

Watering Lawns

Turfgrasses, like all living plants, require water for growth and survival. Since rainfall patterns vary, seasonal droughts are common in South Carolina. During long, dry hot periods in the summer, there are two choices when it comes to lawn irrigation: water the grass to keep it green, or do not water and watch the lawn turn brown and dormant. Unfortunately, each choice bears some consequences. Besides increasing mowing time, watering may encourage weed growth, stimulate disease outbreaks and raise your water bill.

If you choose to allow the lawn to go dormant, you can expect warm-season grasses — such as centipedegrass, bermudagrass, St. Augustinegrass or zoysiagrass — to remain alive and grow when more favorable conditions prevail. However, tall or red fescue cool-season grasses may not fare as well. While a well-established fescue lawn can be allowed to go dormant without serious injury, a newly established lawn with a limited root system may be severely injured or killed.

Irrigation

The most efficient way to water a lawn is to apply water when the lawn begins to show signs of stress from lack of water. Use the following techniques to identify signs or indications of water need.

Color Test: When water becomes unavailable for an extended period, a lawn will exhibit a bluish-gray cast.

Footprinting: Walk across your lawn late in the day and examine the lawn behind you to see if your steps left any "footprints." Your footprints will appear in a lawn when the grass plants have low levels of water in their tissues. When the grass blades are compressed by your feet, the low water

levels prevent the grass blades from springing back up. If your footprints remain for an extended period of time, the lawn should be watered to prevent the grass from becoming dormant.

Leaf Check: During dry periods, grass leaves respond by wilting, rolling or folding. These symptoms signal that watering is necessary to prevent the turfgrass from turning brown and becoming dormant.

Screwdriver Test: Press a screwdriver (or a reasonable facsimile) into the lawn. If the soil is very dry, it will be difficult to push the screwdriver into the ground. Use the screwdriver test to confirm the results of the other visual methods to help judge when you should water the lawn. You can also sample the soil from the root zone and see if it feels dry. Prolonged dry periods of high temperatures, strong winds and low relative humidity cause the lawn to appear drought-stressed. During such times, plants wilt even though water may be in the soil. This is because the leaves lose water faster than can be absorbed through the root system. However, always check the soil since watering may be needed.

If a lawn exhibits symptoms of drought stress, apply about half an inch of water on coarse, sandy soil and 1 inch of water on heavy or fine-textured soil. These amounts will moisten the soil to a depth of 4 to 6 inches. However, if you cannot apply this entire amount at once because of water running off from the lawn, apply about half an inch at a time and allow the water to soak in before you continue. Determine the depth of penetration with the "screwdriver test." If you have a portable sprinkler you can move it frequently to avoid surface runoff and excessive water use.

Once you water, do not water again until you observe water deficiency symptoms. Never water the grass every day except during the establishment of newly seeded, sodded or sprigged lawns. Watering every day with a small amount will encourage a shallow root system, making the grass less drought tolerant. Try to stretch the interval between waterings to as many days as possible to encourage the development of deep, extensive roots. Once you choose to water, continue watering. Encouraging the lawn to break dormancy and then not watering again will exhaust the plants and can cause injury.

Water early in the morning; it is the most efficient and beneficial time. Water evaporation is minimized so that a high proportion of the applied water is used by the grass plants. Also, early morning irrigation may curtail the development and spread of diseases. Grass blades dry off quickly, reducing the probability of fungus spores from germinating and infecting the leaf tissues. You may have no control over when you can water if you use municipal water, since you may have to schedule watering to avoid peak residential water use.

Select the Correct Sprinkler

Water should never be applied at a rate faster than it can be absorbed by the soil. If the sprinkler applies too much water, it runs off and is wasted. This seldom happens with small sprinklers unless the lawn is very dense or the soil is compacted.

How to Calibrate a Sprinkler: Knowing the amount of water an irrigation system applies over a certain time period is an important step in using water efficiently. Most people irrigate for a given number of minutes without knowing how much water they are really applying. This leads either to giving too little water or to wasted water, which runs down sidewalks and streets, or through the root zone and deep into the ground where grass roots cannot reach it. Calibrating or determining the rate of water a sprinkler system applies is an easy job. Use the following procedure for an in-ground system or a sprinkler at the end of a hose.

Step 1: Obtain several (five to 10) coffee cans, tuna cans or other straight-sided containers to catch the irrigation water. Containers that are 3 to 6 inches in diameter work best.

Step 2: If you have an in-ground system, randomly place the containers in one zone at a time. Repeat the entire procedure in every zone because the irrigation rates may differ. If you use a hose-end sprinkler to water turf, place the containers in a straight line from the sprinkler to the edge of the watering pattern. Space the containers evenly.

Step 3: Turn the water on for 15 minutes.

Step 4: After the elapsed time, collect the cans and pour the water into a single can.

Step 5: Measure the depth of water you collected .

Step 6: Calculate the average depth of water by dividing the amount of collected water in inches by the number of cans.

Step 7: Multiply the average depth by 4 to determine the application rate in inches per hour. Now that you know the sprinkler system irrigation rate, you can apply water more efficiently.

Use Table 1 as a guide for sprinkler times. For example, if the sprinkler system applies water at the rate of 2 inches per hour and you wish to apply three-quarters of an inch, then run the sprinklers for about 23 minutes. To determine how long to run a sprinkler system for irrigation rates not listed in Table 1, use Equation 1 in the box below.

Water-Saving Ideas

Here are some pointers to help save water when watering a lawn:

- Let the lawn "show" you when it needs water. Look at your footprints, a bluish-green or bluish-gray cast or wilted leaves.
- You don't have to water the entire lawn. Consider only those areas that need water. Look for signs of thirst to identify highly drought-prone areas: high spots; sandy locations; and areas adjacent to sidewalks, patios and driveways.
- In lawns on compacted clay soil where water does not penetrate easily, consider aerifying the lawn. Loosen up the soil with a spading fork or use a powered machine that creates holes or "pores" in the lawn by the action of spoons or tines mounted on a drum or reel. As the machine rolls over the lawn, it removes

cores of soil from the ground, loosening the soil. The holes also serve as water reservoirs by collecting water that reduces surface runoff. Cool-season lawns are best aerified in the fall; warm-season lawns in the summer.

- For an in-ground, automatic sprinkler system, set the time clock to "off" and manually turn the system "on" when the lawn needs water. The automatic position on the time clock is useful when you are away for more than a few days. Even then, the clock can be made to operate more efficiently by installing a rain shut-off device that overrides the system when it rains.
- Fix leaky hoses, spigots and valves. A considerable amount of water is wasted with leaky hose connections and worn-out spigots. Check sprinkler heads for an even spray pattern and direction of spray. Check for damaged sprinkler heads and replace heads that leak.

Managing the Lawn During Stressful Summers

Follow these steps to help the lawn deal with the stresses of summer weather:

- Get your soil tested and follow a fertilization program according to the test results. Add the appropriate amount of lime and maintain adequate levels of phosphorus and potassium

to encourage deep rooting and drought tolerance.

- Reduce thatch layers thicker than half an inch by dethatching. Heavy thatch layers may contain more grass roots than soil, thus making the grass plants less tolerant to drought and more susceptible to heat injury.
- Use natural fertilizers with "slowly available" or "water-insoluble" nitrogen and synthetic fertilizers that contain slow-release nitrogen, such as urea formaldehyde or sulfur-coated urea. The nitrogen in these types of fertilizer does not quickly wash away, and it provides green color without causing excessive leaf growth.
- Do not water when rain is forecast.
- Raise the mowing height of the lawn mower during summer months; a higher mowing height encourages root growth and reduces heat stress. A well-established fescue lawn can be allowed to go drought dormant in the summer without serious damage. A new lawn of fescue that is less well-established, only a few months old and has a limited root system can be severely thinned and may need to be replanted.

Table 1. Time Required to Apply Water for a Given Irrigation Rate.

	Irrigation Rate (Amount of water per hour)			
	0.5 in.	1 in.	1.0 in.	2 in.
Amount of water to be applied	Minutes to run each zone			
0.25 in	30	15	10	8
0.5 in.	60	30	20	15
0.75 in.	90	45	30	23
1 in.	120	60	40	30

Equation 1.

$$\text{Minutes required to run each zone} = \frac{\text{Amount of water to be applied} \times 60}{\text{Your calibrated irrigation rate}}$$

For example, if the sprinkler system applies water at the rate of 2 inches per hour and you wish to apply 0.75 inches of water, then you would need to run your sprinklers for about 23 minutes.

Excerpted from the *South Carolina Master Gardener Training Manual*, EC 678.

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