



Phosphorus and Home Lawns

Dr. Kevin W. Frank
Department of Crop and Soil Sciences
Michigan State University



ORNAMENTALS TEAM

Water quality concerns

One of the primary contaminants of surface water in Michigan is phosphorus. The contribution of phosphorus from urban landscapes has been identified as a significant input for many watersheds in lower Michigan, including the Kalamazoo River, Grand River, Huron River, Clinton River and River Rouge. Reducing the loading of phosphorus from urban landscapes is a major concern for local communities as they strive to meet federally mandated water quality standards. Decision makers are using various computer models in an attempt to estimate which activities or land uses are adding phosphorus to surface waters.

Phosphorus movement from urban landscapes can be attributed to several sources, including the physical movement of soil or organic debris (tree leaves, grass clippings, animal waste), the leaching or runoff of phosphorus from the soil, and direct movement of phosphorus from fertilizer applied to impervious surfaces. Phosphorus movement that is not attributed to a specific activity or land use is often attributed to home lawn fertilizer applications.

Phosphorus applications

Phosphorus is an essential nutrient for plant growth and is routinely used as part of fertilization programs on home lawns. Home lawn fertilizer applications are primarily based on the application of nitrogen; phosphorus in most cases is applied according to the predetermined ratio of nitrogen to phosphorus in the fertilizer. It is common for homeowners to apply phos-

phorus as a casual complement for nitrogen rather than use a soil test to judge phosphorus requirements. As a result, phosphorus is often applied when a soil test would recommend no application. Throughout many areas of Michigan, home lawns are grown on phosphorus-rich soils that do not require phosphorus fertilizer applications to maintain a healthy turf. Soil testing should be used to determine phosphorus needs for home lawns, and when soils test high for phosphorus, phosphorus-free fertilizers should be applied. Care should always be taken when applying fertilizers to keep fertilizer particles on the turf. If particles end up on sidewalks or streets, take the time to sweep them back into the turf. Fertilizer applications near surface water should be avoided. Maintain a 5- to 10-foot buffer strip where fertilizer applications are avoided so as to minimize the potential for any direct application of fertilizer to the water.

Selecting a fertilizer

The fertilizer analysis refers to the percentage by weight of nutrients in a bag of fertilizer. The analysis is listed on the bag, usually on the front of the package. The first number represents nitrogen, the second is phosphorus (expressed as P_2O_5), and the third, potassium (expressed as K_2O).

Sample analysis: 20 (N) – 5 (P_2O_5) – 10 (K_2O).

Because of water quality concerns over phosphorus concentrations in surface waters, many communities have instituted partial or complete bans on applying phosphorus-containing fertilizers to home lawns.

Phosphorus ordinances may result in confusion for homeowners as they try to select fertilizer products for home lawns. Generally, it is difficult to buy phosphorus-free fertilizers from retail outlets. Often the only fertilizers available that satisfy the zero phosphorus requirement, are fast-release nitrogen fertilizers such as urea (46-0-0). Such fertilizers can be very effective when used properly. For homeowners, however, these products may not be the best choice. Fast-release nitrogen fertilizers are readily soluble in water and have potential to leach to groundwater, especially if applied at high rates. Another potential problem with applying fast-release fertilizers is that they produce excessive amounts of top growth, often at the expense of root growth. Fast-release fertilizers also have the potential for burning turfgrass when applied at high rates or at high temperatures, or when they are not watered in. For most homeowners, using fast-release nitrogen fertilizers for lawn fertilization is not recommended.

Another option when phosphorus fertilizer reduction is being considered is to use a percentage value to determine whether a particular fertilizer is acceptable. For example, let's say that the local township determines that 3 percent phosphorus (P_2O_5) by weight in the fertilizer bag is an acceptable percentage for reducing the amount of phosphorus applied to lawns. Following this guideline, fertilizers with nitrogen to phosphorus ratios of 28:3 and 4:3 would both be acceptable. Fertilizer applications to home lawns are usually based on applying approximately 1 pound of actual nitrogen per 1,000 square feet (1 lb. N/1000

ft.²). If the 28:3 fertilizer is used, there would be 0.05 lb. phosphorus/1000 ft.² applied. If the 4:3 fertilizer is used, there would be 0.33 lb. phosphorus/1000 ft.² applied. Establishing a guideline for selecting fertilizers based on the percent of phosphorus contained in the fertilizer will not necessarily result in reducing the amount of phosphorus applied to home lawns.

An alternative to phosphorus-free or percentage-based fertilizer recommendations is to use nitrogen to phosphorus ratios (N:P). For example, the local township decides that a 5:1 ratio of nitrogen to phosphorus is an acceptable ratio to reduce phosphorus fertilizer applications. Using this guideline, the 28:3 fertilizer would be acceptable, but the 4:3 fertilizer would not. Using ratio guidelines is preferred to using percentages to determine the acceptability of a particular fertilizer. The difficult job is to determine what the appropriate ratio should be.

Phosphorus fertilization tips

1. Soil test to determine if phosphorus applications are necessary
2. Keep fertilizer particles on the turf. If particles end up on paved areas such as sidewalks or streets, take the time to sweep them back into the turf.
3. Maintain a 5- to 10-foot buffer strip around surface waters to avoid direct application of fertilizers to the water.