

**This booklet is a
collaborative effort
between**



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Noxious Weed Management



Guide

Summit County, CO

About This Guide

The purpose of this guide is to provide information to the citizens and land managers of Summit County, Colorado, who are interested in noxious weed management. The goal is to increase awareness of noxious weeds, emphasize the importance of proper identification and management of noxious weeds, and provide means of control for local noxious weed species based on local, state, and national research-based information.

For more detailed information on specific noxious weeds, contact

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Thank you to everyone who contributed to the success of this publication!!!



What are Noxious Weeds & Why Should You Care?

Noxious weeds, as defined in the Colorado Noxious Weed Act, are non native “alien” plants that aggressively invade; are detrimental to economic crops or native plant communities; are poisonous to livestock; are carriers of detrimental insects, diseases or parasites; or have direct or indirect effects that are detrimental to the environmentally sound management of a natural or agricultural ecosystem.

You should care about noxious weeds because they are a threat to Colorado’s natural resources. Thousands of acres of cropland, rangeland, wildlife habitat and native plant communities are being destroyed by noxious weeds every single year.

Colorado Noxious Weed Act

The Colorado Department of Agriculture has been enforcing noxious weed control since 1990, but the most recent revision of the Colorado Noxious Weed Act came in 2004.

The act specifically states, “It is the duty of ALL persons to use integrated methods to manage noxious weeds if the same are likely to be materially damaging to the land of neighboring landowners.”

The Colorado Noxious Weed Act also laid the foundation for the formation of county and municipality noxious weed plans in order to organize a statewide, coordinated effort to stop the spread of noxious weeds in Colorado.

Read the Colorado Noxious Weed Act in its entirety at <http://www.100thmeridian.org/laws/pdfs/Colorado%20Noxious%20Weed%20act.pdf>

Noxious Weed Designation

Noxious weeds are designated in one of three lists under the Colorado Noxious Weed act according to their statewide distribution and level of required control.

“List A” species are rare in Colorado and are **SUBJECT TO ERADICATION WHEREVER DETECTED** statewide in order to protect neighboring lands and the state as a whole.

“List B” species have discrete statewide distributions that are **SUBJECT TO ERADICATION, CONTAINMENT, OR SUPPRESSION** in order to stop the continued spread of these species.

“List C” species are widespread and well-established noxious weeds for which **CONTROL IS RECOMMENDED BUT LEFT UP TO LOCAL AUTHORITY(IES) FOR FINAL DECISION.**

Summit County Noxious Weed Plan

Under the guidelines of Colorado Noxious Weed Act, the Board of County Commissioners for Summit County has adopted the “Summit County Noxious Weed Management Plan”. The plan designates the noxious weeds that pose a threat by rapidly displacing native vegetation, causing a loss of native ecosystems’ stability and diversity, while negatively affecting recreational resources. The management plan also outlines means of control aimed at eradicating, reducing, suppressing or containing populations of noxious weeds. Finally, the Summit County Noxious Weed Management Plan specifies Landowner Responsibility and Enforcement per the procedures detailed in Colorado Noxious Weed Act (CRS§35-5.5-110).

Read the Summit County Noxious Weed Management Plan at <http://co-summitcounty.civicplus.com/DocumentCenter/Home/View/415>

Noxious Weeds in Summit County

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Weed descriptions on the following pages come from [Noxious Weeds of Colorado, 12th edition](#), by the Colorado Noxious Weed Management Association, and [Noxious Weed Species ID](#) by the Colorado Department of Agriculture.

Glossary of Terms

Annual: A plant which completes its life cycle in one season, spring through fall.

Biennial: Plants that require 2 seasons to complete life cycle. They typically germinate in late summer of year one, then over-winter, flower, and set seed by mid-summer of the following year.

Perennial: Plants that live 3 or more years.

Bract: A small structure below the flower; can be leaf-like or spiny

Pappus: The “parachute” of a seed.

Rhizome: An underground stem, usually lateral, sending out shoots above ground and roots below ground. The photo on page 12 of Canada thistle roots depicts rhizomes.

Taproot: One large, central root from which other roots sprout laterally. A carrot is an example of a taproot

Fibrous Roots: Many small, thin roots of similar size. Most grass roots are fibrous roots.

Icons for Possible Management Methods



Herbicide



Biological



Pulling



Grazing



Mowing

Orange Hawkweed

List A

Eradicate



- **Growth Form:** Perennial
- **Height:** 1-2'
- **Reproduction:** seed; rhizomes; above ground roots (stolons)
- **Flowers:** bright reddish-orange; dandelion-shaped; 0.5-0.75" wide; groups of 5-30; petals notched at tip; bracts have dark hairs; June-August
- **Seed:** with pappus; 100-1000 per plant; viable for 7 years
- **Leaves:** basal; dark green; hairy
- **Stem:** fine dark hairs; no leaves
- **Roots:** fibrous; stolons; rhizomes
- **Other:** Has a milky sap. Can be confused with native Orange agoseris, but agoseris is dull orange and has a single flower.



Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	Rosette to early flower

Myrtle Spurge

List A

Eradicate



- **Growth Form:** Perennial
- **Height:** 4-8"; 18" wide
- **Reproduction:** seed & plant fragments
- **Flowers:** yellowish-green; inconspicuous petal-like bract; 3/4" wide; April-August
- **Seed:** sticky seeds expelled 15'; viable for 8 years
- **Leaves:** alternate; 1/2-1" wide; fleshy; spiraled on stem; blue-green
- **Stem:** fleshy; trailing on ground
- **Roots:** taproot
- **Other:** Milky latex is toxic to livestock and irritating to people, Looks similar to "hens & chicks" ornamental but grows upright ; may be called "Donkey-tail spurge"

WEAR GLOVES

Option	HERBICIDE	RATE	TIMING
1	2,4-D Ester	Read Label	Spring or during fall regrowth

Bull Thistle

List B

Suppress



- **Growth Form:** Biennial, sometimes Annual
- **Height:** 18"-6'
- **Reproduction:** seed
- **Flowers:** dark purple to pinkish-purple with spiny bracts; 1.5-2" wide; 1-2" long; single flower at end of branch; July-September
- **Seed:** seeds with pappus; up to 4,000 per plant
- **Leaves:** alternate; 3-12" long; lance-shaped; clasping; tipped with spines; top side of leaf has small spines; bottom side has white hairs; small at top of plant
- **Stem:** highly branched; slightly hairy; spiny wings
- **Roots:** taproot 2' long; lateral spreading roots from crown



Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	Anytime before full flower
2	Chlorsulfuron	Read Label	

Canada Thistle

List B

Contain

- **Growth Form:** Perennial
- **Height:** 1-4'
- **Reproduction:** seed & rhizomes
- **Flowers:** white to purple; clusters of 1-5 at the end of stems; 0.5-0.75" wide; 1" long; July-October
- **Seed:** seeds with pappus; up to 5,000 per plant; viable for 20 yrs

Leaves: alternate; 0.5-2.5" wide; to 7" long; lance-shaped; edges with spine-tipped lobes; top side dark green; bottom side lighter green.

- **Stem:** hollow; upper stem is smooth; lower stem covered with fine hairs.
- **Roots:** Rhizomatous and extensive; spreading up to 20 ft deep and 15 ft laterally



Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	Anytime, but most effective when applied AFTER seed set

Musk Thistle

List B

Contain

- **Growth Form:** Biennial
- **Height:** 2-10' tall
- **Reproduction:** seed only
- **Flowers:** purple; nodding when mature; 1.5-2" in diameter; only one flower per stem with prickly, pinecone-like bracts below the flower; June-September
- **Seed:** seed with pappus; 120,000 per plant; viable for 10 years
- **Leaves:** alternate; 10" long; 1-1.5" wide; dark green and deeply lobed; with spines on edges. Midrib and leaf margins may be whitish. **Rosettes 2-3' wide with distinctive white midrib.**
- **Stem:** One to several stems from base; highly branched in upper portion of stem; spiny-winged
- **Roots:** taproot



Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	At rosette to bud.
2	Chlorsulfuron	Read Label	If flowering, cut heads off and bag.

Plumeless Thistle

List B

Suppress

- **Growth Form:** Biennial or Annual
- **Height:** 1-6' tall
- **Reproduction:** seed only
- **Flowers:** pink; red; or purple; rarely white. 1-2" wide; single at ends of branches or in clusters of 2-5; June-August
- **Seed:** without pappus; up to 9,000 per plant; viable for 10 yrs
- **Leaves:** Basal leaves are 4-8" wide; spiny lobes; stem leaves are alternate and blend in to stem; prominent midrib (like musk thistle)
- **Stem:** spiny wings that extend to flower head
- **Roots:** taproot
- **Other:** may hybridize with Musk thistle (page 11)



Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	At rosette to bud.
2	Chlorsulfuron	Read Label	If in flower, cut heads off and bag.

Scotch Thistle

List B

Eradicate



- **Growth Form:** Biennial
- **Height:** 18" - 10'
- **Reproduction:** seed only
- **Flowers:** violet to red; 1-2" wide; globe-shaped with spiny; needle-like bracts; 2-3 flowers at ends of branches; June-August



- **Seed:** small seeds with pappus; up to 40,000 per plant; viable for 20 yrs or more
- **Leaves:** alternate; bluish or greyish-green. Leaves are slightly hairy; toothed, with spines. Lower leaves are larger than upper leaves with lower leaves growing from 4-20" long, 6-8" wide. **Rosettes to 6' wide.**
- **Stem:** broad spiny wings; up to 4" wide; entire plant is covered in fine hairs and can appear woolly.
- **Roots:** taproot stout and fleshy



Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	At rosette to bud. If flowering, cut heads off and bag.
2	Chlorsulfuron	Read Label	

Latin Name	Common Name	Origin	Flower Color	Leaves	Stems	Avg. Height	Growth Form
<i>Carduus nutans</i>	Musk thistle	Nonnative, noxious	Purple; single very large <u>nodding</u> flower at end of stem; purple bracts	Deeply lobed, dark green with light green or white midrib; spiny margins. No hairs	Spiny winged. No hairs	To 10 ft	Biennial
<i>Onopordum acanthium</i>	Scotch thistle	Nonnative, noxious	Purple; large <u>upright</u> globe-shaped flowerheads; bracts are spine-tipped	Toothed with slight lobe; attach directly to stem; hairy, giving grayish appearance to plant	Spiny winged, hairy	To 10 ft	Biennial
<i>Cirsium arvense</i>	Canada thistle	Nonnative, noxious	Light purple to white; multiple small flower heads in clusters on each stem	Whitish underside; spiny-tipped irregular lobes; attach directly to stem	Smooth with no spines; ridged	To 4 ft	Perennial
<i>Cirsium vulgare</i>	Bull thistle	Nonnative, noxious	Pink to purple; single flowers at ends of branches; spiny bracts	Tops of leaves with sharp spines; underside with prominently raised main veins and white hairs; tipped with spines; clasping	Spiny winged	To 6 ft	Biennial
<i>Carduus acanthoides</i>	Plumeless thistle	Nonnative, noxious	Pink, red, or purple; single or in clusters of 2-5 at end of branch	Basal leaves have spiny lobes; stem leaves blend into stem; leaves with prominent midrib (like musk thistle)	Spiny winged; extend to flower head	To 6 ft	Biennial or annual

Source: Reference #1

Chamomile Daisy

List B

Contain

- **Growth Form:** Annual or short-lived perennial
- **Height:** 6-30" tall
- **Reproduction:** seed
- **Flowers:** white with yellow center; 0.75-1.5" wide; single at end of branches; multiple flowers per plant; constantly flowering
- **Seed:** viable as soon as flower is formed; up to a million seed per plant; viable for up to 15 yrs
- **Leaves:** alternate; 1-2" long; ferny or feather-like; may have a disagreeable odor
- **Stem:** smooth; multiple
- **Roots:** fibrous
- **Other:** sometimes confused with pineapple weed



Chamomile: Noxious
 Oxeye: Noxious
 Shasta: Non-Native, but not noxious



Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	Anytime. If flowering, use chlorsulfuron; be sure to spray flowers
2	Chlorsulfuron	Read Label	

Oxeye Daisy

List B

Contain

- **Growth Form:** perennial
- **Height:** 10-24" tall
- **Reproduction:** seed and rhizomes
- **Flowers:** white with yellow center 1-2" wide; only one flower per plant and the end of stem; smell like wet dog; July-August
- **Seed:** over 200 seeds per flower



- **Leaves:** alternate along stem; 1.5-5" long; 0.25-0.5" wide; lower leaves are spoon-shaped; upper leaves are narrow and clasp stem
- **Stem:** erect and hairless
- **Roots:** rhizomes
- **Other:** looks similar to the Shasta daisy; but Shasta daisy has larger flower and larger leaves (see page 15)



Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	Anytime; less effective at flower, but can treat AFTER flowering

Dalmatian Toadflax

List B Eradicate



- **Growth Form:** perennial
- **Height:** 1-3' tall
- **Reproduction:** seed and rhizomes
- **Flowers:** snapdragon-like yellow flowers with orange throats; 0.75-1.5" long; double-lipped with long spur; July-August



- **Seed:** 500,000 per plant; viable for 10 yrs
- **Leaves:** alternate; 1" long; bluish cast; **very waxy**; dense; smooth; wrap around the stem
- **Stem:** thick and fleshy; multiple stems from one root crown; branched near top

- **Roots:** creeping rhizomes; 6' deep and up to 12' laterally
- **Other:** may hybridize with yellow toadflax (page 18). May also be confused with native golden banner; but golden banner flowers in the spring (April-May).



Yellow Toadflax

List B Suppress

- **Growth Form:** perennial
- **Height:** 1-2' tall
- **Reproduction:** seed and rhizomes
- **Flowers:** yellow; 1" long; bearded orange throat and spur; similar to snapdragons; clusters of 15-20 at the end of the stem; July-August
- **Seed:** egg-shaped, double celled
- **Leaves:** alternate; dense; 2.5" long; 0.25" wide
- **Stem:** multiple stems from base; erect; 1-2' long; simple and sparingly branched
- **Roots:** fibrous, creeping rhizomes; 3' deep; more than 10' laterally
- **Other:** may hybridize with Dalmatian toadflax (page 17). Young plants look similar to leafy spurge (page 19) prior to flowering, but yellow toadflax lacks the milky latex of leafy spurge.



Option	HERBICIDE	RATE	TIMING
1	Chlorsulfuron	Read Label	Anytime; less effective at flower

Option	HERBICIDE	RATE	TIMING
1	Chlorsulfuron	Read Label	Anytime; Though it is less effective at flower

Leafy Spurge

List B

Suppress

- **Growth Form:** Perennial
- **Height:** 1-3'
- **Reproduction:** seed & rhizomes
- **Flowers:** yellowish-green ; 1/2" wide; a pair of 1/2" wide heart-shaped bracts that look like petals; May-Aug depending on elevation
- **Seed:** seeds explode and project up to 15' away; 350 seeds per plant that are viable for 5-8 yrs.
- **Leaves:** alternate; 1-2.5" long, 1/4" wide; blue-green in color; lance-shaped
- **Stem:** multiple; branched near end
- **Roots:** rhizomes; 17' deep; 15' long
- **Other:** Milky latex causes blisters in livestock and is irritating to people

Wear GLOVES



Option	HERBICIDE	RATE	TIMING
1	Plateau / Ammonium salt of Imazapic	Read Label	Treat plants before they loose their milky sap in the fall

Black Henbane

List B

Eradicate



- **Growth Form:** annual or biennial
- **Height:** 6"-4' tall; forms large clumps
- **Reproduction:** seed only
- **Flowers:** brownish-yellow with purple center; has veins that are funnel-shaped; one-sided; not showy; June-September
- **Seed:** black and pitted; 10,000-500,000 per plant; pods remain on stem; upright.
- **Leaves:** alternate; 8" long by 6" wide; coarsely toothed; fuzzy and sticky to touch.
- **Rosettes:** large with hairy leaves and saw-tooth margins; prominent deep veins; crinkly
- **Stem:** erect; coarse; branched; hairy
- **Roots:** taproot; fleshy; white; branched
- **Other:** poisonous to livestock and humans if ingested; member of the Nightshade family.



Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	Anytime up to seed



Diffuse Knapweed

List B Suppress



- **Growth Form:** annual, biennial, or short-lived perennial
- **Height:** 1.5-3.5' tall
- **Reproduction:** seed only
- **Flowers:** white; or sometimes lavender; 0.25" wide by 0.75" long; bracts with fringed edges and are spiny or pokey; June-September
- **Seed:** scaly pappus; 900-1,200 per plant; viable for 10 yrs
- **Leaves:** alternate; 1.25-3" long; 0.5-1.25" wide; finely divided; smaller and farther apart as you go higher on stem.
- **Rosettes:** flat; finely-divided; silvery-green in color; 1-2" wide, 8" long
- **Stem:** stiff and branching from a single main stem
- **Roots:** taproot
- **Other:** may hybridize with spotted knapweed (page 22); plants may break off and become tumbleweeds later in the year



Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	Prior to flower. After flower, cut & bag.

Spotted Knapweed

List B Suppress

- **Growth Form:** short-lived perennial or biennial
- **Height:** 1-3' tall
- **Reproduction:** seed
- **Flowers:** pinkish-purple; 0.25-0.5" wide and 0.75-1" long; bracts are not spiny but have distinct veins and darkened spots. Usually a single flower at the end of branches; June-Sept
- **Seed:** with pappus; 0.125" long; 1,000 per plant; viable for 8 yrs
- **Leaves:** alternate; 0.75-1.5" long; greyish-green and divided
- **Stem:** upright; rigid; one or more branches
- **Roots:** stout taproot



Tansyaster

• **Other:** differing from diffuse knapweed by bracts—spotted is not spiny or fringy and has dark tips. May be confused with native Tansyaster; but spotted knapweed does not have a yellow center.



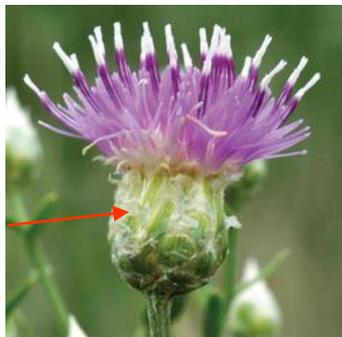
Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	Anytime you see it

Russian Knapweed

List B

Eradicate

- **Growth Form:** perennial
- **Height:** up to 3.5' tall
- **Reproduction:** seed and rhizomes
- **Flowers:** pink to lavender; 0.25-0.5" wide; distinctive papery bracts below; June-August
- **Seed:** small; with pappus
- **Leaves:** alternate; lower leaves 1.5-4" long; upper leaves 0.25-1.25" long; lance-shaped ; smooth edges or toothed
- **Stem:** erect and branched
- **Roots:** vigorous; creeping rhizomes; black and scaly (which differentiates it from other knapweeds)
- **Other:** toxic to horses; very aggressive competitor



Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	Anytime

Houndstongue

List B

Suppress

- **Growth Form:** biennial
- **Height:** 1-4' tall
- **Reproduction:** seed
- **Flowers:** reddish-purple; 0.375" wide; 5-petaled; upper leaf axils in panicles; smell like buttered popcorn; June-September;
- **Seed:** single seed in nutlet; 4 per flower; velcro-like; 0.25" long; readily attach to clothing and animal fur; up to 2,000 per plant
- **Leaves:** alternate; 1-12" long; and 1-3" wide; oblong to lance-shaped rough and hairy; similar to a dogs tongue
- **Stem:** single; stout stem
- **Roots:** taproot up to 3' deep
- **Other:** toxic to livestock. If pulling and seeds are present, bag and discard.



Option	HERBICIDE	RATE	TIMING
1	Chlorsulfuron	Read Label	Rosette to seeding

Common Tansy

List B

Eliminate



- **Growth Form:** perennial
- **Height:** 1.5-6' tall
- **Reproduction:** seed and rhizomes
- **Flowers:** 0.25-0.5" wide; numerous; button-like; no petals; flat-topped dense clusters; June-September
- **Seed:** short crown-shaped pappus
- **Leaves:** alternate; 1-6" wide; 2-12" long; deeply divided in narrow; toothed segments; strong smell when crushed
- **Stem:** often purplish in color; branched near the top
- **Roots:** woody rhizomes
- **Other:** poisonous to livestock and humans if ingested



Option	HERBICIDE	RATE	TIMING
1	Chlorsulfuron	Read Label	Anytime

Dame's Rocket

List B

Suppress



- **Growth Form:** biennial or short lived perennial
- **Height:** up to 4' tall
- **Reproduction:** seed
- **Flowers:** white or purple; 0.5-0.75" wide; 4-petaled; clustered at top of plant; June-September
- **Seed:** narrow seedpods to 1.5" long
- **Leaves:** alternate; 2-4" long; slightly hairy; lance-shaped ; finely toothed margins
- **Stem:** erect and slightly hairy
- **Roots:** fibrous and shallow
- **Other:** may produce flowers and seeds simultaneously. May look



similar to native fireweed, but dame's rocket flowers later than fireweed



Option	HERBICIDE	RATE	TIMING
1	Chlorsulfuron	Read Label	Anytime



Russian Olive List B Eradicate



- **Growth Form:** perennial tree or shrub
- **Height:** up to 10-40' tall
- **Reproduction:** seed or root suckers
- **Flowers:** light yellow; 4 small petals; clustered; fragrant; May-June
- **Seed:** olive shaped fruits; silver color at first; yellow-red when mature; viable for 3 yrs; spread by birds, 0.5" long
- **Leaves:** alternate; 1-3" long; narrow; simple blades with smooth edge; lower surface silvery-white scales; upper surface light green/hairy
- **Stem:** branches have 1-2" thorns. Twigs reddish in color; may have gray, scaly pubescence.
- **Roots:** up to 40' deep; suckers may sprout from roots

• **Other:** prefer riparian areas or areas where the water table is near the soil surface. Very difficult to control once established. A combination of stump cutting and herbicide may be most effective.

Option	HERBICIDE	RATE	TIMING
1	Glyphosate	Read Label	Summer/Fall treatments show less regrowth

Tamarisk/Salt Cedar List B Eradicate



- **Growth Form:** perennial shrub or small tree
- **Height:** 3-20' tall
- **Reproduction:** seed and vegetative
- **Flowers:** pink to white; 0.125" wide in spikes 2" long; strong perfume scent; June-Sept
- **Seed:** tiny; spread by wind
- **Leaves:** alternate; scale-like; small and overlapping; often encrusted with salt; similar in appearance to cedar or juniper leaves
- **Stem:** slender branches; dark brown or reddish-brown
- **Roots:** taproot; branching once it reaches the water table
- **Other:** often found in floodplain areas; can spread downstream 12 miles per year; increases salt content in the soil and consumes large amounts of water; lowers water table; and degrades wildlife habitat value.

Option	HERBICIDE	RATE	TIMING
1	Triclopyr (Aquatic label)	Read Label	Cut-stump treatment or basal bark application, 12-15" above ground
2	Glyphosate	Read Label	

Hoary Cress/Whitetop

List B Eradicate



- **Growth Form:** perennial
- **Height:** up to 2' tall
- **Reproduction:** seed and rhizomes
- **Flowers:** white; 0.25" wide; 4-petaled; flat-topped clusters at end of branch; flowery smell; May-June
- **Seed:** heart-shaped seed capsules; flat; up to 4,800 seeds per plant; viable for 3 yrs
- **Leaves:** alternate; 0.5-4" long; 0.25-1.5" wide; blue-green with small white hairs; oval or oblong with toothed or smooth edges; upper leaves are clasping.



- **Stem:** erect; NOT waxy
- **Roots:** rhizomatous; growing 12-30' per yr

- **Other:** looks similar to perennial pepperweed (page 30) & field pennycress. Pennycress is not hairy and has flowers that smell like dirt.



Option	HERBICIDE	RATE	TIMING
1	Chlorsulfuron	Read Label	Anytime

Perennial Pepperweed

List B Eradicate



- **Growth Form:** perennial
- **Height:** 1-3' tall
- **Reproduction:** seed & rhizomes
- **Flowers:** dense clusters of white flowers near the end of branches; each flower is 0.125" wide; June-July
- **Seed:** round; 0.1" wide; sparsely haired; up to 6 million per acre
- **Leaves:** alternate; 4-11" long and 1-3" wide; lance-shaped; toothed; green to greyish-green; upper leaves smaller; leaves are NOT clasping; WAXY with white midrib
- **Stem:** erect; branching; from a woody crown forming thick patches
- **Roots:** woody stocks & rhizomes creeping 9' deep. 10' laterally
- **Other:** Looks similar to Hoary Cress/Whitetop but pepperweed is taller, and Hoary Cress has clasping leaves that are NOT waxy.



Option	HERBICIDE	RATE	TIMING
1	Chlorsulfuron	Read Label	Anytime

Absinth Wormwood

List B Eradicate



- **Growth Form:** perennial
- **Height:** 3-5' tall; woody at base
- **Reproduction:** seed & root crown
- **Flowers:** small; yellow; inconspicuous; numerous; 0.125" wide; July-August



• **Seed:** 0.06" long; flattened; light grey-brown; viable for 3-4 yrs; 50,000 per plant

• **Leaves:** deeply lobed leaflets; light green to olive green in color; 2-5" long

• **Stem:** 20+ stems grow from a woody crown covered with silky hairs

• **Roots:** taproot 2' deep; lateral roots 6' long

• **Other:** sage odor; may taint milk of grazing animals

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	In spring before plants reach 12" tall, or in the fall

Sources: Noxious Weed Species ID, Noxious Weeds of Colorado, & Google Images

Sulfur Cinquefoil

List B Eradicate



- **Growth Form:** perennial
- **Height:** 1-2' tall
- **Reproduction:** seeds & root fragments
- **Flowers:** pale yellow, dark yellow center; 5 petals; multiple at end of stems; May-July
- **Seed:** numerous; comma-shaped; brownish-purple with net-like pattern of veins; flattened; 0.05" long, viable for 4+ yrs
- **Leaves:** alternate; palmately compound 5-7 toothed leaflets on each leaf; leaf stocks have perpendicular hairs; underside of leaf is green
- **Stem:** one or more stems arising from well-developed root stocks
- **Roots:** tap root and branching roots
- **Other:** unpalatable to grazing animals.

May be confused with native cinquefoil. However, native cinquefoil has a silvery-green back side of leaves, where the non-native is green. Also, the hair on the stem of the native lays flat against the stem and the non-native has hair that is stiff and perpendicular to the stem.

Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	Rosette to early bolt

Sources: Noxious Weed Species ID, Noxious Weeds of Colorado, & Google Images

Wild Caraway List B Eradicate



- **Growth Form:** Biennial or perennial
- **Height:** 1-3' tall
- **Reproduction:** seed
- **Flowers:** small; white or pinkish; form a loose, flat-topped group at the end of the stem; July-September
- **Seed:** 0.25" long; prominent length-wise ridges
- **Leaves:** alternate; finely divided into thread-like segments; 0.25" long
- **Stem:** erect; hollow; branched
- **Roots:** taproot
- **Other:** can be mistaken with young chamomile or yarrow. Also similar to poison hemlock (pg 34). Make sure seeds are not accidentally dispersed if hand pulling.



Option	HERBICIDE	RATE	TIMING
1	Metsulfuron	Read Label	Rosette
2	2,4-D	Read Label	to bud stage

Poison Hemlock List C Eradicate



- **Growth Form:** Biennial
- **Height:** 4-10' tall
- **Reproduction:** seed
- **Flowers:** white; 5-petaled; umbrella-shaped clusters; June-July
- **Seed:** viable for 3 yrs
- **Leaves:** lacy; resembling parsley; musty odor when crushed; shiny. Forms large rosette first year, then bolts second year.
- **Stem:** smooth, rigid, and hollow; distinct purple spots/streaks
- **Roots:** taproot
- **Other:** POISONOUS!!! Similar to wild caraway (pg 33), but wild caraway lacks purple spots/streaks on stem.

Wear GLOVES



Option	HERBICIDE	RATE	TIMING
1	2,4-D	Read Label	Seedlings to rosettes, before plant fully matures

Chinese Clematis

List B Eradicate

- **Growth Form:** Perennial
- **Height:** climbing vine
- **Reproduction:** seed
- **Flowers:** yellow; solitary; 1-2" wide; 4 sepals (petal-like structures; often nodding; delicately scented; Aug-Sept

- **Seed:** multiple, feathery long-tailed seed heads;
- **Leaves:** opposite with 3-7 leaflets; oval to lance-shaped.
- **Stem:** herbaceous or woody vine; 10-27' long
- **Roots:** fibrous, 5-10' long

- **Other:** Can completely cover rock walls, trees, bushes, and fences. The juice of freshly crushed leaves and stems have blister causing agents (MAY BE TOXIC TO LIVESTOCK)



Option	HERBICIDE	RATE	TIMING
1	2,4-D	Read Label	At flowering

Cheatgrass/Downy Brome

List C Contain



- **Growth Form:** Annual Grass
- **Height:** 4-30" tall; depending on moisture
- **Reproduction:** seed only
- **Flowers:** 1-sided drooping panicle; 2-6" long; spikelets will have 5-8 flowers 0.5-0.75" long; mature flower heads have a purplish hue and often get imbedded in clothing and animal fur; April-June
- **Seed:** 300 per plant; viable for 2 yrs
- **Leaves:** 2-6" long; dense soft hairs that give it a downy look
- **Stem:** erect; sender; branched at base
- **Roots:** fibrous
- **Other:** Emerges early in the spring and again in the fall. "Cheats" other vegetation out of space and nutrients. Fire hazard and flourishes after fire. Grazing only works early on before seed sets (seeds are pokey and animals will not eat them).

Option	HERBICIDE	RATE	TIMING
1	Glyphosate	Read Label	Before seeding in spring or in fall when green

Common Mullein

List C Contain



- **Growth Form:** biennial
- **Height:** 2-6' tall
- **Reproduction:** seed
- **Flowers:** yellow; 0.75" wide; 5-lobed; long club-shaped spikes; June-Aug
- **Seed:** viable for up to 80 yrs; tiny; black; poppy-seed size
- **Leaves:** alternate; 15" long by 5" wide; greyish-green; densely woolly; become smaller as you move up the stem.
- **Rosettes:** 3-5' wide; greyish-green with soft fine hairs.
- **Stem:** one tall spike
- **Roots:** taproot
- **Other:** early invader on disturbed sites; looks similar to native green gentian, but green gentian has pinkish flowers and is not woolly



Option	HERBICIDE	RATE	TIMING
1	Aminopyralid (milestone)	Read Label	Rosette to bud stage.
2	Chlorsulfuron	Read Label	

Field Bindweed

List C Contain



- **Growth Form:** Perennial
- **Height:** on the ground or a climbing vine
- **Reproduction:** seed and rhizomes
- **Flowers:** 1" wide; trumpet-shaped (like a morning glory); white to pink
- **Seed:** viable for 50+ yrs
- **Leaves:** 1-2" long by 1" wide; alternate; blunt to arrowhead-shaped.
- **Stem:** prostrate on ground; 1-6' long
- **Roots:** taproots can grow 2-10' deep; rhizomes can be 30' deep and grow laterally to form colonies
- **Other:** shallow tillage and/or pulling is NOT recommended as it increases the number of plants



Option	HERBICIDE	RATE	TIMING
1	Dicamba + 2,4-D	Read Label	After full bloom or in the fall

Means of Control

Integrated Weed Management

A holistic approach to weed management that integrates different methods of weed control.

It incorporates...

Preventative Control

An ounce of prevention is worth a pound of cure!

- Properly manage your land by not overgrazing and by maintaining desired native/adapted species so that there is less opportunity for weeds to encroach.
 - Be aware of weed seed sources
 - Roadways, livestock, wildlife, wind, water, and disturbed areas
 - Detect and identify early on
- Aggressively manage all infestations when they are small



Chemical Control

Use of herbicides to kill or suppress weeds

- Usually the most effective and time-efficient method
 - Different herbicides work for different weeds.
READ THE LABEL...IT'S THE LAW!!!
 - Often selective to NOT kill grass

See herbicide recommendations on weed description pages or page 46.



Google Images

Means of Control

Biological Control

Use of living agents to suppress vigor and reduce the spread of weeds

- Biological agents limit the spread and density of target weed species by feeding on leaves, stems, roots and/or seed heads
- Must call Colorado Department of Agriculture Insectary to obtain the Biological Agent; NOT ALL AGENTS WORK IN ALL SITUATIONS.

- Agents available for:

- ⇒ Canada Thistle
- ⇒ Dalmatian Toadflax
- ⇒ Diffuse Knapweed
- ⇒ Field Bindweed
- ⇒ Leafy Spurge
- ⇒ Musk Thistle
- ⇒ Russian Knapweed
- ⇒ Spotted Knapweed
- ⇒ Tamarisk/Salt Cedar
- ⇒ Yellow Toadflax



Contact the
Colorado State
Insectary at
970-464-7916
or
[www.colorado.gov/
agconservation/
biocontrol](http://www.colorado.gov/agconservation/biocontrol)

- Depending on the weed species and class of livestock, grazing may be an effective tool. Goats tend to be the least picky about what they eat, so they may be the best option if you desire to use livestock as a weed management tool.

Mechanical Control

Killing or suppressing weeds through physical disruption

- Pulling
- Plowing
- Digging
- Disking
- Mowing



Cultural Control

Establishment of competitive and desired vegetation

See Seeding on pages 41-44.

Seeding

It is important to establish competitive & desired vegetation **BEFORE** weeds establish!!! You can establish good vegetation by planting forbs or seeding with desired grass/wildflower seed mixes of good quality & purity.

9 Steps to Successful Seeding

KEY #1 - KILL THE WEEDS FIRST

At seeding time, there should be no actively growing weeds.

KEY #2 - USE ADAPTED SPECIES

Selecting species that are adapted for the conditions you are planting in will make all the difference. Soil, climate, elevation, and exposure all factor into species selection. Furthermore, even if a species grows well at 8,000' elevation, it does not mean that it will grow well in all conditions at 8,000'. Wetland species will not likely do well in dryland conditions and vice versa. Likewise, plants that typically grow on Northeast facing slopes may not grow Southwest facing slopes. Just because it grows well on the Front Range, doesn't mean it will grow well up here in the mountains!

KEY #3 - PREPARE A GOOD SEEDBED

A proper seedbed is firm and free of competing vegetation. **Correct firmness is when an adult footprint is only slightly visible on the prepared bed prior to the seeding operation.** The seedbed can be firmed, if needed, by pulling a commercial or homemade packer or roller. A firm seedbed is essential for proper seeding depth. You have seeded too deep if you cannot see a few seeds on the soil surface.

If the seedbed is very uneven, consider drainage concerns prior to planting. Where will water pool? If needed, attempt to level out the seeding area by moving soil around or adding soil. Be cautious, though, to verify that any soil you add to the site is free of weeds!

Seeding

9 Steps to Successful Seeding Continued...

KEY #3 PREPARING A GOOD SEEDBED CONT...

Most species should be planted at a shallow depth of ¼ to ½ inch.

Larger seeds can be planted up to 1 inch deep. Seed to soil contact is imperative. Seeds spread on top of vegetative residue will have much lower germination rates.

KEY #4 - SEED AT THE RIGHT TIME

The three main seeding windows in Summit County are:

<i>Spring</i> (late April-May right after snow melts off)
<i>Late Summer</i> (mid July-early August during the summer monsoons)
<i>Late Fall</i> (mid to end of October until first perennial snow)

KEY #5 - SEED AT THE PROPER RATE

You should seed at a rate of 40 seeds per square foot.

When broadcast seeding by hand, the best way to determine your personal seeding rate is to cut out a 12"x12" piece of cardboard. Spray paint it with black paint. Then, toss some seed onto the cardboard square. If you count more than 40 seeds on that square, you are seeding too thick. If there are not 40 seeds on that square, you need to seed a little heavier.

If you find it difficult to regulate your seeding rate with small seeds, you can mix in a filler of sand, sawdust, or potting soil to get adequate distribution of seeds. Note that drill seeders or broadcast seeders can be calibrated to specific seeding rates, thus minimizing human errors.

Seeding

9 Steps to Successful Seeding Continued...

KEY #5 - SEED AT THE PROPER RATE **PHOTO ILLUSTRATION**



**1' x 1' square
with 40 seeds
on it**

KEY #6 - COVER YOUR SEEDS

Seeds are lost when wind and water wash them away, or birds and small mammals eat them.

To increase your seeding success rate, it is best to cover your seed. You can cover your seeds by raking or dragging over your seeds with soil. Mulch is also a good cover. Sawdust, straw, and peat moss are good options for mulch. If you are interseeding into existing grass, mulch may not be necessary. **When you look down at your mulched and seeded area, you should see about 50% mulch and 50% seed covered soil.** If you apply it properly, you won't have to remove the mulch later; it'll just break down and disappear.

KEY #7 - WATER, WATER, WATER

Seeds and seedlings need adequate moisture to germinate and grow. Even if you are buying a drought-tolerant seed mix, your little seeds need ample water.

Make sure to water lightly and frequently. If you drench them too much, you risk washing them away.

Seeding

9 Steps to Successful Seeding Continued...

KEY #8 - TO FERTILIZE OR NOT TO FERTILIZE?

To fertilize or not to fertilize, that is the question. The answer is, **"IT DEPENDS"**. If you are seeding into an area that you know is weed free and does not have any weed seeds in it, then you are probably okay to fertilize at the same time as seeding.

If, however, you are unsure that it is a weed free area, then you may want to wait to fertilize. Fertilizer is non-specific, meaning that it will boost the growth of anything that it comes into contact with, including weeds. Because weeds are genetically predisposed to rapid growth and establishment, fertilizer may give them an even bigger boost.

The safe option would be to wait for one growing season to make sure your seeds can outcompete any weeds. Once seed is on the ground, hand pull weeds and avoid the use of herbicides in the first growing season.

KEY #9 - WAIT TO GRAZE

If you are planning to graze the location you are seeding, it would be best to

Wait one entire growing season (preferably two growing seasons) prior to grazing any animals on the seeded site.

This will give the sprouts a full year to grow and establish. *Otherwise, you may be seeding again before you know it.*



Herbicide Recommendations

These herbicide recommendations are provided by the Summit County Division of Natural Resources.

READ AND FOLLOW ALL INSTRUCTIONS ON THE HERBICIDE LABEL PRIOR TO USE. THE LABEL IS THE LAW!!!

Don't forget to add a nonionic surfactant at a rate of 0.32 oz/gallon to reduce water surface tension and allow for better mixing of water and chemical. You may use commercial surfactants or generic dish soap.

Contact Summit County Weed Control with questions... 970-668-4218

Organic Herbicide

Organic herbicides have gained popularity over the last few years. They are often made from a mix of vinegar, salt, and dish soap.

There are mixed reviews on the effectiveness of organic herbicides. Some say they work great; others say they show initial results but the plants bounce right back within a week or two.

Anyone considering the use of organic herbicides should note that they are NON-SPECIFIC, meaning that they have the potential to kill anything they are sprayed on (including grass, desired native plants, and potentially soil organisms).

TAKE CARE TO SPOT SPRAY ONLY WHAT YOU WANT TO DIE!!!

Timing is Everything

Herbicides often target a specific growth stage of a plant and are only effective if applied at the proper time. Check to see when the herbicide you plan to use is most effective and be sure to apply at that time. If you have passed that time, see if there is an alternative herbicide that you can use instead.

NOXIOUS WEED	MILE-STONE	CHLOR--SULFURON	2,4-D	CURTAIL	GLY-PHOSATE	PLATEAU
Absinth Wormwood	X					
Black henbane	X		X			
Chamomile	X	X		X		
Cheatgrass/ Downy brome					X	
Chinese Clematis			X			
Common Mullein	X	X				
Common Tansy		X				
Dame's Rocket		X				
Field bindweed			X			
Hoary cress/ Whitetop		X	X			
Houndstongue		X	X			
Leafy Spurge						X
Knapweeds	X			X		
Myrtle Spurge			X			
Orange hawkweed	X					
Oxeye daisy	X					
Perennial Pepperweed		X	X			
Poison Hemlock			X			
Russian Olive					X	
Sulfur Cinquefoil	X					
Tamarisk/ Salt cedar					X	
Thistles	X	X	X	X		
Whitetop/ Hoary cress		X	X			
Wild caraway			X			
Toadflax(s)		X				

Contact Summit County Weed Control with questions. 970-668-4218

Read label for instructions on Application Rate!!!

Refer to Species Description pages for more specific recommendations.

Sprayer Calibration

It is critical to know the output of a sprayer in order to add the proper amount of herbicide to the tank. *Applying too heavy can kill desirable species and wastes money. Applying too light contributes to resistance, reduces effectiveness, and wastes money.*

Handgun or Backpack Sprayer

1. Measure a plot that is exactly 18.5 ft X 18.5 ft (1/28th of an acre).
2. Spray the plot uniformly with water, keeping the sprayer pressure constant. ***Be sure to record the length of time it takes you to spray the entire area using a stopwatch.***
3. Spray into a bucket (or a graduated container such as a Nalgene) for the same number of seconds. **Keep the sprayer pressure constant!**
4. Measure the number of ounces of water collected in the bucket or Nalgene.
5. The number of ounces of water measured from the bucket is equal to the number of gallons per acre (GPA) the sprayer is delivering.
6. Add the proper amount of herbicide to your tank using the chart on the right.

Gallons/acre (from step 5)	Recommended Herbicide Rate/Acre				
	5 fl oz/ac	7 fl oz/ac	1 pint/ac	1 quart/ac	2 quarts/ac
20	7.5 cc/gal	10.5 cc/gal	5 tsp/gal	10 tsp/gal	3.25 fl oz/gal
30	5 cc/gal	7.0 cc/gal	3 tsp/gal	6 tsp/gal	2 fl oz/gal
40	3.8 cc/gal	5.3 cc/gal	2½ tsp/gal	4.75 tsp/gal	1½ fl oz/gal
50	3.0 cc/gal	4.2 cc/gal	2 tsp/gal	3.75 tsp/gal	1.25 fl oz/gal
60	2.5 cc/gal	3.5 cc/gal	1½ tsp/gal	3.25 tsp/gal	6½ tsp/gal
70	2.1 cc/gal	3.0 cc/gal	1½ tsp/gal	2.75 tsp/gal	5.5 tsp/gal
80	1.9 cc/gal	2.6 cc/gal	1.25 tsp/gal	2½ tsp/gal	4.75 tsp/gal
90	1.7 cc/gal	2.3 cc/gal	1 tsp/gal	2 tsp/gal	4.25 tsp/gal
100	1.5 cc/gal	2.1 cc/gal	1 tsp/gal	2 tsp/gal	3.75 tsp/gal

**Liquid conversions: tsp = teaspoons; TBS = tablespoons; fl oz = fluid ounces;
1 cc = 1 ml; 3 teaspoons = 1 tablespoon; 8 fluid ounces = 1 cup;
2 tablespoons = 1 fluid ounce; 1 cup = 16 tablespoons**

Sprayer Calibration

Boom or Boomless Sprayer

Volume Method

1. On level ground, fill sprayer tank to a known level with water.
2. Turn on sprayer until all nozzles have output, shut off and refill tank to desired level.
3. Measure off ¼ of an acre, marking the start and end with a flag.

<u>Width of boom</u> (feet)	<u>Linear feet</u> to cover ¼ acres
2	5445
4	2723
6	1815
8	1362
10	1090
20	545
30	363

4. Drive the measured ¼ acre with the speed that you will be using to spray, turning on the sprayer at the starting mark and off at the ending flag.
5. Return to the level ground that you filled the sprayer at and carefully measure the amount of water it takes to refill to the known level from step 1.
6. Multiply the amount from above step by 4. This is GPA (Gallons Per Acre).

Stationary Method

1. On level ground, fill sprayer tank with water and drift agent (if using).
2. Turn on sprayer and measure spray pattern width in feet.
3. Collect liquid from each nozzle for 1 minute. Measure in ounces.
4. Divide ounces by 128 to determine GPM (Gallons Per Minute).
5. Determine speed (MPH) you will be using during spraying.
6. With the below formula calculate GPA (Gallons Per Acre).

$$\text{GPA} = (\text{GPM} \times 495) / (\text{MPH} \times \text{swath width in feet})$$

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What to do if you have a weed problem and need help

1. Look through this guide and try to identify the weed.
2. Take the precautionary actions suggested in this guide to contain the weed and reduce its spread.
3. Try not disturb soil, if at all possible. If soil disturbance is necessary, reseed with desirable species ASAP.
4. Remember, weed management is NOT a one time deal; it will require ongoing efforts (likely for many years to come). Perennial weeds require a perennial solution.
5. If you need further assistance, **contact Summit County Weed Control at 970-668-4218 SOONER RATHER THAN LATER!!!**