FERTILIZING LAWNS NEAR SURFACE WATER

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Like many people, I am often drawn to the waters edge of lakes, ponds and streams with great excitement. The land values for home sites having waterfront and demand of these sites for recreation and living spaces makes the adjacent property. Many of these properties are maintained as high quality turf and are outfitted with irrigation system. Concern for adverse impact of lawn maintenance activities on surface waters has prompted several communities in Michigan to restrict the fertility programs of it's residents. It is critical for turf managers to maintain these areas with special care to prevent the maintenance activities from impacting the water. Properly maintained turf around lakes and ponds can be of great benefit by providing filtration of runoff and protecting against erosion and soil sedimentation.

There are many physical characteristics of each pond or lake which contribute to the inherent quality of the water such as the overall depth, slope of the banks, bottom material, temperature, water source and flow, oxygen content, surrounding soil and vegetation, and the land use in the watershed. These and other factors influence the vitality of the water and the plant or animal life it supports. In short - the aquatic environments is a complex biological system. Some have compared a body of water to the human body - that the dynamics of one portion of the body is vital to the well being of the whole system. The focus of this discussion is directed toward minimizing the impact of turf maintenance activities, and particularly fertilization on water quality. By controlling the potential impacts in the management scheme, turfgrasses can provide the positive aspects of cover and filtration.

Turf management activities that may potentially impact water quality include fertilization, clipping/organic debris handling, and irrigation. Fertilization is a routine practice that is often implicated in the degradation of surface waters. Nutrient loading of these waters promotes overabundant weed and algae growth which in turn can lower the oxygen content of the water. The oxygen content in part, determines the population and type of fish the water body can support. This process is called *eutrophication* and turf managers must make every effort to prevent turf fertilizers from being the catalyst of this type of degradation. Let's examine each component of the classic fertilizer mixture of nitrogen - phosphorous - potassium and the potential pathways toward water. We can first eliminate potassium from consideration because it is not a threat to water quality from turf applications.

Nitrogen is generally the most highly applied portion of the fertilizer mix and is also the most soluble. Remember that the concern is movement past the root zone by percolating water, or across the surface in runoff. Excess nitrogen in the aquatic environment will enhance plant growth. There are several components of nitrogen fertilization which a manager can adjust to avoid movement into adjacent lakes or ponds. These include the type or formulation of nitrogen, rate of application, and timing. There are many different forms of nitrogen ranging from quickly available types of urea to slow release formulations like IBDU. Generally, slow release nitrogen forms are more desirable because the nitrogen is released gradually which reduces the potential for movement past the root zone. A similar effect could also be achieved by frequent, low dose applications of a quick release formulation. With any form, no more than 1 pound / 1000 ft^2 should be applied at any one time. For most lawn turf applications, a limit of three pounds of nitrogen / 1000 ft^2 per year should be adequate. More than this amount could be justified by high quality Kentucky bluegrass lawns, but this program should proceed with caution. Timing of nitrogen applications should coincide with growth periods when the grass plant can readily utilize the product. Applications during time of severe heat stress may not be beneficial. In Michigan, great benefit has been demonstrated for fall (early September) nitrogen applications by enhancing root growth and carbohydrate reserves.

While an overabundance of nitrogen is a problem in the aquatic environment, phosphorus is the most detrimental catalyst in this system. It is usually the most limiting factor in aquatic weed growth water and an enormous amount of growth can result from small amounts. Dr. Don Garling in the Fish

and Wildlife Department at Michigan State University estimates that one pound of phosphorous can support over 750 pounds of aquatic weed growth. Compared to nitrogen, phosphorous in relatively insoluble in water. It is bound tightly to the soil and It's introduction into lakes and ponds is usually associated with soil movement. Turf managers should test the soils to determine the phosphorous levels in areas maintained near surface water. Most soils in Michigan have adequate phosphorus levels. Since aquatic environments are so sensitive to this element, turf managers should strictly avoid applying it when soils are adequately fortified. There are several no phosphorus fertilizer combinations available on the market which are useful which have a nice fit for these applications. Also, turf managers should painstakingly protect any disturbed soil on landscape or renovation projects like newly seeded areas to prevent soil movement into surface waters. Densely turfed areas as filter strips or sediment traps are a tremendous benefit to water quality.

Establish a buffer zone adjacent to the water where little or no fertilizers are applied. There is no magic number that dictates how wide a buffer strip should be or how much fertility, if any, is need to maintain turf in this area. I would enlist the turf professional to assess the site and determine the potential for movement. Some considerations are the soils, slope of the bank, runoff patterns, turf use, changes in water level, etc. A buffer of one spreader width may be appropriate for many sites, while 20 feet or more may be appropriate for others. If fertilization is being performed near the water, it should be performed with a drop spreader to ensure that particles are not thrown directly into the water.