Landscape Irrigation Management
Part 2: Determining When to Irrigate

A great deal of irrigation mismanagement occurs simply because few people know when to begin irrigating. Some wait until plants begin to wilt before adding water, while others are convinced that watering very frequently is beneficial for the plants. There are several ways to determine if the landscape needs water.

1. Use a Screwdriver
Simply walk around the landscape once or twice a week with a standard screwdriver. Push the screwdriver 4 to 6 inches deep into the soil in several places in the lawn and flower beds, digging up a small amount of soil. Feel the soil for moisture – if it feels too dry, turn on the irrigation system. If it feels relatively moist, irrigation is not required. If the soil feels quite wet there may be a drainage problem to correct.

This method has the added advantage of allowing you to “tour” your landscape regularly, seeing problems or potential problems that you may not normally see. Some homeowners use this method quite well; others need another method to help maintain the landscape.

2. Foot Printing
Walk across the lawn, then turn around and look for your footprints. If the lawn has adequate moisture you will not be able to see where you have walked. If the lawn is stressed due to lack of water (or some other condition) you will be able to see the footprints. If footprints are readily visible, it is time to begin irrigation. If the lawn “crunches” when you walk, you’ve waited much too long!

Obviously, there are some portions of your yard that do not lend themselves well to this method (flower beds, etc.). Use the screwdriver method in those areas to check the soil moisture. Foot printing the lawn will give a good preliminary indication of the moisture condition of flower beds and foundation plantings, but nothing replaces feeling the soil to make sure.

3. Actual Plant Water Use
There are methods available to determine the actual daily water use of various plants. These methods (Penman-Monteith, etc.) are quite involved and require a large amount of information, including solar radiation, wind speed, relative humidity, and temperature just to name a few. The daily plant water use is calculated, and then the land is irrigated after the calculations show a certain amount of water has been removed from the soil.

This method usually requires more daily work than the average homeowner cares to invest. An entire book found on the United Nation’s Food and Agriculture web site is dedicated to the proper use
4. Measuring Soil Moisture

Since we are trying to maintain a certain soil moisture level to keep our plants healthy, one obvious way to determine when to irrigate would be to measure the soil moisture. There are many different types and models of soil moisture monitoring devices on the market, from inexpensive plastic devices of questionable accuracy costing a few dollars to fully-automated, computer controlled systems using radio links to turn on the irrigation system (and costing thousands of dollars). A happy medium between these two options that might be useful to the homeowner is called a tensiometer.

A tensiometer is a hollow, plastic tube with a porous, ceramic tip on one end and a small water reservoir on the other. A vacuum gauge is attached to the side of the tube. The tube is pushed into the soil, ceramic tip first, until the tip is in the approximate center of the plant’s root zone (more involved methods use two tensiometers, but that is not necessary for our purposes). The tube and reservoir are filled with water and a stopper is screwed into the reservoir to seal the tensiometer.

Water is drawn or “wicked” from the inside of the hollow tube through the porous, ceramic tip as the soil around the tip dries. Since the water reservoir connected to the tube is sealed with a stopper, this removal of water creates a vacuum inside the tube, which registers on the vacuum gauge. As the soil becomes drier the reading on the vacuum gauge climbs higher. When the vacuum gauge reading reaches a certain level (indicating a certain minimum level of moisture in the soil), the irrigation system is turned on to replenish the soil moisture.

It is very easy for a plant to withdraw water from a soil that is saturated with water. As the soil begins to dry, the soil moisture is held more tightly to the soil particles and is increasingly difficult for a plant to remove. The tensiometer device measures this “soil moisture tension” in the soil and helps determine how difficult it may be for a plant to retrieve water from the soil.

This is a fairly effective method of monitoring soil moisture and is not too expensive (tensiometers usually cost between $80.00 and $120.00). The tensiometer must be checked at least once each day (twice each day is a better option during the hot summer months).

The tensiometer may be a tool some homeowners would like to use, but the majority of us will use the screwdriver method - it works quite well and is inexpensive.

Plant Water Needs Vary

Some plants require a great deal of water; others require a very small amount. A mature pecan tree may use between 90 and 140 gallons of water per day. A prickly pear cactus is adapted to an arid climate and will require very little water. We may not have the research to provide estimated water needs for all landscape plants, but we can tell from our own experience which plants seem to use more water and which plants use less.

You should consider the relative water needs of the plants you plan to use before designing the landscape. If a pecan tree and a prickly pear cactus are planted in the same bed, neither will be irrigated correctly. If the bed is irrigated for the needs of the
pecan tree, the cactus will “drown.” If the bed is irrigated for the needs of the cactus, the pecan tree will wither and die. Plan bed plantings with an idea of the plant water requirements as well as the color and foliage to make the best use of your irrigation system and ensure a healthy landscape.

**Summary**

Management is the key to any irrigation system. We cannot expect a timer or controller to “think” for us, but must instead tour our landscape regularly, making adjustments and changes as needed. This will help us provide the best growing environment for our plants all year long.

Adapted from the 2007 *South Carolina Master Gardener Training Manual*.

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