MASTER GARDENER
COLORADO STATE UNIVERSITY
EXTENSION

Turfgrass Management

Learning Objectives

At the end of class, the student will be able to:

- Describe how lawn management practices influence turf quality and why incorrect management decisions lead to common lawn care problems.
- Describe which grass species are best-adapted for lawn use, and the most important factors to consider when choosing a species for a new lawn (or when renovating an existing lawn)
- Describe how mowing height and frequency affect the aesthetic quality and stress tolerance of turfgrass; why grass clippings should be recycled back to the lawn during mowing.
- Describe why nitrogen is the most important nutrient in a lawn fertilization program, how and when to fertilize a lawn, and how to select the appropriate lawn fertilizer.
- Describe the environmental factors affecting turf water use and how to use that knowledge to most effectively irrigate a lawn (how MUCH water to apply, and how OFTEN?).
- Describe thatch, understand why it forms in the lawn, what common problems its accumulation may cause, and how thatch is most effectively managed.
- Describe the negative effects of soil compaction on turf health and how to improve soil physical conditions by using common cultivation practices.
- Describe how to establish a new lawn, using seed, sod or plugs. What is meant by lawn renovation and how this process can be used to improve the quality of an existing lawn.
- Describe the most common lawn weeds, why weeds occur in the lawn, and how to most effectively manage weeds using cultural practices and, if necessary, herbicides.
- Describe the process of diagnosing common lawn problems and know where to find the most useful resources (books, websites) to assist in the diagnostic process

- CMG volunteers approach diagnostic situations as a process. Students will be able to:
    - Describe concepts of *Plant Health Care* (PHC; IPM as it applies to lawn care)
    - Outline the life cycle of a lawn and describe how lawn/turf needs change with the age of the lawn
    - List steps in the diagnostic process
    - Using the diagnostic process, diagnose routine lawn pest problems

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- No endorsement of products named is intended, nor is criticism implied of products not mentioned.

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References

Colorado State University Extension

Grass Species Selection for the Home Lawn

CMG GardenNotes

- Best Turf Varieties: Variety Recommendations for Bluegrasses, Tall Fescues, Fine Fescues Ryegrasses, and Buffalograss – #562
- Buffalograss Lawns – #565
- Fine Fescue Lawns – #564
- Hybrid (Kentucky X Texas) Bluegrasses for Turf Use in Colorado – #563
- Native Grass Lawns – #567
- Sources of Grass Seed, Sod and Plugs for Colorado Lawns – #566
- Turfgrass Species Selection Guidelines – #561

Mowing

Extension Fact Sheets

- Lawn Care - #7.202
- Eliminate Grass Clipping Collection - #7.007

Lawn Fertilization

Extension Fact Sheets

- Lawn Care - #7.202
- Nitrogen Sources and Transformations – #0.550
- Organic Materials as Nitrogen Fertilizers – #0.546
- Soil Testing – #0.501
- Soil Testing – Selecting an Analytical Laboratory – #0.520
- Soil Testing – Soil Test Explanation – #0.502
- Soil Testing – Soil, water and plant testing – #0.507

Lawn Irrigation

Extension Fact Sheets

- Lawn Care - #7.202
- Irrigation: Inspecting and Correcting Turf Irrigation Systems - #4.722
- Watering Established Lawns - #7.199
- Operating and Maintaining a Home Irrigation System - #7.239

Thatch and Compaction Management

- Lawn Care - #7.202

Lawn Establishment and Renovation

Extension Fact Sheets

- Lawn Care - #7.202

- Renovating the Home Lawn - #7.241

CSU TurfNotes

- Lawn Renovation: Terminology and Guidelines - #820

Turf Weed Management

Extension Fact Sheets

- Lawn Care – #7.202
- Control of Weedy Grasses in Home Lawns – #3.101

Books

- ***Integrated Turfgrass Management for the Northern Great Plains***. 1997. Baxendale, F.P. and Gaussoin, R.E. (eds.) University of Nebraska. Publication EC97-1557. 236 pages.
- ***Fundamentals of Turfgrass Management***. 2003. Christians, N.E. John Wiley & Sons. 368 pages. 2nd edition.
- ***Identifying Turf and Weedy Grasses of the Northern United States***. 2005. Pederson, D. and Voigt, T. University of Illinois Extension. 63 pages. Publication C1393. http://www.pubsplus.uiuc.edu
- ***Lawns: Your Guide to a Beautiful Yard.*** (2002 and 2007). Christians, N., Ritchie, A. and Mellor, D. Meredith Publishing. 1st edition ISBN 0696212706; 2nd edition ISBN 9780696229695.
- ***Weeds of the West***. 1991. The University of Wyoming. 630 pages.

Review Questions

Turfgrass Species/Variety Selection

1. What is the best grass to plant in Colorado lawns?
2. What is the best grass to plant if you don't want to water a lawn?
3. What grass can grow with only a "little" irrigation?
4. Can zoysiagrass grow in Colorado? What will happen if I plant it anyway?
5. What is the best grass for a shady lawn?
6. Which grass grows best in salty soil?
7. What is the best grass to plant over my septic leach field?
8. What grass can I plant if I don't want to mow my lawn very often?
9. I would like to have a backyard putting green. What kind of grass is used?

Mowing the Lawn

1. What is the best mowing height for lawns?
2. My neighbor mows their lawn 2 or 3 times a week. I mow only on Saturday morning. Who is right?
3. Should I mow higher or lower during the summer?
4. Will I have less turf disease if I mow my lawn shorter in the fall, just before winter?

5. Shouldn't grass clippings be collected because they create thatch in lawns?

6. My lawn gets a brownish cast after I mow. What is the problem?

7. I see wheel marks in my lawn after it is mowed. What causes this to happen?

8. How should I mow my lawn when it gets very tall?

9. Do I have to buy a mulching mower to return my grass clippings?

10. What is the best mower? Rotary or reel?

11. Can I compost my grass clippings, or use them as mulch, in my gardens?

Lawn Fertilization

1. What is the best fertilizer for my lawn?

2. How often should I fertilize my lawn?

3. How important is it to use a "complete" lawn fertilizer?

4. Is liquid lawn care better (or worse?) than dry/granular lawn care?

5. How do I know if I am applying the correct amount of fertilizer to my lawn?

6. Should I "winterize" my lawn? What does that mean, and what does it do for my lawn?

7. Is it OK to fertilize after aerifying my lawn?

8. Isn't organic fertilizer better for my lawn than synthetic fertilizer?

9. Will I have to fertilize more or less if I leave my grass clippings on the lawn?

10. Should the fertilizer that I use have iron in it?

11. Should sulfur be used to lower a lawn's pH?

Lawn Irrigation

1. Doesn't Kentucky bluegrass need more water than all other lawn grasses?
2. For how long should I run my sprinkler system?
3. Is it OK to water my lawn every 3-5 days, even though my neighbors water their lawns every day?
4. Is it bad to water my lawn every day?
5. Will I get "fungus" if I water at night?
6. At what time of the day is it best to water my lawn?
7. Should I water my lawn in the winter?
8. I have brown spots in my lawn, even though I water every other day. What is causing these dry spots?
9. My new tall fescue lawn (which is supposed to save water) seems to need as much water as my old bluegrass lawn. What is the problem?
10. How should I water my newly seeded/sodded lawn?
11. Should I water my lawn after I fertilize it?
12. Should I ever water my buffalograss lawn?

Thatch and Compaction Management

1. What is thatch?
2. Why do my neighbors' lawns NEVER seem to get thatchy, while mine always seems to be that way?
3. Can I topdress my lawn to get rid of thatch?
4. Do power rakes (dethatchers) work well?
5. Are there any liquid or granular "dethatching" products that work? How about ones which claim to relieve soil compaction?
6. What are some symptoms of soil compaction in a lawn?
7. What is the best time of the year to aerate a lawn?
8. How many times per year should a lawn be aerified?
9. How deep should the aeration core holes be?
10. What should I do with all of those plugs that the aerifier pulls out?
11. Should I topdress the lawn with something to fill in the aerification holes?
12. Does wearing golf spikes aerify my lawn? What about "lawn aeration sandals"?

Lawn Establishment and Renovation

1. Is it better to seed or sod a new lawn?
2. What time of the year can lawns be sodded?
3. When is the best time to seed a lawn?
4. Does soil really need to be tilled before planting a new lawn?
5. Should I bring in topsoil before I plant my new lawn?
6. Before planting my new lawn, how much sand should I add to my soil to loosen it up and improve its drainage?
7. How important is it to amend soil before planting a lawn?
8. What is the best soil amendment?
9. Is hydroseeding a good way to start a lawn?
10. Is "plugging" a good way to start a buffalograss lawn? How does it work?
11. Does "overseeding" help a lawn in any way?
12. When is the best time to overseed a lawn?
13. Is there a way to start a new lawn without going through the process of removing old sod and tilling the soil?

14. How does lawn renovation differ from starting a new lawn from scratch?

Weed Management in Lawns

1. Where do lawn weeds come from? How do they get into a lawn?
2. How do I get rid of the crabgrass in my lawn?
3. Is it important to identify lawn weeds before spraying them with a herbicide? Why?
4. I used a preemergence herbicide this spring and I still have weeds. What went wrong?
5. Can I aerify or dethatch my lawn after I apply my preemergence herbicide?
6. What is the best way to get rid of dandelions? Can I use a preemergence herbicide for dandelions?
7. Is it OK to pull weeds?
8. Do "weed-and-feed" products work well?
9. Are there any "organic" or "natural" weed control products that work?
10. What is the best way to control weeds in my newly seeded lawn?
11. Weeds have come up in the "seams" in my new lawn. Should the sod company replace the sod?
12. What is the best time of the year to spray for weeds?
13. What is the best herbicide to spray for dandelions and other broadleaf weeds?
14. Is it better to spray the entire lawn, or just spot-treat individual weeds? Won't I miss some weeds if I spot-treat?
15. Is it OK to spray lawn weeds growing under my trees? Will the trees be OK?

Miscellaneous Lawn Questions

1. How do I take care of "dog spots" in my lawn?
2. I have high and low spots in my lawn. How can I level them out?
3. Will my lawn care companies mowers and aerifiers bring diseases into my lawn from other lawns?
4. When should I do soil testing on my lawn?
5. If I want to expand my garden areas, what is the best way to kill off areas of my lawn?
6. Is it OK to flood a part of my lawn to make a skating/hockey rink for my children?
7. Can I empty the water from my swimming pool onto my lawn without killing the grass?
8. How long can grass seed last if I don't use all of it?
9. What kind of grass do I have growing in my lawn? How can I find out?
10. My lawn is "lumpy", but my neighbor's is not. What causes the lumps, and why do I have them?

Plant Health Care and the Diagnostic Process

1. Define IPM and PHC.
2. Describe concepts central to PHC?
3. Give examples of common PHC tools used in home lawn care.
4. What is the PIC cycle? What does it explain about lawn problems?
5. In diagnosing *contributing* disorders, why is it important to also identify the *predisposing* and *inciting* factors to the extent possible?
6. List the four steps in the diagnostic process.
7. Give examples of BIOTIC (living) factors that cause turf problems.
8. Give examples of non-living (abiotic) factors that cause lawn problems.
9. Why is it important to correctly identify the turf species in a lawn that is having problems?

10. Define *symptom* and *sign*. Give examples of each.

11. Explain why it is important to understand what is normal versus abnormal when dealing with lawn problems?

12. Why is it important to know the AGE of a lawn as part of the diagnostic process?

13. Why is it important to "start from scratch" with every diagnostic situation?

Diagnosing Abiotic Lawn Disorders

1. Explain how knowing the context of the situation helps in diagnosing the disorder.

2. Explain how painting a mental picture of a lawn problem helps in diagnosing a disorder.

3. Explain how repeating back the details in your own words helps in diagnosing a disorder.

4. Explain how to tactfully change directions with a client when the evidence for the cause of a lawn problem leads down another road.

5. Why is it important to discuss management options ONLY after the problems have been diagnosed?

6. In the landscape setting, what is the universal limiting factor for root growth?

7. What percentage of lawn problems are related to root/soil/water issues?

8. Describe techniques to evaluate soil/root disorders and soil compaction.

9. Why is it important to know if a client uses a professional lawn care company, or is a do-it-yourselfer?

10. Why is it important to look at the ENTIRE landscape (trees, flowers) when diagnosing a lawn problem?

11. Why look to see if the problem is occurring in the back yard/front yard as well – or in neighboring lawns? What can that tell you?

12. What kind of tests can be done to determine whether or not chemical injury has occurred on a lawn?

Diagnosing Biotic Pest Problems on Lawns

1. List the four steps in the diagnostic process.

2. What is the "disease triangle" and how does it apply to diagnosing lawn disease problems?

3. What percentage of summer lawn problems in Colorado are related to irrigation amount/frequency, or other aspects of lawn irrigation?

4. If a client tells you that they get the SAME problem every year, in the same part of the lawn, what are some potential causes of the lawn problem?

5. What is the proper way to obtain a sample of turf for diagnostic purposes? How should it be stored and transported?

6. What do you tell a client who believes that "fungus" has been tracked onto their lawn by a lawn care company's mowing or aeration equipment?

MASTER GARDENER
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CMG GardenNotes #551

Basic Turf Management

Outline:

Reason for lawn problems, page 1
Mowing, page 1
- Lawn clipping and surface water pollution, page 2

Fertilization, page 3
- Selecting a lawn fertilizer, page 3
- When and how much to apply, page 4
- Fertilizer and water pollution, page 5

Irrigation, page 6
- How much water?, page 6
- How often should a lawn be watered?, page 7
- What are some signs that turf need to be watered?, page 7

Thatch, page 8
- Power raking for thatch management, page 9
- Core cultivation or aerating, page 9

Soil compaction, page 9
Weed management, page 10
Insect and disease management, page 11

Reasons for Lawn Problems…

Although there are many specific reasons to which one could attribute lawn problems, the most common general reasons include:

- Poor management decisions (soil compaction, improper mowing, irrigation, fertilization, pest management)
- Using poorly adapted species or cultivars. Limitations in resources (water, time/labor, dollars)

Mowing

The two most important facets of mowing are mowing **height** and **frequency**. The **preferred height** for all species in a lawn is two and half to three inches. Mowing to less than two inches can result in decreased drought and heat tolerance (due to shallow rooting and reduced photosynthesis) and encouraged weed invasion. Higher encourages insects, diseases, and weeds. Mow the lawn at the same height all year. There is no reason to mow the turf shorter in late summer or in the fall.

Mow the turf often enough so no more than one-third of the grass height is removed at any single mowing. This may mean mowing a bluegrass or fescue lawn every three to four days during the active spring growth period, but only once every seven to 10 days at other times of the year when growth is slowed by heat, drought or cold. If weather or another factor prevents mowing at the proper time, raise the height of the mower temporarily to avoid cutting too much at one time. Cut the grass again a few days later at the normal mowing height. [Figure 1]

Figure 1. Mow often enough that no more than 1/3 of the grass height is removed in any single mowing.

Let **grass clippings** fall back onto the lawn while mowing, unless they are to be used for mulching elsewhere in the landscape. Grass clippings decompose quickly and provide a source of recycled nutrients (equivalent to 1 to 1½ fertilizations per year) and organic matter for the lawn. Although a mulching or recycling mower makes this easier to do, clippings can be recycled into the lawn using any mower (as long as the 1/3 rule of mowing frequency is used). Grass clippings do not contribute to thatch accumulation.

Lawn Clippings and Surface Water Pollution

Lawn clippings and leaves mowed, swept, or blown onto the street are the major source of phosphorus pollution in urban lakes and streams. With side discharge lawnmowers, mow in a direction to prevent clippings from being blown onto the street, driveway, and other hard surfaces. Do not sweep or blow lawn clippings into the gutter and street. [Figures 2 and 3]

Figure 2. In a Minnesota study, 60 to 80% of the phosphate loading of surface water in an urban setting came from lawn clippings and leaves that were mowed or blown into the streets.

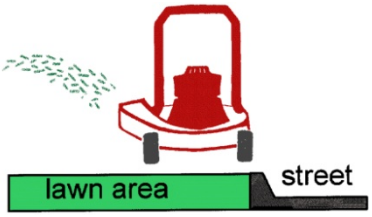

Figure 3. When mowing the lawn, mow in a direction to prevent clippings from being blown into the street.

Also, leave an unmowed grass buffer strip edging any lakes, streams, ponds, and wetlands. [Figure 4]

Figure 4. To reduce surface water pollution, leave an unmowed buffer strip around lakes, streams and ponds.

In a natural setting, rain and snowmelt absorbs mostly into the soil. Air-borne pollutants and pollen washed out of the air are broken down by soil microorganism activity. The nitrogen and phosphorus released from the decay of grass, leaves, and other organic matter recycle back into the soil.

However, in the landscape setting, the water cycle is greatly changed by large areas covered by hard surfaces (streets, driveways, walks, parking lots, compacted soils, and buildings). In a typical landscape setting 55% of a rainfall moves as surface runoff, compared to only 10% in a naturalized setting. Nutrients from grass and leaves (along with fertilizers, pesticides, and other water-soluble pollutants) readily wash off the hard surfaces into the storm sewer system. Here the pollutants end up in local streams, ponds, and lakes.

Fertilization

Selecting a Lawn Fertilizer

Nitrogen (N) is the most important nutrient for promoting good turf color and growth. However, do not over-stimulate the turf with excess nitrogen, especially during the spring and summer. Over-fertilization can contribute to thatch buildup with some species, as well as increased mowing and irrigation requirements. Under-fertilization of some species (bluegrass and ryegrass, for example) can result in poor turf color and turf thinning, which can encourage weed and disease problems. Turf species differ in both the amount of nitrogen required to keep them healthy, as well as the best time of the year to fertilize them.

Balanced or complete fertilizers contain various amounts of phosphorus, potassium, iron, and sulfur. They are a good safeguard against a potential nutrient deficiency and there is no harm in using a “complete” fertilizer. However, if you leave clippings on the lawn, these nutrients are recycled back into the lawn, so there is little likelihood of seeing these deficiencies. Besides nitrogen, the most commonly deficient nutrient in lawns is iron (Fe).

Organic fertilizers will work as effectively as synthetic types. However, it is important to understand the release characteristics of the different fertilizers so that they can be used at the correct times of the year. Organic fertilizers typically release nutrients more effectively when soils are warm and moist. Many synthetic

types work well when soils are cooler, but some synthetic types work like the natural organic sources.

Better lawn fertilizers include a quick release form of nitrogen for quick green-up, plus slow-release forms of nitrogen for sustained greening. Examples are listed in Table 1.

Table 1. Example of Quick and Slow Release Fertilizers

Quick-Release Nitrogen for fast green-up	Slow-Release Nitrogen for sustained green
Ammonium sulfate	Resin-coated urea
Ammonium nitrate	Sulfur-coated urea
Potassium nitrate	Isobutylidene diurea (IBDU)
Urea	Methylene urea
	Urea formaldehyde
	Compost and manure
	Poultry waste
	Poultry feathers

When to Fertilize and How Much to Apply

The natural grass growth cycle influences proper fertilization time for lawns. Figure 5 illustrates typical root and shoot growth patterns of cool season turfgrass species. [Figure 5]

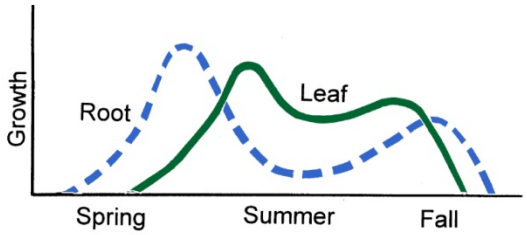

Figure 5. Growth cycle of roots and shoots for cool season turf.

Figure 6 on the right illustrates the influence on shoot growth when nitrogen fertilizer is applied. Heavy spring fertilization promotes shoot growth, reducing carbohydrate energy reserves and stress tolerance. [Figure 6]

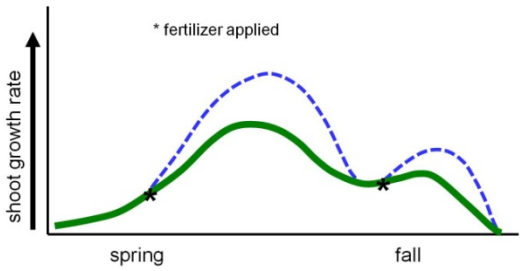

Figure 6. Influence on shoot growth for nitrogen fertilization.

Benefits of Fall Fertilization on Cool Season Home Lawns

- Enhances storage of carbohydrate energy reserves
- Strengthens root system
- Increases shoot density
- Increases stress tolerance
- Better fall and winter color
- Earlier green-up in spring

Timing and Application Rate

Timing and application rates are given in Table 2. If lawn clippings are returned to the lawn, reduce application rate by ¼ to 1/3.

Table 2. Fertilizer Application Schedule for Established Colorado Lawns[1, 2]

Turfgrass species		Mid-March to April[3]	May to mid-June	July to early August	Mid-August to mid-September	Early October to early November[4]
(Nitrogen application rates are in pounds of nitrogen per 1,000 square feet of lawn area.)						
Cool Season Species	High maintenance Bluegrass and Ryegrass	½ to 1	1	Not required	1	1-(2)
	Low Maintenance Bluegrass	½	½-1	Not required	1	(1)
	Turf-Type Tall Fescue	½	½-1	Not required	1	(1)
	Turf-Type Fine Fescue	½	½-1	Not required	½-1	Not required
Warm Season Species	Buffalograss, Blue Grams, and Bermudagrass	Apply no N	½-1	½-1	Apply no N	Apply no N

1 Nitrogen applications can often be reduced by 1/4/ to 1/3 when grass clipping are returned to the lawn during mowing. Nitrogen and other nutrients contained in the clippings are recycled to the lawn as they decompose. **Grass clippings do not contribute to thatch accumulations in lawns.**

2 On sandy soils, use slow-release nitrogen fertilizers (sulfur-coated ureas, IBDU, and natural orgainic-based fertilizers) throughout the year to reduce the potential for leaching loss. On very sandy soils, do not fertilizer turf after late September. Nitrogen can leach into ground water during the winter months.

3 The March-April nitrogen application may not be needed if fertilized in late fall (September to November) the previous years. If spring green-up and growth is satisfactory, delay fertilizing until May or June.

4 Make the final fall nitrogen application (October-November) while the grass is still green and at least two to three weeks before the ground begins to freeze. Optional N applications shown in (). Use extra nitrogen applications where a higher quality turf is desired or on a heavily used turf.

Fertilizers and Water Pollution

Home lawn management techniques play a significant role in protecting or polluting surface water. Popular press has incorrectly labeled lawns as a major contributor to water pollution. It is not the lawn, but rather the management style of the gardener that become the problem.

Fertilizers and pesticides (herbicides, insecticides, and fungicides) spread onto hard surfaces (driveways, sidewalks, streets, and compacted soils) will move with surface water into neighboring lakes, streams, and ponds. (Surface water running down the street gutter is not treated before release into local lakes, streams, and ponds.)

However, phosphate fertilizer applied to a lawn or garden soil is bound to the soil and does NOT leach into ground water. The phosphate could move into surface water with soil erosion.

Organic fertilizers are not necessarily safer for the environment. The pollution potential is based on where the fertilizer is applied and application rates. Any fertilizer becomes a potential pollution problem when over-spread into hard surfaces. Over application of both manufacture and organic fertilizers have been linked to ground water contamination.

Potential pollution problems arise from the careless application rather than the type of fertilizer applied. In most Western soils, lawns do not need phosphate fertilizers.

Irrigation

Many factors influence lawn water requirements, and no two lawns will have exactly the same needs. Table 3 gives the typical water requirement (rain plus irrigation) per week. A healthy, high-quality bluegrass or ryegrass lawn may require up to 2 to 2.25 inches of water per week under hot, dry, windy summer conditions; but may require much less when the weather is cool or cloudy. Turf-type tall fescue may perform well with less irrigation than a bluegrass lawn, if it can grow a deep root system and the soil in which it is growing is holding usable water. In many cases, however, a tall fescue may require as much water as bluegrass to look good. [Table 1]

Table 3.
Typical Water Requirement (Rain Plus Irrigation) for Colorado Lawns

	Late April	May & June	July & August	September	Early October
Inches of water per week (irrigation plus rain)	0.75”	1.0”	1.5”	1.0”	0.75”

Buffalograss and blue grama lawns can remain green for weeks without watering, even during the hottest summer weather, with rainfall.

Shady lawns (not in the rooting zone of large trees) and areas protected from the wind require less water over the growing season than more exposed turf. However, the roots of mature trees and shrubs also need water. You may have to water more in mature landscapes where the roots of many plants compete for water. Healthy turf encouraged by proper mowing, fertilizing, and cultivation, uses water more efficiently.

How Much Water?

Each time you water the lawn, apply enough water to moisten as much of the root zone as possible. Use a soil probe or shovel to determine what the average rooting depth is in your lawn. If the roots grow down 6 inches deep, water so the soil is moistened to that depth. It is important to know not only how deep the turf roots grow, but also how deep your irrigation water penetrates. Watering too deeply, especially on sandy soils, wastes water and allows it to percolate past the root zone. [Figure 7]

Figure 7. Typical water (rain plus irrigation) is given in Table 5. However, actual water use jumps around from day to day based on temperature, wind, humidity, and solar radiation (sunny or cloudy).

How Often Should a Lawn be Watered?

Grass growing on a sandy soil must be watered more often than the same grass growing on clay or loam soils. Even after a thorough watering, sandy soils hold little plant-available moisture. They require more frequent irrigation with smaller amounts of water.

Conversely, turf growing on clayey soils can be irrigated less frequently, with larger quantities of water. Watering less often means more efficient water use because of less loss to evaporation. It can also reduce the number of weeds that appear in the lawn. With most soils, do not apply all of the water in a short period of time. If applied too quickly, water will run off of thatchy turf, from sloped areas, or from turf growing on heavy clay or compacted soils. In these cases, it is more effective to apply only a portion of the water and move the sprinkler or switch to another station to water another section of the lawn. Cycling through irrigation stations (“soak cycles”) will promote infiltration and reduce runoff and puddling in low spots. This allows water to soak into the soil rather than run off.

Core cultivation (aeration) can resolve some infiltration problems by reducing thatch and compaction. Wetting agents may enhance water movement into the soil, but they should not be considered a cure-all, especially when compaction and thatch are problems.

What are Some Signs that Turf Needs to be Watered?

A sure sign that turf requires irrigation is a wilted appearance. One symptom is “footprinting,” where footprints on the lawn that do not disappear within an hour or so following traffic. This symptom is soon followed by actual wilting, where

the turf takes on a grayish or purple-to-blue cast. If only a few such spots regularly appear in the same general location, spot water them to delay watering the entire lawn for another day or so. These indicator spots help predict that the entire lawn will soon need watering.

A hardened or toughened lawn, attained through less frequent, deep irrigation, often withstands minor drought and generally has fewer disease problems. It is important, however, that the turf not be allowed to become overly drought-stressed between waterings. This weakens the turf and makes it more susceptible to insect and disease damage and to weed invasion.

During extended dry periods from late fall to spring, it may be necessary to "**winter water**" every four to six weeks if the ground is thawed and will accept water. Pay particular attention to exposed slopes, sites with shallow soil, and south- or west-facing exposures, where winter mites may infest and kill drought-stressed turf during the winter and early spring.

The most efficient **time of day** to water is late evening and early morning (between 9 p.m. and 9 a,m.). It generally is less windy, cooler, and more humid at this time, resulting in less evaporation and more efficient use of water. Water pressure is generally better, optimizing sprinkler distribution patterns. Contrary to popular belief, watering at night (after 9 p.m.) does not encourage disease development in turf.

Thatch

Thatch is a tight, brown, spongy, organic layer of both living and dead grass roots and stems that accumulates above the soil surface. Factors that lead to thatch problems include the following: [Figure 8]

- **Sod over compacted soil** – When sod is laid over compacted soils, a thatch problem will develop in a couple of years.
- **Soil compaction** is a common contributor to thatch build-up as it slows the activity of soil microorganisms.
- **Over fertilization** is a common contributor to thatch build-up as the lawn may be growing faster than the microorganism can break it down.
- **Grass species** – Thatch tends to be a problem on Kentucky bluegrass, bentgrass, and fine fescue lawns. It is rarely a problem with tall fescue or buffalograss.
- **Frequent heavy irrigation** may contribute to thatch as lower soil oxygen levels slow the activity of soil microorganisms.
- **Pesticides** – Excessive use of some pesticides may also slow soil organism activity.

Figure 8. Thatch is a tight, brown, spongy, organic layer of both living and dead grass roots and stems that accumulates above the soil surface.

Grass clippings do not contribute to thatch accumulation and should be returned to the lawn during mowing to recycle the nutrients they contain.

Measure thatch depth by removing a small piece of turf, including the underlying soil. Up to ½ or ¾ inch of thatch is acceptable and will enhance traffic tolerance. The thatch depth can increase quickly beyond this point, making it difficult to control later. As the thatch layer thickens, it becomes the main rooting medium for the grass. This predisposes the turf to drought stress or winterkill and increases the possibility for insect, disease and weed problems. In addition, fertilizers and pesticides applied to a thatchy lawn work less effectively.

Power Raking for Thatch Management

This method of thatch removal has been used for years. Light (shallow) power raking may be beneficial if done often. Deep power raking of a thatch lawn can be damaging, and often removes a substantial portion of the living turf. Used properly, power raking of wet, matted turf can speed spring green up by letting air move into the root zone and warm the turf. Compost all removed thatch and organic material to kill any living grass before it is used as a mulch or soil amendment.

Core Cultivation or Aerating.

This can be more beneficial than power raking. It helps improve root zone conditions by relieving soil compaction, while controlling thatch accumulation. Soil compaction, in fact, is one factor that contributes to thatch buildup. Aeration removes plugs of thatch and soil two to three inches long (the longer, the better) and deposits them on the lawn. Enough passes should be made to achieve two-inch spacing between holes.

What is done with the cores is a matter of personal choice. From a cultural perspective, there may be an advantage to allowing the cores to disintegrate and filter back down into the lawn. Mingling soil and thatch may hasten the natural decomposition of the thatch. The little fluffs of thatch and turf that remain behind can be collected and composted. Depending on soil type, core disintegration may take a few days to several weeks. Irrigation helps wash the soil from the cores. Running over dried cores with a rotary mower can be effective but will dull the blade. If the cores are removed from the lawn, compost before using as a mulch or soil amendment.

Soil Compaction

Soil compaction is the most common problem in lawn quality. With reduced soil oxygen levels, rooting systems will be more shallow. With compaction, the grass roots have reduced access to water and nutrients. Irrigation and fertilization will need to be light and more frequent.

Aerating (removing plugs) once or twice a year will help reduce soil compaction in an established lawn area if enough passes are made to yield plugholes at two-inch intervals. The best time of year to aerate a lawn is late August to late September,

as fewer weed seeds germinate this time of year. Aerating the lawn area around a tree is also the best method to promote tree vigor. [Figure 9]

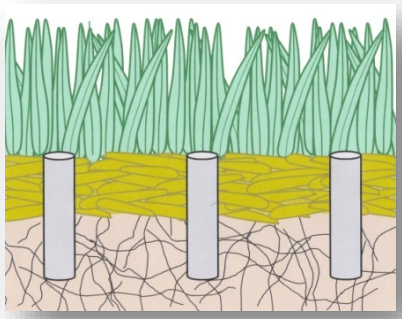

Figure 9. Core aeration helps reduce soil compaction when enough passes are made over the lawn to yield plugholes at two-inch intervals.

Weed Management

Lawn weed killers provide only temporary control if management factors that favor weeds are not addressed. In a thin turf with heavy traffic, weed problems may intensify following the use of weed killers. When the weeds (which help absorb the wear and tear of foot traffic) are removed with weed killers, the lawn may thin. The thin lawn opens the soil to increased weed problems.

Soil compaction is the primary cause of weed problems. Weed management factors include the following.

Core aeration – Soil compaction favors weeds and discourages lawn growth. Common lawn weeds including annual bluegrass, black medic, chickweed, clover, crabgrass, knotweed, prostrate spurge, and plantain thrive in compacted soils. Clover may be a good companion crop for lawns in compacted soils, filling in between the thin grass.

Mowing – High mowing height (shading) and frequent cutting discourages weeds.

Watering – Deep, infrequent watering will drought out many common shallow rooted lawn weeds. [Figure 10]

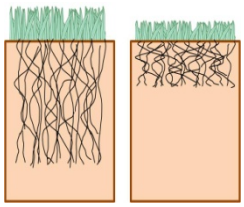

Figure 10. Deep infrequent watering will drought out many common shallow root lawn weeds.

Limited fertilizer – A thick, actively growing turf chokes out most weeds. However, fertilizer will not thicken up a turf when soil compaction is the growth-limiting factor.

For additional information on turf weed management, refer to these CSU Extension Publications available online at www.cmg.colostate.edu.

- ***Annual Grassy Weed Control in Lawns***, Extension Fact Sheet #3.101

Insect and Disease Management

In semi-arid climates like Colorado, turf insect and disease problems are minimal, compared to other areas of the nation.

Frequent use of lawn insecticides may increase the occurrence of lawn insect problems. Some garden insecticides have a potential to kill birds feeding in the treated areas (refer to the insecticide label). Thus, avoid unwarranted treatments of lawn areas.

When controlling soil insects, the insecticide must be watered into the root zone to be effective. Some insecticides get heldup in the thatch and do not water in effectively.

In semi-arid climates like Colorado, lawn diseases are minimal, compared to other areas of the nation. With Colorado's dry climate, fungicides do little to nothing for home lawn disease management. Cultural practices (fertilizer, watering, and soil compaction) are the keys to disease management. [Table 3]

Table 3. Influence of Cultural Practices on Kentucky Bluegrass Diseases

	Soil Compaction	High N	Low N	Thatch	Irrigation	Mowing
Asochyta Leaf Blight	yes	yes		yes	timing	yes
Necrotic Ring Spot	yes	yes		yes	drought with heat	yes
Leafspot and Melting Out	yes	yes	yes	yes	timing (wet/dry cycle)	yes
Gray Snow Mold	yes	yes				
Dollarspot	yes		yes	yes	drought	low
Stripped Smut			yes	yes		
Fairy Ring	yes		yes	yes		

Authors: Tony Koski, PhD, Extension Turf Specialist, and David Whiting, Extension Consumer Horticulture Specialist (retired); Department of Horticulture & LA; Colorado State University. Artwork by David Whiting and Tony Koski; used by permission.

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MASTER GARDENER
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CMG GardenNotes #552

Broadleaf Weed Control in Lawns

Outline:
Where do lawn weeds come from?, page 1
Using herbicides on manage lawn weeds, page 2
Summer broadleaf weed management page 2
Difficult-to-control weeds, page 3
Post emergence weed control products for home lawns, page 4

Dandelion, clover, plantain and other broadleaf weeds are among the most common and troublesome turf pest problems in lawns. Even though most broadleaf weeds can be easily controlled with herbicides, a completely weed-free lawn is neither practical nor environmentally sensible. A safe and sound approach to lawn weed control is to grow a healthy lawn, spot-treat weeds with the correct weed control product as they appear, and avoid the temptation to have a 100% weed-free lawn.

The best way to minimize weed problems in your lawn is through the use of good cultural practices: proper mowing height and frequency, sensible fertilization, and adequate irrigation. On the other hand, lawn weeds are encouraged by: mowing your lawn too short or not often enough; fertilizing too much, not enough, or at the wrong time of the year; and over- or under-watering.

Where Do Lawn Weeds Come From?

- Seeds of broadleaf weeds occur naturally in all soils, and can persist for 30 or more years. They will germinate when a lawn is thin and not healthy, when the seeds are brought to the surface by human or pet traffic, or when the turf is damaged or killed by drought, heavy traffic, insect feeding, or disease activity.

- Cheap, low-quality grass seed often contain unwanted weed seed. If the seed label lists ANY weed seed as a component, DON'T buy it! The best quality grass seed (sold by professional seed suppliers) will almost always be 100% weed-free, and will often cost nearly the same as poor quality products which contains weed seed. READ THE SEED LABEL! The Weed Content of any grass seed you buy (expressed as a %) should be 0%.

- Weed seeds are often brought to a landscape in topsoil or low quality compost. Make sure that all soil or compost comes from a reputable supplier and is guaranteed to be weed-free.

Using Herbicides to Manage Lawn Weeds

The most common herbicide choice is a general- purpose mixture comprised of two or three of the following individual herbicides or active ingredients: 2,4-D; MCPP (mecoprop); and dicamba (Banvel). Multiple active ingredients will control a wider spectrum of broadleaf weeds, than a single active ingredient. Read and follow all directions on the herbicide label if you choose to apply a herbicide to your lawn.

The best time to apply a general-purpose broadleaf herbicide for the control of perennial broadleaf weeds such as dandelion, plantain, and clover is early-September to early November. As winter approaches, perennial broadleaf weeds are storing energy reserves in stems and roots; a fall-applied herbicide will enter the plant and travel to these plant parts with the food reserves. The second best time is in the late spring or early summer period after the weeds have flowered. If applying in the late spring, be extremely cautious with these herbicides near ornamentals, trees, flowers, and vegetable gardens because these plants can be damaged by these herbicides through direct application, drift, and/or volatilization (the herbicide turns into a vapor). This is another reason why we prefer to apply these herbicides in the fall.

- If you only have a few weeds in your lawn, simply spot-apply a herbicide rather than applying to the entire lawn. Apply just enough to wet the leaf and do not apply to the point that the herbicide is dripping off the leaf.
- Apply to actively growing, preferably young weeds.
- Do not apply herbicides when the soil moisture is low and weeds are drought-stressed; an actively growing, healthy, non-stressed weed is the easiest one to control.
- Apply herbicides on a calm, clear day when the air temperature is between 50 and 85F; applying when temperatures exceed 90^{o} F increases the potential for volatilization injury to other plants in the landscape.
- Don't apply if rainfall will occur within 12 hours; avoid applying irrigation for at least 12 hours following a herbicide application.
- Don't mow the lawn for 2 days before and after the herbicide application.
- Do not apply to new turfgrass seedlings until the grass has been mowed at least three times.
- Delay applying a broadleaf herbicide to new sod for 4 to 5 weeks after planting.

Summer Broadleaf Weed Management

Summer annual broadleaf weeds (e.g., spurge, knotweed, purslane, etc.) are very difficult to control for a number of reasons. Depending on the species, these weeds germinate at different times during the summer and mature in a very short period of time. Thus, a single application of herbicide might only control a single weed species because other species have not germinated or have grown

too large to be controlled. Summer annual weeds often have a thick, waxy cuticle layer on their leaf surface to prevent water loss; this layer may also make it more difficult to get herbicide into the weed.

Some annual broadleaf weeds can be effectively controlled by preemergence herbicides. For example, summer annuals like spurge, knotweed, purslane and puncturevine can be controlled with products containing prodiamine, pendimethalin or isoxaben.

Difficult-to-Control Weeds

Weeds such as bindweed, thistles, and wild violets are difficult to control because they spread by underground stems. Multiple herbicide applications may be necessary to completely control difficult perennial weeds, including dandelions. Post-emergence broadleaf herbicides containing 2,4-D, MCPP, dicamba, triclopyr or sulfentrazone should be used.

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

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December 2010

MASTER GARDENER
COLORADO STATE UNIVERSITY
EXTENSION

CMG GardenNotes #553

Dog Urine Damage on Lawns:
Causes, Cures and Prevention

Outline:

Urban legends about urine damage, page 1
- Only female dogs cause spotting in lawns, page 1
- Dog spots are more common with certain breeds of dogs, page 1
- Dog spots occur because urine is alkaline (has a pH above 7.0), page 2
- Dog spots can be prevented by using food supplements that acidify a dog's urine, page 2
- Dog spots can be "cured" by sprinkling the affected area with backing soda, gypsum, dishwashing detergent, etc. to neutralize the urine. page 2

Dealing with dog spots, page 2
- What can be done with the dog(s)?, page 2
- If the affected spots are green and grass growth is stimulated (no browning is apparent), page 3
- If the affected spots are brown (the turf may or may not be dead), page 3

Urban Legends About Urine Damage

Dog urine damage is a common problem for home lawns, and one that has generated numerous home remedies and commercial products claiming to be cures for the spots. This lawn problem is misunderstood when it comes to causes and cures. Dog spotting on turfgrass is caused by the deposition of a high concentration of nitrogen (N)-containing compounds and associated salts on a small area in the lawn. These deposits are often concentrated in a relatively small portion of the lawn, resulting in turf injury or death. Some common "urban legends" surrounding dog urine damage to lawns are:

- **Only female dogs cause spotting in lawns.**

  FALSE. Dog spotting in lawns is most often caused by dogs that squat when they urinate, thus depositing a large volume of concentrated urine in a small area. Most "squatters" are female dogs, but some males do this as well, especially in their own yard. Many male dogs tend to "mark" vertical objects in the landscape (trees, posts, etc.), which presents problems for landscape plants.

- **Dog spots are more common with certain breeds of dogs.**

  MOSTLY FALSE. Dog spotting is more likely to occur (or be more obvious) with larger dogs, since they produce larger amounts of urine. Dog spots can occur with smaller breeds, especially if the dog tends to urinate in a limited area of the lawn.

- **Dog spots occur because urine is alkaline (has a pH above 7.0).**

  FALSE. Dog spots occur because a high concentration of N and salts has been deposited in a very small area of the lawn. In some cases, the added N causes dark green spots and rapid grass growth, without injuring the grass. In other cases, the result is a brown spot – often surrounded by a halo of dark green grass. The browning is caused by the concentrated nitrogen deposited in the center, which burns the leaf tissue, and may or may not cause tissue death. The lower concentration of salts on the periphery fertilizes the grass – resulting in a darker green ring.

- **Dog spots can be prevented by using food supplements that acidify a dog's urine.**

  FALSE. Dog spots do not occur because a dog's urine is alkaline. Products advertised to "naturally" reduce urine alkalinity (including the amino acid, dl methionine, also known as methioform) may cause urinary system problems and can affect calcium deposition in growing bones of younger dogs. The addition of baking soda, potassium citrate and other salts are likewise not recommended as curatives for dog spots. A veterinarian should always be contacted before giving a dog a food supplement known to affect urine pH. There are medically sound reasons for altering urine pH, but the prevention of dog spots in lawns is not one of them. *There are no dietary supplements that have been scientifically proven to reduce either the incidence or severity of dog spotting in lawns.*

- **Dog spots can be "cured" by sprinkling the affected area with baking soda, gypsum, dishwashing detergent, etc. to neutralize the urine.**

  FALSE. The only "product" that can neutralize the urine's negative effects is water. Gypsum and baking soda (sodium bicarbonate) are salts and may compound the problem. Dishwashing detergents, which act as wetting agents or surfactants, may enhance water movement into and through the soil. While this theoretically could promote leaching and dilution of accumulated salts, some dishwashing detergents can burn grass plants.

Dealing with Dog Spots

What can be done with the dog(s)?

- Train the dog to use a non-turf area in the landscape, such as an area covered with mulch or gravel, or select a location where dog spotting will not become an aesthetic problem and damage can be tolerated. *This is the ONLY sure solution for the problem!*

- Always provide adequate water for your pet; increased water consumption will dilute urine, reducing the potential for turf injury.

- While the addition of salt, garlic, tomato juice and other "home remedies" to your pet's food can increase water consumption (thus diluting their urine),

your veterinarian should always be consulted before doing so. The increased salt intake can cause problems for older dogs, as well as for those with heart or kidney conditions.

- Except for the addition of water to a dog's food, no additive or supplement should be fed to your pet without first consulting with your veterinarian. Certain additives may increase a dog's water intake, but can have detrimental and unintended consequences for its health.

If the affected spots are green and grass growth is stimulated (no browning is apparent):

1. Increase nitrogen fertilization frequency and/or the amount of fertilizer to help mask the urine-induced stimulation of growth and color; dark green spots will be especially visible on lawns that are not receiving adequate nitrogen fertilization.

2. Maintain adequate irrigation to prevent accumulation of salts in the soil; drought or lack of water can allow salts to accumulate and injure or kill turf.

If the affected spots are brown, (the turf may or may not be dead):

1. Increase irrigation amount and/or frequency to help dilute salts that have accumulated in the soil. This may help still-living turf recover, and will dilute salts in those areas where the turf has been killed (allowing for more effective re-seeding).

2. When turf has been killed, the dead sod and some soil (0.5-1 inch of soil) can be removed. Re-sod the area with new grass.

3. Individual dead/damaged spots can be re-seeded as follows:

    - In a **Kentucky bluegrass lawn:** Spot seed with Kentucky bluegrass (marginally effective) or perennial ryegrass (more effective). Tall fescue, K31 tall fescue, "dwarf" fescue, or annual (Italian) ryegrass should NOT be used for spot-seeding a bluegrass lawn.

    - In a **tall fescue lawn:** Spot seed with turf-type tall fescue (sometimes called "dwarf" fescue). Perennial ryegrass can also be used, but it has a finer texture and the newly seeded spots will look different from the rest of the lawn. Do NOT use K31 fescue or annual (Italian) ryegrass for spot-seeding a tall fescue lawn.

    - **Fine fescue lawns:** Seed with fine fescue seed. The use of perennial ryegrass or tall fescue is NOT recommended, as the spots will have a different color, texture, and growth rate.

    - **Zoysiagrass and bermudagrass lawns:** Patch using sod from a sod farm, or by transplanting sod from an inconspicuous area of same the lawn.

Consult your veterinarian before supplementing a pet's diet with any product or food additive claiming to reduce dog spots in lawns. Similarly, no "spray-on" product for lawns, claiming to prevent or "cure" dog spots, has been scientifically proven to be effective.

Authors: *Alison Stoven O'Connor, Ph.D, CSU Extension Horticulture Agent, Larimer County; and Tony Koski, Ph.D., Extension Turf Specialist;* Colorado State University Extension.

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MASTER GARDENER
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CMG GardenNotes #554

Earthworms and Nightcrawlers
in the Home Lawn

Outline:
Pesticides and earthworms, page 1
Reducing earthworm activity in lumpy uneven lawns, page 2

Earthworms and nightcrawlers are considered beneficial because they aid in the decomposition of turfgrass thatch and grass clippings, which helps to recycle nutrients and organic matter into a lawn's soil. The tunneling and burrowing caused by earthworm activity provides a natural cultivation effect that is much more effective than that experienced with mechanical core cultivation/aeration equipment. These tunnels help oxygen and water to enter the turf root zone more easily.

Unfortunately, earthworms are regarded by many homeowners to be pests because their burrows and castings can cause a lawn surface to become anywhere from slightly to extremely bumpy.

Several species of earthworms are found in the U.S. The nightcrawler, *Lumbricus terrestris* Linnaeus, and the red earthworm, *Lumbricus rubellus* Hoffmeister, are the most common larger species. Smaller species belong to the genera *Allolobophora* and *Eisenia*. Earthworms are generally found in the top 12" to 18" of the soil because this is where food is most abundant. The worm ingests soil and organic matter that is swallowed and ground in the gizzard. The ejected material (called castings) is used to line the burrow or is deposited at the entrance (on the lawn surface). Earthworm activity is greatest when soil is warm and moist, becoming active when soil thaws in the spring. The worms will move deep into the soil if it becomes dry during the summer.

Pesticides and Earthworms

Preservation of a healthy earthworm population is important for thatch and compaction management in turfgrass systems. When insect, disease, or weed problems occur and a pesticide application is deemed necessary, it is important to select products that have the least detrimental effect on earthworm populations. Some pesticides can cause severe and long-term reductions in earthworm numbers. Most earthworm species grow slowly, live for several years, and have low reproductive rates. Earthworm populations may take many months or years to

recover following intentional or non-intentional pesticide applications that reduce worm populations.

To reduce detrimental effects of pesticide use on earthworm populations in lawns:

1. Apply pesticides only when needed; eliminate preventive applications whenever possible.
2. Use spot applications of pesticides.
3. Select products that are least injurious to earthworms and do not exceed labeled rates.
4. Avoid pesticide applications when earthworms are near the soil surface (soon after a rain or irrigation).

Reducing Earthworm Activity in Lumpy Uneven Lawns

In many lawns earthworm activity can cause the surface to become mildly to excessively lumpy and uneven. Where earthworm populations approach nuisance levels, some measures can be taken to discourage activity or to reduce the impact of earthworm activity on surface smoothness.

1. Core cultivation of the lawn and spreading of the plugs throughout the lawn may cause some leveling of a severely bumpy surface.

2. The use of heavy rollers to flatten the lawn surface can be effective. Heavy rolling is likely to cause soil compaction. Heavy rolling should be followed by core cultivation.

3. Topdressing (spreading a thin layer of soil or other material) the bumpy lawn can provide some relief. Appropriate materials might include good quality compost, composted sewage sludge, or soil from an adjacent vegetable garden or flowerbed. Spread ½-1 inch of material on the lawn and rake it into the grass canopy; repeat every 1-2 weeks, until surface is acceptably level. Sand (on a clay soil), peat moss, sawdust, or wood shavings are not good topdressing materials because they will disrupt water movement into the soil and may cause nutrient deficiencies to occur.

4. Earthworms prefer moist soil. Less frequent irrigation that allows the soil surface to dry out between irrigation events may reduce surface activity of the earthworms.

5. Dethatching mowers, also known as power rakes, can be used to level the earthworm mounds. Adjust the power rake so that the teeth operate low enough to shave off the tops of the worm mounds, but not so low that the crowns and roots of the grass plants are pulled up. It is best to do this early in the spring, before the lawn has begun greening up.

6. Earthworms are generally intolerant of acidic soils (pH < 6.0). On some soils (those in the eastern, Midwest and southern US) the use of sulfur, ammonium sulfate, ammonium chloride, or other acidifying fertilizers can reduce worm activity. However, it important to note that *the pH of most soils in Colorado lawns can NOT be easily acidified by fertilizer application.*

7. Lawn care operators may not apply any pesticide for the purpose of controlling earthworms.

8. Employees of Colorado State University Extension may not recommend any pesticide application for the purpose of controlling earthworms in any turf area.

The presence of earthworms in the home lawn is an indicator of a healthy soil environment. Earthworms aid in the breakdown of thatch and other organic matter and create tunnels, which promote water infiltration, oxygen movement, microbial activity, and deeper grass rooting. Rich in nutrients, their castings are a combination of minerals moved from deep in the soil and from their main food sources: grass clippings and thatch. Although the bumpiness caused by earthworm mounds can be annoying, the homeowner should consider the benefits provided to their lawn's health and avoid the temptation to use pesticides to reduce or eliminate earthworm populations in the lawn.

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

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December 2010

MASTER GARDENER
COLORADO STATE UNIVERSITY
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CMG GardenNotes #561

Turfgrass Species Selection Guidelines

Outline:

Species selection, page 1
What does "low maintenance" mean?, page 2
Kentucky bluegrass, page 2
Turf-type tall fescue, page 3
Buffalograss, page 4
Perennial Ryegrass, page 4
Fine Fescue, page 5
Blue Grama, page 5
Crested Wheatgrass, page 6
Zoysiagrass, page 6
Bermudagrass, page 7
Alkaligrass, page 7

Species Selection

There are many factors that SHOULD be considered when selecting a turfgrass species for planting in a new lawn situation.

- First, consider what will be the use of the turf. For example, is it being planted strictly for aesthetic purposes, or will it be played on heavily and/or frequently.
- What is the desired level of visual quality?
- Will the turf receive a high level of maintenance? Alternatively, will it receive only minimal amounts of water and fertilizer, and little or no pest control?
- What is the owner's interest in irrigated, summer green lawns versus a summer dormant lawn? Is there a readily available supply of inexpensive water? On the other hand, is the water supply limited or expensive? Is the owner willing to pay for the amount of water that might be required to maintain a specific turfgrass species at the desired quality level? Is the water salty?
- Is the soil sandy or clayey? Does the soil have high salt levels or poor drainage?
- Is the lawn area sunny or shady?
- What is the elevation?
- How quickly must a turf cover appear, and how hard is the owner willing to work in establishing the lawn?
- Is there a history of a certain insect, mite, or disease problems on the site?
- Is there willingness to use pesticides, or are they totally out of the question?
- Will the lawn be sodded or seeded?

Unfortunately, few people ask such questions before establishing a new turf. The basic assumption is that Kentucky bluegrass must be planted, and little consideration is given to alternative turfgrass species. The following descriptions of available turfgrass species,

including available cultivars (a cultivar is a cultivated or man-made variety of a plant species), provide information that might allow selection of a species better-adapted for a specific situation. There are large numbers of commercially-available cultivars for most turfgrass species, but all of them will never be available for sale by one seed company, much less a nursery or garden center. Local seed companies align themselves with specific national seed growers, thus limiting the number of cultivars sold by them. The selection of species and cultivars offered by even the best garden centers is generally quite limited. Local seed companies are often willing to sell smaller amounts of seed to the homeowner, and usually at a very reasonable price.

What Does "Low Maintenance" Mean?

"Low maintenance turf" means different things to different people. To some, it means NO maintenance (no water, no fertilizer, no/infrequent mowing, no/little pest control), such as the way in which roadside turf is managed. To most, however, it means reduced levels of irrigation, fertilization, and pest control. The quality expectations of a low maintenance turf should not be high, since minimal inputs can only be expected to produce a turf of minimal quality. Proper selection of species and/or cultivar is important, because some species do not persist under low maintenance or neglect.

Turfgrass Persistence Under Low Maintenance
(1=best persistence; 10=worst persistence)

Common Name	Scientific Name	Persistence Ranking	
Buffalograss	*Buchloe dactyloides*	1	**BEST**
Blue grama	*Bouteloua gracilis*	1	
Wheatgrass	*Agropyron spp.*	1	
Smooth bromegrass	*Bromus inermis*	1-2	
Hard fescue	*Festuca longifolia*	2-3	
Sheep fescue	*Festuca ovina*	2-3	
Creeping fescues	*Festuca rubra* spp. *rubra/trichophylla*	3-5	
Chewings fescue	*Festuca rubra* spp. *commutata*	3-5	
Tall fescue	*Festuca arundinacea*	5-6	
Common Kentucky bluegrass	*Poa pratensis*	6	
Improved Kentucky bluegrass	*Poa pratensis*	8	
Perennial ryegrass	*Lolium perenne*	9-10	**WORST**

Kentucky Bluegrass (*Poa pratensis*)

Kentucky bluegrass, *Poa pratensis*, has been a standard for the beautiful green lawn since the days of King Louis of France due to its dense stand, rich bluish green color, and wear tolerance. There are hundreds of different cultivars with vast differences characteristics and management needs.

Advantages

- \+ Sod-forming (has underground rhizomes)
- \+ High recuperative potential and rate
- \+ Soft, easily mowed leaves
- \+ High quality (color, density)
- \+ Readily-available in sod form
- \+ Excellent heat and cold tolerance

+ Good drought resistance (can go dormant and survive long periods without water)

Disadvantages

— Thatch-former
— More disease (leaf spot, necrotic ring spot, Ascochyta leaf blight)
— Poor to fair shade tolerance
— More frequent insect problems (billbug, grubs, mites)
— Poor to fair salt tolerance
— Higher nitrogen requirement than other grasses
— May require more frequent irrigation to maintain quality
— Will invade flower and vegetable gardens

Suggested Seeding Rate: three to five pounds per 1,000 square feet

Turf-Type Tall Fescue (*Festuca arundinacea*)

Seed distributors often sell turf-type tall fescue blends that are combinations of two to five different tall fescue varieties. These blends are ideal for home lawn use and are generally less expensive than buying a single variety. The use of tall fescue named "K-31" or "Kentucky 31" is discouraged, as this type of tall fescue provides poor quality turf.

Advantages

+ Establishes quickly
+ Drought resistant (deep-rooted)
+ Wear-tolerant
+ Few disease problems
+ Few insect problems
+ Turf-types possess nice texture and deep green color
+ Excellent heat and cold tolerance
+ Slow thatch-former
+ Does well in shade
+ Good salt tolerance
+ Slow to invade flower and vegetable gardens

Disadvantages

— Seeding can produce poor results unless done very carefully.
— Sod availability more limited, compared to bluegrass.
— Leaf shredding more common when mower blade is dull.
— Some varieties must be mowed more often than bluegrass.
— Heavy use by children and/or pets can produce worn areas that may require overseeding.
— If rooting is restricted by poor soil, may require the same amount of irrigation as Kentucky bluegrass (or more!)

Suggested Seeding Rate: six to eight pounds per 1,000 square feet

Buffalograss (*Buchloë dactyloides*)

Advantages

+ Excellent heat and drought resistance
+ Excellent cold tolerance
+ Few disease and insect problems
+ Sod-former (aggressive stolons)
+ Low fertility requirement
+ Requires only infrequent mowing
+ Can be established from seed, sod, plugs
+ A native species

Disadvantages

— Warm season grass; becomes straw-colored with first hard fall frost and begins to green up in mid to late May.
— Poor to fair shade tolerance. Needs at least a half day of full sun.
— Fair salt tolerance. Not adapted to soils with greater than 5–8 mmhos/cm salinity.
— Not recommended for use over 6,500 feet elevation. A protected, sunny, south- or west-facing exposure may allow buffalograss to be used successfully at 6,500 to 7,000 feet.
— Not well adapted to very droughty, sandy soils—unless supplemental irrigation is provided.
— Will not tolerate heavy, constant traffic. Not well adapted to small, heavily used home lawns, athletic fields (soccer, football), or other situations where foot or vehicular traffic will be concentrated and constant.
— Prone to weed invasion if overfertilized or overwatered.
— Aggressive stolons may invade flower beds, neighboring lawns.

Suggested Seeding Rate: two (if drilled) or three (if broadcast) pounds per 1,000 square feet

Perennial Ryegrass (*Lolium perenne*)

Advantages

+ Quick establishment
+ Wear tolerant
+ Good color and density
+ Does not form thatch
+ Compatible in color and texture with bluegrass
+ May contain endophytes
+ Good heat tolerance
+ Can possess good drought resistance (if deep-rooted in well-prepared soil)
+ Moderate to good salt tolerance (6-10 mmhos/cm)

Disadvantages

- — Poor recuperative potential
- — Leaf shredding common (dull mowers)
- — Disease prone (rust, leafspot)
- — Poor shade tolerance
- — Unavailable as pure sod
- — Poor freezing tolerance if flooded or exposed to wind

Suggested Seeding Rate: six to eight pounds per 1,000 square feet

Fine Fescues (*Festuca* spp.)

Advantages

- + Quick germination (but matures slowly).
- + Fine leaf texture
- + High leaf density
- + Prefers low nitrogen fertility
- + Tolerates poor (rocky, sandy, clay) soil conditions
- + Drought resistant (but will go dormant)
- + Moderate salt tolerance (6-10 mmhos/cm)
- + Very good shade tolerance
- + Very cold tolerant
- + EXCELLENT high elevation/mountain grass

Disadvantages

- — Moderate wear tolerance (NOT for high traffic areas)
- — Slow to recuperate from traffic injury
- — Can become thatch
- — May be difficult to mow (lays down; "tough" leaves)
- — May go dormant during extended (1-2 weeks) heat (90s +)
- — Susceptible to red thread, leaf spot, and dollar spot

Suggested Seeding Rate: five pounds per 1,000 square feet

Blue Grama (*Bouteloua gracilis*)

Advantages

- + Excellent cold, heat, drought tolerance
- + Low fertility requirement
- + Requires infrequent mowing
- + Few insect and disease problems
- + Rapid germination and establishment
- + Native species

Disadvantages

- — Warm season grass that becomes straw-colored with first frost in fall, greening up in late spring (May)
- — Not traffic tolerant
- — Not shade tolerant
- — Not a sod-forming grass
- — Not adapted to high elevations (>6,500 feet)
- — High seed cost
- — Difficult to seed (high % inert component; "fluffy")

Suggested Seeding Rate: one to three pounds per 1,000 square feet

Crested Wheatgrass (*Agropyron* spp.)

Advantages

- + Excellent cold, heat, drought tolerance
- + Low fertility requirement
- + Rapid recovery from dormancy (drought)

Disadvantages

- — Becomes dormant quickly under drought conditions
- — Does not form a tight sod (bunch grass)
- — Light green or blue-green color

Suggested Seeding Rate: five pounds per 1,000 square feet

Zoysiagrass (*Zoysia* spp.)

Zoysiagrass use is not recommended for Colorado, especially when it is introduced to the lawn via the use of plugs. Solid sodding can be successful, but no zoysiagrass sod is available in Colorado. Some winter dieback can be expected with this species. Since it is a warm-season grass, it becomes straw-colored with the first fall frost and remains so until the following spring (May). It can be quite invasive (forms stolons and rhizomes) and nearly impossible to eradicate once established. This species requires close mowing (one to one and half inches), and can become quite thatchy. The cultivar 'Meyer' is the only commercially available cultivar with adequate cold tolerance.

Suggested Seeding Rate: usually not seeded, but some seeded types now available

Bermudagrass (*Cynodon* spp.)

There are naturalized biotypes of bermudagrass throughout Colorado, even in the northernmost portions of the state. Some people have used these bermudagrasses for home lawn purposes, often with great success. They will perform in a fashion similar to buffalograss, since Bermuda is also a warm-season grass. It can be quite invasive and aggressive because of prolific stolon and rhizome production. When found in most lawn situations, it is considered a weed. It is quite difficult to eradicate once it becomes established in a lawn. The varieties Yukon and Riviera have demonstrated excellent cold hardiness and persistence in Fort Collins research plots since 2005.

Alkaligrass (*Puccinellia distans*)

This is a specialty grass, useful for high saline soil conditions. One commercially available cultivar, 'Fults', was developed at Colorado State University. Other commercially available cultivars include 'Salty' and 'Fults II'. Alkaligrass resembles fine fescue in appearance and is a bunch grass. It requires moist soil conditions.

Suggested Seeding Rate: two to three pounds per 1,000 square feet

Inclusion of variety or trade names does not imply any endorsement; exclusion does not imply any criticism. Inclusion neither guarantees ready availability, nor implies any level of performance.

Availability of grasses named here is not guaranteed; see your local seed supplier for availability.

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

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MASTER GARDENER
COLORADO STATE UNIVERSITY
EXTENSION

CMG GardenNotes #562

Best Turf Varieties:

Variety Recommendations for Bluegrass, Tall Fescue, Fine Fescue, Ryegrass, and Buffalograss

Recommendations for Kentucky Bluegrasses

America
Arcadia
Avalanche
Award
Awesome
Bedazzled
Bewitched
Bordeaux
Brilliant
Cheetah
Diva
Everest
Full Moon
Julius
Kingfisher
Langara
Limousine
Marquis
Midnight
Midnight Star
Moonbeam
Moonlight
Moon Shadow
NuDestiny
NuGlade
Odyssey
Orfeo
P-105
Prosperity
Quantum Leap
Rampart
Rugby II
SR2284
Touchdown
Ulysses

Cultivar names in **BOLD** have exhibited better traffic tolerance

Recommendations for Turf-Type Tall Fescues

3rd millennium SRP
AST 7002
AST9001
AST9002
AST9003
Biltmore
Bullseye
Cezanne
Compete
Darlington
Einstein
Escalade
Faith
Firecracker LS
Firenza
Gazelle II
Hudson
Hunter
Justice
Lindbergh
Magellan
Monet
Mustang 4
Padre
Raptor II
Rembrandt
Renovate
Reunion
Rhambler SRP
Skyline
Speedway
Spyder LS
SR 8650
Talladega
Tulsa Time
Turbo
Van Gogh
Wolfpack II

Recommendations for Fine Fescues

Chewing	Creeping	Hard	Sheep's
Ambassador	Aberdeen	Berkshire	Quatro
Compass	Audubon	Firefly	
Intrigue 2	Cardinal	Gotham	
J-5 (Jamestown 5)	Class One	Oxford	
LaCrosse	Epic	Predator	
Longfellow II	Fortitude (TL 53)	Reliant IV	
SR 5130	Garnet	Scaldis	
Treasure II	Pathfinder	Spartan II	
Zodiac	Shoreline	SR 3000	
	Wendy Jean		

Recommendations for Perennial Ryegrasses

1G squared	Forever	Phenom
Accent II	Fusion	Pizzazz
Allstar 3	Galatti	Plateau
Amazing GS	Grand slam 2	Pleasure Supreme
Apple GL	Gray star	Premier II
ASP 6004	Harrier	Primary
Attribute	Hawkeye 2	Prototype
Baccarat	Homerun	Quick Silver
Barlennium	Inspire	Regal 5
Brea	Keystone 2	Repell GLS Revenge
Brightstar SLT	Kokomo II	GLX
Buena Vista	La Quinta	Ringer II
Cabo II	Line drive GLS	Secretatiat II GLSR
Caddieshack II	LS 2300	Silver Dollar
Calypso 3	Mach I	Soprano
Cutter II	Majesty II	SR 4600
Dart	Monterey 3	Stellar GL
Dasher 3	Nexus XR	Sunshine 2
Defender	Overdrive	Top Gun II
Derby Xtreme	Palace	Transformer
Edge II	Palmer IV	Uno
Exacta II Glsr	Palmer V	Wayfarer
Fiesta 4	Panther GLS	Wind dance 2
Fiji	Paragon GLR	Zoom
Firebolt	Pentium	

Recommendations for Buffalograss

Seeded Varieties
(will be a mixture of male and female plants)

Bison
Bowie
Cody
Plains
Topgun

The varieties Texoka and Sharp's Improved will produce a lesser quality lawn. Certain varieties of buffalograss are only available in vegetative form (sod or plugs).

Vegetative Varieties
(female only; planted as sod or plugs)

Prairie (likely to winterkill in northern CO)
609 (may suffer winter injury/winterkill in northern CO)
Legacy
Prestige
Turffalo

These varieties will form the best quality buffalograss lawn, but are more expensive than using the seeded cultivars.

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

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December 2010

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CMG GardenNotes #563

Hybrid (Kentucky X Texas) Bluegrasses
for Turf Use in Colorado

In the 1990s, Dr. James Read of Texas A&M University, successfully crossed Kentucky bluegrass (*Poa pratensis*) and Texas bluegrass (*Poa arachnifera*, a bluegrass species native to the Panhandle of Texas). He named the first commercially available variety 'Reveille'. There are a number of potential advantages to using these Kentucky x. Texas bluegrass hybrids for lawn and sports turf applications in Colorado. The following observations and comments are based on limited research at CSU, as well as field observations and testimonials from sod producers and those who have planted these hybrids in the Western United States.

1. ***Excellent heat tolerance.*** This grass, in fact, seems to grow better the warmer it gets in the summer. The growth and vigor of most Kentucky bluegrass varieties will generally decline under high heat (upper 80s to 100s), which can reduce its traffic and wear tolerance during the hottest times of the growing season. The hybrid bluegrasses appear to maintain more active summer growth, which translates into better traffic tolerance and ability to recover from traffic injury.

2. ***Deep and extensive root production.*** These hybrids produce an extensive root system, which can enhance heat and drought resistance. A dense root system will also improve traffic tolerance, ability to recover from wear, and will improve footing (traction) in a sports turf application.

3. ***Extensive and aggressive rhizome formation.*** These grasses form large, extensive and aggressive rhizomes (underground stems). Different from roots, rhizomes contain growing points that produce new grass plants. Grasses that produce rhizomes are better able to tolerate traffic and will recover more quickly from traffic-induced wear – often without the need to reseed the worn areas. An aggressive rhizome system also means better traction in a sports turf situation.

4. ***Low mowing height tolerance***. Its excellent heat tolerance and aggressive root and rhizome formation characteristics allow this grass, when necessary, to be mowed at lower heights than many Kentucky bluegrasses – especially during the heat of summer. This can be important for "showcase" sports turf applications.

5. ***Potential to require less irrigation***. Variability exists among the hybrid bluegrasses with respect to irrigation requirement and drought resistance. Research has shown some of them to possess very good drought resistance

(compared to other bluegrasses, and even to tall fescue), while as other varieties are only moderately (or have poor) drought resistant. The ability to sustain growth and vigor with less irrigation results from deeper roots and its excellent heat tolerance.

Commercially Available Hybrid Bluegrass Cultivars

- Fahrenheit 90 (Mountain View Seeds)
- Fire and Ice (Turf Merchants)
- Longhorn (Scotts Turf-Seed)
- Bandera (Seed Research of Oregon)
- Spitfire (Seed Research of Oregon)
- Reveille (Gardner Turfgrass)
- Dura Blue (Scotts)
- Solar Green (Scotts)
- Thermal Blue (Scotts)
- Thermal Blue Blaze (Scotts)

Inclusion of cultivar or variety names does not imply any endorsement, nor does exclusion imply criticism.

Availability of grasses named here is not guaranteed; see your local seed supplier for availability.

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

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December 2010

MASTER GARDENER
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CMG GardenNotes #564

Fine Fescues for Lawns

Outline:
Advantages and disadvantages, page 1
Types, page 2
Management of Fine Fescue Turf, page 2

Advantages and Disadvantages of Fine Fescue

The fine fescues are among the most complex groups of turfgrass species, comprising at least five different types. Hard fescue, Chewings fescue, (blue) sheep fescue, creeping red fescue and slender creeping red fescue are the five species or subspecies. While all are fescues, they differ both in appearance and where they are most effectively used. In general, this group of grasses performs well in the cooler, more temperate climates of the world (including cool, maritime locations). I n North America, the fine fescues do well where most cool-season turfgrasses are used. The relative advantages and disadvantages of using the fine fescues for turf are as follows:

Advantages

+ quick germination (but may establish slowly)
+ fine leaf texture
+ high leaf density
+ prefers low nitrogen fertility
+ tolerates poor (rocky, sandy, clay) soil conditions
+ drought resistant (but will go dormant)
+ moderate to very good salt tolerance (6-10 mmhos/cm)
+ good to very good shade tolerance
+ very cold tolerant
+ EXCELLENT high elevation/mountain grass

Disadvantages

- moderate wear tolerance (NOT for constant high traffic areas)
- slower to recuperate from traffic injury
- can become thatchy
- may be difficult to mow (lodges; "tough" leaves)
- may go dormant during extended (1-2 weeks) heat (90s +)
- some are susceptible to red thread, leafspot, and dollarspot

Types

Hard fescue (*Festuca longifolia* or *duriuscula*) is gaining wider use due to its better heat tolerance, relative to the other fine fescues. This better tolerance to warm summer conditions makes it especially well suited to use in the Front Range of Colorado. As with the other fine fescues, hard fescue performs best with minimal nitrogen fertilization and when soil is kept on the drier side (but supplemental irrigation IS required to keep a good hard fescue lawn in Colorado). This is a bunch grass, so uniform seeding at establishment is essential for obtaining a good quality lawn.

Chewings fescue (*Festuca rubra* subp. commutata), named after George Chewings of New Zealand (who discovered and first sold the seed of this species in the late 1800s), is typical of the fine fescues in that it possesses excellent shade tolerance. It has a darker green color and very fine texture, resulting in a very good quality turf. This species does not creep, so uniform seeding is essential.

Creeping red fescue (*Festuca rubra* subp. rubra) is a creeping fine fescue (has rhizomes) that has been used in shady lawn seed mixtures for years ('Pennlawn' was commonly used a number of years ago). A "common type" (possessing lesser turf qualities), grown in large amounts in Canada is sold in lower quality, less expensive seed mixes (sometimes called 'Boreal' in these mixes). Improved cultivars, sometimes referred to as "strong creeping red fescue", are produced in the Pacific Northwest, with a few being imported from Europe.

Slender creeping red fescue (*Festuca rubra* subp. litoralis) produces rhizomes, but is not as vigorous a grower as (strong) creeping red fescue. These fescues are tolerant of lower mowing heights, which can allow their use in golf course fairways. However, the biggest advantage of fine fescues in this grouping lies in their generally good to excellent salinity tolerance. This makes them attractive for use where deicing salts are aggressively used. Their fine texture and compatible color allow them to be mixed with alkaligrass (*Puccinellia distans*). 'Fults' is the most commonly planted alkaligrass variety) for use on salty soils.

Sheep fescue (*Festuca ovina*), sometimes called "blue sheep fescue" is generally used in lower maintenance lawns, performing especially well in infrequently- or un-mowed, naturalized lawn areas. They are long-lived bunch grasses that mix well with wildflowers, without dominating them. Some sheep fescues have been developed to produce a blue-green or glaucous green color (Azay Blue, SR3200), while others are more powder blue or "flat" blue in color (Azay, Quatro).

Management of Fine Fescue Turf

Establishment/Seeding

Use 5-7 pound of seed per 1000 square feet. Late summer/fall (September) fall planting is recommended at lower elevations. Spring or summer planting can be done at higher elevations. Can be dormant seeded (late in fall, when temperatures will prevent germination). Will germinate in 7-10 days, under warm soil conditions.

Mowing

Mow 1-3 inches (or leave unmowed, for naturalizing). A sharp blade is necessary to prevent leaf fraying, for optimal turf quality.

Irrigation

The fine fescues prefer drier soils. Constant root zone moisture will cause rapid decline and thinning, as well as increase the potential for disease. While preferring dry soil, fine fescue lawns REQUIRE supplemental irrigation in Colorado. Fine fescue will require 18-20 inches of supplemental irrigation (compared to 24 inches for bluegrass) in a normal precipitation year (10-11 inches, April to October) along the Front Range; less irrigation. These grasses can go dormant without irrigation, but their dormancy mechanism is not as good as that of Kentucky bluegrass.

Fertilization

The fine fescues require only 1-2 pounds of nitrogen per 1000 square feet per year under average lawn conditions. Where traffic is heavier, on sandy soils and where higher quality is desired, 3-4 pounds of nitrogen can be used. Late season (fall) or early spring nitrogen benefits fine fescue lawns. Summer fertilization may reduce heat tolerance, resulting in partial dormancy. Naturalized (unmowed) fine fescue requires only infrequent fertilization, especially when growing with wildflowers.

Pest Problems

In Colorado the fine fescues will have few pest problems. Possible insect problems include: billbugs, grubs, and winter mites. Dollarspot can be common on some fine fescues; this can be a sign that some nitrogen fertilization is required. Red thread may be common during moist, cool spring or early summer conditions; it rarely causes any permanent turf injury. The fine fescues are generally tolerant of herbicides used on Kentucky bluegrass and other cool-season grasses, but the label should always be consulted before use on fine fescue turf.

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CMG GardenNotes #565

Buffalograss Lawns

Outline:

Available cultivars, page 2
Buffalograss establishment and management, page 2
- Seeding, page 2
- Plugging, page 2
- Sodding, page 3
- Fertilization, page 3
- Moving, page 3
- Irrigation, page 3
- Weed management, page 4
- Disease management, page 4
- Insect management, page 4

Where Buffalograss is not well adapted, page 5

Buffalograss (*Buchloë dactyloides*) is a perennial, warm-season grass species. It is a sod-forming grass that spreads by stolons (aboveground stems) which root at nodes, forming new plants. Buffalograss is native to the North American Great Plains, and displays a wide range of adaptability. An important range and pasture grass for both wild and domesticated animal herds, its use as an alternative lawn grass was proposed as early as the 1930s. Older range-type varieties form an open, low-density turf when mowed; the newer, turf-type buffalograss varieties can form a dense, attractive turf during its active growing season.

Because of its warm-season physiology, this species becomes dormant with the onset of cold temperatures in the fall and breaks dormancy in mid to late spring, well after bluegrass and fescue lawns become green. Buffalograss grows most actively during from late May through early September, becoming brown and dormant with the first hard frost in the fall. Its long dormant period and reputation as an expensive and difficult-to-establish lawn has made it a less-attractive lawn option for many homeowners.

However, the development of attractive turf-type cultivars and greater availability of less expensive sod and plugs has generated new interest in this grass for home lawns. These new varieties are darker green, form a dense, short-growing turf, and are more resistant to weed invasion than previously used varieties. Those who choose to plant newer buffalograss varieties find that their lawn can remain green and attractive on 50-75% less irrigation than Kentucky bluegrass, and that buffalograss requires less frequent mowing, will thrive when fertilized only once or twice yearly, and has good resistance to weed invasion.

Available Cultivars

Turf-type seeded cultivars of buffalograss that will produce a good quality lawn include: Bison, Bowie, Cody, Plains, and Topgun. The varieties Texoka and Sharp's Improved will produce a lesser quality lawn.

Certain varieties of buffalograss are only available in vegetative form (sod or plugs). These varieties will form the best quality buffalograss lawn, but are more expensive than using the seeded types. Commercially available vegetative types include: Prairie, 609, Legacy, Prestige, and Turffalo. Prairie and 609 will suffer significant winterkill during most winters if planted along the Colorado Front Range, and are not recommended except in Pueblo and southeastern CO and in the Grand Junction area. Legacy, Prestige and Turffalo have proven to be quite winter hardy throughout Colorado and will produce high quality buffalograss turf.

Buffalograss Establishment and Management

Acceptance of buffalograss in the marketplace is critically dependent upon the knowledge of proper establishment and management. While it can be considered a low-maintenance grass, proper management is necessary to realize the full benefits of the species. ***The amount of water required to establish a buffalograss lawn from seed, sod or plugs will be equal to (and occasionally greater than) that amount required to establish a bluegrass or tall fescue lawn.***

Seeding

Proper seedbed preparation is critical in obtaining uniform stands. Seed should be planted to half-inch depth (drill seeding is preferred). If broadcast, seed should be covered with ¼ to ½ inch of soil to obtain a reasonable stand. Seeding should begin in mid-late May or early June. Seeding too late in the season (beyond August 1) may result in winter seedling loss. Use a seeding rate of three to five pounds seed/1,000 square feet.

With warm soil and consistent irrigation, germination and appearance of seedlings will occur in seven to 21 days. Preemergent herbicides should NOT be used at the time of seeding, but may be safe after seed has germinated. Apply one pound of nitrogen (N) per 1,000 square feet two to three weeks after the seedlings appear; fertilize again about six weeks later. Irrigate to prevent excessive drying and to maintain active grass growth.

Plugging

The use of pre-rooted plugs can provide complete cover within eight to 12 weeks after planting. Proper soil preparation is essential for successful establishment using plugs. Plant plugs on 12 to 18 inch centers following the last spring frost and at least six weeks prior to the first expected fall frost. Apply one pound of nitrogen per 1,000 square feet using a starter-type fertilizer at planting, and again about six to seven weeks after planting. Irrigate to maintain a moist surface for seven to ten days, and to maintain active grass growth thereafter. The preemergence herbicide pendimethalin (sold as Pre-M or Scotts Halts/Crabgrass Preventer) can be used to prevent weed invasion and is safe to use at the time of planting.

Transplanted plugs will often go dormant (become brown) after planting, even with adequate irrigation. This is quite normal. T he grass will come out of dormancy after the plugs have formed a healthy root system. *It is important that the plugs and soil be kept moist after planting, even though the plugs may appear to be dead or dormant.*

Sodding

Buffalograss can be sodded like many other grass species to produce an instant lawn. Adequate soil preparation and careful post-plant care will aid in sod establishment. Transplanted buffalograss sod should be irrigated like any other transplanted sod - enough water to maintain a moist, but not saturated, rootzone under the sod. It is very common for buffalograss sod to quickly turn brown following transplanting, even when irrigated. It may remain dormant for one to two weeks while new roots are being formed. New, white root growth can be seen on the bottom of the sod after a few days of watering, even though the top of the sod may be entirely brown in color. After enough rooting has occurred, the buffalograss will begin to form new leaves and green up. *Proper irrigation is crucial during this root formation period.*

Fertilization

Color and growth of buffalograss will improve with fertilization, but little advantage can be seen beyond two pounds of total nitrogen per 1,000 square feet per growing season. A suggested application schedule is one-half to one pound of nitrogen per 1,000 square feet in late May to mid June, and again in late July. Excessive fertilization (more than two pounds of nitrogen per 1,000 square feet per year), especially in combination with excessive irrigation, can cause serious weed invasion in the buffalograss lawn. Buffalograss is sometimes prone to iron chlorosis (yellowing) on high pH soils; supplemental iron applications will help to prevent this problem.

Mowing

Weekly mowing at two inches will be adequate for irrigated buffalograss lawns. Buffalograss that is supplied with only infrequent irrigation or is not irrigated will require less frequent mowing. Left unmowed, buffalograss produces little growth above three to six inches and will remain attractive.

Irrigation

Once established, buffalograss can survive without irrigation. However, however unirrigated buffalograss will become dormant during most summers, and will be prone to weed invasion while dormant. Buffalograss lawns require a minimum of one to two inches of rainfall or irrigation every two to four weeks during the summer to maintain active growth and be acceptably green. Deeper, infrequent irrigation (for example, one inch every two to four weeks, depending on rainfall) will produce a good quality buffalograss lawn and discourages weed invasion. Irrigation can begin in mid- to late-May if the spring is dry; earlier season irrigation will not speed spring green-up and will encourage weed growth.

Weed Management

Weed invasion is the most common and frustrating problem in the buffalograss home lawn. Buffalograss appears to have adequate seedling and/or established turfgrass tolerance for benefin (Balan), bensulide (Bensulide), carfentrazone (Quicksilver), clopyralid (Lontrel), imazapic (Plateau), isoxaben (Gallery, Portrait), metsulfuron (Manor), oxadiazon (Ronstar), pendimethalin (many, including Pre-M, Scotts Crabgrass Preventer/Halts), prodiamine (Barricade), quinclorac (Drive) when the label use recommendations were followed. Tenacity appears safe on established buffalograss (but is not labeled for this use).

Some turf injury is likely when the following are used: 2,4-D, dicamba, dithiopyr (Dimension), fenoxaprop-ethyl (Acclaim Extra), mecoprop/MCPP, MSMA, oryzalin (Surflan), sethoxydim (Poast, Vantage) , siduron (Tupersan), triclopyr (Turflon), triclopyr + 2,4-D (Turflon D), and triclopyr + clopyralid (Confront). Buffalograss can be especially sensitive to off-the-shelf herbicides (especially 2,4-D) bought by homeowners for the control of dandelions and other broadleaf weeds, particularly when these herbicides are applied during periods of very warm temperatures (80s and 90s). These products can be safely used on fully dormant buffalograss in spring or fall (spot treat only; do not broadcast apply).

One effective (but risky) method of controlling winter/early spring weeds in buffalograss is to apply glyphosate (Round-up, Kleen-up) when the buffalograss is **TOTALLY** brown and dormant, but while the weeds are green and growing (March to early April). Glyphosate will work better when applied on a warm day (55-60 degrees F or greater) and weeds are not drought-stressed. Remember that glyphosate will kill any green buffalograss which it contacts. When applied to dormant buffalograss, the glyphosate should be applied as a very light mist (use the pre-mixed, hand-pump products if possible) and only on those spots where the weeds are growing. Glyphosate applied too heavily will move down onto green stolons in the buffalograss lawn, causing dead spots in the lawn. **DO NOT APPLY GLYPHOSATE ONCE BUFFALOGRASS BEGINS TO SHOW SIGNS OF SPRING GREEN-UP!**

Disease Management

No diseases have been observed as causing problems on buffalograss lawns in Colorado.

Insect Management

Mealybugs (*Tridiscus sporoboli* and *Trionymus* sp.) and a short-winged species of chinch bug (*Blissus* sp.) have been found in Nebraska buffalograss lawns, but have not yet caused problems in Colorado. Leafhoppers and grasshoppers are common nuisance pests, but do not generally damage buffalograss lawns.

Where Buffalograss Is Not Well-Adapted.

- Moderate to very shady locations (more than ½ day complete shade).
- Saline soils (greater than 6-8 mmhos/cm salinity).
- Above approximately 6500 feet elevation. A protected, sunny, south- or west-facing exposure may allow buffalograss to be used successfully at 6500-7000 feet, but the growing (green turf) season will be short.
- Very droughty, sandy soils - unless supplemental irrigation is provided.
- Small, heavily used home lawns, athletic fields (soccer, football), or other situations where foot or vehicular traffic will be concentrated and constant.

Inclusion of chemical or trade names does not imply any product endorsement, nor does exclusion imply criticism, by the author or Colorado State University. Follow all label instructions when using any pesticide.

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MASTER GARDENER
COLORADO STATE UNIVERSITY
EXTENSION

CMG GardenNotes #566

Sources of Grass Seed, Sod and Plugs for Colorado Lawns

Seed

The following are Colorado seed companies that will sell seed directly to homeowners. Some may work cooperatively with select garden centers and nurseries to fill homeowner orders. They are all reputable seed companies that carry high quality, weed-free seed at fair prices.

Arkansas Valley Seed Solutions
I-25 & Hwy 66
Longmont, CO 80504
970-535-4481
http://www.avseeds.com

Pawnee Buttes Seed Company
605 25th Street
Greeley, CO. 80632
800-782-5947 or 970-356-7002
FAX 970-356-7263
www.pawneebuttesseed.com

Rocky Mountain Seed Co
1925 County Rd 54G
Fort Collins, CO 80524
970-493-7100
www.rockymountainseedco.com

Sharp Bros. Seed Co.
104 East 4th Street Road
Greeley, CO 80631
970-356-4710 or 800-421-4234
Fax 970-356-1267
http://www.sharpseed.com

Southwest Seed
13260 County Road 29
Dolores, CO 81323
970-565-8722
www.southwestseed.com

Sod Producers

For information on Colorado sod producers, go to: **Rocky Mountain Sod Growers Association** at sod-growers.com

Buffalograss Plugs

To order buffalograss plugs (Legacy, Prestige):

- **Todd Valley Farms** (Mead, NE – near Lincoln) at www.toddvalleyfarms.com
- **High Country Gardens** at www.highcountrygardens.com

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