Sinapis arvensis L.

Wild mustard

Family: Brassicaceae
Range: Throughout the western United States.
Habitat: Disturbed places, roadsides, fields, pastures, agronomic crops, orchards, vineyards, ditch banks, dry washes.
Origin: Native to Europe.
Impacts: Wild mustard can form dense patches that outcompete desirable plants. It is most common in croplands, roadsides and waste areas, as well as urban environments, but can also be a problem in some natural areas. Wild mustard seeds contain alkaloids that can be toxic to livestock if ingested in large quantities.
California Invasive Plant Council (Cal-IPC) Inventory: Limited Invasiveness

Wild mustard is a familiar roadside weed, erect to 3.5 ft tall with yellow four-petaled flowers. It is a winter annual in many parts of western United States, but a summer annual in cooler climates. The mature plant has basal leaves 2 to 8 inches long, with rounded lobes and the terminal lobe larger than lateral lobes, on long stalks. Upper stem leaves are smaller than the lower leaves and lack petioles. The stem bases have sparse hairs pointing downward. The plant has a slender taproot with fibrous lateral roots.

Wild mustard flowers in late winter to early spring, occasionally in early fall. The flowers appear in racemes. The four petals are pale to bright yellow, 8 to 12 mm long. Flowers are followed by pods (siliques) which are linear, with a persistent beak at the tip, on a stalk that is shorter than the pod. The pods are ascending, not laying close to the stem, 1 to 1.5 inches long, and often slightly constricted between seeds. After senescence, brown stems with pod remnants can persist for a few months. Seeds generally fall near the parent plants. Seeds can survive at least 11 years under field conditions.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, disking)	Manual removal or cultivation before seeds develop can control populations. Physical removal is easiest during the seedling stage. Control methods implemented over a period of years will eventually exhaust the seedbank. Mowing during the bud to bloom stage can help suppress seed production.
Cultural	Wild mustard is palatable to livestock, but if eaten in excess can cause gastric distress. Grazing is not an effective control method. Burning is not an effective control method, as the plants remain succulent into the seeding stage and they produce too early in the season to use broad scale fire. Flaming can be used to control young plants.
Biological	There are no biological control agents available for this weed, primarily because of its close relationship with other economically important mustard crops.

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	
2,4-D Several names	**Rate:** 1 to 2 qt product/acre (0.95 to 1.9 lb a.e./acre) **Timing:** Postemergence, to rapidly growing plants. Most effective on smaller plants. **Remarks:** 2,4-D is broadleaf-selective. Effective control may require repeat applications. It has no soil activity. Use a surfactant. Do not apply ester formulations when outside temperatures exceed 80°F. 2,4-D can be mixed with various other compounds (e.g., dicamba, triclopyr, carfentrazone), either in tank mixes or in commercial combinations.
Aminocyclopyrachlor + chlorsulfuron *Perspective*	**Rate:** 1.75 to 2.75 oz product/acre **Timing:** Postemergence in spring up to flowering. **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 + metsulfuron *Opensight*	**Rate:** 1.5 to 2 oz product/acre **Timing:** Preemergence in fall or postemergence when target plants are in the seedling to rosette stage. **Remarks:** Not registered for use in California.
Dicamba *Banvel*, *Clarity*	**Rate:** 1 to 2 pt product/acre (0.5 to 1 lb a.e./acre) **Timing:** Postemergence, to rapidly growing plants. Most effective on smaller plants. **Remarks:** Dicamba is a broadleaf-selective herbicide often combined with other active ingredients. It is effective earlier in the season than 2,4-D. It can be tank-mixed with 2,4-D. Has very limited soil residual. Do not apply when outside temperatures exceed 80°F. *Overdrive,* a premix of dicamba with diflufenzopyr, has been reported to be effective on some mustard species. Diflufenzopyr is an auxin transport inhibitor which causes dicamba to accumulate in shoot and root meristems, increasing its activity. *Overdrive* is applied postemergence at 4 to 8 oz product/acre rapidly growing plants. Higher rates should be used on large annuals. Add a non-ionic surfactant to the treatment solution at 0.25% v/v or a methylated seed oil at 1% v/v solution.
Picloram *Tordon 22K*	**Rate:** 1 qt product/acre (8 oz a.e./acre) **Timing:** Preemergence in winter, or early postemergence in late fall or spring. **Remarks:** Picloram has a very long residual activity and should provide 2 years of control. It is a broadleaf-selective herbicide and will not generally injure grasses. Wild mustard is listed on the *Tordon 22K* label, though few other recommendations indicate it is the desired option for control. However, picloram can be used in a premix with fluroxypyr (*Surmount*) for the control of mustards. Picloram is a restricted use herbicide. Picloram formulations are not registered for use in California.
Triclopyr *Garlon 3A*, *Garlon 4 Ultra*	**Rate:** 0.33 to 1.33 gal *Garlon 3A* /acre, or 0.25 to 1 gal *Garlon 4 Ultra*/acre of (1 to 4 lb a.e./acre) **Timing:** Postemergence, to rapidly growing weeds, up to bud stage. **Remarks:** Triclopyr is broadleaf-selective and safe on most grasses. It is most effective on smaller plants. *Garlon 4 Ultra* is formulated as a low volatile ester. However, in warm temperatures, spraying onto hard surfaces such as rocks or pavement can increase the risk of volatilization and off-target damage.
Triclopyr + 2,4-D *Crossbow*	**Rate:** 1 qt product/acre **Timing:** Postemergence, to small, rapidly growing weeds. **Remarks:** Include non-ionic surfactant.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup*, *Accord XRT II*, and others	**Rate:** 1 to 2 pt product (*Roundup ProMax*)/acre (0.56 to 1.1 lb a.e./acre) **Timing:** Postemergence, to rapidly growing plants from rosette to bud stage. **Remarks:** Glyphosate has no soil activity and is nonselective. Its effectiveness is increased by addition of ammonium sulfate.

BRANCHED-CHAIN AMINO ACID INHIBITORS	
Chlorsulfuron *Telar*	**Rate:** 0.25 to 0.5 oz product/acre (0.19 to 0.375 oz a.i./acre) **Timing:** Preemergence to early postemergence. **Remarks:** Chlorsulfuron has mixed selectivity and is generally safe on grasses. It is most effective preemergence. Use a surfactant for postemergence applications. It has fairly long soil residual activity. Some populations have developed resistance to related herbicides; where resistance is suspected, use other herbicides or combinations.
Chlorsulfuron + metsulfuron or sulfometuron *Cimarron X-tra* or *Landmark XP*	**Rate:** 0.5 oz *Cimarron X-tra*/acre; 0.9 oz *Landmark XP*/acre **Timing:** Postemergence, to rapidly growing plants. Most effective on smaller plants. **Remarks:** Mixed selectivity. *Cimarron X-tra* is not registered for use in California.
Imazapic *Plateau*	**Rate:** 4 to 6 oz product/acre (1 to 1.5 oz a.e./acre) **Timing:** Preemergence in fall to postemergence in spring. **Remarks:** Imazapic has mixed selectivity and tends to favor species in the Asteraceae, as well as some grasses. In postemergence applications, use a methylated seed oil surfactant at 1.5 to 2 pt product/acre. It has some soil residual activity. Not registered for use in California.
Metsulfuron *Escort*	**Rate:** 0.33 to 0.5 oz product/acre (0.2 to 0.3 oz a.i./acre) **Timing:** Postemergence, to young, rapidly growing weeds in spring before flowering, or in fall to new rosettes. **Remarks:** Mixed selectivity, generally safe on grasses. Use a surfactant. Can be tank-mixed with 2,4-D and/or dicamba, or with chlorsulfuron. Not registered for use in California.
Propoxycarbazone-sodium *Canter R+P*	**Rate:** 0.9 to 1.2 oz product/acre (0.63 to 0.84 oz a.i./acre) **Timing:** Postemergence to small, rapidly growing plants. **Remarks:** Propoxycarbazone is a broad-spectrum herbicide that will control many species, including wild mustard. Perennial grass species vary in tolerance. A non-ionic surfactant should be added at 0.25 to 0.5% v/v solution.
Rimsulfuron *Matrix*	**Rate:** 2 to 4 oz product/acre (0.5 to 1 oz a.i./acre) **Timing:** From preemergence in fall to early postemergence in 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.
Sulfosulfuron *Outrider*	**Rate:** 0.75 to 2 oz product/acre (0.56 to 1.5 oz a.i./acre) **Timing:** Early postemergence, winter to early spring, when desirable perennials are dormant. **Remarks:** Sulfosulfuron has mixed selectivity but is fairly safe on native perennial grasses, especially wheatgrasses. To be most effective it may be necessary to add a non-ionic surfactant. Sulfosulfuron has fairly long soil residual activity.
PHOTOSYNTHETIC INHIBITORS	
Hexazinone *Velpar L*	**Rate:** 2 to 4 pt product/acre (0.5 to 1 lb a.i./acre) **Timing:** Preemergence to early postemergence. **Remarks:** Hexazinone has both foliar and soil activity. Its selectivity is mixed. Use higher rates on fine soils or high organic matter soils, or when weeds are under stress. It also has fairly long soil residual activity. Hardwood trees near application site can be damaged when they absorb this chemical through the roots. High rates of hexazinone can create bare ground, so only use high rates in spot treatments.

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.