

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).

Lythrum salicaria L.

Purple loosestrife

Family: Lythraceae

Range: Throughout the western United States, except Arizona. It is more prevalent in the Midwestern and northeastern states.

Habitat: Freshwater and brackish wetlands including marshes, riparian areas, lakeshores, floodplains, seasonally wet areas, intermittent streams, ditches and canals. It sometimes invades upland sites as well. Moisture is critical for establishment, but once established, purple loosestrife can survive for years at dry sites. Somewhat shade-tolerant and grows in most soil types, including infertile soils, but prefers slightly acid to neutral soils.

Origin: Considered to be native to Eurasia.

Impact: An extremely aggressive colonizer which disrupts the ecology of wetland sites by displacing native vegetation and wildlife. An isolated colony of purple loosestrife plants can spread to cover wetland sites in a single season under optimum growing conditions. Purple loosestrife can clog irrigation systems causing significant economic losses. The species has poor palatability and impacts the value of meadows and wetland pastures for grazing. Purple loosestrife is not considered a threat to cultivated crops.

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

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



Purple loosestrife is a perennial, aquatic herb that grows 3 to 7 ft tall, but can reach 10 ft under ideal conditions. It has a persistent taproot and spreading root stock with a dense bushy growth pattern. Plants start producing multiple stems from a single rootstock as early as the second year and can have more than 50 stems per plant. Established plants can have a crown 5 ft wide. Stems are erect and green to purple in color, with few branches, and are either 4- or 6-sided. The stalkless leaves are 0.75 to 4 inches long, 0.2 to 0.5 inch wide, sometimes with fine hairs. They can be opposite or whorled. The leaves are lance-shaped, rounded or heart-shaped at the base, clasping and with smooth margins. Shoots die each fall and new shoots develop the following spring from buds located at the top of the root crown.

Purple loosestrife has showy purple to magenta flowers, clustered on a spike a few inches to 3 ft long. The seed capsule has two cells with numerous tiny reddish-brown seeds (1 mm long or less). Seed production per plant ranges from around 100,000 seeds for young plants to over 2.7 million seeds for established plants. Seeds are dispersed by water and to a lesser degree by wind. Seeds can germinate underwater, and their longevity is at least 3 years. While sexual reproduction by seed is most important, purple loosestrife can also spread vegetatively from stem cuttings. Buried stems have adventitious buds that can produce new shoots or roots.

NON-CHEMICAL CONTROL

Mechanical

(pulling, cutting, disking)

Manually digging or hand-pulling is effective for early infestations to help prevent the establishment of dense colonies. Early detection and removal is essential because established plants are too large and deep-rooted to remove easily. All plant material, especially the root crown, should be removed to prevent resprouting. Pulled plants should be dried or burned. Repeat visits are important to ensure there is no regrowth.

Mowing purple loosestrife can be impractical due to the sites it occupies. Mowing or cutting stems can help

	<p>reduce seed bank accumulation. Late-season cutting was found to reduce shoot production to a greater degree than mid-summer cutting. Mowing or cutting may be more effective when used as part of an integrated approach with herbicides.</p> <p>Tillage is probably not an effective control measure for purple loosestrife. Wetland sites where it grows are not conducive to tillage operations. In addition, any disturbance that fragments live stem or root tissue is likely to spread purple loosestrife, and its extensive soil seedbank is likely to reinvade open areas created with tillage. Three to four consecutive years of tillage might be effective.</p>
Cultural	<p>Purple loosestrife grows in wet areas that are not usually grazed and it has poor palatability.</p> <p>There is little information on the effectiveness of fire, but some sources indicate that purple loosestrife does not burn well and it would be difficult to get a fire to carry through an infested area. Additionally, it is doubtful that burn temperatures in wetland areas would get high enough to kill the massive crown. However, burning removes biomass and may improve the effectiveness of herbicides.</p> <p>Continuous flooding has been somewhat effective for large infestations where the water level can be controlled. The duration of the flooding appears to be more important than the depth of flooding. The precise parameters for maximum effectiveness need further study.</p> <p>Black plastic mulch was found to be marginally effective, but while it can reduce growth and seed production, it does not kill the roots of mature plants.</p>
Biological	<p>Several non-native insects have been released in the United States to control purple loosestrife. These include the black-margined and golden loosestrife beetles (<i>Galerucella californiensis</i> and <i>G. pusilla</i>), whose larvae and adults feed on the foliage and flowers, reducing seed production. In addition, the larvae and adults of the root weevil (<i>Hylobius transversovittatus</i>) feed on the root. Larvae of the loosestrife flower weevil (<i>Nanophyes marmoratus</i> and <i>N. brevis</i>) feed on flowers, and the adults feed on foliage and flowers.</p> <p>The two <i>Galerucella</i> spp. have been the most successful of these biocontrol agents. These beetles were released between 1992 and 1994 and have become established in some states. They are not present in California yet but have shown promising results in Oregon. The root weevil and the flower weevil have been released at test sites in California with mediocre results.</p> <p>There is ongoing research on the use of pathogenic fungi as biocontrol agents for purple loosestrife.</p>

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	
Triclopyr <i>Garlon 3A</i>	<p>Rate: Broadcast foliar treatment: 6 to 8 qt <i>Garlon 3A</i>/acre (4.5 to 6 lb a.e./acre). Spot treatment: 1.5 to 2% v/v solution</p> <p>Timing: Postemergence at bud to mid-flowering stage.</p> <p>Remarks: Thorough coverage and a minimum of 50 gal/acre spray solution is recommended. Follow-up applications should be made to regrowth the following year. Triclopyr is broadleaf-selective and safe on most grasses. It is 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. Triclopyr (1 to 2 qt <i>Garlon 3A</i>/acre) can be mixed with aminopyralid (<i>Milestone</i>) at 7 oz product/acre or with 1 to 2 pt product/acre 2,4-D.</p>
AROMATIC AMINO ACID INHIBITORS	
Glyphosate <i>Roundup, Rodeo, Aquamaster,</i> and others	<p>Rate: Broadcast foliar treatment: 1 to 2 pt product (<i>Roundup ProMax</i>)/acre (0.56 to 1.1 lb a.e./acre). Spot treatment: 1% v/v solution</p> <p>Timing: Postemergence to rapidly growing plants in the full to late flowering stage. Seedlings may be treated in spring following a fall treatment.</p> <p>Remarks: Nonselective, no soil activity. 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.</p>
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Imazapyr <i>Arsenal, Habitat,</i>	<p>Rate: 1 to 2 pt product/acre (4 to 8 oz a.e./acre)</p> <p>Timing: Postemergence to rapidly growing loosestrife after mid-bloom until killing frost.</p>

<i>Stalker, Chopper, Polaris</i>	Remarks: Nonselective, 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: 1 to 2 oz product/acre (0.6 to 1.2 oz a.i./acre) Timing: Postemergence from seedling to flowering stage. Most effective at flower-bud and flowering stage. Remarks: Primarily active on broadleaf species. Always use a surfactant. It can be tank-mixed with 2,4-D for quicker burndown. Other premix formulations of metsulfuron can be used at similar application timing. These include <i>Cimarron Max</i> (metsulfuron + dicamba + 2,4-D) and <i>Cimarron X-tra</i> (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.