



**Idaho's Noxious Weeds**  
**2010 CONTROL GUIDELINES**  
***Noncrop and Rangeland Sites***

Timothy S. Prather  
Extension Weed Specialist

Linda M. Wilson  
Former Research Scientist

John M. Wallace  
Research Support Scientist

Department of Plant, Soil and Entomological Sciences

**University of Idaho**  
Extension

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These guidelines are not recommendations. If site-specific help is needed, land managers should contact a licensed consultant. The label will describe legal use of the herbicide for pasture, rights-of-way, rangeland, etc., and it will document restrictions on reentry intervals and subsequent haying or grazing restrictions.



**These guidelines were prepared and published independently from the handbook *Idaho's Noxious Weeds*. Neither the Idaho State Department of Agriculture nor any of its federal partners played any role in the preparation or publication of these guidelines.**

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## Preface to 2010 control guidelines

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The Idaho noxious weed law now contains three categories of weeds: (1) those that are thought not to be in Idaho or, if here, recently established (statewide early detection and rapid response), (2) those not widely distributed in the state that must be controlled or eradicated in some areas (statewide control), and (3) those distributed throughout the state that must be contained or controlled to prevent further economic and environmental damage (statewide containment).

The control guidelines include control using herbicides, cultural methods, and biological control for noncropland and rangeland sites. These guidelines are updated annually.

The **Pacific Northwest Weed Management Handbook** contains more detailed information on most of the weed species encountered in Idaho. The handbook is available online at:

<http://pnwpest.org/pnw/weeds>

## Legend

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oz/A	=	ounces per acre of product
lb/A	=	pounds per acre of product
pt/A	=	pints per acre of product
qt/A	=	quarts per acre of product
gal/A	=	gallons per acre
oz ai/A	=	ounces active ingredient per acre
oz ae/A	=	ounces acid equivalent per acre
lb ai/A	=	pounds active ingredient per acre
lb ae/A	=	pounds acid equivalent per acre
ai/A	=	active ingredient per acre
ae/A	=	acid equivalent per acre
mg	=	milligrams
L	=	liters
ml	=	milliliters
v/v	=	by volume

## **Black henbane**

*Hyoscyamus niger*

### **Chemical control**

---

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 0.5 oz/A Escort; use a surfactant

**Timing:** Actively growing plants

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 to 0.50 lb ae/A picloram

**Timing:** Before bloom

**Herbicide:** Banvel, Clarity, Vanquish, etc. (dicamba)

**Description:** Apply 0.125 to 0.375 lb ai/A dicamba

**Timing:** Rosette stage

**Herbicide:** Cimarron X-tra (metsulfuron + chlorsulfuron)

**Description:** Apply one 20-oz pack of Cimarron X-tra for each  
10 acres

**Timing:** Actively growing plants

**Herbicide:** Cimarron Max (metsulfuron + dicamba + 2,4-D)

**Description:** Apply 0.5 oz/A Part A and 2 pt/A Part B

**Timing:** Actively growing plants

## **Bohemian knotweed**

*Polygonum x bohemicum*

### **Chemical control**

---

**Herbicide:** Garlon 4 (triclopyr)

**Description:** Apply 1% v/v Garlon 4 to foliage

**Timing:** Actively growing plants

*(cont. on page 6)*

## Bohemian knotweed (*cont.*)

### Chemical control (*cont.*)

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**Herbicide:** Habitat or Arsenal (imazapyr)

**Description:** Apply 0.5 to 1 lb/A or 1% v/v Habitat adjacent to water or Arsenal away from water

**Timing:** Mid-summer after seed head forms

**Herbicide:** Aquamaster or Rodeo (glyphosate)

**Description:** Hollow-stem injection—Inject 5 ml Aquamaster or Rodeo per stem between 2nd and 3rd internode

**Timing:** Actively growing plants

## Brazilian elodea

*Egeria densa*

### Chemical control

---

**Herbicide:** Sonar (fluridone)

**Description:** Maintain a concentration of 45 to 90 ppb for 30 to 90 days

**Timing:** Early in the season as plants begin growth and oxygen levels are higher. Applying early reduces the chance of aquatic animals facing an oxygen deficit when dying plants use oxygen as they decompose. Applications within  $\frac{1}{4}$  mile of a potable water intake cannot exceed 20 ppm

**Herbicide:** Nautique (copper)

**Description:** Apply 0.5 to 1 ppm copper depending on water depth and infestation density. Treat  $\frac{1}{3}$  of the surface in 10-day intervals to prevent depletion of dissolved oxygen. No swimming or irrigation restrictions

**Timing:** Sunny mornings when water temperature is above 60°F

## Brazilian elodea (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** Reward (diquat)

**Description:** Apply 0.185 to 0.74 gal/surface A Reward (0.5 ppm is effective in clear water, but with clay sediment turbidity, 1 to 2 ppm is effective)

**Timing:** When water temperatures rise above 50°F

## Buffalobur

*Solanum rostratum*

### Chemical control

---

**Herbicide:** 2,4-D + Banvel, Clarity (dicamba)

**Description:** Apply 1.6 lb ae/A 2,4-D and 0.5 lb ai/A dicamba

**Timing:** Rosette stage

**Herbicide:** Tordon (picloram) + 2,4-D

**Description:** Apply 0.25 to 0.50 lb ae/A picloram + 0.5 lb ae/A 2,4-D

**Timing:** Rosette stage

**Herbicide:** Cimarron Max (metsulfuron + dicamba + 2,4-D)

**Description:** Apply 0.5 oz/A Part A and 2 pt/A Part B

**Timing:** Actively growing plants

## Canada thistle

*Cirsium arvense*

### Chemical control

---

**Herbicide:** Redeem R&P (clopyralid + triclopyr)

**Description:** Apply 2.5 to 4 pt/A Redeem R&P. Higher rates may result in persistence into the next field season

**Timing:** Rosette to bud stages  
(*cont. on page 8*)

## Canada thistle (*cont.*)

### Chemical control (*cont.*)

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**Herbicide:** Stinger or Transline (clopyralid)

**Description:** Apply 0.25 to 1.33 pt/A Stinger or Transline

**Timing:** Up to bud stage

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 5 to 7 fl oz/A Milestone. Higher rates may result in persistence into the next field season

**Timing:** In spring to plants in the prebud growth stage; in fall to plant regrowth

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 2 to 3.3 oz/A Chaparral

**Timing:** Bud to early flower stage; fall prior to frost

**Herbicide:** Forefront R&P (aminopyralid + 2,4-D)

**Description:** Apply 2 to 2.6 fl pt/A Forefront R&P

**Timing:** Actively growing plants

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.5 lb ae/A picloram

**Timing:** Before budding

**Herbicide:** Cimarron X-tra (metsulfuron + chlorsulfuron)

**Description:** Apply 0.5 oz/A Cimarron X-tra for suppression

**Timing:** Rosette through flowering stage but prior to seed development

**Herbicide:** Cimarron Max (metsulfuron + dicamba + 2,4-D)

**Description:** Apply 0.25 oz/A Part A plus 1 pt/A Part B for suppression

**Timing:** In spring to plants in the rosette to early bolt stage



## Canada thistle (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** Telar (chlorsulfuron)

**Description:** Apply 1.5 oz/A Telar; use a surfactant

**Timing:** Fall rosettes or when plants are at the bud to bloom stages

**Herbicide:** glyphosate

**Description:** Apply 1.50 to 2.25 lb ae/A glyphosate

**Timing:** Actively growing plants at bud stage

**Herbicide:** Banvel, Clarity, Vanquish, etc. (dicamba)

**Description:** Apply 2 lb ae/A dicamba

**Timing:** Actively growing plants

**Herbicide:** Overdrive (dicamba + diflufenzopyr)

**Description:** Apply 4 to 8 fl oz/A Overdrive

**Timing:** Actively growing plants

### Biological control

---

**Insect:** Stem weevil (*Ceutorhynchus litura*)

**Description:** Adults feed on leaf and stem tissue. The greatest damage is caused by larvae feeding within the stem and crown.

Impact is mostly indirect, providing access into shoots for harmful arthropods, nematodes, and pathogens. Collect weevils as adults in spring.

**Redistribution:** April 1 to May 1

**Insect:** Gall fly (*Urophora cardui*)

**Description:** Larvae burrow into the stems, causing a gall to form.

Some plant resources are used to maintain the gall rather than for plant growth. Stem deformation may prevent seed production.

Collect galls in early spring.

**Redistribution:** February 15 to April 15

# Common crupina

*Crupina vulgaris*

## Chemical control

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**Herbicide:** Transline or Stinger (clopyralid)

**Description:** Apply 0.35 pt/A Transline or Stinger

**Timing:** Split—fall then spring

**Herbicide:** Escort (metsulfuron)

**Description:** 0.5 to 1 oz/A

**Timing:** Actively growing plants

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 3 to 3.3 oz Chaparral

**Timing:** Actively growing plants

**Herbicide:** Cimarron Max (metsulfuron + dicamba + 2,4-D)

**Description:** Apply 0.5 oz/A Part A plus 2 pt/A Part B

**Timing:** Actively growing plants

**Herbicide:** Cimarron X-tra (metsulfuron + chlorsulfuron)

**Description:** Apply 2 oz/A Cimarron X-tra

**Timing:** Actively growing plants

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 to 0.50 lb ae/A picloram

**Timing:** Fall or late winter

**Herbicide:** Banvel, Clarity, Vanquish, etc. (dicamba) + 2,4-D

**Description:** Apply 0.5 lb ae/A dicamba + 1 lb ae/A 2,4-D

**Timing:** Actively growing plants

## **Common or European frogbit**

*Hydrocharis morsus-ranae*

### **Chemical control**

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**Herbicide:** No herbicides are labeled for control

## **Common reed**

*Phragmites australis*

### **Chemical control**

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**Herbicide:** Habitat (imazapyr)

**Description:** Apply 4 to 6 pt/A Habitat; ensure 100% coverage

**Timing:** Actively growing, green foliage after full leaf elongation

**Herbicide:** Clearcast (imazamox)

**Description:** Apply 4 pt/A Clearcast as broadcast spray or 1-2% v/v as spot spray; use 1 qt/A MSO

**Timing:** Late vegetative stages up to killing frost

**Herbicide:** Rodeo, Aquamaster or Touchdown Pro (glyphosate)

**Description:** Apply 2 to 3 lb ae/A glyphosate as broadcast spray or 0.75% v/v as backpack spray

**Timing:** Actively growing plants through full bloom stage

# Curlyleaf pondweed

*Potamogeton crispus*

## Chemical control

---

**Herbicide:** Reward (diquat)

**Description:** Apply 2 qt/A Reward (0.5% solution) with aquatic wetting agent (0.25-1% v/v); see label for special regulations

**Timing:** Actively growing plants

**Herbicide:** Aquathol K (endothall dipotassium salt)

**Description:** Apply 0.5 to 1.5 ppm of Aquathol K (24-hour swimming restriction, 3-day fishing restriction, and 14-day irrigation/stock watering restriction); rates above 1 ppm should be limited to 10% of the water body to avoid damage to fish

**Timing:** Actively growing plants

**Herbicide:** Hydrothol 191 (endothall mono salt)

**Description:** Apply 0.5 to 2 ppm of Hydrothol 191; see label for special regulations

**Timing:** Actively growing plants

**Herbicide:** Sonar or Avast (fluridone)

**Description:** Apply 15 to 31 oz/A Sonar or Avast (45 to 90 ppb at 4 ft water depth); special regulations may apply

**Timing:** Actively growing plants

**Herbicide:** Clearcast (imazamox)

**Description:** Apply 50 ppb Clearcast; see label for restrictions

**Timing:** Actively growing plants

# Dalmatian toadflax

*Linaria dalmatica* ssp. *dalmatica*

## Chemical control

---

**Herbicide:** Telar (chlorsulfuron)

**Description:** Apply 2 to 3 oz/A Telar; use a surfactant

**Timing:** Bud to bloom. Fall timing is most effective

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 1.5 to 2 oz/A

**Timing:** Actively growing plants

**Herbicide:** Tordon (picloram) + Telar (chlorsulfuron)

**Description:** Apply 0.25 ae/A picloram + 1.5 oz/A Telar

**Timing:** Bud to bloom

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 to 1 lb ae/A picloram

**Timing:** Late summer to fall or late winter

**Herbicide:** Banvel, Clarity, Vanquish, etc. (dicamba)

**Description:** Apply 2 lb ae/A dicamba

**Timing:** Early spring

## Biological control

---

**Insect:** Defoliating moth (*Calophasia lunula*)

**Description:** Defoliation from larval feeding reduces plant vigor and seed production. Collect moths as larvae.

**Redistribution:** May and June

**Insect:** Stem-boring weevil (*Mecinus janthinus*)

**Description:** Larval feeding can kill shoots, which reduces flower and seed production. Adult weevils feed externally on foliage. Collect weevils as adults.

**Redistribution:** May to early July

# Diffuse knapweed

*Centaurea diffusa*

## Chemical control

---

**Herbicide:** Redeem R&P (clopyralid + triclopyr)

**Description:** Apply 0.75 to 1 qt/A Redeem R&P

**Timing:** Rosette to early bolting

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 to 0.50 lb ae/A picloram

**Timing:** Spring—rosette to early bolting stages

**Herbicide:** Stinger or Transline (clopyralid)

**Description:** Apply 0.66 to 1.33 pt/A Transline or Stinger

**Timing:** Up to bud stage

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 5 to 7 fl oz/A Milestone

**Timing:** Rosette to bolting stages or in fall

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 2.5 to 3.3 oz/A Chaparral

**Timing:** Rosette to bolting stages or in fall

**Herbicide:** Forefront R&P (aminopyralid + 2,4-D)

**Description:** Apply 2 to 2.6 fl pt/A Forefront R&P

**Timing:** Rosette to bolting stages

**Herbicide:** Curtail (clopyralid + 2,4-D)

**Description:** Apply 2 to 4 qt/A Curtail; higher rates may result in persistence into the next field season

**Timing:** Rosette to early bolting stages

**Herbicide:** Overdrive (dicamba + diflufenzopyr)

**Description:** Apply 4 to 8 fl oz/A Overdrive

**Timing:** Actively growing plants

## Diffuse knapweed (*cont.*)

### Chemical control (*cont.*)

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**Herbicide:** glyphosate

**Description:** Apply 3 lb ae/A glyphosate

**Timing:** Bud stage

**Herbicide:** 2,4-D

**Description:** Apply 1 to 2 lb ae/A 2,4-D

**Timing:** Early bolting

### Biological control

---

**Insect:** Seedhead fly (*Urophora affinis*, *U. quadrifasciata*)

**Description:** The two species together reduce seed production by 75% to 95% at some sites but have little impact on stand density. *U. affinis* larvae attack the seed head causing the plant to form a hard gall, which depletes the plant's energy resources. Collect infested seed heads in early spring.

**Redistribution:** March 1 to April 30

**Insect:** Root boring moth (*Agapeta zoegana*)

**Description:** Larvae mine the root of the plant, reducing storage capacity and increasing susceptibility to infection from fungi or bacteria.

**Redistribution:** July 1 to August 15

**Insect:** Seed-head weevil (*Larinus minutus*, *L. obtusus*)

**Description:** Larvae destroy seeds in the seed heads, reducing seed production. Adults can defoliate plants. *L. minutus* is causing the decline of diffuse knapweed in some areas. Collect weevils as adults.

**Redistribution:** June 1 to October 1

(*cont. on page 16*)

## Diffuse knapweed (*cont.*)

### Biological control (*cont.*)

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**Insect:** Root boring beetle (*Sphenoptera jugoslavica*)

**Description:** Larvae tunnel within the roots. Surviving plants are stunted and produce fewer flowers. Adults do less damage feeding on leaves. Collect beetles as adults.

**Redistribution:** July 15 to August 1

**Insect:** Broad-nosed knapweed seedhead weevil (*Bangasternus fausti*)

**Description:** Adults feed on leaves, stems, and florets but prefer flower heads when available. Collect weevils as adults.

**Redistribution:** June 1 to July 1

**Insect:** Knapweed peacock fly (*Chaetorellia acrolophi*) Not established in Idaho

**Description:** Larvae burrow into the center of the bud and eat their way into the seed, destroying the seed head. Collect infested seed heads in early spring (February 1 to March 30).

**Redistribution:** March 1 to April 30

**Insect:** Root weevil (*Cyphocleonus achates*)

**Description:** Larvae mine into the root, causing a root gall to form. Dispersal is slow as adults rarely fly. Collect weevils as adults.

**Redistribution:** August 1 to October 1

**Insect:** Knapweed seedhead moth (*Metzneria paucipunctella*) Widely established in the West

**Description:** Larvae feed on developing seeds. Larvae also attack and destroy other seed head insects, including larvae of the two seed head flies, *Urophora* spp. Collect infested seed heads in early spring.

**Redistribution:** March 15 to April 30



## Dyer's woad

*Isatis tinctoria*

### Chemical control

---

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 0.5 to 1 oz/A Escort; use a surfactant

**Timing:** Actively growing plants

**Herbicide:** Telar (chlorsulfuron)

**Description:** Apply 1 oz/A Telar

**Timing:** Before or just after emergence

**Herbicide:** Cimarron Max (metsulfuron + dicamba + 2,4-D)

**Description:** Apply 0.5 oz/A Part A and 2 pt/A Part B

**Timing:** Actively growing plants

**Herbicide:** Cimarron X-tra (metsulfuron + chlorsulfuron)

**Description:** Apply one 20-oz pack of Cimarron X-tra for each 10 acres; use a surfactant

**Timing:** Actively growing plants

**Herbicide:** 2,4-D LV ester

**Description:** Apply 1.90 to 2.85 lb ae/A 2,4-D LV ester

**Timing:** Rosette or bud stage

## Eurasian watermilfoil

*Myriophyllum spicatum*

### Cultural control

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**Method:** Hand pull

**Description:** Divers pull plants by hand

**Timing:** Late spring to summer

(cont. on page 18)

## Eurasian watermilfoil (*cont.*)

### Cultural control (*cont.*)

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**Method:** Suction dredge

**Description:** Plants can be selectively removed

**Timing:** Late spring to summer

**Method:** Benthic barrier

**Description:** Place benthic barrier frames over milfoil for 8 weeks

**Timing:** When plants are small

### Chemical control

---

**Herbicide:** Sonar (fluridone)

**Description:** Apply 0.06 to 0.09 mg ai /L fluridone in ponds. Special regulations apply; may require NPDES (National Pollution Discharge Elimination System) permit

**Timing:** Actively growing plants

**Herbicide:** Aquathol K (endothall dipotassium salt)

**Description:** Apply 1 to 3 ppm of endothall (24-hour swimming restriction, 3-day fishing restriction, and 14-day irrigation/stock watering restriction). Rates above 1 ppm should be limited to 10% of the water body to avoid damage to fish

**Timing:** Actively growing plants

**Herbicide:** Aqua-Kleen or Navigate (2,4-D)

**Description:** Apply 100 to 200 lb/A Aquaclean or Navigate. Do not irrigate unless concentration is less than 0.1 ppm and do not use for drinking above 0.07 ppm

**Timing:** Spring to early summer

**Herbicide:** Renovate 3 (triclopyr)

**Description:** Apply 0.75 to 2 ppm triclopyr. Setback distance from potable water intake applies; see label

**Timing:** Spring to early summer

## **Fanwort**

*Cabomba caroliniana*

### **Chemical control**

---

**Herbicide:** Hydrothol 191 (endothall mono salt)

**Description:** Apply 2 to 3 ppm of Hydrothol 191; see label for special regulations

**Timing:** Actively growing plants

**Herbicide:** Sonar or Avast (fluridone)

**Description:** Apply 15 to 31 oz/A Sonar or Avast (45 to 90 ppb at 4 ft water depth); special regulations may apply

**Timing:** Actively growing plants

**Herbicide:** Galleon SC (penoxsulam)

**Description:** Apply 17 to 52 oz/A Galleon; equivalent to 25 to 75 ppb at 4 ft depth; special regulations may apply

**Timing:** Actively growing plants

## **Feathered mosquito fern**

*Azolla pinnata*

### **Chemical control**

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**Herbicide:** No herbicides are labeled for control

# Field bindweed

*Convolvulus arvensis*

## Chemical control

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**Herbicide:** Banvel, Clarity, Vanquish, etc. (dicamba)

**Description:** Apply 0.5 to 1 lb ae/A dicamba

**Timing:** Actively growing plants; during bloom

**Herbicide:** Tordon (picloram)

**Description:** Apply 1 lb ae/A picloram

**Timing:** Early bud to bloom

**Herbicide:** Banvel, Clarity, Vanquish, etc. (dicamba) + 2,4-D

**Description:** Apply 0.5 to 1 lb ae/A dicamba + 1 to 2 lb ae/A 2,4-D

**Timing:** Late summer or fall before frost

**Herbicide:** Cimarron Max (metsulfuron + dicamba + 2,4-D)

**Description:** Apply 1 oz/A Part A plus 4 pt/A Part B

**Timing:** Actively growing plants

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 1.5 to 2 oz/A Escort; use a surfactant

**Timing:** Bloom stage

**Herbicide:** Cimarron X-tra (metsulfuron + chlorsulfuron)

**Description:** Apply 2 oz/A Cimarron X-tra

**Timing:** Actively growing plants

**Herbicide:** glyphosate

**Description:** Apply 3 to 3.75 lb ae/A glyphosate

**Timing:** Full bloom

**Herbicide:** 2,4-D

**Description:** Apply 2 to 3 lb ae/A 2,4-D

**Timing:** Bud stage

## **Flowering rush**

*Butomus umbellatus*

### **Chemical control**

---

**Herbicide:** Habitat (imazapyr)

**Description:** Apply 2 to 3 pt/A Habitat

**Timing:** Actively growing plants

## **Giant hogweed**

*Heracleum mantegazzianum*

### **Chemical control**

---

**Herbicide:** glyphosate

**Description:** Apply 1.5 lb ae/A glyphosate broadcast, or inject 5% v/v into stems

**Timing:** Bud stage

**Herbicide:** Garlon 4 (triclopyr)

**Description:** Apply 1% v/v Garlon 4 to foliage

**Timing:** Actively growing plants

**Herbicide:** 2,4-D

**Description:** Apply 0.95 to 1.9 lb ae/A 2,4-D

**Timing:** Bud stage

## **Giant knotweed** *Polygonum sachalinense*

### **Chemical control**

---

**Herbicide:** Garlon 4 (triclopyr)

**Description:** Apply 1% v/v Garlon 4 to foliage

**Timing:** Actively growing plants

**Herbicide:** Habitat or Arsenal (imazapyr)

**Description:** Apply 0.5 to 1 lb/A or 1% v/v Habitat adjacent to water or Arsenal in areas away from water

**Timing:** Mid-summer after seed head forms

**Herbicide:** Aquamaster or Rodeo (glyphosate)

**Description:** Hollow-stem injection—Inject 5 ml Aquamaster or Rodeo per stem between the 2nd and 3rd internodes

**Timing:** Actively growing plants

## **Giant salvinia** *Salvinia molesta*

### **Chemical control**

---

**Herbicide:** Aquamaster (glyphosate)

**Description:** Apply 2.0% v/v Aquamaster as a spot spray; ensure thorough coverage

**Timing:** Actively growing plants

**Herbicide:** Reward (diquat)

**Description:** Apply 2 qt/A Reward (0.5% solution) with aquatic wetting agent (0.25-1% v/v); special regulations may apply

**Timing:** Actively growing plants

## Hoary alyssum

*Berteroa incana*

### Chemical control

---

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 0.5 to 1 oz/A Escort; use a surfactant

**Timing:** Rosette to bolting stages

**Herbicide:** Telar (chlorsulfuron)

**Description:** Apply 1 oz/A Telar; use a surfactant

**Timing:** Rosette to bolting stages

## Houndstongue

*Cynoglossum officinale*

### Chemical control

---

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 1 to 2 oz/A Escort; use a surfactant

**Timing:** Actively growing plants

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 2.5 to 3.3 oz/A Chaparral

**Timing:** Rosette to early bud stage; increase rate to 3 to 3.3 oz/A at bud stage

**Herbicide:** Plateau (imazapic)

**Description:** Apply 8 to 12 oz/A Plateau

**Timing:** Low rate at rosette stage; high rate at rosette to bolting stages

**Herbicide:** Cimarron Max (metsulfuron + dicamba + 2,4-D)

**Description:** Apply 1 oz/A Part A + 4 pt/A Part B

**Timing:** Spring up to floral bud stage

*(cont. on page 24)*

## Houndstongue (cont.)

### Chemical control (cont.)

---

**Herbicide:** Tordon 22K (picloram)

**Description:** Apply 1 to 2 pt/A Tordon 22K

**Timing:** Actively growing plants

**Herbicide:** 2,4-D ester

**Description:** Apply 2 lb ae/A 2,4-D ester

**Timing:** Actively growing plants; before bloom stage

## Hydrilla

*Hydrilla verticillata*

### Chemical control

---

**Herbicide:** fluridone

**Description:** Maintain a concentration of 45 to 90 ppb of fluridone for 30 to 90 days

**Timing:** Early in the season as plants begin growth and oxygen levels are higher. Applying early reduces the chance that aquatic animals will face an oxygen deficit when dying plants use oxygen as they decompose. Applications within  $\frac{1}{4}$  mile of a potable water intake cannot exceed 20 ppm

**Herbicide:** Aquathol K (endothall dipotassium salt)

**Description:** Apply 1 to 3 ppm endothall (24-hour swimming restriction, 3-day fishing restriction, and 14-day irrigation/stock watering restriction). Rates above 1 ppm should be limited to 10% of the water body to avoid damage to fish

**Timing:** Actively growing plants



## **Japanese knotweed** *Polygonum cuspidatum*

### **Chemical control**

---

**Herbicide:** Garlon 4 (triclopyr)

**Description:** Apply 1% v/v Garlon 4 to foliage

**Timing:** Actively growing plants

**Herbicide:** Habitat or Arsenal (imazapyr)

**Description:** Apply 0.5 to 1 lb/A or 1% v/v Habitat adjacent to water or Arsenal away from water

**Timing:** Mid-summer after seed head forms

**Herbicide:** Aquamaster or Rodeo (glyphosate)

**Description:** Hollow-stem injection—Inject 5 ml Aquamaster or Rodeo per stem between the 2nd and 3rd internodes

**Timing:** Actively growing plants

## **Johnsongrass** *Sorghum halepense*

### **Chemical control**

---

**Herbicide:** glyphosate

**Description:** Apply 2.25 lb ae/A glyphosate

**Timing:** Heading

**Herbicide:** Poast (sethoxydim)

**Description:** Apply 1.5 to 2.5 pt/A Poast

**Timing:** Actively growing plants 15 to 25 inches tall

*(cont. on page 26)*

## **Johnsongrass** (*cont.*)

### **Chemical control** (*cont.*)

---

**Herbicide:** Fusilade (fluazifop)

**Description:** Apply 1 to 1.5 pt/A Fusilade

**Timing:** Actively growing plants 8 to 18 inches tall; before boot stage

**Herbicide:** Bueno or Trans-Vert (MSMA)

**Description:** Apply 2 lb ai/A MSMA

**Timing:** Rapidly growing plants

**Herbicide:** Acclaim Extra (fenoxaprop)

**Description:** Apply 2 to 2.4 pt/A Acclaim Extra. For turf and ornamental use only

**Timing:** 2- to 5-leaf stages; 24 to 60 inches tall

## **Jointed goatgrass**

*Aegilops cylindrica*

### **Chemical control**

---

**Herbicide:** glyphosate

**Description:** Apply 0.38 to 0.75 lb ae/A glyphosate

**Timing:** Actively growing plants before boot stage

**Herbicide:** Oust (sulfometuron)

**Description:** Apply 1.3 to 2 oz/A Oust; use a surfactant

**Timing:** Early in fall to late winter before plants are 3 inches tall

# Leafy spurge

*Euphorbia esula*

## Chemical control

---

**Herbicide:** Plateau (imazapic)

**Description:** Apply 8 oz/A Plateau

**Timing:** After summer dry period when plants begin to grow

**Herbicide:** Tordon + 2,4-D (picloram + 2,4-D)

**Description:** Apply 0.5 lb ae/A picloram + 1 lb ae/A 2,4-D

**Timing:** Bloom stage

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.5 to 1 lb ae/A picloram

**Timing:** Bloom stage

**Herbicide:** glyphosate

**Description:** Apply 0.38 lb ae/A glyphosate three times at 1-month intervals beginning in June or apply 0.75 lb ae/A glyphosate two times at 1-month intervals beginning in June

**Timing:** June, July, and August or June and July

**Herbicide:** Banvel, Clarity, Vanquish, etc. (dicamba)

**Description:** Apply 1 lb ae/A dicamba

**Timing:** Spring to early summer

**Herbicide:** 2,4-D LV ester

**Description:** Apply 1 lb ae/A 2,4-D LV ester to suppress seed production or 6 lb ae/A 2,4-D LV ester for control

**Timing:** Actively growing plants

*(cont. on page 28)*

## Leafy spurge (*cont.*)

### Biological control

---

**Insect:** Flea beetle (*Aphthona cyparissiae*, *A. czwalinae*, *A. flava*, *A. nigriscutis*, and *A. abdominalis*)

**Description:** Adult aphthona beetles feed on leaves; larvae feed on root hairs and root tissues. Collect beetles as adults.

**Redistribution:** August 1 to October 1

**Insect:** Gall midge (*Spurgia esulae*)

**Description:** Larvae feed on shoot tips and stimulate the production of galls and malformed shoots. Collect galls in spring.

**Redistribution:** April 1 to May 1

**Insect:** Red-headed spurge stem borer (*Obera erythrocephala*)

**Description:** Larval feeding kills shoots and reduces root reserves.

Adult feeding has little impact. Collect beetles as adults.

**Redistribution:** July 15 to August 31

**Insect:** Spurge clearwing moth (*Chamaesphecia hungarica*)

**Description:** Root feeding inhibits shoot production and reduces plant vigor. Collect moths as adults.

**Redistribution:** May 15 to June 30

**Insect:** Leafy spurge hawkmoth (*Hyles euphorbiae*)

**Description:** Larvae feed and defoliate the plant. Collect moths as adults June 15 to July 30 and again August 15 to September 30.

**Redistribution:** June 15 to July 30 and August 15 to September 30

## **Matgrass** *Nardus stricta*

### **Cultural control**

---

**Method:** Hand removal

**Description:** Dig small clumps and remove them from the site

**Timing:** Early to late spring

### **Chemical control**

---

**Herbicide:** glyphosate

**Description:** Apply 2 lb ae/A glyphosate as a spot treatment or to heavily infested areas where selective control is not required

**Timing:** Actively growing plants

## **Meadow knapweed** *Centaurea debeauxii*

### **Chemical control**

---

**Herbicide:** Redeem R&P (clopyralid + triclopyr)

**Description:** Apply 0.75 to 1 qt/A Redeem R&P

**Timing:** Rosette to early bolting stages

**Herbicide:** Stinger or Transline (clopyralid)

**Description:** Apply 0.66 to 1.33 pt/A Stinger or Transline

**Timing:** Up to bud stage

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 5 to 7 fl oz/A Milestone

**Timing:** Rosette to bolting stages or in the fall

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 to 0.50 lb ae/A picloram

**Timing:** Spring before bolting

*(cont. on page 30)*

## Meadow knapweed (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** Curtail (clopyralid + 2,4-D)

**Description:** Apply 2 to 4 qt/A Curtail. Higher rates may result in persistence into the next field season.

**Timing:** After rosettes form in spring; before bolting

**Herbicide:** 2,4-D

**Description:** Apply 1 to 2 lb ae/A 2,4-D

**Timing:** Early bolting

**Herbicide:** glyphosate

**Description:** Apply 3 lb ae/A glyphosate

**Timing:** Bud stage

## Mediterranean sage

*Salvia aethiopsis*

### Chemical control

---

**Herbicide:** Escort (metsulfuron) + 2,4-D

**Description:** Apply 1 oz/A Escort + 32 oz/A 2,4-D

**Timing:** Rosette to bolting stages

**Herbicide:** Tordon 22K (picloram)

**Description:** Apply 1 to 2 pt/A Tordon 22K

**Timing:** Rosette to bolting stages

**Herbicide:** glyphosate

**Description:** Spot spray 1 to 2% v/v glyphosate

**Timing:** Rosette to bolting stages

## Mediterranean sage (cont.)

### Biological control

---

**Insect:** Mediterranean root weevil (*Phrydiuchus tau*)

**Description:** Adults chew holes in the aromatic sage leaves, leaving characteristic shot holes. At high weevil densities, leaves can be severely damaged. Females lay eggs at the base of rosette leaves in fall or early spring. Larvae chew into the root crown, feeding on root tissue for about 6 weeks before emerging from the root to pupate for about 10 days. Heavy larval feeding damage can kill small plants. Collect weevils as adults of the new (spring) generation in May to June (adults hide during the hot summer).

**Redistribution:** Distribute weevils as adults in the spring

## Milium

*Milium vernale*

### Chemical control

---

**Herbicide:** Hoelon (diclofop)

**Description:** Apply 1 lb ai/A diclofop

**Timing:** 1- to 5-leaf stage

## Musk thistle

*Carduus nutans*

### Chemical control

---

**Herbicide:** Telar (chlorsulfuron)

**Description:** Apply 1 oz/A Telar; use a surfactant

**Timing:** After rosettes form in spring; before bolting

(cont. on page 32)

## Musk thistle (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 1 oz/A Escort; use a surfactant

**Timing:** Actively growing rosettes

**Herbicide:** Cimarron Max (metsulfuron + dicamba + 2,4-D)

**Description:** Apply 0.25 oz/A Part A plus 1 pt/A Part B

**Timing:** Prior to flowering

**Herbicide:** Cimarron X-tra (metsulfuron + chlorsulfuron)

**Description:** Apply 0.5 oz/A Cimarron X-tra

**Timing:** Prior to flowering

**Herbicide:** Redeem R&P (triclopyr + clopyralid)

**Description:** Apply 1.5 to 2 pt/A Redeem R&P

**Timing:** Rosette to early bolting stages

**Herbicide:** Stinger or Transline (clopyralid)

**Description:** Apply 0.25 to 1 pt/A Stinger or Transline

**Timing:** Rosette to early bolting stages

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 3 to 5 fl oz/A Milestone

**Timing:** Apply 3 to 5 fl oz/A to rosettes or bolting plants. Apply 4 to 5 fl oz/A at the late bolting through early flowering stages

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 1 to 2 oz/A Chaparral

**Timing:** Spring to early summer to rosette or bolting plants; fall to seedlings and rosettes

**Herbicide:** Forefront R&P (aminopyralid + 2,4-D)

**Description:** Apply 1.5 to 2 fl pt/A Forefront R&P

**Timing:** Rosette to bolting stages



## Musk thistle (cont.)

### Chemical control (cont.)

---

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 lb ae/A picloram

**Timing:** Rosettes in fall

**Herbicide:** Curtail (clopyralid + 2,4-D)

**Description:** Apply 2 to 4 qt/A Curtail. Higher rates may result in persistence into the next field season.

**Timing:** Late rosette to just before flower bud formation

**Herbicide:** Banvel, Clarity, Vanquish, etc. (dicamba)

**Description:** Apply 0.5 to 1 lb ae/A dicamba

**Timing:** Fall or spring but before bolting

**Herbicide:** Overdrive (dicamba + diflufenzopyr)

**Description:** Apply 4 to 8 fl oz/A Overdrive

**Timing:** Actively growing plants

**Herbicide:** 2,4-D

**Description:** Apply 1.5 to 2 lb ae/A 2,4-D

**Timing:** Fall or spring but before bolting

**Herbicide:** Campaign (glyphosate + 2,4-D)

**Description:** Apply 1 to 2 pt/A Campaign

**Timing:** Rosette in fall; before freezing in spring

### Biological control

---

**Insect:** Thistle rosette weevil (*Trichosiromachus horridus*)

**Description:** Larvae attack the rosettes and interrupt apical dominance of the plant. Rosette weevil populations have caused a dramatic reduction in both thistle population and plant vitality. Collect weevils as adults.

**Redistribution:** March 15 to April 1 and July 15 to August 1

# Orange hawkweed

*Hieracium aurantiacum*

## Chemical control

---

**Herbicide:** Transline or Stinger (clopyralid)

**Description:** Apply 0.66 to 1 pt/A Transline or Stinger

**Timing:** Fall or spring but before bolting

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 4 to 6 fl oz/A Milestone

**Timing:** Rosette to bolting stages

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 2.5 to 3.3 oz/A Chaparral

**Timing:** Bolting stage

**Herbicide:** Forefront R&P (aminopyralid + 2,4-D)

**Description:** Apply 2 to 2.6 fl pt/A Forefront R&P

**Timing:** Rosette to bolting stages

**Herbicide:** Curtail (clopyralid + 2,4-D)

**Description:** Apply 2 qt/A Curtail

**Timing:** Fall or spring but before bolting

**Herbicide:** Redeem R&P (clopyralid + triclopyr)

**Description:** Apply 1.5 to 2 qt/A Redeem R&P

**Timing:** In fall to rosettes

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 lb ai/A picloram

**Timing:** After rosettes form in spring; before bolting

**Herbicide:** 2,4-D

**Description:** Apply 1.43 to 1.90 lb ae/A 2,4-D

**Timing:** Actively growing rosettes

# Oxeye daisy

*Leucanthemum vulgare*

## Chemical control

---

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 0.5 to 1 oz/A Escort; use a surfactant

**Timing:** Rosette to bolting stages

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 4 to 6 oz/A Milestone

**Timing:** Rosette to bolting stages

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 2.5 to 3.3 oz/A Chaparral

**Timing:** Prebud stage

**Herbicide:** Forefront R&P (aminopyralid + 2,4-D)

**Description:** Apply 1.5 to 2 fl pt/A Forefront R&P

**Timing:** Rosette to bolting stages

**Herbicide:** Tordon 22K (picloram)

**Description:** Apply 1.5 to 2 pt/A Tordon 22K with at least 30 gal/A of water

**Timing:** Rosette to bolting stages

**Herbicide:** Transline (clopyralid)

**Description:** Apply 4 to 11 oz/A Transline

**Timing:** Rosette to bolting stages

**Herbicide:** Overdrive (dicamba + diflufenzopyr)

**Description:** Apply 4 to 8 fl oz/A Overdrive

**Timing:** Actively growing plants

## Parrotfeather milfoil

*Myriophyllum aquaticum*

### Chemical control

---

**Herbicide:** Navigate (2,4-D) + Stingray (carfentrazone)

**Description:** Apply 100 to 200 lb/A Navigate + 0.286 to 2.86 gal/A Stingray

**Timing:** New growth in spring to early summer

**Herbicide:** Habitat (imazapyr)

**Description:** Apply 2 to 4 pt/A (1% v/v) Habitat

**Timing:** Actively growing emerged foliage; foliage must be above water

## Perennial pepperweed

*Lepidium latifolium*

### Chemical control

---

**Herbicide:** Telar (chlorsulfuron)

**Description:** Apply 1 oz/A Telar; use a surfactant

**Timing:** Flower bud stage

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 1 oz/A Escort; use a surfactant

**Timing:** Flower bud stage

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 3.3 oz/A Chaparral for suppression

**Timing:** Early flowering to bloom stage; add 2 lb ae/A 2,4-D for optimum control

**Herbicide:** Cimarron X-tra (metsulfuron + chlorsulfuron)

**Description:** Apply 2 oz/A

**Timing:** Actively growing plants less than 4 inches tall

## Perennial pepperweed (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** Telar (chlorsulfuron) + mowing

**Description:** Apply 1 oz/A Telar; use a surfactant

**Timing:** Apply to resprouting stems

**Herbicide:** glyphosate

**Description:** Apply 3 lb ae/A glyphosate to stems recovered to flower bud stage after previous mowing at flower bud stage. In riparian areas and wetlands, apply 3 qt/A Rodeo.

**Timing:** Flower bud stage

**Herbicide:** Weedar (2,4-D amine)

**Description:** Apply 1.9 lb ae/A 2,4-D amine

**Timing:** Flower bud stage

**Herbicide:** Weedone (2,4-D ester)

**Description:** Apply 2 lb ae/A 2,4-D ester; see label for air temperature restrictions

**Timing:** Resprouting stems in late summer

**Herbicide:** Arsenal (imazapyr)

**Description:** Spot spray 6 to 24 fl oz/A Arsenal

**Timing:** Flower bud stage

**Herbicide:** Cimarron Max (metsulfuron + dicamba + 2,4-D)

**Description:** Apply 1 oz/A Part A plus 4 pt/A Part B

**Timing:** Bud to bloom stages

**Herbicide:** Cimarron X-tra (metsulfuron + chlorsulfuron)

**Description:** Apply one 20-oz pack of Cimarron X-tra per 10 acres; use a surfactant

**Timing:** Bud to bloom stages

# Perennial sowthistle

*Sonchus arvensis*

## Chemical control

---

**Herbicide:** 2,4-D

**Description:** Apply 2 lb ae/A 2,4-D

**Timing:** Bud stage or regrowth 8 to 10 inches high

**Herbicide:** Curtail (clopyralid + 2,4-D)

**Description:** Apply 1 to 4 qt/A Curtail. Higher rates may result in persistence into the next field season.

**Timing:** Rosettes or before flower buds form

**Herbicide:** Redeem R&P (triclopyr + clopyralid)

**Description:** Apply 2 pt/A Redeem R&P

**Timing:** Rosettes or before flower buds form

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 3 to 5 fl oz/A Milestone

**Timing:** Rosettes or before flower buds form

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 2 to 2.5 oz/A Chaparral

**Timing:** Rosettes to prebud stage

**Herbicide:** Forefront R&P (aminopyralid + 2,4-D)

**Description:** Apply 2 to 2.6 fl pt/A Forefront R&P

**Timing:** Rosettes to prebud stage

**Herbicide:** Cimarron Max (metsulfuron + dicamba + 2,4-D)

**Description:** Apply 1 oz/A Part A + 4 pt/A Part B

**Timing:** Actively growing plants

**Herbicide:** Overdrive (dicamba + diflufenzopyr)

**Description:** Apply 4 to 8 fl oz/A Overdrive

**Timing:** Actively growing plants

# Plumeless thistle

*Carduus acanthoides*

## Chemical control

---

**Herbicide:** Weedar (2, 4-D amine)

**Description:** Apply 2 to 4 pt/A 2,4-D amine

**Timing:** Rosette to bolting stages

**Herbicide:** Banvel, Clarity, Vanquish (dicamba)

**Description:** Apply 0.5 to 1 lb ae/A dicamba

**Timing:** Rosette stage

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 0.5 to 1.0 oz/A Escort; use a surfactant

**Timing:** Rosette to bolting stages

**Herbicide:** Tordon 22K (picloram)

**Description:** Apply 8 to 12 oz/A Tordon 22K

**Timing:** Rosette to bolting stages; in fall prior to freeze up

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 3 to 5 oz/A Milestone

**Timing:** Rosette to bolting stages in early summer; seedling to rosette stages in fall

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 1 to 2 oz/A Chaparral

**Timing:** Spring to early summer to rosette or bolting stages; fall to seedlings and rosettes

**Herbicide:** Forefront R&P (aminopyralid + 2,4-D)

**Description:** Apply 1.5 to 2 fl pt/A Forefront R&P

**Timing:** Rosette to bolting stages in early summer

# Poison hemlock

## *Conium maculatum*

### Chemical control

---

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 0.75 oz/A Escort; use a surfactant

**Timing:** Rosette in spring

**Herbicide:** 2,4-D

**Description:** Apply 1 to 2 lb ae/A 2,4-D

**Timing:** Rosette in spring

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 2.5 to 3.3 oz/A Chaparral for suppression

**Timing:** Rosette in spring

**Herbicide:** MCPA

**Description:** Apply 1 to 2 lb ae/A MCPA

**Timing:** Rosette in spring

**Herbicide:** glyphosate

**Description:** Apply 1 lb ae/A glyphosate

**Timing:** Rosette in spring

**Herbicide:** Cimarron Max (metsulfuron + dicamba + 2,4-D)

**Description:** Apply 1 oz/A Part A plus 4 pt/A Part B

**Timing:** Bud to bloom stages

**Herbicide:** Cimarron X-tra (metsulfuron + chlorsulfuron)

**Description:** Apply one 20-oz pack of Cimarron X-tra per 10 acres;  
use a surfactant

**Timing:** Bud to bloom stages

**Herbicide:** Telar (chlorsulfuron)

**Description:** Apply 1 to 3 oz/A Telar

**Timing:** Rosette in spring



## Poison hemlock (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** Overdrive (dicamba + diflufenzopyr)

**Description:** Apply 4 to 8 fl oz/A Overdrive

**Timing:** Actively growing plants

### Biological control

---

**Insect:** Defoliating hemlock moth (*Agonopterix alstroemeriana*)

**Description:** Larvae can cause severe defoliation by consuming leaves, young stem tissue, flowers, and seeds. Collect March 15 to June 15.

**Redistribution:** April 1 to July 1

## Policeman's helmet

*Impatiens glandulifera*

### Chemical control

---

**Herbicide:** glyphosate

**Description:** Apply 35% to 75% glyphosate solutions for wick applications; apply 1 to 2% v/v glyphosate for spot spray

**Timing:** Wick applications—when policeman's helmet plants are taller than surrounding desirable plants; spot spray—rosette to bolting

**Herbicide:** 2,4-D

**Description:** Apply 0.8 to 1 lb ae/A 2,4-D

**Timing:** Spring after plants emerge

## **Puncturevine**

*Tribulus terrestris*

### **Chemical control**

---

**Herbicide:** Telar (chlorsulfuron)

**Description:** Apply 1.5 oz/A Telar; use a surfactant

**Timing:** Late fall or late winter

**Herbicide:** Krovar (bromacil + diuron)

**Description:** Apply 10 lb/A Krovar in fall or 8 lb/A Krovar in spring

**Timing:** Fall or spring

**Herbicide:** 2,4-D

**Description:** Apply 2 lb ae/A 2,4-D

**Timing:** Seedlings; will require retreatment when new seedlings emerge

## **Purple loosestrife**

*Lythrum salicaria*

### **Chemical control**

---

**Herbicide:** Garlon 3A (triclopyr)

**Description:** Apply 1 to 1.5% v/v Garlon 3A

**Timing:** Bloom stage or seedlings

**Herbicide:** Rodeo (glyphosate) + 2,4-D

**Description:** Apply 0.25% v/v Rodeo + 2% v/v 2,4-D

**Timing:** Before bloom

**Herbicide:** Rodeo (glyphosate)

**Description:** Apply 1% v/v Rodeo

**Timing:** Full to late flowering

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 1 oz/A Escort

**Timing:** Actively growing plants

## Purple loosestrife (cont.)

### Chemical control (cont.)

---

**Herbicide:** Cimarron X-tra (metsulfuron + chlorsulfuron)

**Description:** Apply one 20-oz pack of Cimarron X-tra per 10 acres; use a surfactant

**Timing:** Actively growing plants

**Herbicide:** Cimarron Max (metsulfuron + dicamba + 2,4-D)

**Description:** Apply 1 oz/A Part A + 4 pt/A Part B

**Timing:** Actively growing plants

### Biological control

---

**Insect:** Loosestrife leaf feeding beetle (*Galerucella californiensis* and *G. pusilla*)

**Description:** Adults consume newly formed buds and leaves, while larvae feed on buds, leaves, and stems. Collect beetles as adults in May and June (early generation) or July 1 to August 1 (summer generation).

**Redistribution:** May and June or July 1 to August 1

**Insect:** Loosestrife flower weevil (*Nanophyes marmoratus*)

**Description:** Adults feed on developing leaves near shoot tips and flower buds. Larvae consume the developing petals, stamens, and ovaries, thereby destroying the bud. Collect weevils as adults.

**Redistribution:** July 15 to August 15

**Insect:** Loosestrife root mining weevil (*Hylobius transversovittatus*)  
Establishment not confirmed in Idaho.

**Description:** Adults feed on newly formed foliage. Larvae penetrate the root and feed within it, depleting important sugar reserves and diminishing plant survival. Collect adults in spring to late summer.

**Redistribution:** April 15 to September 30

# Rush skeletonweed

*Chondrilla juncea*

## Chemical control

---

**Herbicide:** Transline or Stinger (clopyralid)

**Description:** Apply 0.66 to 1 pt/A Transline or Stinger

**Timing:** Rosettes in fall or spring

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 5 to 7 fl oz/A Milestone

**Timing:** After rosettes form in spring

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 2.5 to 3 oz/A Chaparral

**Timing:** After rosettes form in spring

**Herbicide:** Tordon (picloram)

**Description:** Apply 1 lb ae/A picloram

**Timing:** Rosettes in fall or spring

**Herbicide:** Cimarron X-tra (metsulfuron + chlorsulfuron)

**Description:** For best results, apply 2 oz/A Cimarron X-tra plus 0.5 pt/A dicamba plus 1 pt/A 2,4-D

**Timing:** Rosettes in spring

**Herbicide:** Overdrive (dicamba + diflufenzopyr)

**Description:** Apply 4 to 8 fl oz/A Overdrive

**Timing:** Actively growing plants

**Herbicide:** 2,4-D

**Description:** Apply 2 lb ae/A 2,4-D; additional treatment will be necessary

**Timing:** Rosettes in spring

## Rush skeletonweed (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** MCPA

**Description:** Apply 2 lb ae/A MCPA; additional treatment will be necessary

**Timing:** Rosettes in spring

### Biological control

---

**Rust:** Rust (*Puccinia chondrillina*)

**Description:** Rust infects the rosette in fall and spring, causing brown pustules to erupt through the leaf and stem surfaces. Collect July 1 to August 15.

**Redistribution:** July 1 to August 15

**Insect:** Gall midge (*Cystiphora schmidtii*)

**Description:** Larval feeding stresses the plant and can reduce flowering. Collect stems with galls.

**Redistribution:** July 1 to August 1

**Insect:** Gall mite (*Eriophyes chondrillae*)

**Description:** Mites feed on flower buds or stem tips. High mite populations stunt and deform plants and can stop seed production. Collect green galls with some yellow to rust color.

**Redistribution:** July 1 to August 15

# Russian knapweed

*Acroptilon repens*

## Chemical control

---

**Herbicide:** Redeem R&P (triclopyr + clopyralid)

**Description:** Apply 1.25 to 2 qt/A Redeem R&P. Higher rates may result in persistence into the next field season.

**Timing:** Rosette to early bolting stages

**Herbicide:** Tordon (picloram)

**Description:** Apply 1 lb ae/A picloram

**Timing:** Spring before bolting

**Herbicide:** Curtail (clopyralid + 2,4-D)

**Description:** Apply 2 to 4 qt/A Curtail. Higher rates may result in persistence into the next field season.

**Timing:** After rosettes form in spring; before bolting

**Herbicide:** Stinger or Transline (clopyralid)

**Description:** Apply 0.66 to 1.33 pt/A Stinger or Transline

**Timing:** Up to bud stage

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 4 to 6 fl oz/A Milestone

**Timing:** Bud to flowering stages; dormant plants in fall

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 2.5 to 3.3 oz/A Chaparral

**Timing:** Early bud to flowering stage in spring to summer; dormant plants in fall

**Herbicide:** Forefront R&P (aminopyralid + 2,4-D)

**Description:** Apply 2 to 2.6 fl pt/A Forefront R&P

**Timing:** Rosette to bolting stage

## Russian knapweed (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** glyphosate

**Description:** Apply 3 lb ae/A glyphosate

**Timing:** Bud stage

**Herbicide:** 2,4-D

**Description:** Apply 4 to 8 lb ae/A 2,4-D

**Timing:** Early bolting

**Herbicide:** Telar (chlorsulfuron)

**Description:** Apply 1 to 3 oz/A Telar

**Timing:** Fall

### Biological control

---

**Nematode:** Nematode (*Subanguina picridis*)

**Description:** Nematode produces galls on stems. Collect galls in fall (September to November), transfer them to new sites, and place them on soil.

**Redistribution:** September to November

## Saltcedar

*Tamarix* sp.

### Chemical control

---

**Herbicide:** Garlon 4 (triclopyr)

**Description:** Cut stump—Apply 100% v/v of Garlon 4 to wet circumference of cut stump. Low-volume basal bark—Apply with oil-water mix at 20 to 30% v/v of Garlon 4 to thoroughly wet lower stems, including the root collar

**Timing:** Cut stump—year-round but avoid drought conditions. Basal bark—year-round unless snow covers root collar

(*cont. on page 48*)

## Saltcedar (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** Habitat (imazapyr)

**Description:** Spot spray—Apply 1% v/v Habitat. Foliar—Apply 2 pt/A Habitat

**Timing:** Actively growing foliage; during flowering

**Herbicide:** Rodeo (glyphosate)

**Description:** Broadcast—Apply 3 to 7.5 pt/A Rodeo. Cut stump—Apply 100% v/v of Rodeo to wet circumference of stump

**Timing:** Broadcast—When soil moisture is available for plant growth. Cut stump—Year-round; avoid drought conditions

## Scotch broom

*Cytisus scoparius*

### Chemical control

---

**Herbicide:** glyphosate

**Description:** Apply 2% v/v of glyphosate to foliage; stop application before runoff

**Timing:** Actively growing plants

**Herbicide:** Garlon 3A or 4 (triclopyr)

**Description:** Apply 1 to 1.5% v/v of Garlon 3A or 0.5 to 1.5% of Garlon 4 to foliage; stop application before runoff

**Timing:** Actively growing plants

**Herbicide:** Milestone VM Plus (aminopyralid + triclopyr)

**Description:** Apply 6 to 9 pt/A Milestone VM Plus

**Timing:** Optimal timing at bloom stage

**Herbicide:** Crossbow (triclopyr + 2,4-D)

**Description:** Apply 1 to 1.5% v/v of Crossbow to foliage; stop application before runoff

**Timing:** Actively growing plants



# Scotch thistle

*Onopordum acanthium*

## Chemical control

---

**Herbicide:** Telar (chlorsulfuron)

**Description:** Apply 1 oz/A Telar; use a surfactant

**Timing:** Actively growing rosettes

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 1 oz/A Escort; use a surfactant

**Timing:** Actively growing rosettes

**Herbicide:** Cimarron Max (metsulfuron + dicamba + 2,4-D)

**Description:** Apply 0.25 to 0.5 oz/A Part A plus 1 to 2 pt/A Part B

**Timing:** Spring prior to flowering

**Herbicide:** Cimarron X-tra (metsulfuron + chlorsulfuron)

**Description:** Apply 0.5 oz/A Cimarron X-tra

**Timing:** Rosette stage

**Herbicide:** Redeem R&P (triclopyr + clopyralid)

**Description:** Apply 1.5 to 2 pt/A Redeem R&P

**Timing:** Rosette to early bolting stages

**Herbicide:** Curtail (clopyralid + 2,4-D)

**Description:** Apply 2 to 4 qt/A Curtail. Higher rates may result in persistence into the next field season

**Timing:** Late rosette to just before flower bud formation

**Herbicide:** Stinger or Transline (clopyralid)

**Description:** Apply 0.25 to 1 pt/A Stinger or Transline

**Timing:** Rosette to early bolting stages

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 5 to 7 oz/A Milestone

**Timing:** Rosette to bolting stage. Use higher rate at bolting stage

*(cont. on page 50)*

## Scotch thistle (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 1.5 to 2.5 oz/A Chaparral

**Timing:** Rosette to bolting stage in spring and summer

**Herbicide:** Forefront R&P (aminopyralid + 2,4-D)

**Description:** Apply 1.5 to 2 fl pt/A Forefront R&P

**Timing:** Rosette to bolting stage

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 lb ae/A picloram

**Timing:** Rosettes in the fall

**Herbicide:** Banvel, Clarity, Vanquish, etc. (dicamba)

**Description:** Apply 0.5 to 1 lb ae/A dicamba

**Timing:** Fall or spring before bolting

**Herbicide:** 2,4-D

**Description:** Apply 1.5 to 2 lb ae/A 2,4-D

**Timing:** Fall or spring before bolting

**Herbicide:** Campaign (glyphosate + 2,4-D)

**Description:** Apply 1 to 2 pt/A Campaign

**Timing:** Rosette in fall before freezing or in spring

## Small bugloss

*Anchusa arvensis*

### Chemical control

---

**Herbicide:** 2,4-D ester

**Description:** Apply 2 lb ae/A 2,4-D ester; surfactant necessary

**Timing:** Rosette to bolting stages

## Small bugloss (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** glyphosate

**Description:** Apply 1 to 2% v/v glyphosate

**Timing:** Spot spray rosette to bolting stages

**Herbicide:** Tordon 22K (picloram)

**Description:** Apply 1 to 2 pt/A Tordon 22K; surfactant necessary

**Timing:** Rosette to bolting stages

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 1 to 2 oz/A Escort; surfactant necessary

**Timing:** Rosette to bolting stages

## Spotted knapweed

*Centaurea stoebe*

### Chemical control

---

**Herbicide:** Redeem R&P (triclopyr + clopyralid)

**Description:** Apply 0.75 to 1 qt/A Redeem R&P

**Timing:** Rosette to early bolting stages

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 to 0.50 lb ae/A picloram

**Timing:** Spring before bolting

**Herbicide:** Curtail (clopyralid + 2,4-D)

**Description:** Apply 2 to 4 qt/A Curtail. Higher rates may result in persistence into the next field season

**Timing:** After rosettes form in spring, before bolting

*(cont. on page 52)*

## Spotted knapweed (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** Stinger or Transline (clopyralid)

**Description:** Apply 0.66 to 1.33 pt/A Stinger or Transline

**Timing:** Up to bud stage

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 5 to 7 fl oz/A Milestone

**Timing:** Rosette to bolting stages or in fall

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 2.5 to 3.3 oz/A Chaparral

**Timing:** Rosette to bolting stage or in fall

**Herbicide:** Forefront R&P (aminopyralid + 2,4-D)

**Description:** Apply 2 to 2.6 fl pt/A Forefront R&P

**Timing:** Rosette to bolting stage

**Herbicide:** Overdrive (dicamba + diflufenzopyr)

**Description:** Apply 4 to 8 fl oz/A Overdrive

**Timing:** Actively growing plants

**Herbicide:** 2,4-D

**Description:** Apply 1 to 2 lb ae/A 2,4-D

**Timing:** Early bolting

**Herbicide:** glyphosate

**Description:** Apply 3 lb ae/A glyphosate

**Timing:** Bud stage

## Spotted knapweed (*cont.*)

### Biological control

---

**Insect:** Seedhead fly (*Urophora affinis* and *U. quadrifasciata*)

**Description:** The two species together reduce seed production by 75% to 95% at some sites but have no impact on stand density. *U. affinis* larvae attack the seed head causing the plant to form a hard gall, which depletes the plant's energy resources. Collect infested seed heads in early spring.

**Redistribution:** March 1 to April 30

**Insect:** Root-boring moth (*Agapeta zoegana*)

**Description:** Larvae mine the root of the plant, reducing its storage capacity and increasing susceptibility to infection by fungi or bacteria.

**Redistribution:** July 1 to August 15

**Insect:** Seed-head weevil (*Larinus minutus* and *L. obtusus*)

**Description:** Larvae destroy seeds in the seed heads, reducing seed production. *L. minutus* is causing decline of diffuse knapweed in some areas. Collect weevils as adults.

**Redistribution:** June 1 to October 1

**Insect:** Root boring beetle (*Sphenoptera jugoslavica*)

**Description:** Larvae tunnel within the roots. Surviving plants are stunted and produce fewer flowers. Adults do less damage by feeding on leaves. Collect beetles as adults.

**Redistribution:** July 15 to August 1

**Insect:** Broad-nosed knapweed seedhead weevil (*Bangasternus fausti*)

**Description:** Adults feed on leaves, stems, and florets but prefer flower heads when available. Collect weevils as adults.

**Redistribution:** June 1 to July 1

(*cont. on page 54*)

## Spotted knapweed (*cont.*)

### Biological control (*cont.*)

---

**Insect:** Knapweed peacock fly (*Chaetorellia acrolophi*) Not released in Idaho

**Description:** Larvae burrow into the center of the bud and eat their way into the seed, destroying the seed head. Collect infested seed heads in early spring (February 1 to March 30).

**Redistribution:** March 1 to April 30

**Insect:** Root weevil (*Cyphocleonus achates*)

**Description:** Larvae mine into the root, causing a root gall to form.

Dispersal is slow as adults rarely fly. Collect weevils as adults.

**Redistribution:** August 1 to October 1

**Insect:** Knapweed seedhead moth (*Metzneria paucipunctella*) Widely established in the West

**Description:** Larvae feed on developing seeds. Larvae also attack and destroy other seed head insects, including larvae of the two seed head flies, *Urophora* spp. Collect infested seed heads in early spring (February 1 to March 30).

**Redistribution:** March 15 to April 30

## Squarrose knapweed

*Centaurea triumfetti*

### Chemical control

---

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 4 to 6 fl oz/A Milestone

**Timing:** Rosette to bud stages

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 to 0.5 lb ae/A picloram

**Timing:** Rosette stage

## Squarrose knapweed (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** Stinger or Transline (clopyralid)

**Description:** Apply 0.25 to 0.5 lb ae/A clopyralid

**Timing:** Rosette to bud stages

## Syrian beancaper

*Zygophyllum fabago*

### Chemical control

---

**Herbicide:** glyphosate

**Description:** Apply 1.5 lb ae/A glyphosate

**Timing:** Flower bud stage

**Herbicide:** Tordon 22K (picloram)

**Description:** Apply 1 lb ae/A picloram

**Timing:** In fall before frost

## Tall hawkweed

*Hieracium piloselloides*

### Chemical control

---

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 4 to 6 oz/A Milestone

**Timing:** Rosette to bolting stages

**Herbicide:** Transline (clopyralid)

**Description:** 0.66 to 1 pt/A Transline

**Timing:** Rosette to bolting stages

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 lb ae/A picloram

**Timing:** Rosette to bolting stages

# Tansy ragwort

*Senecio jacobaea*

## Chemical control

---

**Herbicide:** 2,4-D

**Description:** Apply 1 to 2 lb ae/A 2,4-D

**Timing:** Before flowers open

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 lb ae/A picloram

**Timing:** Up to flowering stage

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 4 to 5 fl oz/A Milestone

**Timing:** Up to flowering stage

**Herbicide:** Banvel, Clarity, Vanquish, etc. (dicamba)

**Description:** Apply 1 lb ae/A dicamba

**Timing:** Up to flowering stage

**Herbicide:** Weedmaster (2,4-D + dicamba)

**Description:** Apply 2 qt/A Weedmaster

**Timing:** Up to flowering stage

**Herbicide:** Crossbow (triclopyr + 2,4-D)

**Description:** Apply 1.5 to 2 qt/A Crossbow

**Timing:** Before flowering stage

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 0.75 oz/A Escort; use a surfactant

**Timing:** Actively growing plants

**Herbicide:** Cimarron Max (metsulfuron + dicamba + 2,4-D)

**Description:** Apply 0.5 oz/A Part A plus 2 pt/A Part B

**Timing:** Actively growing plants prior to flowering



## Tansy ragwort (*cont.*)

### Biological control

---

**Insect:** Cinnabar moth (*Tyria jacobaeae*) Not established in Idaho

**Description:** Larvae feed on leaves, buds, and flowers, frequently defoliating all plants in 1 to 3 weeks.

**Redistribution:** May and June

**Insect:** Ragwort seed fly (*Botanophila seneciella*) Not released in U.S.

**Description:** Larvae penetrate the seed heads and feed on the developing seeds.

**Redistribution:** June

**Insect:** Ragwort flea beetle (*Longitarsus jacobaeae*) Established in Idaho

**Description:** Larvae burrow into and feed on roots, injuring or killing them. Adults feed on the leaves.

**Redistribution:** Fall through early spring

## Variable-leaf-milfoil

*Myriophyllum heterophyllum*

### Chemical control

---

**Herbicide:** Navigate (2,4-D ester)

**Description:** Apply 100 to 200 lb/A Navigate. Do not irrigate unless concentration is less than 0.1 ppm and do not use for drinking above 0.07 ppm

**Timing:** Spring to early summer

**Herbicide:** Reward (diquat)

**Description:** Apply 2 qt/A Reward (0.5% solution) with aquatic wetting agent (0.25-1% v/v); see label for special regulations

**Timing:** Actively growing plants

(*cont. on page 58*)

## Variable-leaf-milfoil (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** Aquathol K (endothall dipotassium salt)

**Description:** Apply 2 to 3 ppm of Aquathol K (24-hour swimming restriction, 3-day fishing restriction, and 14-day irrigation/stock watering restriction); rates above 1 ppm should be limited to 10% of the water body to avoid damage to fish

**Timing:** Actively growing plants

**Herbicide:** Hydrothol 191 (endothall mono salt)

**Description:** Apply 1 to 2 ppm of Hydrothol 191; see label for special regulations

**Timing:** Actively growing plants

**Herbicide:** Renovate 3 (triclopyr)

**Description:** Apply 2.7 to 7.2 gal/A Renovate (0.75-2.0 ppm ae at 4 ft water depth); see label for special regulations

**Timing:** Actively growing plants

**Herbicide:** Clearcast (imazamox)

**Description:** Apply 4 pt/A Clearcast with 1% v/v MSO broadcast; 1-3% v/v Clearcast as spot spray; or 100 to 200 ppb Clearcast sub-surface; see label for restrictions

**Timing:** Emerged plants

**Herbicide:** Sonar or Avast (fluridone)

**Description:** Apply 15 to 31 oz/A Sonar or Avast (45 to 90 ppb at 4 ft water depth); special regulations may apply

**Timing:** Actively growing plants

## Vipers bugloss

*Echium vulgare*

### Chemical control

---

**Herbicide:** 2,4-D ester

**Description:** Apply 2 lb ae/A 2,4-D ester; surfactant necessary

**Timing:** Rosette to bolting stages

**Herbicide:** glyphosate

**Description:** Apply 1 to 2% v/v glyphosate

**Timing:** Spot spray rosette to bolting stages

**Herbicide:** Tordon 22K (picloram)

**Description:** Apply 1 to 2 pt/A Tordon 22K; surfactant necessary

**Timing:** Rosette to bolting stages

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 1 to 2 oz/A Escort; surfactant necessary

**Timing:** Rosette to bolting stages

## Water chestnut

*Trapa natans*

### Chemical control

---

**Herbicide:** Navigate (2,4-D ester)

**Description:** Apply 150 to 200 lb/A Navigate; application rates differ with water depth

**Timing:** Actively growing plants early in the growing season

## **White bryony**

*Bryonia alba*

### **Chemical control**

---

**Herbicide:** glyphosate

**Description:** Apply 100% v/v glyphosate to cut root

**Timing:** Cut root 3 to 4 inches below surface

## **Whitetop**

*Cardaria draba*

### **Chemical control**

---

**Herbicide:** Escort (metsulfuron)

**Description:** Apply 1 oz/A Escort; use a surfactant

**Timing:** Bud to bloom stages or rosette in fall

**Herbicide:** Telar (chlorsulfuron)

**Description:** Apply 1 oz/A Telar; use a surfactant

**Timing:** Bud to bloom stages or rosette in fall

**Herbicide:** Cimarron X-tra (metsulfuron + chlorsulfuron)

**Description:** Apply one 20-oz pack of Cimarron X-tra per 10 acres;  
use a surfactant

**Timing:** Bud to bloom stages

**Herbicide:** 2,4-D

**Description:** Apply 2 to 3 lb ae/A 2,4-D

**Timing:** Before bud stage

## Yellow devil hawkweed

*Hieracium glomeratum*

### Chemical control

---

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 4 to 6 oz/A Milestone

**Timing:** Rosette to bolting stages

**Herbicide:** Transline (clopyralid)

**Description:** Apply 0.66 to 1 pt/A Transline

**Timing:** Rosette to bolting stages

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 lb ae/A picloram

**Timing:** Rosette to bolting stages

## Yellow flag iris

*Iris pseudacorus*

### Chemical control

---

**Herbicide:** Aquamaster (glyphosate)

**Description:** Hollow stem injection— inject 0.5 mL/stem in cut flower stems up to 9 inches above root crown; do not exceed 8 quarts /A

**Timing:** Actively growing plants

## Yellow floating heart

*Nymphoides peltata*

### Chemical control

---

**Herbicide:** No herbicides are labeled for control

# Yellow hawkweed

*Hieracium caespitosum*

## Chemical control

---

**Herbicide:** Redeem R&P (clopyralid + triclopyr)

**Description:** Apply 1.5 to 2 qt/A Redeem R&P. Higher rates may result in persistence into the next field season

**Timing:** After basal leaves form, before flower bud stage

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 lb ae/A picloram

**Timing:** After basal leaves form, before flower bud stage

**Herbicide:** Curtail (clopyralid + 2,4-D)

**Description:** Apply 2 qt/A Curtail

**Timing:** After basal leaves form, before flower bud stage

**Herbicide:** Transline or Stinger (clopyralid)

**Description:** Apply 0.66 to 1 pt/A Transline or Stinger

**Timing:** After basal leaves form, before flower bud stage

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 4 to 6 fl oz/A Milestone

**Timing:** Rosette to bolting stages

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 2.5 to 3.3 oz/A Chaparral

**Timing:** Bolting stage

**Herbicide:** Forefront R&P (aminopyralid + 2,4-D)

**Description:** Apply 2 to 2.6 fl pt/A Forefront R&P

**Timing:** Rosette to bolting stages

**Herbicide:** 2,4-D

**Description:** Apply 1.43 to 1.90 lb ae/A 2,4-D

**Timing:** After basal leaves form, before flower bud stage

# Yellow starthistle

*Centaurea solstitialis*

## Chemical control

---

**Herbicide:** Transline or Stinger (clopyralid)

**Description:** 0.25 to 1 pt/A Transline or Stinger

**Timing:** Rosette to early bolting stages

**Herbicide:** Milestone (aminopyralid)

**Description:** Apply 3 to 5 fl oz/A Milestone

**Timing:** Rosette to bolting stages

**Herbicide:** Chaparral (aminopyralid + metsulfuron)

**Description:** Apply 1.5 to 2 oz/A Chaparral

**Timing:** Rosette to bolting stages

**Herbicide:** Forefront R&P (aminopyralid + 2,4-D)

**Description:** Apply 2 to 2.6 fl pt/A Forefront R&P

**Timing:** Rosette to bolting stages

**Herbicide:** Redeem R&P (triclopyr + clopyralid)

**Description:** Apply 1.5 to 2 pt/A Redeem R&P

**Timing:** Rosette to bolting stages

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 to 0.375 lb ae/A picloram

**Timing:** Rosette to bolting stages

**Herbicide:** Curtail (clopyralid + 2,4-D)

**Description:** Apply 2 to 4 qt/A Curtail. Higher rates may result in persistence into the next field season

**Timing:** Rosette to bolting stages

*(cont. on page 64)*

## Yellow starthistle (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** Telar (chlorsulfuron)

**Description:** Apply 1.5 oz/A Telar; use a surfactant

**Timing:** Rosette stage

**Herbicide:** Overdrive (dicamba + diflufenzopyr)

**Description:** Apply 4 to 8 fl oz/A Overdrive

**Timing:** Actively growing plants

**Herbicide:** 2,4-D LV ester

**Description:** Apply 1 lb ae/A 2,4-D LV ester

**Timing:** Before flowering

### Biological control

---

**Insect:** Starthistle bud weevil (*Bangasternus orientalis*)

**Description:** Larvae tunnel through the flowering stalk and into the flower head where they feed on receptacle tissue and developing seeds. Larval feeding reduces seed production. Collect weevils as adults.

**Redistribution:** May 31 to July 1

**Insect:** Starthistle hairy weevil (*Eustenopus villosus*)

**Description:** Adult weevils feed externally on flowers; larvae feed within, destroying seed production. A good disperser, this agent can become widespread and have a significant impact on seed production. Collect weevils as adults.

**Redistribution:** June 15 to August 15

**Insect:** Starthistle flower weevil (*Larinus curtus*)

**Description:** Larvae feed on the developing seeds, with single larvae destroying more than 90% of the seeds in infested heads. Collect weevils as adults.

**Redistribution:** July 15 to August 30



## Yellow starthistle (*cont.*)

### Biological control (*cont.*)

---

**Insect:** Peacock fly (*Chaetorellia australis*)

**Description:** Larvae feed in the flower head and reduce seed production. Collect infested seed heads in early spring.

**Redistribution:** March 1 to April 15

**Insect:** Starthistle gallfly (*Urophora sirunaseva*)

**Description:** Larvae feed in the flower head and reduce seed production. Collect infested seed heads in early spring.

**Redistribution:** March 1 to 15

## Yellow toadflax

*Linaria vulgaris*

### Chemical control

---

**Herbicide:** Telar (chlorsulfuron)

**Description:** Apply 2 to 3 oz/A Telar; use a surfactant

**Timing:** Bud to bloom

**Herbicide:** Tordon (picloram) + Telar (chlorsulfuron)

**Description:** Apply 0.5 ae/A picloram + 1 oz/A Telar

**Timing:** Bud to bloom

**Herbicide:** Tordon (picloram) + Escort (metsulfuron)

**Description:** Apply 0.5 ae/A picloram + 1 oz/A Escort

**Timing:** Bud to bloom

**Herbicide:** Tordon (picloram)

**Description:** Apply 0.25 to 1 lb ae/A picloram

**Timing:** Late summer to fall or late winter

(*cont. on page 66*)

## Yellow toadflax (*cont.*)

### Chemical control (*cont.*)

---

**Herbicide:** Banvel, Clarity, Vanquish, etc. (dicamba)

**Description:** Apply 2 lb ae/A dicamba

**Timing:** Early spring

### Biological control

---

**Insect:** Flower feeding beetle (*Brachyterolus pulicarius*)

**Description:** Flower and fruit feeding by larvae may reduce toadflax seed production by more than 75%. Collect adult beetles in late spring.

**Redistribution:** May 1 to June 15

**Insect:** Defoliating moth (*Calophasia lunula*)

**Description:** Defoliation from larval feeding reduces plant vigor and seed production. Collect moth as larvae.

**Redistribution:** May and June

**Insect:** Stem-boring weevil (*Mecinus janthinus*)

**Description:** Larval feeding can kill shoots, which reduces flower and seed production. Adult weevils feed externally on foliage, and larvae feed within the stems. Collect weevil as adults.

**Redistribution:** May to early July

**Insect:** Toadflax seed weevil (*Rhinusa antirrhini*) Establishment confirmed in Idaho

**Description:** Adults eat shoots and flowers, and larvae feed on developing seed capsules. Both adult and larval feeding can reduce seed production by 85% to 90%. Collect weevil as adults.

**Redistribution:** June



**Always read and follow the label to ensure  
any application made is safe and legal.**

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