

## **Landscape Irrigation Management Part 5: Irrigation Time of Day**

The best time of day to irrigate is the subject of some debate. One group suggests that early morning is the best time, while another group claims that afternoon is the best. Very few people consider night irrigation to be a viable alternative due to concerns of increased disease pressure. In all practicality, disease is not increased except when lawns are routinely over-irrigated.

### **Water Conservation & Time of Day**

From a water conservation standpoint, daytime is a poor time to irrigate. Evapotranspiration is the combination of (a) the loss of water by transpiration of plants, and (b) evaporation from soil and plant surfaces. Evapotranspiration is greatest during the hottest hours of the day (10:00 am to 4:00 pm). This is when plants work the hardest to deal with the stress associated with mid-day climatic factors such as high temperatures, strong solar radiation (Figure 1), and lower humidity. It is best to take a more preventative approach and prepare plants for this stress rather than a curative approach and irrigate plants when they are already stressed. In addition, water applications from sprinklers are more susceptible to drift and evaporation because of the previously mentioned climatic factors and because wind speeds are typically higher during the day. Estimates of water loss during daytime irrigation range from 20% to 30%, depending on humidity, wind speed, and temperature. In effect, the resident who applied 1 inch of water only received the benefit from 0.7 inches.

The best time of day to begin irrigation is after nightfall. The irrigation cycle should end early enough before sunrise to allow excess water to soak into the landscape so that the leaves will dry in the

normal time period. Night-time temperatures and wind speeds are much lower, which means lower evaporative losses during irrigation. Night-time humidity is higher, which also reduces evaporation. There is no sun, so solar radiation does not contribute to water evaporation. Estimates of water loss during night-time irrigation are approximately 15%, once again depending on humidity, wind speed, and temperature. The resident who applied 1 inch of water receives the benefit from 0.85 inches.

### **Disease Pressure & Time of Day**

So we have conserved water, but what are the consequences? Consider a commonplace, unremarkable event that happens most spring and summer evenings – dewfall. If a person walks across a lawn in the evening, his or her shoes will become wet quickly. The leaves of the plants in the landscape are moist from dewfall and will remain so until the dew naturally dries from windy conditions or in the morning as it is exposed to sunlight.

By irrigating during the evening a new factor to the disease equation is introduced – moisture already exists on the leaves from dew, but now there is moisture on the plant that is closer to the soil surface. Let's look at a turfgrass lawn, for example. Water may be present on the leaves from dew, but irrigating in the evening will increase the moisture below the blades in the thatch layer by (a) water applied from the irrigation system, and (b) by “knocking” the dew off the leaves. This “traps” the moisture and creates a humid microclimate around the thatch and blades, providing an optimum environment for diseases.

In comparison, if irrigation occurs early in the morning before the dew has dried, the humid microclimate will not persist as long as if we had irrigated during the night. With these concepts in mind we can see that irrigating early morning is most appropriate. The majority of landscapes in South Carolina will respond well with no disease pressure increase to early morning irrigations. Irrigation systems should be programmed so that all zones are irrigated before 5:00 am.

As with any new practice, try this irrigation timing for your own landscape and monitor the plants for several weeks. If you do notice an increase in disease pressure, try beginning irrigation in the morning after the dew has dried from the plant leaves (probably around 10:00 a.m. or slightly later).

Turf diseases seem to flourish when temperatures are moderately warm and the turf is moist, which describes the spring and fall nighttime climates in South Carolina. Monitor your landscape carefully during these times. If disease pressures increase, change your irrigation schedule to late morning watering for a month or two in the early spring and again in the late fall. Move back to early morning watering during the summer months after the temperatures grow warmer and the climate becomes less humid. It is also important to reduce your irrigation frequency. As mentioned previously, disease pressure is increased more by routine irrigations that apply more water than is required.

If your irrigation system utilizes subsurface irrigation (subsurface drip irrigation, or buried drip lines) the issue of irrigating at night or early morning is not important because water is delivered directly to the root zone and therefore no water is present above the soil surface on above ground plant tissue.

### **Municipal Water & Early Irrigation**

One final caution – if you use city or county water for irrigation, set your irrigation program to finish irrigating before 5:00 a.m. Local municipalities try to keep reservoirs filled for the “morning rush” of showers and baths in the community. If a number of residents have irrigation systems running during this time, the reservoirs will be depleted quickly and the water pressure for the community will be much lower than normal that morning. Be a good neighbor.

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

---

Prepared by W. Bryan Smith, Area Extension Agent, Agricultural Engineer, Clemson University and Dara Park, Assistant Professor, Water and Soil Relationships in Turfgrass Systems, Clemson University. (New 5/08.)

---

This information is supplied with the understanding that no discrimination is intended and no endorsement by the Clemson University Cooperative Extension Service is implied. All recommendations are for South Carolina conditions and may not apply to other areas. Use pesticides only according to the directions on the label. All recommendations for pesticide use are for South Carolina only and were legal at the time of publication, but the status of registration and use patterns are subject to change by action of state and federal regulatory agencies. Follow all directions, precautions and restrictions that are listed.