Texas Cooperative EXTENSION
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Lawn

WATER MANAGEMENT

lawn

water management

James McAfee*

Homeowners know how important water is to a healthy lawn. Water is a limited resource in Texas, and it will become more limited as the population grows. Water rationing programs and rising water prices are already occurring in some areas of the state.

Homeowners can conserve a significant amount of water with no loss in grass quality by learning to water their lawns properly. Most homeowners drastically *over-water* their lawns. Over-watering can harm lawn quality more than under-watering. To establish an irrigation plan for your lawn, consider soil type, grass variety, management practices, and environmental conditions.

* Associate Professor and Extension Turfgrass Specialist, Texas Cooperative Extension, The A&M University System

Soil Type

Soil type affects the amount of water a lawn needs. Of the three soil types (clay, loam, and sand), clay soil retains the most water and thus needs watering less often. However, because water seeps into clay soil more slowly, it must be applied at lower rates over a longer period of time. Sandy soil retains less water than clay soil, but less water is needed to properly wet sandy soil.

Therefore, watering sandy soil takes less time than watering clay soil but must be done more fre-

quently. Loam soil lies between clay and sandy soil in its ability to hold water. Loam retains a moderate amount of water following irrigation and requires a moderate amount of water.

Water moves very slowly into some soil, especially fine-textured clay and loam. If a sprinkler head applies water faster than water can seep into the soil, significant water can be lost as run-off. To avoid this problem, use sprinklers with low application rates and/or irrigate to a point just before run-off. Then stop watering. Let the surface dry and then begin watering again. Repeat this process until the soil is wet to the desired depth.

Water can be lost when it leaches or filters through the soil, especially in coarse-textured sand and loam soils. Both water and nutrients may seep below the root zone where they are unavailable to plants. Consequently, watering deeper than the root zone should be avoided.

Grass Varieties

Using the appropriate grass can make water management easier and less expensive. Grass species vary significantly in their water needs and drought resistance (Table 1). Before establishing a

Table 1. Drought tolerance of the common southern turfgrass species.

Excellent	Good	Fair	Poor
Buffalograss	Bermudagrass	St. Augustinegrass	Zoysia matrella*
	*Zoysia japonica**	Centipedegrass	Kentucky bluegrass
	Seashore paspalum	Ryegrass	
		Tall fescue	

*Can vary depending on the variety.

new lawn, determine which grass species work best for your location. See Figure 1 for information about your specific location or contact your county Extension agent for more information.

Management Practices

The way you care for your lawn affects the amount of water it will need. You can conserve water by properly fertilizing, mowing, controlling thatch, reducing soil compaction, and considering the salt content of water in the region.

Fertilization

A good fertilization program provides essential nutrients in the amounts needed by the grass. Proper fertilization promotes healthy plant shoot and root development.

The deeper a plant's root system, the better able it is to use water held deep within the soil, reducing the need for supplemental watering. Too much fertilizer, especially nitrogen, may encourage shoot growth but hinder the development of hardy roots. Nutrient deficiencies are just as bad because they stunt roots and shoots and make the turf more vulnerable to disease, insects, weeds and drought.

Mowing

To determine how often to mow, use the "one-third" rule no more than one-third of the leaf area should be cut at any one time. Frequent mowing produces thicker, denser turf. The denser the grass, the less water will evaporate from the soil. Also, dense turf is more able to resist weeds.

Controlling Thatch

Thatch, the layer of non-decomposed organic matter found between the soil surface and the base of the leaves, can slow water movement into the soil and cause run-off. Thatch accumulates because of heavy fertilization, improper mowing, and over-watering. Topdressing, verticle mowing (dethatching) and aerification can help control thatch development.

Aerifying the Soil

Soil compaction keeps water and air from moving into the soil and reduces plant shoot and root development. Aerification of compacted soils once or twice a year helps break up packed layers to allow air and water to reach plant root systems.

Considering the Role of Salt in Soil and Water

In areas of the state where water is high in salts, plant a salt-tolerant grass species, such as Seashore *Paspalum*, bermudagrass, or Zoysia. Water deeply but only occasionally so salt does not accumulate in the soil. High levels of sodium damage soil quality and affect the ability of water to filter through the soil. Also, salt can exacerbate the effect of drought on turfgrass. Contact your county Extension agent for more information.

Environmental Conditions

Environmental conditions affect the water requirements of a lawn. With low humidity, high temperatures, and/or high winds, water is quickly lost from the soil by transpiration and evaporation (evapotranspiration) and grass will need watering more often. When weather is cool, humid, and/or less windy, grass will need less water.

Table 2. Yearly nitrogen fertilizer requirements for common Texas turfgrasses.

Grass species	Maintenance needs (Pounds of nitrogen per 1,000 square feet per year)
Buffalograss	0-1
Carpetgrass	1-2
Centipedegrass	1-2
St. Augustinegrass	2-3
Tall fescue	2-3
Bluegrass	2-4
Zoysia	2-3
Common bermudagrass	3-5
Hybrid bermudagrass	4-6

The time of year also influences irrigation needs. During the summer, when temperatures are high and days are long, lawns generally need supplemental watering. The need for additional watering drops from late fall through early spring when temperatures become cooler, the days are shorter, and rain is more frequent.

Table 3. Recommended mowing heights for common Texas turfgrass species.

Grass species	Mowing height (inches)
Buffalograss	2-3
Carpetgrass	1-2
Centipedegrass	1-2
St. Augustinegrass	2-3
Tall fescue	2-3
Bluegrass	1-3
Zoysia	.05-2
Common bermudagrass	1-2
Hybrid bermudagrass	0.5-1.5

When to Water

Rather than watering on the same schedule each week, adjust your watering schedule according to the weather. Irrigate deeply. Then wait until the grass begins to show signs of drought stress before watering again.

Symptoms of drought stress include grass leaves turning a dull, bluish color, leaf blades rolling or folding, and footprints that remain in the grass after walking across the lawn. To time watering properly, look for the area of the lawn that shows water stress first. Water the entire lawn when that area begins to show symptoms.

A lawn that is watered deeply should generally be able to go 5 to 8 days between waterings. Established lawns with deep, extensive root systems sometimes can be watered less often. However, if soil is less than 5 inches deep, irrigation may need to be more frequent.

Early morning is the best time to water. Wind and temperatures are usually the lowest of the day, and water pressure is generally good. That allows

water to be applied evenly and with little loss from evaporation. Watering late in the evening or at night causes leaves to remain wet for an extended period of time, which increases the chance for disease. Mid-afternoon watering may cause uneven distribution from high winds.

How Much to Water

Thoroughly wet the soil to a depth of 6 inches with each watering. Shallow watering produces weak, shallow-rooted grass that is more susceptible to drought stress.

Soil type, sprinkler style and water pressure determine how much water is needed to wet the soil to a depth of 6 inches and how long a sprinkler must run. Use the following steps to determine how long to run your sprinkler or irrigation system.

- Set five to six open-top cans randomly on the lawn (cans with short sides such as tuna or cat food cans work best).
- Turn the sprinkler head or system on for 30 minutes.
- Measure and record the depth of water caught in each individual can.
- Calculate the average depth of water from all of the cans. For example, you have used five cans in your yard. The amount of water found in the cans was as follows: 0.5 inch, 0.4 inch, 0.6 inch, 0.4 inch, and 0.6 inch. Add the depths together and then divide by the number of cans you used (five in this case).

  0.5 inch + 0.4 inch + 0.6 inch + 0.4 inch + 0.6 inch = 2.5 inches, 5 cans = 0.5 inch of water in 30 minutes
- Use a garden spade or a soil probe to determine how deeply the soil was wet during the 30-minute time period. The probe will easily push through wet soil but less easily into dry areas.

- From the amount of water that was applied in the 30-minute cycle and the depth that it wet the soil, you can then determine how long the sprinkler must run to wet the soil to a depth of 6 inches.

  In this example, the system put out .5 inch of water in 30 minutes, wetting the soil 3 inches deep. Therefore, 1 inch of water will need to be applied to wet the soil to a depth of 6 inches, giving a total watering time of one hour.

In some soils, especially heavy clay, it is difficult to irrigate 6 inches deep. Never apply water to the point of run-off. Water lost as run-off finds its way to sidewalks or cement gutters. If a sprinkler applies water faster than the soil can absorb it, stop irrigating until the surface dries and then resume watering.

Checking Your Irrigation System

There are many different irrigation systems available. Whether you choose an aboveground or underground system, it is important that it is working properly. A routine check should be made to ensure that water is being applied where it is needed, in the amount that it is needed, and in a uniform manner. Use the can method to check the distribution and amount of water being applied, and then make any needed adjustments.

Make sure sprinkler heads have the right water pressure to apply water as drops and not as mist. Excess water pressure can cause significant water loss. Sprinklers should never water sidewalks, driveways or streets.

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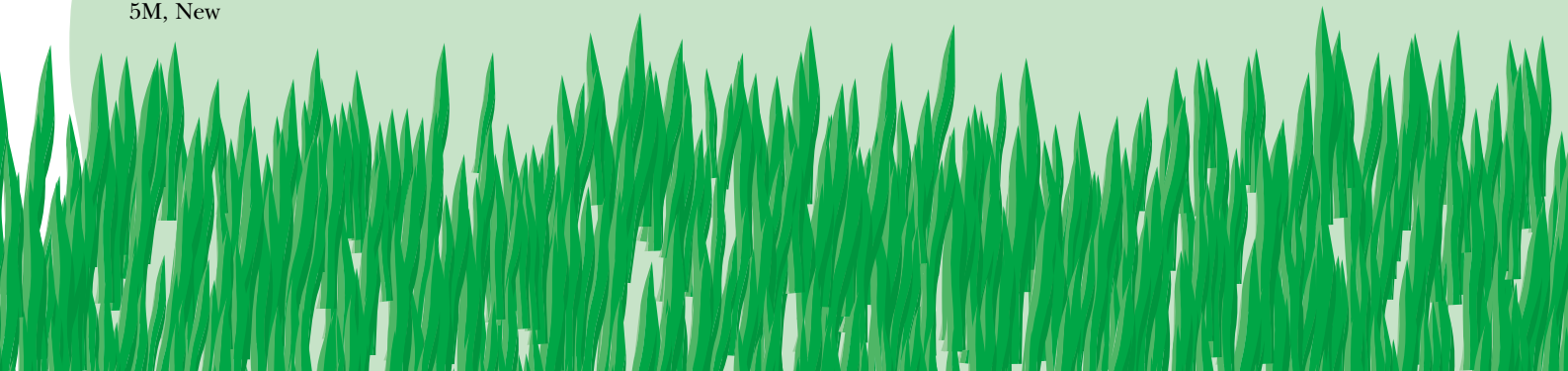
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