

## HOW WELL DO LAWNS FILTER RUNOFF? DIG DEEP FOR THE ANSWER

*By: John Barten, Water Quality Mgr. Hennepin Parks. Written for Focus 10,000-Minnesota's Lakeside Magazine*

With the coming of summer, local, regional and statewide publications have been printing numerous articles extolling the virtues of lush green lawns as filters for runoff water, and encouraging the use of fertilizers and herbicides to grow these lawns. As concerned lake users, we need to be aware of the limitations of lawns as runoff filters, and make an informed assessment of what is really needed to maintain an adequate lawn.

Research done at Penn State University as well as other places shows that properly established and managed turf on good soils can filter runoff water. While this may be true, it is also true that most lawns are not established on good soils.

During the home construction process, most lots are repeatedly driven over with earthmovers, bulldozers, and trucks loaded with concrete and other building materials. After the building is completed, the compacted ground is leveled, covered with one to two inches of black dirt, and then seeded or sodded. In many suburban lots, the ground is so hard that a sharp metal soil probe cannot be pushed more than two or three inches into the lawn. Unfortunately, neither grass roots nor rainfall can easily penetrate the compacted ground. **As a result of the compaction, the typical residential lawn cannot filter runoff like the test plots at research facilities.**



Compounding the compaction problem is the fact that turf grasses have a very shallow rooting depth (two to four inches). Effective infiltration of rainfall is limited to the top few inches of the turf, severely limiting the ability of turf to filter runoff. Conversely, native grasses, trees and shrubs have a rooting depth of two to three feet, resulting in a much higher rainfall infiltration capacity, and more effective filtering of runoff. In addition, the taller vegetation in natural buffer areas and landscape beds slows down raindrops and runoff water, allowing more time for infiltration. Therefore, **properly established and managed natural buffer areas and landscape beds have the capacity to infiltrate runoff much more effectively than turf areas.**

Another important point is that poor turf does not necessarily mean more pollutant runoff. A study of lawn runoff quality by Hennepin Parks showed that medium fertility lawns had a significantly higher suspended solids concentration than high fertility lawns, but medium fertility lawns had a much lower phosphorus concentration in runoff water. This suggests that **lush lawns are more of a water quality problem than poorer turf lawns.**

The reason that the lush lawns had such a high phosphorus concentration in runoff water is that they had phosphorus fertilizer applied to them. **Most lawns in Minnesota (approximately 80 percent) have soils that are saturated with phosphorus, and do not need any more added to**

**them.** Therefore, the only fertilizer that will not create a water quality problem is a phosphorus-free product. It does not make any difference what kind of phosphorus is applied; if your lawn has enough, whatever is added will just be washed off with rainfall runoff water. Adding phosphorus fertilizer to a lawn is like pouring coffee into a full cup. It is going to spill over. The good news is that we do not have to choose between poor lawns and clean lakes. Studies on golf courses clearly show that turf does not necessarily have to degrade water quality. The phosphorus concentration in golf course runoff water was one-half of the concentration in medium fertility lawn runoff, and one-fifth that from very high fertility lawns. The difference is that golf course operators do not apply phosphorus unless a soil test indicates a need for it. Many golf courses have very high quality turf, and good runoff water quality. In order to maintain high quality turf, golf course managers need to aerate the soil regularly to reduce compaction, overseed bare or thin turf areas, maintain adequate organic matter in the soil, and establish turf on till subsoil to encourage a deeper rooting depth. By implementing these practices, and raising the mower cut height to three inches or higher, the impact of lawns on water quality can be significantly reduced.

However, the most important thing you can do for our lakes is to **insist on a true phosphorus free fertilizer product.** Remember, as golf courses have shown, you can have good turf and protect water quality by using a phosphorus free fertilizer.