Alhagi pseudalhagi (M. Bieb.) Desv.
(= *A. maurorum* [Jepson Manual 2012], *A. camelorum*)

Camelthorn

Family: Fabaceae
Range: Much of the western United States, especially the desert southwest.
Habitat: Arid agricultural areas and riverbanks where roots can access water tables or other water sources during the growing season. Often grows in heavy clay soils. Tolerates some salinity.
Origin: Native to the Mediterranean region and western Asia.
Impacts: Weedy and competitive in rangeland. Because of its sharp spines, animals will not eat the foliage and plants can interfere with human activities. It can become established in croplands, where tillage may spread it.
Western states listed as Noxious Weed: Arizona, California, Colorado, Nevada, New Mexico, Oregon, Washington
California Invasive Plant Council (Cal-IPC) Inventory: Moderate Invasiveness

Camelthorn is an herbaceous perennial to shrub, 3 to 6 ft tall, with simple leaves, many thorny branches, and an extensive woody, creeping root system. One plant can rapidly colonize an area by developing new plants from the creeping roots, which grow more than 6 ft deep and as much as 30 to 40 ft in all directions. Like other legumes, the roots associate with nitrogen-fixing bacteria. Because camelthorn stores extensive reserves below ground, control efforts (including herbicide applications) must be repeated until the plant's root reserves are exhausted.

The mature plant has greenish, ridged, nearly hairless stems. Stems are highly branched, with a spiny branchlet at nearly every leaf axil. Leaves are alternate, sparse, and simple, thick and leathery, oval-shaped and 0.25 to 0.8 inch long. Upper leaf surfaces are hairless to sparsely hairy and covered with tiny red dots. Camelthorn is deciduous in cool climates. In moist habitats, thorns are smaller and fewer, and leaves larger and more numerous. The above-ground parts can be killed by hard frost.

Camelthorn flowers in summer. Each branchlet develops two to six magenta to pink pea-like flowers on short stalks. Flower production is high under hot dry conditions and low to non-existent under moist shady conditions. Reddish-brown pods with a beaked tip develop in late summer. Pods are constricted between seeds and break apart at the constrictions rather than splitting open. Plants reproduce locally from root sprouts, but can be spread greater distances by seed. Seeds disperse in water and, when eaten, can pass through the digestive tracts of herbivores. High winds may tumble clumps of branches with fruits. Seeds can survive submersion in water for at least 8 months and, like most other legumes, can remain viable for many years (> 20) in semi-arid soils. It is thought that viability decreases after 1 year in cool, moist soil conditions.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, disking)	Mechanical removal is not effective, as it can stimulate remaining roots to spread and to develop new shoots. Tillage can spread plant fragments which resprout. Tilling multiple times per season may eventually deplete an infestation over several seasons but is very expensive and impractical on rangeland and in natural areas.
Cultural	When plants are less spiny, cattle and sheep can graze camelthorn. Cattle may preferentially feed on pods, but moving livestock that have browsed on fruits can disperse seeds to new locations. To avoid spread by livestock, forage should be weed-free. Restrict grazing in areas where camelthorn occurs, and quarantine

	livestock for seven days after they have fed on the weed. Burning is not an effective control method, as fire stimulates root sprouting.
Biological	Currently, no registered biocontrol agent for camelthorn is available in the United States.

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:** 3.2 to 4.2 qt product/acre (3 to 4 lb a.e./acre) **Timing:** Postemergence to rapidly growing plants, particularly at the flower bud stage. **Remarks:** Experimental results indicate effective control using 3 to 4 lb a.e./acre 2,4-D twice annually for 3 years. Repeated applications at the label rate may be effective. Do not apply ester formulations when outside temperatures exceed 80°F.
2,4-D + dicamba tank mix	**Rate:** 1.6 qt product/acre of 2,4-D + 1.5 qt product/acre of dicamba **Timing:** Postemergence to rapidly growing plants. **Remarks:** One study reported 95% control using this tank mix treatment.
Aminopyralid *Milestone*	**Rate:** 5 to 7 oz product/acre (1.25 to 1.75 oz a.e./acre) **Timing:** Postemergence to rapidly growing plants before bloom. **Remarks:** Aminopyralid is a broadleaf herbicide similar to picloram, but more selective and with shorter soil residual activity. Very safe on grasses. The residual activity of aminopyralid will also provide preemergence control of germinating seeds.
Aminopyralid + triclopyr *Capstone* or tank mix	**Rate:** 4 to 8 pt product (*Capstone*)/acre **Timing:** Postemergence to rapidly growing plants before bloom. **Remarks:** Residual activity will also provide preemergence control of germinating seeds.
Picloram *Tordon 22K*	**Rate:** 2 to 4 pt product/acre (0.5 to 1 lb a.e./acre) **Timing:** Postemergence in spring or fall. **Remarks:** Picloram is one of the most effective chemical control options. It has long soil residual, so broadcast applications will also control germinating seed. Can be tank mixed with triclopyr, imazapyr, or glyphosate for improved control. Picloram is a restricted use herbicide. Not registered for use in California.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup*, *Accord XRT II*, and others	**Rate:** 2 qt product (*Roundup ProMax*)/acre (2.25 lb a.e./acre) **Timing:** Postemergence to rapidly growing plants. Most effective in spring or fall. **Remarks:** Glyphosate has no soil activity and is nonselective. Repeated applications will probably be necessary. This species is a good candidate for wiper applications at 33% to 50% v/v solution.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Imazapyr *Arsenal*, *Habitat*, *Chopper*, *Stalker*, *Polaris*	**Rate:** 3 to 4 pt product (*Habitat*)/acre (0.75 to 1 lb a.e./acre) broadcast, or spot treatment with 0.75 to 1.5 qt per 100 gal water (0.2 to 0.4% v/v solution). *Chopper* or *Stalker* can also be used in basal bark treatments at 20% v/v solution with methylated seed oil. **Timing:** Postemergence to rapidly growing plants. **Remarks:** Imazapyr has a fairly long soil residual and is nearly non- selective.
Metsulfuron *Escort*	**Rate:** 1 to 3 oz product/acre (0.6 to 1.8 oz a.i./acre) broadcast, or spot treatment with 1 to 2 oz per 100 gal water. **Timing:** Postemergence to rapidly growing plants at flower bud stage. **Remarks:** Metsulfuron has some soil residual activity. It is safe on most grasses. 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.