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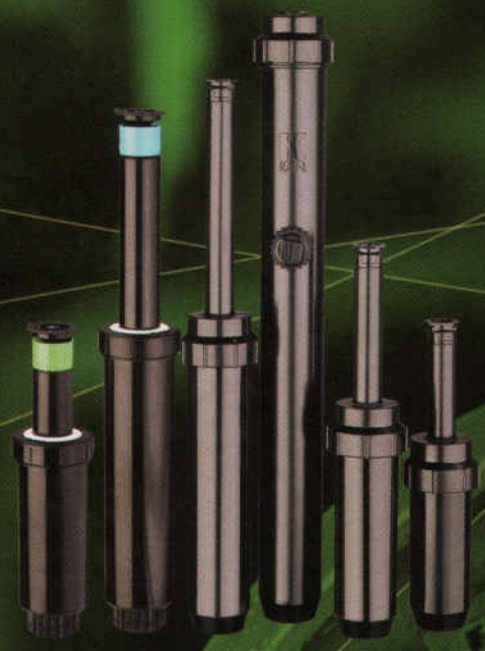

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features

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ON THE COVER: Competition is lively at Iowa's North Scott Community schools' showcase soccer field. Photo by John Mohr Photography.

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Salmagundi III

When I showed up to file the paperwork with my son's fall soccer league last month, my knees nearly buckled when the volunteer told me his age group was "closed." "Closed" sounds good when you're buying or selling a house maybe but the word nailed me. I was technically beating the deadline for sign-ups but should have mailed in the material months ago.

My wife said later, "Maybe you should have told them that you coached last year." To which I was thinking, "A good coach wouldn't have procrastinated so long!"

All's well though: the kid will get his first real football experience through the NFL's Flag Football program (and probably play soccer to boot).

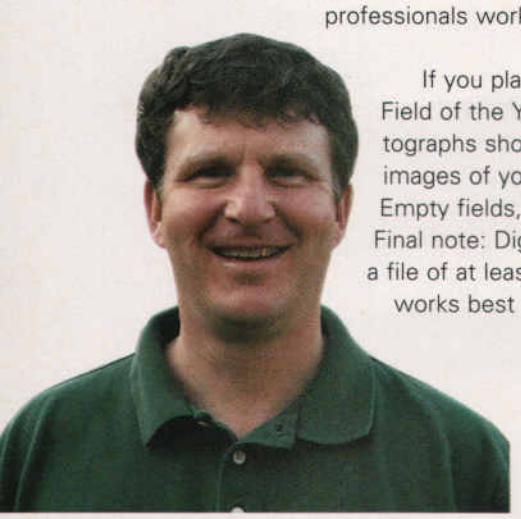
Speaking of football, is it America's favorite sport? I for one anticipate autumn mostly for two reasons, the weather and football. Football is the perfect spectator sport, from seeing a beautiful stand of turf to the promise of local tradition, whatever that might be.

Baseball's attendance, especially if you factor in minor league and independent league games, shows that game continues to appeal to millions as well. I still follow the pennant races and enjoy the game's numbers, but I admit some of the marketing nonsense gets to me. The All-Star Game in Detroit last month was nearly unwatchable for this old-schooler. How long until team names are for sale?

Heather Nabozny's field looked terrific, and next time I run into her, I'm going to ask about the All-Star Game designs in the infield dirt at Comerica Park. I'm not sure what they were or how it was done, but I'd never seen it before.

Kudos to Clay Wood of the Oakland A's, too, I caught his infield mowing design, a checkerboard effect, on television recently and thought it was cool.

Last month our publisher, Steve Brackett, and I had the privilege of meeting with Sports Turf Managers Association (STMA) Board members during their summer session. Imagine the time these Board members put in, all in addition to devoting time to their families, as well as excelling at those pesky full-time jobs! All of our readers are fortunate to have these dedicated professionals working on behalf of turf managers everywhere.



If you plan entering your field in this year's prestigious STMA Field of the Year Award program, I urge you to take some photographs showing users actually on the field, and better yet, images of you and your crew maintaining or preparing your field(s). Empty fields, no matter how green, don't make for exciting photos. Final note: Digital cameras are great but if yours isn't able to handle a file of at least 1 megabyte, use a 35mm. Old school film still works best for us.

ERIC SCHRODER, EDITOR

Comments always welcome.
Call Eric at **717-805-4197,**
email **eschroder@aip.com,**
or write P.O. Box 280, Dauphin, PA 17018.

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PHONE **800-323-3875** FAX **800-366-0391**
EMAIL **stmainfo@sportsturfmanager.com**
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Gearing up for the 2006 Conference & Exhibition

The January 18-22, 2006, Annual Conference and Exhibition at the Coronado Springs Resort and Conference Center in Orlando is just around the corner. All indications are that it will surpass the size and scope of last year's event in Phoenix. Conference Chairman Mike Andresen, CSFM, reports that all subcommittees are working to finalize their programs in preparation for the conference.

The Conference Subcommittees consist of the following:

* Conference Education, chaired by Dr. Dave Minner, develops education topics and recommends speakers.

* Conference Exhibition, co-chaired by Vickie Wallace and Tra DuBois, addresses all aspects of the trade show.

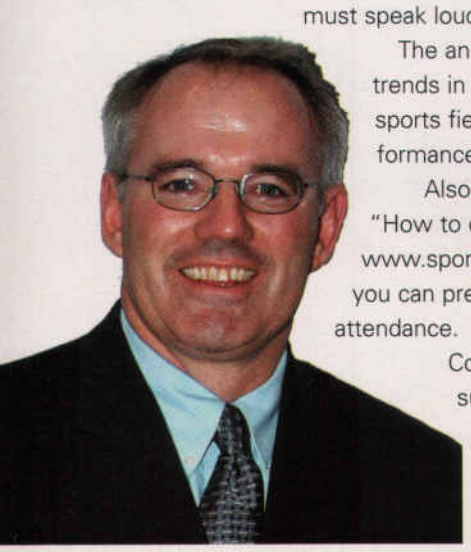
* Seminar-on-Wheels Tours, chaired by Darian Daily, conducts the off-site educational tour of sports venues.

* Conference MLB/NFL Program, co-chaired by Bob Christofferson and Darian Daily, creates the hands-on workshop presented by the MLB/NFL

* Conference Student Challenge, chaired by Steve Cockerham, organizes the student challenge test and study guide.

Our overall theme for the 2006 Conference is professionalism. The annual conference can be a catalyst for any STMA member to increase one's professionalism. STMA recognizes the importance of fostering and improving professionalism within the sports turf industry. Past President Bob Campbell, CSFM, is a proponent and has written about its importance in his May 2004 President's Message, "Professionalism ... it's about you."

Campbell says, "It should go without saying that sports turf managers cannot rely entirely on their professional organization to make this happen. We all must be involved individually to make our profession respected for what it is . . . and what we want it to be. We are on the front lines of the way people see us and have it within our power to build a positive image for what we do. Our individual actions must speak louder than any words from our association."



The annual conference enables you to keep on top of the latest issues and trends in the profession. It encourages networking with fellow professional sports field managers and provides access to resources to improve your performance and advance in your organization.

Also, check out the article that ran in the June Electronic Newsletter, "How to convince your employer to send you to the STMA Conference," at www.sportsturfmanager.org. At the end of the article is a 1-page document you can present to your employer that outlines the cost and benefits of your attendance.

Continuing education and industry connections can be crucial to your success and the success of your sports facility. So begin planning your trip now to the 2006 STMA Conference.

Mike Trigg

MIKE TRIGG, CSFM

mtrigg@waukeganparks.org

Misguided phosphorus restrictions could impact field management

BY **DR. JOHN STIER**

Safe and acceptable quality athletic turf requires good mowing, fertility, and irrigation. State and local regulations are starting to take away the right to use good fertility practices due to concerns about phosphorus (P) in turf fertilizers. Regulations restricting or banning P-containing turf fertilizers have already been enacted in Minnesota and Wisconsin, with Indiana, Michigan, Texas, and other states considering regulations. Sports turf managers need to know why such regulation is occurring and where P is actually coming from to ensure forthcoming regulations actually benefit the environment and allow science-based turf management.

Phosphorus is essential to all life and is contained primarily in DNA and the energy-carrying molecule ATP. Phosphorus is present in turf between 0.25-0.5% by weight. Much of the P and potassium (K) come from the soil but soil P is not always adequate for turf growth. Turf absorbs N-P-K in roughly a 4-1-3 ratio. Inadequate P slows turf growth, enhancing the likelihood of bare soil and weeds especially in high traffic areas.

Why is P undesirable?

Phosphorus levels > 0.02 ppm in surface waters cause algae to grow (algal "blooms") and sometimes aquatic weeds. In many soils the background level of P is naturally above 0.02 ppm. When rain hits bare soil, some of the P in the soil dissolves into the rainwater; this is known as "soluble P". Since bare soil can't stop water as well as a dense turf, runoff from croplands dwarfs potential runoff from turf (Table 1, p.10). Heavy rainstorms can carry sediment with its attached P-this is known as "sediment P." Both soluble and sediment P can be either inorganic or organic P (from a living or dead organism). Total P is the sum of soluble and sediment P and is usually what is measured in water samples as both soluble and sediment P can become "bioavailable" for algae growth.

Where is P?

Agriculture and construction account for a majority of P entering surface waters due to the lack of vegetative cover and high sediment loss in runoff. A Kentucky study showed the underlying geography and soil type can dictate the amount of P runoff; 50 years after a wooded watershed was converted to fertilized farmland, P concentrations in the streams remained the same because the soil absorbed P from fertilizer and controlled its release. In 2003 Roger Bannerman from the United States Geological Survey estimated lawns in Madison, WI contributed 1-4% of P entering area lakes but the amount due to turf fertilizer was unclear. Research actually shows a properly fertilized turf has less runoff than non-fertilized turf because the dense turf reduces runoff and sediment loss (Kussow, 1995; 1998). Therefore it may be better for the environment to fertilize turf than to avoid fertilization. Another Wisconsin study in an urban area determined that lawn and garden fertilizers contribute insignificant N and P unless they're applied to paved areas (Lee and Klusner, 1974). A small background level of P will also be present as P is present in dust, pollen, and can be leached from vegetation. Another study determined streets with 80% tree cover had 0.8 ppm P in runoff while street without overhead trees had only 0.1 ppm P in runoff (Waschuch et al., 1999).

Who is pushing P regulation?

The Environmental Protection Agency has set Total Daily Maximal Loads for P and other contaminants in certain parts of the country. In many cases local regulation is occurring due to citizen complaints that something be done to reduce algae and weeds in lakes used for recreation. Because the Green Industry is not well organized and is without lobbyists, turf fertilizers are politically a much easier target compared to agriculture or construction. Once a municipality has passed regulation, others are quick to follow in a case of "me-too"ism. Unfortunately banning turf P applications will have no measurable effect on reducing P levels in water. Our surface water quality will continue to deteriorate until officials take steps to combat the major sources of P and redesign urban areas to stop runoff from impervious surfaces such as roads.

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Most P in synthetic fertilizers is from monoammonium phosphate and is water soluble. As soon as it contacts soil moisture most of the P is tightly bound to soil. At pH < 7, P binds to iron and aluminum to form insoluble P forms. Above pH 7, P binds to calcium and magnesium to form insoluble P forms. Only a small amount of P is ever found in the soil solution. Natural fertilizers, sometimes mistakenly referred to as "organic" (organic is defined as any carbon-containing molecule, which would include the synthetic fertilizer urea), are usually based on animal or human waste products. Some natural fertilizers include activated sewage sludge, composted turkey manure, and fish or plant by-products.

All living organisms contain P. Fertilizers made from dead organisms or their waste products have a relatively high P to N ratio. Natural products displaying an analysis of 10-0-0 will still contain P; the manufacturer has simply decided to not claim the P, which is perfectly legal. The high P:N ratio causes more P to be applied when natural products are used compared to most synthetic turf fertilizers that have a low P:N ratio (starter fertilizers being an exception). For example, application of 1 lb N/1000 ft2 using a 25-3-12 product would supply 0.12 lb P expressed as P2O5 per thousand square feet. The actual amount of P applied would be only 0.05 lb since P is only 44% of P2O5. In contrast a natural organic fertilizer with a 6-2-0 analysis would provide 0.33 lb P2O5 per thousand square feet, roughly 3 times as much P as the synthetic fertilizer. While a University of Wisconsin study showed no difference in P runoff when natural and synthetic P-containing fertilizers were used on turf (Kussow, 1998), it seems silly to think of natural fertilizers as "better" when they actually supply more P than synthetic fertilizers.

Table 1. Phosphorus in runoff from crops, turf, and grassland prairies

Investigators	*Situation*	*Average Phosphorus loss (lb/A/yr)*
Burwell et al., 1975	Corn or corn-oat-hay (10 yrs)	10
Kussow, 1995	Lawn turf, compacted soil (2 yrs)	0.3
Sharpley et al., 1992	Native grassland (5 yrs)	0.2

What about soil testing?

Soil tests use chemicals to strip P from soil so it can be measured. Different procedures give different results: a lab which uses the Bray P1 method may show 60 lb P/acre, another lab using the Mehlich III method may show 108 lb P/acre, while a third lab using the Olsen method may show 56 lb P/acre for the same soil sample (Carrow et al., 2001). (Some labs report P as parts per million, or ppm. Multiply by 2 to convert lb/acre to ppm.)

The type of test used should depend on the type of soil, amount of organic matter, and soil pH. It is up to the soil lab to determine the appropriate method, however, many labs only use one method. A bigger problem is that all soil tests results are based on data collected over numerous years of correlating crop yields (e.g., bushels of corn produced per acre) with soil test results. Turf is grown for quality, not yield, and the required soil test calibrations have not been developed for turf. All current recommendations are a "best guess" based on crop yields, so no, current soil tests cannot reliably measure P needs for turf. However, they are the best tools we have. Regulations in some areas allow fines to be levied for persons who apply P when a soil test indicates it isn't needed. Until soil tests are calibrated for turf, soil tests should be used as a guideline for fertilization rather than a regulatory tool.

Allowing P fertilizer to be used even when a soil test indicates levels are sufficient is important for other reasons. Phosphorus is needed to re-establish turf roots of plants damaged by root rot diseases such as summer patch and necrotic ring spot. Without an adequate root system, diseased plants cannot access P in the soil and need the quick access to P provided by fertilizer. Furthermore, P uptake is reduced in cold soils which is why turf leaves may appear purple in the early spring. Sports turf with events in the spring may benefit from P fertilization regardless of soil test results. Lastly, research has shown starter fertilizer applications improve turf establishment from seed. Recent work conducted by Dr. Frank Rossi at Cornell University shows regular overseeding of athletic fields during the growing season helps maintain a denser turf (personal communication, 2005). Regulations that allow starter fertilizer applications whenever an area is being established or overseeded are critical for maintaining high quality athletic fields with reduced reliance on herbicides.

Phosphorus enters surface waters from a variety of sources, with bare or exposed soil causing the majority of runoff. Agricultural operations and building construction are the two greatest contributors, though the soil geology of the area can dictate the amount of P in the runoff. Organic sources include pollen, seeds, leaves, and even wild animal waste: 100 Canada geese produce over 5 oz of P per day (Sherer et al., 1995), while a pet dog contributes 2.6 lb P2O5 annually which is over 5 times more than a typical turf fertilization program would add to the soil. Unfertilized turf contributes more P and runoff than properly fertilized turf because dense turf slows runoff and prevents sediment P from leaving the site.

In northern climates approximately 75% of the annual P runoff from turf and prairie systems occurs during winter when the ground is frozen, having nothing to do with fertilization. A small amount of P runoff will always be present as P is leached from leaves of all vegetation (trees, etc.).

In our urban environment, runoff is often funneled directly to lakes, ponds and streams where wetlands once existed to intercept and filter runoff before it entered surface waters. Ultimately there is no vegetation type better adapted to intercepting runoff from rooftops, parking lots, and roads on a wide scale than turf. Athletic fields, because of the amount and timing of play, need flexibility to apply P to maintain safe playing conditions. As state and local proposals are developed to limit or ban P applications to turf, athletic field managers will need to partner with other Green Industry groups (golf courses, lawn care companies, etc.) to ensure passage of practical and environmentally sound regulations based on science. ST

John Stier is associate professor, environmental turfgrass science, University of Wisconsin-Madison.