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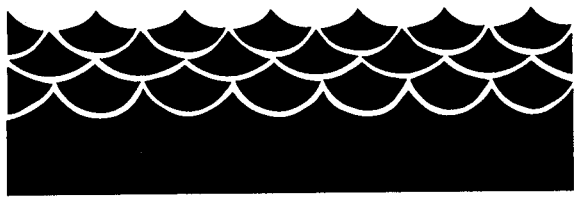
TURFGRASS MANAGEMENT
FOR PROTECTING SURFACE WATER QUALITY



Phosphorus Management Practices for Lawns

Phosphorus (P) is an essential nutrient contained in every living grass plant cell. The amount of P needed by the grass plant is significantly less than nitrogen or potassium. It has positive effects on turfgrass establishment, rooting, and increased root branching, maturation, and seed head production. Phosphorus is particularly important during early grass seedling growth and development stages.

While P is an important nutrient for grasses and other green plants, it is also an important nutrient for algae and weeds in our lake systems. Phosphorus is often the least abundant nutrient in freshwater lakes, which limits growth of algae and weeds. Lake enrichment with P can cause undesirable algae blooms and vigorous growth of other lake weeds, a process termed eutrophication. For this reason, much concern has been raised about the contribution of lawn and garden fertilizers to lake pollution.

Offsite movement of phosphorus
Phosphates, P combined with oxygen, are removed from the soil solution and immobilized in the soil. Consequently, Phosphates are not prone to leaching and pose little or no threat to groundwater resources.

Phosphorus can also be part of organic material such as manures, composts, various natural fertilizers, grass clippings, or tree leaves. In the soil solution, these organic forms of P may not be bound to the soil particles. Thus, they are more prone to leaching or runoff than the phosphates. Of course, sandy soils will pose a greater leaching threat for other plant nutrients as well as either phosphorus form, than heavier loam or clay soils.

Offsite transport of P to surface waters tends to be associated with sediment erosion. Phosphorus is carried along with the soil (silt and clay primarily) and organic matter sediments to which it is adsorbed. Phosphorus also may be carried by wind erosion and later deposited into lakes. Living plants such as trees, shrubs, and turfed areas around lakes can help stabilize the soil against wind and water erosion. Also, they act as filters to help remove these fine soil particles from the air thus trapping both the soil particles and any associated nutrients adsorbed onto them.

Phosphorus management practices
Phosphorus fertilizer additions to turf areas should be based on a reliable soil test. A soil test can usually be obtained from soil testing labs at land grant universities or through private soil testing laboratories.

In established turfgrass areas, runoff potential is quite low due to dense turfgrass and its extensive fibrous root

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systems. Therefore, where P is applied to turfgrass areas, it should be watered into the soil where it is immobilized and generally protected from loss by runoff.

During the winter months, freezing and thawing can breakdown leaves, dead grass plants, and other organic debris and release soluble forms of phosphate and nitrates. These nutrients potentially can runoff from frozen ground, especially slopes, during spring snowmelt and early spring rains and possibly be carried into surface water areas. Raking the lawn in the fall to remove excess organic debris is beneficial from a water quality standpoint. Grass clippings, leaf litter, and other forms of organic debris should be removed and kept off of hard surface areas where they could be carried in runoff to surface water areas. Obviously, these same materials should not be dumped on or near shoreline areas where nutrients released during decomposition can move directly into the water.

It is often advisable to add some P when establishing a lawn even though soil P levels may be adequate for turf. This ensures that some P is available near the soil surface for the young developing grass roots. Protecting newly seeded areas, especially slopes, with some type of mulch cover during establishment helps prevent runoff and erosion of soil and possible nutrients. Applying P to an established turf following core cultivation helps get P down into the soil thereby protecting it from loss by runoff.

General fertilization practices

In addition to the specific phosphorus management practices already mentioned, following are some general lawn fertilization practices that can help reduce potential water pollution.

- Never directly deposit or inadvertently apply fertilizer materials into lake areas.
- Fill granular fertilizer spreaders on a hard surface where any spills can be easily cleaned up. NEVER wash off fertilizer spills into the street or other hard surface area where they can easily enter storm sewers and ultimately surface water areas. Wash off granular fertilizer spreaders over turfed areas to prevent runoff of fertilizer from hard surfaces. Fill and clean liquid fertilizer applicators over turfed areas for similar reasons.
- Close the gate on the fertilizer spreader when crossing hard surface areas or go back and sweep up the material. Reuse it another time or put it back into the spreader.
- Try to use a drop spreader, which are more precise but slower than a rotary type spreader near surface water. Next to shoreline areas, apply fertilizer around the perimeter of the property with a drop spreader to create a buffer zone. The rest of the area farther away from the shoreline can be fertilized with a rotary spreader. Since the perimeter has already been done with the drop spreader, it is not necessary to hug the shore because fertilizer may get into the water. The same kinds of precautions should be taken when using liquid fertilizer.
- Avoid getting fertilizer into natural drainage areas or pathways on a property. These areas may not necessarily be hard-surfaced areas, but they can carry fertilizer directly into the surface water before having the chance to infiltrate into the surrounding turf/soil area.
- Leave a buffer zone of unmanaged grasses or possibly natural vegetation growing around the shoreline. This can help prevent soil erosion and may retain some of the nutrients that might otherwise enter the lake.

Improper management or use of turf fertilizers may contribute to potential pollution of surface water and groundwater. However, combining appropriate landscape management practices with a modest lawn fertilizer program may further reduce surface water pollution.

For additional information regarding the responsible use of lawn fertilizers and pesticides to protect surface water quality, see the following publications, available at county extension offices.

Using Lawn Fertilizers and Pesticides Responsibly. AG-FO-5889-B
Turfgrass Management Practices for Protecting Surface Water Quality, AG-BU-5726-E
Lawn Care Practices to Reduce the Need for Fertilizers and Pesticides, AG-FO-5890-B
Responsible Use of Lawn Care Pesticides, AG-FO-5891-B
Nitrogen Fertilizer Use for Lawns, AG-FO-5893-B

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