

# Hoary Cress Whitetop: Options for Control

Hoary Cress, commonly called Whitetop, a deep-rooted, perennial mustard, is a highly-competitive and aggressive noxious weed.

In Lincoln County, Whitetop is found in Wilbur, Almira, Creston, Odessa, Reardan, Edwall and Lords Valley and along Crab, Goose, Wilson, Canniwai and Indian Creeks. It is also seen by Sylvan Lake on Laney Brothers Road.

Whitetop forms a dense monoculture that displaces native plant species, and reduces biodiversity, wildlife habitat and forage production. It can be a serious threat to the cattle industry since Whitetop contains glucosinolates that can be toxic to cattle. This noxious weed will reduce crop yields on farmland by aggressively out-competing for soil moisture.



Hoary Cress Whitetop in bloom



A Whitetop seedling



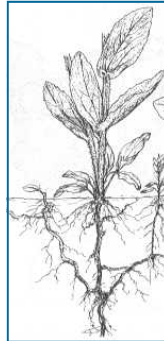
Distinctive, pubescent leaf



Whitetop out of control

Whitetop begins its life cycle in the fall with seed germination and seedling establishment. Seedlings grow quite rapidly! Lateral roots develop within three weeks. Seedlings over-winter as rosettes.

Whitetop will form an extensive mesh of roots that can



dominate an entire parcel. Small infestations are spread by rhizomes which are underground stems capable of producing shoots. A single plant can spread to an area 12 feet in diameter in its first year; and 12 to 30 feet in the second and third growing seasons.

The root system consists of a vertical taproot that develops several lateral roots. Lateral roots eventually turn down to also become vertical roots, sometimes deeper than the parent roots. Whitetop can often

place its roots directly into the water table. Without competition, a single plant can produce 450 shoots in a single year, but it rarely exceeds 50 shoots.

A single plant can produce from 1,200 to 4,800 seeds each year. There can be as many as 850 seeds per flowering stem.

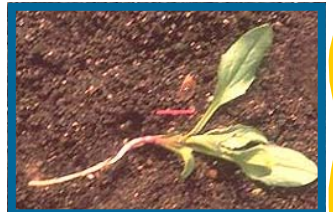
Despite its tenacity, Whitetop can be effectively controlled. Use a variety of management techniques including spraying plants while they are still in the rosette stage, both early in the spring as well as later in the fall. If you spray at the right time, with a good herbicide and an MSO surfactant, Whitetop can be licked and your control efforts will be successful.



Hoary Cress Whitetop



Patch of Hoary Cress Whitetop



Long root of Whitetop seedling



Hoary Cress Whitetop seedling

## Biology of Hoary Cress Whitetop

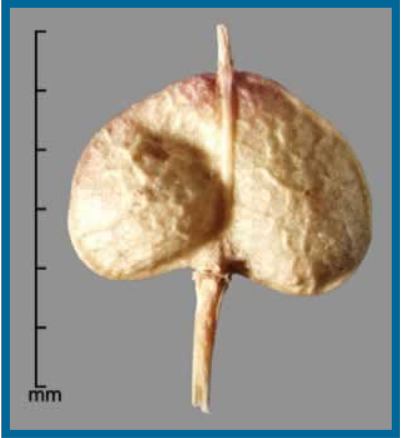
- **Scientific Name:** *Lepidium draba*, formerly called *Cardaria draba*.
- **Origin:** The former USSR, northern Iran and Afghanistan. It probably arrived in North America with contaminated alfalfa seeds.
- **First Found:** Long Island, New York in 1862. In state of Washington in 1916 (Whitman County), and Lincoln County in 1987.
- **Where Found:** Open, unshaded areas, especially after a disturbance, in moist, sub-irrigated pastures, rangeland, ditch banks, roadsides and waste areas. Invasion of arid rangeland is not likely. Whitetop requires 12 to 16 inches of moisture annually. It is best adapted to alkaline soils, but alkaline soils are not an absolute requirement for invasion.
- **Identification:** Hoary Cress Whitetop is a member of the mustard family. The plant normally grows from 10 to 24 inches tall. It is a herbaceous, relatively long-lived, perennial weed with deep, extensive rhizomes.
- **Leaves:** It has both basal and stem leaves. Basal leaves taper to a short stalk that attaches to the crown near the ground. Stem leaves are grayish-to bluish-green, arrowhead-shaped, with smooth and occasionally finely-toothed edges. All leaves have a covering of soft white hairs. A good surfactant is thus needed when spraying. The base of each leaf clasps around the stem at the point of attachment.
- **Flowers:** The flowers have four petals and six stamens. Dense blooming stands look very much like a patch of late-melting snow.
- **Blooms:** The weed blooms by late-April. After blooming, it continues to grow until frost. If conditions are right, it will flower and produce a second crop of seeds later in the summer.

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# More Biology of Hoary Cress Whitetop



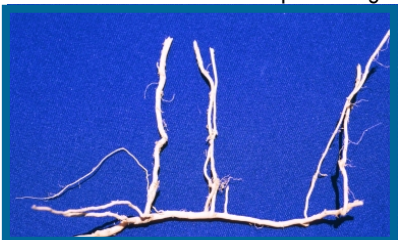
Whitetop seeds are only 1-2 mm long.



The Whitetop seed germinates.

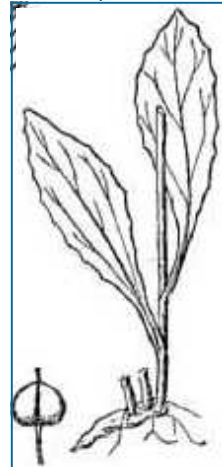


The seed becomes a Whitetop seedling.



Whitetop grows a massive system of

- **Life Cycle:** The weed begins its life cycle in the fall, with seed germination and seedling establishment. Seedlings over-winter as rosettes.
- **Growth Pattern:** The plant initiates growth very early in the spring, by mid-April. New green growth can be seen before other plants. The time to apply herbicides is when the plant is still a rosette.
- **Seed Production & Dispersal:** Seeds are spread by the wind, along waterways and irrigation systems, on vehicles and machinery (especially during cultivation) and in contaminated hay and crop seed. A single plant can produce from 1,200 to 4,800 seeds each year, or as many as 850 seeds per flowering stem. Buried seeds are viable for up to three years in the soil.



- **Roots:** Roots grow very rapidly, 12 to 30 feet by the second or third seasons. The root system consists of a vertical taproot with a mesh of lateral roots. Whitetop can place its roots directly into the water table. Vertical and lateral roots produce adventitious buds which develop into rhizomes and shoots. The deep root system and the weeds' ability to reproduce vegetatively make these weeds difficult to control. Due to its extensive system of roots, this weed can form a monoculture that squeezes out all other plants and vegetation.
- **Shoots:** Shoot development tends to occur at or just above the point where lateral roots bend downward and become vertical. However, buds can form on any part of the root system.

## Preventing Invasion & Containing Infestations

- **Integrated Weed Management:** Successful management of Whitetop requires combining strategies to prevent the movement of weeds, containing existing infestations, and reducing weed infestations to tolerable levels.
- **Prevent Invasion:** Detect and eradicate new plants early. Refrain from driving vehicles and machinery through infested areas during seeding. Wash the undercarriages of vehicles and machinery before leaving infested areas. Livestock should not graze weed-infested areas during flow-

- ering and seed set. Avoid Whitetop patches during cultivation. Go around small weed infestations during harvest. Screen irrigation water before it enters a clean field. Limit access to property to campers, hunters and off-road vehicles.
- **Proper Grazing Plan:** Alter the seasons used for grazing to allow favorable plants time to recover. Rotate livestock.
- **Early Detection:** Perform systematic surveys to locate new infestations. An eradication plan should include spraying, revegetation and follow-up monitoring.



The Dennis Buddrius property in Wilbur, on the left, had been a "carpet of whitetop," but was sprayed on April 17, 2006, while the weed was still in the rosette stage. Notice the new grassy groundcover.



The adjoining property, across the railroad tracks, was sprayed in June, after the "popcorn stage." Notice the dead Whitetop with viable seed-heads remaining along Goose Creek.

## Mechanical and Cultural Control

- Successful hand pulling or digging can only be done on very small infestations. It requires complete plant removal within 10 days after weed emergence throughout the growing season for two to four years.
- Cultivation must be at least six inches deep, and repeated within 10 days of weed emergence throughout the growing season for two to four years.
- Mowing to ground level during flowering

reduces biomass and seed production, but does not provide long-term control, unless herbicides are sprayed about a month later.

- Planting competitive legumes, such as alfalfa, can reduce Whitetop in crop-pasture rotations. Extremely dense stands of legumes can successfully compete for soil moisture and shade out the Whitetop.

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The lush, green growth of Whitetop

## Cattle Grazing On Hoary Cress Whitetop

- Cattle grazing on Whitetop is not effective noxious weed control.
- Whitetop contains glucosinolates that can be toxic to cattle, especially in dense patches.
- Cattle avoid Whitetop but when forced to graze it, they produce tainted milk.
- Livestock should not graze weed-infested areas during flowering and seed set. Otherwise, seeds will pass through their digestive systems and spread infestations throughout an entire pasture.

## Chemical Control of Hoary Cress Whitetop

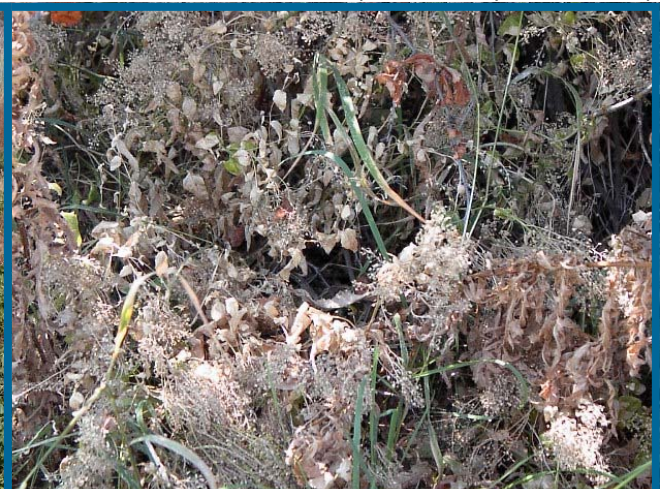
- Successful control depends on spraying at the right time with an aggressive re-application program.
- Spray when the plant is still a rosette, both early in the spring, and later in the fall.
- Spraying rosettes twice a season should eradicate the weed after three years.
- Milestone and 2,4-D have been very effective in test plots in Lincoln County. These products can be used to the edge of a creek. A state applicator's license is not needed for their use. Unlike 2,4-D, Milestone provides some residual coverage for 1-2 years.
- Apply 5 oz. of Milestone; or 1 gallon of 2,4-D; plus 3 quarts of a good surfactant like Excel-90, for each acre.
- For each acre, apply Escort or Telar, at 0.5 to 1 oz.; Tordon at 1 pint; or Weedmaster at 1 quart. They are all very effective, but do not use them along creeks.
- The use of a good, penetrating MSO or silicone surfactant is essential since the leaves are covered with soft, white hairs.
- Applying herbicides at the "popcorn stage" will "knock Hoary Cress down," but not eradicate it for very long.



A thick patch of Hoary Cress Whitetop



The herbicide Milestone was sprayed in this strip near Lewis Bridge in western Lincoln County. The herbicide definitely controlled the Hoary Cress Whitetop. The herbicide allowed 95 percent control.



**Frozen in time:** The Hoary Cress Whitetop in this field near Lewis Bridge was sprayed with Milestone, leaving the noxious weeds definitely dead just one week later.

## What The Experts Say About Chemical Control



When the Whitetop rosette emerges, it is time to spray for an effective kill.



Whitetop seedling mixed in with grass



Whitetop is often found along creeks.



Whitetop has an extensive mesh of roots.

- **Montana Weed Control Association:** Whitetop species can be controlled using herbicides, although it is difficult. Successful control usually depends on an aggressive reapplication program. On rangeland, roadsides and waste areas, apply Escort (metsulfuron) at ranges from 2/10 to 3/4 ounces of product per acre to actively growing rosettes early in the spring, and to re-growth before the bud stage, or to fall re-growth before the first killing frost. Treatment after bloom is generally less effective. It is important to apply this chemical with at least 10 gallons of water per acre and to use a nonionic surfactant at a rate of two quarts per 100 gallons of solution. Nitrogen fertilization will enhance the vigor of grasses which will slow the rate of reinvasion.



- **Lander County, Nevada Conservation District:** Apply one ounce of Escort or Telar per acre (in non-crop sites). Apply to pre-bloom rosettes in the early spring and

to re-growth rosettes in the fall. Use of a surfactant will increase its effectiveness. Follow the label instructions and precautions. Do not contaminate water.

- **Montana State University Extension:** Apply Escort (metsulfuron) at ranges from 0.5 to 1 ounce of product per acre to actively growing rosettes early in the spring, to re-growth before bud stage, or to fall re-growth before the first killing frost. Treatment after bloom is generally less effective.

- **Lander County: Back-Pack Sprayer:** Add 1/2 ounce of Escort or Telar to 64 ounces of water, plus an ounce or two of Surfactant, plus one teaspoon of household ammonia (The ammonia will provide complete mixing or solubilization of Escort or Telar). Stir mixture; add 8 ounces of this mixture to 3-4 gallons of water in the sprayer. Rate is approximately 1 ounce per acre when spraying roughly 2,000 square feet. The mixture is effective for 70 hours. Do not mix more than you can use in 70 hours.

## Biocontrols: Developments on the Horizon

- No natural enemies for biological control are yet available in the United States for Whitetop, but there is a massive amount of ongoing research to find biocontrols.
- The Hoary Cress Consortium is a group of international scientists attempting to find solutions for controlling this noxious weed. Check out their latest research at: <http://www.sidney.ars.usda.gov/hoarycress/index.html>
- Hoary Cress Consortium participants include Dr. Mark Schwarzlaender at the University of Idaho; CABI Biosciences-

Switzerland; and the U.S. Dept. of Agriculture- Ag. Research Service.

- Current biocontrol research is focused on a leaf rust, a seed rust, the Shiny Hoary Cress Flea Beetle (*Psylloides wrasei*), a fungus (*Cercospora bizzoerian*), a stem weevil (*Ceutorhynchus merkli*), a root weevil (*Barris Semistriata*) and several *viruses*.
- A biocontrol must be host-specific and effective before it will be released. This may require many years of research before its use in Lincoln County.



Two views of Hoary Cress Stem Weevil, *Ceutorhynchus merkli*



Seed rust on Hoary Cress seeds



Root Weevil, *Barris Semistriata*



Shiny Hoary Cress Flea Beetle, *Psylloides wrasei*