Verbascum thapsus L.; common mullein
Verbascum blattaria L.; moth mullein

Common and moth mullein

Family: Scrophulariaceae
Range: All western states.
Habitat: Open areas including rangeland, forest clearings, meadows, and roadsides. Prefers, but is not limited to, disturbed sites with well-drained soils.
Origin: Native to Eurasia.
Impacts: Populations can spread rapidly and form dense stands in disturbed areas. Unpalatable to livestock due to their woolly leaves. Established stands are extremely difficult to control due to their abundant, long-lived seed bank.

Common mullein is a biennial, short-lived perennial or, rarely, an annual to 7 ft tall. Moth mullein is a biennial to 4 ft tall. Both species exist as basal rosettes until they develop a single tall flowering stem at maturity. Common mullein rosettes grow up to 2 ft in diameter with oblong to oblanceolate, gray-green woolly leaves. Moth mullein rosettes grow to 16 inches in diameter with oblanceolate, bright green leaves that are irregularly-toothed and sparsely hairy to glabrous. Both mullein species form a deep tap root.

The common mullein inflorescence is a spike-like raceme with yellow flowers 1 to 1.5 inches wide. The moth mullein inflorescence is a spike-like raceme with white or pale yellow flowers with fine purple hairs covering stamen filaments. Each plant can produce over 100,000 seeds. The seeds can survive over 100 years in the soil. Most seed falls near the parent plant. Seedling establishment is dependent on periodic disturbance. These are ephemeral plants that are often displaced by other plants in undisturbed, densely vegetated sites. Studies have shown common mullein establishment is greatly enhanced in bare ground areas.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, disking)	Hand-pulling before seed set is an effective control method for mullein plants growing on loose soils. When digging, sever the root below the soil surface. Soil disturbance stimulates recruitment. Repeated mowing in the bolting to early flowering stage can reduce seed production. Mowing low-growing rosettes is not effective as rosettes quickly regrow if mowing is discontinued. Tillage is effective for controlling existing plants, but soil disturbance stimulates recruitment. Common mullein is not competitive in areas that experience annual cropping.
Cultural	Common mullein has low palatability at all growth stages. Livestock typically avoid grazing mullein if palatable forage is available. A California study reported the abundance of common mullein in a cow's summer diet ranged from 0% to 3.5%. Common mullein is common on over-grazed sites. Fire is not an effective control and often can dramatically stimulate recruitment from the seedbank. Thus, fire can be used to manage the seedbank if the new seedlings are controlled after they germinate. After a disturbance event, common mullein populations are typically ephemeral, and in time the abundance normally decreases. Promoting competitive vegetation and minimizing soil disturbance are likely the best control options. Competitive vegetation that shades and competes for early season moisture reduces mullein seedling establishment.
Biological	A curculionid weevil (*Gymnaetron tetrum*), specific to *Verbascum thapsus*, was accidentally introduced to North America from Europe before 1937. The larvae mature in the seed capsules and destroy up to 50% of the seeds.

CHEMICAL CONTROL

The following specific use information is based on research papers and reports by 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	
Aminocyclopyrachlor + chlorsulfuron *Perspective*	**Rate:** 4.75 to 8 oz *Perspective*/acre **Timing:** Postemergence or preemergence. Postemergence applications are most effective when applied from the rosette to early bolting stage. **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 *Milestone*	**Rate:** 7 oz product/acre (1.75 oz a.e./acre) **Timing:** Postemergence from the rosette to young bolting stage. **Remarks:** 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. For postemergence applications, add a non-ionic surfactant at 0.25 to 0.5% v/v to aid in absorption into the woolly leaves. Other premix formulations of aminopyralid can be used. These include *Opensight* (aminopyralid + metsulfuron) (see below) and *Forefront HL* (aminopyralid + 2,4-D). *Forefront HL* is applied at 1.5 to 2.1 pt product/acre during the rosette stage.
Aminopyralid + metsulfuron *Opensight*	**Rate:** 2 to 3.3 oz product/acre **Timing:** Spring or fall. Apply 2 oz product/acre to plants in the rosette stage, or 2.5 to 3.3 oz product/acre for bolting plants less than 12 inches tall. **Remarks:** Not registered for use in California.
Fluroxypyr *Vista XRT*	**Rate:** 22 oz product/acre (7.7 oz a.e./acre) **Timing:** Postemergence, from seedling state to young bolting stage. **Remarks:** Fluroxypyr provides only suppression of the *Verbascum* species. It is a broadleaf-selective herbicide with no soil residual activity. Add a surfactant or seed oil surfactant.
Picloram *Tordon 22K*	**Rate:** 1 qt product/acre (8 oz a.e./acre). **Timing:** Preemergence and postemergence. With postemergence applications, treat at rosette to early bolting stage, when plants are growing rapidly. Add a surfactant to aid absorption into the woolly leaves. **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. Picloram is a restricted use herbicide. It is not registered for use in California. On the label, *Tordon 22K* at 1 to 1.5 pt + 2,4-D at 1 lb a.e./acre is listed as controlling common mullein.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup, Accord XRT II*, and others	**Rate:** 2 qt product (*Roundup ProMax*)/acre (2.25 lb a.e./acre). Spot treatment: 2 % v/v solution **Timing:** Postemergence, from seedling to late bolting stage. **Remarks:** Glyphosate will provide control only during the year of application; it has no soil activity and will not kill seeds or inhibit germination the following season. Glyphosate is nonselective. It can create 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 affect 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 *Telar*	**Rate:** 1 to 2.6 oz product/acre (0.75 to 1.95 oz a.i./acre) **Timing:** Postemergence from seedling to bolting stage. **Remarks:** Chlorsulfuron has mixed selectivity and is generally safe on grasses. Always use a surfactant. Also included with aminocyclopyrachlor in *Perspective*. *Telar* can be used near water, but cannot be applied to water.
Imazapyr *Arsenal, Habitat, Stalker, Chopper, Polaris*	**Rate:** 1 to 2 qt product/acre (0.5 to 1 lb a.e./acre) **Timing:** Preemergence and postemergence. **Remarks:** Imazapyr has soil residual activity and may impact restoration efforts. Add a spray adjuvant.
Metsulfuron *Escort*	**Rate:** 1 to 2 oz product/acre (0.6 to 1.2 oz a.i./acre) **Timing:** Postemergence from seedling to bolting stage. **Remarks:** Metsulfuron has similar activity to chlorsulfuron. Metsulfuron has some soil residual activity. Always use a surfactant. 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.