Nutrient Restrictions in Turf: What's Down the Road for Pennsylvania?

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Unless you've been living in a deep, dark hole, you have probably heard that nitrogen and phosphorus fertilizers are on the hot seat in the United States. Several states are either considering or have enacted legislation involving nutrient restrictions in turf. If the Environmental Protection Agency (EPA) has its way, Pennsylvania and the other five states in the Chesapeake Bay watershed will soon have laws governing the application of phosphorus, and perhaps nitrogen fertilizer on turf. The following is a summary of EPA's new program for reducing nutrient loading into the Chesapeake Bay, and how it may affect golf courses and other turf sectors in Pennsylvania.

Nutrients and the Chesapeake Bay

To understand why EPA and state governments have begun to crack down on fertilizers, consider where we've been and where we are headed with respect to water quality in the Chesapeake Bay. The Chesapeake Bay is the largest estuary in the United States, providing critical habitat for thousands of species of fish, birds, and mammals. About half of the Bay's water volume comes from the Atlantic Ocean, whereas the other half drains into the estuary from the enormous 64,000 square mile watershed. Of the 50 major tributaries that feed into the Bay, three rivers (Susquehanna, Potomac, and James) deliver about 80 percent of the fresh water, with Pennsylvania's Susquehanna River contributing the largest volume (48%).

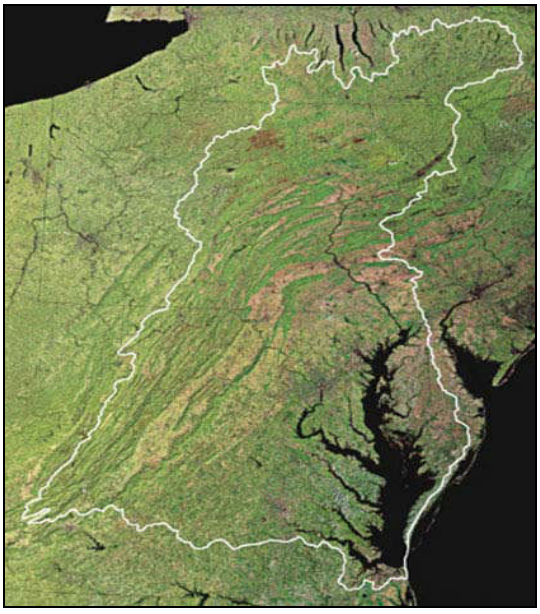

Fig. 1. The Chesapeake Bay watershed encompasses 64,000 square miles, and approximately one-third of Pennsylvania's land area (photo courtesy of EPA).

As the Susquehanna River meanders through the mountains and valleys of central Pennsylvania, it picks up nutrients and sediment from farms, wastewater treatment plants, forests, and developed areas. The Susquehanna eventually flows into the northern portion of the Bay, where it deposits nutrients and sediment-enriched water. The EPA estimates that 41% of the nitrogen and 24% of the phosphorus entering the Bay comes from Pennsylvania. During the summer, excess nutrients foster algae blooms which block sunlight from reaching the submerged aquatic vegetation that provides habitat for fish, shellfish, and waterfowl. As algal colonies die, they sink to the bottom of the estuary where they undergo decomposition. Decomposition of algae depletes water of oxygen and results in "dead zones" and fish kills.

Fig. 2. Algae bloom in northern portion of Chesapeake Bay resulting from excess nutrients (photo courtesy of EPA).

Although some progress has been made over the past 25 years in reducing nutrient loading into the Chesapeake Bay, it is still impaired and in poor health. Since 2005, Chesapeake Bay watershed states and EPA have been involved in developing a program that would help restore the Bay to "fishable" and "swimmable" status, as required by the Clean Water Act. A pollution reduction program would also help resolve commitments made in consent decrees, memos of understanding, and settlement agreements dating back to the late 1990s that address impaired water in the District of Columbia, Delaware, Maryland, and Virginia. In May of 2009, the Obama administration issued Executive Order 13508, which set aggressive goals for restoring health of the Bay by 2025. Because EPA is the regulatory and enforcement agency responsible for ensuring clean water, it launched a comprehensive program to significantly improve water quality of the Bay over the next 15 years.

EPA's Chesapeake Bay TMDL Program

In response to slow progress in reducing nutrient loading, legal challenges, and Executive Order 13508, EPA initiated the Chesapeake Bay TMDL Program. TMDL stands for total maximum daily load, and defines the amount of pollution (in this case nutrients and sediment) a water body can handle and still be healthy. Through this program, EPA is essentially establishing a

"pollution diet" for all six Bay watershed states and the District of Columbia. The TMDL program involves establishing limits on pollutants, schedules for pollution reduction plans, expectations and evaluation criteria for meeting pollution limits, controlling point and nonpoint source pollution, and actions to ensure progress.

The first step in the TMDL program is to establish caps or allowances for nitrogen, phosphorus, and sediment loads in all six Bay watershed states and the District of Columbia. The allowances are based on models developed over a number of years from extensive water monitoring and research across the Bay watershed. The EPA hopes to achieve total allowances of 187.4 million pounds of nitrogen and 12.5 million pounds of phosphorus by 2025. Pennsylvania's allocation is 76.77 million pounds of nitrogen and 2.74 million pounds of phosphorus. These numbers represent about one-half of the nitrogen and phosphorus loading that occurred in 1985.

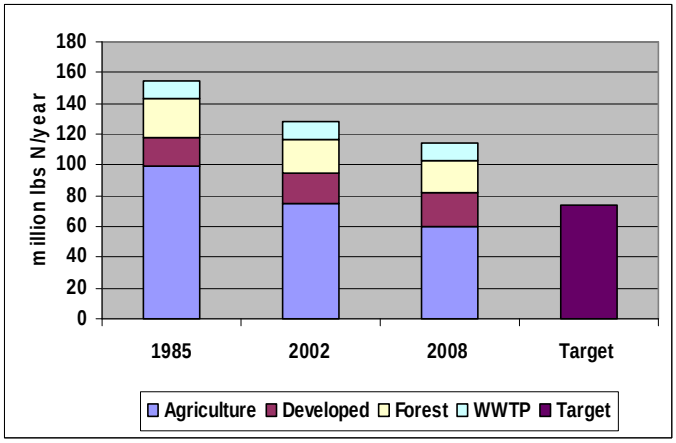

Fig. 3. Nitrogen loading into Chesapeake Bay from Pennsylvania over 23-year period and 2025 target nitrogen allocation (Figure courtesy of EPA).

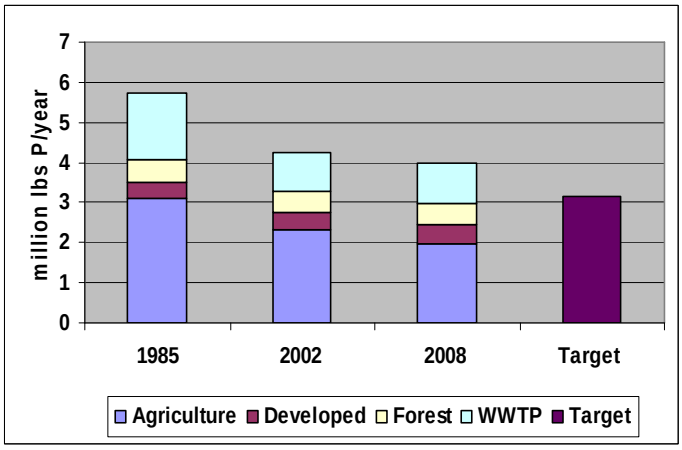

Fig. 4. Phosphorus loading into Chesapeake Bay from Pennsylvania over 23-year period and 2025 target phosphorus allocation (Figure courtesy of EPA).

The second step in EPA's TMDL program is for each Bay watershed state to develop a watershed implementation plan or WIP. The WIP is the state's road map to achieving the nutrient and sediment load allocations. Each WIP will be developed in two phases. The Phase 1 WIP will divide nutrient and sediment load allocations by pollution source sector (e.g. agriculture, wastewater treatment plants, urban/suburban/rural storm water). The Phase 2 WIP will further subdivide nutrient and sediment load allocations by county. The Phase 2 WIP is intended to inform county conservation districts or planning commissions of the nutrient and sediment loads generated by their geographical area so they can help implement actions to reduce the loads. EPA works with each state to refine the WIPs, and provides feedback on whether they believe the load allocation will be met. They also provide guidance on where more pollution controls are needed.

In Pennsylvania, the Department of Environmental Protection (DEP) is in charge of developing the WIP. In spring of 2010, DEP formed workgroups for agriculture, wastewater treatment, and urban/suburban/rural storm water. Each workgroup is composed of stakeholders who discuss and debate how various best management practices, existing and proposed regulations, and upgrades in infrastructure can achieve EPA's TMDL nutrient and sediment allocations by 2025. After a series of meetings during the spring and summer of 2010, DEP submitted a 132-page draft of Pennsylvania's WIP to EPA. In this first draft, only three paragraphs focused on lawns and golf courses, and the language on nutrient restrictions was very general.

A few weeks after the first draft of the Pennsylvania WIP was submitted, it was rejected by EPA. EPA claimed that although the nitrogen allocation was met, there was insufficient information to provide reasonable assurance that this would be achieved by 2025. EPA also stated that Pennsylvania's draft WIP did not account for 11% of the phosphorus allocation, and was 1% over its sediment allocation.

In October of 2010, EPA and DEP explained their respective positions regarding the draft WIP in a series of public meetings around Pennsylvania. EPA threatened to impose a "federal backstop" if DEP did not provide reasonable assurance that nutrient and sediment allocations would be met in the final Phase 1 WIP (submitted on November 29, 2010). The backstop involves expensive and severe restrictions on point sources of pollution such as animal feedlots, wastewater treatment plants, and storm water retention systems. Such a backstop would be very expensive for Pennsylvania. Thus, DEP revised the first draft of the Pennsylvania WIP and included more provisions for phosphorus reductions and greater detail on how nitrogen, phosphorus, and sediment allocations would be achieved. One of the items addressed in the final Phase 1 WIP was turfgrass fertilizer restrictions and a certification program for professional fertilizer applicators.

Proposed phosphorus restrictions and certification program in Pennsylvania's Phase 1 WIP

To address EPA's concerns and provide reasonable assurance nutrient allocations will be met by 2025, DEP proposed many changes in the final Phase 1 WIP, including an Urban Nutrient Management program. The proposed program includes two main components, education and legislation. The education component will be geared to homeowners and professional fertilizer

applicators. Homeowner education programs will focus on proper fertilizer application techniques and reducing use of phosphorus-containing fertilizers. Education for professional applicators may involve a certification program for continuing education credit. The legislation component will focus on reducing phosphorous applied and sold by commercial lawn services, retailers, landscapers, turf growers, and other nonagricultural entities. Education and legislation programs will be statewide.

DEP stated that Pennsylvania's Urban Nutrient Management program should be built from programs that already exist. For example, the Pennsylvania Department of Agriculture Bureau of Plant Industry (PDA) already has a pesticide applicator certification program for lawn care operators, landscapers, sports turf managers, and golf course managers. Pesticide applicators must be certified, keep records, and comply with pesticide rules and regulations. The PDA also administers fertilizer labeling laws and routinely inspects manufacturers, wholesalers, and retailers that sell fertilizer materials. A professional fertilizer applicator certification program could be modeled after PDA's pesticide applicator certification program.

DEP stated in the WIP that Pennsylvania's Urban Nutrient Management program should not be overly restrictive, but instead be designed to reduce the amount of nutrients in the Bay watershed that reach local streams. The following eight items were proposed as a means of achieving nutrient reductions with certain exemptions:

1. Limiting the application of fertilizer that contains phosphorus to lawns, golf courses, and other mowed grassy areas (turf).
2. Exempting the application to lands used for agricultural production.
3. Exempting the use of animal manure that is mechanically dried, ground, or pelletized, or to a finished sewage sludge product (do not discourage alternative uses of manure).
4. Allowing fertilizer containing phosphorus to establish grass during the first growing season.
5. Allowing application of fertilizer containing phosphorus to an area if a soil test shows that the soil in the area is deficient in phosphorus.
6. Prohibiting the intentional application of turf fertilizer, manure that is mechanically dried, ground, or pelletized, and finished sewage sludge product to an impervious surface and requires a person who spills any of these substances onto an impervious surface to immediately remove it.
7. Regulating the retail sale of turf fertilizer containing phosphorus unless the fertilizer is sold for one of the purposes for which it is authorized (labeled) to be used, such as new lawns, reseedings, or where a soil test demonstrates a need.

DEP stated that Pennsylvania does not expect components of the Urban Nutrient Management program will occur immediately upon publishing the final WIP. They anticipate it may take 1-2 years for the research, drafting, and stakeholder input to be in place before introduction and enactment of legislation. Discussions on the development of this program will begin early in 2011. Enhancing the tracking and reporting of best management practices will be pursued upon publishing the WIP. EPA will notify DEP of the acceptance status of the final version of the Phase 1 WIP before the end of 2010.

Fig. 5. Much of Pennsylvania's proposed Urban Nutrient Management program will be aimed at reducing use of phosphorus fertilizer.

The third step of EPA's TMDL program will involve monitoring progress towards meeting nutrient and sediment target allocations. Beginning in 2012, Pennsylvania and the other Bay watershed states will develop two-year milestones to track progress toward reaching nutrient and sediment reduction goals. These milestones will demonstrate the effectiveness of the WIPs by identifying pollutant reduction controls and a schedule for implementation. EPA will review these two-year milestones and evaluate whether they are sufficient to achieve necessary pollution reductions. Through use of the Bay Tracking and Accountability System, EPA will determine if milestones are met. If plans are inadequate or progress is insufficient, EPA can invoke backstop actions to ensure pollution reductions. These include expanding coverage of National Pollution Discharge Elimination System (NPDES) permits to sources that are currently unregulated, requiring additional pollution reductions from point sources such as wastewater treatment plants, increasing federal enforcement and compliance in the watershed, prohibiting new or expanded pollution discharges, redirecting EPA grants, and revising water quality standards to better protect local and downstream waters. If all goes well, 60% of the targeted nutrient and sediment reductions will be achieved by 2017, and 100% will occur by 2025.

What's next?

Pennsylvania's turfgrass industry needs to be vigilant and engaged in any legislative process involving turfgrass fertilizer restrictions that may occur within the next few years. Legislation could be reasonable and straightforward, or politicized and encumbered by demands from special interests. Some other states are dealing with fairly restrictive fertilizer bills, which may result in additional costs and less flexibility for certain businesses. Hopefully, leaders from local and state-wide turf organizations will be involved in the process and provide updates in newsletters and as presentations at conferences.