

STRATEGIES TO CONSERVE IRRIGATION WATER

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All intensively managed turfgrass systems require water for proper growth and development. Water can be supplied to the turf either as rainfall or through irrigation. Within the United States, supplemental water through irrigation is necessary because evapotranspiration (ET) from the landscape exceeds rainfall inputs typically during summer months when heat stress can affect turf growth.

Unfortunately, it is during these hot summer months that potable water demand is greatest. Moreover, it is during these periods that individual cities are imposing water use restrictions on residential and commercial landscapes. During the drought of 1988, the Wisconsin Department of Natural Resources ordered some golf courses not to use their irrigation systems or face large fines and other penalties. This was devastating and some golf courses lost considerable amounts of turf. Although watering bans are not a frequent occurrence in the Midwest, nationally this trend is increasing. To avoid watering bans, resort and private golf courses in the Southeast and Southwest pay millions of dollars annually to purchase water.

Part of the problem is the ability to add science to the determination of plant water needs. Today, turfgrass managers will select irrigation programs based on visual appearance of the turf or based on a long history of setting the irrigation clocks to run a predetermined length of time. In addition, some archaic irrigation systems designs require that all heads run together even though variations in the landscape warrant more individual head control.

Technology has advanced and individual irrigation head control is available which will allow for more precise application of water where it is needed. Also, soil moisture sensors like time-domain reflectometry or capacitance based, can provide the turfgrass managers a real-time plant available soil moisture status that is nondestructive. In the near future, these sensors can be remotely accessed either through a personal computer or through the irrigation controller to aid in the decision making process of watering frequency and rates of application. With below-ground knowledge of soil moisture status and with new formulas that more accurately predict ET (FAO56) that are turf species specific, irrigating will become more of a science rather than purely an art. However, advocating for new irrigation systems and the installation of moisture sensors is not realistic on all properties but should be considered when upgrading or installing a new system.

In the meantime, turfgrass managers should not wait to implement water conservation strategies on their properties. Combining improved species of grasses; better soil management; improved mowing, establishment and renovation practices; and more efficient use of fertilizers and pesticides is a good place to start to conserve water.

The following reference has an excellent section describing tips for conserving water which will be summarized below.

Brede, D. 2000. Turfgrass maintenance reduction handbook. Sleeping Bear Press. Ann Arbor, MI. pgs. 231-253.

1. Training in the spring: wait and avoid the temptation to turn on the irrigation in the spring. This will require the plants to grow deeper roots looking for water.
2. Adjusting the irrigation system: changing the irrigation controller (although easier said than done in many circumstances) as the weather changes can save a significant amount of water. If this is too ambitious of a goal, then at a minimum, install a rain cutoff switch.
3. Evaluate the status of the turf prior to watering: Just because it is Wednesday, doesn't mean that you have to irrigate your turf. Look for signs of wilt, like "footprints" or a slight discoloration (purplish or bluish) then turn on the water.
4. Determine your irrigation systems coefficient of uniformity: poor irrigation coverage wastes water as you apply more to cover the areas that receive less. Use soup cans, or a similar collection container, and place these throughout an irrigation zone; measure the amount of water collected and adjust the irrigation heads so that no more than 10% difference is present.
5. Pick an appropriate species of grass for your landscape. Warm season grasses use 20% less water than cool season species and perennial ryegrass uses more water than fine fescue.
6. Mow less frequently with a properly sharpened mower will conserve moisture within the plant.
7. Take care of your soil to help plants through stress periods. One way to accomplish this is through core aeration. This promotes deeper rooting and aids the plant in its ability to extract water from greater depths.
8. Apply fertilizer for better water use efficiency: a balanced fertility program with adequate K has been shown to reduce irrigation needs.
9. Evaluate your landscape and design your irrigation system in zones that have similar characteristics. For example, the top of a sloped surface will require more frequent application of water to reduce runoff.

10. Don't skimp on water during establishment. A healthy stand of turf established quickly will reduce irrigation needs in the long term. In addition, try to renovate or establish turf during times of the year when adequate moisture is naturally present through rainfall.