

HOME LAWN IRRIGATION

A.J. Powell and M.L. Witt

For best quality landscapes, supplemental irrigation is almost always necessary during Kentucky summers. If you compare the long-term average rainfall for Kentucky (46 inches annually) and water requirements for growing turf and woody plants, you could easily conclude that lawns and woody plants do not need irrigation. On the other hand, if you consider the extreme variability in our rainfall and temperatures, your need for supplemental irrigation is obvious.

How Much Water Should You Apply?

How Much Water Does Your Landscape Need?

Most Kentucky soils can hold about 2/3 inches of plant extractable water in the top 4 inches where most plant feeder roots persist. Although this amount is less than turf and woody plants will likely use during a week it is equivalent to about 400 gal of water/1000 sq ft of landscape area. A common rule of thumb is that turf and woody plants need about one inch of rainfall or irrigation water/week from May through September.

Beware of Overwatering

Irrigation is used mainly to supplement rainfall rather than to provide all the moisture that plants need. Consequently, irrigation should never be done on some arbitrary, regular schedule such as daily, every other day, etc. Rather, water should be applied when soil is dry an inch below the surface; when leaves begin to wilt; when grass begins to show off-colors like yellow or

bluish casts. The exception to this rule is when you are trying to get a new lawn established. If possible, seeds need daily (even twice daily) watering to germinate and rapidly develop in the small seedling stage.

It would be better to let an existing lawn suffer or die naturally without water, than to kill it with expensive overwatering. Overwatering causes shallow roots, nutrient loss, disease-susceptible plants, oxygen deficiency around plant roots, and very severe problems with weeds like nutsedge, nimblewill, bentgrass, annual bluegrass, oxalis and crabgrass. Roots must have a balance of water and air; overwatering excludes air.

In most situations with woody plants, enough water should be applied at each irrigation to replace water that was used. If enough water is applied to penetrate deeply and to be absorbed before further irrigations, deep rooting will be encouraged and crown-rotting organisms minimized.

Overwatering stimulates damage to ornamentals such as Taxus, junipers, azaleas, rhododendrons, Japanese hollies, hemlock, dogwood, geraniums, chrysanthemums, etc. These plants are susceptible to diseases such as Phytophthora root rot and Pythium, diseases encouraged by overwatering. Other ornamentals such as pin oak, river birch, alder, willow, bald cypress, red maple and sweet gum are much more tolerant of overwatering. Woody plants planted in drainage areas and planted too deeply will be most severely affected by overwatering.

Water Use by Plants

To manage irrigation properly, you need to know how fast water is lost by

transpiration (through leaves) and by evaporation from the soil (evapotranspiration).

Environmental factors that influence evapotranspiration are sunlight, temperature, humidity and wind. Often leaves take on a wilted, dull appearance after a strong wind, probably because of low humidity, high temperature, intense sunlight and mechanical injury.

Large landscape plants use more water than does grass. Solid plantings of trees and shrubs use 10-20% more water than turf, whereas a solitary shrub or tree may use 2-3 times as much water as a comparable area of turf because it has greater exposure to sun and wind.

Evapotranspiration varies greatly during the year for evergreens and turf, but it varies even more for deciduous plants. In summer, deciduous plants may use 40% more water per day than broadleaved evergreens of similar size.

Let Your Plants Tell You When to Water

Turf is too dry when:

- turf on high spots and/or south slopes starts to show some chlorosis or turns bluish-gray in color;
- footprints remain in 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.

Woody plants are obviously too dry when:

- leaves that were shiny become dull;
- bright green leaves fade to gray-green;
- leaves begin to wilt or curl;
- dead areas appear on the edges of leaves.

However, the same symptoms of wilting, curling and leaf chlorosis show up when plants are growing in soils that are too wet.

The very best way to determine if you

need to irrigate is to probe the surface soil and determine if the top inch or two is visibly dry. You may even want to pick up a handful of soil and mold it into a ball. If the ball crumbles when rubbed, the moisture is probably about right. If the ball will not crumble when rubbed, the soil is too wet. If the soil will not mold into a ball, it is too dry to adequately supply water to plants.

Guidelines for Watering?

How Often?

Not all sites in a landscape 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 east and north sides of buildings. Probe the soil and see! Newly set annual flower transplants need water every other day for a week or two until roots have a chance to grow. You need to check your plants often for signs of water stress and apply water as needed.

More frequent irrigation is usually required:

- on hotter, south-facing slopes;
- where turfgrass has 1/2-inch or greater of turf thatch;
- when growing Kentucky bluegrass rather than tall fescue;
- when mowing at 1 1/2-inch height rather than 2 1/2-inch height;
- around newly planted landscape plants;
- certainly during the hottest time of year;
- for the first 2 years after planting trees and shrubs; nothing is more important to keeping them alive and reestablishing the root system than regular watering.

During summer vacations and other summer periods when you cannot give close attention to the landscape, consider having someone check your turf and woody plants every week and then irrigate if needed.

During fall and spring, when temperatures are cooler, the lawn and established woody plants can usually go 2 to 3 weeks without significant rainfall or irrigation.

How Much?

When necessary to irrigate, apply about 2/3-inch of water. Check the irrigation rate and uniformity by placing straight edged cups or pie pans around several lawn and landscape bed 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 and wait a few hours for additional irrigation. An efficient irrigation wets only the active root zone, does not saturate the soil and does not cause run-off.

How to Apply Water to Trees?

Trees should be watered with soaker hoses rather than overhead. A slow running garden hose, trickle system, leaky pipe system or any other method you can think of to get water localized in the root ball area, at a very slow rate, for a couple hours is the best way to water trees.

Directing a stream of water over the root system for a few minutes does little good if the soil is heavy. The amount of water entering the root system is limited by the infiltration capacity of soil; many soils can only take in water at a rate of one or two inches per hour and heavy clay soils may only absorb 0.1 inches per hour. Therefore, the amount of time for soaking is much more important than the rate of application.

Drip irrigation systems are now available. These often improve water infiltration because they can be timed to apply a small amount of water for a long period of time. In addition, since water is applied below the plant foliage, leaves do not get too wet and fewer disease problems develop. If a root ball is thoroughly wetted,

additional irrigation may not be needed for several weeks.

What Time of Day?

Water can be applied anytime during the day without damaging turf. However, more water evaporates during the heat of day. Early morning watering is often advantageous since it removes dew and guttation water that often encourages 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.

Irrigation Equipment

Automatic Systems

Automatically time-controlled underground lawn irrigation systems have become readily available in Kentucky. When systems are properly designed and installed, they can be effectively used to grow high-quality landscapes.

When compared to hand-watering with hoses and sprinklers, these automatic systems give more uniform coverage and can reduce water loss by keeping water off sidewalks, streets and buildings. In addition, irrigation can be automatically scheduled to avoid peak residential water demand, which is important when using municipal water.

Overwatering is the biggest mistake made by homeowners utilizing automatic irrigation systems. 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 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.

Drip and Trickle Irrigation

Drip and trickle irrigation systems deliver very small amounts of water directly to the root zone. Water reaches the root zone through a network of pipes, usually consisting of a large main line and smaller laterals running to individual plants or among plants in a landscape bed.

Drip and trickle systems have advantages and disadvantages, but the advantages far outweigh the disadvantages:

- (1.) A high degree of water control is possible. It can supply plants with the precise amount of water they need.
- (2.) Smaller water supplies can be utilized. Drip requires roughly 50% less water than sprinkler or surface irrigation.
- (3.) Lower operating pressures and lower flow rates are required.
- (4.) Disease and insect damage is reduced because leaves are not wetted. This advantage is very important in woody plants like roses.
- (5.) Weed problems and cultivation costs are reduced because water is not lost to weed growth between plants.
- (6.) On hilly terrain, good systems can operate efficiently with no water runoff and without interference from the wind.

The main disadvantage is plugging of the system's small orifices with soil, sand, algae or mineral precipitates. Proper filtration reduces these problems. Other drawbacks:

- Moisture distribution is limited.
- Rodents and insects may damage some components.
- Occasionally, as people walk over the area where it is installed, they may damage the tubes.

Sprinkler Irrigation

Although somewhat inconvenient and time-consuming, the most common and least expensive method of irrigation involves attaching a single sprinkler to a portable hose. **Oscillating** (wave) sprinklers can be used to effectively irrigate rectangular areas; but because they generally throw small droplets high into the air, much water is lost in evaporation. **Fixed spray** sprinklers are particularly good for watering individual plants or hot-spots in a lawn, but often apply water non-uniformly to large lawn areas. **Rotary** sprinklers usually apply a higher rate of water, but only in a circular pattern. Even distribution is therefore most difficult unless the sprinkler is moved very often so that watered areas overlap each time. **Soaker** hoses are suitable for steep slopes and narrow beds or areas between the sidewalk and street; again, distribution is often uneven and the hose's quality quickly deteriorates.

You can easily check the rate and uniformity of water application by placing a row of cans or pie pans in a line at 1-3 ft intervals from the sprinkler to the point of furthest throw. By allowing the sprinkler to run for 1/2 or one hour, you can then evaluate its quality and the inches per hour it delivers.

In summary, remember that extra water from irrigation may only be needed, or even desirable, during the most severe droughts. If you just irrigate particular hot spots, shallow soil areas, or drought-susceptible plants, your irrigation program will be less costly and unlikely to cause problems for many plants that suffer from "wet feet."