



Idaho's Noxious Weeds
2011 CONTROL GUIDELINES
Noncrop and Rangeland Sites

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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 2011 control guidelines

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. Find it at: <http://pnwhandbooks.org/weed/>

For **biological control agent collection site locations**, contact the Nez Perce Biocontrol Center at (208) 843-9374 or Mark Schwarzlaender at (208) 885-9319.

Legend

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 XP (metsulfuron)

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

Timing: Actively growing plants

Herbicide: Tordon 22K(picloram)

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

Timing: Before bloom

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

Description: Apply 0.125 to 0.375 lb ae/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 (Part A: metsulfuron, Part B: dicamba + 2,4-D)

Description: Apply 0.5 oz/A Part A and 2 pt/A Part B Cimarron Max;
use a surfactant

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.*)

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: Seedling stage

Herbicide: Tordon 22K (picloram) + 2,4-D

Description: Apply 1 to 2 pt/A Tordon 22K + 0.5 lb ae/A 2,4-D

Timing: Seedling stage

Herbicide: Cimarron Max (Part A: metsulfuron, Part B: dicamba + 2,4-D)

Description: Apply 0.5 oz/A Part A and 2 pt/A Part B Cimarron Max; use a surfactant

Timing: Actively growing plants

Canada thistle

Cirsium arvense

Chemical control

Herbicide: Redeem R&P (clopyralid + triclopyr)

Description: Apply 3 to 4 pt/A Redeem R&P

Timing: Rosette to bud stages

(*cont. on page 8*)

For biological control contacts see page 4—7

Canada thistle (*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; use a surfactant

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 pt/A Forefront R&P; use a surfactant under adverse conditions

Timing: Actively growing plants

Herbicide: Tordon 22K (picloram)

Description: Apply 2 pt/A Tordon 22K

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 (Part A: metsulfuron, Part B: dicamba + 2,4-D)

Description: Apply 0.25 oz/A Part A and 1 pt/A Part B Cimarron Max, use a surfactant (for suppression only)

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

Canada thistle (*cont.*)

Chemical control (*cont.*)

Herbicide: Telar XP (chlorsulfuron)

Description: Apply 1 to 2.6 oz/A Telar XP; 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 oz/A Overdrive

Timing: Actively growing plants

Biological control

Insect: Stem weevil (*Hadroplontus litura*)

Description: Adults feed on leaf and stem tissue. The greatest damage is caused by larvae feeding within the stems. Impact is mostly indirect, providing access into shoots for harmful pathogens. Attack rates are mostly low (>10%) and their impact undetermined. Collect weevils as adults.

Redistribution: April 1 to May 1. Limited collection sites.

Insect: Gall fly (*Urophora cardui*)

Description: Larvae form galls in the stems that act as metabolic sinks, using plant resources to maintain the gall and nourish the larvae and reducing the plant's vigor. Seed production of attacked main stems is greatly reduced but galled side stems can still produce seeds.

Documented attack rates are low (>25%) but recently increasing.

Current attack levels provide little control. Collect galls in early spring.

Redistribution: February 15 to April 15. Limited collection sites.

Common crupina

Crupina vulgaris

Chemical control

Herbicide: Transline or Stinger (clopyralid)

Description: Apply 5.6 oz/A Transline or Stinger

Timing: Split—fall then spring

Herbicide: Escort XP (metsulfuron)

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

Timing: Actively growing plants

Herbicide: Chaparral (aminopyralid + metsulfuron)

Description: Apply 3 to 3.3 oz/A Chaparral

Timing: Actively growing plants

Herbicide: Cimarron Max (Part A: metsulfuron, Part B: dicamba + 2,4-D)

Description: Apply 0.5 oz/A Part A and 2 pt/A Part B Cimarron Max;
use a surfactant

Timing: Actively growing plants

Herbicide: Cimarron X-tra (metsulfuron + chlorsulfuron)

Description: Apply 2 oz/A Cimarron X-tra

Timing: Actively growing plants

Herbicide: Tordon 22K (picloram)

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

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

Herbicide: No herbicides are labeled for control

Common reed

Phragmites australis

Chemical control

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 XP (chlorsulfuron)

Description: Apply 2 to 2.6 oz/A Telar XP; use a surfactant

Timing: Bud to bloom. Fall timing is most effective

Herbicide: Escort XP (metsulfuron)

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

Timing: Actively growing plants

Herbicide: Tordon 22K (picloram) + Telar XP (chlorsulfuron)

Description: Apply 1 pt/A Tordon 22K + 1.5 oz/A Telar XP; use a surfactant

Timing: Bud to bloom

Herbicide: Tordon 22K (picloram)

Description: Apply 2 to 4 pt/A Tordon 22K

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: Flower beetle (*Brachypterolus pulicarius*)

Description: Adults and larvae feed on flowers and developing fruits and reduce seed production. Documented high attack rates (>70%) yield fair control. Collect beetles in spring when the plant begins flowering. Large numbers can be collected easily using sweep nets.

Redistribution: May and June. Widespread collection sites.

(cont. on page 14)

Dalmatian toadflax (*cont.*)

Biological control (*cont.*)

Insect: Defoliating moth (*Calophasia lunula*)

Description: Defoliation from larval feeding reduces plant vigor and seed production. Total defoliation occurs infrequently. Attack rates overall low (>10%) with infrequent mass outbreaks. Overall impact undetermined. Collect moths as larvae.

Redistribution: May and June. Widespread collection sites.

Insect: Stem boring weevil (*Mecinus janthinus*)

Description: Adults feed on foliage of plants whereas larvae mine within stems. Both can suppress flowering, reduce seed production, or kill stems. High attack rates are common (>70%) and yield excellent control. Collect weevils as adults.

Redistribution: May to late June. Widespread collection sites.

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 22K (picloram)

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

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

Diffuse knapweed (*cont.*)

Chemical control (*cont.*)

Herbicide: Milestone (aminopyralid)

Description: Apply 5 to 7 fl oz/A Milestone; use a surfactant

Timing: Rosette to bolting stages or in fall

Herbicide: Chaparral (aminopyralid + metsulfuron)

Description: Apply 2.5 to 3.3 oz/A Chaparral; use crop oil concentrate or surfactant

Timing: Rosette to bolting stages or in fall

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

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

Timing: Rosette to bolting stages

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

Description: Apply 2 to 4 qt/A Curtail

Timing: Rosette to early bolting stages

Herbicide: Overdrive (dicamba + diflufenzopyr)

Description: Apply 4 to 8 fl oz/A Overdrive

Timing: Actively growing plants

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

(cont. on page 16)

Diffuse knapweed (*cont.*)

Biological control

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

Description: Both flies together reduce seed production by up to 75% at some sites but have little impact on stand density. *U. affinis* larvae attack the flower heads and cause a hard gall to form; in the case of *U. quadrifasciata* the gall is soft. Seed head galls reduce seed production. Documented heavy attack rates (>70%) yield fair–good control. Collect infested seed heads.

Redistribution: March 1 to April 30. Extremely widespread collection sites. Check whether they are already present at your redistribution site.

Insect: Root boring moth (*Agapeta zoegana*)

Description: Larvae mine the root of the plant, damaging root tissues, reducing storage capacity, and increasing the plant's susceptibility to infection by pathogens. Attack rates are low (<10%). Where present, the larvae provide fair–good control. Collect adult moths.

Redistribution: July 1 to August 15. Very limited collection sites.

Insect: Seed head weevil (*Larinus minutus*)

Description: Larvae destroy seeds in the seed heads, reducing seed production. Adult feeding can defoliate plants. *L. minutus* is causing the decline of diffuse knapweed in some areas. Documented attack rates are heavy (>70%) and yield excellent control. Collect weevils as adults.

Redistribution: May 1 to July 1. Widespread collection sites.

Diffuse knapweed (*cont.*)

Biological control (*cont.*)

Insect: Root boring beetle (*Sphenoptera jugoslavica*)

Description: Larvae tunnel within the roots. Surviving plants are stunted and produce fewer stems and flowers. Adult feeding on foliage is less damaging. Documented attack rates are heavy (>70%) and yield good–excellent control. Collect beetles as adults.

Redistribution: July 1 to August 1. Widespread collection sites.

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

Description: Adults feed on leaves, stems, and florets but prefer flower heads when available. Larvae feed on seed head tissues and reduce seed production. Documented attack rates are medium (>30%) and yield fair–good control. Collect weevils as adults

Redistribution: June 1 to July 1. Widespread collection sites.

Insect: Root weevil (*Cyphocleonus achates*)

Description: Larvae mine in the roots and root crown, causing a root gall to form. Damage to root tissues causes stunted plant growth and greatly reduced plant vigor. Dispersal is slow. Documented medium attack rates (>30%) yield good–excellent control. Collect weevils as adults.

Redistribution: August 1 to October 1. Widespread collection sites.

Dyer's woad

Isatis tinctoria

Chemical control

Herbicide: Escort XP (metsulfuron)

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

Timing: Actively growing plants

Herbicide: Telar XP (chlorsulfuron)

Description: Apply 1 to 2.6 oz/A Telar XP; use a surfactant

Timing: Before or just after emergence

Herbicide: Cimarron Max (Part A: metsulfuron, Part B: dicamba + 2,4-D)

Description: Apply 0.5 oz/A Part A and 2 pt/A Part B Cimarron Max; use a surfactant

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

Method: Hand pull

Description: Divers pull plants by hand

Timing: Late spring to summer

Eurasian watermilfoil (*cont.*)

Cultural control (*cont.*)

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 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. May require NPDES permit.

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. May require NPDES permit.

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. May require NPDES permit.

Timing: Spring to early summer

(cont. on page 20)

Eurasian watermilfoil (*cont.*)

Biological control

Insect: Stem weevil (*Euhrychiopsis lecontei*)

Description: This weevil co-evolved with the native milfoil, *Myriophyllum sibiricum*, but also attacks Eurasian watermilfoil. It is naturally occurring in some lakes in the Pacific Northwest but augmentation may boost its populations. Documented light attack rates (>10%) yield little control. Its impact is unknown but may be great where weevil populations are large. It may be more suitable for smaller water bodies.

Redistribution: Currently only available commercially.

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. May require NPDES permit.

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. May require NPDES permit.

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. May require NPDES permit.

Timing: Actively growing plants

Feathered mosquito fern

Azolla pinnata

Chemical control

Herbicide: No herbicides are labeled for control

Field bindweed

Convolvulus arvensis

Chemical control

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

Description: Apply 0.5 to 1 lb ae/A dicamba

Timing: Actively growing plants; during bloom

Herbicide: Tordon 22K (picloram)

Description: Apply 2 to 4 pt/A Tordon 22K

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 (Part A: metsulfuron, Part B: dicamba + 2,4-D)

Description: Apply 1 oz/A Part A and 4 pt/A Part B Cimarron Max;
use a surfactant

Timing: Actively growing plants

Herbicide: Escort XP (metsulfuron)

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

Timing: Bloom stage

Herbicide: Cimarron X-tra (metsulfuron + chlorsulfuron)

Description: Apply 2 oz/A Cimarron X-tra; use a surfactant

Timing: Actively growing plants

(cont. on page 22)

Field bindweed (*cont.*)

Chemical control (*cont.*)

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

Biological control

Insect: Gall mite (*Aceria matherbae*)

Description: Mites feed on mid-veins and foliage causing stunted growth and a fuzzy appearance. Documented light attack rates (>10%) can produce good control.

Redistribution: Limited collection sites.

Insect: Defoliating moth (*Tyta luctuosa*)

Description: Larvae defoliate plants by consuming leaves and flower buds.

Redistribution: The moth has established in neighboring states but not yet in Idaho.

Flowering rush

Butomus umbellatus

Chemical control

Herbicide: Habitat (imazapyr)

Description: Apply 2 to 3 pt/A Habitat. May require NPDES permit

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. May require NPDES permit

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. May require NPDES permit

Timing: Actively growing plants

Hoary alyssum

Berteroa incana

Chemical control

Herbicide: Escort XP (metsulfuron)

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

Timing: Rosette to bolting stages

Herbicide: Telar XP (chlorsulfuron)

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

Timing: Rosette to bolting stages

Houndstongue

Cynoglossum officinale

Chemical control

Herbicide: Escort XP (metsulfuron)

Description: Apply 1 to 2 oz/A Escort XP; 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; use an adjuvant (methylated seed oil, vegetable oil concentrate, or surfactant)

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

Herbicide: Cimarron Max (Part A: metsulfuron, Part B: dicamba + 2,4-D)

Description: Apply 1 oz/A Part A and 4 pt/A Part B Cimarron Max; use a surfactant

Timing: Spring up to floral bud stage

Herbicide: Throttle XP (chlorsulfuron + sulfometuron methyl + sulfentrazone)

Description: Apply 12.5 oz/A Throttle XP. Non-crop registration only

Timing: Pre-emergence to early postemergence

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. May require NPDES permit

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 ¼ 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. May require NPDES permit

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

Japanese knotweed (*cont.*)

Chemical control (*cont.*)

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

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; use an adjuvant (methylated seed oil, vegetable oil concentrate, or surfactant)

Timing: After summer dry period when plants begin to grow

Herbicide: Tordon 22K (picloram) + 2,4-D

Description: Apply 2 pt/A Tordon 22K + 1 lb ae/A 2,4-D

Timing: Bloom stage

Herbicide: Tordon 22K (picloram)

Description: Apply 2 to 4 pt/A Tordon 22K

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

Leafy spurge (cont.)

Chemical control (cont.)

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

Biological control

Insect: Flea beetles (*Aphthona cyparissiae*, *A. czwalinae*, and *A. flava*)

Description: Adults feed on leaves; larvae feed on root hairs and root tissues. Light attack rates (>10%) yield good control. Collect beetles as adults.

Redistribution: June 1 to August 1. Limited collection sites.

Insect: Flea beetles (*Aphthona lacertosa* and *A. nigriscutis*)

Description: Adults feed on leaves; larvae feed on root hairs and root tissues. Documented high attack rates (>70%) yield excellent control. Collect beetles as adults.

Redistribution: June 1 to August 1. Widespread collection sites.

Insect: Leafy spurge hawkmoth (*Hyles euphorbiae*)

Description: Larval feeding defoliates the plant. Documented medium attack rates (>30%) yield little control. The larvae are prone to disease and are preyed upon. Collect moths as adults.

Redistribution: June 15 to July 30 and August 15 to September 30. Widespread collection sites.

(cont. on page 30)

Leafy spurge (cont.)

Biological control (cont.)

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

Description: Larval mining within stems can greatly reduce seed production, kill stems, and reduce root reserves. Adult feeding has little impact. Documented medium attack rates (>30%) yield good control. Collect beetles as adults.

Redistribution: July 15 to August 31. Widespread collection sites.

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; use a surfactant

Timing: Rosette to bolting stages or in the fall

Herbicide: Tordon 22K (picloram)

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

Timing: Spring before bolting

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

Description: Apply 2 to 4 qt/A Curtail.

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

(cont. on page 32)

Meadow knapweed (*cont.*)

Biological control

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

Description: Weevils overwinter as adults and emerge in spring when they begin to feed on knapweed foliage. Larvae feed on seeds and seed head tissues. High attack rates (>70%) yield excellent control. Collect weevils as adults.

Redistribution: May 1 to July 1. Limited collection sites in Idaho; mass collection sites in Oregon.

Insect: Seed head gall fly (*Urophora quadrifasciata*)

Description: Larvae form soft galls in the seed head of the plant, reducing seed production but with little impact on stand density. Attack rates unknown for Idaho. Collect infested seed heads in early spring.

Redistribution: March 1 to May 1.

Mediterranean sage

Salvia aethiopsis

Chemical control

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

Description: Apply 1 oz/A Escort XP + 1 lb ae/A 2,4-D; use a surfactant

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. Larvae chew into the root crown, feeding on root tissue for about 6 weeks. Heavy larval feeding damage can kill small plants. Documented heavy attack rates (70%) yield good control. Collect weevils as adults of the new (spring) generation (adults hide during the hot summer).

Redistribution: May to June. Widespread collection sites.

Milium

Milium vernale

Chemical control

Herbicide: No herbicides are labeled for control

Musk thistle

Carduus nutans

Chemical control

Herbicide: Telar XP (chlorsulfuron)

Description: Apply 0.5 to 1 oz/A Telar XP; use a surfactant

Timing: After rosettes form in spring; before bolting

Herbicide: Escort XP (metsulfuron)

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

Timing: Actively growing rosettes

(cont. on page 34)

Musk thistle (*cont.*)

Chemical control (*cont.*)

Herbicide: Cimarron Max (Part A: metsulfuron, Part B: dicamba + 2,4-D)

Description: Apply 0.25 oz/A Part A and 1 pt/A Part B; use a surfactant

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 to 2 pt/A Redeem R&P

Timing: Rosette to early bolting stages

Herbicide: Stinger or Transline (clopyralid)

Description: Apply 0.25 to 1.33 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 2.5 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 pt/A Forefront R&P

Timing: Rosette to bolting stages

Herbicide: Throttle XP (chlorsulfuron + sulfometuron methyl + sulfentrazone)

Description: Apply 12.5 oz/A Throttle XP. Non-crop registration only

Timing: Pre-emergence to early postemergence

Musk thistle (*cont.*)

Chemical control (*cont.*)

Herbicide: Tordon 22K (picloram)

Description: Apply 0.5 to 1 pt/A Tordon 22K

Timing: Rosettes in fall

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

Description: Apply 2 to 4 qt/A Curtail

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; use a surfactant

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 4 pt/A Campaign

Timing: Rosette in fall; before freezing in spring

Orange hawkweed

Hieracium aurantiacum

Chemical control

Herbicide: Transline or Stinger (clopyralid)

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

Timing: Fall or spring but before bolting

Herbicide: Milestone (aminopyralid)

Description: Apply 4 to 7 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 pt/A Forefront R&P

Timing: Rosette to bolting stages

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

Description: Apply 2 to 4 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 22K (picloram)

Description: Apply 1 pt/A Tordon 22K

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 XP (metsulfuron)

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

Timing: Rosette to bolting stages

Herbicide: Milestone (aminopyralid)

Description: Apply 4 to 7 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 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 oz/A Overdrive

Timing: Actively growing plants

Herbicide: Throttle XP (chlorsulfuron + sulfometuron methyl + sulfentrazone)

Description: Apply 12.5 oz/A Throttle XP. Non-crop registration only

Timing: Pre-emergence to early postemergence

Parrotfeather milfoil

Myriophyllum aquaticum

Chemical control

Herbicide: No herbicides are labeled for control

Perennial pepperweed

Lepidium latifolium

Chemical control

Herbicide: Telar XP (chlorsulfuron)

Description: Apply 1 to 2.6 oz/A Telar XP; use a surfactant

Timing: Flower bud stage

Herbicide: Escort XP (metsulfuron)

Description: Apply 1 to 2 oz/A Escort XP; 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 Cimarron X-tra; use a surfactant

Timing: Actively growing plants less than 4 inches tall

Herbicide: Telar XP (chlorsulfuron) + mowing

Description: Apply 1 to 3 oz/A Telar XP; use a surfactant

Timing: Apply to resprouting stems

Perennial pepperweed (*cont.*)

Chemical control (*cont.*)

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 (Part A: metsulfuron, Part B: dicamba + 2,4-D)

Description: Apply 1 oz/A Part A and 4 pt/A Part B Cimarron Max; use a surfactant

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.

Timing: Rosettes or before flower buds form

Herbicide: Redeem R&P (triclopyr + clopyralid)

Description: Apply 2.5 to 4 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 pt/A Forefront R&P

Timing: Rosettes to prebud stage

Herbicide: Cimarron Max (Part A: metsulfuron, Part B: dicamba + 2,4-D)

Description: Apply 1 oz/A Part A and 4 pt/A Part B Cimarron Max;
use a surfactant

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 XP (metsulfuron)

Description: Apply 0.5 to 1.0 oz/A Escort XP; 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 2.5 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 pt/A Forefront R&P

Timing: Rosette to bolting stages in early summer

Poison hemlock

Conium maculatum

Chemical control

Herbicide: Escort XP (metsulfuron)

Description: Apply 1 to 2 oz/A Escort XP; 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 (suppression only)

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 (Part A: metsulfuron, Part B: dicamba + 2,4-D)

Description: Apply 1 oz/A Part A and 4 pt/A Part B Cimarron Max;
use a surfactant

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

Poison hemlock (*cont.*)

Chemical control (*cont.*)

Herbicide: Telar XP (chlorsulfuron)

Description: Apply 1 to 2.6 oz/A Telar XP; use a surfactant

Timing: Rosette in spring

Herbicide: Overdrive (dicamba + diflufenzopyr)

Description: Apply 4 to 8 fl oz/A Overdrive

Timing: Actively growing plants

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 XP (chlorsulfuron)

Description: Apply 1 to 2.6 oz/A Telar XP; 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. May require NPDES permit

Timing: Bloom stage or seedlings

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

Description: Apply 0.25% v/v Rodeo + 2% v/v 2,4-D. May require NPDES permit

Timing: Before bloom

Herbicide: Rodeo (glyphosate)

Description: Apply 1% v/v Rodeo. May require NPDES permit

Timing: Full to late flowering

Purple loosestrife (*cont.*)

Chemical control (*cont.*)

Herbicide: Escort XP (metsulfuron)

Description: Apply 1 to 2 oz/A Escort XP; use a surfactant. May require NPDES permit

Timing: Actively growing plants

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 (Part A: metsulfuron, Part B: dicamba + 2,4-D)

Description: Apply 1 oz/A Part A and 4 pt/A Part B Cimarron Max; use a surfactant

Timing: Actively growing plants

Biological control

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

Description: Adults consume newly formed buds and foliage, while larvae feed on buds, leaves, and stems. Documented heavy attack rates (>70%) provide excellent control. Collect beetles as adults.

Redistribution: Collect first generation in May and early June or the second generation from July 1 to August 1. Widespread collection sites.

Insect: Loosestrife root mining weevil (*Hylobius transversovittatus*)

Description: Adults feed on newly formed foliage during dusk and dawn. Larvae penetrate the root and feed within it, depleting sugar reserves and diminishing plant survival. Documented light attack rates (>10%) provide good and long-term control. Collect adults in spring to late summer.

Redistribution: April 15 to September 30. Limited collection sites.

(*cont. on page 46*)

Purple loosestrife (*cont.*)

Biological control (*cont.*)

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 buds. Collect weevils as adults.

Redistribution: July 15 to August 15. Widespread collection sites.

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 22K (picloram)

Description: Apply 2 to 4 pt/A Tordon 22K

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

Rush skeletonweed (*cont.*)

Chemical control (*cont.*)

Herbicide: Overdrive (dicamba + diflufenzopyr)

Description: Apply 4 to 8 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

Herbicide: MCPA

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

Timing: Rosettes in spring

Biological control

Rust: Skeletonweed rust (*Puccinia chondrillina*)

Description: Rust infects the rosette in fall and spring, causing brown pustules to erupt through the leaf and stem surfaces.

Documented heavy attack rates (>70%) provide good control on susceptible genotypes. Collect leaves with rust lesions.

Redistribution: May 1 to July 1. Widespread collection sites.

Insect: Root boring moth (*Bradyrrhoa gilveolella*)

Description: Larvae feed on root hairs and on roots during the summer. Larval feeding reduces plant vigor. Unknown attack rates and unknown control in Idaho. Collect adult moths.

Redistribution: July 1 to September 1. Very limited collection sites.

(*cont. on page 48*)

Rush skeletonweed (*cont.*)

Biological control (*cont.*)

Insect: Gall midge (*Cystiphora schmidtii*)

Description: Larval feeding stresses the plant and can reduce flowering. Documented heavy attack rates (>70%) provide good control. Collect stems with galls.

Redistribution: June 1 to July 1. Widespread collection sites.

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. Documented heavy attack rates (>70%) provide excellent control. Collect green galls with some yellow to rust color.

Redistribution: June 1 to July 1. Widespread collection sites.

Russian knapweed

Acroptilon repens

Chemical control

Herbicide: Redeem R&P (triclopyr + clopyralid)

Description: Apply 1.25 to 2 qt/A Redeem R&P

Timing: Rosette to early bolting stages

Herbicide: Tordon 22K (picloram)

Description: Apply 2 to 4 pt/A Tordon 22K

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

Russian knapweed (*cont.*)

Chemical control (*cont.*)

Herbicide: Stinger or Transline (clopyralid)

Description: Apply 1 to 1.33 pt/A Stinger or Transline

Timing: Up to bud stage

Herbicide: Milestone (aminopyralid)

Description: Apply 5 to 7 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 pt/A Forefront R&P

Timing: Rosette to bolting stage

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 XP (chlorsulfuron)

Description: Apply 1 to 2.6 oz/A Telar XP; use a surfactant

Timing: Fall

(cont. on page 50)

Russian knapweed (*cont.*)

Biological control

Nematode: Nematode (*Subanguina picridis*)

Description: Nematode produces galls on stems. Unknown attack rate and unknown control in Idaho. Collect galls in fall.

Redistribution: September to November. Place galls on soil. Very limited collection sites.

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

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

Biological control

Insect: Scotch broom bruchid (*Bruchidius villosus*)

Description: Larvae feed within pods of scotch broom and reduce seed production. Documented attack rates (>25%) provide fair control. Collect adult beetles.

Redistribution: May 1 to July 1. Limited collection sites.

Nematode: Scotch broom seed weevil (*Exapion fuscirostre*)

Description: Adults feed on flowers in spring to stimulate egg production. Eggs are laid into seed pods, and larvae feed on the seeds.

Documented attack rates (>50%) provide good control. Collect adults.

Redistribution: May 1 to July 1. Limited collection sites.

Scotch thistle

Onopordum acanthium

Chemical control

Herbicide: Telar XP (chlorsulfuron)

Description: Apply 1 to 2.6 oz/A Telar XP; use a surfactant

Timing: Actively growing rosettes

Herbicide: Escort XP (metsulfuron)

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

Timing: Actively growing rosettes

Herbicide: Cimarron Max (Part A: metsulfuron, Part B: dicamba + 2,4-D)

Description: Apply 0.25 oz/A Part A and 1 to 2 pt/A Part B Cimarron Max; use a surfactant

Timing: Spring prior to flowering

Herbicide: Cimarron X-tra (metsulfuron + chlorsulfuron)

Description: Apply 0.5 oz/A Cimarron X-tra; use a surfactant

Timing: Rosette stage

Herbicide: Redeem R&P (triclopyr + clopyralid)

Description: Apply 1 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.

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

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 pt/A Forefront R&P

Timing: Rosette to bolting stage

Herbicide: Tordon 22K (picloram)

Description: Apply 0.5 to 1 pt/A Tordon 22K

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

Herbicide: Throttle XP (chlorsulfuron + sulfometuron methyl + sulfentrazone)

Description: Apply 12.5 oz/A Throttle XP. Non-crop registration only

Timing: Pre-emergence to early postemergence

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

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 XP (metsulfuron)

Description: Apply 1 to 2 oz/A Escort XP; 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 22K (picloram)

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

Timing: Spring before bolting

Spotted knapweed (*cont.*)

Chemical control (*cont.*)

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

Description: Apply 2 to 4 qt/A Curtail

Timing: After rosettes form in spring, before bolting

Herbicide: Stinger or Transline (clopyralid)

Description: Apply 0.33 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 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

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Spotted knapweed (*cont.*)

Biological control

Insect: Seed head flies (*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; the gall of *U. quadrifasciata* is soft. Documented heavy attack rates (>70%) yield good control. Collect infested seed heads in early spring.

Redistribution: March 1 to April 30. Widespread collection sites.

Insect: Root boring moth (*Agapeta zoegana*)

Description: Larvae mine the root of the plant, reducing its storage capacity and increasing its susceptibility to infection by fungi or bacteria. Documented light attack rates (>10%) provide good control. Collect adults.

Redistribution: July 1 to August 15. Widespread collection sites.

Insect: Seed head weevils (*Larinus minutus* and *L. obtusus*). The two weevils are difficult to distinguish.

Description: Larvae feed on seed head tissues and developing fruits, reducing seed production. Adult weevils feed on foliage and stem rind tissues. *L. minutus* heavy attack rates (>70%) provide excellent control. *L. obtusus* medium attack rates (>30%) provide fair control. Collect adult weevils.

Redistribution: May 1 to July 1. *L. minutus* has widespread collection sites. *L. obtusus* has limited collection sites.

Insect: Root boring beetle (*Sphenoptera jugoslavica*)

Description: Larvae tunnel within the roots. Surviving plants are stunted and produce fewer stems and flowers. Adult feeding on foliage is less damaging. Attack rates are low to intermediate but provide good control. Collect beetles as adults.

Redistribution: July 1 to August 1. Widespread collection sites.

Spotted knapweed (*cont.*)

Biological control (*cont.*)

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

Description: Adults feed on leaves, stems, and florets but prefer flower heads when available. Larvae feed on seed head tissues and reduce seed production. Documented medium attack rates (>30%) yield fair–good control. Collect weevils as adults

Redistribution: May 1 to July 1. Widespread collection sites.

Insect: Knapweed peacock fly (*Chaetorellia acrolophi*)

Description: Larvae of this fruit fly burrow into the center of buds and feed on seed head tissues and developing seeds, destroying the seeds and reducing seed production. Documented light attack rates (>10%) provide fair control. Collect infested seed heads in early spring.

Redistribution: February 1 to April 1. Limited collection sites.

Insect: Root weevil (*Cyphocleonus achates*)

Description: Larvae mine in the upper part of the root, causing a root gall to form. Larval feeding reduces general plant vigor and leads to stunted plant growth. Documented medium attack rates (>30%) provide good to excellent control. Collect weevils as adults.

Redistribution: August 1 to October 1. Widespread collection sites.

Squarrose knapweed

Centaurea triumfetti

Chemical control

Herbicide: Milestone (aminopyralid)

Description: Apply 5 to 7 fl oz/A Milestone

Timing: Rosette to bud stages

Herbicide: Tordon 22K (picloram)

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

Timing: Rosette stage

Herbicide: Stinger or Transline (clopyralid)

Description: Apply 0.33 to 1.33 pt/A Stinger or Transline

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 4 pt/A Tordon 22K

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 22K (picloram)

Description: Apply 0.5 pt/A Tordon 22K

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 22K (picloram)

Description: Apply 2 to 4 pt/A Tordon 22K

Timing: Up to flowering stage

Herbicide: Milestone (aminopyralid)

Description: Apply 5 to 7 fl oz/A Milestone

Timing: Up to flowering stage

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Tansy ragwort (*cont.*)

Chemical control (*cont.*)

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 XP (metsulfuron)

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

Timing: Actively growing plants

Herbicide: Cimarron Max (Part A: metsulfuron, Part B: dicamba + 2,4-D)

Description: Apply 0.5 oz/A Part A and 2 pt/A Part B Cimarron Max; use a surfactant

Timing: Actively growing plants prior to flowering

Herbicide: Throttle XP (chlorsulfuron + sulfometuron methyl + sulfentrazone)

Description: Apply 12.5 oz/A Throttle XP. Non-crop registration only

Timing: Pre-emergence to early postemergence

Biological control

Insect: Ragwort seed fly (*Botanophila seneciella*)

Description: Larvae penetrate the seed heads and feed on the developing seeds. Light attack rates (>10%) provide fair control. Collect adult flies.

Redistribution: June 1 to July 1. Limited collection sites.

Tansy ragwort (*cont.*)

Biological control (*cont.*)

Insect: Ragwort flea beetle (*Longitarsus jacobaeae*).

Description: Larvae mine inside and outside the roots, significantly damaging the plant and often killing it. Adults feed on the leaves and stems. Documented heavy attack rates (>70%) provide excellent control.

Redistribution: Fall through early spring. Widespread collection sites.

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. May require NPDES permit

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. May require NPDES permit

Timing: Actively growing plants

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. May require NPDES permit

Timing: Actively growing plants

(*cont. on page 62*)

Variable-leaf-milfoil (*cont.*)

Chemical control (*cont.*)

Herbicide: Hydrothol 191 (endothall mono salt)

Description: Apply 1 to 2 ppm of Hydrothol 191; see label for special regulations. May require NPDES permit

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. May require NPDES permit

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 subsurface; see label for restrictions. May require NPDES permit

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. May require NPDES permit

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 XP (metsulfuron)

Description: Apply 1 to 2 oz/A Escort XP; 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. May require NPDES permit

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 XP (metsulfuron)

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

Timing: Bud to bloom stages or rosette in fall

Herbicide: Telar XP (chlorsulfuron)

Description: Apply 0.5 to 1 oz/A Telar XP; 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: Throttle XP (chlorsulfuron + sulfometuron methyl +
sulfentrazone)

Description: Apply 12.5 oz/A Throttle XP. Non-crop registration only

Timing: Pre-emergence to early postemergence

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 1.33 pt/A Transline

Timing: Rosette to bolting stages

Herbicide: Tordon 22K (picloram)

Description: Apply 0.5 pt/A Tordon 22K

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 qt/A. May require NPDES permit

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

Timing: After basal leaves form, before flower bud stage

Herbicide: Tordon 22 K (picloram)

Description: Apply 0.5 pt/A Tordon 22K

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 1.33 pt/A Transline or Stinger

Timing: After basal leaves form, before flower bud stage

Herbicide: Milestone (aminopyralid)

Description: Apply 4 to 7 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

Yellow hawkweed (*cont.*)

Chemical control (*cont.*)

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

Description: Apply 2 to 2.6 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: 0.5 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 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

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Yellow starthistle (*cont.*)

Chemical control (*cont.*)

Herbicide: Tordon 22K (picloram)

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

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

Herbicide: Telar XP (chlorsulfuron)

Description: Apply 0.5 to 2.6 oz/A Telar XP; 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. Documented light attack rates (>10%) provide little control. Collect weevils as adults.

Redistribution: May 1 to July 1. Widespread collection sites.

Yellow starthistle (*cont.*)

Biological control (*cont.*)

Insect: Starthistle hairy weevil (*Eustenopus villosus*)

Description: Adult weevils feed externally on flower buds. Larvae feed within buds and destroy developing seeds and receptacle tissues and have a significant impact on seed production.

Documented heavy attack rates (>70%) provide good control.

Collect weevils as adults.

Redistribution: June 1 to July 15. Widespread collection sites.

Insect: Starthistle flower weevil (*Larinus curtus*)

Description: Larvae feed on developing seeds; a single larva can destroy more than 90% of the seeds in infested seed heads.

Documented medium attack rates (>30%) provide fair control.

Collect weevils as adults.

Redistribution: *Larinus curtus* may be infected with a disease that can reduce insect populations. It should not be redistributed to avoid spreading the disease to healthy *L. curtus* populations. July 15 to August 15. Widespread collection sites.

Yellow toadflax

Linaria vulgaris

Chemical control

Herbicide: Telar XP (chlorsulfuron)

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

Timing: Bud to bloom

Herbicide: Tordon 22K (picloram) + Telar XP (chlorsulfuron)

Description: Apply 2 pt/A Tordon 22K + 1 oz/A Telar XP; use a surfactant

Timing: Bud to bloom

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

Description: Apply 2 pt/A Tordon 22K + 1 oz/A Escort XP; use a surfactant

Timing: Bud to bloom

Herbicide: Tordon 22K (picloram)

Description: Apply 4 pt/A Tordon 22K

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: Flower beetle (*Brachyterolus pulicarius*)

Description: Adults and larvae feed on flowers and developing fruits and reduce seed production. Documented high attack rates (>70%) yield fair control. Collect beetles in spring when the plant begins flowering. Beetles can be collected easily in larger numbers using sweep nets.

Redistribution: May and June. Limited collection sites.

Yellow toadflax (*cont.*)

Biological control (*cont.*)

Insect: Defoliating moth (*Calophasia lunula*)

Description: Defoliation from larval feeding reduces plant vigor and seed production; total defoliation occurs infrequently. Attack rate overall is low (>10%), with infrequent mass outbreaks. Overall impact is undetermined. Collect moths as larvae.

Redistribution: May and June. Widespread collection sites.

Insect: Stem boring weevil (*Mecinus janthinus*)

Description: Adults feed on foliage whereas larvae mine within stems. Both can suppress flowering, reduce seed production, or kill stems. Genotypes attacking yellow toadflax are sparsely distributed and only recently introduced to Idaho. The level of control is not yet known. Collect weevils as adults.

Redistribution: May to late June. Limited collection sites.

Insect: Toadflax seed weevil (*Rhinusa antirrhini*)

Description: Adults feed on buds and flowers, and larvae feed on developing seed capsules. Both adult and larval feeding can reduce seed production by 80% to 90%. Documented medium attack rates (>30%) produce an unknown level of control. Collect weevils as adults.

Redistribution: June. Limited collection sites.

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

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