

## Managing Houndstongue

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Houndstongue (*Cynoglossum officinale* L.) is a biennial introduced to North America from Europe as a contaminant of cereal seed. In addition to being very invasive, this member of the Boraginaceae (Borage) family contains alkaloids that are highly toxic to cattle and horses. Houndstongue displaces native rangeland vegetation by capturing soil resources with its deep, well-anchored taproot, and infests pastures, hay fields, and disturbed areas throughout North America.



Figure 1. Houndstongue forms rosettes in the first year of growth.

### Identification

Houndstongue produces a leafy rosette in the first year (Fig 1.) and then grows to one to four feet tall the second season. The taproot is thick, woody, black, and branching. The plant's rough, hairy leaves are alternate, one to twelve inches long, one to three inches wide, and lack teeth or lobes. They have distinct veins and resemble a houndstongue. The

lower leaves taper to the stem and are linear and pointed, while the upper leaves are smaller and stemless.

The small, terminal flowers are reddish-purple, have five lobes, and are borne in long flower clusters on erect, unbranched, hairy, coarse stems. Houndstongue's flowers have five anthers, five petals, and five sepals that form a star-shaped calyx.

Four prickly nutlets are produced from a flower. Each is about 1/3 inch long (Fig. 2). They break apart into single seeds at maturity. The egg-shaped seeds are flat on top, with a scar that runs near the lower surface and a hard spiny husk with barbs. They easily cling to animals and clothing. A plentiful amount of seeds are produced in the second year and germinate from February to May. Seeds can remain viable on the soil surface for up to two years.



Figure 2. Houndstongue flowers in the second year of growth, producing an abundance of barbed seeds.

## Habitat

Houndstongue can survive hot, dry summers, as well as cold winters. It is found on a variety of soils from well-drained, relatively coarse, alkaline soils to clay subsoil. It is tolerant of shade and prospers in wetter grasslands. It is found on roadsides, meadows, and disturbed places. Houndstongue has been found in Elko County, Nevada and can quickly spread to other areas of the state.



Figure 3. Mature houndstongue plants grow one to four feet tall.

## Threat

Houndstongue contains pyrrolizidine alkaloids that are toxic and stop the reproduction of liver cells. Animals may survive for six months or longer after eating a lethal amount. Sheep are less vulnerable to poisoning than are cattle or horses. Horses may be especially affected when restricted to a small, infested area without other desirable forage.

Livestock will avoid houndstongue in rangelands because it is unpalatable and has a distinctive, unpleasant odor, but any small pieces found in hay will not be shunned. Symptoms of poisoning include: weight loss, photosensitization, jaundice, diarrhea, nervousness, convulsions, and coma. Horses also respond by pressing their heads against solid objects, buildings posts, trunks, etc. Animals will not recover. Houndstongue may also cause dermatitis in humans.

Houndstongue very strongly competes with desirable forage. Its prickly seeds easily attach to people, animal coats, and vehicles, spreading to unlimited distances. The seeds are very hard to remove after they cling to animals, thus lowering the wool value of sheep. They may also cause irritation and behavioral problems in cattle.

## Weed Management Options

**Prevention:** Preventing the spread of houndstongue into uninfested areas is the most important approach to managing weeds. Seeds are the only source of reproduction, so it is important to be aware of seeds clinging to animals, clothing, and vehicles. Seeds removed should be burned in a hot fire. Ranges and pastures should be maintained to encourage production of grasses and high quality forage.

It is recommended both private and public lands be monitored annually for houndstongue invasions. Eliminate it where it is found and then revisit the site each year in order to assure there are no escapes. It may be necessary to limit recreational access in both infested and uninfested areas to prevent its spread. Back-packers must clean the coats and purge their animals before entering areas free of infestation. They must use certified weed-free feeds while moving through uninfested lands. Always select and plant weed-free forage seed, and beware of seed and hay from different areas where houndstongue has been found.

**Mechanical Control:** Digging, pulling, and cutting are considered ineffective means of control, but can be effective if the root crown is

severed and all plants are disposed of properly. Mechanical methods must be done frequently in order to have any effect, and is only feasible for small infestations.

**Cultural Control:** Houndstongue will not withstand regular cultivation of the young rosettes. Clipping and mowing close to the ground during flowering can greatly reduce seed production. Reseed problem areas with fast growing grasses, and do not overgraze.

Long-term reductions of houndstongue must involve planting competitive plant species. Many improved grass species can be seeded in late fall or winter when seedbeds are prepared correctly. An initial broadleaf herbicide treatment is necessary to restrain problem weeds before and after seeding. Characteristics to look at in grasses are: adaptation to the soil and climate, ease of establishment, and competitiveness.

**Biological Control:** A biological control project for houndstongue was initiated in 1988. Success was site specific and depended upon climate, soil and plant conditions.

The species to consider for management are *Mogulones cruciger* (a root-mining weevil) and *Longitarsus quadriguttatus* (a flea beetle).

This flea beetle is host specific to the *Cynoglossum* genus, with a strong preference for houndstongue. *L. quadriguttatus* was introduced into Canada in 1998. The adult flea beetles emerge in late May to mid-June until October, and feed on aerial plant parts. The females lay eggs at the bases of petioles or at the root crown. The three larval instars develop during late summer and fall, mining on the cortex of the taproot and secondary roots. They overwinter in the roots, complete development in early spring, and pupate in the soil in April.

**Chemical Control:** Effective chemical control requires multiple applications. Timing and application rate are extremely important for success.

Applying one quart/acre of picloram in the spring, summer, or fall can control first-year rosettes. Very successful control of second-

year rosettes can be obtained by an early spring application of 2,4-D amine before bloom. Applying at flowering will also provide control, but not as much. Metsulfuron is recommended for use in pastures and disturbed areas. Reapplication may be necessary in the first year of control in order to prevent seed production. Annual herbicide applications will likely be required for complete control of houndstongue.

## Conclusion

This poisonous plant infests pastures, fields, and disturbed areas. Actions such as limited weed seed dispersal, control of current infestations, reduction of soil disturbances, early weed detection, establishment of competitive grasses, and proper grazing must be taken to prevent its spread and establishment. Houndstongue is very competitive and control practices must be repeated in order to obtain results.

## References

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Photographs courtesy of *Weeds of the West*.

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