Halogeton glomeratus (M. Bieb.) C.A. Meyer

Halogeton

Family: Chenopodiaceae
Range: Throughout the dry arid regions of the western U.S.
Habitat: Disturbed open sites, dry lakebeds, shrublands, roadsides, typically where native vegetation is sparse. Inhabits arid and semi-arid regions, especially where winters are cold. Primarily adapted to alkaline and saline soils.
Origin: Native to the cold desert regions of Eurasia.
Impacts: Plant tissues accumulate salts from lower soil horizons. The salts leach from dead plant material, increasing topsoil salinity and favoring halogeton seed germination and seedling establishment. The foliage contains variable amounts of soluble sodium oxalates and can be fatally toxic to livestock, especially sheep, when ingested in quantity. Impacts grazing capacity as animals generally avoid consuming the bitter-tasting foliage if more palatable forage is available. Caution should be exercised, however, when unloading hungry livestock onto halogeton-infested rangeland.
Western states listed as Noxious Weed: Arizona, California, Colorado, New Mexico, Oregon
California Invasive Plant Council (Cal-IPC) Inventory: Moderate Invasiveness

Halogeton is an erect winter or summer annual to 1.5 ft tall, with small fleshy leaves. Stems are usually tinged reddish or purple and the leaves are alternate, sessile, dull green to bluish-green, with a stiff bristle tip.

The flower clusters are numerous and dense in most leaf axils. Flowers lack petals and produce one-seeded fruits (utricles) with the sepals forming a fan-shaped structure concealing the black or brown seeds. Plants reproduce only by seed, which are dispersed by seed-gathering ants, animals, and when dry plants break off at ground level and tumble with the wind. Many seeds survive ingestion by animals, including sheep and rabbits. Black seeds can imbibe water and germinate in less than 1 hour. Because seed form small coiled embryos in fruit, they do not persist long in the soil.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, disking)	Because halogeton is a simple shallow-rooted annual, it can be controlled effectively by tillage or pulling. Plants are easiest to control as seedlings or in early vegetative growth. Plants not controlled until after flowering begins may contain seeds and should be removed and destroyed to prevent reseeding. Periodic mowing close to the soil surface can significantly reduce but not completely prevent seed production. Surviving branches below the reach of mower blades will continue to produce viable seeds. It is best to avoid increasing disturbance unless successful restoration of perennials is highly probable.

Cultural	Disturbances such as overgrazing and fire typically reduce desirable vegetation and increase open sites with bare soil. This can encourage invasion and establishment of halogeton. Any cultural control strategy should increase perennial vegetation, as halogeton has been shown to compete poorly with established perennial species. Grazing alone is not a control option because of the toxicity of the plant. However, timely grazing of desired vegetation has been shown to reduce halogeton spread. For example, halogeton in Nevada decreased under late spring to early summer (mid-April to mid-June) grazing at moderate intensity, compared to high intensity grazing in early spring (March to April). While fire can kill standing halogeton plants, fire disturbance often enhances seed germination and favors the growth of dense stands when the burns are not hot enough. In most cases, halogeton is one of the first plants to reestablish following wildfire on infested rangeland.
Biological	No biological control agents are available for the control of halogeton. A stem-boring moth (*Coleophora parthenica*) from Pakistan was released for halogeton control in the U.S. However, it failed to establish. Other potential biological control agents have been identified in Central Asia, but they have not yet been developed and tested.

CHEMICAL CONTROL

The following specific use information is based on 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:** 2 to 6 pt product/acre for ester formulation (0.95 to 2.85 lb a.e./acre) **Timing:** Postemergence in early spring when plants are growing rapidly before bloom stage. **Remarks:** 2,4-D gives good, but not excellent, control and may damage desirable broadleaf natives, particularly at high rates. Reapplications are required to control subsequent germinants. Ester formulations are considered more effective than amine formulations. Apply with a crop oil concentrate for consistent control. Because of injury to native shrubs and a lack of desirable forage species adapted to alkali conditions, the use of 2,4-D for halogeton control has declined in recent years.
Aminocyclopyrachlor + chlorsulfuron *Perspective*	**Rate:** 3 to 4.5 oz product/acre **Timing:** Postemergence in early spring when plants are growing rapidly before bloom stage. **Remarks:** *Perspective* provides broad-spectrum control of many broadleaf species. Although generally safe to grasses, it may suppress or injure certain annual and perennial grass species. Little is known of the herbicide for halogeton control as its registration is relatively new. However, it has been shown to be very effective in herbicide trials. 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).
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup, Accord XRT II*, and others	**Rate:** Spot treatment, 2% v/v solution *Roundup ProMax* **Timing:** Postemergence in summer before plants bloom. **Remarks:** Use as a spot treatment on small infestations. Repeat treatments are necessary to control flushes emerging later in the season.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Chlorsulfuron *Telar*	**Rate:** Label recommends 0.5 to 1 oz product/acre (0.375 to 0.75 oz a.i./acre), but field results have shown 0.2 to 0.5 oz product/acre (0.15 to 0.375 oz a.i./acre) to be effective. Apply with surfactant. **Timing:** Postemergence in late spring or early summer when plants are only 1 to 3 inches tall. **Remarks:** Chlorsulfuron has been shown to be more effective than metsulfuron in western rangelands. Chlorsulfuron can damage some native shrubs, including Nuttall's saltbush (*Atriplex nutalllii*). Chlorsulfuron is considered the most effective herbicide for control of halogeton in

	rangelands.
Imazapic *Plateau*	**Rate:** 4 to 6 oz product/acre (1 to 1.5 oz a.e./acre) **Timing:** Preemergence or early postemergence to seedlings 1 to 3 inches tall. **Remarks:** For postemergence application, add a surfactant at about 1.5 oz/acre. Imazapic is selective to most native grasses, but will injure some species. Higher rates may suppress seedlings of some cool-season grasses. Imazapic is not registered for use in California.
Metsulfuron *Escort*	**Rate:** 0.5 to 1 oz product/acre (0.3 to 0.6 oz a.i./acre). Apply with surfactant. **Timing:** Postemergence in the late spring or early summer when seedlings have emerged and are growing rapidly, generally 1 to 3 inches tall. **Remarks:** Metsulfuron does not cause injury to grasses and this may be a desirable feature in areas with crested wheatgrass or other forage grasses. Metsulfuron is not registered for use in California.
PHOTOSYNTHETIC INHIBITORS	
Tebuthiuron *Spike 20P*	Tebuthiuron is a pelleted formulation that provides total vegetation control for several years and may be desirable for use on railroad ballast and oil field locations, where halogeton is often found. It has a very long soil residual activity and will provide total vegetation control for 3 to 5 years.

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.