OFFICE COPY

Michigan State University Extension • Bulletin E09TURF • May 2002 • www.turf.msu.edu

Turf Tips

Irrigation Practices to Preserve Water Quality

G.T. Lyman, P.E. Rieke & J.M. Vargas Jr.
Departments of Crop and Soil Sciences and Plant Pathology, Michigan State University

ORNAMENTALS TEAM

Watering the lawn is a necessary activity for many homeowners who desire a high quality turf. Correctly irrigating turf will ensure better density and growth that allows the turf to compete more effectively with weeds and reduce other pest problems. A healthy turf can offer outstanding protection of water resources by significantly reducing surface runoff and soil erosion and increasing the infiltration rate of water into the soil. The first watering after a fertilizer or pest control application is the most critical. Excessive water after application has the potential to move these products past the active plant growing zone in runoff or leachate. A light irrigation (0.2 inch) after application moves these products into the thatch and root zone, where they are intended to go. There the potential for them to move off the site is significantly reduced. Understanding a few basics of turf growth and the effects of supplemental irrigation can help determine the best approach for your property.

The major factors involved in proper irrigation are the desired level of maintenance, soil conditions, the water delivery system, weather conditions and the timing of water application.

Basics of Turfgrass Growth

The natural cycle for cool-season grasses found on Michigan lawns has two distinct growth peaks during the year. The first is in the spring, when growth increases rapidly following winter dormancy. Characteristic warming temperatures and abundant rainfall during this period promote vigorous growth. Depending on weather conditions, this first growth surge will peak during May or June. In July and August, weather patterns usually provide higher temperatures and low rainfall. The cool-season turfgrasses respond by reducing the amount of leaf and root growth. Extended hot and dry periods will cause the turf to go dormant (stops growth and turns brown). This is a natural process that allows the plant to survive these conditions. The crown of the plant (which is the critical growing point) remains alive, waiting for adequate water. Supplemental irrigation during this period can prevent dormancy and allow the turf to remain green throughout the summer stress period. During late August through October, leaf growth increases as temperatures cool and rainfall is normally more available. Root growth increases during this period and continues into the fall while soil temperatures remain above freezing. The late summer/early fall period is considered the second growth peak of the season. Weather conditions each year determine the duration of the active or dormant periods.

Setting Goals

Setting objectives for your lawn and selecting the level of maintenance that you are willing to commit to are the first steps in determining your irrigation practices. If you desire a high quality lawn and have a reliable irrigation system, this goal will be easier to achieve. Medium- or low- maintenance lawns would not normally be irrigated, and dormancy during the hot, dry periods would be expected. Some homeowners welcome this dormancy as a relief from regular mowing! The amount of water involved in achieving a high quality turf will vary from year to year, depending on weather patterns. It is important to note that an abrupt change in watering practices from regular irrigation to no irrigation during the heat stress period might be harmful to the turf. Dormancy must be induced gradually to condition the grass plants to tolerate the onset of hot, dry conditions. The cost and availability of water in your area are other factors to consider when setting your irrigation goals.

Soil Type

The amount of water required by a lawn is influenced by the soil type. Sandy soils hold less water than loamy soils, so the turf dries out faster in sand. Low-volume, frequent applications ensure that excessive water doesn't move past the plant zone. Soils with more silt and clay or organic matter can hold more water per application. Compacted clay

soils do not accept water readily, however, and runoff can occur from sloping sites. The goal is to match the delivery rate of the irrigation system with the infiltration rate of the soil.

Amount and Timing of Irrigation

Generally, lawn turf requires 0.5 to 1.5 inches of water per week. The amount of water you apply will vary, depending on the weather conditions and rainfall. In periods of high temperatures coupled with full sun and high wind, lawns will require more water. It is important to note that the water can come from either rainfall or irrigation. Light, frequent applications of water are much more productive than heavy applications once a week. Remember that turf roots are naturally shorter during hot and dry weather, and water moved past the root zone is of no benefit. Research at Michigan State University also indicates that damage from certain turf diseases and insects is reduced when light, frequent (daily) irrigation is used rather than heavy, infrequent watering. That corresponds to 0.1 to 0.2 inch of water. Applying this amount could correspond to 10 to 60 minutes of irrigation, depending on the output of your system. The rate and pattern of delivery for your system can be measured by placing cans in the lawn throughout the irrigation pattern. Turn on the system for one hour and measure the amount collected. Use this information to determine how long it will take to provide the amount needed. An in-ground irrigation system is more expensive but will give better coverage and is easier to use than hose-end sprinklers. The best time of day for watering is early afternoon just before the highest temperature period of the day. This takes advantage of the cooling effects of water. You should slightly increase the amount during periods of high temperatures and sustained wind to make up for evaporation.

Wrap It All Together Success

First, choose a level of quality or maintenance that is compatible with your objectives and choose a range of total water needed (0.5 to 1.5 inches per week). Pick a specific amount after making adjustments for weather and soil conditions. Then split that amount up into several light, frequent waterings. During dry, hot periods, this will be daily irrigation.

Be aware of poor distribution when irrigating during periods of high winds. Additional irrigation cycles may be needed to achieve adequate distribution and prevent dry spots. On sloping lawns, using shorter cycles with repetition will permit time for infiltration to occur and reduce the potential for runoff.

Finally, take control of the sprinkler! Coordinate the irrigation with rain and don't overload your lawn by irrigating in the rain. Install a rain override device on your irrigation system to prevent wasting water. During rainy periods, turn off a clock-controlled irrigation system. Remember that keeping the water where the turf can use it is the most efficient and environmentally sound program.

MICHIGAN STATE UNIVERSITY EXTENSION

MSU is an affirmative-action equal-opportunity institution. Michigan State University Extension programs and materials are open to all without regard to race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, marital status, or family status. ■ Issued in furtherance of Extension work in agriculture and home economics, acts of May 8 and June 20, 1914, in cooperation with the U.S. Department of Agriculture. Margaret A. Bethel, Extension director, Michigan State University, E. Lansing, MI 48824. ■ This information is for educational purposes only. Reference to commercial products or trade names does not imply endorsement by MSU Extension or bias against those not mentioned. This bulletin becomes public property upon publication and may be printed verbatim with credit to MSU. Reprinting cannot be used to endorse or advertise a commercial product or company.

Revised-5/02-3M-kmf/BP-40 cents; Single copies free to Michigan residents. (Turf and Sod)