has been noted as a possible control method. However, it is unlikely that fire will control below-ground rhizomes, and high soil moisture levels in most pennyroyal habitats may limit the effectiveness of burning. Control by livestock grazing is unlikely. Pennyroyal is unpalatable as forage for cows or sheep and sometimes causes gastrointestinal irritation when ingested.
Biological	There are no biological control agents available for the management of *Mentha pulegium*. This is likely due to the importance of mints as a crop in some areas of the west, as well as the number of native mints that potentially could be affected by bioagents.

CHEMICAL CONTROL

There is little information on the chemical control of *Mentha pulegium*.

The following specific use information is based on 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	
2,4-D Several names	**Rate:** 4 pt product/acre (1.9 lb a.e./acre) for amine formulation **Timing:** Postemergence when plants are mature; best when they have bolted but before seed production. **Remarks:** In Australia they recommend the ester formulation of 2,4-D, but this cannot be used when pennyroyal infests wetland areas. Only the amine formulation is registered for aquatic areas. Results from New Zealand show that 2,4-D provides only good control, not excellent control. 2,4-D is a broadleaf-selective herbicide.
Triclopyr *Garlon 3A*	**Rate:** 2 to 4 qt product/acre (1.5 to 3 lb a.e./acre) **Timing:** Postemergence when plants are mature; best when they have bolted but before seed production. **Remarks:** Only the amine formulation should be used in wetland areas. Triclopyr is a broadleaf-selective herbicide.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Rodeo*, *Aquamaster*	**Rate:** Broadcast treatment: 2 to 4 qt product (*Roundup ProMax*)/acre (2.25 to 4.5 lb a.e./acre) or 2 to 4 qt product (*Rodeo* or *Aquamaster*)/acre (2 to 4 lb a.e./acre) near aquatic sites. Spot treatment: 1 to 2% v/v solution **Timing:** Postemergence when plants are mature; best when they have bolted but before seed production. **Remarks:** Glyphosate is a nonselective herbicide with no soil activity. Thus, it is best used in monotypic stands or as a spot treatment. Only aquatic formulations should be used in wetland areas. This will require the addition of a surfactant registered for use in aquatic sites.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Metsulfuron *Escort*	Some evidence indicates that metsulfuron can be effective for control of pennyroyal. Although this herbicide is registered for use in aquatic systems in other countries, e.g. Australia, it is not registered for use in wetland habitats in the United States. On dry sites it can be effective. It 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.