Penn State Study Confirms that Traditional Late Fall Fertilization is Not Beneficial

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During the first week of November I had the chance to attend an international meeting of crop and soil scientists in Long Beach, CA. This is always a great opportunity to see the latest and greatest research results from researchers all around the world. In particular, several sessions are dedicated exclusively to turfgrass research where scientists present their latest results in either fifteen minute talks or by printing their results on enormous posters which are displayed on the convention center floor for all to see.

This year, a presentation on fall applied nitrogen really caught my attention. The presentation was made by graduate student Chase Rogan, advised by Dr. Max Schlossberg at Penn State University. The study was conducted on a mixed stand of bentgrass and *poa*, and treatments included nitrogen applied at four different dates in the late fall.

Contrary to the long-held belief that nitrogen applied while the grass is not growing will increase root growth, the PSU researchers found the best fall N timing was actually 15 days before the first hard frost. Nitrogen applications made after this date had poorer spring density, vigor, and growth rate.

While I've felt like somewhat of a heretic for my against-the-grain pronouncements about fall applied N, I'm now a bit relieved because the PSU findings are nearly identical to our results from field research in Madison and St. Paul.

For maximum benefit, nitrogen applications should be made earlier than traditionally thought. Based on our research (and now the PSU research), I suggest three options to replace the traditional large (1 lb/M) fertilizer application in the late fall:

1) Fertilize no later than the first hard frost at a reduced rate (0.5 lb/M).
2) Use a granular 50% slow-release fertilizer in late September (1 lb/M).
3) Continue spoon feeding (0.1 - 0.2 lb/M) every two weeks until the first hard frost.

Each of these three options will result in increased nitrogen uptake compared to large applications of soluble fertilizer in late October. If you want to stick with a single, large application of a soluble fertilizer, a map of the first killing frost dates can help you determine when to apply (Figure 1). For Madison, the best timing appears to be late September or early October. Up north, the best timing may be as early as September 1, a fairly radical departure from the old recommendations.

I expect the PSU study is only the first among many to re-evaluate the conventional wisdom of late-fall applied N in cold climates. As I've written in these pages before, the original fall N research was conducted in coastal Virginia and Rhode Island in climates much unlike our own. A critical component of field research is to test results for applicability in various

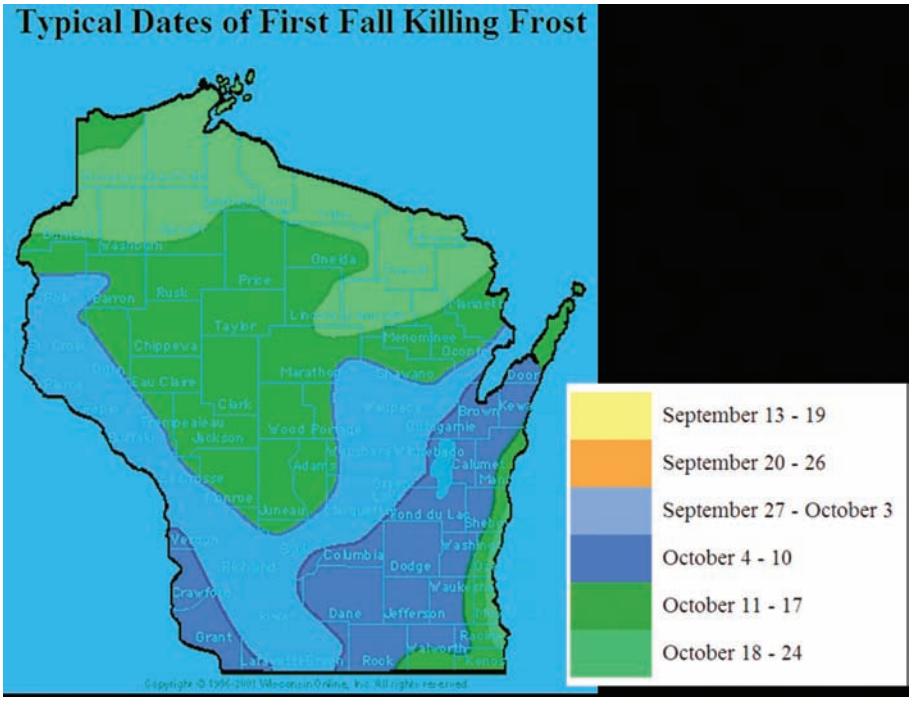

Figure 1. A map from www.wisconline.com showing a map of average dates of the first killing frosts across Wisconsin.

climates. It appears that in cold climates, late-fall nitrogen applications aren't the best idea.

Congratulations to the Wisconsin Golf Course Superintendents Association and the Wisconsin Turfgrass Association for having the wisdom and courage to provide much of the funding to support our research which originally proposed to evaluate the one thing we thought we knew best - turns out we learned something new after all.

A second notion that appears to be on its last legs is the notion that potassium is a good "winterizer". My position on potassium has been conservative and largely influenced by Dr. Kussow: if the soil contains adequate potassium, applying additional potassium is akin to burning money.

Maintaining soil potassium levels remains important, and applying potassium in small doses on sandy soils with low CEC is probably a good idea. However, research that began at Cornell nearly a decade ago has continued to show that applying large amounts of potassium to sandy soils can create more problems than it solves.

Graduate student Dave Moody under the direction of Dr. Frank Rossi has found a strong relationship between potassium concentration in the leaves of turf and the amount of gray snow mold damage: the more potassium in the leaf, the faster gray snow mold progresses. The relationship was fairly weak for pink snow mold. Dave is currently investigating several reasons for why this may be the case, but the data seem fairly clear that juicing the turf with potassium will increase the amount of gray snow mold damage.

These were just two of hundreds of talks on turfgrass, and I enjoy watching the incremental progress that is being made in all areas of turfgrass science. I hope you see the value in supporting research like this which can sometimes overturn long-held beliefs and increase your ability to become a more efficient turfgrass manager.

As always the turfgrass research from University of Wisconsin-Madison was well represented at the conference. Our turf group made eleven presentations, two of which won awards in the graduate student competition: Ben Pease won 2nd place for his oral presentation on growing velvet bentgrass in the shade and Shane Griffith won 2nd place for his poster on using biosolids to grow sod. Congratulations to Ben and Shane and the rest of the UW graduate students, it's a pleasure to work with such a talented group of people.