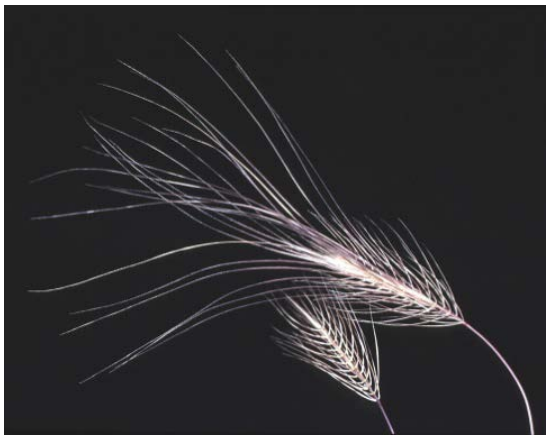
Taeniatherum caput-medusae (L.) Nevski
(= *Elymus caput-medusae* L. [Jepson Manual 2012])

Medusahead



Family: Poaceae
Range: Arizona, California, Idaho, Nebraska, Nevada, Oregon, Utah, Washington; a few locations in the northeastern states.
Habitat: Disturbed sites, grassland, rangeland, openings in chaparral, oak woodlands, and rarely in agronomic fields. Generally in areas that receive at least 9 inches of rain per year, so not common in the low desert. Grows best on clay soils or where deep soil moisture is available late in the growing season.
Origin: Native to the Mediterranean region.
Impact: Dense stands displace desirable vegetation and reduce livestock and wildlife carrying capacity. Unpalatable to livestock except during the early growth stages. The stiff awns and hard florets can injure eyes, nostrils, and mouths of grazing animals. Birds and rodents usually avoid feeding on the seeds. Senesced plants form a dense layer of thatch that takes a couple of years to decompose. The thatch layer changes the temperature and moisture dynamics of the soil, reduces seed germination of other species, and creates fuel for wildfires.
Western states listed as Noxious Weed: California, Colorado, Nevada, Oregon, Utah
California Invasive Plant Council (Cal-IPC) Inventory: High Invasiveness

Medusahead is a noxious rangeland weed that is increasing its range in most of the western states. It is an ascending to erect winter annual grass to 2 ft tall, producing spikes of long-awned spikelets. Medusahead matures at least 2 to 4 weeks later in the season than most other annual grasses, and from a distance, the yellowish-green sheen of dense stands is highly visible after other annual grasses turn brown. The mature plant has slender stems, and the leaf surfaces are glabrous or covered with soft, short hairs, and often appear glassy under magnification. Medusahead produces fibrous roots that grow throughout the cool season, depleting upper soil moisture early in the growing season and accessing deep soil moisture later on.

Medusahead flowers in early summer, often after other annual plants have senesced. Its spikes are 0.5 to 2 inches long excluding awns, and the main spike axis does not break apart at maturity. The fertile seeds have long, often twisted, awns 1 to 3 inches long; the seeds and awns are covered with minute, upward-pointing barbs and are rough to the touch. Seed production is usually prolific. Some florets (seeds) can remain attached to spikes long after plants turn brown. This characteristic allows seeds to disperse by clinging to the feet, fur, and feathers of animals and the shoes and clothing of people.

Most seeds germinate in fall after the first rain, but some seeds remain dormant or germinate in winter or spring. Seeds can germinate in dense litter under low moisture conditions. Seedlings remain attached to the long-awned floret. Seedlings can survive desiccation of the primary root and develop adventitious roots when moisture becomes available. Most seed appears to germinate or lose viability within 2 years in the field.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, disking)	There are mixed reports on the effectiveness of mowing. Early-season mowing is likely to be ineffective and may harm other species. Late-season mowing, at the boot to early flowering stage, may help to suppress medusahead. However, mowing after seed set will disperse the seeds. In areas where medusahead has built up a heavy thatch, removal of the thatch by raking, tillage, or burning

	can reduce dominance by medusahead and can help other plant species to get established. Tillage (disking and plowing) will control existing medusahead plants, as well as burying seed and breaking up deep thatch layers. Tillage should be accomplished before seed set. In rangeland or wildland areas, the increased potential for soil erosion, loss of soil moisture, loss of organic matter, and loss of macrobiotic crusts may outweigh the weed control benefits of tillage. These factors should be considered before applying tillage over a large area.
Cultural	The use of fire has given mixed results for medusahead control. Burning in low-elevation, warm-winter sites (e.g., California's Central Valley and foothills) can be extremely effective. Burns are conducted when medusahead is beginning to head out but before seed drop, when most desirable plants have already dropped seed. Two years of burning can nearly eliminate an infestation. In contrast, burning in high-elevation, cool-winter sites usually fails to control medusahead. It is thought that because of reduced ecosystem productivity and a shorter growing season at these sites, there isn't adequate fuel to carry a fire hot enough to kill medusahead seeds. Because of its high silica content, livestock generally avoid grazing medusahead as it approaches maturity. However, heavy grazing in spring, when medusahead is still palatable, can reduce, but not eliminate, an infestation. To limit seed dispersal, animals should be removed before the plants mature. Spring grazing is especially effective in areas where dried medusahead litter has been previously burned or grazed. Best control is achieved if plants are grazed in the stage of boot to flowerhead emergence. In experimental trials, medusahead populations have been reduced using confined grazing with sheep. In recent trials, fertilizing pastures with nitrogen improved the palatability of medusahead, making it attractive to cattle and resulting in medusahead suppression. As discussed above, thatch removal by raking, tillage, or burning can favor establishment of desirable plants. This can also improve efficacy of subsequent applications of some soil-applied herbicides, particularly imazapic.
Biological	Crown rot fungus (*Fusarium culmorum*), an endemic fungus of dry soils in the western states, is a potential biocontrol agent. However, there are no studies to show its effectiveness.

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	
Aminopyralid *Milestone*	**Rate:** 7 to 14 oz product/acre (1.75 to 3.5 oz a.e./acre) **Timing:** Preemergence in fall. **Remarks:** A broadleaf-selective herbicide that is safe on most grasses. There is a 2(ee) Supplemental label for this use in Arizona, California, Colorado, Idaho, Oregon, Washington, Wyoming, and Utah. Research in California's Central Valley showed that 14 oz of *Milestone* (spot treatment rate)/acre gave ~90% control of medusahead, and 7 oz/acre gave ~60% control.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup, Accord XRT II*, and others	**Rate:** 0.75 to 1 pt product (*Roundup ProMax*)/acre (0.42 to 0.56 lb a.e./acre) for early-season selective control in shrubland or other perennial systems; 1 to 2 qt product (*Roundup ProMax*)/acre (1.1 to 2.25 lb a.e./acre) for late-season, nonselective control. **Timing:** For selective control, apply postemergence in spring after all seedlings are up and before heading; the tillering stage is ideal. For late-season, nonselective control, apply to rapidly growing plants before seeds are produced. **Remarks:** Glyphosate is a nonselective herbicide with no soil activity.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Imazapic *Plateau*	**Rate:** 4 to 12 oz product/acre (1 to 3 oz a.e./acre) **Timing:** Fall or spring. In warm-winter areas, fall applications may be most effective. In colder climates, spring applications after snow melt are better. **Remarks:** Imazapic has some soil residual activity and mixed selectivity. It tends to favor members of the

	Asteraceae and some grasses. Use a spray adjuvant for postemergence applications. Effects vary depending on soil texture and soil organic matter. Heavy soils and high organic matter may require higher rates. Imazapic also can tie up in litter, and its efficacy is reduced under situations where there is lots of thatch on the soil surface. Not registered for use in California.
Rimsulfuron *Matrix*	**Rate:** 4 oz product/acre (1 oz a.i./acre) **Timing:** Preemergence (fall) to early postemergence (early spring). **Remarks:** Rimsulfuron controls several annual grasses and broadleaves. Perennial grasses are tolerant to fall applications when established and grown under dryland conditions. Application to rapidly growing or irrigated perennial grasses may result in their injury or death. It provides soil residual control in cool climates but degrades rapidly under warm conditions. Rimsulfuron will not control summer annual weeds when applied in fall or spring. Add a surfactant when applying postemergence.
Sulfometuron *Oust* and others	**Rate:** 0.75 to 1.5 oz product/acre (0.56 to 1.13 oz a.i./acre) **Timing:** Preemergence to early postemergence. Preemergence (fall) applications are generally more effective. **Remarks:** Sulfometuron is a broad-spectrum herbicide that is fairly safe on native perennial grasses. This can be an advantage in revegetation use. Use lower rates in arid environments, higher rates in wetter areas (> 20 inches rainfall) and on high organic matter soils. It has fairly long soil residual activity.
Sulfometuron + chlorsulfuron *Landmark XP*	**Rate:** 1.5 to 2.25 oz product/acre **Timing:** Preemergence, in fall or after soil thaws in spring. **Remarks:** See sulfometuron.

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.