OFFICE COPY

Michigan State University Extension • Bulletin E05TURF • May 2002 • www.turf.msu.edu

Turf Tips

Fertilizing Home Lawns to Preserve Water Quality

P.E. Rieke and G.T. Lyman,
Department of Crop and Soil Sciences, Michigan State University

ORNAMENTALS TEAM

The first step in developing a fertilizer program for your lawn is to identify the objectives for the lawn area on your property. Homeowners demand a wide range of functions from their lawns. Many property owners desire a formal appearance with the lawn providing a uniform and manicured setting. Others may utilize their lawns as highly trafficked play areas, while others are interested in as little maintenance as possible to provide a reliable and stable surface. Carefully consider the function for your lawn along with the growing conditions on your property, and then set realistic objectives for your lawn. The fertilizer programs described below are structured into three levels of maintenance-low, medium and high. Choose the level of maintenance that will best fit the level of input you want to dedicate to your lawn area and also achieve your objectives.

All property owners should understand the environmental considerations of their lawn maintenance activities. Fertilizers can be used in a manner that will minimize the potential for off-site movement. Properly fertilized turfgrasses can provide an excellent filter for environmental contaminants, but excessive, poorly timed or misapplied fertilizers have the potential for off-site movement resulting in degraded water resources. Of particular concern are fertilizer particles that land on impervious surfaces such as driveways and sidewalks. These materials are likely to run off in rainwater and be carried downstream. Be aggressive in sweeping these particles back into the lawn area where they will be utilized. Homes located in urban areas with curb and gutter systems that are connected to storm water drainage systems should consider themselves connected to surface water resources via the storm water handling system. Sensitive sites such as waterfront properties should refer to Turf Tips E11TURF, "Maintaining Waterfront Turf" for special instructions.

The three main components of turf fertilizers are nitrogen (N), phosphorus (P) and potassium (K) (potash). A fertilizer labeled 20-5-15 contains 20 percent nitrogen, 5 percent phosphorus and 15 percent potash by weight. The importance of each of these components is discussed individually below.

Soil Testing

Knowing the conditions of your soil is one of the most important factors in growing a healthy lawn. Your MSU Extension office can instruct you on how to conduct a soil test through the MSU Plant and Soil Nutrient Laboratory.

Components of a Fertility Program

Nitrogen

Nitrogen is an essential nutrient for all plant growth and is available in many forms from garden centers or professional lawn care services. To successfully meet the objectives of most lawn areas, annual applications of nitrogen are required. The total amount of nitrogen required each season will vary, depending on the desired level of maintenance and the growing conditions on your property. Recommendations for the amount of nitrogen and time of application for each maintenance level (low, medium, high) are listed below in the timing chart.

High maintenance situations are those where a high quality, uniform, dense lawn or athletic field is desired and an irrigation system is available. The primary turfgrass species used in this situation is Kentucky bluegrass. The medium maintenance situation is for most general lawn or athletic field areas where no supplemental irrigation will be applied, but the intention is to optimize turf growth for quality, density or playing conditions. The low maintenance situation is intended for lawn areas where the lowest level of input to maintain turfgrasses for a stable surface is desired.

Please consider the environmental responsibility of applying nitrogen to your lawn. Nitrogen is easily dissolved in water. When too much nitrogen is available for turfgrass plants to consume and excessive water is present, nitrogen can move away from the lawn and into water resources. This situation can be easily avoided by following these suggestions.

- Do not apply more than 1 pound of nitrogen to 1,000 square feet of lawn per application.

In general, the recommendations located on lawn fertilizer bags are designed to apply the desired amount — 1 pound of nitrogen per 1,000 square feet of lawn. For example, if a bag of fertilizer lists that it will cover 5,000 square feet of lawn, it will deliver approximately 5 pounds of nitrogen to that area. Follow the bag directions and don't overapply.

■ Consider using slow-release forms of nitrogen.

Slow-release nitrogen fertilizers are designed to release nitrogen to the plants over a long period of time. Slow-release fertilizers include organic sources such as poultry manure or sewage sludge. Others include common nitrogen sources such as urea or ammonia nitrate that are coated with materials that release the nitrogen slowly over time. The portion of slow-release nitrogen available in the fertilizer product is listed as "water insoluble" nitrogen on the label.

Choose products with slow-release nitrogen to reduce the potential for off-site movement.

■ Keep fertilizers off impervious surfaces. Sweep fertilizer particles from driveways and sidewalks back onto the lawn area. This will prevent them from moving downstream with rain water.

Phorosphorus

Phosphorus is a common component in most turfgrass fertilizers. It is an important element for turf growth and is critical for establishment of new seedlings. Phosphorus levels in soil are stable, and most Michigan soils have adequate phosphorus levels and therefore may not need continual applications of phosphorus. A soil test will reveal the amount needed annually on your lawn. Phosphorus is a primary water quality concern in Michigan. Phosphorus applied to lawns is quickly bound to soil particles after the fertilizer has been adequately watered into the lawn. It is important to sweep these fertilizer particles from impervious surfaces to reduce the potential for them to move away from lawn areas. Sensitive lawn sites adjacent to lakes, streams and ponds should use no-phosphorus fertilizers when soil levels for lawns are adequate.

Potassium

Potassium is also a primary turfgrass fertilizer element. It is usually applied in quantities ranging from 50 to 100 percent of the nitrogen rate at each application. Potassium levels in soil are relatively stable. A soil test will reveal the amount needed annually on your lawn. Levels below 120 pounds of K per acre are low for lawn turf; soils with levels above 250 pounds of K per acre need no additional potassium. Potassium is not regarded as a major water quality concern.

Putting Your Program Together

Identify the objectives for your lawn and choose the nitrogen fertility program from the chart below that will best fit your objectives. Phosphorus and potassium should be added to the program on the basis of soil test information.

Once you have picked the level of maintenance and quality for your lawn, you can target the application time for the most effective use of the nutrients. The application times listed in the table take advantage of late fall fertility. Research at Michigan State University has demonstrated several benefits for late fall nitrogen applications. During this time of year, the top growth of the plant slows down as the temperatures cool, but root growth continues to be active. Fertilizing at this time of year will enhance the root growth and enable the plant to store additional carbohydrates. These reserves provide vigorous spring green-up, allowing the traditional early spring fertilizer applications to be delayed. This adjustment helps limit the heavy top growth usually associated with early spring fertilizer applications. Environmental studies at MSU reveal that this late fall application does not pose an elevated risk to water quality. The application times listed in the table are general guidelines for the mid-Michigan area. Adjustments can be made for growing conditions in northern or southern areas.

Special Considerations

You will need to adjust fertility for grasses grown in shady areas by reducing the overall nitrogen applied. The overall nitrogen applied can also be reduced by approximately 1 pound of N per 1,000 square feet when you return clippings to the turf.

Home Lawn Fertilization Timing Chart

Pounds of nitrogen per thousand square feet of lawn

Fertility Level	April	May	June	July	Aug	Sept	Nov
Low 1-2# per year						1.0 and/or 1.0	
Medium 3# per year		1.0 or 1.0				1.0	1.0
High 4-6# per year		1.0 and/or 1.0		0.5-1.0	0.5-1.0	1.0	1.0

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-5/02-2M-kmf/BP-40 cents; Single copies free to Michigan residents. (Turf and Sod)