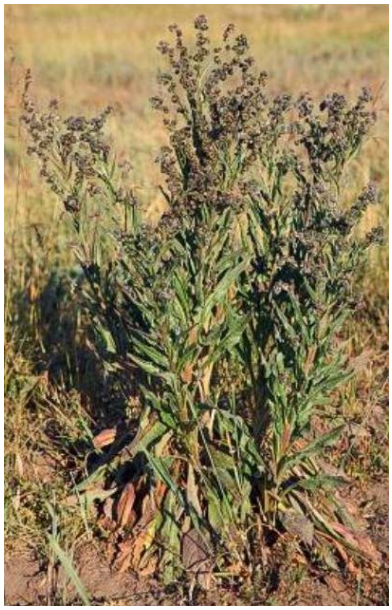
Cynoglossum officinale L.

Houndstongue



Family: Boraginaceae
Range: Throughout contiguous United States, except Texas, Oklahoma, Louisiana, Mississippi, and Florida. Found in all western states.
Habitat: Woodlands, pastures, fields, rangeland, forest margins and disturbed sites such as roadsides, sand dunes, abandoned cropland, ditch banks, and urban waste areas. Often on sandy or gravelly soil; colonizes bare soil and under dripline of trees and shrubs, making control difficult.
Origin: Native to Eurasia and accidentally introduced in the late 1800s as a seed contaminant in cereal grain.
Impacts: Houndstongue can be a serious problem in rangeland, pasture and forest settings. The weed is highly invasive and can form dense monotypic stands. Foliage, especially young leaves, and fruits contain pyrrolizidine alkaloids and are liver toxins in all livestock classes, especially horses, when ingested in small amounts over time or in a single large quantity. Plants have a distinctive scent that appears to deter animals from consuming live foliage, thus most poisonings occur when animals consume hay over time.
Western states listed as Noxious Weed: Colorado, Montana, Nevada, Oregon, Utah, Washington, Wyoming
California Invasive Plant Council (Cal-IPC) Inventory: Moderate Invasiveness

Houndstongue is a biennial or short-lived perennial, with erect flower stems to 4 ft tall. The leaves can vary in size, depending on growing conditions, from 4 to 12 inches long and 1 to 3 inches wide. During its first year, the plant stores carbohydrates in a large developing taproot that becomes black and woody by the season's end.

During the second year of growth, plants develop additional leaves followed by an inflorescence, up to 4 ft tall, with reddish-purple flowers, 0.25 inch wide, often horizontal to slightly drooping. The seeds are contained within four distinctive nutlets. Each nutlet is 0.5 inch long, brown or grey-brown and covered with short, hooked prickles that cling to hair, fur, or clothing. Often referred to as "beggar's lice", these nutlets are exceptional dispersal agents. A few of the nutlets drop from the plant, but most stay attached to the persistent inflorescence many months or even years until they are picked up by a passing animal. Houndstongue reproduces solely from seed and a single plant can produce up to 2,000 seeds that can remain viable for 2 to 3 years.

NON-CHEMICAL CONTROL

Mechanical (pulling, cutting, disking)	Digging, pulling, and cutting can be effective if the root crown is severed. Cut young rosettes below the crown in fall or early spring. Clipping or mowing second-year plants close to the ground during flowering can greatly reduce seed production, even in plants which survive and regrow. Mechanical control must be done frequently to have any effect, and is only feasible for small infestations. Houndstongue will not withstand regular cultivation of the young rosettes.
Cultural	Grazing is not practical due to risk of poisoning. Reseeding problem areas with fast growing grasses, and not overgrazing can prevent invasion. Long-term reduction of houndstongue must involve planting competitive plant species. Many improved grass species can be seeded in late fall or winter.
Biological	A biological control program for houndstongue was initiated in 1988. The first North American releases for biological control were the root-mining flea beetle *Longitarsus quadriguttatus* and the houndstongue root-mining weevil, *Mogulones cruciger*, in British Columbia in 1997-1998. *M. cruciger* has become well-

	established in Alberta and has greatly reduced houndstongue there. However, this species has not been approved yet for release in the U.S. Several other insects are being evaluated, although initial results are not as promising as those of the root weevil. The native fungal pathogen that causes powdery mildew (*Golovinomyces cynoglossi*) has been reported to cause some foliar damage to houndstongue in many western 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:** 4 pt product/acre (1.9 lb a.e./acre) **Timing:** Postemergence when plants are growing rapidly. Applications in spring provide the best control. **Remarks:** Selective herbicide for broadleaf species. In areas where desirable grasses are growing around houndstongue, 2,4-D can be used without non-target damage. Good coverage is necessary.
Aminocyclopyrachlor + chlorsulfuron *Perspective*	**Rate:** 4.75 to 8 oz product/acre plus 0.25 to 0.5% v/v surfactant **Timing:** Preemergence or postemergence. **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. 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).
Aminopyralid + metsulfuron *Opensight*	**Rate:** 2.5 to 3.3 oz product/acre plus 0.25 % v/v surfactant **Timing:** Apply rosette to mid-bolt when plants are actively growing. **Remarks:** Use the higher rate on bolting plants.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup*, *Accord XRT II*, and others	**Rate:** Broadcast treatment: 1 to 2 pt product (*Roundup ProMax*)/acre (0.56 to 1.1 lb a.e./acre). Spot treatment: 1.5 to 2% v/v solution *Roundup* (or other trade name) and water to thoroughly wet all leaves. **Timing:** Postemergence when plants are growing rapidly. **Remarks:** Glyphosate is a nonselective systemic herbicide with no soil activity.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Chlorsulfuron *Telar*	**Rate:** 1 to 1.5 oz product/acre (0.75 to 1.125 oz a.i./acre) plus 0.25 to 0.5% v/v surfactant **Timing:** Preemergence or postemergence. Spring applications are most effective. **Remarks:** Selective herbicide effective for controlling broadleaf weeds and some grasses.
Imazapic *Plateau*	**Rate:** 8 to 12 oz product/acre (2 to 3 oz a.e./acre) plus 0.25 to 0.5% v/v surfactant **Timing:** Preemergence or early postemergence. **Remarks:** Imazapic is a selective herbicide effective for controlling broadleaf weeds and some grasses. Imazapic is not registered for use in California.
Imazapyr *Arsenal*, *Habitat*, *Stalker*, *Chopper*, *Polaris*	**Rate:** 1 pt product/acre (4 oz a.e./acre) plus 0.25 to 0.5% v/v surfactant **Timing:** Preemergence or postemergence. **Remarks:** Imazapyr is a preemergent and postemergence herbicide effective for controlling broadleaf and grass weeds.
Metsulfuron *Escort*	**Rate:** 1 oz product/acre (0.6 oz a.i./acre) plus 0.25 to 0.5% v/v surfactant **Timing:** Early postemergence. Spring applications are most effective. **Remarks:** Selective herbicide for broadleaf species. Can be used safely around desirable grasses. It

	can be used as a premix with aminopyralid (*Opensight*) at 2.5 to 3.3 oz product/acre. Metsulfuron is not registered for use in California.
Sulfometuron + chlorsulfuron *Landmark* XP	**Rate:** 0.75 to 2.25 oz product/acre plus 0.25 to 0.5% v/v surfactant **Timing:** Preemergence or postemergence. **Remarks:** Effective for controlling broadleaf weeds and some grasses. Long soil residual activity.

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.