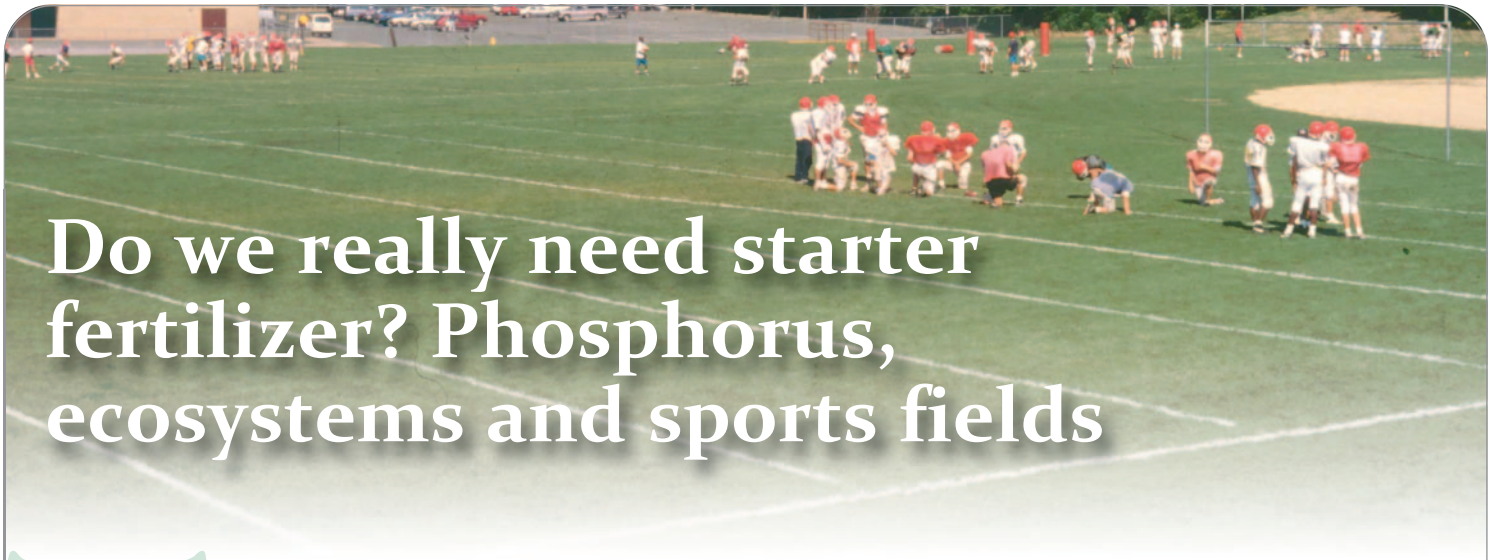


Do we really need starter fertilizer? Phosphorus, ecosystems and sports fields

THE THINNING OUT of turfgrass is inevitable once fall sports practice begins. Here in New York State and other cool season areas, the wear and tear of soccer, field hockey and football extends into the latter half of fall when cooling temperatures inhibit seed germination and establishment. Spring seeding is usually the next option. Athletic field managers are familiar with the cycle of autumn sports damage and the need for spring reestablishment. Applications of starter fertilizers are often built into this annual cycle.

In recent times these high phosphorus-containing materials have become the subject of justifiable environmental concern because of the risks associated with phosphorus runoff in surface waters. Excessive nutrients can throw aquatic ecosystems out of balance, a process called eutrophication. Even low levels of phosphorus can be detrimental to water quality by stimulating overcrowded plants and algal blooms, making the water unsuitable for drinking and recreation. The subsequent death and decomposition of this accelerated growth reduces dissolved oxygen, killing fish and other organisms. Although eutrophication does occur naturally, it is often triggered by nutrients associated with human activities.

Obviously, as sports turf managers we strive to make the world a better place, not to contribute to environmental degrada-

tion. While research has shown that a dense stand of turf impedes runoff, our routine applications of high-phosphorus "starter" fertilizer may pose risks because we're applying when turf cover is thin or even non-existent. Nutrients applied to thin turf or bare soil can readily become mobile. Also, our fields are typically graded to promote good drainage. In addition, the likelihood of seasonal rain compounds the potential for runoff and threatens environmental quality.

Conventional wisdom

If soil tests indicate adequate phosphorus, do we need additional P in the seedbed? Pick up most any turfgrass textbook and take a look at the section on establishment. Odds are there will be something that reads like this: "It is important to use a starter fertilizer because seedlings need a lot of phosphorus to develop. This application is recommended even if soil tests show adequate P levels because the seedlings' immature roots must have P right there where they can access it."

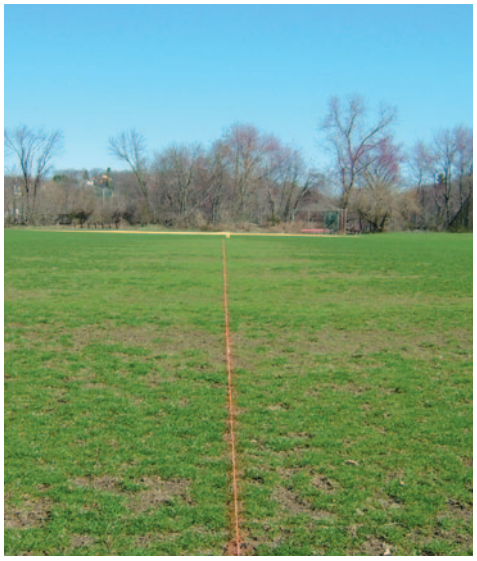
Some of us have always been skeptical of this last assertion. Two years ago I decided to test it.

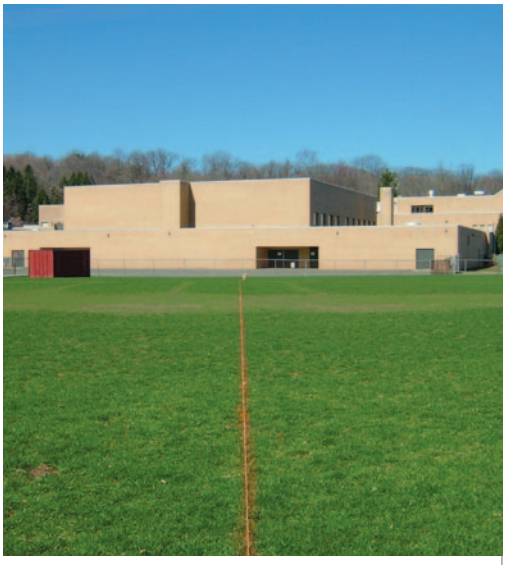
Hash mark science

I designed and implemented a phosphorus study 2 years ago that was too complicated to be useful. I won't even bother to discuss it here. But it did clarify several issues for me, pointed the way to a better experiment, and gave me an early glimpse of what I would ultimately observe.

This past spring I had a better plan in mind that I wisely shared with turf guru A. Martin Petrovic, Ph. D. of Cornell. Marty was characteristically generous in his guidance, support and encouragement.

This second experiment would be simple. I had two football practice fields to work with. (These were no puny university test plots but a robust 2.6 acres of sports turf.) These bruised and battered practice fields were seeded in late March with a perennial rye blend at a rate of 10,000 lb/ft2. These fields would be need-





ed again for practice in August. Soil tests indicated existing P levels at 19 pounds per acre, by all standards more than adequate. I divided each field in half: one cross-field on the 50-yard line and the other lengthwise, goal to goal. On one side of each field I applied triple super phosphate at the substantial rate of 75 pounds of P per acre (8 LB 0-45-0 / 1000 ft^2) in early April, just before germination. The other side received no P. It had been apparent in the first study that applied nitrogen was absolutely essential for vigorous establishment so the entire 2.6 acre study area was fertilized with a controlled release 20-0-5 at a rate of 1 pound of N per thousand square feet just as the seed began to germinate.

Then I watched.

There was absolutely no difference anywhere in the study area. The rye established equally well across the two fields. The entire area got equally beaten up by PE classes and baseball outfielders and showed no detectable differences in response. There was no discernible disparity in density. No visible variation in vigor. No observable benefit from the added P.

The potential for problematic phosphorus concentrations in runoff and the risks of surface water contamination with resulting ecological threat compel us to exercise caution in the use of high P starter fertilizers. As stewards and green industry leaders, we're obliged to be responsibly prudent in the management of all inputs, including nutrients. I'm hopeful that this experiment encourages further study (with other species, in different climates, soils, how much P is enough, etc.).

So, if soil tests indicate adequate phosphorus, do we need to apply additional phosphorus when seeding perennial rye? It does not appear that we do. ■

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