

Is Phosphorus Regulators' Whipping Boy?



Source: www.TurfMagazine.com

Could it be that regulators are only half right in banning the application of phosphorus on lawns? If that's the case, they are half wrong, as well.

Indeed, there seems to be more than a few misconceptions about phosphorus in turf fertilizers in the regulatory community, but probably more so by homeowners who buy lawn fertilizer at Home Depot, Lowe's or at their local hardware store. The misconceptions revolve around the need for phosphorus in maintaining healthy, vigorous lawns and also, discouragingly, the nutrient's role in degrading inland ponds and lakes.

Let's briefly look at phosphorus and why it is needed in keeping turfgrass healthy. Then we'll explain why regulators are targeting this essential plant nutrient, and what their regulations may mean for homeowners and lawn care operators.

Phosphorus is one of the essential macronutrients (along with nitrogen, potassium, calcium, magnesium and sulfur) that plants need. If it is not available in the soil or supplied as a fertilizer, turfgrass will lack vigor. Phosphorus-deficient plants also are more prone to suffer from environmental stresses, weeds, insects and diseases.

"Not only plants, but all life on earth needs phosphorus," said Chuck Darrah, founder and owner of CLC Labs, Westerville, Ohio, at the recent Ohio Turfgrass Conference. And therein lies the reason why Minnesota ignited the phosphorus issue almost 10 years ago—this essential nutrient, in addition to being essential for turfgrass growth, also encourages the growth of algae and other aquatic plant life in inland rivers, ponds and lakes.

Minnesota gets the ball rolling

The issue of the role of phosphorus in turf fertilizers took off in Minneapolis/ St. Paul almost a decade ago when regional storm water management authorities became concerned about the quality of their inland water resources. They identified runoff from home lawns (among other sources) as contributing phosphorus to their streams and lakes.

After determining that most soils in the region contained sufficient (or more than sufficient) phosphorus to sustain turfgrass, they passed laws to ban the use of phosphorus fertilizer, allowing its use only for lawn establishment or when soil tests indicate phosphorus deficiencies. Eventually, Minnesota made the phosphorus restrictions statewide. They went into effect Jan. 1, 2007.

But that wasn't the only issue affecting phosphorus fertilizer at the time. In 2008, the price of super-phosphate jumped from \$418 a ton to \$840 a ton. Similarly, diammonium phosphate went from \$442 to \$850 a ton, according to the USDA. It has remained in the \$600- to \$700-per-ton range since. One can wonder if the sudden spike in phosphate prices figured into the decision by major turf fertilizer manufacturers to take this nutrient out of their retail products.

But, back to the spread of the lawn-phosphorus-as-a-polluter issue.

At least 10 other states, following Minnesota's example, now also restrict the use of phosphorus as a lawn fertilizer only to the establishment of new turfgrass or to soils that have been tested and shown to be phosphorus deficient. They include Illinois, Maine, Maryland, New Jersey, Vermont, Virginia, Washington and Virginia. Lawn fertilizers containing phosphorus have pretty much vanished from retail locations there and across the U.S.



Half right also means half wrong

Have regulators' restrictions on the use of phosphorus fertilizer gone too far? Water authorities argue that's not so. They claim, rightly so, that the more phosphorus there is on home lawns the more likely the plant nutrient is to show up in runoff. They also claim that many soils are already high in phosphorus. Beyond that, they stress their regulations allow for phosphorus applications to newly established turfgrass and to lawns when tests show their soils are low in the nutrient.

But that's the half-right reason for their actions. As it turns out, the issue is more nuanced than that.

Yes, research has shown that as more phosphorus is added to lawns, more phosphorus turns up in runoff. What's often overlooked, however, is that the same research casts phosphorus in a much more favorable light. Specifically, it demonstrates that lawns receiving sufficient amounts of nutrients—phosphorus included—produce much less runoff, thereby actually keeping phosphorus from waterways. Thin, poorly nourished lawns (i.e. lawns

deficient in phosphorus) are much more prone to runoff.

Also, lawn runoff is just one of many sources of nutrients ending up in rivers, ponds and lakes.

Minnesota says non-point sources, such as the atmosphere, pastures/croplands, stream erosion and seepage from individual sewage treatment systems, account for two-thirds of the phosphorus entering its rivers, ponds and lakes. Another 30 percent of the phosphorus load comes from point sources, such as municipal and industrial wastewater treatment facilities.

The amount of phosphorus runoff from home lawns is still largely unknown. In banning the nutrient from turf fertilizers, regulators spread a very wide net. Phosphorus is a so-called limiting nutrient. Water with concentrations less than 10 parts per billion (ppb) of phosphorus will not support excessive algae and aquatic plant growth. Algae and plants begin to clog lakes as concentrations of the nutrient approach 100 ppb.

Yes, phosphorus matters

There are legitimate reasons for including phosphorus in turfgrass fertility programs beyond what the states' restrictions imply.

The nutrient is needed for healthy root development, but it also serves many other vital growth processes in turfgrasses. Researchers long ago began realizing its importance in fueling plants' "metabolic machinery" required for root, leaf and stem growth. If a phosphorus deficiency is not corrected, then portions of the lawn will thin and lose density. This reduces its effectiveness in preventing runoff.

Also, of course, not all urban soils contain high levels of phosphorus. And this was even the case as Minnesota formulated its nutrient reduction regulations. Of the 3,500 "lawn data points" compiled from the region by CLC Labs' soil testing facility, 28 percent of the soils tested in the low phosphorus test range, said CLC's Darrah at the OTF Conference. His soil-testing lab, based in Westerville, Ohio, is one of the busiest private testing facilities of its kind in the U.S.



So, ultimately, what's the outcome of the turf phosphorus restrictions?

It is too early (or perhaps impossible) to evaluate the effect it is having on inland waters, given the many other sources of phosphorus that impact them.

What is more certain is the regulations have cast this vital plant nutrient in a negative light, at least in the minds of consumers who buy fertilizer at Home Depot, Lowe's or local hardware stores or garden centers. How much do they really understand about plant nutrition? How likely are they to get soil tests? What percentage of them can correctly diagnose a phosphorus deficiency should their lawns begin to thin and look anemic? Even lawns testing high for phosphorus will eventually exhaust their supply of the nutrient.

"I don't know how the average homeowner is going to recognize that their soil has run out of phosphorus," said Darrah. "It's a myth that the phosphorus bans will reduce or result in less phosphorus runoff."

"Good lawn maintenance practices have the capacity for larger reductions in runoff phosphorus than does banning phosphorus," he added.

Professional applicators have adjusted to the bans and continue to do business in states with phosphorus bans. Obviously, they have to be on the lookout for lawns that are beginning to thin, and they cannot hesitate to suggest soil tests to those customers. From a lawn maintenance standpoint, they probably should also suggest that property owners not remove clippings from their lawns.

Darrah added, "When we remove the clippings, we are mining the phosphorus out of the soil."

Read Focus Moves To NPS Pollution