

Plant phosphorus is a critical constituent in almost all metabolic processes, especially those involved in energy storage and transfer. Phosphorus is most apparent in adenosine triphosphate (ATP), the energy that drives metabolic processes. Its greatest visual impact is on newly established turf as it greatly enhances the rate of establishment.

During this past decade, however, phosphorus applications on golf courses and lawn turf have come under attack as a water pollutant. Phosphorus is the nutrient directly associated with algal blooms that can lead to eutrophication of water bodies, resulting in dead zones in oceans, lakes and ponds.

As one would expect, the greatest concern with phosphorus pollution is in areas surrounded by or areas bordering large water bodies. The Great Lakes region is an area that has seen state laws banning the use of phosphorus for home-lawn use.

The Great Lakes consist of Lakes Ontario, Erie, Huron, Michigan and Superior. The lakes were created more than 10,000 years ago during the last glacial age. The Great Lakes account for 20 percent of the accessible fresh water in the world. About 40 million people depend on them as a source of drinking water. The annual water withdrawal since 1940 is 2.5 percent to 3 percent while the annual renewal rate is only 1 percent from the hydrological cycle. The lakes and associated watersheds are home to 130 endangered or rare plants and animals, and more than 30,000 islands. Lake Erie, with which Ohio shares a northern border, is one of the top 10 sports fisheries in the world — producing more fish annually than the other four lakes combined.

The lakes and associated watersheds share their borders with both large urban areas and agriculture. The point-source pollution for the lakes comes from industrial waste, municipal waste and sewage overflow, while non-point pollution is from agricultural runoff (pesticides, and animal waste) and urban storm-water runoff.

It's storm-water runoff — and fertilizer

Fact Is Phosphorus Gets a Bad Rap

BY KARL DANNEBERGER



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runoff, specifically phosphorus from turf, is the root of legislative bans. Science, however, doesn't seem to support that phosphorus lawn or turf fertilization is a source of concern. Phosphorus, when applied to turf, is in a soluble form but is quickly fixed to soil particles, and thus its primary movement would be through sediment runoff. But runoff studies have found phosphorus runoff from turf to pose little risk, similar to prairies and significantly less than that from agriculture. Additionally, the amount of phosphorus applied to turf — compared to other areas where phosphorus is used — doesn't even move the needle. Why the bans?

Unfortunately, science alone doesn't carry the day when there are emotionally charged and politically sensitive issues. It's easy to say special-interest groups, radicals and politicians looking for votes have marginalized or ignored the science.

Ironically, we're quite capable of marginalizing science, too. For example, we have used phosphorus-free fertilizers for years in the golf industry because phosphorus is believed to encourage *Poa annua*, based at best on inconclusive data.

What's my take on this? I think we'll see more phosphorus-free fertilizers, those fertilizers containing phosphorus moving to a ratio of 10:1 (N:P₂O₅), and a phasing out of the 10-10-10 fertilizers for turf.

But I do wonder what will happen when these bans and reduction in turf phosphorus use are in place for several years and no appreciative change occurs.

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