Weed Management
Class Reading / Reference

CMG GardenNotes on Weed Management

- Weed Management, #351
- Weed Identification, #352
- Weed Associations with Specific Environments and Cultural Conditions, #353
- Homework: Weed Management, #354

Learning Objectives

Students will be able to:

- Define what a “weed” is from the perspective of the home landscape
- List the problems that weeds can cause in the home landscape
- Describe why plants become weeds in the home landscape
- Understand the difference between noxious, exotic, native and invasive weeds
- Describe environmental, ecological and cultural/management factors that contribute to landscape weed problems
- Understand why weed identification is important and what resources are available to assist in weed identification
- Describe the different weed life cycles and how that knowledge is vital for developing weed control strategies
- Describe the different landscape settings in which weed problems arise, and how each of those settings each can present a unique set of weed management challenges
- Understand the principles of Integrated Pest Management (IPM) and how to apply those principles to managing specific landscape weed problems
- Describe cultural and management techniques for control of landscape weeds
- Describe the different types of herbicides and how/when each type can most effectively be used as part of a weed management program

Authors: Tony Koski, Ph.D., Irene Shonle, Ph.D., Kurt Jones, and David Whiting, Colorado State University Extension

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Weed Identification and Management Resources

CSU Extension Resources

Extension Fact Sheets

- Control of Annual Grassy Weeds in Lawns, #3.101
- Musk Thistle, #3.102
- Weed Management for Small Rural Acreages, #3.106
- Leafy Spurge, #3.107
- Canada Thistle, #3.108
- Diffuse and Spotted Knapweed, #3.110
- Russian Knapweed, #3.111
- Biology and Management of the Toadflaxes, #3.114
- Cheatgrass and Wildfire, #6.310

CSU Turf web site at www.csuturf.colostate.edu

- Turf fact sheets
- Identification and Management of Perennial Weedy Grasses in Lawns
- Broadleaf Weed Control in Home Lawns

Weed Identification Books


Online Weed Identification Keys

- North Carolina State University at http://www.turffiles.ncsu.edu/turffid/itemselector.aspx
- Michigan State University at http://www.msuturfweeds.net/

Other Weed Management Resources

- **Colorado Natural Areas** - Creating an Integrated Weed Management Plan: A Handbook for Owners and Managers of Lands with Natural Values at http://parks.state.co.us/NaturalResources/CNAP/Publications/
- **Colorado Weed Management Association** (www.cwma.org)
- **Colorado Department of Agriculture, Noxious Weed Program (Noxious Weed Lists and Photos)** http://www.colorado.gov/cs/Satellite/Agriculture-Main/CDAG/1167928159176
• **IPM – Principles of Landscape Weed Management**

• **Solarization for Landscape Weed Management**
  o [http://solar.uckac.edu/new_page1.htm](http://solar.uckac.edu/new_page1.htm) (solarization resource website)

• **Invasive Plants**: University of California – Definition of Invasive Plants

**Review Questions**

1. What “makes” a plant a weed, and what problems can weeds cause in the home landscape?

2. List/describe a few of the major types of landscape plantings/settings in which weed problems arise and how they might differ in terms of weed management solutions?

3. What are some plant characteristics that allow certain plants to become landscape weed problems?

4. Describe at 4 ways by which weeds may be introduced into the home landscape.

5. Explain what the “seed bank” is and how it factors into weed management decisions.

6. Give an example of a setting/location in YOUR OWN home landscape where weeds almost never occur – and explain why.

7. How do winter annuals and summer annuals differ? How does understanding this difference affect management strategies for each type?

8. For which type of weeds (life cycle, age) and in which landscape situation is the use of citric acid/acetic acid/botanical oil herbicides most effective? Least effective?

9. For which types of weeds (life cycle and age) is cultivation (hoeing) most effective? Least effective?

10. How can water/irrigation management be used to lessen weed problems in the home landscape?

11. How effective is mowing and string-trimming for weed management?

12. What is solarization? In what garden situations is it most effectively used?

13. How effective is landscape fabric for controlling weeds?

14. Why is mulch effective for weed control? Which types of mulch are 1) most and 2) least effective for weed control?

15. Why are biological control weed control products not used more often for landscape and garden weed management?

16. What is the difference between systemic and contact herbicides – and in which landscape situations (or on what types of weeds) would each be used most effectively?

17. How do preemergent herbicides work – and for which types of weeds (think life cycle) are they most effectively and commonly used?

18. What is the difference between selective and non-selective herbicides? Give examples of where each might be most effectively used.

19. What are some reasons that herbicides do not always control weeds as expected?

20. How would strategies for the management of BINDWEED and PURSLANE in a vegetable bed differ?
**CMG GardenNotes #351**

**Weed Management**

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What Makes a Plant a “Landscape Weed”?

A weed is any plant that becomes undesirable in the landscape because of the following:

- It is growing in a place where it is unwanted (lawn grass in a flowerbed, tree seedlings in a lawn, purslane growing between patio pavers, spearmint invading a raised vegetable bed).
- It is visually unattractive (color, texture, growth habit, growth rate makes it aesthetically unappealing to the eye).
- It poses a health or safety hazard (poisonous plants, thorny plants, fuel for fires).
• It out-competes more desirable plants in the home landscape (competes for water, nutrients, light) or when it escapes into native landscapes (creating biodiversity problems).
• It acts as a host or shelter for other pests (alternate host for rust, attractive to injurious insects, food/shelter for damaging wildlife).

What Characteristics Make Weeds Successful?

Characteristics that make weeds successful where they become a problem include the following:

• Rapid growth rate.
• Prolific seed producer.
• Long longevity of seed.
• Deep roots, stolons, tubers, etc. making them tolerant of adverse growing conditions.
• More “ecologically fit” than other plants in the landscape.
• Adapted to readily spread (wind, animal manure, water, and human activities).
• Often adapted to disturbed soil/sites.
• May not have insects and diseases to keep them in check.
• May be better competitors for light, nutrients, or sun.

Seed Bank

A seed bank builds up as a weed drops seed into the soil over many years – seed can remain viable for years. Persistence and vigilance to keep weeds from going to seed are keys to depleting seed bank [Tables 1 & 2]

Weeds tend to be very competitive and are capable of taking advantage of disturbed areas. They often produce large amounts of seeds or are capable of quick reproduction. Weeds are generally a problem where the desired crop is doing poorly or the soil has been disturbed.

**Table 1. Seeds per Plant**

<table>
<thead>
<tr>
<th>Weed</th>
<th>Number of Seeds Produced Per Plant</th>
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</thead>
<tbody>
<tr>
<td>Dandelion</td>
<td>15,000</td>
</tr>
<tr>
<td>Canada thistle</td>
<td>680</td>
</tr>
<tr>
<td>Curly dock</td>
<td>29,500</td>
</tr>
<tr>
<td>Lamb’s quarter</td>
<td>72,450</td>
</tr>
<tr>
<td>Mullein</td>
<td>223,200</td>
</tr>
<tr>
<td>Pigweed</td>
<td>117,400</td>
</tr>
<tr>
<td>Purslane</td>
<td>52,300</td>
</tr>
</tbody>
</table>

**Table 2. Viability of Buried Seed**

<table>
<thead>
<tr>
<th>Weed</th>
<th>Viability of Buried Seed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black mustard</td>
<td>50 years</td>
</tr>
<tr>
<td>Curly dock</td>
<td>80 years</td>
</tr>
<tr>
<td>Foxtail</td>
<td>30 years</td>
</tr>
<tr>
<td>Mallow</td>
<td>20 years</td>
</tr>
<tr>
<td>Plantain</td>
<td>40 years</td>
</tr>
<tr>
<td>Shepherd’s purse</td>
<td>35 years</td>
</tr>
</tbody>
</table>
How Do Weeds Get Into Our Landscapes?

Major sources of landscape weeds include the following:

- Weeds going to seed (seed bank)
- Brought into garden in manure and soil amendments or with soils
- Disseminated from neighboring property’s plants and weeds
- Deliberate introduction

Minor sources of landscape weeds include the following:

- Brought into garden with plant materials
- Brought into garden in irrigation water
- Brought into garden by humans or animals
- Using poor quality seed (weed content in seed)

Noxious Weeds

Common weeds refer to weeds commonly found in various cropping situations, such as the lawn, vegetable garden, flowerbeds, or naturalized areas.

Noxious weeds refer to weed species declared by state or local statues as a threat to agriculture and naturalized areas. Some designations require control under the law.

Legal Designations for Noxious Weeds

List A: All populations of List A species in Colorado are designated for eradication because they are not widespread (myrtle spurge, purple loosestrife)

List B: These weeds have discrete populations and will be managed to stop their continued spread, or eradicated in certain areas (Chinese clematis, oxeye daisy)

List C: These weeds are already very widespread, and not required to be controlled; however, education and research continue on these species. (downy brome, field bindweed)

For additional information on Colorado’s noxious weed laws, refer to the Colorado Department of Agriculture Noxious Weed Management Program at www.colorado.gov/ag/weeds
Weed Life Cycle

To control weeds, the gardener needs to know their life cycles.

**Annuals**

**Summer Annual** – The seed germinates in the spring, the plant develops and produces seed during the summer, and the plant dies with killing frost in the fall. Examples include crabgrass and puncture vine.

**Winter Annual** – The seed germinates in late summer or fall; and lives over winter as small tufts or rosettes of leaves. It resumes growth in spring, matures seed early in the summer, and dies in summer heat. Examples include downy brome and shepherd’s purse.

**Keys to controlling annuals are preventing seed production, depleting the seed bank, and preventing germination.**

- Timing is important.
- Winter annuals must be controlled before seed set in early summer.
- Summer annuals must be controlled before seed set in middle to late summer or early fall.
- The use of herbicides at the end of an annual’s life cycle is often ineffective and does not make sense!
- Competition (from other plants and mulch) to prevent seed germination and seedling development.

**Biennials**

Requires two seasons to complete growth cycle. Seeds germinate in spring; the following season, the plant flowers and matures seeds in summer and fall before dying. An example is dame’s rocket.

**Keys to control are preventing seed production and depleting the seed bank, and preventing germination and seedling establishment.**

**Perennials**

**Simple Perennials** have a root crown that produces new shoots every year. It depends upon seed production to spread. Examples include foxtail barley and dandelion.

**Creeping Perennials** propagate by seed, creeping above ground stems (stolons), and/or creeping underground stems (rhizomes). Examples include quackgrass and Canada thistle.

**Keys to control are to prevent seed production and to kill the plant.** Creeping perennials have a more extensive root system, and are harder to control.
IPM: Integrated Weed Management

“Integrated Pest Management, IPM, is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks.” - the National IPM Network

The best weed control is prevention!

- Plant weed-free seed, sod, nursery stock
- Avoid using plant species known to be invasive
- Use weed-free amendments, topdressing
- Uses mulch where appropriate
- Maintain healthy, competitive plants
- Irrigate and fertilize appropriately

Methods of Control

Cultural Methods

Irrigation

Irrigation methods and frequency have a direct influence on weeds. Infrequent, deep irrigation droughts out many shallow rooted weeds. Sprinkler irrigation (wetting the entire soil surface) encourages weeds. Drip irrigation (keeping most of the soil surface dry) discourages weeds. Keep non-irrigated areas dry to help suppress weeds.

Lawn Mowing

Many common garden weeds will not survive the frequent mowing of a lawn. However, mowing the lawn too short (less than 2 inches for Kentucky bluegrass) encourage weeds as it reduces vigor of the grass.

Mulching

If maintained at adequate depths, mulching has many benefits including preventing weed seed germination. For wood/bark chips, a depth of three inches is best for weed control. Less is ineffective. Mulching may not effectively control established perennials growing from root.

Landscape Fabrics

In landscape management, landscape fabric with wood/bark chips or rock mulch above is common. However, it prevents soil improvement by organic breakdown, decreasing plant vigor. Weed seeds that germinate above the fabric layer will be difficult to pull and must be removed with herbicides. Use of landscape fabric
should be considered as a deferred maintenance technique rather than a low maintenance technique.

**Crop Competition**

Competition with the crops and weeds for light, water, nutrients, and growing space is an effective weed management tool. For example, mowing a cool season lawn (like Kentucky bluegrass) gives the lawn a growth advantage, shading out many weeds like crabgrass.

Block planting in the vegetable garden and close spacings in a flowerbed, with plants filling the bed space, helps suppress weeds.

**Summary: Cultural Methods for Weed Management**

**Pros:** This is the best long-term control as the gardener increases the conditions for desired plants to grow at the same time decrease the conditions for weeds.

**Cons:** Possibly more expensive and time-consuming; control may be slow.

**Mechanical Methods**

**Tilling / Cultivating**

Tilling or cultivating effectively controls 90% of annual and biennial weeds if done before seed set. It also brings a new set of weed seeds to the soil surface ready to germinate. When tilling for weed control, use only shallow cultivation. Deep tilling can damage crop roots. Cultivating/tilling may actually propagate most perennial weeds.

**Hand Pulling**

Hand pulling is quick when pulled while the weeds are small, and it is effective for small infestations. A few minutes on a weekly basis to keep the garden weed free will be more effective than a long weed pulling session as the weeds get large. For many gardeners, pulling weeds is a great way to vent stress. With hand pulling, most weed species require that they be pulled out by the roots. The weed will readily regrow if just the tops are removed. It is essential that weeds are removed before they go to seed, filling the seed bank. Some weed species, like purslane, must be removed from the garden bed. It can reroot if left in the garden.

**Mowing Naturalized and Low Maintenance Areas**

Mowing is a common weed management tool in natural areas and lower maintenance sections of a yard, reducing the unsightly appearance of the yard and fire hazard.
String Trimming (“Weed Whacking”)

Use of a string trimmer is a form of weed management by mowing. It can be effective in preventing weeds from going to seed. However, it can sow seeds if done on weeds with seeds.

Flame (Propane Torch)

Flaming off weeds with a propane torch is a common practice in production agriculture and has limited application in landscape maintenance due to fire hazards. During the flaming process, heat from the flame is transferred to the plant tissues, increasing the thermal energy of the plant cells and resulting in coagulation of cell proteins if the temperature is above 50°C. Exposing plant tissue to a temperature of about 100°C for a split second (0.1 second) can result in cell membrane rupture, resulting in loss of water and plant death. Thus, the weeds do not need to be burned up, but rather just scorched. Flaming works best on very young weeds.

It is rather expensive and many not be cost effective in some production agriculture situations. It presents a fire and explosion hazard; use with caution. Fire prevention measures prohibit the use of flaming in many communities.

Burning

Burning of fields and ditch banks is a weed management tool in production agriculture. Generally, a permit is required. Most communities prohibit burning of weeds inside city limits.

Solarization

Solarization is a method of heating the soil to kill roots, weed seeds, and soil borne insects and diseases near the soil surface. In regions with hot summer temperatures, it is effective in open areas will full sun. However, do not solarize the soil in the rooting area of trees, shrubs, and other desired plants. Steps include the following:

1. Remove vegetation and cultivate the soil to a six inch depth.
2. Sprinkle irrigate the area.
3. Cover the area with 4 mil clear plastic. Bury the edges of the plastic all the way around the plot.
4. Leave in place for three weeks during the summer heat of July and August.
5. After removing the plastic, avoid deep cultivation what would bring up weed seeds, insects, and disease pathogens from deeper soils.

Summary: Mechanical Method

Pros: Mechanical methods can be quick, inexpensive, environmentally friendly, and effective on small weed seedlings.
Cons: Mechanical methods have limited effectiveness on many established perennials, and could be detrimental at wrong time.

**Biological Methods**

Biological methods include the use of carefully screened insects to attack portions of the weed (i.e., stems, seeds, flowers, etc.). Development of biological methods with insects is rather complex and must be used with caution. The introduced insects must survive and become established in the new ecosystem. The insects need to reduce the weed population, but cannot entirely eliminate it as the weeds as that would eliminate the insect’s food supply. The insects must not attach beneficial plants. The insects must not become insect pest. A great example of biological methods that failed is earwigs. They were intentionally introduced into the United States as a biological control agent and have since become a pest.

Biological methods also include the grazing of sheep, cows, horses, or goats. The purposeful use of grazing animals to control weed patches can be extremely expensive.

**Pros:** Biological methods can be an inexpensive, long-term control solution. It can be environmentally friendly and require little labor.

**Cons:** Biological methods are not always effective, may require a large population of weeds to maintain insect populations (will not work in backyard setting), and does not eradicate weeds. Insects can sometimes attack non-target plants.

**Herbicides (Chemical Methods)**

The use of herbicides is the use of chemicals that disrupt key physiological processes in plants, leading to plant death. Among the various herbicides, many different modes of action are found.

**Pros:** Use of herbicides is generally effective (if the correct herbicide is used), cost-effective, and provides quick control.

**Cons:** Use of herbicides can be environmentally problematic when incorrectly applied. Proper use includes proper selection of the specific herbicide for the weeds and for the growing crops in the area, timing of application, correct application rates, correct application procedures, and application safety measure to protect the application and non-target plants. Some require special licensing and may not be used in a home landscape or garden setting.

**Be sure to follow the label, it is the law.** Components of the herbicide label include the following:

- Trade Name
- Common name
- Chemical name
- Signal Words (Danger, Warning, Caution)
- Use instructions
  - Weeds controlled
  - Plant tolerances
o Application rate(s)
o Application timing
o Application technique
o Application restrictions

- Safety
  o Applicator
  o Bystanders, pets
  o Wildlife
  o Non-target plants

How Herbicides Are Applied

- **Broadcast** application refers to a uniform application over a treatment area.
- **Spot treat** refers to application to a specific area, such as directly to individual weeds.
- **Foliar** application refers to application to the leaves
- **Soil incorporation** refers to tilling or watering the herbicide into the soil after application.

Types of Herbicides

- **Systemic or Translocated** herbicides move internally in the plant. They must be applied during period of active growth with adequate water. Systemic herbicides are especially good for many perennials. Examples include glyphosate (Round-up), and 2,4-D.

- **Contact** herbicides only desiccate the portion of the plant that is contacted. Contact herbicides are most effective on annuals. Examples include vinegar and diquat.

- **Pre-emergent** herbicides are applied to soil prior to weed seed germination, killing germinating seeds. They will not kill growing weeds. Application timing is critical. For example, to control crabgrass in lawns, pre-emergent herbicides need to be applied late April to early May before the crabgrass germinates, about the time that common lilac blooms. Most require soil incorporation by irrigation.

Some desired crops germinating from seeds may also be killed. For example, do not apply pre-emergent herbicides prior to seeding or laying sod. Uniform application and strict adherence to application rate are essential for attaining good weed control and for preventing injury to landscape plants.

- **Post-emergent** herbicides are applied to foliage of actively growing plants. Example include 2,4-D, and glyphosate (Round-up).

- **Selective** herbicides control a limited group of plants, like monocots versus dicots.

- **Non-selective** herbicides are effective on a broad range of plants.
Examples of Common Herbicides Used in the Home Landscape

Selective Herbicides for Broadleaf Weed Control in Lawns

Examples: 2,4-D, MCPP and MCPA, Banvel (dicamba), and Confront

Caution:

- Avoid drift and ground water movement to non-target crops. Tomatoes and grapes are extremely sensitive to 2,4-D products.
- Do not use with temperatures above 85°F.
- Do not broadcast apply under trees. Spot individual weeds.
- Banvel and Confront have higher toxicity on some shade trees including honeylocust, linden, and Japanese pagoda.
- Keep pets off treated area until lawn dries.
- Low human toxicity. Stay out of area until lawn dries.

Non-Selective Herbicides for Control of Herbaceous Plants

Example: Glyphosate (Round-up). Note: Many Round-up products in the home garden trade have a combination of other herbicides added for quicker kill or longer holding potential.

Caution:

- Requires application to leaf tissue. No soil action. Do not spray the ground.
- Neutralized up contact with soil. Mix only with drinking quality water. The dirt in non-potable water may neutralize the product.
- Effective on most herbaceous plants. May or may not be toxic on woody plants.
- Low human toxicity, but avoid skin contact.
- Extremely toxic to dogs. Keep dogs out of treated area until spray dries.

Pre-Emergent Herbicides to Check Germinating Weeds in the Lawn

Examples: Balan, Betasan (bensulfide), Dacthal (DCPA, Ronstar (oxadiazon), Tipersan (siduron), etc.

Cautions:

- Require soil incorporation by irrigation.
- Do not apply prior to seeding or sodding. (Refer to label direction.)

Approach to Clients Having Weed Problems

- The weed must be correctly identified.
- What is the landscape setting (lawn, vegetable garden, flowerbed, shrub border, hardscape)?
- What is the health of the plants where the weeds are growing?
- What is the degree of weed infestation (by numbers, area, time, nearby sources of weeds)?
• What management has been done to date?
• Cultural issues: How is the area being managed (water, mowing, etc.)?
• Indicator species: Certain weeds “indicate” overwatering, too much/too little fertilizer, etc.
• Do they use mulch, where appropriate?
CMG GardenNotes #352

Weed Descriptions

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Summer Annuals

**Common Mallow, *Malva neglecta***

- Most frequent in cultivated ground, gardens, newly seeded lawns, or stressed lawns that lack density; found at 4,500 to 7,000 feet in elevation
- Prostrate, low-spreading annual, biennial, or perennial; deep taproot; foliage similar to geranium, pinkish-white flowers, fruits look like small round wheels of cheese
- Increase turf density
- Pull plants from moist soil
- Pre-emergent herbicides are effective
- Post-emergent herbicides can be effective

**Common Purslane, *Portulaca oleracea***

- Summer annual, found in newly seeded or thinning, non-vigorous lawns and also in cultivated garden sites; up to 8,500 feet in elevation
- Smooth, thick, succulent, alternate (to sub-opposite) edible leaves; small yellow flowers in leaf axils; stems are smooth and reddish; plant is sprawling, prostrate, forming dense vegetative mats from shallow fibrous root system
- Increase turf density
- Pulls easily when soil is moist; easily re-roots after cultivation—remove and dispose of plant
- Pre-emergent herbicides may be helpful
- Post-emergent herbicide use is more effective when plants are young; difficult to kill with an herbicide when larger

**Crabgrass, *Digitaria sanguinalis***

- Low-growing, prostrate, summer annual grass; leaf blades wider and lighter green color than Kentucky bluegrass with leaf sheaths with long stiff hairs
- Base of stems are often reddish-purple in color; plant spreads by rooting at the lower stem nodes as well as by seed; forms seedheads below mowing height; seedheads are composed of slender, finger-like spikes
- Crabgrass is less prevalent when turf has good density; mowing too low promotes crabgrass seed germination; maintain mowing height at 2.5 to 3 inches.
- A pre-emergent herbicide applied correctly and at the proper time should provide control; do not use a pre-emergent herbicide on a newly-seeded or sodded lawn or when overseeding a lawn
- Post-emergent “crabgrass killer” sprays are not effective unless crabgrass plants are at the young seedling stage

**Green Foxtail, *Setaria viridis***

- A summer annual grass with wider blades and a lighter green color than Kentucky bluegrass
- Faster growing than Kentucky bluegrass; seedheads (known as spikes) have bristles that give it a fuzzy appearance; may form a seedhead despite regular mowing
- Foxtail is much less prevalent when turf has good density; resod or reseed bare spots
A pre-emergent herbicide applied correctly and at the proper time should provide control; do not use a pre-emergent herbicide on a newly-seeded or sodded lawn or when overseeding a lawn

Post-emergent herbicides will kill foxtail seedlings (but not mature plants)

Kochia, *Kochia scoparia*

- Very prevalent in disturbed soils, cultivated fields, gardens
- In spring, seedlings have alternate leaves; lower leaves often wider than upper leaves; underside of leaves hairy, margins hairy
- Flowers are yellow, inconspicuous; seed production occurs from July to October
- Stems are 1 to 6 feet tall
- In fall, entire plant first becomes reddish-brown, then brown, becomes “tumbleweed”
- Germinates early; use pre-emergent herbicides before soil temps reach 38°F
- Post-emergent herbicides can be effective
- Mulch inhibits seedling development

Netseed Lambsquarters, *Chenopodium berlandieri*

- Summer annuals prevalent in disturbed soils, gardens, cultivated fields, waste areas
- Extremely variable in appearance; stems 1 to 6 feet tall, grooved, often reddish tinged; undersides of leaves whitish, mealy (mottled, granular appearance)
- Flowers inconspicuous, greenish, at tips of stems and leaf axils; seed production occurs from July to September
- Edible when plant is young and tender
- Competitive weed with rapid growth and high water use
- Can be hoed or pulled when young
- Pre-emergent herbicides applied at the right time in spring can provide good control
- Post-emergent herbicides can be effective
- Mulch inhibits seedling development

Prostrate Knotweed, *Polygonum aviculare*

- Prostrate summer annual from a thin taproot; tough, durable plant common along sidewalks, in turf that is stressed and less vigorous, and in gardens; found to 9,500 feet in elevation
- Thrives in dry, compacted soils or wherever there is excessive foot traffic
- Forms a tough, wiry mat of stems that are enlarged at each joint as well as a papery sheath at each leaf node; to differentiate from spurge, broken stem does not produce a milky sap; leaves and stems are not hairy, and leaves are alternate
- Flowers small, white, inconspicuous; found where leaf meets stem; produces many seeds
- Annual core aeration spring and/or fall will reduce knotweed infestation
- Apply pre-emergent herbicides in late fall/winter (knotweed can germinate in February or March)
- Post-emergent herbicides are mostly ineffective after plants become larger
**Prostrate Spurge, *Chamaesyce maculate***

- Prostrate summer annual forming dense mats; found in thinning, less vigorous turf
- Leaves are opposite and each leaf has a reddish-purple spot in the center; small pinkish flowers in leaf axils; stems and leaves are both hairy; sap is milky latex; some people develop a rash after skin contact with sap
- Increase turf density
- Plants can be pulled and bagged if soil is moist; wear gloves because of the sap
- Post-emergent herbicides can be effective

**Redroot Pigweed, *Amaranthus retroflexus***

- Coarse, summer annual; fast growing to 12 to 36 or more inches tall; dependent on moisture received
- Alternate leaves vary in appearance, but have prominent veins and midrib
- Lower stem reddish or red-striped; roots pink-red even down the taproot
- Flowers/seedheads at top of plant; prickly; produces many small black seeds
- Very toxic to cattle and swine
- Found in waste areas, gardens, disturbed soils, and in turf if thin and patchy in quality
- Hoe or pull from moist soil before seedheads mature; bag plants if pulled later
- Easy to kill with most herbicides, but apply according to label directions well before seedheads mature; herbicides suggested only where large numbers of plants exist or where large areas are infested

**Scentless chamomile, *Matricaria perforata***

- Noxious weed in Colorado List B
- Annual forb that can persist as a biennial or shortlived perennial
- Stems of the plant are green, erect, often branched, glabrous, or slightly pubescent, and can range in height from 6 to 20 inches tall
- Leaves are alternate, 1 to 2 inches long, slightly pubescent or glabrous, and are finely divided into several short thread-like segments
- Terminal flowers are 0.75 to 1.25 inch in diameter, with a daisy-like appearance consisting of white petals surrounding a central yellow core
- Key to control is reducing seed production; hand pulling is effective, but may not be practical in larger patches; mowing conducted early in the growing season before plants flower and prior to seed production will reduce populations
- Maintaining healthy stands of desirable vegetation can also be an effective control measure because scentless chamomile seedlings cannot tolerate intense competition
- Post-emergent herbicides can be effective

**Winter Annuals**

**Downy Brome/Cheat Grass, *Bromus tectorum***

- Noxious weed in Colorado (List C)
- Winter annual, extremely abundant in intermountain west; after maturity can become a fire hazard, especially when dry; found at 4,000 to 9,000 feet in elevation
- Leaf sheaths and blades are covered by dense soft hairs
- Droopy seedheads develop in spring; long awns; prolific seed producer; plants turn reddish brown in early summer (mid to late June), and then fade to a blond color
- Competes vigorously with other perennial grasses for moisture because of its winter and early spring growth habit; root growth during winter can occur until soil temperature goes below 37°F
- Hand-pulling effective for small infestations—repeat pulling over the season is necessary, as seeds will germinate irregularly; extract as much root as possible to prevent re-growth
- Infrequent in mowed turf; in the landscape, glyphosate (Round-up and others) works well in early spring prior to seedhead appearance; best when non-target species are dormant

**Shepherd’s Purse, Capsella bursa-pastoris**

- Small winter annual with small white flowers early in spring; common in cultivated gardens and roadsides; common up to 9,000 feet in elevation
- Slender stems from basal rosettes; leaves are hairy below, smooth above, and often deeply lobed; seed pods are heart-shaped (or purse-shaped); seed production from April to September
- Hand-pulling or hoeing before seed set is very effective—get on it early!
- Post-emergent herbicides should be labeled for use in turf grass

**Biennials**

**Dame’s Rocket, Hesperis matronalis**

- Noxious weed in Colorado (List B)
- Can be a short-lived perennial
- Was introduced as an ornamental
- Flowers have four petals, are purple or white, clustered in loose stalks, and fragrant
- Mature plants range from 1 to 3 feet tall
- Can be aggressive in the landscape
- Pulling or cutting flower heads before seed set will control the plant, but this will need to be repeated for several years to exhaust seed bank
- For larger infestations, post-emergent herbicides can be effective
- Do not buy seed mixes that contain this plant

**Diffuse Knapweed, Centaurea diffusa**

- Noxious weed in Colorado (List B)
- A biennial, short-lived perennial, or occasionally an annual
- The plant develops a single shoot (stem), 1 to 2 feet tall that is branched toward the top; first year rosette leaves and lower shoot leaves are finely divided; leaves become smaller toward the top of the shoot and have smooth margins
- Many solitary flowering heads occur on shoot tips; they are about one-eighth inch in diameter and 0.5 to 0.66 inch long; flowers usually are white but may be purplish; involucre bracts are divided like teeth on a comb and tipped with a slender spine that makes them sharp to the touch; sometimes the bracts are dark-tipped or spotted like spotted knapweed; the long terminal spine differentiates diffuse from spotted knapweed
- It reproduces and spreads from seed—keep from going to seed; hoeing or hand pulling before the plant goes to seed can accomplish this
- For larger areas, post-emergent herbicides can be effective
• Cultural controls include revegetating with desirable grasses
• Biological controls include the seedhead flies *Urophora affinis* and *U. quadrifasciata* and root-feeding insects such as the diffuse knapweed root beetle (*Sphenoptera jugoslavica*), the yellow-winged knapweed moth (*Agapeta zoegana*), and the knapweed root weevil (*Cyphocleonus achates*)

**Musk Thistle, *Carduus nutans***

• Noxious weed in Colorado (List B)
• Musk thistle is a biennial or winter annual that can grow up to 8 feet tall
• Leaves are up to 10 inches long, dark green with a light green midrib, spiny, and deeply lobed; often have a white margin
• Solitary, lightly spiny, and nodding flower heads develop at the stem tips in midsummer and grow to a diameter of 1.5 to 3 inches and are deep rose to violet
• The key to control is not to let the plant go to seed; herbicides and hand pulling the rosette are both effective
• Applications should be made in late spring/early summer and again in the fall

**Prickly Lettuce, *Lactuca serriola***

• Biennial or winter annual to 48 inches tall from a large taproot; invades disturbed garden soils
• Cut stems/leaves exude a “milky juice”; more common in areas from 4,500 to 6,000 feet
• Upper leaves lobed like oak leaves and are often twisted to lie in a vertical plane, also known as “compassplant” because leaves may “point” to north and south; lower leaves often not as lobed; leaves have prominent spines on back side of midrib
• Small yellow daisy-like flowers on elongated stems; seedheads are like those of dandelion
• Hoe or pull from moist soil before yellow flowers mature
• Easy to kill with most herbicides, especially when younger; apply according to label directions well before seedheads mature; herbicides suggested only where large numbers of plants exist or where large areas are infested

**Yellow Sweet Clover, *Melilotus officinalis***

• Biennial herbaceous plants; second year plants grow 3 to 5 feet high and are bush-like; sweet clovers are very fragrant
• Leaves are alternate, divided into three finely toothed leaflets; middle leaflet grows on a short stalk
• Flowers are crowded densely at the top 4 inches along a central stem; each flower is attached by a minute stalk
• There are one or two hard small seeds per flower; they stay viable in the soil for 30 years
• Strong taproot
• Can be good forage; however, moldy hay made from yellow sweet clover (or hay made from drought stressed or frost-damaged plants) is toxic to livestock (contains coumarin which converts to dicoumarin, a blood thinner)
• The key to controlling sweet clovers is to keep them from flowering and then concentrate on depleting viable seeds in the soil
• Hoe, hand pull, or spray with post-emergent herbicide when young

#352-6
Simple Perennials

Curly Dock, *Rumex crispus*

- Leaves emerge from stout taproot in spring
- Elongated leaves have wavy (curly) margins; leaves mostly basal, with long petioles
- Stems 2 to 4 feet tall, reddish, ridged; nodes sheathed with clear membrane
- Flowers greenish, May
- Winged fruits on flowering stems, reddish-brown
- Habitat—Fields, roadsides, railroads, waste ground, disturbed sites, turf/landscape
- Dig taproot, must remove at least 75% of the taproot to control
- Post-emergent herbicides can be effective

Myrtle Spurge, *Euphorbia myrsinites*

- Noxious weed in Colorado (List A)
- Mat-forming perennial to 9 inches tall
- Escaped ornamental; formerly sold as a drought-tolerant ground cover
- Blue-green succulent leaves form a “donkey tail”; has chartreuse bracts (“flowers”)
- For small infestations, dig or pull out clumps with caution; white latex sap from stems and leaves can cause severe dermal reactions—always wear gloves if hand pulling
- For larger infestations, use an herbicide; the best time to treat myrtle spurge with herbicide is during late fall
- *Eradication of all plants is required throughout Colorado.* If you see it, contact your county weed supervisor or the state weed coordinator!

Spotted Knapweed, *Centaurea maculosa*

- Noxious weed in Colorado (List B)
- A short-lived, noncreeping perennial that reproduces from seed (primary means of spread)
- Produces one or more shoots that are branched and 1 to 3 feet tall; rosette leaves can be 6 inches long and deeply lobed
- Leaves are similar to diffuse knapweed
- Lavender to purple flowers are solitary on shoot tips and about the same size as diffuse knapweed flowers; involucre bracts are stiff and black-tipped; the tip and upper bract margin have a soft, spine-like fringe and the center spine is shorter than others
- For control measures, see diffuse knapweed

Creeping Perennials

Bouncingbet, *Saponaria officinalis*

- Noxious weed in Colorado (List B)
- An escaped ornamental, aggressive in landscapes and wild areas
- Spreads aggressively through rhizomes and seeds
- White to pink five-petaled flowers are clustered at the ends of branches
- Leaves are opposite, smooth, and have three veins from base
- Mature plants are up to 3 feet tall

#352-7
- Saponins in plant are toxic to livestock
- Can be controlled by mowing or pulling several times a year—before seed production
- Post emergent herbicides can be effective

Canada Thistle, *Cirsium arvense*

- Noxious weed in Colorado (List B)
- Colony-forming creeping perennial spreading primarily by horizontal roots (can grow as much as 18 feet in one season!) and to a lesser degree by seed; found from 4,000 to 9,500 feet in elevation
- Flowers are purple and are borne in clusters; spiny foliage with variable leaf shapes; when mowed in a lawn, will not develop full height and flower
- Highly invasive species; control is difficult because of its extensive root system; pulling generally is not effective due to the tremendous reserves in the root system; *regular, persistent* pulling may gradually starve root system; shoots should be pulled as they are noticed, as all shoots (leaves) are producing food reserves
- Increase density and competitiveness of turf
- Post-emergent herbicides can be effective
- Vinegar is a contact herbicide and will only brown leaves; these will be replaced by new shoots; frequent applications may be effective
- Biocontrol insects include a seed head weevil, a stem-mining weevil, and a gall-forming fly; these may not be significantly effective alone but can provide good results when combined with other control methods; biocontrol insect releases are best suited to large acreage infestations; backyard releases are generally impractical

Common Tansy, *Tanacetum vulgare*

- Noxious weed in Colorado (List B)
- Introduced from Europe as an ornamental and medicinal herb
- Found in yards, along roadsides, stream banks, and in waste places
- Spreads by rhizomes, can reach 3 to 4 feet tall
- Flowers are button-shaped and yellow in flat-topped clusters
- Leaves are deeply divided into narrow leaflets and rank smelling
- Is toxic to livestock, although unpalatable
- Mowing before seed production can limit spread, although it may have to be repeated several times in a season to prevent regrowth from rootstocks
- Hand pulling in damp soil can remove small infestations; wear gloves; will readily regrow from fragments in soils
- For larger infestations, post-emergent herbicides can be effective

Creeping Woodsorrel/Oxalis, *Oxalis corniculata*

- Prostrate, creeping perennial from slender taproot; stems root where they touch the ground
- Leaves have a shamrock appearance; plants often mistaken for a clover; leaves may “fold up” at night or on cloudy days; leaves turn purplish with the arrival of cooler weather in fall; some plants may have purplish leaves year-round
- Small yellow flowers
- Fruits “explode” when mature, scattering seed often more than 10 feet
- More common in thin, less vigorous turf given too frequent, light irrigation; increase turf density
- Pre-emergent herbicides may be helpful

#352-8
• Post emergent herbicides can be effective

Field Bindweed, *Convolvulus arvensis*

• Noxious weed in Colorado (List C)
• Creeping perennial; found as high as 10,000 feet in elevation; general range 4,000 to 8,000 feet
• Vining, sprawling, prostrate growth habit; may climb by twining around fence wire or around stems of other plants; not shade tolerant but drought tolerant due to large roots; leaves are arrowhead-shaped; attractive, white or pink bell-shaped flowers that resemble morning glory from late June until frost
• Increase density and competitiveness of turf
• Control is difficult because of its extensive root system, which can penetrate the soil profile to a depth of 20 feet; seeds also can remain viable for 20 to 50 years; pulling generally is not effective due to the tremendous reserves in the root system; *regular, persistent* pulling may gradually starve root system; shoots should be pulled as they are noticed, as all shoots (leaves) produce food reserves
• Post-emergent herbicides can be effective
• The bindweed mite has been used as a biological control with some success; initial impact is reduction of growth and limited flower and seed production; mowing moves mites around and stimulates plant growth for mites to feed on; survival is better in drier settings; excessive moisture may limit establishment; contact your local Colorado State University Extension office for information

Hoary Cress (White Top), *Cardaria draba*

• Noxious weed in Colorado (List B)
• A creeping perennial that reproduces by seed and creeping roots; one of the earliest perennial weeds to emerge in the spring
• It grows erect from 10 to 18 inches high and has a white color
• The alternate leaves clasp the stem and are oval or oblong with toothed or almost smooth margins; the leaves are often covered with very fine white hairs; each leaf is 0.5 to 2 inches long with blunt ends
• The flowers are white, one-eighth inch across, and numerous in compact flat-top clusters, which give the plant its name; each heart-shaped seed pod contains two oval, finely pitted, red-brown seeds each about one-twelfth inch long
• Due to the rhizomes of this perennial weed, mechanical control provides minimal control; diligent digging can provide control of very small infestations; hand pulling of above-ground plant parts is ineffective; successful digging requires complete plant removal within 10 days after weed emergence throughout the growing season for 2 to 4 years; cultivation 6 inches deep must be repeated within 10 days of weed emergence throughout the growing season for 2 to 4 years
• Revegetate with desirable vegetation
• Post-emergent herbicides can be effective
Leafy Spurge, *Euphorbia esula*

- Noxious weed in Colorado (List B)
- An erect plant that grows 1 to 3 feet tall
- Leaves are bluish-green with smooth margins, 0.25 inch to 0.5 inch wide, and 1 inch to 4 inches long
- Umbel flowers are surrounded by heart-shaped, showy, yellow-green bracts (an umbel looks like the stays of an umbrella if it is held upside down); flowers occur in many clusters toward the top of the plant; seeds are round to oblong, about one-twelfth inch long, gray or mottled brown with a dark line on one side
- Leafy spurge contains a white milky latex in all plant parts; latex distinguishes leafy spurge from some other weeds (e.g., yellow toadflax), particularly when plants are in a vegetative growth stage
- Leafy spurge has an extensive root system that is abundant in the top foot of soil, and it may grow 15 feet deep or more; roots contain substantial nutrient reserves that allow the weed to recover from stress, including control efforts; many vegetative buds along roots grow into new shoots
- Use a combination of methods to control leafy spurge; vigorous grass helps weaken leafy spurge through competition
- Post-emergent herbicides can be effective

Orange Hawkweed, *Hieracium aurantiacum*

- Noxious weed in Colorado (List A)
- Shallow, fibrous roots
- Leaves are hairy, spatula shaped, up to 5 inches long, and basal
- Extensive stolons create a dense mat that practically eliminates other vegetation—makes mechanical control very difficult once established
- Stems and leaves exude a milky latex when cut or broken
- Up to 30 half-inch red to orange flowers appear in late May or June
- Post-emergent herbicides can be effective
- *Eradication of all plants is required throughout Colorado.* If you see it, contact your county weed supervisor or the state weed coordinator!

Oxeye Daisy, *Chrysanthemum leucanthemum* or *Leucanthemum vulgare*

- Noxious weed in Colorado (List B)
- A perennial from rhizomes with characteristic “daisy-like” flowers
- Plants initially develop as a basal rosette; lower rosette leaves occur on petioles and are from 1.5 to 6 inches long; leaves are lobed
- Flowers are white with a yellow center and range from 1.25 to 2 inches
- Oxeye daisy should be mowed as soon as flowers appear to reduce seed production; root systems are shallow and the plant can be dug up and removed; hand removal will have to be continued for several years because seeds may remain viable in the soil for a long time
- Post-emergent herbicides can be effective
- Native daisies are a good, non-invasive garden alternative
Purple Loosestrife, *Lythrum salicaria*

- Noxious weed in Colorado (List A)
- Escaped ornamental, aggressive in riparian areas
- Square stem, whorled leaves
- Purple-magenta flowers with five to seven petals in long racemes
- If left unchecked, a wetland may become a monoculture of loosestrife
- Control of small infestations can be managed through digging all the plants and roots—this will need to be monitored for a few years
- Large infestations should be controlled with an aquatic-labeled herbicide
- *Eradication of all plants is required throughout Colorado.* If you see it, contact your county weed supervisor or the state weed coordinator!

Quackgrass, *Elytrigia repens*

- Noxious weed in Colorado (List B)
- Very aggressive creeping perennial grass especially in moist soils; found from 4,500 to 9,000 feet in elevation; spreads by seeds and invasive rhizomes (underground stems)
- Rhizomes are yellow-white, with brown sections; rhizome ends are sharp-pointed and can penetrate hard soils; base of leaf blade with claw-like appendage that clasps the stem
- Believed to be allelopathic (release of a chemical that inhibits growth of nearby plants)
- Mechanical control is difficult as any rhizome segment produces new plants
- A few quackgrass plants can be spot-sprayed with glyphosate, or individual blades can be painted with glyphosate; note that glyphosate will kill any bluegrass it contacts; repeat applications will likely be needed
- Renovate severely infested lawn areas—spray area with glyphosate; repeat applications will likely be needed; ensure that quackgrass is killed before areas are resodded or reseeded

Russian Knapweed, *Centaurea maculosa*

- Noxious weed in Colorado (List B)
- Creeping perennial that reproduces from seed and vegetative root buds
- Emerges in early spring, bolts in May to June, and flowers through the summer into fall
- Shoots or stems are erect, 18 to 36 inches tall, with many branches; lower leaves are 2 to 4 inches long and deeply lobed; upper leaves are smaller, generally with smooth margins, but can be slightly lobed; shoots and leaves are covered with dense gray hairs
- The solitary, urn-shaped flower heads occur on shoot tips and generally are 0.25 to 0.5 inch in diameter with smooth papery bracts; flowers can be pink, lavender, or white
- Has vertical and horizontal roots that have a brown to black, scaly appearance, especially apparent near the crown
- Toxic to horses; allelopathic to other plants
- The key to Russian knapweed control is to stress the weed and cause it to expend nutrient stores in its root system
- An herbicide alone will usually not effectively manage Russian knapweed; combine treatment with perennial grasses sown in late fall; tillage is necessary to overcome the residual allelopathic effects of Russian knapweed

White Clover, *Trifolium repens*

- Creeping perennial that forms runners that root at nodes
Many people like clover in lawns, while others find white flowers and the bees they attract objectionable. A legume that fixes nitrogen, so it is often found in lawns having low fertility. Increase turf density with proper watering, mowing, and fertilization. Post-emergent herbicides can be effective.

**Wild Violet, Viola spp.**

- Heart-shaped leaves on long petioles, purple flowers in spring; may also spread by rhizomes.
- Difficult to control due to resistance to many herbicides.
- Improve light penetration to shaded areas by pruning trees and shrubs.
- Mow lawn higher to increase competition from grass.
- Best control may be to pull plants when ground is moist.
- Post-emergent herbicides can be effective.

**Yellow Toadflax, Linaria vulgaris**

- Noxious weed in Colorado (List B).
- Yellow toadflax is a perennial that spreads sideways by underground rhizomes and by seeds.
- Flowers are small, yellow, look like snapdragons, and bloom mid-late summer; leaves are linear.
- Some people confuse a native plant, golden banner, with toadflax, but golden banner blooms very early and has three leaves, like a clover.
- Yellow toadflax is difficult to control; its extensive root system lets it recover from control attempts.
- Yellow toadflax is very variable, genetically; therefore the effectiveness of herbicides is also variable.
- Hand pulling can be effective on small patches, especially in gravelly soils when you can pull a large part of the root; it will need to be pulled for several years; pull before it goes to seed.
- Post-emergent herbicides can be effective.

**Woody Plants**

**Russian Olive, Elaeagnus angustifolia**

- Noxious weed in Colorado (List B).
- Small tree 10 to 25 feet tall originally planted as an ornamental and for windbreaks.
- Leaves are narrow and appear silvery.
- Branches have long thorns 1 to 2 inches in length.
- Small sweet smelling yellow flowers are followed by a berry-like fruit which is spread by birds.
- Has become a serious weed in low-lying pastures, meadows, and waterways.
- The most effective control is to cut the tree and immediately paint the stump with a herbicide.
- Silver buffalo berry is an excellent native alternative plant.
Tamarisk, *Tamarix ramosissima*

- Noxious weed in Colorado (List B)
- Tamarisk was sold as an ornamental plant for gardens during the 1800 and 1900s; tamarisk has now spread to most of the western United States, displacing the native cottonwoods and other plants
- Plants can grow to 6 inches tall during the first 2 months and can grow over 18 feet tall; the taproot can reach 100 feet down with a root spread of up to 150 feet; adventitious roots can produce new trees when buried!
- Mature tamarisk trees can produce millions of pollen-size seeds dispersed through wind and water; seeds can germinate while floating and establish themselves on wet banks within 2 weeks; newly formed sand banks are particularly susceptible; trees may reproduce in the first year, but typically they reproduce during the second year
- It is very “thirsty”—one tree can use up to 300 gallons per day, and it alters hydrologic conditions in riparian areas
- Salt glands on the leaves release salt, increasing salinity of soil
- Tamarisk is difficult to control; single treatment approaches to control tamarisk have not proven feasible because no method completely eliminates tamarisk or its regeneration; use revegetation in conjunction with other methods
- The saltcedar leaf beetle, *Diorhabda elongata*, has been released on some stands, and has shown to be fairly effective
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**CMG GardenNotes #353**

## Weed Associations with Specific Environments and Cultural Conditions

### Compacted Soils
- annual bluegrass (*Poa annua*)
- common chickweed (*Stellaria media*)
- goosegrass (*Eleusine indica*)
- knotweed (*Polygonum aviculare*)
- mouse-ear chickweed (*Cerastium vulgatum*)
- prostrate spurge (*Euphorbia supina*)

### Moist, Fertile Soils
- annual bluegrass (*Poa annua*)
- curled dock (*Rumex crispus*)
- henbit (*Lamium amplexicaule*)
- yellow woodsonrrel (*Oxalis stricta*)

### Moist, Infertile (Low N) Soils
- black medic (*Medicago lupulina*)
- plantains (*Plantago spp.*)
- white clover (*Trifolium repens*)

### Dry Soil
- black medic (*Medicago lupulina*)
- dandelion (*Taraxacum officinale*)
- bindweed (*Convolvulus spp.*)
- kochia (*Kochia scoparia*)
- stinkgrass (*Eragrostis cilianensis*)

### Dry, Infertile Soils
- black medic (*Medicago lupulina*)
- yarrow (*Achillea millefolium*)

### Moist or Poorly Drained Soils
- annual bluegrass (*Poa annua*)
- bentgrasses (*Agrostis spp.*)
- common chickweed (*Stellaria media*)
- crabgrasses (*Digitaria spp.*)
- goosegrass (*Eleusine indica*)
- ground ivy (*Glechoma hederacea*)
- mouse-ear chickweed (*Cerastium vulgatum*)
- violets (*Viola spp.*)
- yellow nutsedge (*Cyperus esculentus*)

### Low Mowing Height
- annual bluegrass (*Poa annua*)
- crabgrasses (*Digitaria spp.*)
- yellow woodsonrrel (*Oxalis stricta*)
- white clover (*Trifolium repens*)

### New Seedings (Spring/Summer)
- annual bluegrass (*Poa annua*)
- barnyardgrass (*Echinochloa crusgalli*)
- crabgrasses (*Digitaria spp.*)
- purslane (*Portulaca oleracea*)
- foxtail (*Setaria spp.*)
New Seedings (Fall)

henbit (*Lamium amplexicaule*)
storksbill (*Erodium cicutarium*)
shepardspurse (*Capsella bursa-pastoris*)
annual mustards (many)

Old Lawns (25-30+ years)

bentgrasses, redtop (*Agrostis spp.*)
orchardgrass (*Dactylis glomerata*)

Shady Lawns

annual bluegrass (*Poa annua*)
common chickweed (*Stellaria media*)
ground ivy (*Glechoma hederacea*)
mouse-ear chickweed (*Cerastium vulgatum*)
nimblewill (*Muhlenbergia shreberi*)
violets (*Viola spp.*)

Formerly Agricultural/Farm Land

barnyardgrass (*Echinochloa crusgalli*)
bindweed (*Convolvulus spp.*)
Canada thistle (*Cirsium arvense*)
foxtail (*Setaria spp.*)
quackgrass (*Elytrigia repens*)
smooth bromegrass (*Bromus inermis*)

Author: Dr. Tony Koski, Extension Turf Specialist, Department of Horticulture & LA, Colorado State University

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