

Turf Management

Description

Plan, properly install and maintain practical turf areas. Healthy, properly maintained turf can reduce stormwater runoff rates and volumes, sediment and pollutant loads, reduce heat island effects and provide other environmental benefits.

Basic Practice Guidelines

Design

1. Design and allocate appropriate space for turf areas based on desired functional, recreational and/or aesthetic benefits.
2. Select turfgrass species that will best meet the requirements and purposes of the lawn area. Areas that receive wear and tear will require sod-forming species such as Kentucky bluegrass. Areas that are difficult to mow, or are only for visual appeal, may be appropriate for slower-growing, lower maintenance, lower-water-requiring species such as buffalograss or blue grama. Soil conditions, such as soluble salt level, should also be taken into consideration when selecting turfgrass species.
3. Consider turf alternatives for some areas (e.g., narrow strips, hard-to-water areas, steep slopes, low-usage areas) such as native or low-water-use plantings, patios, decks or mulches or low-water turfgrasses, when these alternatives meet the needs of the area and do not create a negative environmental impact.
4. When considering lower-water-requiring alternatives to Kentucky bluegrass, base turf selection on the results of a soil analysis. In sandy soils in particular, some alternative species do not perform as well.
5. When possible, avoid placing turf in long narrow areas, on steep slopes, hard-to-maintain corners and isolated islands due to difficult mowing and irrigation challenges. Turf is better suited to larger, relatively flat areas.
6. Good surface drainage can be achieved by sloping the lawn away from buildings and properly grading low areas and steep slopes to prevent future trouble spots. Where appropriate, grade to allow water-harvesting techniques.

Installation

7. Although turf can be established from seed or sod, sod provides the additional benefits of lower initial water use, quick establishment and the ability to handle heavy rains with less susceptibility to erosion. (See <http://www.rockymountainsodgrowers.com/install.html> for more detailed sod installation guidance.)

BMP Type			
Design			X
Installation			X
Maintenance/Operation			X
Green Industry Relevance			
ASLA	X	GCC	
ALCC	X	ISA	
CALCP	X	RMSGGA	X
CGGA		WFC	
CNA			

8. Prepare the site prior to the arrival of the sod.

- Remove weeds and debris.
- Establish a rough grade and eliminate low spots.
- Spread and rototill a minimum of three cubic yards of organics per 1,000 square feet at least four inches deep.
- Level and rake the installation site until it is smooth.
- Grade areas along sidewalks and driveways approximately one and one-half inches below top of concrete.

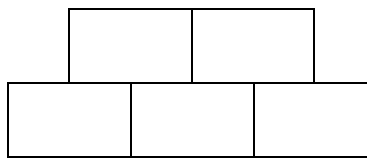
9. Have on site all hoses and sprinklers for the initial watering.

- Make sure sprinkler system is performing properly.
- Understand the operation of the sprinkler clock for proper watering of the new and established lawn.

10. Order sod to be delivered once site is prepared and the sprinkler system is understood and operating properly.

11. Install the sod immediately after delivery.

- Arrange the rolls so there is a minimum amount of traffic on the prepared soil and the newly installed grass.
- Lay sod in a horizontal brick pattern.



- Once an area of approximately 15 feet by 15 feet has been laid, rolled and fertilized, water immediately. The objective is not to let the sod dehydrate.
- Butt ends and sides of the sod strips making sure there is no overlapping.
- Fit the sod around obstacles or in smaller places by merely cutting the dirt side with a sod knife.

12. Water properly, as follows:

- Once all the sod is laid, begin watering to build up the sub-soil moisture. This is the most critical time to apply water. Up to one-half inch of water per day for the first two to three days may be required. Probe the soil to determine if the moisture has penetrated at least four inches.
- During the following two weeks, the amount of water needed will be similar to the chart below. Each day may require more than one application depending upon wind and temperature. The reason for several light applications is to keep the root zone and blades moist.
- Week three is used as a transition period from daily watering with frequent applications per day to an increased number of days between watering. During this time the grass should be ready for routine maintenance. By the end of the establishment period, the grass should be able to go several days between waterings depending on the season and weather.

13. After initial three weeks, adjust watering times and sprinkler clocks to conform to any water restriction program in your area.

14. When starting a lawn from seed, amend the lawn in a manner similar to sod and work in a starter fertilizer at the rate recommended on the label. Frequent, light waterings are needed until the seed has germinated and should then be reduced.

Maintenance

15. The approximate amount of water that needs to be applied each week for an average, traditional lawn to supplement normal rainfall is listed in the following chart:

**Approximate Supplemental Water for an Average Traditional Lawn
(inches per week)**

April	May	June	July	Aug	Sept	Oct
1/4"	3/4"	1 1/4"	1 1/4"	1"	3/4"	1/2"

The above data are based on historical averages and should be used as a guideline and not as a substitute for good judgment, reason and common sense. Under less-than-average rainfall conditions, the amounts shown in the chart should be increased. If there is greater-than-normal rainfall, then the amount of supplemental water should be reduced.

16. Measure the water applied by using rain gauges or cans placed on the lawn in areas covered by sprinklers.

17. Become aware of dehydration signs: 1) Stage 1: grass has a purplish tint; 2) Stage 2: blades turn steel gray and foot prints are left when walked upon; and 3) Stage 3: grass blades turn straw color.
18. Mulch-mowing turfgrass at a height of 2.5 to 3.0 inches helps turfgrass develop deeper root systems. Mulched grass clippings can return roughly 25 to 30 percent of the needed nitrogen that grass requires to be healthy, thereby reducing fertilizer requirements. Avoid throwing grass clippings onto streets and sidewalks to reduce nutrient pollution to surface waterbodies.
19. If thatch deeper than ½ inch is present, aerate the lawn with a core-aerator to allow grass penetration into the root zone and water infiltration. Minimize thatch development by mowing frequently, avoiding overwatering, preventing overfertilization and aerating the lawn.
20. Fertilize the turfgrass at a rate appropriate to the turfgrass species, season and soil conditions. Over-application of fertilizer can result in runoff and leaching. Slow-release fertilizers may reduce the chances of nutrients leaching into groundwater or running off-site. *See the Fertilizer Application BMP for more information.*
21. Apply fertilizer timed to the needs of the plants. Cool season grasses such as Kentucky bluegrass need to be fertilized when the growing season is cool. Apply no more than one pound of nitrogen per thousand square feet at each application. Warm season grasses such as buffalograss need less fertilizer and are best fertilized when the temperature is hot. One application about mid-June and another at the beginning of August is usually sufficient.
22. Water the lawn uniformly until the soil is moist to a depth of 4 to 6 inches to encourage deep roots. Frequent, light sprinklings moisten only the surface and may cause shallow-rooted turf and increase weed seed germination.
23. Proper irrigation can minimize the amount of fertilizer and other chemicals that are leached below the root zone of the grass or washed away by runoff. Properly maintain the irrigation system to ensure that the irrigation is being applied at appropriate rates and to the turfgrass, not the sidewalk. (*See the Irrigation BMPs for more information and <http://www.rockymountainsodgrowers.com/irrigation.html>.*)
24. Follow a proper maintenance schedule to prevent stress, disease and turf injury. (See <http://www.rockymountainsodgrowers.com> for guidance.)

Regional or Industry Considerations/Adaptations

1. Particularly during recent drought conditions, Kentucky bluegrass has received significant attention as a high-water use plant. However, field studies have shown that bluegrass, with a base of properly prepared soil and proper irrigation, performs well at half of the recommended rate (evapotranspiration or ET) for supplemental irrigation. Therefore, the water use for bluegrass is not so much the grass itself, but how it is cultivated. For more information, see http://www.ncwcd.org/ims/ims_turfandurban_demos.asp.

2. Some areas of Colorado, particularly the western slope, have serious problems with high salt levels in soils. A soil test should be conducted to determine the salt level. Salt in soils can be reduced by improving internal drainage through addition of good-quality organic matter mixed to a depth of at least 6 inches then watering heavily to help flush salts below the root zone. In cases where the irrigation water has high salts, alternative grass species may be required. Kentucky bluegrass does poorly where salt levels are greater than 6 mmhos/cm. Use perennial ryegrass, fine fescue, tall fescue, wheatgrass or alkaligrass for lawns where salt levels are high. Nurseries and garden centers serving areas with salt problems should carry these more salt-tolerant grass species. More information on salt-tolerant grasses can be obtained from www.ext.colostate.edu/pubs/garden/07227.html.
3. In areas with salt problems, a high water table may aggravate the salt problem. In these cases, a tile drain or gravel-filled trench system may be required to move salt-laden water away. Prior to installing such a system, consult with relevant local, state and/or federal officials to determine any regulatory constraints or permit requirements.
4. Sodic soils (“black alkali”) contain an excess of sodium and often need to be amended prior to planting turfgrass. Before leaching sodic soils, test the soil through a reputable lab to determine if amendments such as gypsum are required. Leach the soil only after addition of any required amendment.
5. Turf water requirements for the western slope can be obtained from Swift (2001) “Watering Established Lawns in Western Colorado,” Colorado State University Cooperative Extension Tri-River Area, www.coopext.colostate.edu/TRA/PLANTS/lawnwat.html.

Key References

- Associated Landscape Contractors of America. 2003. *Landscape Installation Training*. Herndon, VA: ALCA.
- Associated Landscape Contractors of America. 2003. *Landscape Irrigation Training*. Herndon, VA: ALCA.
- Associated Landscape Contractors of America. 2003. *Landscape Maintenance Training*. Herndon, VA: ALCA.
- City and County of Denver. 2000. *Denver Landscape Design and Maintenance Guidelines for Water Conservation on City Owned and Operated Properties*. Denver, CO: City.
- City of Colorado Springs City Planning. 1998. *Landscape Code and Policy Manual*. Colorado Springs, CO: City.
- Colorado Association of Lawn Care Professionals. 2002. Web site: www.gardeningcolorado.com/calcp.
- Colorado State University. 2003. CSU Turfgrass website: <http://csuturf.colostate.edu/>.

- Colorado State University Cooperative Extension. 2003. *Xeriscape Turf and Alternatives*. Planttalk Colorado 1912. <http://www.ext.colostate.edu/ptlk/1912.html>. Ft. Collins, CO: CSU.
- Colorado State University Cooperative Extension. 2001. *Lawns*. Planttalk Colorado 1500 (www.ext.colostate.edu/ptlk/1500.html). Ft. Collins, CO: CSU.
- Colorado State University Cooperative Extension. 2001. *Mowing Guidelines*. Planttalk Colorado 1515 (<http://www.ext.colostate.edu/ptlk/1515.html>). Ft. Collins, CO: CSU.
- Denver Water. 2004. Denver Water Conservation and Xeriscape Web Site: http://www.denverwater.org/cons_xeriscape/cons_xeriscapeframe.html. Also Denver Water brochures.
- Garden Centers of Colorado. 2004. X-rated Xeriscape Gardening Web site: <http://www.xratedgardening.com/turf.htm>.
- Gross, M. and C. Swift, 2003. *Watering Established Lawns*. Fact Sheet No. 7199. (<http://www.ext.colostate.edu/pubs/garden/07199.html>). Ft. Collins, CO: Colorado State University Cooperative Extension.
- International Turf Producers Foundation. 2001. *Water Right—Conserving Our Water, Preserving Our Environment*. Rolling Meadows, IL: ITPF.
- Irrigation Association Water Management Committee. 2001. *Turf and Landscape Irrigation Best Management Practices*. (<http://www.irrigation.org/>) Falls Church, VA: Irrigation Association.
- Koski, T. 2003. *Winter/Spring (2003) Lawn Management for Colorado Lawns*. (<http://csuturf.colostate.edu/Pages/summer2003lawnCARE.htm>). Ft. Collins, CO: Colorado State University Cooperative Extension.
- Koski, T. and V. Skinner. 2004. *Lawn Care*. Fact Sheet No. 7.202 (<http://www.ext.colostate.edu/pubs/garden/07202.html>). Ft. Collins, CO: Colorado State University Cooperative Extension.
- Mecham, B.Q. 2001. *Recommended Best Management Practices for Urban Turfgrass in Colorado*. Loveland, CO: Northern Colorado Water Conservancy District.
- Mecham, B.Q. 2003. *Responsible Lawn Watering*. (http://www.ncwcd.org/ims/ims_info/responsi.pdf). Loveland, CO: Northern Colorado Water Conservancy District.
- Northern Colorado Water Conservancy District. 2004. *Turf and Urban Landscape Demonstrations and Studies* (http://www.ncwcd.org/ims/ims_turfandurban_demos.asp). Loveland, CO: Northern Colorado Water Conservancy District.

- Rocky Mountain Sod Growers Association. 2004. Web site:
www.rockymountainsodgrowers.com.
- Rocky Mountain Sod Growers Association. 2003. *Guidelines: Installation and Establishment of New Sod in the Landscape* (<http://www.rockymountainsodgrowers.com/install.html>).
- Rocky Mountain Sod Growers Association. 2004. *Guidelines: Watering Recommendations for Established Bluegrass Lawns*.
(<http://www.rockymountainsodgrowers.com/irrigation.html>).
- Rocky Mountain Sod Growers Association. 2004. *Fall and Winter Lawn Care*.
(<http://www.rockymountainsodgrowers.com/fall.html>).
- Swift C.E. 2002. *Late Season Fertilization of Cool Season Grasses: Bluegrass, Perennial Ryegrass and Tall Fescue*. (www.coopext.colostate.edu). Montrose, CO: Colorado State University Cooperative Extension Tri-River Area.
- Swift, C.E. 2001. *Watering Established Lawns in Western Colorado, Cool-Season Grasses—Kentucky Bluegrass, Turf-Type Dwarf Tall Fescue and Perennial Ryegrass*. (www.coopext.colostate.edu). Montrose, CO: Colorado State University Cooperative Extension Tri-River Area.
- Swift, C.E. and A.J. Koski. 2001. *Growing Turf on Salt-Affected Sites*. Gardening Fact Sheet 7.227 (www.ext.colostate.edu/pubs/garden/07227.html). Ft. Collins, CO: Colorado State University Cooperative Extension.
- Turfgrass Producers International. 1998. *Turf Resource Center: The Basic Grasses* (<http://www.turfgrassod.org/trc/grass.html>).
- Turfgrass Producers International. 1998. *Turf Resource Center: Soil Prep for Beautiful Lawns* (<http://www.turfgrassod.org/trc/soilprep.html>).
- Wilson, C. and T. Koski, 2004. *Eliminate Grass Clipping Collection*. Fact Sheet No. 7.007 (<http://www.ext.colostate.edu/pubs/garden/07007.html>). Ft. Collins, CO: Colorado State University Cooperative Extension.