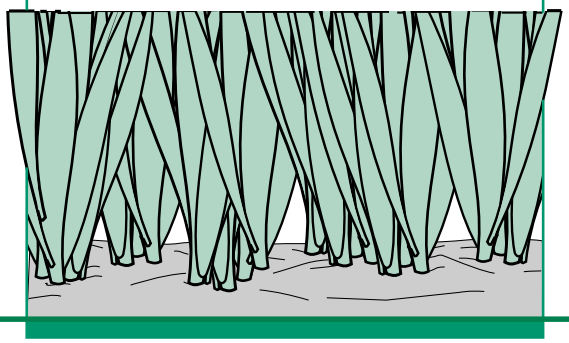
WATERING YOUR LAWN

Turfgrass



Today, water conservation is an important issue, and in urban areas, mismanaged home lawns can be big users of water. Trying to maintain a lawn at the peak of perfection at all times, especially during the summer, is not only a waste of water but is bad for the grass and increases pest problems. Through efficient use, water consumption may be reduced by up to 50 percent, with only a 10 percent reduction in turf quality. This quality reduction is hardly noticeable. Positive effects include less mowing and fewer weeds, diseases and insects.

Here are some water conservation goals for lawns. Maintain attractive, healthy turf with less water. Establish zero water runoff from turf irrigation. No water loss from soaking soil below the root zone. Sustain water when evaporation loss from heat and wind is low. Follow cultural practices that conserve water. Use water conserving grasses

Seven factors affect lawn watering. These includewarm or cool-season grasses. Weather — temperature, humidity, sun, rain, wind. Soil, including sand, clay, loam or compacted soil. Sunny or shady areas. Seasons-shorter days and cooler temperatures, like Spring and Fall. Longer days and hotter temperatures, like Summer. Amount of fertilizer applied. Mowing height. The slope of the yard is also a factor.

Use the following practices to conserve water. Water only when lawn shows signs of needing water. Water in the morning. Water slowly so all water is absorbed, no runoff. Direct the water only onto the turf.

Use sprinklers that produce drops of water. Soak soil to a depth of 6 to 8 inches. Stop watering at least 30 minutes before sundown. Start water conserving practices at the beginning of the season. Water as infrequently as possible without stressing the grass. Don't practice shallow, frequent watering. Don't water paved walks, drives, and streets. Don't water with a fine mist spray. Don't water in high winds. Don't mow grass short. Don't fertilize excessively.

Water According to the Weather

Water Less	Water More
Cooler temperatures	High temperatures
Cloudy or overcast	Bright sunlight
Low wind	High wind
High humidity	Low humidity
Rain or showers	No rain

How Often to Water

How often to water depends on the weather, grass species, soil type, season, shade, fertilization practices, mowing height and slope. Weather is the main factor in determining how often to water. Weather changes with the season and often varies considerably from year to year. Adjust watering frequency according to the weather and not a calendar schedule.

Use the "soak and wait" method of watering. Soak the soil to the depth of the root zone, then wait as long as possible before watering again. Watch for signs that the turf needs water, such as a darker bluish-green color or footprints remaining in the turf. Do not wait until the turf severely wilts. Sandy soils will have to be watered more frequently than loam or clay soils.

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Frequency of Irrigation

Buffalograss	Least frequent
Bermudagrass	
Tall fescue	
Zoysiagrass	
Kentucky bluegrass	
Perennial ryegrass	Most frequent

Watering too frequently and lightly is a common mistake. Frequent, shallow watering produces a short root system, making the turf less resistant to heat, cold, drought and wear. Strive to water as infrequently as possible without stressing the turf. Because each lawn differs with respect to soil characteristics, species, etc., no simple formula can be applied. The guidelines discussed here must be adjusted for the conditions at each individual site.

How Much to Water

How much water to apply at one time depends largely on the soil. The soil type determines how much water is absorbed and held in addition to the potential rooting depth of the grass. Apply enough water to soak the soil to slightly below the depth of the roots. You can determine the rooting depth by excavating a small portion of the soil profile with a shovel. Most roots will be 6 to 8 inches deep in a loam soil, deeper in sandy soil, and shallower in a clay soil. Roots will not grow as deep in compacted soils because of a lack of oxygen.

Sandy soils hold the least amount of water. Excessive water will quickly be lost below the root zone. Loam soils are ideal for good root growth and hold water efficiently. Although clay soils hold the most water, excess water drains slowly causing an oxygen deficiency to the roots. It is important not to saturate clay soils.

Amount of water needed to soak soil 6 to 8 inches deep and time required for the soil to absorb water

	Amount of water	Absorption time
Sandy soil	.5 inch	30 minutes
Loam soil	1 inch	2 hours
Compacted clay soil	1–1.3 inches	5 hours

Watering less than 3 inches deep is considered shallow watering. Shallow watering promotes shallow root growth making the lawn less drought resistant and more likely to have weed, insect, disease and thatch problems. In addition, more water evaporation occurs from shallow watering practices.

To ensure the lawn has been sufficiently watered, push a rod or screwdriver into the ground. When the rod will go no farther dry soil has been found. If the rod penetrates slightly deeper than the rooting depth, the turf has been adequately watered.

When to Water

Certain times of the day are preferred for irrigation. Morning is the most efficient time to water, because it is cooler and less evaporation occurs. Wind is less likely to be a problem during early morning hours. City water pressure is greater at this time than during the peak use time from 5 p.m. to 10 p.m.

Although not harmful to the grass, mid-afternoon watering is the least efficient time to water. Evaporation loss from high temperature, wind, and low humidity is greatest during afternoon hours.

Many people who work outside of the home and do not have an automated underground sprinkler system, begin watering after they get home from work and shut off the water at bedtime. Grass stays wet longer at night and is more likely to be infected by disease. If watering after work is the most convenient time, shut the water off 30 minutes before sundown to give the grass time to dry.

Night watering is efficient from the standpoint of temperature, wind and humidity. But it should be timed to finish the watering cycle after sunup. Some diseases can develop in as little as two hours when a film of water remains on the grass. Another drawback of night watering is that the homeowner is unlikely to notice problems such as water runoff, poor sprinkler coverage, water breaks, etc.

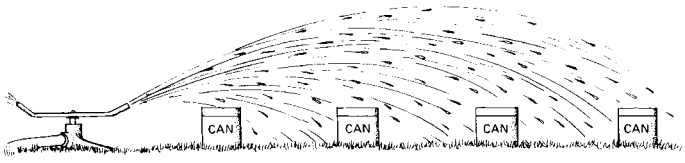
An exception to these guidelines is when the grass is severely wilting. At this time, it should be watered immediately regardless of the time of day or night. While turfgrass needs water for acceptable appearance during hot, dry weather, most turfgrass is over-watered rather than under-watered. The problems from over-watering are more numerous, serious, and take longer to correct.

How to Avoid Water Runoff

Homeowners need to use sprinklers that apply water at a rate that can be absorbed by the soil without runoff. If the water starts to run off before the soil is soaked to the rooting depth, the sprinkler is applying water too fast and should be replaced with one that applies water at a slower rate. Another option for controlling runoff is to cycle the watering. Water until it starts to run off. Then turn it off and let the water soak in for a few hours. Repeat.

Amount of water soils absorb in an hour without runoff

Soil type	Under Healthy Sod
Coarse sandy loam	1.3 inch per hour
Sandy loam	1.0 inch per hour
Silt loam	0.6 inch per hour
Silty clay loam	0.5 inch per hour
Compacted clay	0.2 inch per hour



This measures the rate of application and distribution uniformity.

Factors Affecting Lawn Watering

Soil types. Clay soils are the most difficult to water. Clay compacts easily, resulting in poor water penetration and root growth. Clay soils compacted during house construction should be replaced with 6 to 8 inches of sandy loam topsoil. A compacted, clay slope is an almost impossible situation. Clay soils absorb water at extremely slow rates and have poor internal drainage. Although clay holds the most water, the pores are small and lack air for root growth when too wet. Clay soils should be aerated 2 to 3 inches deep, once or twice a year to increase water penetration and root growth. Species such as tall fescue root deeply in good soil and have good drought resistance, but will not be as drought resistant in a shallow, clay soil.

A sandy loam is the ideal soil for growing turfgrass. It has good water penetration, drainage and water-holding capacity. Roots grow deep in these soils, making a quality, easy-to-manage turf. The "soak and wait" method of watering works well for sandy loam and loam soils.

Sandy soils absorb water quickly and drain well, but don't hold much water. These soils require more frequent watering but less water per application. Although roots grow deep in sandy soil, it can be difficult to establish grass from seed in sandy soil.

Warm and cool-season grasses. Warm-season grasses (Bermudagrass, zoysiagrass, and buffalograss) require less water than cool-season grasses. They use less water during the high water use summer months and only a small amount during the spring and fall.

Cool-season grasses (bluegrass, fescue, and ryegrass) green up earlier in the spring and stay green later in the fall. However, a longer growing season means a longer watering season. More water is needed for cool-season grasses during the peak water-use summer months to maintain a quality appearance.

Sun versus shade. Sunny areas generally need more water than shady areas because sunny areas have a higher evaporation rate. Since shady areas have less evaporation, it is important not to over water them.

Fertilizer. Fertilizer speeds up the growth process, thus requiring additional water. The more nitrogen is applied, the greater the water requirement.

Mowing. Mow at the tallest recommended height for your species—this encourages deeper rooting. Deeper roots allow the grass plant to take water from deeper in the soil, making for a more drought-resistant plant.

Thatch. Thatch causes grasses to be shallow rooted and less drought resistant. Lawns with a heavy layer of thatch will wilt sooner than similar lawns with less thatch. Frequent, shallow watering is one of several factors causing thatch. Core-aeration will help control thatch and will aid water penetration and root growth into the soil.

Slope. Slope also influences irrigation practices. Slopes are dryer because of water runoff, especially at the top of a slope. Water slopes slowly to get maximum soil water intake. Aerate the slope in spring and fall to help water infiltrate.

Effect of Slope of Watering Rate

Slope	Reduce Watering Rate
0–5%	0–10%
5–0%	10–20%
10–15%	20–45%
15–20%	45–60%
Over 20%	60% and up

Native Grasses

In recent years, use of native grasses for lawns has increased due to their low water requirements and natural look. Native grasses are warm-season and must be planted in areas receiving full sunlight. Buffalograss is the most common native grass used in turf. It grows best in regions with less than 25 inches of annual rainfall.

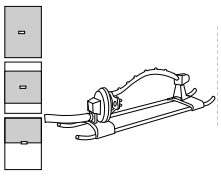
Native grasses should be watered and fertilized sparingly. Watering and fertilizing native grasses as much as regular lawngrasses causes them to become weedy, and negates the low maintenance aspect. People may want the low-maintenance requirements of a native grass but still expect the look of bluegrass. This is not realistic.

Types of Irrigation Systems

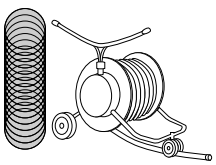
Aboveground irrigation system. It is important to have the right sprinkler to water the turf correctly and to avoid wasting water. Types of sprinklers include oscillating, traveling, pulsating and turrent. The traveling sprinkler works best in odd-shaped areas. For a more restricted area, use the oscillating, pulsating or turrent sprinkler.

Underground irrigation system. The underground irrigation system with an automatic timer is popular because of the convenience of not having to move hoses, sprinklers, and turn water on and off. Because automatic timers do not account for the changing water requirements of the lawn unless a moisture sensor is attached.

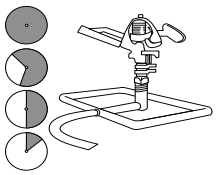
A moisture sensor measures the amount of moisture in the soil and regulates the sprinkler system accordingly. It will automatically turn the water on and off when needed. A moisture sensor saves money by reducing unnecessary water applications. Additionally, leaching of fertilizers past the root zone is less likely to occur. Rainout devices also can be installed to avoid irrigating when it's raining.



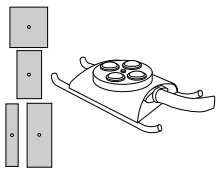
Oscillating sprinkler



Traveling sprinkler



Pulsating sprinkler



Turrent sprinkler

Water Quality

If municipal water is safe for drinking, it is safe for turfgrass. Irrigation water from home wells should be free of suspended sand, soil, algae, and other particles that clog the irrigation system. Salty water frequently is a problem in Kansas. Home well-water samples should be taken to the local Extension office for salt and sodium analysis.

Watering Newly Seeded and Sodded Lawns

The information contained in this publication is for established grass. Newly seeded or sodded lawns will require a light, frequent watering program, which is inappropriate for established lawns.

If the soil is dry before planting time, soak it as deep as possible several days before planting seed or laying sod. Adequate subsoil moisture makes it easier to keep the seedbed moist during the critical germination and establishment time. An alternative to soaking the subsoil is to plant after a deep soaking rain.

After planting seed, the soil surface must be kept moist continuously until the seed germinates. But, because the seed does not produce roots until after germination, there is no need for deep soaking. When the grass is about 1 inch tall, begin to water less often but soak the soil deeper. Let the soil surface dry between waterings.

Keeping the seedbed moist may require watering several times a day during hot weather. As the seedlings grow, gradually lengthen the interval between each irrigation, but apply more water each time to encourage deeper rooting. After the new grass has been mowed three times, water deeply and infrequently as for established grass. Check new grass daily for the first few months, and water whenever it shows signs of wilting. Remember, new grass can be over-watered—continuously saturated soil may even cause the roots to die.

Watering sod is much like watering newly seeded lawns. Although sod is mature grass, most of the root system is cut off during harvesting. Water sod immediately after it is laid and firmed into place. Water must go through the sod and wet the soil. Sod will not root into dry soil nor into saturated soil. Lift the corner of a sod piece every few days, checking that the soil is moist but not saturated. Also, look for new white roots growing into the soil. The challenge is to water often enough to keep the sod healthy but not so often that it doesn't root into the soil.

Back Flow Prevention. A back flow preventer keeps flow from the irrigation system from entering the home watering system. This ensures drinking water will not be contaminated. Check local city ordinances for regulations on back flow prevention.

Water Conversion Table

1 inch of water per 1,000 square feet	=	623.37 gallons or 83.33 cubic feet
1 inch of water per acre	=	27,154 gallons or 3,630 cubic feet
1 cubic foot of water	=	7.48 gallons or 62.37 pounds
1 gallon of water	=	0.1337 cubic foot or 8.34 pounds

Hose diameter	Length	Pressure PSI	Flow Rate gallons per hour
½ inch	50 feet	40 PSI	300 gallons per hour
⅝ inch	50 feet	40 PSI	384 gallons per hour
¾ inch	50 feet	40 PSI	528 gallons per hour

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