

This WEED REPORT does not constitute a formal recommendation. When using herbicides always read the label, and when in doubt consult your farm advisor or county agent.

This WEED REPORT is an excerpt from the book *Weed Control in Natural Areas in the Western United States* and is available wholesale through the UC Weed Research & Information Center (wric.ucdavis.edu) or retail through the Western Society of Weed Science (wsweedscience.org) or the California Invasive Species Council (cal-ipc.org).

Cirsium arvense (L.) Scop.

Canada thistle

Family: Asteraceae

Range: Found throughout much of the United States, including all western states.

Habitat: Open, disturbed sites such as roadsides, gardens, pastures, hillsides, rangeland, stream banks, forest openings, and sometimes cropland such as alfalfa or grains. Prefers moist soils but will tolerate a wide range of soil types.

Origin: Native to southeastern Europe and the eastern Mediterranean area.

Impact: Competes aggressively with native plant species. It causes extensive yield loss in crops by competing for nutrients, light and water. It may also have an allelopathic effect. The productivity of pastures is significantly reduced because livestock avoid grazing Canada thistle and surrounding plants due to the spiny nature of the mature foliage. Canada thistle can also be economically damaging to ranchers by causing an increase in infections due to abrasions. Canada thistle is a host species for several agricultural insect and disease pests such as the sod-web worm, bean aphid, stalk borer, and cucumber mosaic virus.

Western states listed as a noxious weed: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming

California Invasive Plant Council (Cal-IPC) Inventory: Moderate Invasiveness



Canada thistle is an erect perennial that grows up to 3 to 5 ft tall and forms patches or clumps that are usually of a single sex. Stems ordinarily die back over winter and new shoots are formed in spring from old stem bases or root buds when the soil moisture permits. Canada thistle has an extensive creeping root system that can reach depths of 6 to 15 ft making eradication difficult. The spiny lobed leaves are 6 to 8 inches long and 1 to 1.5 inches wide. The leaves are alternate, oblong or lance-shaped and the base leaves stalkless and clasping.

Plants are dioecious (separate male and female plants) and flower heads are white to purple, borne in clusters of 1 to 5 per branch. The purplish involucre is glabrous or has white wooly hairs. Plants develop from seed and from vegetative shoots that generate from adventitious root buds. Canada thistle can produce between 1,000 and 5,000 seeds per stem. Most seeds fall near the parent plants or disperse short distances with wind. Birds and small mammals can consume and disperse some seeds. The seeds have been known to survive in the soil for up to 20 years and longevity is favored by deep burial.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, disking)	Mowing can be used to reduce the nutrient storage in the roots and suppress flower formation. However, for mowing to be effective it must be repeated at least every 3 to 4 weeks over several growing seasons or coupled with other control practices. Tillage or cultivation can actually increase Canada thistle because it breaks the root system into fragments, spreading the roots through the soil and stimulating development of new plants. Small root pieces have enough stored reserves to develop new plants. Small roots can survive at least 100 days without nutrient replenishment from photosynthesis. For cultivation to be effective it must be repeated at 21 day intervals throughout the growing season.
Cultural	Neither grazing nor prescribed burning have been shown to be effective for the management of Canada thistle.
Biological	Three insects have been released as biocontrol agents. None of these species have had a significant impact

	<p>on Canada thistle.</p> <p>The larvae of the Canada thistle stem weevil (<i>Ceutorhynchus litura</i>) bore into the main leaf vein and then into the crown. It is considered the most effective of the current biocontrol agents, reducing plant vigor. When present in high enough densities it can kill the plant. Larvae of the bud weevil (<i>Larinus planus</i>) feed on the bud and can reduce the potential for sexual reproduction. Larvae of the thistle stem gall fly (<i>Urophora cardui</i>) bore into the apical meristem of shoots and form a gall. They can reduce plant vigor and can prevent flower formation depending upon the location of the gall.</p> <p>A pathogenic rust (<i>Puccinia punctiformis</i>) infects Canada thistle (mix sap from infected plant with water and spray uninfected plants to infect them), but it too has not had a significant effect on its control.</p>
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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	
<p>2,4-D</p> <p>Several names</p>	<p>Rate: 2 qt product/acre (1.9 lb a.e./acre)</p> <p>Timing: Postemergence in spring at the pre-bud to early bud stage.</p> <p>Remarks: Control with 2,4-D alone is only temporary; therefore, it is commonly mixed with other growth regulator herbicides. Research from Colorado showed control from a spring 2,4-D application followed by fall application with different herbicides. 2,4-D is broadleaf-selective and has no soil activity. Do not apply ester formulation when outside temperatures exceed 80°F.</p>
<p>Aminocyclopyrachlor + chlorsulfuron</p> <p><i>Perspective</i></p>	<p>Rate: 4.75 to 8 oz product (<i>Perspective</i>)/acre</p> <p>Timing: Postemergent to plants before they produce seed.</p> <p>Remarks: <i>Perspective</i> provides 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. May need retreatment for 1 to 2 additional years. 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).</p>
<p>Aminopyralid</p> <p><i>Milestone</i></p>	<p>Rate: 5 to 7 oz product/acre (1.25 to 1.75 oz a.e./acre)</p> <p>Timing: Postemergence in spring after all plants have fully emerged (some may be budding) until the oldest plants are in full flower stage. Use the higher rate when applying to flowering plants. Applications are also effective in fall before a killing frost. Use higher rates for older/dense stands or for longer residual control.</p> <p>Remarks: May need retreatment for 1 to 2 additional years. Aminopyralid is one of the most effective herbicides for the control of Canada thistle. It is safe on grasses, although preemergence application at high rates can greatly suppress invasive annual grasses, such as medusahead. Aminopyralid has a longer residual and higher activity than clopyralid. Other members of the Asteraceae and Fabaceae are very sensitive to aminopyralid.</p> <p>Other premix formulations of aminopyralid can also be used for Canada thistle control. These include <i>Opensight</i> (aminopyralid + metsulfuron; 2.5 to 3 oz product/acre) and <i>Forefront HL</i> (aminopyralid + 2,4-D; 1.5 to 2.1 pt product/acre), both applied at the rosette to bolting stages. The formulation with metsulfuron is not registered for use in California.</p>
<p>Clopyralid</p> <p><i>Transline</i></p>	<p>Rate: 0.67 to 1.33 pt product/acre (4 to 8 oz a.e./acre)</p> <p>Timing: Postemergence before the bud stage when most of the basal leaves have emerged. Fall applications are also effective.</p> <p>Remarks: One or more treatments per season may be needed for 1 to 3 consecutive years for complete control. Allow at least 20 days after application before disturbing treated areas. While clopyralid is very safe on grasses, it will injure many members of the Asteraceae, particularly thistles, and can also injure legumes, including clovers. Most other broadleaf species and all grasses are not injured. Also applied in a premix with triclopyr (<i>Redeem</i>, 2.5 to 4 pt product/acre) to rosette</p>

	to bud stage Canada thistle.
Dicamba <i>Banvel</i>	<p>Rate: 4 pt product/acre (2 lb a.e./acre)</p> <p>Timing: Postemergence to rosettes. Fall applications are also effective.</p> <p>Remarks: Dicamba is a broadleaf-selective herbicide often combined with other active ingredients. It is not typically used alone to control Canada thistle because it is not as effective as other herbicides such as aminopyralid, clopyralid or aminocyclopyrachlor.</p> <p>Dicamba is available mixed with diflufenzopyr in a formulation called <i>Overdrive</i>. This has been reported to be effective on Canada thistle. Diflufenzopyr is an auxin transport inhibitor which causes dicamba to accumulate in shoot and root meristems, increasing its activity. <i>Overdrive</i> is applied postemergence at 4 to 8 oz product/acre to rapidly growing plants. Higher rates should be used when treating perennial weeds. Add a non-ionic surfactant to the treatment solution at 0.25% v/v or a methylated seed oil at 1% v/v solution.</p>
Picloram <i>Tordon 22K</i>	<p>Rate: 2 pt product/acre (8 oz a.e./acre).</p> <p>Timing: Best when applied postemergence to rapidly growing thistle after most leaves emerge but before bud stage. Fall applications are also effective.</p> <p>Remarks: Picloram gives a broader spectrum of control than aminopyralid, aminocyclopyrachlor, and clopyralid, and has much longer soil residual activity. Most broadleaf plants are susceptible. 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. <i>Tordon 22K</i> is a federally restricted use pesticide. Picloram is not registered for use in California.</p>
AROMATIC AMINO ACID INHIBITORS	
Glyphosate <i>Roundup, Accord XRT II,</i> and others	<p>Rate: Broadcast foliar treatment: 2 qt product (<i>Roundup ProMax</i>)/acre (2.25 lb a.e./acre). Spot treatment: 2% v/v solution</p> <p>Timing: Postemergence to rapidly growing thistles when most plants are past the bud stage. Fall applications must be before the first killing frost.</p> <p>Remarks: Do not tank-mix other herbicides with glyphosate for thistle control. More than 1 year of treatment may be necessary for complete control. Glyphosate will only provide control during the year of application; it has no soil activity and will not kill seeds or inhibit germination the following season. Glyphosate is nonselective. To achieve selectivity, it can be applied using a wiper or spot treatment to control current year's plants.</p>
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Chlorsulfuron <i>Telar</i>	<p>Rate: 1 to 1.33 oz product/acre (0.75 to 1 oz a.i./acre)</p> <p>Timing: Postemergence from bolting to bloom stages. Can also apply in fall.</p> <p>Remarks: Chlorsulfuron has mixed selectivity on both broadleaf and grass species but is generally safe on most grasses. It has fairly long soil residual activity. The herbicide solution requires constant agitation during application.</p>
Imazapyr <i>Arsenal, Habitat, Stalker,</i> <i>Chopper, Polaris</i>	The herbicide label indicates that 4 to 6 pt product/acre gives some level of control, but imazapyr is not usually the herbicide of choice for the control of Canada thistle.
Sulfometuron <i>Oust</i> and others	<p>Rate: 6 to 8 oz product/acre (4.5 to 6 oz a.i./acre)</p> <p>Timing: Apply preemergence or early postemergence before or during the rainy season when weeds are germinating or actively growing.</p> <p>Remarks: Sulfometuron has mixed selectivity. It can cause minor damage to some native perennial grasses and has a fairly long soil residual. Higher rates may increase control but will also give more bare ground. Requires 20 inches of annual rainfall or more for effective preemergence control.</p>

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.