Conium maculatum L.

Poison-hemlock

Family: Apiaceae
Range: Throughout the contiguous U.S., including every western state.
Habitat: Moist soil along hedgerows, along the banks of streams and rivers, roadsides and wastelands, woodlands, meadows, and pastures.
Origin: Native to Europe.
Impact: Produces piperidine alkaloids which are highly toxic to humans and animals. Domestic animals such as swine, cattle, goats, horses, and sheep can be poisoned by the toxin coniine after ingesting any portion of the plant. Poison-hemlock is the most toxic to cattle. Symptoms can include vomiting, nausea, trembling, rapid respiration, joint and movement problems, slow, weak and rapid pulse, increased salivation and urination, convulsions, paralysis, coma, and death from respiratory paralysis. Ingestion during fetal development can result in severe birth defects.
States listed as Noxious Weed: Colorado, Idaho, Nevada, New Mexico, Oregon, Utah, Washington
California Invasive Plant Council (Cal-IPC) Inventory: Moderate Invasiveness

Poison-hemlock is a tall branching biennial to 4 to 6 ft tall. The stem is erect, hollow, smooth, bright green with a distinctive mottled appearance and irregular purple splotches. The long-stalked leaves are glabrous, up to 2 ft long, bright green, alternate, and tripinnately compound (divided into leaflets which are again divided and subdivided). Its root is a long, forked, fleshy taproot, pale yellow in color, with numerous lateral roots.

The inflorescence is a compound umbel with 12 to 16 rays, and numerous small white flowers located at the terminal positions. Each flower produces two gray-brown seeds with five wavy longitudinal ridges. The seeds have the highest concentration of coniine. Poison hemlock smells like mouse urine when crushed, a characteristic of the poisonous alkaloids. Plants reproduce only by seed. Most seeds fall near the parent plant. Seed dispersal is prolonged and occurs from late summer through winter. Most seeds germinate almost immediately if conditions are favorable, but a small proportion remains dormant. Dormant seeds require a period of high summer and/or low winter temperatures before they can germinate. Seeds survive up to about 3 years under field conditions.

NON-CHEMICAL CONTROL

Mechanical (mowing, plowing, and cultivation)	Hand removal is recommended for small infestations. When pulling the plants, dig down and remove the entire taproot. Wear gloves and wash hands after working with poison-hemlock. Manual control efforts can be successful, but can cause soil disturbance encouraging further germination of seeds. Solid carpets of hemlock seedlings are not uncommon following soil disturbance. Cutting is ineffective; the plants send up new seed stalks in the same season the cutting occurs. Establishment of populations can be prevented with repeated cultivation and plowing.
Cultural	Due to the plant's toxicity, grazing is not recommended for control. Even dried plant parts are not safe as the toxins take several years to dissipate. Use certified weed-free hay to prevent the poisoning of livestock. Do not burn, as toxins can be released into the air through the smoke.
Biological	There are no known biological controls. Since its introduction to North America, only a few native insects have been able to overcome its toxic defenses. These attack the seedhead, but do very little damage to the rest of the plant.

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 4 pt product/acre (0.48 to 1.9 lb a.e./acre) **Timing:** Postemergence in seedling to rosette stage. **Remarks:** Broadleaf-selective, most effective when applied soon after plants emerge. Adding a wetting agent may enhance control. Also effective tank mixed with dicamba.
Aminocyclopyrachlor + chlorsulfuron *Perspective*	**Rate:** 4.75 to 8 oz product/acre **Timing:** Postemergence in seedling to rosette stage. **Remarks:** Broad-spectrum control of many broadleaf species. Although generally safe to 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:** 2.5 to 3.3 oz product/acre **Timing:** Preemergence in fall, or postemergence in the seedling to rosette stage. **Remarks:** Not registered for use in California.
Triclopyr *Garlon 4 Ultra*, *Remedy Ultra*	**Rate:** 5 to 8 pt product/acre (2.5 to 4 lb a.e./acre) **Timing:** Postemergence in seedling to rosette stage. **Remarks:** Broadleaf-selective, safe on most grasses. Most effective on smaller plants. *Garlon 4 Ultra* and *Remedy Ultra* are low volatile esters. However, in warm temperatures, spraying onto hard surfaces such as rocks or pavement can increase the risk of volatilization and off-target damage. Also effective in a premix with 2,4-D (*Crossbow*) or tank mixed with clopyralid (*Transline*).
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup*, *Accord XRT II*, and others	**Rate:** Broadcast treatment: 1.33 to 2.67 qt product (*Roundup ProMax*)/acre (1.5 to 3 lb a.e./acre). Spot treatment: 1 to 1.5% v/v solution **Timing:** Best when applied postemergence to rapidly growing plants before bolting. However, higher rates can control plants at the bud to full bloom stage. **Remarks:** Glyphosate is a nonselective herbicide that has no soil activity. Add a non-ionic surfactant.
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 to rapidly growing plants. **Remarks:** Desirable grasses should be well established before application.
Imazapic *Plateau*	**Rate:** 8 to 12 oz product/acre (2 to 3 oz a.e./acre) **Timing:** Preemergence. **Remarks:** Mixed selectivity, favors members of the Asteraceae and some grasses. Some soil residual activity. In postemergence applications, use methylated seed oil at 1.5 to 2 pt/acre. Not registered for use in California.
Imazapyr *Arsenal AC*, *Habitat*, *Stalker*, *Chopper*, *Polaris*	**Rate:** 2 pt product (*Arsenal AC*)/acre (1 lb a.e./acre); 4 pt product (*Habitat*)/acre (1 lb a.e./acre) + 1 qt/acre methylated seed oil **Timing:** Preemergence or early postemergence in the rosette stage. **Remarks:** Nonselective. Long soil residual, leaves more bare ground than other treatments, even a year after application. Do not apply more than 3 qt product/acre. *Habitat* is an aquatic registered formulation for use close to water.
Metsulfuron *Escort*	**Rate:** 1 oz product/acre (0.6 oz a.i./acre) **Timing:** Postemergence to rapidly growing plants. **Remarks:** Use a non-ionic surfactant or silicone surfactant. Prevent drift to sensitive plants. Apply only to pastures, rangeland, and non-crop sites. Metsulfuron can also be used in a premix with dicamba + 2,4-D (*Cimarron Max*). Metsulfuron and its formulations are not registered 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.