

Watering Established Lawns in Western Colorado Cool-season Grasses (Kentucky bluegrass, turf-type dwarf tall fescue and perennial ryegrass)

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Introduction

In the semiarid regions of the world where insufficient rain falls to maintain turfgrass, supplemental irrigation must be applied. When to irrigate and how much to apply to maintain the turf in a healthy condition is a common question of gardeners in these drought-stressed regions. As a horticulturist I frequently am asked to provide simple answers for when to water and how long to leave on the sprinklers to ensure sufficient water is received by the grass.

Neither I or anyone else can give quick answers to these supposedly simple questions. The slope and exposure of the turf, placement of trees, shrubs, sidewalks and drives, soil types found in the lawn area, the difference in soil depth and preparation, turf diseases common in the area, the type of sprinkler heads in your system, changes in water pressure throughout the day, and community water restrictions are just some of the factors that must be taken into

account when determining when to water and how long to leave your sprinkler system on.

Only you can determine the water needs of your grass and how long you must irrigate each of the many different areas of turf. Recommendations from your lawn maintenance firm, nurseryman or turf professional should be taken into consideration **but** must be adjusted as a result of your personal observations.

How will I know when my turf needs water?

The frequency of irrigation of turf areas should be based on the condition of the grass. When turfgrass requires water it will:

- turn darker than normal (it appears as if a shadow is cast on the lawn)
- or
 - the lawn will turn blue-gray
 - or will not spring back when walked on (depressions left by footprints do not bounce back)
- and the blade of a screwdriver or other such implement can not be pushed into the soil to a depth below two inches.

These drought symptoms can appear in patches or over the complete turf area. When only small areas exhibit drought stress, water only those areas that need to be irrigated. Watering the complete lawn when only a small area requires water, or watering too frequently results in shallow roots, increased susceptibility to drought, especially during the hot and dry days of July and August, and increased susceptibility to [Melting-out Disease](#) (Leaf-spot Disease).

Watering turf based on the condition of the grass will create a deeper root system and fewer problems with [Dollar spot](#) and [Ascochyta Leaf Blight](#). Unlike Melting-out disease these two fungal diseases tend to be more serious when grass does not receive adequate water. Ascochyta has become a very serious turf disease in our area, consequently as soon as the turf turns blue-gray, water should be applied. Neglecting to water drought-stressed turf often results in [Dollar spot and/or Ascochyta](#) showing up within two days of the drought stress symptoms.

A light watering in midday may be required to cool the grass and provide water for parched turf. The drought-stressed grass will require a more thorough watering later that night. Routine water in midday should be avoided.

Does the time I water influence disease problems?

Yes! Water should be applied taking into account the environmental requirements of the various turf diseases found in the Tri River Area. In other words, watering should be avoided when conditions necessary for the development of turf diseases will be extended or enhanced.

A more complete discussion on the topic of [leaf wetness and disease](#) is provided for your information.

Can I water every day?

Vargas (1994) writes that the "best time to irrigate is in the afternoon, lightly and daily." Not all researchers, however, agree. Frequent irrigations increase the chances for pathogen infection and pathogen movement (Lewis, 1994, p. 389). Ascochyta leaf blight is reported to require the presence of a film of water or [guttation fluids](#) on the leaf surface. Frequent irrigation appears to favor this disease. In addition, watering too often, or too shallow is known to result in the death of the deeper roots of woody plants making these plants more susceptible to summer and winter drought problems. When irrigating turfgrass, enough water should be applied to adequately moisten the entire root system.

In some instances you may need to water daily or every other day. This is especially true if the soil is very sandy as this soil texture dries out quickly. Turf on a shallow soil underlaid by shale or gravel will likewise require more frequent irrigations. Where possible, soils should always be amended with a good quality organic matter such as compost, composted horse manure, or composted chopped straw or hay. This will help hold the soil moisture and reduce the need for frequent irrigations. Avoid [manures](#) high in salts.

Individuals who water turf too frequently in the spring promote shallow roots. When hot weather arrives, the lack of deep roots increases the need for more frequent irrigations.

The need to water turfgrass should be determined by the drought response (color change and foot printing) as discussed previously. This need will change throughout the season. Setting an automatic sprinkler clock in the spring expecting your job is done for the year, is not the best way to go.

Watering deep and infrequently based on the needs of the turfgrass is the recommendation of most researchers and turf professionals.

What time of day is the best time to water?

The most efficient and ideal time to irrigate turfgrass is between midnight and 6 A.M. This takes into account the reduction in evaporative loss as well as [disease considerations](#). Such

timing is however, difficult for all but those gardeners with an automatic sprinkler system. Gardeners not wishing to spend their night hours watering, should consider watering during the day after the night moisture has been burned off by the morning sun, but not too late in the day. The turf must dry before night-time dew again takes over.

How deep do I need to water?

Sufficient water should be applied to wet the soil to a minimal depth of 9 inches. Turf type tall fescue planted in a soil that was deeply prepared may have a more extensive root system than Kentucky bluegrass or perennial ryegrass and would benefit from a deeper watering. If the soil is shallow due to a gravel or shale layer, the watering depth and frequency will need to be adjusted accordingly.

How much water will it take to wet my soil to the proper depth?

Based on the soil type, the amount of irrigation water to apply is given in the following table.

Soil Type	Water holding capacity (inches of water per foot of soil)	Water required to wet soil to a depth of 9 inch
Clay, silty clay	1.6 - 2.5 inches	1.2 to 1.875 inches
Silt loam, sandy clay loam	1.4 - 2.4 inches	1.05 to 1.8 inches
Fine sandy loam, sandy loam	1.0 - 1.6 inches	.75 to 1.2 inches

How long will it take to apply the proper amount of water?

The amount of water applied by a sprinkler system is determined by the type of sprinkler heads used, the spacing of those heads, the number of heads per sprinkler zone, the water pressure going through the system, the time of day, and several other factors. The following gives a brief and easy method to determine the amount of water your sprinkler system supplies to a given area:

- Place straight sided cans or glasses in the area to be irrigated. Turn the sprinkler system on for a set length of time and measure the amount of water collected in the containers during that time.

An hour after watering use a long-bladed screwdriver or similar implement to determine soil moisture depth. The depth the blade can be inserted into the soil with ease, indicates the depth of water penetration. (Note: this technique cannot be used in rocky soil.) If the depth of water penetration is not adequate, turn the system back on and irrigate until the required depth is achieved.

Once you know the amount of time required to wet the soil to the proper depth, the next time you need to water the lawn, turn the sprinkler system on for that length of time.

Using containers to measure the amount of water applied will pinpoint any variation in water distribution in the irrigated area. Plugged heads, improper spacing of sprinkler heads, etc. can be identified and subsequently corrected by using this method.

The amount of water applied and depth of water penetration should be rechecked occassionally during the summer months to avoid problems that develop from clogged or twisted heads. Reset or clean heads as necessary.

When designing a sprinkler system, what do I need to consider?

- The water used to irrigate turfgrass in Western Colorado will typically be domestic water provided by the community in which you live or non-potable water provided by an irrigation company through a series of irrigation canals. The later is untreated water collected from reservoirs or rivers to be used specifically for irrigation and the watering of livestock.

If you do not have access to irrigation (non-potable) water, ensure that the water purveyor providing your domestic water will permit the use of treated water for irrigation. Some water providers restrict such use necessitating a [xeriscape](#) landscape with little if any high water requiring turfgrass.

If irrigation water (non-potable) is available ensure that the irrigation (ditch) company will provide adequate water for your turf and ornamental needs and that you have adequate shares to take care of those needs. In some instances the water is deeded to the land; in other cases you must purchase the number of shares of water you feel you will need . Different standards are used to measure the amount of water in a share. A share provided by one ditch (irrigation) company may be a different quantity of water contained in a share of a neighboring ditch company. Contact your respective ditch company for further information.

The following suggestions are provided to help you avoid sprinkler system problems:

- if using ditch water, be sure to install the proper filter for the size of your irrigation system. A self-cleaning/flushing unit is recommended.
- be sure the sprinkler system is designed to take into account the variations in your lawn area. South facing slopes should be on a separate zone from areas shaded by the home. Areas of turf under trees will need different amounts of water than areas in full sun.
- be sure the sprinkler system is designed to provide head to head coverage (overlap). In other words, water from one sprinkler should reach the neighboring sprinkler head in the system.
- be sure to install adequate sprinkler heads to cover ALL areas of turf you wish to irrigate. Some sprinkler systems are erroneously designed without sprinkler heads at the edge of the turf. Only half the needed amount of water will be received and that area will be stressed and thus more susceptible to disease.
- be sure to take into account wind direction and the effect it will have on the water applied by the sprinkler system. Additional sprinkler heads, a closer spacing between heads, or setting the heads so that they spray into the wind may be necessary to compensate.
- be sure to avoid the tendency to place spray and impact heads on the same sprinkler zone. Since these heads can apply greatly differing amounts of water in the same amount of time, an uneven distribution of water will occur.
- be sure to double check the precipitation rate (amount of water applied) is the same for all sprinkler heads used on system. A half-circle (180°) nozzle should apply only one-half as much water as any full-circle (360°) sprinkler. The precipitation rates of quarter and other partial pattern heads also should be taken into consideration. Companies that sell sprinkler supplies and systems should be able to provide you with the precipitation rates for each of the nozzles used in the system.
- be sure to design the system so that at least 3.6 inches of water can be applied through each zone of the sprinkler system per week. This amount of water takes into account the efficiency of the typical sprinkler system (70%), the amount of water necessary to keep the turf in a healthy condition, and the hottest time of year (July and August).
- be sure to put quick coupler units in your design so you can plug in a sprinkler at the far edge of the system or in other hard to reach areas in case you need to water a special planting. Plan for the future. It is less expense to install quick coupler units in the beginning stages of the design process than to add connections several years later.

What effect does temperature have on the amount of water applied?

The amount of water needed by turf is based on the growth pattern of the turf as well as the

temperature during the growing season. Less water is needed in the spring than during the 90 +° Fahrenheit days of summer.

The following chart gives general recommendations as to the needs of the turf based on the evapotranspiration rate. Ideally, turf should be irrigated once a week. While turf can be watered more frequently, watering deep and infrequently takes into account the root system of trees and shrubs. In August, 16.2 inches of water needs to be applied. Of this, only 70% (11.35 inches) on average will reach and penetrate the soil. When the turf is watered once a week, 3.6 inches will be required each time the sprinkler system is activated. The systems, therefore, should be designed so that it applies 3.6 inches of water during a single application.

Water is used by turf in the winter as shown in the table. Therefore, winter watering is necessary to replenish this moisture.

Monthly Water Requirements

Month	Water required by the turf/month (in inches) ¹	Total inches of water required/month ²
January	0.90	1.29
February	1.52	2.17
March	2.95	4.21
April	6.26	8.95
May	7.18	12.5
June	10.45	14.9
July	9.17	13.1
August	11.35	16.2
September	6.02	8.61
October	3.42	4.44
November	1.08	1.4
December	0.86	1.11

Footnotes:

¹ based on the [evapotranspiration](#) (ET) rate in Grand Junction, CO., January through December, 2000.

² the total inches of water required to be applied through the system based on a 70% efficiency rate of a typical sprinkler system.

Do I need to water during the growing season even if it is raining?

In most cases - Yes!

If you look at the [climatic data](#) for the Tri River Area, you will notice that we receive insufficient moisture for many of our ornamentals and turfgrasses. Even if you are using the Xeriscape plants recommended by [Colorado State University](#) you will find that some of the areas in Western Colorado even lack sufficient moisture to maintain these xeric plantings in a healthy condition. In addition, the moisture we do receive often comes at the wrong time for these plants. For detailed information on your site, you may wish to look at the data at the [Colorado Climate Center](#).

Do I need to water my lawn during the winter?

Most of the winters in much of Western Colorado are dry. The snow that does fall is typically gone within a few days. This is especially true in the valleys where Grand Junction (Mesa County), Delta (Delta County) and Montrose (Montrose county) nestle. Even some of the higher communities have open dry winters. Root dehydration and crown death as well as winter mite injury are more severe under winter drought conditions.

Residents of other parts of the United States often hear of blizzards and other winter storms in Colorado believing that what occurs in the Colorado Rocky Mountains also occurs in Western Colorado. Many winter storms totally bypass our area and drop their snow loads in the mountains east of our valleys.

Soaking lawn areas once a month during a snowless winter helps prevent spring and summer turfgrass problems. This also helps avoid the die-back of trees and shrubs the following summer as a result of winter drought. Additional information on [winter watering](#) is available from Colorado State University.



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Further information on [Lawn Watering](#) is available from the Colorado State University Publication on Line Site.



to the Turf Care and Maintenance Web Page

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