

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).

Rumex crispus L.; curly dock
Rumex obtusifolius L.; broadleaf dock

Curly and broadleaf dock

Family: Polygonaceae

Range: Curly dock is found throughout the U.S., including every western state. Broadleaf dock is found in most of the western states, except Nevada, Wyoming and North Dakota.

Habitat: Ditches, roadsides, wetlands, meadows, riparian areas, alfalfa and pasture fields (especially with poor drainage), orchards and other disturbed moist areas. Plants prefer wet to moist soils but tolerate periods of dryness, and can grow in most climates and soil types.

Origin: *R. crispus*, Eurasia; *R. obtusifolia*, western Europe.

Impact: Both species can be very competitive and outcompete more desirable vegetation for water, nutrients and light. Under certain conditions, they can accumulate soluble oxalates making them toxic to livestock.

California Invasive Plant Council (Cal-IPC) Inventory: *R. crispus*, Limited Invasiveness



Both species are erect perennials from 1.5 to 3 ft tall, occasionally to 5 ft tall. Curly dock leaves are lanceolate and up to 20 inches long, whereas broadleaf dock has lanceolate-ovate leaves that are up to 30 inches long. Leaf width is the most diagnostic feature to separate the two species. Curly dock has dark green, hairless leaves that are relatively narrow, with curly or wavy margins, while broadleaf dock has wider leaves with smooth to finely ruffled margins. As members of the buckwheat family, these plants have a characteristic membranous sheath at the leaf base and usually swollen nodes. Both docks have a taproot that extends deep into the soil, enabling them to survive drought periods and outcompete other vegetation. The plant bolts from the rosette in late spring.

The flower stalk is round in cross-section, hairless, and ribbed in both species. Stems are usually unbranched below the flower head. The flowers are not showy; they are small, greenish and appear in whorled clusters at the end of the upright stems. Flower clusters of broadleaf dock are not as dense and closely spaced as those of curly dock. After the flowers senesce, the fruit takes on a characteristic rusty-brown color and can remain on the plant over winter. Plants reproduce primarily by seed which falls close to the plant. The fruit can also disperse long distances by water, as they have a corky appendage called a callosity that allows them to float. Both species are prolific seed producers. Seed remains viable for 20 years; some sources suggest it can survive for over 50 years.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, disking)	Curly and broadleaf dock are difficult to control by hand-pulling because of their deep taproot. The root usually breaks off and plants can regenerate from the portion left in the soil. Cutting them off at least 2 inches below the soil surface with a shovel or other implement is more effective. Continual mowing before seeding can be effective in reducing seed production, but most habitats are not amenable to mowing. Both docks can be controlled mechanically through tillage but the habitats where they are found are not usually conducive to cultivation.
Cultural	As the docks are not readily eaten by livestock, intensive grazing will likely result in an increase in populations. In some cases, the high levels of soluble oxalates are toxic to grazing species. Prescribed burning is not effective for the control of the perennial dock species.

	Improving drainage, when feasible, can help to control dock species.
Biological	No insect or disease biocontrol agents are available for use on any <i>Rumex</i> species in North America.

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	<p>Rate: 0.5 to 2 pt product/acre (0.24 to 0.95 lb a.e./acre)</p> <p>Timing: Postemergence, to rapidly growing plants. Smaller plants are more easily controlled.</p> <p>Remarks: 2,4-D is broadleaf-selective and has no soil activity. It is often combined with other active ingredients, e.g., dicamba. Do not apply ester formulations when outside temperatures exceed 80°F. Aquatic registered formulations are available for use close to water.</p>
Aminocyclopyrachlor + chlorsulfuron <i>Perspective</i>	<p>Rate: 4.75 to 8 oz product/acre</p> <p>Timing: Postemergence similar to aminopyralid.</p> <p>Remarks: <i>Perspective</i> 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).</p>
Aminopyralid <i>Milestone</i>	<p>Rate: 4 to 7 oz product/acre (1 to 1.75 oz a.e./acre)</p> <p>Timing: Postemergence in spring to rapidly growing plants, or treat soil shortly before plants emerge.</p> <p>Remarks: Aminopyralid is a broadleaf herbicide similar to picloram, but more selective. It is safe on most grasses but will kill most legumes and members of the Asteraceae. It has some soil residual activity and is registered for application up to water's edge.</p>
Aminopyralid + 2,4-D, <i>Forefront HL</i> Aminopyralid + metsulfuron, <i>Opensight</i> Aminopyralid + triclopyr, <i>Capstone</i>	<p>Rate: 1.5 to 2.1 pt <i>Forefront HL</i>/acre; 1.5 to 2 oz <i>Opensight</i>/acre; 4 to 6 pt <i>Capstone</i>/acre</p> <p>Timing: Postemergence, to rapidly growing plants.</p> <p>Remarks: The tank mixes are all broadleaf-selective. <i>Opensight</i> is not registered for use in California.</p>
Clopyralid <i>Transline</i>	<p>Rate: 0.67 to 1.33 pt product/acre (4 to 8 oz a.e./acre)</p> <p>Timing: Postemergence, to rapidly growing plants.</p> <p>Remarks: Clopyralid is a broadleaf herbicide similar to picloram, but more selective on the docks. It is very safe on grasses but will kill most legumes and members of the Asteraceae.</p>
Clopyralid + 2,4-D <i>Curtail</i>	<p>Rate: 2 to 4 qt product/acre</p> <p>Timing: Postemergence, to rapidly growing plants.</p> <p>Remarks: The mixture is broadleaf-selective with a wide range of susceptible species.</p>
Dicamba <i>Banvel, Clarity</i>	<p>Rate: 1 to 2 qt product/acre (1 to 2 lb a.e./acre)</p> <p>Timing: Postemergence, to rapidly growing plants. Smaller plants are more easily controlled. Use higher rates for larger plants.</p> <p>Remarks: Dicamba is a broadleaf-selective herbicide often combined with other active ingredients. It may injure grasses at higher rates. Do not apply when outside temperatures exceed 80°F.</p> <p><i>Overdrive</i>, a premix of dicamba with diflufenopyr, has been reported to be effective on both curly and broadleaf docks. Apply postemergence to rapidly growing plants, 4 to 8 oz</p>

	product/acre. Diflufenzopyr is an auxin transport inhibitor which causes dicamba to accumulate in shoot and root meristems, increasing its activity. Higher rates should be used on biennials or 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.
Fluroxypyr <i>Vista XRT</i>	Rate: 6 oz product/acre (2.1 oz a.e./acre) Timing: Postemergence when the target plants are growing rapidly. For optimum control add 0.25 to 0.5% seed oil surfactant. Remarks: Reduced control occurs if plants are under stressed growth conditions.
Picloram <i>Tordon 22K</i>	Rate: 1 to 2 qt product/acre (0.5 to 1 lb a.e./acre) Timing: Postemergence, to rapidly growing plants before the bloom stage. Remarks: Most broadleaf plants are susceptible, but relatively safe on established grasses. Use non-ionic surfactant at 0.25%. It has a relatively long residual activity. May injure young or germinating grasses. Do not apply near trees, or where soil is highly permeable and where water table is high. Also available as a premix with 2,4-D (<i>Grazon P+D</i>) or fluroxypyr (<i>Surmount</i>). Picloram is a restricted use herbicide. Picloram and its formulations are not registered for use in California.
Triclopyr <i>Garlon 3A, Garlon 4 Ultra</i>	Rate: 0.33 to 1.5 gal <i>Garlon 3A</i> /acre (1 to 4.5 lb a.e./acre), 0.25 to 1 gal <i>Garlon 4 Ultra</i> /acre (1 to 4 lb a.e./acre) Timing: Postemergence, to rapidly growing plants. Remarks: Broadleaf-selective, safe on most grasses. Most effective on smaller plants and has little or no residual activity. <i>Garlon 3A</i> and other amine formulations are registered for aquatic use. <i>Garlon 4 Ultra</i> 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. Can be used in a tank mix with clopyralid or 2,4-D and is available in premixed formulations with these chemicals.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate <i>Roundup, Rodeo, Aquamaster, and others</i>	Rate: 2 to 3.3 qt product (<i>Roundup ProMax</i>)/acre (2.25 to 3.7 lb a.e./acre) Timing: Postemergence, to rapidly growing plants. Remarks: Glyphosate is a nonselective herbicide. It has no soil activity and its effectiveness is increased by addition of ammonium sulfate. Aquatic registered formulations, e.g., <i>Rodeo</i> and <i>Aquamaster</i> , are available for use close to water.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Chlorsulfuron <i>Telar</i>	Rate: 1 to 2.6 oz product/acre (0.75 to 1.95 oz a.i./acre) Timing: Postemergence from bud to bloom stage or to fall rosettes. Remarks: Chlorsulfuron provides residual control up to one year after treatment. It has mixed selectivity, but is generally safe on grasses. Always use a surfactant.
Imazapic <i>Plateau</i>	Rate: 8 to 12 oz product/acre (2 to 3 oz a.e./acre) Timing: Preemergence or postemergence. Remarks: Mixed selectivity, tends to select for members of the Asteraceae and some grasses. It has some soil residual activity. In postemergence applications, use a methylated seed oil surfactant at 0.25%. Imazapic is not registered for use in California.
Imazapyr <i>Arsenal, Habitat, Stalker, Chopper, Polaris</i>	Rate: 3 to 4 pt product/acre (0.75 to 1 lb a.e./acre) Timing: Shortly after emergence. Remarks: Nonselective herbicide; long soil residual activity, leaves more bare ground than other treatments, even a year after application. <i>Habitat</i> is an aquatic registered formulation available for use close to water.
Metsulfuron <i>Escort</i>	Rate: 0.5 to 1 oz product/acre (0.3 to 0.6 oz a.i./acre) Timing: Postemergence from bud to bloom stage or to fall rosettes. Remarks: Do not apply when plants are under stressed growing conditions. In addition to a premix with aminopyralid, metsulfuron can also be used in a premix with 2,4-D + dicamba

	(<i>Cimarron Max</i>). Metsulfuron and its formulations are not registered for use in California.
Sulfometuron <i>Oust</i> and others	Rate: 1.33 to 2 oz product/acre (1 to 1.5 oz a.i./acre) Timing: Preemergence or early postemergence before or during the rainy season, when the target plants are germinating or actively growing. Remarks: Add a surfactant at 0.25% v/v for improved control.
PHOTOSYNTHETIC INHIBITORS	
Hexazinone <i>Velpar DF</i>	Rate: 2 to 5.33 lb product/acre (1.5 to 4 lb a.i./acre) Timing: Postemergence, to rapidly growing plants. Remarks: Apply when there is adequate moisture for activation. A broad-spectrum herbicide which kills or injures many desirable grasses or forbs. High rates of hexazinone can create bare ground, so only use high rates in spot treatments.

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