

# LAWN IRRIGATION WITH AUTOMATIC SYSTEMS

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Automatically time-controlled underground lawn irrigation systems have become readily available in Kentucky. When the systems are properly designed and installed, they can be effectively used to grow high-quality turf. In addition to applying necessary water for plant growth, proper irrigation can

- provide water to move pesticides and fertilizers to the root zone,
- remove frost,
- help reduce thatch by maintaining a moist environment for microbial degradation,
- cool the plant surface and air that surrounds the home or commercial building, through the process of plant evapotranspiration.

When compared to hand watering with hoses and sprinklers, these automatic systems give more uniform coverage and can reduce water loss by not watering sidewalks, streets and buildings. In addition, irrigation can be automatically scheduled to avoid peak residential water demand, which is important when using municipal water.

## **Beware of Overwatering**

Since Kentucky receives an average of about one inch of precipitation per week during the summer, automatic irrigation systems mainly supplement rainfall rather than providing all the moisture that turf needs. Consequently, irrigation should almost never be programmed daily, every other day, etc. It would be better to let the lawn suffer or die naturally without water,

than kill it with expensive overwatering. Overwatering causes shallow roots, nutrient loss, disease-susceptible turf and very severe problems with weeds like nutsedge, nimblewill, bent grass, annual bluegrass, oxalis and crabgrass. Turf roots must have a balance of water and air - overwatering excludes air. Further, due to diseases such as Phytophthora Root Rot and Pythium, overwatering stimulates damage to susceptible ornamentals such as taxus, junipers, azaleas, rhododendrons, Japanese hollies, hemlock, dogwood, geraniums, chrysanthemums, etc. Other ornamentals such as pin oaks, willows, bald cypress, red maples and sweet gum are much more tolerant of overwatering. Ornamentals planted in drainage areas and planted too deeply will be most severely affected by overwatering.

## **How Much Water?**

Most Kentucky soil can hold about 2/3 inches of plant extractable water in the surface 4 inches where most turfgrass roots persist. Although this is less than the turf will likely use during a week, it is equivalent to about 400 gal of water/1000 sq ft of lawn. The difference between the Total Amount Needed for evaporation and transpiration per week and the Amount of Plant Extractable Soil Water plus weekly Rainfall is approximately equal to the Amount of Irrigation Needed to maintain maximum growth, e.g.

**Total needed - [soil water + rainfall] = irrigation needed**

It is commonly suggested, as a rule-of-thumb, that turf needs about one inch of rainfall or irrigation water/week from May through September. Long term weather data, relating water loss and rainfall, indicate that most Kentucky lawns need less than 1/4 inch of irrigation water/week as an average. However, such long term weather averages mask the increased need for irrigation during periods of obvious drought.

### **Weather Variations and Water Cost**

Kentucky's weather has been extremely variable in recent years. A weekly water deficit occurred 10 times during the relatively wet 1985 and 18 times during an extremely dry 1983 (Figures 1 and 2). Also note that almost every deficit was more severe in 1983 than in 1985. If you irrigated each time the 2/3 inches of available soil water was depleted, and if you applied 2/3 inches each time, then you would have irrigated 15 times in 1985 and 42 times in 1983. Even in the very dry year, 42 irrigations averaged less than 2 times/week during this 26-week period. At 400 gal/1000 sq ft, 42 irrigations equals 16,800 gal/1000 sq ft without considering any evaporative losses during irrigation. At a cost of \$1.70/gal and excluding sewage charges, the water cost per 1000 sq ft in 1983 and 1985 would have been \$29 and \$10 respectively.

### **Good Judgment Needed**

Although an automatic timer may be set to irrigate several times a day, everyday and at various time intervals-DON'T. Instead, use good judgment to decide when irrigation is needed, then either (1) manually set the clock to automatically rotate through the different stations (valves/zones), (2) program the system for one irrigation to occur; for example the next morning, or (3)

set the automatic timer to provide one or two irrigations per week with either automatic or manual cutoff if significant rainfall or mild weather occur. However, it is best and most economical to initiate watering only when drought becomes evident.

### **When is Turf Too Dry?**

Dryness is evident when

- turf on high spots and/or south slopes starts to show some chlorosis or turns bluish gray in color,
  - footprints remain in the grass long after being made,
  - soil from the root zone is dry or powdery,
  - no rain has occurred for about one week and hot, dry, sunny, windy weather persists.
- The very best way to determine if irrigation is needed is to probe the surface soil and determine if the surface inch or two is visibly dry. Economical soil water tensiometers may soon be available to electronically initiate irrigation when soil becomes too dry.

### **Other Guidelines**

The following guidelines may help you use your irrigation system effectively:

- (1.) Not all sites in a lawn will need the same frequency of irrigation. If, for example, you are watering a flower bed under a roof overhang, you may need irrigation even during rainy spells, especially on the east and north sides of buildings. Probe the soil and see!
- (2.) When necessary to irrigate, apply about 2/3 inch of water. Check the irrigation rate and uniformity by placing straight edge cups or pie pans around several lawn areas. Also probe the soil to see if it is wet approximately 3 to 4 inches deep after irrigation. If surface run-off occurs before irrigation is complete, apply only 1/2 of the amount in future irrigations and let the

system recycle after a few hours. An efficient irrigation wets only the turfgrass root zone, does not saturate the soil and does not cause run-off

(3.) More frequent irrigation is usually required on the hotter, south-facing slopes, where 1/2 inch or greater of thatch is present, when growing Kentucky bluegrass rather than tall fescue, when mowing at 1 1/2 inch height rather than 2 1/2 inch height, and certainly during the hottest time of year.

(4.) During summer vacations and other summer periods when close attention cannot be given to initiate each irrigation, consider setting the clock to apply about 2/3 inches of water two times/week. During fall and spring, since temperatures are cooler, the lawn can usually go 2 to 3 weeks without significant rainfall or irrigation.

(5.) Water can be applied anytime during the day without damaging turf. However, evaporative water loss during irrigation is much higher during the heat of day. Early morning watering is often advantageous since it removes dew and guttation water which often encourage disease problems. If a turf disease is evident, avoid late evening watering that would prolong leaf wetness. Otherwise watering during late evening or night causes no problems.

Kentucky's continuously changing environment provides a challenge to planning an efficient turfgrass irrigation program. After a few weeks of experience, using the guidelines mentioned above, you may tend to develop a sixth sense concerning irrigation. At that point, irrigation becomes an efficient and effective tool in developing a high quality lawn.

