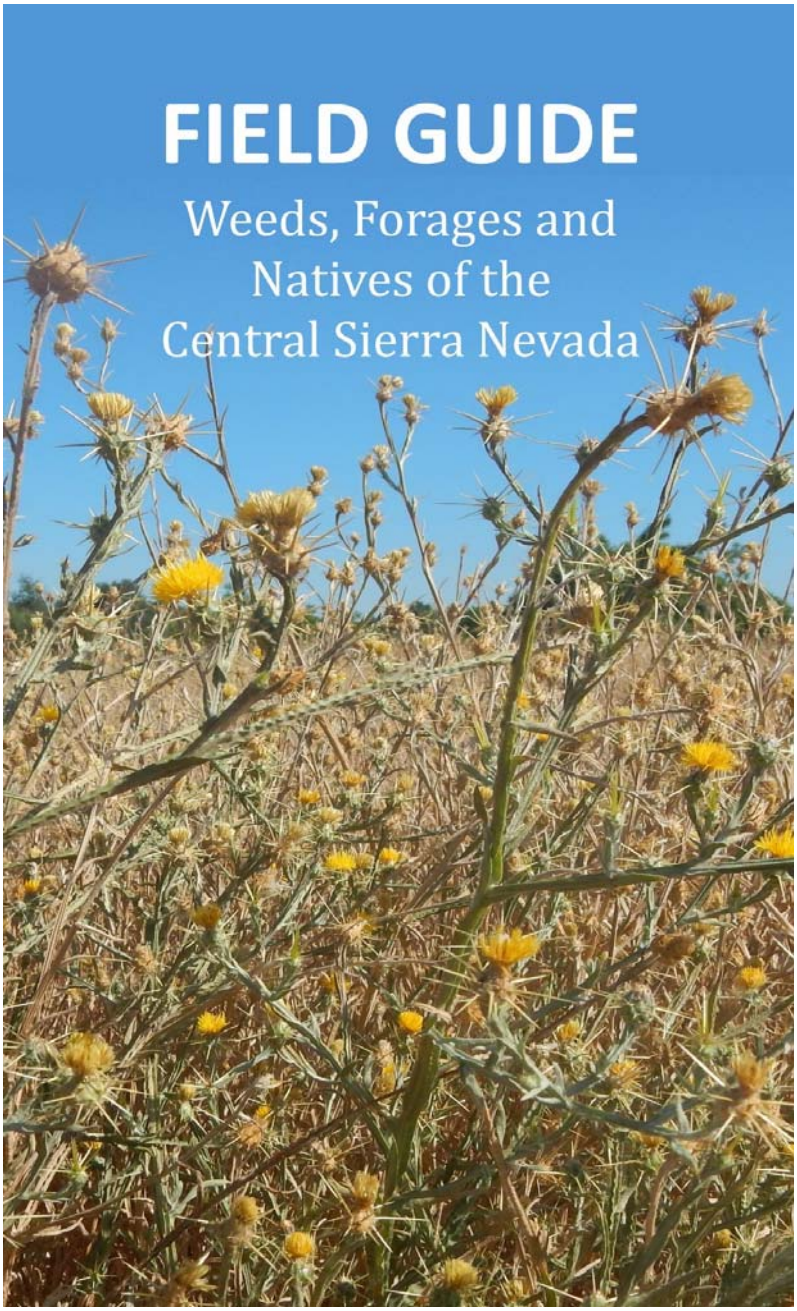

FIELD GUIDE
Weeds, Forages and
Natives of the
Central Sierra Nevada

FIELD GUIDE

Weeds, Forages and Natives of the

Introduction

Weeds pose a significant threat to agriculture and natural ecosystems throughout the central Sierra Nevada. They generally are capable of outcompeting the existing vegetation, spreading rapidly, and are difficult to control. Weed populations often decrease the biological diversity of an area, diminish wildlife values, reduce forage production and usability, lessen agricultural production and restrict recreational opportunities.

The intent of this booklet is to provide a valuable resource for people to identify select weeds. forages and natives in the Central Sierra Nevada region. Identifying weeds and controlling populations early is the best way to prevent weeds from becoming well established and widespread. Understanding the threat that these species pose, reporting invasions and treating problem areas will result in healthier, more productive natural and agricultural communities.

What is Integrated Weed Management?

Integrated Weed Management (IWM) is an ecosystem-based strategy that focuses on long-term prevention of weeds. IWM uses a combination of techniques such as biological control, habitat manipulation and modification of cultural practices. Herbicides are used only after monitoring indicates they are needed according to established guidelines and treatments are made with the goal of removing only the target organism. Weed control practices are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms and the environment.

Purpose of Field Guide

This field guide was developed to be used in the field as a quick reference for identifying weeds, forages and natives found throughout the central Sierra Nevada region of California. This guide includes common weeds as well as weeds of limited distribution and lists some of the identifying characteristics for identification. Many of the weeds in the guide are invasive weeds, meaning they are not native to California and were introduced from other parts of the world. Other weeds included are plants that are native to California or the U.S. and can be weedy in certain environments. For more information about a particular weed found in the field guide, see the publication, Weed Control in Natural Areas in the Western United States. Each weed in the field guide will reference this publication where more information can be found. The book can be purchased from the California Invasive Plant Council (http://www.cal-ipc.org), or from your local University of California Cooperative Extension office.

How to Use this Handbook

1. Carry the handbook with you whenever you are out and about. Put it in your glove compartment, backpack, back pocket or lunch box.
2. Use the pictures and description to identify the weed. If you are not sure about the identity of the plant, collect a sample (as much as possible of the stem, leaf, flower, seed, etc.) and place it in a plastic bag and seal tightly. Bring the sample to one of the agencies below.
3. You can also take a photo of the plant and email it. Be sure to include the location with any photos.

4. **TAKE ACTION:** Some plants have the following symbol. These are some of the worst weeds in the area. Many of these plants are either rapidly expanding or are limited in distribution and eradication is possible. If you see these plants please take immediate action either by controlling the population and/or reporting any sightings to the below agencies. Landowners, agencies or land managers may determine that other plants should be included or excluded from this classification.
5. **Plant Distribution:** To help aid in determining if a particular plant or weed occurs in your area, the following websites have distribution data for many plants. While not exhaustive, the maps can be used to show where plant occurrences have been recorded.
   https://www.calflora.org/
   https://calweedmapper.cal-ipc.org/

El Dorado County

University of California Cooperative Ext.	Department of Agriculture
530-621-5502	530-621-5520
311 Fair Lane, Placerville CA 95667	311 Fair Lane, Placerville CA 95667
cecentralsierra@ucdavis.edu	eldcag@edcgov.us

Amador County

University of California Cooperative Ext.	Department of Agriculture
209-223-6482	209-223-6487
12200B Airport Rd., Jackson CA 95642	12200B Airport Rd., Jackson CA 95642
cecentralsierra@ucdavis.edu	agriculture@amadorgov.org

Calaveras County

University of California Cooperative Ext.	Department of Agriculture
209-754-6477	209-754-6504 ext 3
423 E. Saint Charles St., San Andreas CA 95249	23 E. St. Charles St., San Andreas CA 95249
cecentralsierra@ucdavis.edu	agpublic@co.calaveras.ca.us

Tuolumne County

University of California Cooperative Ext.	Department of Agriculture
209-533-5695	209-533-5691
52 N. Washington St., Sonora CA 95370	22365 South Airport Rd., Sonora CA 95370
cecentralsierra@ucdavis.edu	AgCommissioner@tuolumnecounty.ca.gov

Weed Ratings Used in this Booklet

The California Department of Food and Agriculture (CDFA) and the California Invasive Plant Council (Cal-IPC), a non-profit organization, each maintain lists of weeds that are of serious concern. For each species presented in this booklet, the ratings given by each organization are presented.

The CDFA identifies the following categories of weeds:

A. These weeds are mandated to be targeted for containment, eradication and quarantine.

B. Species more widespread and therefore difficult to contain. The agency allows county Agricultural Commissioners to decide whether to target them for eradication or containment in their jurisdiction.

C. Species so widespread that the agency does not endorse state or county-funded eradication or containment efforts except in nurseries or seed lots.

The Cal-IPC focuses on non-native pests that pose serious threats in wildlands using the following categories:

- **High** - Species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
- **Moderate** - Species have substantial and apparent, but generally not severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, with establishment dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
- **Limited** - These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Both lists are available at the following websites:
CDFA
California Invasive Plant Council

Table of Contents

Introduction 4
How to Use this Handbook 5
Weed Ratings Used in this Booklet 6
Use of Pesticides 7
Thistles and Thistle-like Relatives 10
- Bull thistle
- Canada thistle
- Cat's-ear
- Cocklebur, common and spiny
- Diffuse knapweed
- Horseweed
- Italian thistle
- Milk thistle (blessed milkthistle)
- Prickly sow thistle
- Purple starthistle
- Rush skeletonweed
- Russian knapweed
- Smooth distaff thistle
- Spotted knapweed
- Stinkwort
- Tarweed, Fitch's (spikeweed)
- Tarweed, virgate
- Tocalote (malta thistle)
- Yellow starthistle

Grasses and Grass-like Relatives 48
- Bermudagrass
- Blue wild-rye
- Bulbous bluegrass
- California brome
- Cheat grass
- Dogtail grass
- Foxtail (barley)
- Giant reed
- Goat grass, barbed and jointed
- Harding grass
- Johnson grass
- Medusa head
- Oats, wild and slender
- Pampas grass and Jubata grass
- Purple needle grass
- Rabbitfoot grass
- Ripgut brome
- Rush
- Ryegrass
- Soft chess (blando brome)

Table of Contents

Trees and Shrubs 88
Blackberry, Himalayan
Buckbrush (wedgeleaf ceanothus)
Chamise (greasewood)
Deer brush
French broom
Manzanita
Scarlet wisteria (rattlebox)
Scotch broom
Spanish broom
Tamarisk (saltcedar)
Toyon
Tree of heaven
Tree tobacco
Vines..... 114
Bindweed
English ivy
Periwinkle
Poison oak
Non-Thistle Broadleaves 122
Bird's-foot trefoil
Burclover
Curly dock
Dalmatian toadflax
Fennel
Fiddleneck
Filaree
Hedgeparsley
Hoary cress, heart & lens-podded
Horehound
Klamathweed (St. John's wort)
Lupine
Milkweed, Mexican whorled and showy
Mullein
Mustard, black
Oblong spurge
Perennial pepperweed (tall whitetop)
Poison hemlock
Pokeweed
Puncturevine (goatheads)
Purple loosestrife
Sweetclover, yellow and white
Tumbleweed (pigweed)
Vinegar weed
Index 170
References & Weed Related Websites 174

Bull thistle
Cirsium vulgare
Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Bull thistle
Cirsium vulgare
Sunflower Family (Asteraceae)

CDFA: C
Cal-IPC: Moderate

Description
Bull thistle is an erect biennial with a short fleshy taproot, growing 1-5 feet tall, with many branched stems. Plants are green, sometimes brownish. Leaves in the first year form a rosette. Stem leaves are deeply lobed with sharp tips, hairy and prickly on the upper side, and cottony underneath. The pinkish-purple to dark purple flowers are 1.5-2 inches wide, with one or more clustered at the end of branches. Flowering occurs from July through September. Seeds are topped by a circle of plume-like white hairs.

Reproduction
Reproduces by seed. Seeds are short-lived and most on or near the soil surface do not remain viable for more than a year. Seeds buried at a depth of five inches may remain viable for up to three years.

Origin and Habitat Description
Native to Europe and Asia and is now widely established. Introduced many times as a seed contaminant. Primarily found in disturbed sites, pastures, roadsides, logged sites, riparian areas and urban areas.

Control
- Tillage, hoeing and hand pulling are effective as long as they are done before flowering to prevent seed production. Any treatment that severs the root below the soil surface is very effective.
- Intensive grazing by goats and sheep can be effective.
- Mowing is most effective when plants are just beginning to flower.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor, aminopyralid, clopyralid, dicamba and triclopyr provide selective control without injuring many grasses. These herbicides can be used as a broadcast or spot treatment. The non selective herbicide glyphosate is effective and best used as a spot treatment.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Canada thistle

Cirsium arvense

Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Canada thistle infestation in a pasture (above) with male (left) and female (right) plants

Canada thistle male flowers (left)

Canada thistle sprout from rhizome (below)

12

Canada thistle

Cirsium arvense
Sunflower Family (Asteraceae)

CDFA: B
Cal-IPC: Moderate

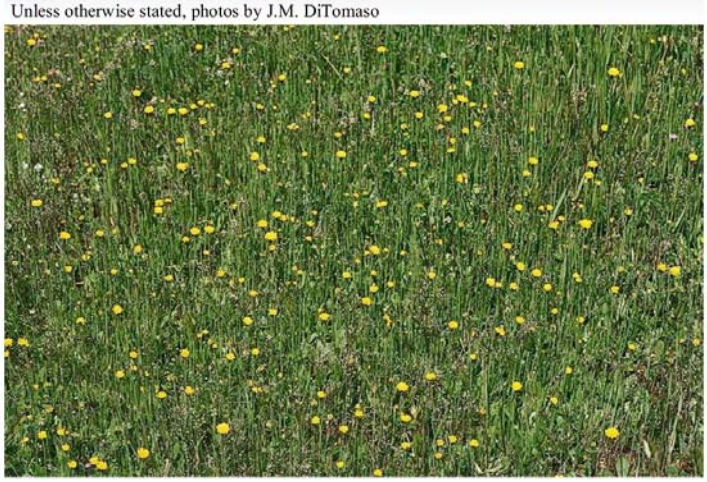
Description
A perennial with deep extensive horizontal roots. Stems 1-4 feet tall, ridged and branching above. Leaves are oblong or lanced-shaped and have spiny tips. Flowers are purple (occasionally white) arranged in a head 1/2 to 3/4 inch in diameter.

Reproduction
Reproduces vegetatively from creeping shoots and by seed. Male and

Cat's-ear

Hypochaeris glabra, Hypochaeris radicata
Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso



Smooth cat's-ear (H. glabra) infestation (above)

John M. Randall, The Nature Conservancy

Ohio State Weed Lab, Bugwood.org

Rough cat's-ear (H. radicata) foliage (above) and close up of cat's-ear flower (left)

Cat's-ear

Hypochaeris glabra, Hypochaeris radicata
Sunflower Family (Asteraceae)

CDFA: Not rated
Cal-IPC: *H. glabra* - Limited, *H. radicata* - Moderate

Description
Cat's-ear resemble dandelion with milky juice, a basal rosette of leaves, and yellow dandelion-like flowers. Unlike dandelions, cat's-ears have branched flowering stems with multiple flowers. The leaves are also quite different. Dandelion leaves are pointed and "rocket-shaped" with sharp lobes pointed back towards the base, whereas cat's-ears leaves are smooth to shallow-lobed. Smooth cat's-ear (*H. glabra*) is an annual with flower stems to 16 inches tall with a slender taproot. Leaves are hairless with smooth to shallow margins. Rough cat's-ear (*H. radicata*) is a perennial with flower stems to 32 inches tall with a fibrous root system. Leaves are toothed to lobed and covered with rough hairs.

Reproduction
Smooth cat's-ear reproduces only by seed. Rough cat's-ear reproduces primarily by seed but can also reproduce vegetatively by offsets from the crown. Seeds are dispersed with wind, soil movement, water, animals and human activities. Seeds generally do not persist long in the soil.

Origin and Habitat Description
Cat's-ear is native to Europe. It is commonly found along roadsides, agronomic crops, landscaped areas, orchards, vineyards, pastures and rangelands. In overgrazed pastures cat's-ears can form dense stands and outcompete desirable vegetation.

Control
- Tillage, hoeing and hand pulling are effective as long as they are done before flowering to prevent seed production.
- Mowing is generally not effective.
- Heavy grazing and burning often stimulates germination.
- The broadleaf herbicides 2,4-D, aminopyralid, clopyralid, dicamba and triclopyr provide selective control. The non selective herbicides glyphosate and imazapyr are also effective.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Cocklebur, common and spiny

Xanthium strumarium, Xanthium spinosum

Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Steve Matson, CalPhotos

Mary Ellen (Mel) Harte, Bugwood.org

Common cocklebur (X. strumarium) (above), spiny cocklebur (X. spinosum) (below)

John Doyen, CalPhotos

Neal Kramer, CalPhotos

16

Cocklebur, common and spiny

Xanthium strumarium, Xanthium spinosum
Sunflower Family (Asteraceae)

Diffuse knapweed

Centaurea diffusa
Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Diffuse knapweed plants in two color forms

Seedling

Flower heads in white and purple form

18

Diffuse knapweed

Centaurea diffusa

Sunflower Family (Asteraceae)

CDFA: A
Cal-IPC: Moderate

Description

A bushy, herbaceous taprooted biennial or short-lived perennial that grows to about 3 feet tall. The leaves are alternate and covered with short hairs. The upper leaves are linear and not lobed. The lower leaves are 4-8 inches long and deeply lobed. Seedlings have finely divided leaves covered with short hairs. Flowers are white to rose or sometimes purplish and are numerous and narrow. Leaf-like structures under the flower have yellow spines with teeth appearing as a comb along spine margins. *Centaurea* species are poisonous to horses.

Reproduction

Reproduces by seed with many plants germinating after the first fall rains. Most seeds fall near the parent plant. Seeds also disperse when plants break off near the ground and tumble along with the wind. Diffuse knapweed has been shown to hybridize with spotted knapweed.

Origin and Habitat Description

Native to the Mediterranean region. Infests roadsides, disturbed open sites and rangelands. Plants seldom persist in shaded places, but are highly competitive in open areas.

Control

- Hand pulling 2-4 times per year or severing plants at least 2 inches below root crown can be effective.
- Mowing at the early bloom stage can reduce seed population but won't kill plants.
- Grazing is often not effective since knapweed is typically not considered palatable.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor, aminopyralid, clopyralid and dicamba provide selective control without injuring many grasses. The non selective herbicides glyphosate and imazapyr are also effective.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Horseweed
Erigeron canadensis
Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Horseweed population near an agricultural field

Horseweed
Erigeron canadensis
Sunflower Family (Asteraceae)

CDFA: Not rated
Cal-IPC: Not rated

Description
Native summer annual or biennial to 6.5 feet tall, typically with a single erect main stem that branches only in the upper half. Leaves are unstalked, narrow (up to 0.4 inch) and long (3/4" to 4 inches). The flowers are small (1cm) and occur in dense heads. Each flower has a ring of white or pale purple flowers (ray flowers) and a center of yellow disc flowers.

Reproduction
Reproduces only by seed. Seeds are dispersed with wind, soil movement, water, and human activities. Seeds can germinate year-round under favorable conditions. Spring-germinating plants are annual. Late-summer and fall-germinating plants are usually biennial.

Origin and Habitat Description
Horseweed is native to North America and has spread to many areas throughout the world including Asia, Europe and Australia. It is commonly found along roadsides, agronomic crops, landscaped areas, orchards, vineyards, waste places, ditch banks and urban sites.

Control
- Tillage, hoeing and hand pulling are effective as long as they are done before flowering to prevent seed production. Any treatment that severs the root below the soil surface is very effective.
- Mowing is generally not effective as it stimulates branching.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor, aminopyralid, clopyralid, dicamba and triclopyr provide selective control without injuring many grasses. The non selective herbicide glyphosate can be effective however populations of horseweed resistant to the herbicide glyphosate are found throughout California.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Italian thistle

Carduus pycnocephalus
Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Eric Coombs, Oregon Dept of Agriculture

Italian thistle infestation along a fence line

Italian thistle rosette

John M. Randall, The Nature Conservancy

Close up of flower and seeds

22

Italian thistle

Carduus pycnocephalus
Sunflower Family (Asteraceae)

CDFA: C
Cal-IPC: Moderate

Description
Winter annual growing up to 6 feet tall. The leaves are white-woolly below and hairless-green above. Leaves are deeply lobed and spiny. Stems are winged and spiny. Flower heads are small (1/2 to 1 inch), pink to purple and covered with dense hairs. Flowering is April through July.

Reproduction
Reproduces only by seed. Seeds fall near the parent plant and disperse greater distances with wind, water, birds, small mammals, and human activities. Most seeds germinate in fall and spring. Seeds may remain dormant and can persist in the soil seedbank for up to 7 years.

Origin and Habitat Description
Introduced from Europe. Typically grows in disturbed open sites, roadsides, pastures and annual grasslands. Found commonly along fence lines. Tends to prefer sandy and clay soils.

Control
- Tillage, hoeing and hand pulling are effective as long as they are done before flowering to prevent seed production. Any treatment that severs the root below the soil surface is very effective.
- Intensive grazing by goats and sheep can be effective.
- Mowing is most effective when plants are just beginning to flower.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor, aminopyralid, clopyralid, dicamba and triclopyr provide selective control without injuring many grasses. The non selective herbicide glyphosate is also effective.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Milk thistle (Blessed milkthistle)

Silybum marianum

Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Milk thistle (Blessed milkthistle)
Silybum marianum
Sunflower Family (Asteraceae)

CDFA: Not rated
Cal-IPC: Limited

Description
Blessed milkthistle is an erect winter or summer annual or biennial that generally grows to 6 feet tall, with white-variegated prickly leaves. Stems are branched, thick, hollow, ribbed, lack wings or spines and are sparsely hairy. Leaves are coarse, lobed, prickly-toothed, ruffled, and often hairless. Upper leaf surface is shiny, green and conspicuously variegated with white splotches. Flower heads are large, up to 2.5 inches in diameter and consist of numerous pink to purple flowers on long stalks.

Reproduction
Reproduces only by seed. Seeds disperse short distances by wind and longer distances with human activities, water, soil movement, animals and as a crop seed or feed contaminant. Most seeds germinate after the first fall rain, but some can germinate throughout the winter and early spring. Seeds can survive in the soil up to 9 years.

Origin and Habitat Description
Native to the Mediterranean. Commonly found in disturbed sites, roadsides, pastures, fields, rangelands, agronomic crops, waste places and orchards. Often seen growing in large patches under oak trees. Grows best on fertile soils.

Control

- Tillage, hoeing and hand pulling are effective as long as they are done before flowering to prevent seed production. Any treatment that severs the root below the soil surface is very effective.
- Intensive grazing by goats and sheep can be effective.
- Mowing is most effective when plants are just beginning to flower.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor, aminopyralid, clopyralid and dicamba provide selective control without injuring many grasses. The non selective herbicide glyphosate is also effective.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Prickly sow thistle

Sonchus asper subsp. asper

Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Flowering plant and close up of stem

Keir Morse, CalPhotos

Stem and leaves

Steve Dewey, Utah State University, Bugwood.org

Seedlings, common sow thistle (left) and prickly sow thistle (right)

26

Prickly sow thistle

Sonchus asper subsp. asper
Sunflower Family (Asteraceae)

CDFA: Not rated
Cal-IPC: Not rated

Description
Coarse, erect, winter or summer annuals to 4 feet tall, with milky juice and yellow dandelion-like flower heads. Plants exist as rosettes until flower stems develop in spring or summer. Flower heads clustered at stem tips, mostly 0.5 - 1 inch in diameter, consist only of yellow ligulate flowers. Closed flower heads are urn-shaped. Stems are dull green or reddish green, round and smooth. Leaves have conspicuous longitudinal

Purple starthistle

Centaurea calcitrapa
Sunflower Family (Asteraceae)

Richard Spellenberg, CalPhotos

Purple starthistle infestation along a road

Barry Rice, CalPhotos

Close up of flower

Close up of lobed leaf

Zoya Akulova, CalPhotos

Purple starthistle

Centaurea calcitrapa

Sunflower Family (Asteraceae)

CDFA: Not rated
Cal-IPC: Moderate

Description

Coarse, erect, annual to short lived perennial, growing to 3 feet tall. Plants exist as basal rosettes until they bolt. Bolting stems are highly branched with spiny heads and purple flowers. A large taproot provides a competitive advantage over other desirable vegetation. Purple starthistle is similar in size and stature to yellow starthistle. *Centaurea* species are poisonous to horses.

Reproduction

Reproduces only by seed. Seeds primarily germinate in fall or spring. Seeds can remain viable in the soil for up to 3 years.

Origin and Habitat Description

Native to southern Europe. Grows in disturbed areas, roadsides, fields, pastures, open forests and riparian areas.

Control

- Tillage, hoeing and hand pulling are effective as long as they are done before flowering to prevent seed production. Any treatment that severs the root below the soil surface is very effective.
- Grazing is not considered effective as most livestock find it unpalatable.
- Mowing is most effective when plants are just beginning to flower. Mowing will reduce seed production but will not always kill plants.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor, aminopyralid, clopyralid, dicamba and triclopyr provide selective control without injuring many grasses. The non selective herbicide glyphosate is also effective.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Rush skeletonweed

Chondrilla juncea

Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Rush skeletonweed infestation in a vineyard

Scott Oneto, UC Regents

Close up of flower (left) and base of stem showing downward hairs (right)

Scott Oneto, UC Regents

Immature foliage is very similar to dandelion and chicory (right)

30

Rush skeletonweed

Chondrilla juncea

Sunflower Family (Asteraceae)

Russian knapweed

Acroptilon repens

Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Clinton Shock, Oregon State University, Bugwood.org

Mature flowering plant (above) and close up of flower (left)

Rosette

32

Russian knapweed

Acroptilon repens

Sunflower Family (Asteraceae)

CDFA: B
Cal-IPC: Moderate

Description

Perennial to 3 feet tall. The stems are erect, branched, leafy and mostly covered with gray hairs. Upper leaves are narrow, 1/2 to 1.5 inches long and basal leaves are 2 to 5" long. Roots can grow several feet deep with extensive branching. Roots are black/brown in color which aid in identification. The solitary, urn-shaped flower heads occur on shoot tips and generally are 1/4 to 1/2" in diameter with smooth papery bracts. Flowers can be pink, lavender or white. Flower heads remaining on old stems can aid in identification. Russian knapweed is poisonous to horses.

Reproduction

Reproduction is primarily by vegetative shoots from creeping roots. Root fragments as small as 1" can develop into a new plant. Seed production also contributes to spread.

Origin and Habitat Description

Native to central Asia, southern Ukraine, and southeast Russia. Found along roadsides, rangelands, pastures and disturbed sites. Once established plants are extremely drought tolerant.

Control

- Hand pulling is effective on seedlings but not on established plants.
- Multiple mowings during a season can suppress growth. Cultivation is not effective as root fragments can spread population.
- Grazing is often not effective since knapweed is typically not considered palatable.
- The broadleaf herbicides aminocyclopyrachlor, aminopyralid and clopyralid provide selective control without injuring many grasses. The non selective herbicide glyphosate also provides control. Chlorsulfuron provides pre and post emergent control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Smooth distaff thistle

Carthamus creticus

Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Smooth distaff flowering plant (left) and close up of flower head (below)

Smooth distaff thistle

Carthamus creticus

Sunflower Family (Asteraceae)

CDFA: B
Cal-IPC: Not rated

Description
Erect winter annual with rigid stems to 3 feet tall and spiny leaves. Plants exist as rosettes until flower stems develop in spring or summer. Yellow flowers occur solitary at stem tips, 1-2 inches long, with spiny lobed phyllaries. The spiny foliage and flower heads can injure the eyes and mouths of livestock grazing in infested areas.

Reproduction
Reproduces only by seed. Most seeds germinate after the first fall rain, generally 1-3 years following maturation, but some seeds can remain dormant and viable for up to 8 years.

Origin and Habitat Description
Introduced from Europe. Typically grows in disturbed open sites, roadsides, pastures and annual grasslands. Grows on many soil types.

Control

- Tillage, hoeing and hand pulling are effective as long as they are done before flowering to prevent seed production. Any treatment that severs the root below the soil surface is very effective.
- Intensive grazing by goats and sheep can be effective.
- Mowing is most effective when plants are just beginning to flower.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor, aminopyralid, clopyralid, dicamba and triclopyr provide selective control without injuring many grasses. The non selective herbicide glyphosate is also effective.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Spotted knapweed

Centaurea stoebe ssp. micranthos

Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Mature flowering plants

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Spotted knapweed flower heads from bud to full flower

Spotted knapweed rosette

36

Spotted knapweed

Centaurea stoebe ssp. micranthos

Sunflower Family (Asteraceae)

CDFA: A
Cal-IPC: High

Description

Biennial or short-lived perennial with stout taproot growing to 3 feet tall. Leaves at the base of the plant up to 6 inches long, narrow, and may or may not be divided into leaflets. Flowers are pinkish to purple, 1/2 - 1" long, and thistle-like. Leaf-like structures (bracts) around flower head are stiff, and tipped with a dark, comb-like fringe resembling "spots." Flowers June to October. *Centaurea* species are poisonous to horses.

Reproduction

Reproduces primarily by seed, with some vegetative reproduction from lateral roots. Seeds are about 1/8" long and tipped with a tuft of persistent bristles. Seeds can remain dormant for up to 8 years in the soil. Germination occurs from fall to early spring.

Origin and Habitat Description

Native to Europe. Found in fields, roadsides, disturbed open sites, grasslands, overgrazed rangelands and logged areas. Spotted knapweed may release chemical substances which inhibit the growth of surrounding vegetation.

Control

- Hand pulling is effective on seedlings. For established plants, hand pulling 3 times a year can provide control.
- Multiple mowings during a season can suppress growth but often doesn't kill plants. Cultivation is not effective as root fragments can spread population.
- Grazing is not effective since knapweed is typically not considered palatable.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor, aminopyralid, clopyralid and dicamba provide selective control without injuring many grasses. The non selective herbicide glyphosate is also effective.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Stinkwort
Dittrichia graveolens
Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Stinkwort
Dittrichia graveolens
Sunflower Family (Asteraceae)

CDFA: Not rated
Cal-IPC: Moderate

Description
Erect, fall-flowering annual to about 3 feet tall, with sticky, glandular-hairy and strongly aromatic foliage. During late spring and summer it develops into a shrubby, pyramid or sphere-shaped plant which resembles Russian thistle. Leaves are narrow, 1/2-1 inch long and 1-3mm wide. Flowers from September to December producing small yellow flower heads, 1/4" in diameter, turning reddish with age. Foliage can cause contact dermatitis similar to poison oak to humans and in rare cases, illness or death to horses and other livestock.

Reproduction
Reproduces only by seed. Stinkwort is an unusual winter annual because it does not begin to grow rapidly until about July. Unlike most winter annuals, stinkwort does not flower and produce seed until late fall. Seeds can persist in the soil for 3 years.

Origin and Habitat
Native to southern Europe. Only recently reported in California (mid 1980's). Stinkwort is rapidly expanding its range. Found along roadsides, disturbed sites, levees, pastures, fields and riparian woodlands.

Control
- Tillage, hoeing and hand pulling are effective as long as they are done before flowering to prevent seed production.
- Grazing is not effective since stinkwort is typically not considered palatable.
- Mowing is most effective when plants are just beginning to flower. Multiple mowings may be required.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor, aminopyralid, dicamba and triclopyr provide selective control without injuring many grasses. The non selective herbicide glyphosate is also effective.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Tarweed, Fitch's (spikeweed)

Centromadia fitchii

Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Fitch's tarweed growing in a pasture

Neal Kramer, CalPhotos

Mary Ellen (Mel) Harte, Bugwood.org

Close up of Fitch's tarweed leaves (above) and flower head (left)

Tarweed, Fitch's (spikeweed)

Centromadia fitchii

Sunflower Family (Asteraceae)

CDFA: not rated
Cal-IPC: not rated

Description

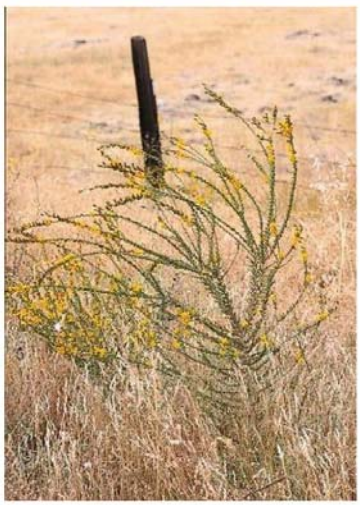
Fitch's tarweed or commonly called spikeweed, is a late season annual with rigid, bristly, branching stems. Grows to heights varying from 1.5-3 feet tall. The basal leaves are yellowish green, narrow, stiff and 2-6 inches long. Stem leaves are alternate, 1/2 inch long and spine-tipped. Plants grow from a rosette and flower in mid to late summer. Plants are covered with sticky, glandular hairs. Flowers are yellow and occur at the tips of

Tarweed, virgate

Holocarpha virgata

Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso



Virgate tarweed infestation (top), close up of flowering plant (left), close up of flower (above)

Tarweed, virgate

Holocarpha virgata

Sunflower Family (Asteraceae)

CDFA: not rated
Cal-IPC: not rated

Description

Virgate tarweed is a 3-4 feet tall, very aromatic native annual covered with a sticky resin. Plants germinate in fall and winter, and overwinter as rosettes until flower stems develop in spring. Flowering persists into late summer, much later than many other annuals. Stem leaves are tipped with a very distinctive resin gland. Main stems are branched well above the base giving the plant a wispy appearance. Flowers are yellow 1/4 inch long and have black anthers. Mature plants are unpalatable to livestock and can increase to an undesirable density following late spring rainfall after annual grasses have matured.

Reproduction

Reproduces only by seed. Seed viability is expected to be a couple of years in the soil.

Origin and Habitat Description

Native to California. Found on roadsides, rangeland, wildlands, pastures and waste areas.

Control

- In many areas, tarweeds are not considered a problem and may be a desirable component of the ecosystem. In areas with livestock dense populations may warrant control.
- Tillage, hoeing and hand pulling are effective as long as they are done before flowering to prevent seed production. Any treatment that severs the root below the soil surface is very effective.
- Intensive grazing can be effective early in the season when plants are succulent.
- Burning is not considered an effective tool.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor and aminopyralid provide selective control without injuring many grasses. Chlorsulfuron provides pre and post emergent control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Tocalote (malta thistle)

Centaurea melitensis

Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Flower buds and flower heads

Tocalote (left) compared to yellow starthistle (right)

Ron Vanderhoff,

Tocalote rosette

44

Tocalote (malta thistle)

Centaurea melitensis

Sunflower Family (Asteraceae)

Yellow starthistle

Centaurea solstitialis

Sunflower Family (Asteraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Mature flowering plant

Cindy Roche, Bugwood.org

Seedling (top left) and rosette (left)

Flower head showing sharp spines at base of flower

46

Yellow starthistle

Centaurea solstitialis

Sunflower Family (Asteraceae)

CDFA: C
Cal-IPC: High

Description

A long-lived winter annual that matures in late summer. Grows to heights varying from 6 inches to 5 feet. Stems of mature plants are rigid, spreading and typically branch from the base in open areas. Stems and leaves are blue-green, covered with loose, cottony wool that gives them a whitish appearance. Produces a deep taproot and has bright, thistle-like yellow flowers with sharp spines surrounding the base. *Centaurea* species are poisonous to horses.

Reproduction

Reproduces only by seed. Most seeds germinate within a year, but some can remain viable in the soil for more than 3 years. Seeds germinate from fall through spring.

Origin and Habitat Description

Native to Europe and Asia. Introduced to California around 1850 as a seed contaminant. Now common on roadsides, rangeland, wildlands, pastures, waste areas and disturbed sites.

Control

- Tillage, hoeing and hand pulling are effective as long as they are done before flowering to prevent seed production. Any treatment that severs the root below the soil surface is very effective.
- Intensive grazing can be effective using some species of livestock. Timing is critical and should occur during bolting to early flowering.
- Mowing is most effective when plants are just beginning to flower.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor, aminopyralid, clopyralid, dicamba and triclopyr provide selective control without injuring many grasses. The non selective herbicides glyphosate and imazapyr are effective. Chlorsulfuron provides pre and post emergent control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Bermudagrass
Cynodon dactylon
Grass Family (Poaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Bermudagrass
Cynodon dactylon
Grass Family (Poaceae)

CDFA: C
Cal-IPC: Moderate

Description
Bermudagrass is a warm-climate perennial with an extensive system of creeping above ground and below ground stems. Commonly grown as a turf or forage in tropical or warm regions. Because of its vigorous growth, it can often be invasive. Although the plant typically grows along the ground, it can grow to 1.5 feet tall. Stems are slender, tough and scaly, producing roots at the nodes. Leaf blades are flat and less than 2.5 inches long. Usually there are long hairs around the collar region. Flower is umbrella-like with 4-8 spike-like branches 1.5-3 inches long.

Reproduction
Reproduces by seeds, creeping underground stems (rhizomes), and aboveground stems (stolons). Small fragments can readily generate new plants. Seeds can remain viable for 3-4 years in the soil.

Origin and Habitat Description
Native to Africa. Can be a useful forage but can escape and become invasive. Found in disturbed sites, gardens, agronomic crops, orchards, turf, pastures and areas with adequate soil moisture.

Control
- Persistent hand pulling can be effective on small patches if done frequently and if the entire root system is removed.
- Repeated cultivation and mowing can expose rhizomes to sun-drying or freezing temperatures when there is no soil moisture.
- Grazing and burning are not effective.
- The post emergent grass herbicides clethodim, fluazifop-P-butyl, and sethoxydim can be effective if applied to actively growing plants that are not stressed. These herbicides will injure desirable grasses. The non selective herbicides glyphosate and imazapyr can be effective but may require multiple applications.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Blue wild-rye

Elymus glaucus

Grass Family (Poaceae)

Jean Pawek, CalPhotos

Blue wild-rye (above), close up of flower head (right), close up of seed head (below)

Jean Pawek, CalPhotos

Laura Ann Eliassen, CalPhotos

50

Blue wild-rye

Elymus glaucus

Grass Family (Poaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description

Blue wild-rye is a large, slender, perennial bunchgrass native to California. Leaves grow to 2 feet tall and flower stalks often reach 3-5 feet in length. Roots are fibrous, grow very quickly and become deep and widespread. Sometimes plants will have short underground stems (rhizomes). Leaves are narrow, green to blue-green in color and can be hairless to hairy with an inconspicuous ligule (1 mm) and auricles (2 mm). Flower is a dense spike, 2-8 inches long. In rangeland, blue wild-rye is considered a desirable forage and is sometimes planted as pasture grass or in restoration projects.

Reproduction

Reproduces only by seed. Most seeds germinate with fall rains. Seed viability in the soil is 2-5 years.

Origin and Habitat Description

Native to California and western states. Found in grasslands, woodlands, pastures, meadows, forests and disturbed sites.

Control

- Control is often not warranted as blue wild-rye is native and a desirable forage.
- Tillage, hoeing and hand pulling small populations is effective as long as they are done before flowering to prevent seed production.
- Repeated mowing and heavy grazing can reduce seed set and occasionally kill plants.
- Burning is not effective as crowns often resprout.
- The grass selective herbicides clethodim, fluazifop-P-butyl and sethoxydim are effective but will damage most grasses. The non selective herbicides glyphosate and imazapyr are effective but may injure other desirable forages.

More Information

- Distribution

Bulbous bluegrass
Poa bulbosa
Grass Family (Poaceae)

Bulbous bluegrass
Poa bulbosa
Grass Family (Poaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description
A densely tufted cool-season perennial from 6-12 inches tall. The lower stems are flattened, while the upper stems are wiry and round. Stems are thickened and bulb-like at the base which is a good distinguishing characteristic from other grasses. Leaves are narrow (1-3 mm wide) and long (2-6 inches). The leaf blades are flat or loosely rolled in the stem and have a membranous ligule with no auricles. The leaves are keeled at the tip (similar to the front of a boat), which is a good characteristic for most *Poa* species. Flowers are produced in clusters on a loose branching stem, 2-5 inches long. Flowers develop into leafy bulblets with a dark purple-colored base. The plant senesces soon after bulblets mature.

Reproduction
In the United States, plants reproduce asexually by the formation of bulblets. Bulblets germinate immediately and likely do not survive long in the soil. In Europe, plants also reproduce sexually and produce seed.

Origin and Habitat Description
Native to Europe, Asia and North Africa. Commonly found in pastures, hay fields, rangelands, roadsides, abandoned sites, disturbed sites and urban sites. Tolerates wide range of conditions, but best adapted to shallow soils where it only receives moisture in the winter and spring.

Control
- Hand pulling can be effective if done frequently and if all the bulbs are removed.
- Intensive grazing or early season cultivation is effective.
- The post emergent grass herbicide clethodim is effective if applied to young plants. The non selective herbicides glyphosate and imazapyr are also effective. Rimsulfuron, sulfometuron and chlorsulfuron mixed with sulfometuron provide control as a post and/or pre emergent herbicide.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

California brome

Bromus carinatus

Grass Family (Poaceae)

Unless otherwise stated, photos by J.M. DiTomaso

California brome flowering (right), close up of flower cluster (lower right), close up of seed head (above), hairy leaf sheath (below)

Keir Morse, CalPhotos

Tokarska-Guzik, University of Silesia, Bugwood.org

54

California brome

Bromus carinatus
Grass Family (Poaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description
California brome is a native, cool-season perennial bunchgrass that lives 3-5 years and grows to be 2-4 feet tall. Roots are fibrous, grow very quickly and become deep and widespread. Young plants are erect, but older stems grow along the ground with only the tips erect. Stems are robust with hairy sheaths. Leaves are narrow, up to 1 foot in length.

Cheat grass

Bromus tectorum
Grass Family (Poaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Leslie J. Mehrhoff, Univ. of Connecticut, Boxwood.org

Cheat grass infestation (above), close up of flower head (left), close up of dry flower head (below)

Leslie J. Mehrhoff, Univ. of Connecticut, Boxwood.org

Cheat grass

Bromus tectorum

Grass Family (Poaceae)

CDFA: Not rated
Cal-IPC: High

Description

Erect, winter annual that grows to 1.5 feet tall. Leaves are typically covered with short, soft hairs but can sometimes be hairless. Flowers occur in loose, nodding panicles 2-9 inches long. The awns are long, stiff and have course bristles. Flowering occurs in early spring and can often be identified as they mature and turn reddish-brown. The long awns cause mechanical injury to livestock by getting logged in the eyes, nose and mouth. Cheat grass can increasing fire frequency.

Reproduction

Reproduces only by seed. Most seeds germinate with first fall rains. Seeds can persist for 2-3 years with some seeds lasting 5 years.

Origin and Habitat Description

Native to Europe and Asia. Found in grasslands, woodlands, pastures, crop fields, orchards, vineyards, gardens, roadsides and disturbed sites.

Control

- Tillage, hoeing and hand pulling small infestations is effective as long as they are done before flowering to prevent seed production.
- Mowing is most effective during flowering, but before seeds reach the soft boot stage. Early mowing will result in vigorous resprouts.
- Burning after desirable forage has dropped seed can be effective, however it must be done before cheat grass seed heads shatter.
- The broadleaf selective herbicide aminopyralid has shown to reduce seed production in some brome species when applied prior to bloom. The grass selective herbicides clethodim and fluazifop-P-butyl are effective but will damage most grasses. The non selective herbicide glyphosate is effective before seed maturation. Pre emergent herbicides including rimsulfuron, sulfometuron and chlorsulfuron mixed with sulfometuron are also effective, but may injure desirable forage.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Dogtail grass

Cynosurus echinatus

Grass Family (Poaceae)

Jean Pawek, CalPhotos

Dogtail grass infestation in a pasture (top), close up of flower head (left), leaf showing sheath surrounding stem unevenly (right)

Gary McDonald, CalPhotos

Zoya Akulova, CalPhotos

Dogtail grass

Cynosurus echinatus

Grass Family (Poaceae)

Foxtail (barley)

Hordeum sp.

Grass Family (Poaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Steve Dewey, Utah State University, Bugwood.org

D. Walters and C. Southwick, Table Grape Weed Disseminule ID, USDA APHIS PPQ, Bugwood.org

Foxtail barley (H. jubatum) infestation in a pasture (top), close up of smooth barley (H. murinum ssp. glaucum) flower head (left), close up of Mediterranean barley (H. marinum ssp. gussoneanum) seed head (above)

60

Foxtail (barley)

Hordeum sp.

Grass Family (Poaceae)

CDFA: Not rated
Cal-IPC: Moderate

Description

Foxtail or barley is the common name given to a number of closely related *Hordeum* species. Some of the most common include Mediterranean barley (*H. marinum ssp. gussoneanum*), foxtail barley (*H. jubatum*), and smooth barley (*H. murinum ssp. glaucum*). Foxtails are winter annuals that grow 1-3 feet tall. The leaves are flat, narrow and typically hairy. Stems are round in cross-section, grow erect to somewhat spreading and often bend abruptly at the base. Flowers are produced in a bristly thick spike, 1-3 inches long. The flower spike breaks apart at maturity which is a good way to distinguish foxtail from medusa head and goatgrass, whose flower heads stay in tact. The long awns cause mechanical injury to livestock by getting logged in the eyes, nose and mouth.

Reproduction

Reproduces only by seed. Most seeds germinate with first fall rains. Seeds can persist in the soil for 2-3 years.

Origin and Habitat Description

Native to Europe. Found in grasslands, woodlands, pastures, crop fields, orchards, vineyards, gardens, roadsides and disturbed sites.

Control

- Tillage, hoeing and hand pulling small infestations is effective as long as they are done before flowering to prevent seed production.
- Mowing is most effective during flowering, but before seeds reach the soft boot stage. Early mowing will result in vigorous resprouts.
- Burning can be effective, however it must be done before seed heads shatter. Burning will not kill seeds on the soil surface.
- Clethodim and fluazifop-P-butyl are effective but will damage most grasses. The non selective herbicide glyphosate is effective. Pre emergent herbicides rimsulfuron, sulfometuron and chlorsulfuron mixed with sulfometuron are effective, but may injure desirables.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Giant reed
Arundo donax
Grass Family (Poaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Giant reed
Arundo donax
Grass Family (Poaceae)

CDFA: B
Cal-IPC: High

Description
Large, bamboo-like perennial with underground horizontal stems that can reach heights to 25 feet tall. An extremely fast grower that can increase more than 3 inches per day under optimum conditions. Once established tends to form large, continuous root masses, sometimes covering several acres. First year canes are unbranched and pliable. Older canes are branched, semi-woody, and often only have leaves on branches. Leaves are up 1-3 inches wide and up to 3 ft long. Flower consists of large terminal plume, 1-2 feet long, and silvery cream to purple-brown.

Reproduction
Does not appear to produce viable seed in North America. Spread is entirely vegetative. Underground stems form a dense network and root or stem fragments can start new infestations.

Origin and Habitat Description
Native to Mediterranean and tropical Asia. Grows along lakes, streams, riparian areas, drainages, urban sites and occasionally along roadsides. Grows best in well-drained moist soils.

Control
- Minor infestations can be eradicated by manual methods. Hand removal of small plants arising from a new stem can be effective.
- Chopping, cutting or mowing can be used to reduce biomass although the fibrous nature of the plant can make this difficult. Resprouting after these treatments can be vigorous.
- Grazing by goats, sheep and cattle can reduce populations.
- Herbicides have been effective in controlling giant reed. Because the plant is often located near or in water, care must be taken as to the type of herbicide applied and the timing of application. The non selective herbicides glyphosate and imazapyr are effective.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Goat grass, barbed and jointed

Aegilops triuncialis, Aegilops cylindrica
Grass Family (Poaceae)

Scott Oneto, UC Regents

Barbed goat grass infestation in a pasture (above), jointed goat grass (left), barbed goat grass (center), barbed goat grass seedling (right)

USDA APHIS PPQ - Oxford, North Carolina, Bugwood.org

Neal Kramer, CalPhotos

John M. Randall, The Nature Conservancy, Bugwood.org

64

Goat grass, barbed and jointed

Aegilops triuncialis, Aegilops cylindrica

Grass Family (Poaceae)

CDFA: B
Cal-IPC: High

Description

Both are late maturing winter annual grasses growing to 20 inches tall. Goat grass matures much later than most desirable annual grasses making it easy to identify in summer. Both can resemble wheat, however unlike wheat, mature flower heads fall to the ground in whole sections. When mature, plants turn reddish-purple and then dry to a straw color. Plants are high in silica content which results in thatch buildup making them highly unpalatable for livestock.

Reproduction

Reproduces only by seed. Seeds germinate with fall rains while often still attached to the seed head making it easy to identify seedlings. Barbed goat grass seeds can remain viable for 2 years while jointed goat grass can remain viable for 3-5 years.

Origin and Habitat Description

Native to Mediterranean, Europe and western Asia. Found in woodlands, pastures, chaparral, fields, roadsides and disturbed sites.

Control

- Tillage, hoeing and hand pulling small infestations is effective as long as they are done before flowering to prevent seed production.
- Mowing is most effective during flowering, but before seeds reach the soft boot stage. Early mowing will result in vigorous resprouts.
- Burning after desirable forage has dropped seed can be effective, however it must be done before goat grass seed heads disarticulate and drop to the ground. Burning will not kill seeds on the soil. Germination may increase after a fire, so follow up control is essential.
- The non selective herbicide glyphosate is effective before seed maturation. Pre emergent herbicides including sulfometuron and chlorsulfuron mixed with sulfometuron are effective, but may injure desirable forage.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Harding grass
Phalaris aquatica
Grass Family (Poaceae)

Harding grass
Phalaris aquatica
Grass Family (Poaceae)

CDFA: Not rated
Cal-IPC: Moderate

Description
Harding grass is a coarse, tufted perennial grass growing to 5 feet tall, with dense, spike-like flower heads. Stem has pinkish juice when broken at the base. Leaves have delicate membranous ligules and no auricles. The plant forms deep fibrous roots. Clumps expand by short underground stems (rhizomes), and under suitable conditions, rhizome fragments can develop into a new plant. Flowers from late spring to end of summer. Spikes are 0.5-1 inch in diameter and up to 4.5 inches long. Spikes remain intact after senescence which helps aid in identification. Drought stressed plants may develop toxic levels of alkaloids.

Reproduction
Reproduces primarily by seed with limited expansion from creeping rhizomes. Seed viability is short, generally less than 2 years.

Origin and Habitat Description
Native to the Mediterranean. Was introduced to extend the forage season on pastures. It can become weedy and displace other desirable vegetation and natives. Tall stands can present a fire risk in summer. Generally found in riparian areas, ditch banks, fields, pastures and roadsides.

Control
- Hand pulling can be effective if done frequently and if the entire root system is removed.
- Mowing late in the season before flowering can reduce vigor.
- Intensive grazing can be used to suppress growth.
- Burning early can suppress growth and reduce seed set.
- The post emergent grass herbicides clethodim and fluazifop-P-butyl can be effective if applied to actively growing plants that are not stressed. These herbicides will injure desirable grasses. The non selective herbicides glyphosate and imazapyr can be effective but may require multiple applications.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Johnson grass

Sorghum halepense

Grass Family (Poaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Mature flowering Johnson grass plant

Close up of flower head (above), close up of leaf collar and sheath (left)

68

Johnson grass
Sorghum halepense
Grass Family (Poaceae)

CDFA: C
Cal-IPC: Not rated

Description
Massive perennial grass to 6 feet tall. Erect stems are generally solid with prominent swollen nodes. Underground stems (rhizomes) are white, long and scaly with purple or red areas, 1/2 inch in diameter and up to several feet in length. Seedlings resemble corn plants, but can be distinguished by carefully examining the seed. Flower heads are pyramid

Medusa head
Elymus caput-medusae
Grass Family (Poaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Medusa head infestation in a pasture at early flowering stage

Medusa head infestation showing light straw color at maturity

Scott Oneto, UC Regents

Close up of flower head

Medusa head

Elymus caput-medusae

Grass Family (Poaceae)

CDFA: C
Cal-IPC: High

Description

An aggressive winter annual grass from 1/2 to 2 feet tall. Matures 2 to 4 weeks later in the season than most other annual grasses which can aid in identification. Plant has slender stems and fibrous roots. The flowers have long, twisted awns 1-3 inches long. Plants are high in silica which results in thatch buildup making them unpalatable for livestock.

Reproduction

Reproduces only by seed. Most seeds germinate with first fall rains, but some seeds remain dormant and germinate in winter or spring. Seeds can germinate in deep thatch. Seed viability in the soil is 2 years.

Origin and Habitat Description

Native to the Mediterranean region. Extremely competitive, invading millions of acres of semi-arid rangeland. Most commonly found in pastures, roadsides, crop fields, disturbed areas and waste areas.

Control

- Tillage, hoeing and hand pulling small infestations is effective as long as they are done before flowering to prevent seed production.
- Mowing is most effective during flowering, but before seeds reach the soft boot stage. Early mowing will result in vigorous resprouts.
- Burning after desirable forage has dropped seed can be effective, however it must be done before medusa head seed heads drop to the ground. Burning will not kill seeds on the soil surface.
- The broadleaf selective herbicide aminopyralid has shown to be effective both as a pre emergent fall treatment and as a late season post emergent application just before flowering. The non selective herbicide glyphosate is also effective before seed maturation. The pre emergent herbicides rimsulfuron, sulfometuron and chlorsulfuron mixed with sulfometuron are also effective, but may injure desirable forage.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Oats, wild and slender

Avena fatua and Avena barbata

Grass Family (Poaceae)

Zoya Akulova, CalPhotos

Slender oats flowering

Robert F Norris, CalPhotos

Neal Kramer, CalPhotos

Close up of flower/ seed head (left) and leaf sheath (above) showing large ligule

72

Oats, wild and slender

Avena fatua and Avena barbata

Grass Family (Poaceae)

Pampas grass and Jubata grass

Cortaderia selloana and Cortaderia jubata

Grass Family (Poaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Jubata grass infestation

Neal Kramer, CalPhotos

Pampas grass female plant showing large white tufted flower heads

The Nature Conservancy, Bugwood.org

Pampas grass flower head, female (left) and male (right)

74

Pampas grass and Jubata grass

Cortaderia selloana and Cortaderia jubata

Grass Family (Poaceae)

CDFA: *C. jubata* - B
Cal-IPC: High

Description

Large, perennial grass 6-13 feet tall, rising from a tufted base. Long leaves are folded at midrib and have tiny serrated edges that can cut flesh. Flowers are produced in a plume (1-3 feet long) at the top of a stiff stem. Pampas grass is generally larger and more robust than jubata grass.

Reproduction

Reproduction is by seed, division of crown or plant fragments. Despite the similarity in appearance, all jubata grass plants are female and develop seed without fertilization (apomixis). In pampas grass, there are male and female plants. Reproduction from seed is rare because historically the horticultural trade has selectively sold the showier white flower female plants. Recently, more male plants are being sold and propagation by seed may become a problem in the future.

Origin and Habitat Description

Native to Argentina, Brazil, and Uruguay. Grows in relatively damp soils along river margins. Found along roadsides, logged forests, ditch banks, urban landscapes and disturbed sites.

Control

- Tillage, hoeing and hand pulling are effective on seedlings. Larger plants require a more concerted effort with a tool such as a Pulaski or shovel.
- Burning of clumps is not effective as plants will re-sprout.
- Grazing is not typically considered an effective control strategy.
- The non selective herbicides glyphosate and imazapyr are effective.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Purple needle grass
Stipa pulchra
Grass Family (Poaceae)

Purple needle grass
Stipa pulchra
Grass Family (Poaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description
Purple needle grass is a large, slender, perennial bunchgrass native to California growing to 3 feet tall. Roots are fibrous and become deep and widespread. Sometimes plants will have short underground stems (rhizomes). Leaves are green, narrow, up to half-inch wide and 4-8 inches long. Flowers are produced on branched stalks up to 2 feet long and nodding. The flower head is purple-pointed when young and has an awn up to 4 inches long and bent twice. In rangeland, purple needle grass is considered a desirable forage and is sometimes planted as pasture grass or in restoration projects. In 2004, it became the state grass.

Reproduction
Reproduces only by seed. Most seeds germinate with fall rains. Seed viability in the soil is 2-5 years.

Origin and Habitat Description
Native to California and western states. Found in grasslands, woodlands, pastures, meadows, forests and disturbed sites.

Control
- Control is often not warranted as purple needle grass is native and a desirable forage.
- Tillage, hoeing and hand pulling small populations is effective as long as they are done before flowering to prevent seed production.
- Repeated mowing and heavy grazing can reduce seed set and occasionally kill plants.
- Burning is not effective as crowns often resprout.
- The grass selective herbicides clethodim, fluazifop-P-butyl and sethoxydim are effective but will damage most grasses. The non selective herbicides glyphosate and imazapyr are effective but may injure other desirable forages.

More Information
- Distribution

Rabbitfoot grass

Polypogon monspeliensis

Grass Family (Poaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Steve Matson, CalPhotos

Rabbitfoot grass infestation in a pasture (above), close up of dried flower heads (below), close up of flower head (right)

78

Rabbitfoot grass

Polypogon monspeliensis

Grass Family (Poaceae)

CDFA: Not rated
Cal-IPC: Limited

Description

Rabbitfoot grass is a winter or sometimes summer annual that grows to 3 feet tall. Leaves are narrow (1/4 inch wide) and long (up to 8 inches). Leaf sheath is open and loosely encloses the stem. Veins on leaves can be minutely prickly when viewed with hand lens. Flower head is a dense, plume-like head up to 6 inches tall. Awns on the flower head are white which gives the spike its visual texture. Rabbitfoot grass is palatable to livestock and can occasionally be considered a weed as it can form dense stands and displace natives or other desirable vegetation.

Reproduction

Reproduces only by seed. Most seeds germinate with first fall rains.

Origin and Habitat Description

Native to Europe. Found in grasslands, woodlands, pastures, crop fields, orchards, vineyards, gardens, roadsides and disturbed sites.

Control

- Control is often not warranted as rabbitfoot grass is considered a desirable forage.
- Tillage, hoeing and hand pulling small infestations is effective as long as they are done before flowering to prevent seed production.
- Mowing is most effective during flowering, but before seeds reach the soft boot stage.
- Burning after desirable forage has dropped seed can be effective, however it must be done before rabbitfoot seed heads mature. Burning will not kill seeds on the soil surface.
- The grass selective herbicides sethoxydim and fluazifop-P-butyl are effective but will damage most grasses. The non selective herbicide glyphosate is effective before seed maturation. The pre emergent herbicide sulfometuron is also effective, but may injure desirables.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Ripgut brome
Bromus diandrus

Ripgut brome
Bromus diandrus
Grass Family (Poaceae)

CDFA: Not rated
Cal-IPC: Moderate

Description
Ripgut brome is an erect, winter annual that grows to 2.5 feet tall. Leaves are typically covered with short, soft hairs. The flowers occur in loose, nodding panicles 2 to 10 inches long. The awns are long, stiff and have course bristles which give rise to the common name. Flowering occurs in early spring and can often be identified as they mature and turn reddish-brown. The long awns cause mechanical injury to livestock by getting logged in the eyes, nose and mouth.

Reproduction
Reproduces only by seed. Most seeds germinate with first fall rains. Seeds can persist for 2-3 years with some seeds lasting 5 years.

Origin and Habitat Description
Native to Europe and Asia. Found in grasslands, woodlands, pastures, crop fields, orchards, vineyards, gardens, roadsides and disturbed sites.

Control
- Tillage, hoeing and hand pulling small infestations is effective as long as they are done before flowering to prevent seed production.
- Mowing is most effective during flowering, but before seeds reach the soft boot stage. Early mowing will result in vigorous resprouts.
- Burning after desirable forage has dropped seed can be effective, however it must be done before ripgut seed heads shatter. Burning will not kill seeds on the soil surface.
- The broadleaf selective herbicide aminopyralid has shown to reduce seed production in some brome species when applied before flowering. The grass selective herbicides clethodim and fluazifop-P-butyl are effective but will damage most grasses. The non selective herbicide glyphosate is effective before seed maturation. Pre emergent herbicides rimsulfuron, sulfometuron and chlorsulfuron mixed with sulfometuron are effective, but may injure desirables.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Rush

Juncus spp.

Rush Family (Juncaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Spreading rush (J. patens) (top), close up of round stems (left), rush flower head (above)

Margo Bors, CalPhotos

Rush

Juncus spp.
Rush Family (Juncaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description
Rushes can be both annuals and perennials but most are perennials. The two most common species that can sometimes be weedy are spreading rush (*J. patens*) and soft rush (*J. effuses*). Both are clump forming erect perennials with pale-green stems, 2-5 feet tall. Stems are round which

Ryegrass

Festuca perennis
Grass Family (Poaceae)

Zoya Akulova, CalPhotos

Zoya Akulova, CalPhotos

Barry Rice, CalPhotos

Ryegrass flowering in a pasture (above), close up of leaf sheath showing auricles clasping the stem (far left), close up of flower head (middle)

Ryegrass

Festuca perennis

Grass Family (Poaceae)

CDFA: Not rated
Cal-IPC: Moderate

Description

Ryegrass or commonly called Italian ryegrass, annual ryegrass or perennial ryegrass can be an annual, biennial, or short-lived perennial that grows to 3 feet tall. Leaves are hairless and glossy green. Stems are round and hollow with swollen nodes. The leaf sheath is generally open with appendages (auricles) at the base of the leaf that clasps the stem. Flowers consist of a spike-like panicle up to 12 inches long. In rangeland, ryegrass is considered a desirable forage and is often a prominent seed in many annual rangeland forage mixes. Occasionally, ryegrass can be infected with fungi that can cause issues with livestock, including staggers, intoxication and/or photosensitization.

Reproduction

Reproduces only by seed. Most seeds germinate with first fall rains. Seeds can persist in the soil for many years.

Origin and Habitat Description

Native to Europe. Found in grasslands, woodlands, pastures, crop fields, orchards, vineyards, gardens, roadsides and disturbed sites.

Control

- Control is often not warranted as ryegrass is considered a desirable forage and is often cultivated.
- Tillage, hoeing and hand pulling small infestations is effective as long as they are done before flowering to prevent seed production.
- Mowing is generally not effective.
- Plants are highly palatable and can tolerate heavy grazing.
- The grass selective herbicides clethodim, fluazifop-P-butyl and sethoxydim are effective but will damage most grasses. The non selective herbicides glyphosate and imazapyr are effective. Pre emergent herbicides rimsulfuron and sulfometuron are effective, but may injure desirables.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Soft chess (blando brome)

Bromus hordeaceus

Grass Family (Poaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Gary McDonald, CalPhotos

Gary McDonald, CalPhotos

Soft chess flowering (above), close up of flower (upper right), leaf sheath (right)

Soft chess (blando brome)
Bromus hordeaceus

Blackberry, Himalayan
Rubus armeniacus
Rose family (Rosaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Blackberry infestation

Himalayan blackberry flowers and foliage

Himalayan blackberry fruit and whitish color on backside of leaf

88

Blackberry, Himalayan

Rubus armeniacus

Rose family (Rosaceae)

CDFA: Not rated
Cal-IPC: High

Description

Sprawling perennial vine, may expand 10 feet or more a year, smothering other plants as it grows. Leaves are in groups of 3 to 5 leaflets (usually 5) with the underside much lighter in color than the top. Flowers are white or rose-colored about 1 inch across, with 5 broad petals. The roundish fruit is black and shiny, and almost an inch long. Canes are 5-angled and bear straight or curved prickles, 1/3 inch long, which draw blood easily. Plant arches to 10 feet in height before bending over and traveling outward toward a new place to put down roots.

Reproduction

A single large plant produces several thousand seeds. Seedlings grow slowly and require full sun to thrive. Berries and seeds are produced on two-year-old canes after which the cane dies. Can reproduce asexually by rooting at the tip of the first year canes. These 'daughter' plants are responsible for the longevity of blackberry thickets.

Origin and Habitat Description

Native to Armenia. First introduced to North America in 1885 as a cultivated crop. Found in disturbed sites, roadsides, open fields, ditch banks, vineyards, orchards, urban landscapes and riparian areas.

Control

- Hand pulling is effective on seedlings and small infestations. Larger plants require a more concerted effort with a tool such as a Pulaski or shovel. For larger plants it is important to also remove the root crowns to prevent resprouting. Repeated cultivation is effective.
- Burning is only effective if root sprouts are controlled.
- Grazing with goats can be effective.
- The broadleaf herbicides dicamba, fluroxypyr, triclopyr and triclopyr mixed with aminopyralid provide control. The non selective herbicides glyphosate and imazapyr also provide control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Buckbrush (wedgeleaf ceanothus)
Ceanothus cuneatus
Buckthorn Family (Rhamnaceae)

Flowering shrub

Buckbrush (wedgeleaf ceanothus)
Ceanothus cuneatus
Buckthorn Family (Rhamnaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description
A rounded to sprawling shrub reaching 9 feet tall. Stems are generally brown to gray-brown. The evergreen leaves are stiff, tough and fleshy, often toothed along the edges and wedge-shaped. Flowers are small, mostly white and produced in clusters. The plant may be variable in appearance and flower color due to its ability to hybridize. Can form impenetrable thickets making it difficult for livestock movement or retard understory growth of desirable vegetation. Shrubs are palatable to deer, sheep and goats but less by cattle.

Reproduction
Reproduces by seeds and stump sprouting. Seeds can persist in the soil for years since fire is required for germination.

Origin and Habitat Description
Native to California. One of the dominant shrub species in chaparral communities. Sometimes found in pure stands, it is more often associated with other shrubs or as an understory in pine and oak woodlands.

Control
- Control is often not warranted as populations are often patchy and serve as food source for many wildlife species.
- Hand pulling is effective on seedlings and small plants. Larger plants may require a tool such as a shovel, pick or Brush Grubber. Mastication is effective at reducing above ground biomass.
- Lopping when plants are stressed can provide some control.
- Burning alone is not effective as this will stimulate germination.
- Intensive grazing with goats or sheep can be effective.
- The broadleaf herbicides triclopyr, triclopyr mixed with aminopyralid and triclopyr mixed with 2,4-D provide control. The non selective herbicides glyphosate and imazapyr also provide control.

More Information
- Distribution

Chamise (greasewood)

Adenostoma fasciculatum

Rose Family (Rosaceae)

Neal Kramer, CalPhotos

Flowering shrub (above), close up of leaves (left), flowers (below)

James Stoughton, CalPhotos

Gary Monroe, CalPhotos

92

Chamise (greasewood)

Adenostoma fasciculatum

Rose Family (Rosaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description

An evergreen shrub growing to 12 feet tall, with dry stick-like branches. The leaves are small and needle-like, 4-10 mm long and 1 mm wide, with a pointed tip. Leaves are shiny with flammable oils especially in warmer weather. The braches terminate in bunches of small white tubular flowers. Can form monotypic stands making it difficult for livestock movement or retard understory growth of desirable vegetation. Chamise is largely unpalatable to most livestock and wildlife, however new tender growth in the spring or immediately after burning does enhance palatability.

Reproduction

Reproduces by seeds and stump sprouting. Seeds can persist in the soil for years since fire is required for germination.

Origin and Habitat Description

Native to California. One of the dominant shrub species in chaparral, woodland and forest communities.

Control

- Dense stands may warrant control to create islands to allow livestock and wildlife movement across the landscape.
- Hand pulling is effective on seedlings and small plants. Larger plants may require a tool such as a shovel, pick or Brush Grubber. Mastication is effective at reducing above ground biomass.
- Lopping when plants are stressed can provide some control.
- Burning alone is not effective as this will stimulate germination.
- Intensive grazing with goats or sheep can be effective.
- The broadleaf herbicides triclopyr, triclopyr mixed with aminopyralid and triclopyr mixed with 2,4-D provide control. The non selective herbicides glyphosate and imazapyr also provide control.

More Information

- Distribution

Deer brush
Ceanothus integerrimus

Deer brush
Ceanothus integerrimus
Buckthorn Family (Rhamnaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description
A drought tolerant shrub that exhibits a variety of growth forms. In most locations, it is a deciduous shrub growing 3-12 feet tall, with open ascending to erect braches. In other locations it is evergreen or semi-deciduous and grows close to the ground. Stems are round, yellow to pale green with either small soft to straight stiff hairs. Leaves are glossy green, 1-3 inches long and 0.5-2" wide. Leaves have 3 parallel veins, a common characteristic amongst *Ceanothus* species. Flowers are white or blue and rarely pink and produced in clusters. Shrubs are palatable to deer and livestock. Seeds provide valuable food source for many small mammals, birds and insects.

Reproduction
Reproduces by seeds and sprouting from the root crown and stems. Seeds can persist in the soil for years since fire or mechanical disturbance is required for germination.

Origin and Habitat Description
Native to California. Grows in the understories of conifer and oak communities and in scattered patches within timberlands and woodlands.

Control
- Control is often not warranted as deer brush is highly palatable.
- Hand pulling is effective on seedlings and small plants. Larger plants may require a tool such as a shovel, pick or Brush Grubber. Mastication is effective at reducing above ground biomass.
- Lopping when plants are stressed can provide some control.
- Burning alone is not effective as this will stimulate germination.
- Intensive grazing can be effective.
- The broadleaf herbicides triclopyr, triclopyr mixed with aminopyralid and triclopyr mixed with 2,4-D provide control. The non selective herbicides glyphosate and imazapyr also provide control.

More Information
- Distribution

French broom

Genista monspessulana

Pea Family (Fabaceae)

Unless otherwise stated, photos by J.M. DiTomaso

French broom infestation

Barry Rice, UC Regents

French broom flowers and seed pods

96

French broom

Genista monspessulana

Pea Family (Fabaceae)

CDFA: Not rated
Cal-IPC: High

Description

Woody shrubs which grow up to 10 feet tall. Branches are dark green with 3-part leaves. Abundant flowers are bright yellow, in clusters at branch tips. Seeds are produced in pods, dark brown when mature and

Manzanita

Arctostaphylos spp.

Heath Family (Ericaceae)

Photos by Jean Pawek, CalPhotos

Mature shrub (above), close up of red flakey bark (lower left), close up of flowers, berries and leaves (lower right)

Manzanita

Arctostaphylos spp.

Heath Family (Ericaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description

There are over 60 species in California. The most abundant in the region include; common manzanita (*A. manzanita*), whiteleaf (*A. viscida*) and greenleaf (*A. patula*). Most are erect, evergreen shrubs that grow to 6-12 feet tall, however some may grow as a single-stemmed tree to 26 feet. The reddish bark is thin and smooth when young and peels in paper-thin flakes as it ages. Leaves are thick, 1-2 inches long and 0.5-1.5" wide. The urn-shaped flowers are white to pink and produce a berry-like fruit. Can form impenetrable thickets making it difficult for livestock movement or retard growth of desirable vegetation. Plants are considered unpalatable to deer and livestock. Berries and seeds provide valuable food source for many mammals, birds and insects.

Reproduction

Reproduces by seeds and stump sprouting. Seeds can persist in the soil for years since fire is required for germination.

Origin and Habitat Description

Native to California. One of the dominant shrub species in chaparral communities.

Control

- Control is often not warranted as populations are often patchy.
- Hand pulling is effective on seedlings and small plants. Larger plants may require a tool such as a shovel, pick or Brush Grubber. Mastication is effective at reducing above ground biomass.
- Lopping when plants are stressed can provide some control.
- Burning alone is not effective as this will stimulate germination.
- Grazing is not considered effective.
- The broadleaf herbicides triclopyr, triclopyr mixed with aminopyralid and triclopyr mixed with 2,4-D provide control. The non selective herbicides glyphosate and imazapyr also provide control.

More Information

- Distribution

Scarlet wisteria (rattlebox)

Sesbania punicea

Pea Family (Fabaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Scarlet wisteria growing along riverbank

Pea-shaped flowers

Close up of fruit pods

100

Scarlet wisteria (rattlebox)

Sesbania punicea

Scotch broom

Cytisus scoparius

Pea Family (Fabaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Scotch broom plant

Scotch broom flowers with 1-2 flowers from each leaf axil

Steve Matson, CalPhotos

Steve Matson, CalPhotos

Scotch broom pods showing hairs only on margins (above), close up of stem showing 5 angles (left)

Scotch broom

Cytisus scoparius

Pea Family (Fabaceae)

CDFA: C
Cal-IPC: High

Description

Woody shrubs which grow up to 10 feet tall. Branches are dark green with 3-part leaves. Abundant flowers are bright yellow, pea-shaped and occur singular or in pairs, not in clusters. Stems are 5-angled or star-shaped in cross-section. Seed pods are flattened, dark brown or black, contain 5-9 seeds and have hairs only along the margin.

Reproduction

Reproduces by seeds and stump sprouting. Plants typically attain reproductive maturity at 2-3 years of age; individual shrubs can survive for up to 15 years. Seeds have a hard, water-impermeable seed coat that delays germination for months or years and enables seeds to survive for 25 to 80 years in the soil.

Origin and Habitat Description

Scotch broom is native to central and southern Europe and the British Isles. Introduced as a nursery plant in California prior to 1870. Brooms grow best in seasonally dry, sandy nitrogen-poor soils in full sunlight. They colonize areas where the soil is distributed such as roadsides, logged areas, burned areas, gravel bars, river beds, ornamental landscapes and fence rows.

Control

- Hand pulling is effective on seedlings and small plants. Larger plants require a more concerted effort with a tool such as a shovel, pick or Brush Grubber.
- Lopping when plants are stressed can provide some control.
- Burning alone is not an effective method.
- Grazing with goats can be effective.
- The broadleaf herbicides triclopyr, triclopyr mixed with aminopyralid and triclopyr mixed with 2,4-D provide control. The non selective herbicides glyphosate and imazapyr also provide control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Spanish broom
Spartium junceum
Pea Family (Fabaceae)

Spanish broom
Spartium junceum
Pea Family (Fabaceae)

CDFA: C
Cal-IPC: High

Description
Woody shrubs up to 15 feet tall. Spanish broom can be distinguished from other brooms by its abundant, fragrant yellow flowers and rounded, bright green, mostly leafless stems. Leaves are small, 0.5 to 1 inch long, oval, smooth-margined, and one-parted (compared to 3-parted leaves of Scotch or French broom). Flowers occur in clusters at the end of branches. Seed pods are dark brown and covered with long, silky hairs.

Reproduction
Reproduces by seeds and stump sprouting. Plants typically attain reproductive maturity at 2-3 years of age; individual shrubs can survive for up to 15 years. Seeds have a hard, water-impermeable seed coat that delays germination for months or years and enables seeds to survive for 25 to 80 years in the soil.

Origin and Habitat Description
Native to Mediterranean region and Canary Islands. Introduced as a nursery plant in California prior to 1870. Brooms grow best in seasonally dry, sandy, nitrogen-poor soils in full sunlight. They colonize areas where the soil is distributed such as roadsides, logged areas, burned areas, gravel bars, river beds, ornamental landscapes and fence rows.

Control
- Hand pulling is effective on seedlings and small plants. Larger plants require a more concerted effort with a tool such as a shovel, pick or Brush Grubber.
- Lopping when plants are stressed can provide some control.
- Burning alone is not an effective method.
- Grazing with goats can be effective.
- The broadleaf herbicides triclopyr, triclopyr mixed with aminopyralid and triclopyr mixed with 2,4-D provide control. The non selective herbicides glyphosate and imazapyr also provide control.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Tamarisk (saltcedar)

Tamarix parviflora, Tamarix ramosissima

Tamarisk Family (Tamaricaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Tamarisk in flower along riparian area

Flowering branch

Flowers and foliage

Young plant with scale-like leaves

106

Tamarisk (saltcedar)

Tamarix parviflora, Tamarix ramosissima

Tamarisk Family (Tamaricaceae)

CDFA: B
Cal-IPC: High

Description
Small trees or shrubs up to 15-20 feet tall with tiny, scale-like leaves. Trunk short, sometimes twisted, with a dense canopy of slender twigs, often drooping. Leaves generally gray-green in color and resemble a juniper. Flowers are small, white to pale or dark pink.

Reproduction
Reproduces by seed and vegetatively from root sprouts, or stem fragments. Seeds disperse primarily with wind and water. Mature plants can produce 500,000 seeds per year. Stem fragments can take root when buried in a moist environment such as might occur with flooding.

Origin and Habitat Description
Native to Europe and eastern Asia. Favors river, lake and pond margins, ditches and roadsides. Mature plants survive heat, below-freezing temperatures, flooding, drought and burning. Plants develop a deep root system to access the water table. Roots extract salts from the soil and excrete it from the leaves which inhibits the growth and survival of desirable vegetation. Tamarix can increase flooding by narrowing channel width. Plants are flammable and can introduce fire into riparian areas.

Control
- Hand pulling is effective on seedlings and small plants. Heavy equipment can be used, however fragments can form new plants.
- Mowing or lopping can reduce biomass before an herbicide application. A single mowing is not effective.
- Burning alone is not an effective method.
- Intensive grazing with livestock can reduce biomass.
- Since the plant is often located near or in water, care must be taken as to the type of herbicide applied and the timing of application. The broadleaf herbicide triclopyr provides selective control. The non selective herbicides glyphosate and imazapyr provide control.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Toyon

Toyon

Heteromeles arbutifolia

Rose Family (Rosaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description

An evergreen shrub that grows 6-15 feet tall, with some plants in shaded areas reaching up to 30 feet. Leaves are alternate, leathery, sharply toothed, and 2 inches in length and 3/4 inch wide. In early summer, plants produce small white flowers 6mm in diameter in dense bunches. Fruit is small, bright red and berry-like, produced in large quantities, maturing in the fall and persisting well into the winter. Flowers are visited by butterflies and other insects, and have a mild, hawthorn-like scent. The berries are consumed by birds and some mammals. All plant parts contain cyanide and are poisonous to livestock. In areas where adequate desirable forage is available, livestock typically avoid toyon as it is unpalatable. However when food is scarce livestock will browse.

Reproduction

Reproduces by seeds and stump sprouting. Seeds can persist for years.

Origin and Habitat Description

Native to California. One of the dominant shrub species in chaparral, woodland and forest communities.

Control

- Dense stands may warrant control to create islands to allow livestock and wildlife movement across the landscape.
- Hand pulling is effective on seedlings and small plants. Larger plants may require a tool such as a shovel, pick or Brush Grubber. Mastication is effective at reducing above ground biomass.
- Lopping when plants are stressed can provide some control.
- Burning alone is not effective as this will stimulate germination.
- Grazing is not effective because the plant is toxic to livestock.
- The broadleaf herbicides triclopyr, triclopyr mixed with aminopyralid and triclopyr mixed with 2,4-D provide control. The non selective herbicides glyphosate and imazapyr also provide control.

More Information

- Distribution

Tree of Heaven

Ailanthus altissima

Quassia Family (Simaroubaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Tree-of-heaven plants growing in a pasture

Young plant

Male plant with flowers

110

Tree of Heaven

Ailanthus altissima

Quassia Family (Simaroubaceae)

CDFA: C
Cal-IPC: Moderate

Description

Fast growing deciduous tree with large leaves and a creeping root system. The leaves have an unpleasant odor, especially when crushed. Trees are erect, usually with a single trunk. New foliage typically reddish and

Tree tobacco

Nicotiana glauca

Nightshade Family (Solanaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Plants growing along a riverbank

Scott Oneto, UC Regents

Seedling

Close up of yellow tubular flower

Steve Matson, CalPhotos

Tree tobacco

Nicotiana glauca

Nightshade Family (Solanaceae)

CDFA: Not rated
Cal-IPC: Moderate

Description

Slender, erect, straggling shrub or tree growing 6 to 20 feet tall. Leaves are ovate, bluish-grey, 2-8 inches long with smooth margins. Produces sprays of nodding, tubular bright yellow flowers and is a prolific seed producer. All plant parts contain the alkaloid anabasine and are toxic to humans and livestock when ingested.

Reproduction

Reproduces only by seed. Seeds disperse with water, soil movement, and human activities. A single tree can produce 10,000 to 1,000,000 seeds per year.

Origin and Habitat Description

Native to South America. Found along roadsides, fields, disturbed areas, washes, riparian areas and waste places. Often grows on open, sandy or gravelly sites.

Control

- Hand pulling is effective on seedlings and small plants. Larger plants require a more concerted effort with a tool such as a shovel, pick or Brush Grubber. Established plants will often resprout.
- Lopping when plants are stressed can provide some control.
- Burning is not an effective method.
- Grazing is not effective because the plant is toxic to livestock.
- Since the plant can be located near or in water, care must be taken as to the type of herbicide applied and the timing of application. The broadleaf herbicide triclopyr provides control. The non selective herbicides glyphosate and imazapyr also provide control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Bindweed

Convolvulus arvensis

Morning glory Family (Convolvulaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Bindweed growing in a field

Jack K. Clark, UC Regents

Flowering bindweed flowers showing various color variations

Bindweed foliage

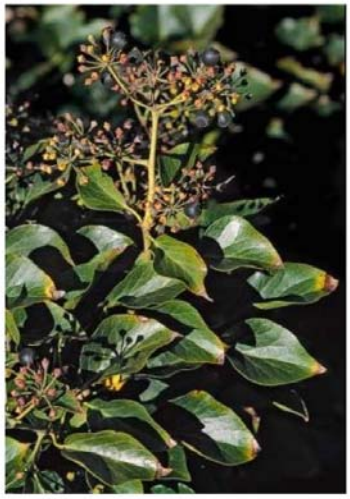
114

Bindweed

English ivy
Hedera helix
Ginseng Family (Araliaceae)

Unless otherwise stated, photos by J.M. DiTomaso

English ivy climbing on an oak tree



Fruiting stem with mature leaves that are not lobed

Juvenile leaves with 3-5 lobes

116

English ivy

Hedera helix

Ginseng Family (Araliaceae)

CDFA: Not rated
Cal-IPC: High

Description
A broadleaf, evergreen vine often used ornamentally as a groundcover. Climbs by means of aerial roots which grasps almost any vertical surface. Leaves of juvenile stems have 3-5 lobes while leaves of mature flowering stems have no lobes and are oval or diamond shaped. Small clusters of greenish flowers are produced in the Fall, which result in small black berries. All parts of this plant are poisonous when eaten, including the sap which can cause skin irritation on contact.

Reproduction
Reproduces by seed and vegetatively by trailing branches or stem fragments.

Origin and Habitat Description
Native to Europe and widely planted as an ornamental throughout milder regions worldwide. Found along riparian corridors, moist woodlands, forest margins, ornamental landscapes and disturbed sites.

Control

- Hand pulling is effective on seedlings and young plants. Not effective on established plants with extensive root systems.
- Cutting/mowing upper stems and leaves is not effective.
- Burning is not effective
- Grazing is not effective because the plant is toxic to livestock.
- The broadleaf herbicide triclopyr provides selective control. The non selective herbicides glyphosate and imazapyr also provide good control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Periwinkle
Vinca major
Dogbane family (Apocynaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Periwinkle
Vinca major
Dogbane family (Apocynaceae)

CDFA: Not rated
Cal-IPC: Moderate

Description
Herbaceous perennial with milky sap, trailing sterile stems to about 3 feet long, and ascending to erect flower-bearing stems to 1.5 feet tall that develop showy lavender-blue funnel-shaped flowers. Leaves are dark glossy green, 2-3 inches long, oval in shape and slightly pointed at the tip.

Reproduction
Considered sterile with only a few documented seedlings encountered. Reproduces vegetatively from trailing stems that root at the tips and stem fragments. Plants and stem fragments disperse with human activities, such as purposeful landscape planting and careless disposal of yard waste. Under favorable conditions, stem cuttings left on the ground can take root.

Origin and Habitat Description
Native to central Europe. Found primarily in riparian sites, old homesteads, moist woodlands and roadsides. Grows best under moist shady conditions. Tolerates deep shade and poor soil.

Control
- Hand pulling is effective if done repeatedly over many years and careful attention is paid to removal of all stems and root nodes.
- Cutting/mowing is not effective.
- Grazing is not effective as the stems contain milky latex that makes the plant unpalatable.
- Burning is not considered effective.
- The broadleaf herbicide triclopyr provides selective control. The non selective herbicides glyphosate and imazapyr also provide good control.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Poison oak

Toxicodendron diversilobum

Sumac Family (Anacardiaceae)

Poison oak climbing up the trunk of a tree

Charles E. Jones, CalPhotos

Poison oak leaves showing 3 prominent leaflets

Gary McDonald, CalPhotos

Close up of berries

Zoya Akulova, CalPhotos

120

Poison oak

Toxicodendron diversilobum

Sumac Family (Anacardiaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description

A native deciduous shrub or vine, with compound leaves that typically consist of three (sometimes five) leaflets. The saying "leaves of 3, let it be," is good advice to live by. Plants are often vine-like with stems to 75 feet long, and may climb trees or other supports. The bright green leaves are round to ovate, lobed or toothed and resemble oak leaves. Small white flowers occur in leaf axils followed by small berries. In fall the leaves turn brilliant shades of scarlet, red and orange. One of the most hazardous plants in the U.S. All plant parts except the pollen contain the compound urushiol. Direct contact with plant parts can cause contact dermatitis in sensitive individuals. Smoke from burning materials can cause severe respiratory irritation.

Reproduction

Reproduces by seed and vegetatively by trailing branches.

Origin and Habitat Description

Native to California and is one of the most widespread shrubs. Found in mixed evergreen forests, woodlands, chaparral and riparian areas.

Control

- Hand pulling is effective on seedlings and young plants. Extreme care must be taken by sensitive individuals.
- Cutting/mowing upper stems and leaves can reduce biomass but will often not kill established roots.
- Burning is not recommended because of harmful smoke.
- Intensive grazing by goats and sheep can be effective.
- The broadleaf herbicides dicamba, triclopyr and triclopyr mixed with 2,4-D provide selective control. The non selective herbicides glyphosate and imazapyr also provide good control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Bird's-foot trefoil

Bird's-foot trefoil

Lotus corniculatus
Pea Family (Fabaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description
Bird's-foot trefoil is a trailing, mat-forming perennial with stems 3 feet long and yellow flowers. Foliage is a distinct blue-green color with no hairs to sparsely hairy. Leaves have 5 leaflets, 3 at the tip of the leaf and 2 as "wings" toward the base. The leaflets are narrow, with a dented tip. Foliage dies back in the fall and regrowth occurs each spring from the well-developed taproot. Roots usually develop nitrogen fixing nodules. Flowers are produced in spring in clusters of 3-8 flowers on long stalks. Small pods form from the flowers that twist into spirals and eject the seeds. Bird's-foot trefoil is generally considered a desirable forage in rangelands and pastures as it is highly palatable. On rare occasions, it has been implicated with cyanide poisoning of livestock in other parts of the world.

Reproduction
Reproduction is primarily by seed. Under favorable conditions, root and stem fragments can develop into new plants. Seeds primarily germinate in the spring however some may germinate in the fall.

Origin and Habitat Description
Native to Europe and Asia. Common in turf, pastures, roadsides, crop fields, ditches, orchards, vineyards and urban sites.

Control
- Tillage, hoeing and hand pulling small infestations is effective as long as they are done before flowering to prevent seed production.
- Repeated cutting or mowing at the base during flowering can limit seed production.
- The broadleaf herbicides aminopyralid, clopyralid, dicamba and triclopyr provide selective control. The non selective herbicide glyphosate also provides good control.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Burclover

Medicago polymorpha

Pea Family (Fabaceae)

Zoya Akulova, CalPhotos

Steve Matson, CalPhotos

Gary McDonald, CalPhotos

Burclover (above) showing trifoliate leaves and burs, close up of flowering stem (left), close up of bur (below)

Burclover
Medicago polymorpha
Pea Family (Fabaceae)

CDFA: Not rated
Cal-IPC: Limited

Description
Burclover is a trailing, mat-forming annual with stems 0.5-2 feet long and yellow flowers. It branches profusely at its base and can attain

Curly dock
Rumex crispus
Buckwheat family (Polygonaceae)

John M. Randall, The Nature Conservancy, Bugwood.org

Curly dock infestation in a field (above), basal rosette showing large wavy leaves (left), flowering stem (right)

Zoya Akulova, CalPhotos

Barry Breckling, CalPhotos

Curly dock

Rumex crispus

Buckwheat family (Polygonaceae)

CDFA: Not rated
Cal-IPC: Limited

Description

Curly dock is an erect perennial from 1.5-3 feet tall. Leaves are oval to lanceolate, up to 20 inches long and 1-3 inches wide. Leaves are dark green, hairless, and the margins are wavy or curly. As a member of the buckwheat family, plants have a characteristic membranous sheath at the leaf base and swollen nodes. Roots consist of a deep taproot that enables plants to survive periods of drought and outcompete other vegetation. Plants bolt from a basal rosette in spring. Flower stalk is round, hairless and the flowers are small, greenish and appear in whorled clusters. After the flowers senesce, the fruits take on a characteristic rusty-brown color and can remain on the plant over winter. Under certain conditions, plants can accumulate soluble oxalates making them toxic to livestock.

Reproduction

Reproduces only by seed. Seeds can persist in the soil for 20-50 years.

Origin and Habitat Description

Native to Europe and Asia. Common along ditches, roadsides, meadows, riparian areas and pastures with poor drainage. Plants prefer moist soils but can tolerate periods of drought.

Control

- Hand pulling is difficult because of the deep taproot. Plants can resprout from the rootstock.
- Repeated mowing or slashing plants just before flowering can prevent seed production and may kill plants.
- Grazing is not effective because the plant is unpalatable and potentially toxic to livestock.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor, aminopyralid, clopyralid, dicamba, fluroxypyr, and triclopyr provide control. The herbicides glyphosate, imazapyr, chlorsulfuron and sulfometuron also provide control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Dalmatian toadflax

Linaria dalmatica ssp. *dalmatica*

Figwort Family (Scrophulariaceae)

Unless otherwise stated, photos by J.M. DiTomaso

K. George Beck and James Sebastian, Colorado State University

Dalmatian toadflax infestation in a field (above)

Flowering plant (left) and close up of flowers (center)

Steve Dewey, Utah State University

Dalmatian toadflax

Fennel

Foeniculum vulgare

Carrot Family (Apiaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Infestation along road

John M. Randall, The Nature Conservancy

Flowing plant (above), close up of flower (upper right), lacy foliage (lower right)

Forest and Kim Starr,
Starr Environmental, Bugwood.org

130

Fennel

Foeniculum vulgare

Carrot Family (Apiaceae)

CDFA: Not rated
Cal-IPC: High

Description
Fennel is an aromatic perennial with a deep thick taproot. Plants can grow to 10 feet tall, with finely dissected leaves that appear fern-like. Foliage and seeds have a strong licorice or anise scent. Flowers are small, yellow and arranged in an umbrella-like head.

Reproduction
Plants reproduce mostly by seed however reproduction from root or crown fragments is also possible.

Origin and Habitat Description
Native to Southern Eurasia. It has long been used and cultivated as a medicinal and edible plant and now is found throughout the western hemisphere. Found in waste places, city streets, landscapes, roadsides, fields, agricultural areas, grasslands, riparian areas and disturbed sites.

Control

- Hand pulling is effective on seedlings and young plants before flowering and seed production.
- Mowing or slashing plants just before flowering can prevent seed production and may kill plants.
- Grazing is not considered an effective strategy and will often spread the population.
- Burning is not considered effective.
- The broadleaf herbicides 2,4-D and triclopyr provide selective control. The non selective herbicide glyphosate also provides good control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Fiddleneck

Amsinckia menziesii

Borage Family (Boraginaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Fiddleneck

Amsinckia menziesii

Borage Family (Boraginaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description

There are several different *Amsinckia* species native to California. The most common are coast fiddleneck (*A. menziesii var. intermedia*) and menzies fiddleneck (*A. menziesii var. menziesii*). Both are winter annuals and usually not major problems in natural settings. Fiddleneck is poisonous to livestock, causing irreversible liver damage. Toxicity is fairly uncommon, however can be increased when cut hay is infested. Plants are slender, erect and grow from 8 to 32 inches tall. Seedlings have a very distinctive deeply lobed Y-shape. Leaves are linear, up to 6 inches long and alternate on the stem. Flowers are yellow-orange and produced at the tip of stalks in curls like the neck of a fiddle.

Reproduction

Reproduces only by seed. Seeds can remain viable in the soil for a few years.

Origin and Habitat Description

Native to western North America. Found in pastures, woodlands, meadows, roadsides, urban sites, orchards, vineyards and disturbed sites.

Control

- Hand pulling is effective before flowering and seed production.
- Mowing plants just before flowering can prevent seed production and may kill plants.
- Grazing is not effective because the plant is toxic to livestock.
- Burning is not considered effective.
- The broadleaf herbicides aminocyclopyrachlor, aminopyralid and triclopyr provide selective control. The non selective herbicides glyphosate and imazapyr also provide good control. Chlorsulfuron can provide control both as a post and pre emergent herbicide.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Filaree

Erodium spp.

Geranium Family (Geraniaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Redstem filaree (E. cicutarium) plant with dissected foliage (left), close up of flower (below)

Joseph Berger, Bugwood

Shortfruit stork's bill filaree fruit (above), redstem filaree dried fruit (right)

134

Jean Pawek, CalPhotos

Filaree

Erodium spp.

Geranium Family (Geraniaceae)

CDFA: Not rated
Cal-IPC: Limited

Description

Filaree is a winter annual forb that has a spreading or erect profile that grows from a rosette reaching 3 inches to 2 feet tall. The stems are hairy and sometimes red in color. Leaves are opposite and depending on the species can be finely divided with toothed or deeply lobed margins to broad with nearly entire margins. The root system consists of a shallow taproot with fibrous secondary roots. The five-petaled flowers are purplish-pink in color and are in clusters of 2 or more. Each flower will produce five long lobed fruits. Each fruit will have an awn-like tail which will dry and split with maturity. In rangeland, filaree is considered a desirable forage for livestock.

Reproduction

Reproduces only by seed. Seeds separate explosively and are propelled a short distance from the plant. Some seeds disperse greater distances with soil movement and especially by clinging to fur, feathers, and feet of animals, and the shoes and clothing of people.

Origin and Habitat Description

Native to Europe and Asia. Favors disturbed sites, roadsides, fields, woodlands, rangelands, pasture, orchards, vineyards and urban areas.

Control

- Control is often not warranted as filaree is considered a desirable forage.
- Hand pulling is effective on seedlings and young plants before flowering and seed production.
- Spring and summer fires generally increase the abundance the following year.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor and dicamba provide selective control. The non selective herbicides glyphosate and imazapyr also provide good control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Hedgeparsley

Hedgeparsley

Torilis arvensis

Carrot Family (Apiaceae)

CDFA: Not rated
Cal-IPC: Moderate

Description

Erect annual 6 to 24 inches tall. Germinates with the first fall rains and its lacy green foliage often makes the plant inconspicuous amongst grasses and forbs. Leaves are alternate on the stem and are sparsely covered with hairs. Plants produce white flowers in umbrella–like clusters, 2 -3 inches across. Each flower produces an oblong fruit that is covered in minutely barbed, hook-tipped bristles. Bristly fruits can be a nuisance to livestock, pets and humans. The burs stick to the fur and hair of animals and can cause mechanical injury by lodging in the nose, eyes, and ears of pets and livestock. Other common names include beggar's lice, hitchhiker, and sock destroyer.

Reproduction

Reproduces only by seed. Seeds fall near the parent plant or disperse away from the plant by water, mud and by clinging to animals, humans and equipment. Seeds can be spread as contaminants in hay, crop seed and bedding material.

Origin and Habitat Description

Native to southern Europe and Asia. Favors disturbed sites, roadsides, fields, woodlands, orchards, vineyards, urban sites, gardens and ornamental landscapes.

Control

- Hand pulling is effective on seedlings and young plants.
- Mowing or slashing plants just before flowering can prevent seed production and may kill plants.
- Intensive grazing can provide some control.
- The broadleaf herbicides 2,4-D and triclopyr provide selective control. The non selective herbicide glyphosate also provides good control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Hoary cress, heart & lens-podded

Lepidium draba, Lepidium chalepensis

Mustard Family (Brassicaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Hoary cress infestation

Heart-podded hoary cress fruits

Heart-podded hoary cress flowering stem

Lens-podded hoary cress flowering stem

138

Hoary cress, heart & lens-podded

Lepidium draba, Lepidium chalepensis

Mustard Family (Brassicaceae)

CDFA: B
Cal-IPC: Moderate

Description

Perennial plant up to 2 feet tall with deep, vigorously creeping roots. Stems and undersides of leaves may be covered with simple, short white

Horehound

Marrubium vulgare

Mint family (Lamiaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Horehound growing in a field (above), flowering stem showing whitish, square stems and hairy leaves (right)

Horehound

Marrubium vulgare

Mint family (Lamiaceae)

CDFA: Not rated
Cal-IPC: Limited

Description

Horehound is a cool-season perennial to 2 feet tall, often looking like a low shrub. It has densely hairy white-woolly stems that are thick and square in cross-section. Leaves are aromatic, opposite on the stems and ovate to nearly round and 0.5-2.5 inches long, with round-toothed margins. Both upper and lower surfaces are hairy. Flowers are produced in head-like whorls consisting of small white flowers in the upper leaf axils, spaced along the stems. Livestock avoid consuming the bitter-tasting foliage and the plant thrives in the absence of competition from other vegetation.

Reproduction

Reproduces only by seed. Seeds can persist in the soil for 7-10 years.

Origin and Habitat Description

Native to Europe and Asia. Especially common along roadsides, open fields, grasslands, oak woodlands, pastures and disturbed sites. Thrives in overgrazed areas.

Control

- Hand pulling is effective before flowering and seed production.
- Mowing or slashing plants just before flowering can prevent seed production and may kill plants.
- Cultivation, when the soil is dry can be effective but generally not practical.
- Grazing is not effective because the plant is unpalatable to most livestock.
- The broadleaf herbicides 2,4-D, dicamba and triclopyr provide selective control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Klamathweed (St. John's wort)

Hypericum perforatum ssp. perforatum

St. John's Wort Family (Hypericaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Klamathweed infestation (above), flowering stem (lower left), close up of flower (center), and leaf showing transparent dots (lower right)

Ohio State Weed Lab, Ohio State University

John Cardina, The Ohio State University

142

Lupine

Lupinus spp.

Pea Family (Fabaceae)

Steve Matson, CalPhotos

John Doyen, CalPhotos

Lupine (L. bicolor) growing in a field (above), close up seed pods (left), close up of leaf with 8 leaflets (lower left), close up of flower head (below)

Gary A. Monroe, CalPhotos

Gary A. Monroe, CalPhotos

Lupine

Lupinus spp.

Pea Family (Fabaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description

Lupine is the common name given to a group of leguminous (pod-forming) plants that have a variety of life forms including herbaceous perennials, annual plants and a few shrubs. Lupines can range in size from plants less than 1 foot to large shrubs 8 feet tall. The leaves are palmate-compound with 3-17 leaflets. Roots can develop nitrogen fixing nodules which add atmospheric nitrogen to the soil. Flowers are produced in dense or open whorls on unbranched stalks. Each flower is 0.5-1 inch long, with a characteristic pea-flower shape. Flowers can range in color from white to yellow to purple. The fruit is an exploding pod. Many lupines can potentially poison livestock and/or cause birth defects.

Reproduction

Reproduces only by seed. Seeds can persist in the soil for many years.

Origin and Habitat Description

Nearly all are native to the western United States. Native lupines are a desirable component to natural ecosystems and provide habitat for many living organisms. Especially common along roadsides, open fields, grasslands, oak woodlands, pastures and disturbed sites.

Control

- Control is often not warranted as lupine is considered a desirable component in natural communities.
- Hand pulling can be effective on seedlings and small infestations.
- Repeated cutting or mowing at the base during flowering can limit seed production.
- Grazing is not effective because the plant is toxic to livestock.
- The broadleaf herbicides 2,4-D and dicamba provide selective control. The non selective herbicide glyphosate provides control. Chlorsulfuron can provide control both as a post and pre emergent herbicide.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Milkweed, Mexican whorled and showy

Asclepias fascicularis, A. speciosa
Milkweed Family (Asclepiadaceae)

Milkweed, Mexican whorled and showy

Asclepias fascicularis, A. speciosa
Milkweed Family (Asclepiadaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description
Erect, herbaceous perennial that grows to 4 feet tall. The two most common milkweeds in the area are Mexican whorled milkweed (*A. fascicularis*) and showy milkweed (*A. speciosa*). Plants produce a milky white sap. Mexican milkweed has long narrow leaves, 6 inches long and 0.75" wide, arranged in whorls of 3-6, and are hairless, or covered with minute hairs. Showy milkweed has oval to oblong leaves that are opposite on the stem, 4-7 inches long and covered with soft woolly hairs. Flowers are pale pink, purple, or greenish-white. Seeds are produced in pods with Mexican milkweed having long narrow pods, 2-3 inches long and smooth, and showy having much larger pods, 3-5 inches long and 1 inch wide and densely covered with hairs. Although native, milkweed is toxic to livestock and can result in cardiac failure. Livestock poisoning is rare as the plants are generally unpalatable.

Reproduction
Reproduce by seed and underground roots, although the primary spread is by seed.

Origin and Habitat Description
Native to western United States. Commonly found on rangelands, pastures and roadsides.

Control

- Control is often not warranted as populations are often patchy and serve as the sole food source for monarch butterflies.
- Hand pulling can be effective on seedlings and small infestations.
- Mowing can reduce seed production and limit spread.
- Cultivation is generally not effective as root fragments can spread.
- Grazing is not effective because the plant is toxic to livestock.
- The broadleaf herbicides aminocyclopyrachlor and dicamba provide control. The non selective herbicide glyphosate provides control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Mullein

Verbascum thapsus

Figwort family (Scrophulariaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Mullein along roadside

Scott Oneto, UC Regents

Rosette

Flowering stem

Mullein

Verbascum thapsus

Figwort family (Scrophulariaceae)

CDFA: Not rated
Cal-IPC: Limited

Description
Mullein is a biennial, short lived perennial or, rarely, an annual to 7 feet tall. After germination, plants exist as a basal rosette until they develop a single tall flowering stem at maturity. Once the plant flowers and sets seeds, the plant will often die. Rosettes can be large, up to 2 feet in diameter with oblong, gray-green woolly leaves. Yellow flowers are produced on a long spike.

Reproduction
Reproduces only by seed. Seeds do not require an after-ripening period, but germination generally occurs in spring. Soil disturbance facilitates germination and seedling establishment. Each plant can produce over 100,000 seeds. Seeds can remain viable for 100 years in the soil.

Origin and Habitat Description
Native to Europe and Asia. Especially common on roadsides, in forest clearings and in other open disturbed sites.

Control
- Hand pulling before seed set is effective.
- Repeated mowing during bolting or early flowering can reduce seed set. Mowing rosettes is not effective.
- A single cultivation before seed set is effective.
- Grazing is generally not used as the plants are unpalatable.
- The broadleaf herbicides aminocyclopyrachlor, aminopyralid, and fluroxypyr provide selective control. The non selective herbicides glyphosate and imazapyr provide control. Chlorsulfuron provides pre and post emergent control. For post emergent herbicides, adding a spray adjuvant to the spray solution will aid in absorption into the woolly leaves.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Mustard, black

Brassica nigra

Mustard family (Brassicaceae)

CDFA: Not rated
Cal-IPC: Moderate

Description
Black mustard is an erect winter annual growing to 6 feet tall. The basal leaves have 1 to 2 pairs of distinct lateral lobes at the base. The upper stem leaves are oblong to linear, and the margins are entire to toothed or weakly lobed. Flowers are bright yellow, with four petals. Fruits are long narrow pods, 1/2-1 inch long and erect against the stem.

Reproduction
Reproduces only by seed. Many mustard species develop a persistent seedbank. Deeply buried seeds can survive for 50 years or more.

Origin and Habitat Description
Native to the Mediterranean region. Especially common along roadsides, open fields, grasslands, oak woodlands, orchards, vineyards and disturbed sites.

Control

- Hand pulling before seed set is effective.
- Repeated mowing during bolting or early flowering can reduce seed set. Mowing rosettes is not effective.
- A single cultivation before seed set is effective.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor, dicamba, fluroxypyr, and triclopyr provide selective control. The non selective herbicide glyphosate provides control. Chlorsulfuron, rimsulfuron and sulfometuron also provide control. Non selective herbicides may impact desirable forages.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Oblong spurge

Euphorbia oblongata

Spurge Family (Euphorbiaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Scott Oneto, UC Regents

Oblong spurge infestation (above), flowering plant (below left), close up of flower (below right)

Gary McDonald, CalPhotos

152

Oblong spurge
Euphorbia oblongata
Spurge Family (Euphorbiaceae)

CDFA: B
Cal-IPC: Limited

Description
Erect perennial to nearly 3 feet tall. The plants form extensive creeping

Perennial pepperweed (tall whitetop)
Lepidium latifolium
Mustard Family (Brassicaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Neal Kramer, CalPhotos

Perennial pepperweed infestation along a canal

Flowering stem

Basal rosette

154

Perennial pepperweed (tall whitetop)

Lepidium latifolium

Mustard Family (Brassicaceae)

CDFA: B
Cal-IPC: High

Description

Perennial plant between 1 and 6 feet tall. The leaves are green to gray-green and often dusted with powdery white caused by a rust fungus. The basal leaves are larger than stem leaves, to 1 ft long and 4 inches wide. The stems typically die in late fall and winter, leaving dead stems and thatch that can persist for years. The roots are long, thick and vigorously creeping. White flowers develop in dense cluster at the ends of branches. Flowering occurs from June to August.

Reproduction

Reproduces by seed and vegetative reproduction from the underground stems (rhizomes). Seeds do not persist for long periods in the soil.

Origin and Habitat Description

Native to southern Europe and western Asia. Grows in waste areas, wet areas, ditches, roadsides, cropland, along waterways and dry habitats such as road cuts and fills.

Control

- Hand pulling new seedlings or small patches before flowering can be effective if repeated several times over the growing season. Not effective on large established infestations.
- Mowing alone is not effective because resprouting can be vigorous.
- Cultivation is generally not effective.
- Grazing can provide some control.
- Burning is not effective.
- The broadleaf herbicide 2,4-D can provide selective control. The non selective herbicides glyphosate and imazapyr provide control. Chlorsulfuron provides pre and post emergent control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

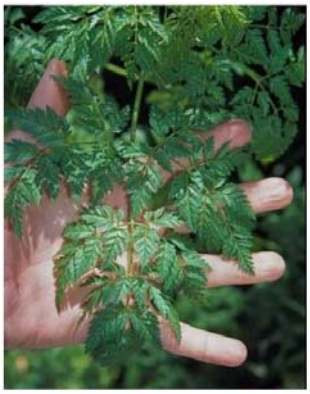
Poison hemlock

Conium maculatum

Carrot Family (Apiaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Flowering plant



Close up of lacy leaf

Stem with purple blotches

156

Pokeweed

Phytolacca americana var. americana

Pokeweed Family (Phytolaccaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Pokeweed growing in a field (above), resprouts from roots (below), close up of berries (right)

158

Pokeweed

Phytolacca americana var. americana

Pokeweed Family (Phytolaccaceae)

CDFA: Not rated
Cal-IPC: Limited

Description

Erect, herbaceous perennial shrub that grows to 8 feet tall, with large leaves and showy purple-black berries. It has a smooth, stout, purplish stem that branches extensively. The bright green, elliptic leaves are simple, alternate on the stem and have a strong unpleasant scent when crushed. Leaves can be up to 7 inches wide and 1 foot in length. Above ground growth dies back every year and regrowth occurs each spring from a very large white fleshy rootstock. The flowers form in clusters that hang from branches. Flowers are white to magenta and give way to distinct deep purple berries with dark ink colored juice. All plant parts, especially the root, contain numerous toxins and can be fatal to humans and livestock when ingested raw. When properly prepared parts of the plant have been used medicinally and as a food source.

Reproduction

Reproduces only by seed. Most seeds drop within a few feet of the plant. Longer dispersal is by water and birds. Seeds can persist for multiple years.

Origin and Habitat Description

Native to United States. Commonly found in woodlands, pastures, fields, forest margins, rangelands, vineyards, orchards, fencerows, roadsides, ornamental landscapes and disturbed sites.

Control

- Hand pulling can be effective on small plants. Large plants have well established root systems making removal difficult.
- Cultivation or cutting before fruits mature can be effective.
- Grazing is not effective because the plant is toxic to livestock.
- The broadleaf herbicides 2,4-D, dicamba and triclopyr provide selective control. The non selective herbicides glyphosate and imazapyr also provide control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Puncturevine (goatheads)

Tribulus terrestris

Caltrop Family (Zygophyllaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Puncturevine (goatheads)

Tribulus terrestris

Caltrop Family (Zygophyllaceae)

CDFA: C
Cal-IPC: Not rated

Description
A creeping summer annual growing to 3 feet wide with green to reddish-brown stems, spreading radially from a central taproot. Stems often have hairs that lie flat against the stem. Leaf shape is pinnate, made up of leaflets less than 1/4 inch long, with 3 to 7 pairs of leaflets per leaf. Plants produce small, solitary yellow flowers, which develop into burs with stout spines that can injure people and animals, as well as puncture tires. The foliage contains several compounds that can be toxic to livestock, especially sheep when ingested in quantity.

Reproduction
Reproduces only by seed. Most seeds are dispersed by animals, equipment, and humans. Seeds can persist for 3 to 6 years in the soil.

Origin and Habitat Description
Native to the Mediterranean region. Found on roadsides, railways, vacant lots, urban areas, vineyards, orchards and disturbed areas.

Control
- Hand pulling is effective before flowering and seed production.
- Mowing is ineffective because of the low growth form of the plant.
- Hoeing or shallow cultivation before seed production is effective.
- Grazing is not effective because the plant is toxic to livestock.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor, dicamba, fluroxypyr, and triclopyr provide selective control. The non selective herbicides glyphosate and imazapyr provide control. Pre emergent herbicides rimsulfuron and chlorsulfuron are effective, but may injure desirables.

More Information
- Weed Control in Natural Areas in the Western United States
- Distribution

Purple loosestrife

Lythrum salicaria

Loosestrife Family (Lythraceae)

Unless otherwise stated, photos by J.M. DiTomaso

Purple loosestrife along riverbank

Flowering stem

Vegetative stem

162

Purple loosestrife

Lythrum salicaria

Loosestrife Family (Lythraceae)

CDFA: B
Cal-IPC: High

Description

Perennial with erect stems between 2 to 6 feet tall. Extensive underground stems (rhizomes). Leaves are lance-shaped, opposite each other on the stem, and have smooth edges. Flowers are rose-purple with 5 to 7 petals all of similar shape and size. Each flower is 1/2 inch long and arranged in spikes at the end of stems. Flowering occurs from August to September.

Reproduction

Persists year-to-year from overwintering root buds and from the root crown. Seed production can be numerous from 100,000 to over 2.7 million seeds per plant. Seeds are mostly spread by water and by wind. Seeds are viable for up to 3 years. While reproduction is mostly by seed, it can also be spread from stem cuttings.

Origin and Habitat Description

Native to Europe. Introduced and cultivated as an ornamental. Found in marshy sites, ponds, meadows, ditches and stream banks.

Control

- Hand pulling is effective before flowering and seed production. All plant material, especially the root crown should be removed.
- Cutting or mowing at the base can reduce seed production but will often result in resprouting.
- Grazing is not recommended due to habitat it occupies and its poor palatability.
- Since the plant is often located near or in water, care must be taken as to the type of herbicide applied and the timing of application. The broadleaf herbicide triclopyr provides selective control. The non selective herbicides glyphosate and imazapyr provide control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Sweetclover, yellow and white

Melilotus officinalis, Melilotus albus

Pea Family (Fabaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description

Erect biennials, sometimes annuals or short-lived perennials, up to 5 feet tall or more. Stems are woody at the base; leaves consist of three leaflets. Taproot tough or woody, slender to thick, typically deep, with fibrous lateral roots. Flowers pea-like, yellow or white, sweetly fragrant, on short stalks. Flowers from spring to fall. Pods on stalks that bend downward containing 1-2 seeds.

Reproduction

Reproduces only by seed. Pods do not open to release seeds. Pods fall near the parent plant and disperse to greater distances with water, mud, road materials (e.g gravel), or as a seed or feed containment. Also moved by clinging to the shoes and clothing of humans, on vehicle tires and undercarriages, and possibly by animals.

Origin and Habitat Description

Native to Europe and Asia. Inhabits roadsides, open fields, pastures and crop land. White sweetclover often grows in moist places such as riparian areas, ditches and disturbed areas. Yellow sweetclover typically inhabits dry places.

Control

- Hand pulling is effective before flowering and seed production.
- Cutting or mowing at the base during flowering can limit seed production.
- Intensive grazing can be effective.
- Burning can kill existing plants, but often stimulates seed germination when moisture conditions are favorable.
- The broadleaf herbicides 2,4-D, aminocyclopyrachlor, aminopyralid, clopyralid, and triclopyr provide selective control. The non selective herbicides glyphosate and imazapyr provide control. Chlorsulfuron provides pre and post emergent control.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Tumbleweed (pigweed)

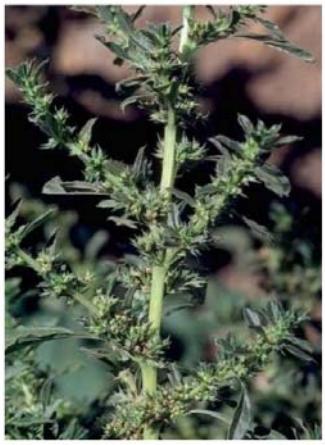
Amaranthus albus

Pigweed Family (Amaranthaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Mature tumbleweed plant

Inconspicuous flower clusters in leaf axils



Seedling

Jack K. Clark, UC Regents

166

Tumbleweed (pigweed)

Amaranthus albus

Pigweed Family (Amaranthaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description

Vinegar weed

Trichostema lanceolatum

Mint family (Lamiaceae)

Unless otherwise stated, photos by J.M. DiTomaso

Vinegar weed infestation in a pasture (above), seedlings (below), flowering stem (right)

168

Vinegar weed

Trichostema lanceolatum

Mint family (Lamiaceae)

CDFA: Not rated
Cal-IPC: Not rated

Description
Highly aromatic native summer annual that grows to 3 feet tall. Vinegar weed has soft-hairy foliage with a strong vinegar-like scent and long, narrow leaves up to 3 inches in length. Flowers are bilateral, purple, and occur on long stalks.

Reproduction
Reproduces only by seed. Seeds can persist in the soil for several years.

Origin and Habitat Description
Native to California. Especially common along roadsides, open fields, grasslands, oak woodlands and disturbed sites. Thrives in overgrazed grasslands. Vinegar weed is often considered a rangeland weed because it is unpalatable to livestock, however it is an important component of native grassland communities, particularly as a pollen source for bees and other insects.

Control

- Hand pulling is effective before flowering and seed production.
- Repeated mowing during bolting or early flowering can reduce seed set. Mowing rosettes is not effective.
- Grazing is not effective since the plants are unpalatable.
- The broadleaf herbicides 2,4-D and triclopyr provide selective control. The non selective herbicide glyphosate also provides control. Non selective herbicides may impact desirable forages.

More Information

- Weed Control in Natural Areas in the Western United States
- Distribution

Index

A-B

Acroptilon repens, Russian knapweed 32
Adenostoma fasciculatum, Chamise (greasewood) 92
Aegilops triuncialis, A. cylindrica, Goat grass, barbed and jointed 64
Asclepias fascicularis, A. speciosa, Milkweed, Mexican whorled and showy.....146
Ailanthus altissima, Tree of heaven 110
Amaranthus albus, Tumbleweed (pigweed) 166
Amsinckia menziesii, Fiddleneck 132
Arctostaphylos spp., Manzanita 98
Arundo donax, Giant reed 62
Avena fatua, A. barbata, Oats, wild and slender 72
Bermudagrass, *Cynodon dactylon* 48
Bindweed, *Convolvulus arvensis* 114
Bird's-foot trefoil, *Lotus corniculatus* 122
Blackberry, Himalayan, *Rubus armeniacus* 88
Blessed milkthistle (milk thistle), *Silybum marianum* 24
Blando brome (soft chess), *Bromus hordeaceus* 86
Blue wild-rye, *Elymus glaucus* 50
Brassica nigra, Mustard, black 150
Bromus carinatus, California brome 54
Bromus diandrus, Ripgut brome 80
Bromus hordeaceus, Soft chess (blando brome) 86
Bromus tectorum, Cheat grass 56
Buckbrush (wedgeleaf ceanothus), *Ceanothus cuneatus* 90
Bulbous bluegrass, *Poa bulbosa* 52
Bull thistle, *Cirsium vulgare* 10
Burclover, *Medicago polymorpha* 124

C

California brome, *Bromus carinatus* 54
Canada thistle, *Cirsium arvense* 12
Carduus pycnocephalus, Italian thistle 22
Carthamus creticus, Smooth distaff thistle 34
Cat's-ear, *Hypochaeris glabra, Hypochaeris radicata* 14
Ceanothus cuneatus, Buckbrush (wedgeleaf ceanothus) 90
Ceanothus integerrimus, Deer brush 94
Centaurea calcitrapa, Purple starthistle 28
Centaurea diffusa, Diffuse knapweed 18
Centaurea stoebe ssp. micranthos, Spotted knapweed 36
Centaurea melitensis, Tocalote (malta thistle) 44
Centaurea solstitialis, Yellow starthistle 46
Centromadia fitchii, Tarweed, Fitch's (spikeweed) 40
Chamise (greasewood), *Adenostoma fasciculatum* 92
Cheat grass, *Bromus tectorum* 56
Chondrilla juncea, Rush skeletonweed 30
Cirsium arvense, Canada thistle 12

Index

I-J
Italian thistle, *Carduus pycnocephalus* 22
Johnson grass, *Sorghum halepense* 68
Jubata grass, *Cortaderia jubata* 74
Juncus spp., Rush 82
K-L-M-N-O
Klamathweed (St. John's wort), *Hypericum perforatum* 142
Lepidium draba, L. chalepensis, Hoary cress, heart & lens-podded ...138
Lepidium latifolium, Perennial pepperweed (tall whitetop) 154
Linaria dalmatica ssp. dalmatica, Dalmatian toadflax 128
Lotus corniculatus, Bird's-foot trefoil 122
Lupine, *Lupinus spp.* 144
Lupinus spp., Lupine 144
Lythrum salicaria, Purple loosestrife 162
Malta thistle (tocalote), *Centaurea melitensis* 44
Manzanita, *Arctostaphylos spp.* 98
Marrubium vulgare, Horehound 140
Medicago polymorpha, Burclover 124
Medusa head, *Elymus caput-medusae* 70
Melilotus officinalis, M. alba, sweetclover, yellow and white 164
Milk thistle (blessed milkthistle), *Silybum marianum* 24
Milkweed, Mexican whorled and showy, *Asclepias fascicularis, A. speciosa* 146
Mullein, *Verbascum thapsus* 148
Mustard, black, *Brassica nigra* 150
Nicotiana glauca, Tree tobacco 112
Oats, wild and slender, *Avena fatua, A. barbata* 72
Oblong surge, *Euphorbia oblongata* 152
P-Q-R
Pampas grass, *Cortaderia selloana* 74
Perennial pepperweed (tall whitetop), *Lepidium latifolium* 154
Periwinkle, *Vinca major* 118
Phalaris aquatica, Harding grass 66
Phytolacca americana var. americana, Pokeweed 158
Pigweed (tumbleweed), *Amaranthus albus* 166
Poa bulbosa, Bulbous bluegrass 52
Poison hemlock, *Conium maculatum* 156
Poison oak, *Toxicodendron diversilobum* 120
Pokeweed, *Phytolacca americana var. americana* 158
Polypogon monspeliensis, Rabbitfoot grass 78
Prickly sow thistle, *Sonchus asper subsp. asper* 26
Puncturevine (goatheads), *Tribulus terrestris* 160
Purple loosestrife, *Lythrum salicaria* 162
Purple needle grass, *Stipa pulchra* 76
Purple starthistle, *Centaurea calcitrapa* 28
Rabbitfoot grass, *Polypogon monspeliensis* 78

Index

Ripgut brome, *Bromus diandrus* 80
Rubus armeniacus, Blackberry, Himalayan 88
Rumex crispus, Curly dock 126
Rush, *Juncus spp.* 82
Rush skeletonweed, *Chondrilla juncea* 30
Russian knapweed, *Acroptilon repens* 32
Ryegrass, *Festuca perennis* 84
S
Scarlet wisteria (rattlebox), *Sesbania punicea* 100
Scotch broom, *Cytisus scoparius* 102
Sesbania punicea, Scarlet wisteria (rattlebox) 100
Silybum marianum, Milk thistle (blessed milkthistle) 24
Smooth distaff thistle, *Carthamus creticus* 34
Soft chess (blando brome), *Bromus hordeaceus* 86
Sonchus asper subsp. asper, Prickly sow thistle 26
Sorghum halepense, Johnson grass 68
Spanish broom, *Spartium junceum* 104
Spartium junceum, Spanish broom 104
Spikeweed (Fitch's tarweed), *Centromadia fitchii* 40
Spotted knapweed, *Centaurea stoebe ssp. micranthos* 36
Starthistle (Yellow starthistle), *Centaurea solstitialis* 46
Stinkwort, *Dittrichia graveolens* 38
Stipa pulchra, Purple needle grass 76
Sweetclover, yellow and white, *Melilotus officinalis, M. alba* 164
T
Tall whitetop (perennial pepperweed), *Lepidium latifolium* 154
Tamarisk (saltcedar), *Tamarix parviflora, T. ramosissima* 106
Tamarix parviflora, T. ramosissima, Tamarisk (saltcedar) 106
Tarweed, Fitch's (spikeweed), *Centromadia fitchii* 40
Tarweed, virgate, *Holocarpha virgata* 42
Tocalote (malta thistle), *Centaurea melitensis* 44
Torilis arvensis, Hedgeparsley 136
Toxicodendron diversilobum, Poison oak 120
Toyon, *Heteromeles arbutifolia* 108
Tree of heaven, *Ailanthus altissima* 110
Tree tobacco, *Nicotiana glauca* 112
Tribulus terrestris, Puncturevine (goatheads) 160
Trichostema lanceolatum, Vinegar weed 168
Tumbleweed (pigweed), *Amaranthus albus* 166
U-V-W-X-Y-Z
Verbascum thapsus, Mullein 148
Vinca major, Periwinkle 118
Vinegar weed, *Trichostema lanceolatum* 168
Virgate tarweed, *Holocarpha virgata* 42
Xanthium strumarium, X. spinosum, Cocklebur, common and spiny 16
Yellow starthistle, *Centaurea solstitialis* 46

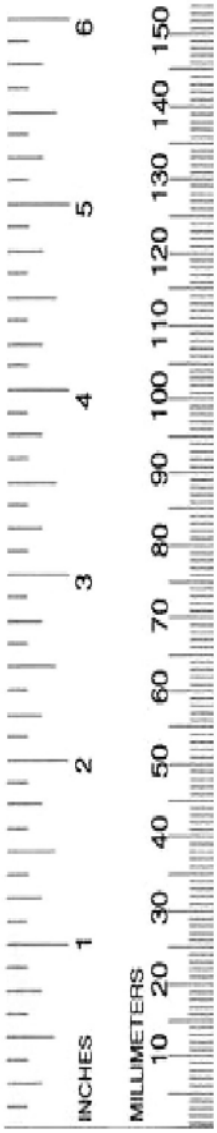
References

A Manual of Vascular Plants of California. University of California Press. 1993

Aquatic and Riparian Weeds of the West. University of California Press (Publication No. 3421). 2003

Grasses in California. University of California Press 1974

Grower's Weed Identification Handbook. Division of Agriculture and Natural Resources, University of California, 1998



Nondiscrimination and Affirmative Action Policy

The University of California, Division of Agriculture and Natural Resources (UC ANR) prohibits discrimination against or harassment of any person in any of its programs or activities on the basis of race, color, national origin, religion, sex, gender, gender expression, gender identity, pregnancy (which includes pregnancy, childbirth, and medical conditions related to pregnancy or childbirth), physical or mental disability, medical condition (cancer-related or genetic characteristics), genetic information (including family medical history), ancestry, marital status, age, sexual orientation, citizenship, status as a U.S. veteran. UC ANR policy prohibits retaliation against any employee or person in any of its programs or activities for bringing a complaint of discrimination or harassment. UC ANR policy also prohibits retaliation against a person who assists someone with a complaint of discrimination or harassment, or participates in any manner in an investigation or resolution of a complaint of discrimination or harassment. Retaliation includes threats, intimidation, reprisals, and/or adverse actions related to any of its programs or activities. UC ANR is an Equal Opportunity/ Affirmative Action Employer. All qualified applicants will receive consideration for employment and/or participation in any of its programs or activities without regard to race, color, religion, sex, national origin, disability, age or protected veteran status. University policy is intended to be consistent with the provisions of applicable State and Federal laws. Inquiries regarding the University's equal employment opportunity policies may be directed to: UCANR, Affirmative Action Compliance and Title IX Officer, University of California, Agriculture and Natural Resources, 2801 Second Street, Davis, CA 95618, (530) 750-1397. Email: jsafox@ucanr.edu.
http://ucanr.edu/sites/anrstaff/Diversity/Affirmative_Action