The View From M.S.U.: Late Fall Fertilization Philosophies

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In the late fall, there are still many projects which require the time and attention of turf managers. Many of the turf management practices done during late fall have a major impact on turf quality the following spring. Fertilization is one of the most important.

Phosphate and Potash

In the opinion of a few agronomists, the key nutrients in fall fertilization are phosphorus and potassium, but most agronomist acknowledge that nitrogen management is the most important. Of course, if P is recommended (based on soil tests), this should be applied as needed. Because K is so important in stress tolerance, application of some K in both fall and late fall programs should be considered. On sandy soils, some late fall K should be a regular part of the program. Potassium is easily leached from sands, so regular applications are needed and should be made in the fall and late fall, as well as throughout the year.

To be confident there is adequate potash in the soil, use a soil test for medium- and fine-textured soils. If tests suggest potash is needed, appropriate rates should be applied based on recommendations and common sense. Remember that recommendations for P_2O_5 and K_2O given in soil test reports are for the amount needed for an entire year. In fall and late fall, apply reasonable amounts to achieve the total needed over the year.

When late fall N fertilization is practiced, some potash should normally also be applied along with the nitrogen. Without benefit of soil test recommendations on finer-textured soils, apply potash at about half the rate of nitrogen. On sands without soil tests, use nearly as much potash as nitrogen in late fall applications.

Timing of Late Fall Nitrogen Applications

For cool-season grasses, both fall and late fall fertilization should be considered. Fall fertilization is best done during September, preferably early in the month. With the weather changes in late summer and early fall (shorter days, cooler nights and more regular rainfall), the turf plant tends to grow less rapidly vertically than in the spring. More lateral growth results in improvement in turf density after the rigors of summer. Fertilization in the fall deserves top priority. More of the carbohydrates manufactured by photosynthesis at this time of year will be stored, building up the plant for next year.

Normally it is best to withhold nitrogen applications during October to permit the turf to "harden off." If not applied earlier, low rates of N (1/2 lb. N/1000 sq. ft. or less) can be applied as needed to hold reasonable color and density. This can help improve turf density and permits the turf to accumulate carbohydrates. Heavier rates of N in early October should normally not be used as this could cause the grass to become very succulent. Should a high rate of N be applied in late September or early October under excellent growing conditions (warm and rainy) followed by a hard freeze, the grass leaf tips

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could be killed, reducing the potential for photosynthesis at this time of year.

There are a number of opinions as to how and when to use late fall nitrogen applications. In part, this occurs because of differences in climactic zones and variations from one season to the next. Perhaps the more important reason for variation in late fall fertilization is the objective for this practice.

In my opinion, the most important objective of late fall nitrogen fertilization is to **supply nitrogen to the turf after growth has ceased but when photosynthesis can still occur.** This will *normally* take place anywhere from the last week of October in northern Michigan to the second week of November in southern Michigan near the lakes. It will vary with the particular year by a week or more. Some additional short growth spurts may require mowing after that time, but regular mowing is no longer necessary. At this time, the root system is still active, since the soil is warmer than the air. Nitrate nitrogen can still be taken up and utilized by the plant. The fall of 1995 proved an exception with the early cold weather and loss of the typical weather during which carbohydrates could accumulate. This contributed to the poor start for turf in 1996.

If proper nitrogen fertilization has been practiced during the fall period (September), the turf should still be green and physiologically active in the late fall. This permits the plant to continue photosynthesis whenever modest temperatures and some sunlight conditions occur. Carbohydrates manufactured during this time are not "burned off" with growth and clippings but are stored. This builds up the plant for next year and permits root growth initiation in the spring, even before top growth begins.

If N is applied during late fall, this reduces the need for N in early spring. Nitrogen applied in early spring enhances top growth and mowing requirements at a time of year when growth is likely to be very rapid anyway.

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Carbohydrates lost with the clippings in the spring are obviously no longer available to the plant. It makes sense to keep those carbohydrates in the plant as long as possible. With the hot weather of summer, there is a natural reduction in carbohydrates. Keeping the carbohydrate level in the plant high enhances stress tolerance and keeps some reserves in the plant for recovery of turf density, if needed.

Nitrogen Carrier

The choice of carrier is very important with late fall nitrogen fertilization. To accomplish the objective of getting a significant portion of the applied nitrogen into the plant right after application necessitates that the major portion of the nitrogen be from fast-acting, soluble sources. Some of the nitrogen can be slow release, as much as 25% or so. This slow-release carrier will provide a small amount of N next spring, but will not result in any major response or flush of growth. Any of the slow-release carriers should be acceptable for this portion of the fertilizer.

If straight slow-release N sources are applied during this late fall period, there is not enough N available to the plant to provide the response desired of enhancement of photosynthesis and carbohydrate storage. This was very apparent in fairway studies we conducted on golf courses in Michigan several years ago. Some golf course superintendents like to use Milorganite right after Thanksgiving and have been pleased with the responses observed the next spring. This approach has been used with success for years but does not accomplish the objective of carbohydrate storage during the late fall.

Rate of N Application

Rate of application of nitrogen to use in the late fall will again vary with turf conditions and philosophy of the turf manager. For greens, 1/2 lb. N per 1000 sq. ft. may be sufficient. If tees are still thin from traffic, especially on par 3 tees, 3/4 to 1 lb. may be needed. Fairways could receive 1/2 to 3/4 lb. Lawns and general grounds can receive 3/4 to 1 lb. N. Some agronomists may encourage even higher rates as a general practice, but the increased potential for leaching of nitrates would suggest caution against using such higher rates of N. An exception might be football and soccer fields which have been thinned by fall play and need the extra boost from N. Rates as high as 1.5 lbs. N/1000 sq. ft. may be needed.

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If late fall N has been applied, the need for early spring N will be reduced. Many turf managers do not fertilize again until just before Memorial Day since the residual effect from fall and late fall applications have provided good color and density without the spring growth flush caused by early spring applications.

Late Fall N for All Turfs?

Some turfs may perform better without the late fall nitrogen. If the turf site is normally very wet in the early spring, which restricts mowing until significant drying occurs, late fall N should probably not be applied as there will be some early spring growth enhancement compared to turfs receiving no late fall N. This should be evaluated on a site-by-site basis.

Late fall nitrogen applications can result in increased snow mold disease. If turfs are hard hit by snow mold nearly every year and no snow mold preventative program is followed, it may be best to avoid late fall nitrogen. However, based on plot research done by Dr. Joe Vargas and on observations in the field, it is clear that while in most years the late fall nitrogen may increase the amount of snow mold, there is a much quicker recovery from any injury caused. The snow mold damage may be more superficial with the late fall nitrogen and/or the recovery is quicker. Either way, the next spring the turf returns to a better quality condition sooner when late fall nitrogen has been applied.

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Other Pros and Cons of Late Fall N

Potential problems with late fall nitrogen fertilization include the potential for leaching of applied nitrogen, late fall growth which would require more mowing, potential for more snow mold and other winter injury, increase in thatch and more growth in the spring. The potential for most of these concerns is considered small in light of the positive results.

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The studies conducted here at Michigan State by Eric Miltner, Bruce Branham and myself compared late fall nitrogen treatments with those emphasizing spring applications. There was no significant leaching of nitrates from either treatment. If the nitrogen is applied while the plant is still physiologically active, the soluble nitrogen should be taken up and used so it will not be available for leaching over the winter.

While there may be a small increase in growth during the fall or spring, most turf managers are satisfied the benefits are far greater than the potential negative effects. There is no evidence that late fall N increases susceptibility to low temperature or crown hydration injury. In fact, if there is such winter injury, recovery may be faster if late fall N has been applied. There is evidence from a study done at Ohio State that late fall nitrogen may increase thatch accumulation to some degree.

Benefits of late fall nitrogen include good carbohydrate levels in the turf the next spring, good early spring root growth, good fall and spring color and good turf density so there is less potential for establishment of spring weeds.

With many advantages apparent for late fall nitrogen and few disadvantages, it is clear why so many turf managers have adopted this practice. I have not talked to anyone who has tried late fall nitrogen fertilization who has not continued to utilize the practice for agronomic reasons. This is the best testimonial for late fall fertilization. ■

Toughening Up Turf Through Fall Feeding
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and herbicides, which makes its inclusion in a preventative spray program a basic part of fall maintenance at no added cost in labor.

We demand a lot from our turf. We want it green at all times and to heal itself, even after we repeatedly drive over it, trample it, and beat it with a club. There aren't many plants that would survive all that we put our turf through. Most gardens would be devastated just to have someone carelessly walk through them. All of this resiliency demands specialized care and feeding. Pushing here and tweaking there. Giving the turf what it needs to survive winter stress is one of those little things that can pay off big. ■

What to Do If You're Pulled Over
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cer's name badge matches the name on the ticket. Mistakes could result in the dismissal of the ticket.

There are three ways to respond to a ticket. First, you can plead guilty. This is usually handled by mailing the fine. Second, you can negotiate a plea bargain which may result in fewer points on your MVR but may result in a larger fine. And finally, you can fight the ticket and hope to have it dismissed. Whatever you do. don't just ignore the ticket. This can result in suspension of your license and a warrant for your arrest.

Drive safely and remember that avoiding a ticket is always your best defense. So keep on trucking—safely! ■

Credit: New World Van Lines

Greg Johnson –N– Eagle Brook C.C.
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yard hole has an island green surrounded by wetlands. After you survive that hole, you will be glad to relax in the new $7+ million clubhouse. Eagle Brook can play to a demanding 6,736 yards from the green and gold tees.

Throughout Greg's tenure at Eagle Brook, his first year was the most challenging. "The summer of '95, right after Southwest bought it," Greg said, "our maintenance facility was an old barn with a dirt floor—and you remember the summer of '95?" Yes, Greg, I think we all do; and thank God for the law of averages. "The biggest challenge now is trying to keep pace with the competition, the other private country clubs, in the Chicagoland area," Johnson noted.

Johnson gave special praise to his assistant Tod Hopphan. "Eagle Brook is a very environmentally sensitive property. With over eighty acres of wetlands, Tod has been very instrumental in working towards the Audubon Cooperative Sanctuary Program certification." (Note Tod's article in the June 1997 issue of *On Course*, "Membership Has Its Price!")

Greg and his bride Cathy have been married for 19+ years and have a future quarterback, Alex, that is eight. Greg states that "Alex is very athletic, and I would not be surprised to see him in a Packer uniform some day." Sounds like Greg's boyhood dream?

I have had the sincere pleasure to know Greg for a number of years. I know his FAVREite colors are green and gold. I know his aspirations ten years down the road are not to stay at Eagle Brook; but if you ever want Packer/Bear tickets, call the superintendent in Titletown, and ask for Greg. ■