Bay County Phosphorus Ban Information

Phosphorus contribution

- It is quite possible that the elevated phosphorus concentrations seen in residential storm runoff could be partly influenced by lawn care activities, as the only other major source, atmospheric deposition, generally can only account for a quarter of the observed TP concentration (MWCOG, 1983) cited in Watershed Protection Techniques.

- USGS study (Smith et al, 1992) found that urban streams had the second highest nitrogen and phosphorus levels, second only to agricultural streams. cited in Watershed Protection Techniques

- USGS study (1994-95) Lakes Wingra and Mendota, found that lawns and streets combined contribute about 80% of the total and dissolved phosphorus in runoff from the residential areas studied, with lawns contributing more than streets.

- USGS study (2002) noted that more than 50% of the storms result in surface runoff from lawns.

- USGS study (2002) noted that the median phosphorus concentration from regular-fertilizer sites was twice that from unfertilized or non-phosphorus fertilizer sites.

- USGS study (2002) noted that runoff from lawn sites with non-phosphorus fertilizer applications had a median total phosphorus concentration similar to the unfertilized sites, and stated that this was an indication that non-phosphorus fertilizer may be an effective, low cost practice for reducing phosphorus in runoff.

- A Minnesota study estimates that 50% of phosphorus in runoff from residential areas comes from lawns.

- Lawns were the greatest source of phosphorus in a sub-watershed study near Marquette, MI (26%). This was in predominantly sandy soils. It is predicted that this contribution would be greater in less permeable soil areas.

Phosphorus Reduction

- Ann Arbor predicts a 22% reduction in phosphorus entering the Huron River from implementation of their phosphorus fertilizer ban.

- A study of two communities in Minnesota showed a 23% reduction in phosphorus from the community that implemented a phosphorus fertilizer ban compared to the other community that did not.

Lawn issues

- MSU Extension notes that most Michigan soils have adequate phosphorus levels and that continual application of phosphorus may not be necessary.
- In one Minnesota study 97% of the 180 lawns tested had soils with high to very high phosphorus fertility.
- A Michigan Environmental Council report states that 99% of soils samples tested from 2000 lawns in the Kalamazoo River Watershed had adequate phosphorus to support healthy lawns.
- Surveys suggest that roughly 70% of all lawns are regularly fertilized regardless of whether nutrients are needed. (Nutrient Movement from the Lawn to the Stream – article from Watershed Protection Techniques.
- MSU extension recommends that no phosphorus fertilizers be used on sensitive lawn sites adjacent to lakes, streams and ponds when soil levels for lawns are adequate.

Impacts on Saginaw Bay

- Presently unable to accurately quantify the impact lawns have on stream water quality. From Watershed Protection Techniques
- Concentration of nitrogen and phosphorus in urban runoff are certainly high enough to trigger eutrophication in nutrient sensitive waters. In this respect, urban watersheds that drain to ... poorly flushed coastal waters and estuaries appear to be most vulnerable to eutrophication.
- Bay County developed acres = 54,920 per 2000 Build-out analysis
- One Minnesota study estimated ~ 25 lbs/yr. of P per 100 acres of residential development added to lakes and streams or 0.25 lbs/acre/yr.
- Typical loadings for total phosphorus from urban land uses range from 0.75 to 1.25 lbs/acre/year. (Deleware DNR)
- 1 lb of P = 500 lbs of algae

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Turf Tips

For the Home Owner

Fertilizing Home Lawns to Preserve Water Quality

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The first step in developing a fertilizer program for your lawn is to identify the objectives for the lawn area on your property. There is a wide range of functions that homeowners demand from their lawns Many property owners desire a formal appearance where the lawn provides 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 different levels of maintenance - low, medium and high. Choose the level of maintenance, which will best fit the level of input you want to dedicate to your lawn area and also achieve the objectives you have prescribed.

All property owners should understand the environmental considerations of their lawn maintenance activities. The use of fertilizers can be conducted in a manner, which will minimize the potential for off-site movement. Properly fertilized turfgrasses can provide an excellent filter for environmental contaminants, yet 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 runoff in rainwater and 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 the "Maintaining Waterfront Turf" fact sheet 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 % nitrogen, 5 % phosphorus, and 15% potash by weight. The importance of each of these components is discussed individually below.

Soil Testing: Knowing the condition 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. For additional information on soil testing refer to the *"Understanding The MSU Soil Test Report"* fact sheet

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 considered to be 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 has the potential to 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 1000 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 1000 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 over apply.

• *Consider using slow release forms of nitrogen.*

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

• *Keep fertilizers off impervious surfaces*

Sweep fertilizer particles from driveways and sidewalks back onto the lawn area. This will prevent them from moving downstream during rainfall events.

Phosphorus: 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 a soil test will reveal the amount needed annually on your lawn. Most Michigan soils have adequate phosphorus levels and therefore continual applications of phosphorus may not be necessary.

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. For additional information refer to the "*Phosphorus and Home Lawns*" fact sheet.

Potassium: Potassium is also a primary turfgrass fertilizer element. Potassium levels in soil are relatively stable and a soil test will reveal the amount needed annually on your lawn. Those soils with potassium levels below 60 ppm are low for lawn turf, and above 120 ppm need no additional potassium. Most consumer lawn fertilizers contain relatively low amounts of potassium. If the soil test indicates additional potassium is needed potassium applications can be made with potassium sources such as muriate of potash (0-0-62). To reduce the risk of turfgrass burning, apply in cool weather and do not exceed 1.0 pound of potash per 1000 square feet. Potassium is not regarded as a major water quality concern.

Putting Your Program Together

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

Once you have picked the level of maintenance and quality for your lawn, you can now 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 the root growth continues to be active. Fertility at this time of year will enhance root growth and encourage the plant to store additional carbohydrates. These reserves facilitate 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. The application times listed in the table are general guidelines for the mid-Michigan area. Adjustments should be made for growing conditions in northern or southern areas.

Special Considerations

The total amount of nitrogen applied should be reduced for grasses grown in shady areas. Returning clippings will reduce the amount of nitrogen necessary to maintain a vigorous, healthy lawn by approximately 1 pound of N per thousand square feet per year.

Homelawn Fertilization Timing Chart : *Pounds of Nitrogen Per Thousand Square Feet Of Lawn*

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

†Summer-timed applications are only recommended for irrigated lawns

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