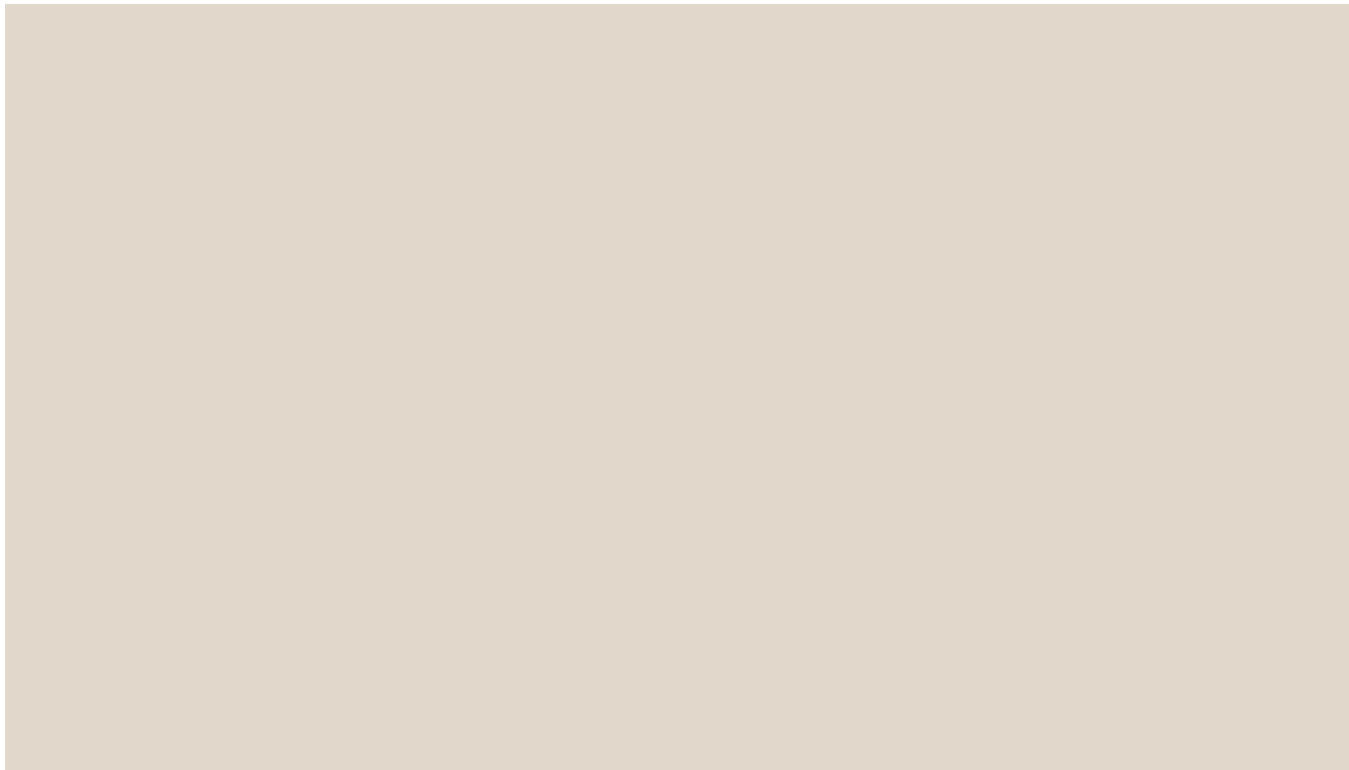




Nevada Noxious Weed Field Guide





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A noxious weed is a plant that has been identified by the state of Nevada to be harmful to agriculture, the general public or the environment. The law stipulates that property owners whose land is infested with noxious weeds are required to implement control measures. Noxious weeds can spread rapidly and compete aggressively with other plants for light, nutrients and water. Once noxious weeds inhabit a site, they often reproduce profusely, creating dense stands with extensive roots and soil seedbanks that can persist for many years. Impacts of noxious weeds in Nevada can include: increased soil erosion and salinity, increased flood potential, decreased water quality, decreased forage and crop yield, displaced wildlife and native plants, reduced recreation potential, reduced aesthetic value, injury to humans and animals, and increased fire danger.

The purpose of this booklet is to help agricultural producers, land managers, homeowners, recreationists and others to identify the noxious weeds of Nevada. All 47 weeds listed in Nevada state law (as of January 2010) are included, each with a brief description, color photographs and recommendations for control. The glossary defines

several technical terms that are used to describe and identify plants.

Correct identification of a weed is important for several reasons. First, it is a critical step in early detection and rapid response to new infestations, a strategy that can save time and money over the long term by eliminating a weed when it first appears as a single plant or small patch, rather than waiting until it covers an entire property. Second, proper weed identification allows a person to understand the harmful characteristics of the weed (i.e., poisonous, fire hazard, etc.) so problems can be avoided. Finally, proper identification is essential to implementing the control tactics that will successfully manage the weed.

We would like to express our gratitude to Joe DiTomaso, Nate Belliston and Steve Dewey for permission to use their photographs. Detailed photo credits can be found on pages 115-117. We would also like to thank Candice Kiel of The Write Type for graphic design and layout and the U.S. Forest Service and the Nevada Department of Agriculture for financial support.

A successful weed management program is based on four fundamental elements: prevention, detection, control and restoration.

Prevention: Weed prevention is accomplished by taking steps to keep weeds from spreading into new areas. Some common prevention tactics include:

- using weed-free hay, straw, seed or mulch
- cleaning contaminated vehicles and equipment
- educating employees, neighbors, visitors and recreationists about weeds
- maintaining a healthy, competitive stand of desirable plants that limits the ability of weeds to establish and thrive.

Detection: Even with the best prevention program, some weeds will find a way to slip through your defenses. An early detection/rapid response program can help to locate and eliminate these new invaders. The idea is to find a new weed, whether it is a single plant or a small patch, early in the invasion process and immediately begin control measures – hopefully resulting in eradication.

Control: Weed control can be accomplished using a number of different tactics:

- cultural control is achieved by manipulating factors that impact weed growth, such as crop rotation, planting date, row spacing, fertilization or irrigation
- mechanical control is based on causing physical harm to weeds through tillage, mowing, mulching, burning, flooding or hand-weeding
- biological control is when other organisms (livestock, insects or diseases) are used to suppress weeds and
- chemical control impacts weed growth through herbicide application.

Restoration: Establishing a healthy, competitive stand of desirable plants (crops, grasses, forbs, shrubs, etc.) is critical to protecting a site from re-invasion by noxious weeds.

Combining several of the above strategies to manage a weed is called integrated weed management - an approach that almost always produces better results than relying on any one tactic alone.

Weed Management Recommendations in this Booklet

Strategies for prevention, detection and restoration are essentially the same for each of Nevada's noxious weeds. Yet, control methods can differ greatly from weed to weed. To minimize the amount of text required in the pages that follow, the specific weed management recommendations for each weed are focused solely on control. Nevertheless, the elements of prevention, detection and restoration are of equal (and often greater) importance as control. Although not specifically mentioned for each weed, all four fundamental elements should be a part of every weed management program.

This booklet also provides herbicide recommendations as a starting point for individuals looking for chemical control options. Due to the large number of trade (brand) named products available and the fact that trade names are constantly changing, common names (active ingredients) of chemicals are presented. To help readers identify the chemical common name, trade names of a few commercial products are provided in the table on pages 112-113.



Disclaimer

Chemical weed control recommendations are supplied with the understanding that no discrimination is intended and no endorsement is implied by University of Nevada Cooperative Extension. Before using any chemical, ALWAYS read the label. Any person using the products listed in these guidelines assumes full responsibility for their use in accordance with current directions of the manufacturer.

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Brassica tournefortii

African mustard

Stem	<ul style="list-style-type: none">Up to 3 ft. tall and branched; upper stem lacks hair (glabrous); lower stem covered with stiff, downward-pointing hairs
Leaves	<ul style="list-style-type: none">Rosette leaves up to 12 in. long and pinnate-divided with 6-14 pairs of leaflets; edges (margins) are toothedStems have very few leaves; typically small and oval to strap-like (linear) with toothed to lobed edges
Flower	<ul style="list-style-type: none">Small (less than 0.6 in. wide) and yellow with four petalsSeed pods are round, slender and 1.5-2.5 in. long; the end tapers to a point; contain numerous round seeds; pod constricts around seeds (appears beaded)
Root	<ul style="list-style-type: none">Deep, slender taproot
Other	<ul style="list-style-type: none">Grows best in sites with dry, sandy soils and sparse vegetation; often infests roadsides, waste areas, washes and desert areas; known to occur in Clark, Lincoln and Nye countiesAnnual; reproduces by seedAlso known as Sahara mustard
Control	<ul style="list-style-type: none">Repeated hand-removal can be effective; disturbances such as fire, tillage and grazing often promote mustard growthApply glyphosate, 2,4-D or triclopyr to actively growing plants before flowering



African mustard

[15]

Peganum harmala

African rue

Stem	<ul style="list-style-type: none">▪ Up to 2 ft. tall; highly branched and bushy
Leaves	<ul style="list-style-type: none">▪ Alternate, bright green and deeply divided; leaflets strap-like (linear), narrow, 0.75-2 in. long, fleshy, lack hair (glabrous) and have smooth edges (margins)
Flower	<ul style="list-style-type: none">▪ 5 white petals surround a yellow center; 1 in. diameter; occur at leaf axils along stems▪ Five strap-like, fleshy, green sepals (0.5 in. long) that resemble leaves are found below flower▪ Seed pod is a small (less than 0.5 in. diameter), round capsule with 2-4 chambers; can be green orange or brown
Root	<ul style="list-style-type: none">▪ Woody, branched taproot with short creeping roots
Other	<ul style="list-style-type: none">▪ Grows best in dry, disturbed sites; often infests roadsides, waste areas, washes and desert areas; known to occur in Churchill, Clark, Mineral and Pershing counties▪ Perennial; reproduces by both seeds and roots▪ All plant parts poisonous to livestock and humans
Control	<ul style="list-style-type: none">▪ Repeatedly dig or pull individual plants; remaining roots can produce new plants▪ Apply glyphosate, metsulfuron or imazapyr to actively growing plants



African rue

[17]

*Rorippa austriaca***Austrian fieldcress**

Stem	<ul style="list-style-type: none"> Up to 3 ft. tall and branched at the top
Leaves	<ul style="list-style-type: none"> Bluish-green, 1-4 in. long and oblong to lance-shaped; edges (margins) are smooth to toothed Stem leaves are alternate; leaf size decreases up the stem; bases of upper leaves have small lobes that clasp the stem.
Flower	<ul style="list-style-type: none"> Small yellow flowers (0.1 in. wide) with 4 petals; clustered at tips of branches Seed pod is oval, 0.1 in. long and borne on a 0.3-0.6 in. long stalk
Root	<ul style="list-style-type: none"> Thick, fleshy taproot with creeping roots
Other	<ul style="list-style-type: none"> Grows best in moist, disturbed areas; often infests roadsides, waste areas, pastures and crop fields; not known to occur in Nevada Perennial; reproduces by roots; forms dense patches
Control	<ul style="list-style-type: none"> Hand removal of individual plants (including roots) can limit spread of small infestations Repeated cultivation and improved drainage of wet areas have also been reported to be effective Apply 2,4-D to actively growing plants



Austrian fieldcress

[19]

*Hyoscyamus niger***Black henbane**

Stem	<ul style="list-style-type: none"> Up to 3 ft. tall, branched and covered with long, sticky hairs
Leaves	<ul style="list-style-type: none"> Alternate, lance-shaped to oblong, 2-8 in. long and covered with short, sticky hairs; veins are prominent and pale; edges (margins) are lobed to toothed; lower leaves have a short stem (petiole), upper leaves have NO leaf stem
Flower	<ul style="list-style-type: none"> Funnel-shaped with a purple center; 5 fused, greenish-yellow petals with purple veins; arise from leaf axils along upper part of stem Seed pods are pineapple-shaped, 1 in. long and covered with long, sticky hairs; open end has 5 lobes; contain many small, dark seeds
Root	<ul style="list-style-type: none"> Thick, fleshy taproot
Other	<ul style="list-style-type: none"> Grows best on open sites with well-drained soils; often infests roadsides, waste areas, field borders and pastures; known to occur in Elko, Eureka, Humboldt, Lander, Lincoln, Lyon and White Pine counties Annual or biennial; reproduces by seed Toxic to humans and livestock but rarely consumed by animals due to foul odor and taste
Control	<ul style="list-style-type: none"> Mowing, tillage, digging and hand-pulling prior to seed production are effective Burning dry, mature plants can kill seed Apply picloram or metsulfuron to actively growing plants prior to bloom



Black henbane

[21]

Alhagi maurorum

Camelthorn

Stem	<ul style="list-style-type: none"> Highly branched with lengthwise ridges, 1.5-4 ft. tall and lacks hair (glabrous); spines (0.5 to 1.5 in. long) with yellow tips arise from leaf axils
Leaves	<ul style="list-style-type: none"> Alternate, simple, narrow to oblong and 0.25-0.75 in. long; hairs on lower surface only
Flower	<ul style="list-style-type: none"> Pea-like; 0.3-0.4 in. long with pink to purple petals; 2-8 flowers occur alternately along short, spine-tipped branches Seed pods are reddish-brown, 0.5-1.25 in. long, often curved, tipped with a small spine and contain 5-8 seeds; pods are deeply indented between seeds
Root	<ul style="list-style-type: none"> Woody, deep, spreading root system; roots often associate with nitrogen-fixing bacteria
Other	<ul style="list-style-type: none"> Grows best in areas where it can access additional water during the growing season; often found in field borders, roadsides and along waterways; known to occur in Clark, Eureka and Lander counties Perennial; reproduces mostly by roots but sometimes seed
Control	<ul style="list-style-type: none"> Hand removal of individual plants (including roots) can limit spread of small infestations Grazing, mechanical removal and burning are NOT effective Apply 2,4-D, dicamba, glyphosate or picloram to actively growing plants



Camelthorn

[23]

Cirsium arvense

Canada thistle

Stem	<ul style="list-style-type: none"> Up to 4 ft. tall, green to brown, branched at the top and usually lacks hair (glabrous)
Leaves	<ul style="list-style-type: none"> Alternate, oblong or lance-shaped, 2-8 in. long, shiny and lack hair; NO leaf stems (petioles); leaf edges (margins) are wavy, lobed or toothed with spiny edges
Flower	<ul style="list-style-type: none"> Pink, purple or white; occur in clusters at the ends of branches; base of flower is vase-shaped, 0.5-0.75 in. wide, lacks prickles and is covered with green to purple bracts with dark tips
Root	<ul style="list-style-type: none"> Deep, extensive creeping root system
Other	<ul style="list-style-type: none"> Grows best in moist areas; often found in pastures, hay fields, waste areas and along waterways; known to occur in all Nevada counties except Esmeralda Perennial; reproduces by both roots and seed; plants often appear in patches or colonies due to the spreading root system
Control	<ul style="list-style-type: none"> Repeated mowing, tillage, cutting or hand removal prior to seed production can provide suppression Several biological control agents are available Apply picloram, aminopyralid or clopyralid to actively growing plants through flowering; repeated applications of 2,4-D, dicamba or glyphosate to actively growing plants



Canada thistle

*Crupina vulgaris***Common crupina**

Stem	<ul style="list-style-type: none"> Up to 3 ft. tall and branched with lengthwise ridges along stem
Leaves	<ul style="list-style-type: none"> Cotyledons are oblong, fleshy and hairless, often with a purplish midvein; rosette leaves are oval to lance-shaped with smooth, toothed or lobed edges (margins) Stem leaves are alternate and deeply pinnate-lobed; lower leaves are larger than upper leaves; edges are covered with short, stiff hairs
Flower	<ul style="list-style-type: none"> Pink or purple; occur in clusters of 1-5 at the tips of branches; base of flower is vase-shaped and narrow (3-4 times longer than wide)
Root	<ul style="list-style-type: none"> Fibrous
Other	<ul style="list-style-type: none"> Grows well under a wide range of environmental and soil conditions; often found in rangeland, pastures, waste areas, roadsides and along waterways; known to occur in Lyon and Storey counties Annual; reproduces by seed; Listed on the Federal Noxious Weed List
Control	<ul style="list-style-type: none"> Grazing or mowing can increase branching and seed production and are NOT effective Apply 2,4-D, dicamba or picloram to actively growing plants prior to flowering



Common crupina

[27]

*Hypericum perforatum***Common St. Johnswort**

Stem	<ul style="list-style-type: none"> Up to 4 ft. tall with a woody base; highly branched; lacks hair (glabrous) and often rust colored with 2 ridges that run the length of the stem
Leaves	<ul style="list-style-type: none"> Opposite, oval to strap-like (linear), prominent veins, less than 1 in. long, lack hair and no leaf stems (petioles); edges (margins) are smooth with the lower surface lined with small black dots Surface covered with tiny transparent dots that can be seen by holding the leaf up to the light
Flower	<ul style="list-style-type: none"> 0.75 in. diameter; 5 yellow petals that often have tiny black dots around the edges; many stamens; clustered at tips of branches
Root	<ul style="list-style-type: none"> Stout taproot with spreading rhizomes
Other	<ul style="list-style-type: none"> Grows best on coarse-textured, gravelly, well-drained soils; known to occur in Elko, Lyon and Washoe counties Perennial; reproduces by seed and rhizomes Ingestion causes skin irritation and weight loss in white-haired animals; sometimes cultivated as a crop and used for medicinal purposes (as an antidepressant) Also known as Klamath weed
Control	<ul style="list-style-type: none"> Mowing, grazing and burning are NOT effective; a biological control agent is available Apply 2,4-D, metsulfuron or picloram to actively growing plants prior to bloom



Common St. Johnswort

*Pennisetum setaceum***Crimson fountaingrass**

Stem	<ul style="list-style-type: none"> Up to 5 ft. tall; round in cross-section; grows in bunches
Leaves	<ul style="list-style-type: none"> Blades are flat to v-shaped, 0.5-2 ft. long and less than 0.16 in. wide; edges (margins) have long hairs, particularly near the collar
Flower	<ul style="list-style-type: none"> Spike, 3-12 in. long and 1-2 in. wide; purplish bristles; can be droopy
Root	<ul style="list-style-type: none"> Fibrous
Other	<ul style="list-style-type: none"> Grows best in climates with mild winters; often infests disturbed areas such as roadsides, desert areas, washes and waste areas; known to occur in Clark County Perennial; reproduces by seed Can be a fire hazard Ornamental; cultivars that DO NOT produce viable seed are NOT considered noxious in Nevada.
Control	<ul style="list-style-type: none"> Hand removal (including the crown) of individual plants is effective for small infestations Burning is NOT effective and may cause weed density to increase Apply glyphosate to actively growing plants



Crimson fountaingrass

Linaria dalmatica

Dalmatian toadflax

Stem	<ul style="list-style-type: none"> Up to 4 ft. tall, lacks hair (glabrous), waxy and branched near the top
Leaves	<ul style="list-style-type: none"> Alternate and dense; lance-shaped to heart-shaped, 1-2.5 in. long, blue-green color, lack hair and waxy; bases clasp the stem; edges (margins) are smooth
Flower	<ul style="list-style-type: none"> Snapdragon-like; 1.5-2 in. long; yellow with an orange-bearded throat and a long spur; clustered along upper part of stem Seed capsules round (less than 0.3 in. diameter) with two chambers, each containing many seeds
Root	<ul style="list-style-type: none"> Creeping root system
Other	<ul style="list-style-type: none"> Grows best in dry, well-drained soils; often infests rangelands, waste areas and roadsides; known to occur in Douglas, Elko, Lincoln, Storey, Washoe and White Pine counties Perennial; reproduces by seed and roots May be toxic to livestock if ingested in large quantities
Control	<ul style="list-style-type: none"> Mechanical control (mowing, burning or tillage) is NOT effective Several biological control agents are available Apply chlorsulfuron, imazapic or picloram, through bloom or to fall rosettes; repeated applications of 2,4-D, dicamba or glyphosate to actively growing plants



Dalmatian toadflax

Centaurea diffusa

Diffuse knapweed

Stem	<ul style="list-style-type: none"> Up to 2 ft. tall; rough-textured; highly branched; bushy; covered with short, stiff hairs; NO wings on upper stems
Leaves	<ul style="list-style-type: none"> Alternate, lower leaves pinnate-divided, 4-8 in. long; sometimes covered with short grayish hairs; upper leaves strap-like (linear) with smooth edges (margins)
Flower	<ul style="list-style-type: none"> White to sometimes purple, each located at the tip of a branch; base of flower is vase-shaped, 0.5 in. long, 0.12 in. wide and covered with yellow, comb-like bracts tipped with a narrow spine
Root	<ul style="list-style-type: none"> Deep, stout taproot
Other	<ul style="list-style-type: none"> Grows best in dry, well-drained soils; often infests rangelands, waste areas and roadsides; known to occur in Churchill, Clark, Douglas, Elko, Eureka, Lander, Lincoln, Nye, Washoe and White Pine counties Biennial, but sometimes annual or perennial; reproduces by seed; dry, mature plants often break off and tumble in the wind to spread seed
Control	<ul style="list-style-type: none"> Mowing plants in bud to flower stage can reduce seed production; repeated hand removal can be effective; burning is NOT effective Several insect biological control agents are available Apply 2,4-D or dicamba in the rosette stage; apply clopyralid, picloram or aminopyralid between rosette and mid-bolt stages

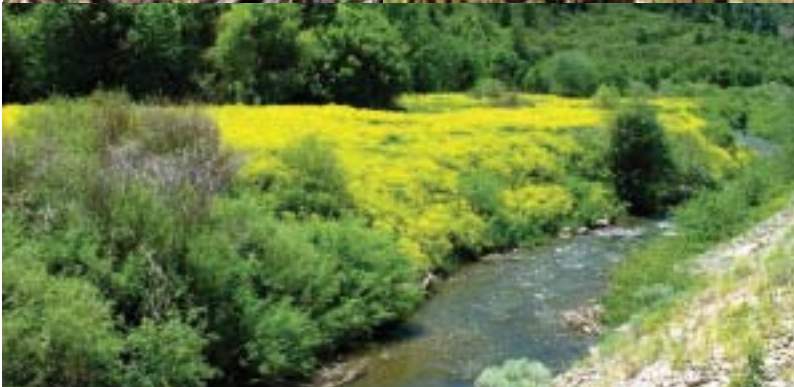


Diffuse Knapweed

Isatis tinctoria

Dyer's woad

Stem	<ul style="list-style-type: none">Up to 4 ft. tall; branched at top; dry plants with attached seed pods remain standing into winter
Leaves	<ul style="list-style-type: none">Lance-shaped, 1-7 in. long, bluish-green and lack hair (glabrous) with a distinct whitish mid-vein; edges (margins) are wavy to smoothStem leaves are alternate with lobed base that clasps the stem
Flower	<ul style="list-style-type: none">Yellow with 4 petals; occur in clusters that give plant a flat-topped appearanceMature seed pods dark brown to black, oblong, flattened and suspended from a small stalk; each contains a single seed
Root	<ul style="list-style-type: none">Deep taproot
Other	<ul style="list-style-type: none">Grows well on a broad range of sites; often infests waste areas, roadsides, rangeland, pastures and crop fields; known to occur in Elko, Washoe and White Pine countiesBiennial, but sometimes annual or perennial; reproduces by seedHistorically cultivated for use as a blue dye and as a medicine
Control	<ul style="list-style-type: none">Mow in early-flower to reduce seed production; spring tillage or digging individual plants prior to seed production can be effectiveApply 2,4-D, metsulfuron, chlorsulfuron or imazapic to young, actively growing plants



Dyer's woad

[37]

Myriophyllum spicatum

Eurasian watermilfoil

Stem	<ul style="list-style-type: none">▪ Aquatic weed up to 12 ft. long, submersed, branched near water surface, growing points often reddish; breaks into fragments easily
Leaves	<ul style="list-style-type: none">▪ Whorled with 4 leaves per node; leaves are green to brown, less than 1.25 in. long and pinnately-divided with more than 14 pairs of narrow, opposite lobes (less than 0.4 in. long)
Flower	<ul style="list-style-type: none">▪ Pinkish and small, each with a small, bract-like leaf▪ Occur in clusters on small, pencil-like stalks that emerge from water (1-3 in. long); stem often bends to become parallel with the water surface after flowering
Root	<ul style="list-style-type: none">▪ Creeping rhizomes
Other	<ul style="list-style-type: none">▪ Most common in still or slow-moving water but can sometimes be found in fast-moving rivers, streams and irrigation ditches; known to occur in Churchill, Douglas Washoe and White Pine counties▪ Perennial; reproduces by rhizomes, stem fragments and seed
Control	<ul style="list-style-type: none">▪ Mechanical removal can be effective but must be done repeatedly; escaped stem fragments can form new plants; draining then allowing an empty water-body to freeze can be effective▪ Aquatic herbicides such as 2,4-D, diquat, endothall, triclopyr, fluridone and copper complexes are effective



Eurasian watermilfoil

Arundo donax

Giant reed

Stem	<ul style="list-style-type: none">Up to 25 ft. tall and 1.5 in. thick; semi-woody, inflexible and hollow except at the nodes; branching usually does not occur until the second year of growth
Leaves	<ul style="list-style-type: none">Alternate; blade is flat, less than 3 ft. long and 1-3 in. wide; edges (margins) are rough texturedLeaf base is lobed, clasps the stem and is fringed with long hairs
Flower	<ul style="list-style-type: none">Plume-like with numerous fine branches; 1-2 ft. long and light-brown to purple; does NOT produce viable seed
Root	<ul style="list-style-type: none">Creeping rhizomes
Other	<ul style="list-style-type: none">Grows best in moist soils; known to occur in Clark, Humboldt and Nye countiesPerennial; reproduces by rhizomes and stem fragmentsResembles bamboo; historically planted to reduce erosion and sometimes planted today as an ornamental
Control	<ul style="list-style-type: none">Hand removal of small populations can be effective; mowing and tillage are NOT recommended as they produce root and stem fragments that generate new plantsApply glyphosate, triclopyr or imazapyr after seedhead formation in late summer or fall to foliage or cut stump; treat regrowth in spring or summer of the following year



Giant reed

[41]

Salvinia molesta

Giant salvinia

Stem	<ul style="list-style-type: none">▪ Floating aquatic plant that grows at water surface; often highly branched
Leaves	<ul style="list-style-type: none">▪ 1 submerged and 2 floating leaves whorled around stem at each node▪ Floating leaves are oval, flat, 1-2.5 in. wide and covered with short hairs (less than 0.12 in. long) that are shaped like an egg-beater▪ Submerged leaves are white to brown, fine, hair-like, up to 1 in. long and resemble roots
Flower	<ul style="list-style-type: none">▪ No true flowers; some submerged leaves develop spores, but they are not viable
Root	<ul style="list-style-type: none">▪ No true roots, but submerged leaves act as roots
Other	<ul style="list-style-type: none">▪ Grows best in areas that do not experience extended periods of freezing temperatures; not known to occur in Nevada▪ Perennial; reproduces by stem fragments; can form a mat over 1.5 ft. thick under favorable conditions▪ Listed on the Federal Noxious Weed List
Control	<ul style="list-style-type: none">▪ Mechanical removal can be effective but must be done repeatedly; escaped stem fragments can form new plants▪ Aquatic herbicides such as 2,4-D, diquat and fluridone are effective



Giant salvinia

[43]

Galega officinalis

Goatsrue

Stem	<ul style="list-style-type: none"> Generally grows 2-5 ft. tall; highly branched with numerous stems that arise from the crown
Leaves	<ul style="list-style-type: none"> Pinnately-compound with 5-8 pairs of leaflets; leaflets are oval to lance-shaped, 0.5-1.5 in. long and lack hair (glabrous); edges (margins) are smooth
Flower	<ul style="list-style-type: none"> Purple to white, less than 0.5 in. long and clustered on stalks at tips of branches Pods are 1-2 in. long and contain numerous seeds
Root	<ul style="list-style-type: none"> Non-spreading taproot; roots associate with nitrogen-fixing bacteria
Other	<ul style="list-style-type: none"> Grows best in moist areas; often found in fencelines, pastures, roadsides, marshy areas and along waterways; not known to occur in Nevada Perennial; reproduces by seed Native to the Middle East; introduced to northern Utah as a potential forage plant but was found to be unpalatable and highly toxic to livestock Listed on the Federal Noxious Weed List
Control	<ul style="list-style-type: none"> Hand removal of individual plants can limit spread of small infestations Mowing and tillage (particularly shallow tillage) are NOT effective Apply 2,4-D, dicamba, metsulfuron or chlorsulfuron to actively growing plants



Goatsrue

[45]

Cardaria spp.

Hoary cress

Stem	<ul style="list-style-type: none"> 0.5-2 ft. tall; branched near top; covered with short hairs
Leaves	<ul style="list-style-type: none"> Alternate, 1-4 in. long, blue-green, oblong to lance-shaped and covered with short hairs; edges (margins) are toothed to smooth Lower leaves have short leaf stems (petioles); bases of upper leaves have lobes that clasp the stem
Flower	<ul style="list-style-type: none"> White with 4 petals; occur in clusters that give plant a flat-topped appearance; occur from spring to early-summer Seed pods are oval to heart-shaped; each contain 2 seeds
Root	<ul style="list-style-type: none"> Deep, spreading root system
Other	<ul style="list-style-type: none"> Grows best in disturbed, alkaline soils; often found in pastures, fields, roadsides, rangelands, waste areas and along waterways; known to occur in all Nevada counties Perennial; reproduces through roots and seeds Also known as whitetop; three species occur in Nevada: hoary cress (<i>C. draba</i>) is most common but lens-podded whitetop (<i>C. chalapensis</i>) and hairy whitetop (<i>C. pubescens</i>) also occur
Control	<ul style="list-style-type: none"> Dig or pull individual plants for small infestations; remaining roots can produce new plants Frequent tillage or mowing for several years can reduce plant density Apply 2,4-D to actively growing plants prior to bud stage; chlorsulfuron or metsulfuron from bud to early bloom; imazapic from full bloom until necrosis



Hoary cress

[47]

Solanum carolinense

Horsenettle

Stem	<ul style="list-style-type: none"> 1-3 ft. tall, branched, covered with spines (less than 0.2 in. long) and short hairs
Leaves	<ul style="list-style-type: none"> Alternate, oval to lance-shaped and 3-6 in. long; spines often on veins on undersides of leaves; edges (margins) are wavy to lobed Leaves covered with tiny yellow hairs; hairs appear star-shaped with magnification
Flower	<ul style="list-style-type: none"> Star-shaped with 5 white to pale violet petals; 0.75-1.5 in. diameter; 5-20 flowers clustered on stalks at tips of branches Berries are round (0.25-0.75 in. diameter), shiny, yellow and resemble tiny tomatoes
Root	<ul style="list-style-type: none"> Deep, creeping root system
Other	<ul style="list-style-type: none"> Grows best in sandy, well-drained soils; often infests crop fields and pastures; known to occur in Elko County Perennial; reproduces by seed and creeping roots Also known as Carolina horsenettle; native to North America; toxic to livestock and humans; hosts a number of diseases and insects that attack related plants, such as tomato and potato
Control	<ul style="list-style-type: none"> Tillage, mowing and grazing are NOT effective Repeated hand-digging of individual plants can be effective for small infestations Apply glyphosate or 2,4-D to young, actively growing plants; picloram at full flower; imazapyr to actively growing plants



Horsenettle

Cynoglossum officinale

Houndstongue

Stem	<ul style="list-style-type: none"> Up to 4 ft. tall and covered with long hairs
Leaves	<ul style="list-style-type: none"> Alternate; resemble a hound's tongue; lance-shaped, 1-12 in. long, 1-3 in. wide, rough texture and covered with long hairs; edges (margins) lack teeth and lobes Leaf stems (petioles) on lower but not upper leaves; leaves decrease in size from bottom to top of plant
Flower	<ul style="list-style-type: none"> Purplish-red flowers with 5 petals; occur in clusters 4 nutlets (seeds) per flower, 0.25 in. long and brownish at maturity; covered with short prickles that can attach to clothing or animal fur
Root	<ul style="list-style-type: none"> Thick, deep taproot
Other	<ul style="list-style-type: none"> Grows best in moist areas; often found in pastures, roadsides, fencelines, waste areas and along waterways; known to occur in Elko, Eureka, Humboldt and Lyon counties Biennial, but sometimes annual or perennial; reproduces by seed Toxic to livestock, especially horses; has a distinctive odor that may cause animals to avoid
Control	<ul style="list-style-type: none"> Mowing or tillage prior to seed production is effective Apply 2,4-D, metsulfuron, picloram or imazapic to actively growing plants prior to bloom



Houndstongue

[5]

*Hydrilla verticillata***Hydrilla**

Stem	<ul style="list-style-type: none"> ▪ Aquatic weed up to 25 ft. long, submersed, slender and branched near water surface
Leaves	<ul style="list-style-type: none"> ▪ Strap-like (linear) to lance-shaped, 0.25-0.75 in. long and less than 0.2 in. wide; NO leaf stems (petioles); arranged in whorls of 4-8 around stem; edges (margins) are toothed; midvein on leaf underside often has one or more sharp teeth
Flower	<ul style="list-style-type: none"> ▪ Small, white, attached to threadlike stalks up to 4 in. long and float on water surface
Root	<ul style="list-style-type: none"> ▪ Unbranched, slender and white; yellowish, potato-like tubers (0.25-0.5 in. diameter) form at root tips
Other	<ul style="list-style-type: none"> ▪ Often found in still or slow-moving water; not known to occur in Nevada ▪ Perennial; reproduces by stem fragments and tubers; occasionally produces turions at leaf axils; turions are mostly cylindrical, dark green reproductive structures up to 0.5 in. long ▪ Listed on the Federal Noxious Weed List
Control	<ul style="list-style-type: none"> ▪ Mechanical removal can be effective but must be done repeatedly; escaped stem fragments can form new plants ▪ Grass carp can be an effective biological control ▪ Aquatic herbicides such as diquat, endothall, fluridone and copper complexes are effective



Hydrilla

[53]

*Centaurea iberica***Iberian starthistle**

Stem	<ul style="list-style-type: none"> Up to 4 ft. tall; highly branched, bushy and covered with hairs; NO wings on upper stems
Leaves	<ul style="list-style-type: none"> Exist as basal rosettes prior to bolting; older rosettes have a circle of straw-colored spines at the center Alternate, 4-8 in. long, mostly pinnate-divided, covered with short hairs and speckled with resin
Flower	<ul style="list-style-type: none"> Pink to white; base of flower vase-shaped, 0.25-0.5 in. wide, 0.75-1 in. long and covered with stout, yellow spines 0.4-1 in. long
Root	<ul style="list-style-type: none"> Stout taproot
Other	<ul style="list-style-type: none"> Grows best in moist areas; often found in pastures, roadsides and along waterways; not known to occur in Nevada Annual or biennial; reproduces by seed Closely resembles purple starthistle in all ways except seed; seed of Iberian starthistle has plume of bristles extending from one end, purple starthistle does NOT
Control	<ul style="list-style-type: none"> Prevent seed production through mowing or pulling Apply 2,4-D, clopyralid or dicamba in the rosette stage; picloram during bolting



Iberian starthistle

[55]

Sorghum halepense

Johnsongrass

Stem	<ul style="list-style-type: none"> Up to 8 ft. tall; many tillers arise from crown; stems slightly flattened with prominent nodes
Leaves	<ul style="list-style-type: none"> Up to 2 ft. long, 0.25-0.75 in. wide, white midvein and mostly hairless except near collar; ligule is membranous and tipped with fine hairs; NO auricles
Flower	<ul style="list-style-type: none"> Seed head open and pyramid-shaped; purplish-brown at maturity Seed is narrow, less than 0.25 in. long and reddish-brown to black
Root	<ul style="list-style-type: none"> Deep, fibrous root system; rhizomes are white and fleshy with brown to purple nodes; roots and new plants often form at nodes
Other	<ul style="list-style-type: none"> Grows best in moist soils; often found in crop fields, pastures, fencerows, roadsides, and along waterways; known to occur in Churchill, Clark, Douglas, Esmeralda, Lincoln, Mineral and Nye counties Perennial; reproduces by seed and rhizomes; seedlings resemble corn and can best be identified by pulling a plant and examining the roots for an attached seed Plants can be toxic to livestock after frost or drought
Control	<ul style="list-style-type: none"> Frequent mowing or tillage is effective; burning is NOT Apply sethoxydim, fluazifop or fenoxaprop to actively growing plants before boot stage; imazapic or glyphosate between boot and bloom stages



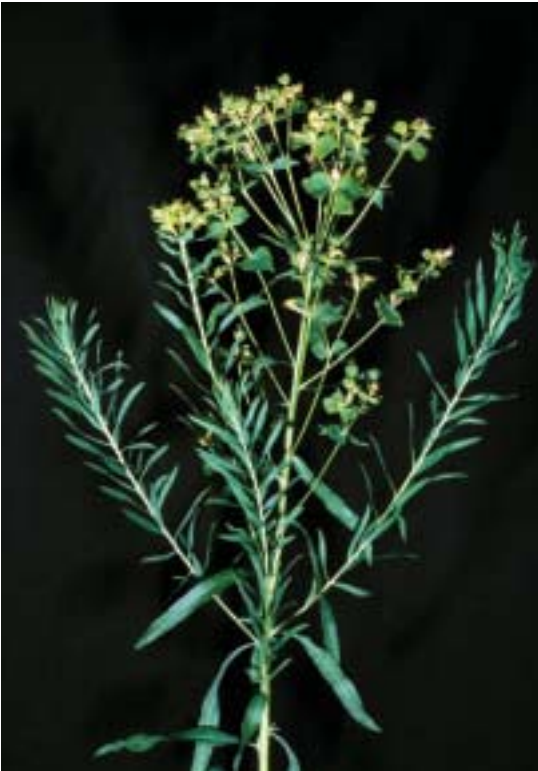
Johnsongrass

[57]

Euphorbia esula

Leafy spurge

Stem	<ul style="list-style-type: none"> Up to 3 ft. tall; branched; base of plant often woody; entire plant contains milky white sap
Leaves	<ul style="list-style-type: none"> Mostly alternate, strap-like (linear), 1-2 in. long, 0.2 in. wide and lack hair (glabrous); NO leaf stem (petiole); smooth edges (margins)
Flower	<ul style="list-style-type: none"> Small, showy, green to yellow and clustered at tips of stems; bracts below flowers are heart- to kidney-shaped and have the appearance of flower petals Produces a spherical capsule with 3 chambers, each containing one seed
Root	<ul style="list-style-type: none"> Creeping, deep root system; new shoots arise from pinkish buds
Other	<ul style="list-style-type: none"> Grows well across a wide range of sites; often found in pastures, waste areas, rangelands, field borders and along waterways; known to occur in Churchill, Douglas, Elko, Eureka, Humboldt, Lander and White Pine counties Perennial; reproduces by seed and roots; sap can irritate skin, eyes and the digestive tracts of humans and animals; sheep and goats are immune
Control	<ul style="list-style-type: none"> Several biological control agents are available Mechanical control (mowing, burning, tillage and grazing) can reduce seed production but are often NOT effective due to new shoot growth from root buds Apply dicamba, 2,4-D or glyphosate to actively growing plants through early bloom; picloram throughout the growing season; imazapic in fall after a killing frost but before loss of milky sap



Leafy spurge

[59]

*Centaurea melitensis***Malta starthistle**

Stem	<ul style="list-style-type: none"> 1-3 ft. tall, stiff, wiry and usually branched; wings (less than 0.1 in. wide) created by leaf bases that extend down the stem
Leaves	<ul style="list-style-type: none"> Gray-green, 0.75-6 in. long and densely covered with fine hairs Rosette leaves are oval to strap-like (linear) with smooth to deeply lobed edges (margins); stem leaves are alternate, strap-like to oblong with smooth, toothed or wavy edges
Flower	<ul style="list-style-type: none"> Yellow, located at branch tips or axils in groups of 1-3; base of flower is vase-shaped, 0.3-0.6 in. diameter and covered with cotton-like hairs and stout, purple-to-brown colored spines (0.2-0.6 in. long)
Root	<ul style="list-style-type: none"> Shallow taproot
Other	<ul style="list-style-type: none"> Often infests rangeland, pastures, crop fields, waste areas and roadsides; known to occur in Clark, Lincoln and Nye counties Annual; reproduces by seed Also known as tocalote
Control	<ul style="list-style-type: none"> Grazing, mowing, burning and cultivation can be effective if done prior to seed production Apply aminopyralid, 2,4-D, clopyralid or dicamba from rosette through bolting; apply picloram from rosette through bud stages



[61]

Malta starthistle

Anthemis cotula

Mayweed chamomile

Stem	<ul style="list-style-type: none">▪ 0.5-2 ft. tall, highly branched and bushy
Leaves	<ul style="list-style-type: none">▪ Alternate, finely and deeply divided, up to 2.5 inches long and sometimes hairy
Flower	<ul style="list-style-type: none">▪ Daisy-like; 0.5-1 in. diameter; yellow center with 10-15 white petals
Root	<ul style="list-style-type: none">▪ Short, thick taproot
Other	<ul style="list-style-type: none">▪ Grows best on disturbed sites; often infests roadsides, waste areas, landscaped areas and crop fields; known to occur in Douglas, Humboldt and Lyon counties▪ Annual; reproduces by seed▪ Foliage has a foul odor when crushed; reported to irritate the skin of livestock and change the milk flavor of lactating animals▪ Also known as dog fennel
Control	<ul style="list-style-type: none">▪ Cultivation or mowing prior to seed set can be effective▪ Apply bromoxynil, dicamba, metsulfuron, picloram or tribenuron to actively growing plants



Mayweed chamomile

[63]

*Salvia aethiopsis***Mediterranean sage**

Stem	<ul style="list-style-type: none"> ▪ 1-3 ft. tall, highly branched and densely covered with hairs
Leaves	<ul style="list-style-type: none"> ▪ Gray-green; densely covered with white hairs, particularly on new leaves and underside of older leaves; wider at base (triangle-shaped); 2-12 in. long; edges (margins) with rounded, irregular teeth; leaves have an aroma when crushed ▪ Lower leaves have leaf stems (petioles); upper leaves are smaller and lack leaf stems
Flower	<ul style="list-style-type: none"> ▪ Yellow to white, arranged in clusters of 5-10, 0.5 in. long; 2 lips, the upper lip is arch- or hook-shaped, the lower lip is smaller and has 3 lobes ▪ 4 nutlets produced per flower, 0.16 in. long
Root	<ul style="list-style-type: none"> ▪ Stout, deep taproot
Other	<ul style="list-style-type: none"> ▪ Often infests rangeland, roadsides and waste areas; known to occur in Clark, Humboldt and Washoe counties ▪ Biennial; reproduces by seed; dried plants detach and “tumble,” which disperses seeds. ▪ Also known as African sage
Control	<ul style="list-style-type: none"> ▪ Hand removal of individual plants (including the crown) can limit spread of small infestations ▪ An insect biological control agent is available ▪ Apply 2,4-D, clopyralid or picloram to actively growing plants prior to seed production



Mediterranean sage

*Taeniatherum caput-medusae***Medusahead**

Stem	<ul style="list-style-type: none"> 0.5-2 ft. tall; slender; round in cross-section
Leaves	<ul style="list-style-type: none"> 4-12 in. long, less than 0.12 in. wide; sometimes covered with short hairs; collar region usually has long hairs, auricles and a membranous ligule
Flower	<ul style="list-style-type: none"> Seedhead is a spike, 0.5-2 in. long; awns are stiff, straight or twisted, barbed and up to 3 in. long; spikes often remain intact on dry plants through winter
Root	<ul style="list-style-type: none"> Fibrous
Other	<ul style="list-style-type: none"> Grows best on clay soils; primarily infests rangeland; known to occur in Churchill, Douglas, Elko, Humboldt, Pershing, Storey and Washoe counties Annual; reproduces by seed; matures 2-4 weeks later than other annual grasses Unpalatable to grazing animals due to high levels of silica in the foliage and long, stiff awns
Control	<ul style="list-style-type: none"> Tillage, mowing or grazing prior to seed set can reduce stands Burning has had mixed results; most effective with a hot, slow fire prior to medusahead seed maturity but after other species have dried-down; burning can also be used to reduce the thatch layer, which can increase the performance of soil-applied herbicides Apply imazapic or sulfometuron before emergence or to small, actively growing plants; glyphosate to actively growing plants



Medusahead

[67]

Carduus nutans

Musk thistle

Stem	<ul style="list-style-type: none"> 2-6 ft. tall and sometimes woolly and branched; spiny wings caused by leaf bases that extend down the stem
Leaves	<ul style="list-style-type: none"> Dark green with a light-green midvein, 4-15 in. long, alternate and sometimes hairy; edges (margins) are deeply lobed and spiny
Flower	<ul style="list-style-type: none"> Pink to purple (occasionally white), up to 3 in. wide, each located at the tip of a stem; head often nods or droops; stem below head usually spineless Base of flower is covered with green, purple- or straw-colored, spine-tipped bracts; bracts are 0.1-0.3 in. wide, lance-shaped and sometimes hairy
Root	<ul style="list-style-type: none"> Deep, fleshy taproot
Other	<ul style="list-style-type: none"> Often infests roadsides, pastures and waste areas; known to occur in all Nevada counties EXCEPT Douglas, Esmeralda, Mineral and Pershing Biennial; reproduces by seed; also known as nodding thistle
Control	<ul style="list-style-type: none"> Mowing, tilling or hand removal after bolting but prior to flowering is effective; remove the top 2 in. of crown by digging before seed production Several biological controls are available Apply 2,4-D, dicamba, chlorsulfuron, metsulfuron or picloram to actively growing rosettes; aminopyralid or clopyralid between rosette and late-bolt stages



Musk thistle

[69]

Lepidium latifolium

Perennial pepperweed

Stem	<ul style="list-style-type: none"> Up to 6 ft. tall, semi-woody, waxy and lacks hair (glabrous); many stems can arise from each crown often branched near top; branches arise from leaf axils
Leaves	<ul style="list-style-type: none"> Alternate, oval to lance-shaped, mostly 3-12 in. long, 1-3 in. wide, green to gray-green, lack hair and waxy; edges (margins) smooth to toothed and can also be curled; leaf bases DO NOT clasp stem; lower leaves larger than upper leaves
Flower	<ul style="list-style-type: none"> Small and white with 4 petals; arranged in dense clusters at the tips of stems Seed pods are round, flattened, less than 0.1 in. diameter, usually covered with hairs; each has 2 chambers, each with 1 seed
Root	<ul style="list-style-type: none"> Creeping root system
Other	<ul style="list-style-type: none"> Grows best on moist sites; often found in floodplains, pastures, meadows, hay fields and along waterways; known to occur in all Nevada counties Perennial; reproduces by roots and seed Also known as tall whitetop
Control	<ul style="list-style-type: none"> Mowing, digging, tillage, burning and grazing established stands are NOT effective Apply metsulfuron or chlorsulfuron to actively growing plants through early-bloom; imazapic from full-bloom until plants become necrotic; 2,4-D and glyphosate at bud to flower can be effective if repeated for several years



Perennial pepperweed

[71]

Sonchus arvensis

Perennial sowthistle

Stem	<ul style="list-style-type: none">▪ Up to 6 ft. tall, mostly unbranched except near the top where several flower stems form; exudes white, milky sap when broken
Leaves	<ul style="list-style-type: none">▪ Alternate; upper leaves are smaller and fewer than lower leaves; leaf bases clasp the stem; exude white, milky sap when broken▪ Edges (margins) smooth to deeply lobed and spiny
Flower	<ul style="list-style-type: none">▪ Yellow; less than 2 in. wide; base of flower is vase shaped; flower base and stalk usually covered with stiff, sticky hairs
Root	<ul style="list-style-type: none">▪ Creeping root system
Other	<ul style="list-style-type: none">▪ Grows best in moist, fertile soils; often infests crop fields, gardens, waste areas and ditch banks; known to occur in Elko, Humboldt, Lincoln, Storey and White Pine counties▪ Perennial; reproduces by seed and roots; seed is wind-dispersed
Control	<ul style="list-style-type: none">▪ Apply 2,4-D, picloram, clopyralid or aminopyralid to actively growing plants before bud stage



Perennial sowthistle

[73]

*Conium maculatum***Poison-hemlock**

Stem	<ul style="list-style-type: none"> Up to 10 ft. tall, green with purple spots, stout, hollow except at nodes and highly branched with lengthwise ridges
Leaves	<ul style="list-style-type: none"> Triangular, 4-12 in. long, finely pinnate-divided (fern-like) and lack hair (glabrous); leaflets have toothed edges; foliage has a musty odor
Flower	<ul style="list-style-type: none"> Small and white; arranged in umbrella-like clusters at end of a stalk
Root	<ul style="list-style-type: none"> Thick, deep taproot
Other	<ul style="list-style-type: none"> Grows best in moist sites; often infests crop fields, waterways, roadsides and waste areas; known to occur in all Nevada counties EXCEPT Clark, Lander, Mineral, Nye and Pershing Biennial; reproduces by seed Highly toxic to animals and humans when consumed
Control	<ul style="list-style-type: none"> Repeated mowing or tillage prior to seed production is effective; hand-removal by cutting the taproot below the crown can also eliminate plants (avoid contact with skin) An insect biological control agent is available Apply 2,4-D, MCPA, glyphosate, chlorsulfuron or metsulfuron to young actively growing plants



Poison-hemlock

[75]

Tribulus terrestris

Puncturevine

Stem	<ul style="list-style-type: none"> Prostrate; multiple stems that spread radially from crown; up to 3 ft. long (sometimes longer); highly branched, green to reddish-brown and often hairy
Leaves	<ul style="list-style-type: none"> Opposite, usually hairy, pinnate-compound, 1-2 in. long, with 3-7 pairs of leaflets; leaflets oval and 0.2-0.6 in. long; edges (margins) are smooth
Flower	<ul style="list-style-type: none"> Yellow, 0.2-0.6 in. diameter, with 5 petals; arise from leaf axils Fruit is a woody bur that breaks into 5 sections (nutlets) at maturity; each nutlet has 2 stout, spines and contains 3-5 seeds
Root	<ul style="list-style-type: none"> Slender, deep taproot; can associate with nitrogen-fixing bacteria
Other	<ul style="list-style-type: none"> Grows best in dry, sandy soils; often infests roadsides, crop fields and waste areas; known to occur in all Nevada counties Annual; reproduces by seed Also known as goathead, Mexican sandbur, Texas sandbur and tackweed; spines on fruit can cause injury to livestock and humans and can also puncture tires; foliage can be toxic to livestock
Control	<ul style="list-style-type: none"> Frequent hand-removal or tillage prior to seed production Two insect biological control agents are available Apply 2,4-D, glyphosate, dicamba, chlorsulfuron or imazapic to young, actively growing plants



[77]

Puncturevine

Lythrum salicaria

Purple loosestrife

Stem	<ul style="list-style-type: none">Up to 6 ft. tall, 4-5 sided, covered with short hairs and often branched; multiple stems arise from root crown
Leaves	<ul style="list-style-type: none">Mostly opposite or whorled, narrow to lance-shaped, 2-6 in. long, smooth edges (margins), lack hair (glabrous) to hairy; NO leaf stems (petioles)
Flower	<ul style="list-style-type: none">Showy; clustered on stalks at the tips of branches; 5-7 pink to purple petals surrounding a yellow center; petals are less than 0.5 in. long, each have a dark midvein and appear wrinkled or crushed
Root	<ul style="list-style-type: none">Taproot with some spreading roots; can associate with nitrogen-fixing bacteria
Other	<ul style="list-style-type: none">Grows best in wet areas; often found in marshes and along the edges of pond and waterways; known to occur in Carson City, Churchill, Clark, Douglas, Elko, Storey and Washoe countiesPerennial; reproduces by seed and stem fragmentsHistorically used as an ornamental plant but has escaped cultivation
Control	<ul style="list-style-type: none">Repeated hand-removal of individual plants (including roots) can be effective; DO NOT mowSeveral biological control agents are availableApply metsulfuron to actively growing plants, glyphosate or triclopyr at bloom; imazapyr from bloom until killing frost



Purple loosestrife

[79]

Centaurea calcitrapa

Purple starthistle

Stem	<ul style="list-style-type: none"> Up to 4 ft. tall, stiff, highly branched, bushy and covered with hairs; NO wings on upper stems
Leaves	<ul style="list-style-type: none"> Alternate; 4-8 in. long, mostly pinnate-divided, covered with short grayish hairs and dotted with resin
Flower	<ul style="list-style-type: none"> Pink to purple, each located at the tip of a branch; base of flower is vase-shaped, 0.75-1 in. long, 0.25 in. wide and covered with stout, straw-colored spines 0.4-1 in. long
Root	<ul style="list-style-type: none"> Deep, stout taproot
Other	<ul style="list-style-type: none"> Grows best in sites with heavy, fertile soils; often infests rangelands, waste areas and roadsides; known to occur in Pershing County Annual, biennial or perennial; reproduces by seed; older rosettes have a circle of straw-colored spines at the center Closely resembles Iberian starthistle in everything except seed; seed of Iberian starthistle has plume of bristles extending from one end, purple starthistle does NOT
Control	<ul style="list-style-type: none"> Mowing plants in bud to flower stage can reduce seed production; repeated hand removal can be effective; DO NOT burn Apply 2,4-D, clopyralid or dicamba in the rosette stage; apply picloram from rosette through mid-bolt stage



Purple starthistle

*Chondrilla juncea***Rush skeletonweed**

Stem	<ul style="list-style-type: none"> Multiple, up to 4 ft. tall and highly branched; contains white, milky sap Lacks hair (glabrous) except lower 4-6 in. which is covered with coarse, downward-pointing, reddish-brown hairs
Leaves	<ul style="list-style-type: none"> Rosette leaves resemble dandelion; 2-5 in. long, 0.5-2 in. wide and lack hair; edges (margins) are irregular with shallow lobes and are often purplish; rosette leaves usually wither at bolting Stems have very few leaves; typically narrow with smooth edges; inconspicuous
Flower	<ul style="list-style-type: none"> Yellow; 0.75 in. wide; 7-15 linear petals with toothed tips; can be alone or in small clusters scattered along branches Seed tipped with a white, parachute-like pappus that allows it to be spread by wind
Root	<ul style="list-style-type: none"> Deep taproot and short creeping lateral roots
Other	<ul style="list-style-type: none"> Grows best in well-drained soils; often infests roadsides, rangelands and waste areas; known to occur in Douglas County Perennial; reproduce by seed and roots
Control	<ul style="list-style-type: none"> Repeated hand-removal of individual plants (including roots) and frequent tillage are effective Several biological control agents are available Apply picloram, clopyralid or 2,4-D in the rosette to early-bolt stages



Rush skeletonweed

*Acroptilon repens***Russian knapweed**

Stem	<ul style="list-style-type: none"> Numerous; highly branched, stiff, 1-3 ft. tall and covered with wooly gray hair; NO wings
Leaves	<ul style="list-style-type: none"> Alternate; mostly covered with wooly gray hair Lower leaves 2-4 in. long with lobed to wavy edges (margins); upper leaves strap-like (linear) or lance-shaped and less than 1.2 in. long with smooth or toothed edges
Flower	<ul style="list-style-type: none"> Purple, pink or white, each located at the tip of a branch; base of flower is vase-shaped, 0.25-0.5 in. wide and covered with green bracts with papery or whitish edges
Root	<ul style="list-style-type: none"> Creeping root system; upper roots often dark brown to black
Other	<ul style="list-style-type: none"> Grows well on a broad range of sites; often found in rangeland, waste areas, roadsides and along waterways; known to occur in all Nevada counties Perennial; reproduces by roots and seed Causes “chewing disease” in horses by damaging the area of the brain that controls fine motor movements, particularly of the mouth; results in starvation or dehydration
Control	<ul style="list-style-type: none"> Mowing and tillage are NOT effective Apply glyphosate, chlorsulfuron or clopyralid from the bud to flower stage; aminopyralid or picloram from bud through dormancy; imazapic to dormant plants in fall



Russian knapweed

Tamarix spp

Saltcedar

Stem	<ul style="list-style-type: none">▪ Shrub or small tree; multiple large stems arise from root crown; up to 20 ft. tall, highly branched with reddish-brown bark; leaves turn yellow to red in autumn
Leaves	<ul style="list-style-type: none">▪ Alternate; deciduous; green to blue-green, small (0.06-0.14 in. long), oval to lance-shaped, overlapping and scale-like
Flower	<ul style="list-style-type: none">▪ Tiny with 5 white to pink petals; arranged in finger-like clusters at the tips of branches
Root	<ul style="list-style-type: none">▪ Deep taproot with creeping roots
Other	<ul style="list-style-type: none">▪ Often found along edges of waterways, lakes and ponds; known to occur in all Nevada counties▪ Perennial; reproduces by seed, roots and stem fragments▪ High concentration of salt in fallen leaves can impact growth of other plants▪ Also known as tamarisk
Control	<ul style="list-style-type: none">▪ Cutting, digging or burning MUST be combined with a chemical application to be effective▪ An insect biological control agent is available▪ Apply imazapyr to actively growing foliage during flowering; triclopyr, glyphosate or imazapyr as a cut stump or basal bark treatment



Saltcedar

[87]

*Onopordum acanthium***Scotch thistle**

Stem	<ul style="list-style-type: none"> Up to 12 ft. tall and branched, with spiny wings along smooth stem; covered with wooly, gray hairs
Leaves	<ul style="list-style-type: none"> Alternate; oblong, 4-20 in. long, covered with wooly, gray hairs giving plant a gray-green appearance; edges (margins) are lobed or toothed with stiff spines
Flower	<ul style="list-style-type: none"> White to purple flowers, each located at the tip of a branch; base of flower is round (resembles a squashed globe), 1-2 in. wide and covered with green, purple or yellow bracts (less than 0.2 in. long), each tipped with a spine; often covered with wooly, gray hairs
Root	<ul style="list-style-type: none"> Fleshy taproot
Other	<ul style="list-style-type: none"> Often infests pastures, rangeland, roadsides and waste areas; known to occur in all Nevada counties Biennial; reproduces by seed Forms dense stands that are difficult for humans and animals to penetrate
Control	<ul style="list-style-type: none"> Hand-removal, digging or mowing prior to flowering can be effective Apply 2,4-D, dicamba, chlorsulfuron, metsulfuron or picloram to actively growing rosettes; 2,4-D + dicamba, aminopyralid, chlorsulfuron or clopyralid between rosette and late-bolt stage



Scotch thistle

[89]

*Solanum elaeagnifolium***Silverleaf nightshade**

Stem	<ul style="list-style-type: none"> 1-3 ft. tall, branched and densely covered with short hairs; sometimes covered with red to yellow spines (less than 0.2 in. long)
Leaves	<ul style="list-style-type: none"> Alternate; oval to lance-shaped and 3-6 in. long with wavy or lobed edges (margins); usually NO spines on leaf veins; covered with tiny hairs that are star-shaped with magnification; gives the plant a gray or silvery appearance
Flower	<ul style="list-style-type: none"> Star-shaped, 0.75-1.5 in. diameter, purple to blue with 5 petals and yellow stamens and; usually 3-5 flowers clustered on stalks at tips of branches Berries are round, shiny, yellow, 0.25-0.5 in. diameter and resemble tiny tomatoes
Root	<ul style="list-style-type: none"> Deep, creeping root system
Other	<ul style="list-style-type: none"> Often infests rangeland, roadsides, waste areas and crop fields; native to North America; known to occur in Clark, Elko and Nye counties Perennial; reproduces by seeds and roots Toxic to livestock and humans Also known as white horsenettle
Control	<ul style="list-style-type: none"> Repeated hand-digging can be effective; DO NOT use tillage, mowing or grazing Apply glyphosate or 2,4-D to young, actively growing plants; picloram at full flower; imazapyr to actively growing plants



Silverleaf nightshade

[9]

*Centaurea biebersteinii***Spotted knapweed**

Stem	<ul style="list-style-type: none"> Up to 4 ft. tall, rough-textured, branched and bushy; NO wings on upper stems
Leaves	<ul style="list-style-type: none"> Alternate, gray-green, up to 8 in. long; most are pinnate-divided, dotted with resin and sometimes covered with small grayish hairs; upper leaves smaller and narrower with few to no lobes
Flower	<ul style="list-style-type: none"> White to purple, each located at the tip of a branch; base of flower is vase-shaped, 0.5 in. long, 0.3-0.5 in. wide and covered with bracts with dark, comb-like tips that give the appearance of spots (after which the weed is named)
Root	<ul style="list-style-type: none"> Deep, stout taproot
Other	<ul style="list-style-type: none"> Grows best on dry, well-drained soils; often infests rangelands, waste areas and roadsides; known to occur in Carson City, Clark, Douglas, Elko, Eureka, Humboldt, Lander, Lyon, Lincoln, Nye, Washoe and White Pine counties Biennial; reproduces by seed and lateral roots
Control	<ul style="list-style-type: none"> Mowing plants in bud to flower stage can reduce seed production; repeated hand removal can be effective; DO NOT burn Several insect biological control agents are available Apply 2,4-D or dicamba in the rosette stage; apply clopyralid, picloram or aminopyralid between rosette and mid-bolt stages



Spotted Knapweed

[93]

Centaurea virgata var. *squarrosa*

Squarrose knapweed

Stem	<ul style="list-style-type: none"> Up to 2 ft. tall, highly branched and rough-textured; multiple stems can arise from woody crown; NO wings on upper stems
Leaves	<ul style="list-style-type: none"> Exist as a basal rosette prior to bolting; alternate; lower leaves pinnate-divided and 4-8 in. long; sometimes covered with short grayish hairs; upper leaves strap-like (linear) with smooth edges (margins)
Flower	<ul style="list-style-type: none"> Pink to purple, each located at the tip of a branch; base of flower is narrow vase-shaped, 0.3 in. long, 0.12 in. wide and covered with comb-like bracts, tipped with a spine (less than 0.12 in. long) that curves outward
Root	<ul style="list-style-type: none"> Deep, stout taproot
Other	<ul style="list-style-type: none"> Often infests rangelands, waste areas and roadsides; known to occur in Elko and White Pine counties Perennial; reproduces by seed
Control	<ul style="list-style-type: none"> Mowing plants in bud to flower stage can reduce seed production; repeated hand removal can be effective; DO NOT burn Several insect biological control agents are available Apply 2,4-D or dicamba in the rosette stage; clopyralid, picloram or aminopyralid between rosette and mid-bolt stages



Squarrose Knapweed

[95]

Potentilla recta

Sulfur cinquefoil

Stem	<ul style="list-style-type: none"> 1-2 ft. tall, stout, covered with hairs and usually unbranched below flowers; sometimes many arise from crown
Leaves	<ul style="list-style-type: none"> Alternate; palmate-compound with 5-7 leaflets; rough, hairy, 1-4 in. long with toothed edges (margins)
Flower	<ul style="list-style-type: none"> 0.5-1 in. wide, each on a short stalk; 5 pale-yellow petals with a notch at tip surround a yellow center
Root	<ul style="list-style-type: none"> Woody taproot with short branch roots
Other	<ul style="list-style-type: none"> Often infests rangeland, pastures, roadsides and waste areas; known to occur in Elko, Humboldt and Lyon counties Perennial; reproduces by seed
Control	<ul style="list-style-type: none"> Hand-digging individual plants can be effective for small infestations; cultivation can also be effective; mowing does NOT control established plants Apply aminopyralid in the pre-bud stage; picloram to actively growing plants in spring or fall



Sulfur cinquefoil

[97]

Sphaerophysa salsula

Swainsonpea

Stem	<ul style="list-style-type: none">▪ Up to 5 ft. tall and covered with short hairs
Leaves	<ul style="list-style-type: none">▪ Pinnate-compound; leaflets are oval, opposite, 0.2-0.8 in. long, lack leaf stems (petioles) and covered with short hairs on lower surface
Flower	<ul style="list-style-type: none">▪ Pea-like, reddish-orange and 0.5 in. long▪ Pods are oval, bladder-like, translucent and contain many seeds; seeds remain in pods during dispersal
Root	<ul style="list-style-type: none">▪ Woody, creeping root system; roots associate with nitrogen-fixing bacteria
Other	<ul style="list-style-type: none">▪ Often infests roadsides, fencerows and irrigation ditches; not known to occur in Nevada▪ Perennial; reproduces by seed and creeping roots▪ Potential contaminant of alfalfa seed due to similar size, shape and weight▪ Also known as Austrian peaweed
Control	<ul style="list-style-type: none">▪ Hand removal of individual plants, including roots, can limit spread of small infestations▪ Apply 2,4-D to actively growing plants



Swainsonpea

Zygophyllum fabago

Syrian beancaper

Stem	<ul style="list-style-type: none">▪ Up to 3 ft. tall; multiple stems from crown; branched; lacks hair (glabrous)
Leaves	<ul style="list-style-type: none">▪ Opposite; compound with 2 opposite leaflets; leaflets oblong, 0.5-1.5 in. long, thick, waxy and lack hair (glabrous) with smooth edges (margins)
Flower	<ul style="list-style-type: none">▪ 5 petals, white to cream colored with a pink or orange tinge; each on short stalks at upper leaf axils▪ Pods cylindrical, 1-1.5 in. long and 5-sided with small wings; thread-like projection extends from tip; 5 chambers, each containing 1 seed
Root	<ul style="list-style-type: none">▪ Deep, woody taproot with creeping roots
Other	<ul style="list-style-type: none">▪ Often infests rangeland, roadsides and desert areas; known to occur in Churchill County▪ Perennial; reproduces by seed and creeping roots
Control	<ul style="list-style-type: none">▪ Cultivation and hand-removal often unsuccessful due to remaining root fragments that can generate new plants▪ Apply glyphosate, imazapic, picloram or metsulfuron from bud stage until fall



Syrian beancaper

[101]

Cicuta spp.

Waterhemlock

Stem	<ul style="list-style-type: none">Up to 5 ft. tall, stout, lacks hair (glabrous) and hollow except at nodes; usually with purple streaks; often branched
Leaves	<ul style="list-style-type: none">Pinnate-compound; leaflets are lance-shaped, 1-4 in. long and lack hair; edges (margins) are toothed
Flower	<ul style="list-style-type: none">Small, white and arranged in umbrella-like clusters at end of a stalk
Root	<ul style="list-style-type: none">Swollen taproot at stem base that can be cut open to reveal multiple narrow, hollow, horizontal chambers; fluid released from cut stem bases is orange-yellow or brown, has the odor of parsnip and is highly toxic
Other	<ul style="list-style-type: none">Grows best in moist soils; often found in crop fields, roadsides, waste areas and along waterways; known to occur in Carson City, Elko, Eureka, Humboldt, Lander, Lincoln, Nye and White Pine counties; native to North AmericaPerennial; reproduces by seedHighly toxic to animals and humans, even in small quantities
Control	<ul style="list-style-type: none">Repeated cultivation or hand-removal can be effective (avoid contact with skin)Apply 2,4-D or glyphosate to actively growing plants



Waterhemlock

[103]

Centaurea solstitialis

Yellow starthistle

Stem	<ul style="list-style-type: none"> Stiff, wiry, 1-6 ft. tall and usually branched; wings (less than 0.2 in. wide) extend down stem
Leaves	<ul style="list-style-type: none"> Blue- to gray-green, 1.5-6 in. long and densely covered with fine hairs Rosette leaves are oval to strap-like (linear) with deeply lobed edges (margins); stem leaves are alternate, strap-like to oblong with smooth to wavy edges
Flower	<ul style="list-style-type: none"> Yellow, located singly at branch tips or axils; base of flower is vase-shaped, 0.5-0.75 in. diameter and covered with cotton-like hairs and stout, straw-colored spines 0.5-1 in. long
Root	<ul style="list-style-type: none"> Deep taproot
Other	<ul style="list-style-type: none"> Often infests rangeland, pastures, cultivated fields, waste areas and roadsides; known to occur in Carson City, Churchill, Douglas, Elko, Humboldt, Lander, Lyon, Mineral, Pershing, Storey and Washoe counties Annual; reproduces by seed Causes “chewing disease” in horses by damaging the area of the brain that controls fine motor movements, particularly of the mouth, resulting in starvation or dehydration
Control	<ul style="list-style-type: none"> Grazing, mowing, burning, pulling, digging and cultivation can be effective if done prior to seed production Several biological control agents are available Apply aminopyralid, 2,4-D, clopyralid, dicamba or picloram to actively growing plants before flowering



Yellow starthistle

[105]

*Linaria vulgaris***Yellow toadflax**

Stem	<ul style="list-style-type: none"> Multiple stems up to 3 ft. tall; woody base; often branched near top; sometimes hairy
Leaves	<ul style="list-style-type: none"> Alternate; strap-like (linear), 1-2.5 in. long, 0.1-0.2 in wide and lack hair (glabrous) to sparsely hairy; NO leaf stems (petioles); DO NOT clasp the stem; edges (margins) are smooth
Flower	<ul style="list-style-type: none"> Snapdragon-like; 0.5-1.5 in. long, bright yellow to white with an orange bearded throat and a yellow spur; clustered along upper part of stem Seed capsules round with two chambers, 0.3-0.5 in. diameter, contain many seeds
Root	<ul style="list-style-type: none"> Creeping root system
Other	<ul style="list-style-type: none"> Grows best in coarse soils; often infests rangelands, waste areas and roadsides; known to occur in Douglas, Elko, Esmeralda, Humboldt and White Pine counties Perennial; reproduces by seed and creeping roots Toxic to livestock if ingested in large quantities; historically used as a medicine, a dye and an ornamental Also known as “butter and eggs”
Control	<ul style="list-style-type: none"> Mechanical control (mowing, burning or tillage) is NOT effective Several biological control agents are available Apply dicamba, 2,4-D or picloram before bloom; imazapic or picloram to fall regrowth or shortly after first killing frost



Yellow toadflax

[107]

alternate: leaves that grow singly along a stem and are not opposite or whorled

annual: a plant that completes its lifecycle in one year

auricle: a small, finger-like appendage found where the blade meets the sheath in grasses

awns: slender bristles, usually associated with the seed heads of grasses

axil: the point where a leaf attaches to the stem

biennial: a plant that completes its lifecycle in two years

boot: in grasses, the stage at which the seed head has formed, causing the stem to swell, but prior to emergence from the sheath

bract: a small, leaf-like structure found at the base of a flower

clasp: occurs when the lobes at the bottom of a leaf wrap partially or entirely around the stem

collar: the junction of the sheath and blade in grasses

compound: a leaf composed of two or more leaflets

cotyledons: seed leaves that appear at germination

creeping: a root system that grows horizontally above or below the soil surface

crown: the persistent base of a non-woody perennial plant that dies to the ground each year

fibrous: a root system composed of many densely packed roots that appear similar in length and thickness

glabrous: lacking hairs (smooth)

lance-shaped: lanceolate; a leaf that is much longer than wide; widest near the base and tapered toward both ends

leaflet: a small leaf of a compound leaf

ligule: a thin membranous or hair-like appendage at the leaf collar

linear: a long, narrow leaf with parallel edges

lobed: a leaf edge that cuts deeply toward the base or midvein

margin: the edge of a leaf

midvein: the central vein of a leaf

node: a place on a stem where a leaf is or has been attached

oblong: a leaf that is longer than it is wide and has edges that are nearly parallel

opposite: a pair of leaves that grow from the same node, directly across from each other

palmate: a leaf whose lobes spread like fingers from the palm

pappus: hairs, bristles, scales or awns that arise from one end of the seed of plants in sunflower family (Asteraceae)

perennial: a plant that persists for three or more years or growing seasons

petiole: a stalk that supports the blade of a leaf

pinnate: a compound leaf with leaflets arranged on opposite sides of a common stalk

rhizome: a creeping underground stem

rosette: a circular cluster of leaves

sheath: the lower, tubular part of a grass leaf that encloses the stem

simple: a single leaf attached to a branch or stem by a leaf stem (petiole); not compound

spike: the seedhead of a grass where the flowers or seeds are attached directly to a central, long, unbranched stalk

stamens: stalk-like appendage(s) on a flower that rise above the petals and produce pollen

submersed: growing below the water surface

taproot: an enlarged, vertical main root

toothed: a leaf edge that has sawtooth-like projections

wings: thin, flat margins (projections of leaves) that extend outward along a stem, fruit or seed

whorled: three or more leaves arranged in a circle at a node



This booklet provides herbicide recommendations as a starting point for individuals looking for chemical control options. Due to the large number of trade (brand) named products available and the fact that trade names are constantly changing, common names (active ingredients) of chemicals are presented. To help readers identify the chemical common name, trade names of a few commercial products are provided.

Active ingredient(s): Product(s)

2,4-D: several products

aminopyralid: Milestone

bromoxynil: Buctril

chlorsulfuron: Telar

clopyralid: Stinger, Transline

clopyralid + 2,4-D: Curtail

clopyralid + triclopyr: Redeem

copper complexes: several products

Active ingredient(s): Product(s)

dicamba: Banvel, Vanquish, Clarity

dicamba + 2,4-D: Weedmaster, Pasturemaster

diquat: Reward

endothall: Aquathol, Hydrothol

fenoxaprop: Acclaim, Horizon

fluazifop: Fusilade

fluridone: Sonar, Avast!

glyphosate: Roundup, Rodeo, Touchdown



Active ingredient(s): Product(s)

glyphosate + 2,4-D: Landmaster

imazapic: Plateau

imazapic + glyphosate: Journey

imazapyr: Arsenal, Habitat

MCPA: several products

metsulfuron: Escort, Ally, Cimarron

metsulfuron + dicamba + 2,4-D:

Cimarron Max

Active ingredient(s): Product(s)

picloram: Tordon

sethoxydim: Poast

sulfometuron: Oust

tribenuron: Express

triclopyr: Garlon, Renovate, Remedy

triclopyr + 2,4-D: Crossbow

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African Mustard: All photos, Joe DiTomaso.

African rue: Flower, Charles Hart; plant and seed pod, Joe DiTomaso; young plant, Earl Creech, University of Nevada Cooperative Extension.

Austrian fieldcress: Plant, Joe DiTomaso; flowering plant and rosette, Jack Kelly Clark; flower, Elizabeth Bella, USDA-USFS, bugwood.org.

Black henbane: Seed pod, Joe DiTomaso; all other photos, Nathan Belliston, Uintah County Weed Department.

Camelthorn: Whole plant, J.P. Clark; plant and seed pod, Ross O'Connell; flower closeup, Richard Old, XID Services, bugwood.org; Leaves and stems, Steve Dewey, Utah State University, bugwood.org.

Canada thistle: Roots, Joe DiTomaso; all other photos, Nathan Belliston, Uintah County Weed Department.

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Goatsrue: Plant with rootstalks, Steve Dewey, Utah State University, bugwood.org; all other photos, Nathan Belliston, Uintah County Weed Department.

Hoary cress: Infestation and seedling, Nathan Belliston, Uintah County Weed Department; all other photos, Joe DiTomaso.

Horsenettle: All photos, Joe DiTomaso.

Houndstongue: Seedling and flowers with seeds, Joe DiTomaso; all other photos, Nathan Belliston, Uintah County Weed Department.

Hydrilla: Cross section and plant, Jack Kelly Clark; tuber and infestation, Joe DiTomaso.

Iberian starthistle: Whole plant and flower head, Ross O'Connell; seeds, Jim O'Brien; rosette, Western Society of Weed Science: "Weeds of the West".

Johnsongrass: Whole plant and leaf close up, Joe DiTomaso; all other photos, Jack Kelly Clark.

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Mediterranean sage: Infestation, Ross O'Connell; all other photos, Joe DiTomaso.

Medusahead: Leaf collar and sheath, Joe DiTomaso; whole plant, Steve Dewey, Utah State University, bugwood.org; all other photos, Nathan Belliston, Uintah County Weed Department.

Musk thistle: Plant and patch, Nathan Belliston, Uintah County Weed Department; all other photos, Joe DiTomaso.

Perennial pepperweed: Inflorescence, Nathan Belliston, Uintah County Weed Department; all other photos, Joe DiTomaso.

Perennial sowthistle: Whole plant, J. Neal; plant with rhizomes, Steve Dewey, Utah State University, bugwood.org; all other photos, Nathan Belliston, Uintah County Weed Department.

Poison-hemlock: Flower close up, Nathan Belliston, Uintah County Weed Department; all other photos, Joe DiTomaso.

Puncturevine: Seeds, Nathan Belliston, Uintah County Weed Department; seedling, Jack Kelly Clark; patch and flowers and seeds, Joe DiTomaso.

Purple loosestrife: Whorled leaf arrangement, Joe DiTomaso; all other photos, Nathan Belliston, Uintah County Weed Department.

Purple starthistle: Seeds, Jim O'Brien; all other photos, Joe DiTomaso.

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Saltcedar: All photos, Nathan Belliston, Uintah County Weed Department.

Scotch thistle: All photos, Nathan Belliston, Uintah County Weed Department.

Silverleaf nightshade: Seedling, Jack Kelly Clark; all other photos, Joe DiTomaso.

Spotted knapweed: Rosette and leaves and stems, Joe DiTomaso; all other photos, Nathan Belliston, Uintah County Weed Department.

Squarrose knapweed: Rosette and leaves and stems, Joe DiTomaso; all other photos, Nathan Belliston, Uintah County Weed Department.

Sulfur cinquefoil: Seedling and leaf and stem hairs, Joe DiTomaso; all other photos, Steve Dewey, Utah State University.

Swainsonpea: All photos, Utah State University Archives, bugwood.org.

Syrian beancaper: Flower and seed pod, Dell O'Clark; whole plant, Joe DiTomaso.

Waterhemlock: All photos, Joe DiTomaso.

Yellow starthistle: Patch and plant, Nathan Belliston, Uintah County Weed Department; winged leaves, Steve Dewey, Utah State University, bugwood.org; flower head, Jack Kelly Clark; rosette, Joe DiTomaso.

Yellow toadflax: Flowering stem and plants with rootstalk, Joe DiTomaso; all other photos, Nathan Belliston, Uintah County Weed Department.

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