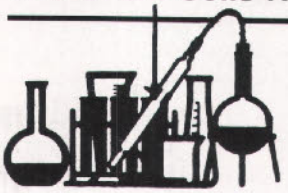

QUESTIONS FROM THE FLOOR

By Dr. Wayne R. Kussow

1. I've just received results from the State Soils Testing Lab of samples sent in last fall. I tested all my fairways. In every case, the phosphorus test read 400 lbs/A and the reading was nearly off the scale in the "excessive" range. Should I be worried? What can I do?

DANE COUNTY

ANSWER: Worry is too strong a term. Vigilant and concerned are more appropriate. Be vigilant because there is the possibility of high phosphate levels triggering one or more micronutrient deficiencies. This possibility is, however, quite remote. I'm not aware of any confirmed micronutrient deficiencies on turfgrass in Wisconsin and certainly none induced by overfertilization with phosphate.

Concern should arise over how soil phosphate became "excessive". This cannot happen overnight. Rather, soil phosphate levels such as these represent years of phosphate applications that were not needed.

What to do? Examine your fertilization program. Applying more than 0.25 to 0.50 lb/(1000ft²(M))of phosphate annually is more than what is removed in clippings and will slowly buildup soil phosphate levels. In your case, where soil test phosphate is excessive, the recommendation is to not apply any phosphate until soil test levels drop to something in the range of 75 to 100 lb/A. Then institute a maintenance program of 0.25 lb/M (10 lb/A) phosphate annually. If soil tests continue to decline, increase the rate to 0.5 lb/M/season.

2. I've been receiving some literature on a product called N-Sure. Using a new fertilizer formula known as triazine, it sounds like it is too good to be true (controlled release, low burn, high stability). Does this product have a place in the management of good golf turf?

MARATHON COUNTY

ANSWER: N-Sure granules consist of powdered triazine (also known as nitrazine and melamine) embedded in urea. Pure triazine has a guaranteed minimum N content of 66%. Its water solubility at room temperature is 0.5%, which is five times that of IBDU but still far too low to cause salt injury. Release of N to turfgrass from triazine is by way of microbially mediated hydrolysis. Initially, the rate of hydrolysis is very slow. In fact, it is so slow that for all practical purposes there is no N release to turfgrass during the first four to six weeks after application. This is why triazine is blended with urea. Once hydrolysis begins to release significant amounts of plant available N, triazine appears capable of satisfying turfgrass N needs for a period of 12 to 14 weeks providing a high enough rate is applied. By relying on urea to meet turfgrass N requirements during the first several weeks after application, N-Sure begins to look like a fertilizer that needs to be applied only once each season.

Field testing of N-Sure has not been extensive, but the product has been shown to be capable of maintaining satisfactory color in Kentucky bluegrass until fall when applied at the rate of 100 1b. N/A in early spring. Turfgrass color tends to drop off rapidly in mid-to-late fall, just as it does with any slow release N source that depends on microbial action for N release.

As with any new product, I would not advise anyone to get too excited about N-Sure until you've experimented with it on a limited basis. If you do decide to try the product, do so in such a way that you have side-by-side strips of turf treated with N-Sure and your normal N applications. If you're naturally skeptical of new products, come to the WTA Field Day next August. Triazine is one of the entries in a fertilizer demonstration installed last fall on a golf tee at the Yahara Hills Golf Course.

3. I've been on a sand topdressing program for over a decade now and for a lot of different reasons I'd like to switch back to using an amended sand material. From what I've read and all I've heard, it seems I shouldn't even consider this. What do you think?

OUTAGAMIE COUNTY

*ANSWER: I think the blanket statement that "once on a sand topdressing program, always on a sand topdressing program" is long overdue for some qualifications. The basic qualifier is that one must never create abrupt soil layers that differ substantially in their moisture characteristics. **If** you are thinking of switching from pure sand to something like an 80/20 sand-peat mix using basically the same sand as before and **if** you continue to core aerify on a regular basis, then you will not create the type of layering such as that often associated with black layer formation. This, of course, assumes that your present sand layer and the original soil beneath do not already present sharp contrasts in water infiltration rates. Assuming here that they do not, then I see no reason why you should not change to an amended sand material **providing the two "ifs" noted above are satisfied.***

4. I'm wondering if I should climb on the "high K bandwagon" so many of my colleagues are riding these days. Many are using 1:2 and 1:3 N/K ratios. What do you recommend for N/K ratios for Wisconsin golf green turf? Do you have a recommended SSTL level for K in golf green rootzones based on this increased interest in potassium?

BROWN COUNTY

ANSWER: The high K bandwagon exists for two reasons: (1) experimental evidence that high levels of K in turfgrass are associated with greater stress tolerance; and (2) recognition that USGA greens mixes have low K storage capacity and, for this reason, are notable for high K leaching rates. What constitutes an appropriate N:K ratio, therefore, depends on whether we're talking about USGA greens mixes or natural soil and/or older mixes that contain substantial amounts of soil. Silt loam

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soil easily stores 500 or more lbs/A of plant available potassium and allows for little or no leaching loss. Under this circumstance, once soil test K is built to 300+ lbs/A, annual application of 0.8 lbs K_2O/M for every pound of N applied will put your turfgrass on a high K diet. Assuming the K goes on only once a year (preferably in early fall), the annual N rate is 3 lbs and the K is going on with 0.5 lbN, then we are, in fact, talking about a fertilizer whose N:K_2O ratio is nearly 1:5 in order to have 0.8 lbK_2O per pound of annual N.

Because of K leaching loss from USGA greens mixes and a K storage capacity of only about 250 lbs/A, the fertilizer N:K_2O ratio required is generally in the range of 1:1.0 to 1.2. In this case, it is impractical to even think of getting by with only one or two K applications per season. If all the N is going on as a dry material, the appropriate N:K_2O fertilizer ratio is 1:1 to 1:1.2. However, the most common situation is one in which N is being applied at frequent low rates for much of the season, often as a urea solution. Then there is no alternative but to apply K alone (preferably as K_2SO_4) three or four times each year. The appropriate rate for each application is the annual N rate multiplied by 1 to 1.2 and divided by the number of applications.

Owing to the fact that we can't expect to build K levels much above 250 lb/A in USGA greens without getting excessive leaching, this is a reasonable soil test to shoot for. However, we need to realize that this is not enough K to keep turfgrass on a high K diet for an entire season.

5. My soil test results are starting to scare me. Soil pH values have slowly been rising in green, tees and fairway results. Many are now in the 7.6-7.8 range. Am I risking real problems of nutrient availability yet? Should I be on an elemental sulfur program? How many lbs/A can I safely use? When's the best time to apply?

ROCK COUNTY

ANSWER: Your pH values have risen to 7.6 to 7.8 because you, like many others in the state, are irrigating with hard water. Every time you irrigate you're applying calcium and magnesium that act as liming material. Your pH values should not increase much above where they are at the present time.

We normally think of high soil pH as a common cause of micronutrient deficiencies in Wisconsin turf. The most likely candidate is iron, but we haven't seen any Fe deficiency.

The pH rise you've experienced is common, cannot be avoided and, at least so far, has not seemed to create nutrient deficiencies. For this reason alone, I'm not a proponent of elemental sulfur programs. Even if widespread micronutrient deficiencies did begin to show up in turfgrass growing on high pH soils, elemental sulfur would not be the total answer to the problem. There are several reasons for this. Sulfur neutralizes soil alkalinity only as a result of microbial oxidation to sulfuric acid. Theoretically, (i.e., when 100 percent of the sulfur is oxidized), slightly more than the equivalent of three pounds of calcium carbonate is neutralized per pound of sulfur applied. Even then, the amount of sulfur required is impressive. For example, decreasing the pH of a sandy soil

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