Fall fertilization of turfgrass

Research suggests many different effects, many different approaches. Weigh them all before making any applications.

by Paul Rieke, Ph.D.
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■ Fertilization is a priority for fall and late-fall turf management. Fall fertilization is one of the most important turf management practices done that has a major effect on the quality of turf the following spring.

Phosphorus and potassium— The key nutrient in fall fertilization is nitrogen, but phosphorus and potassium are also key nutrients. Certainly, these nutrients should be available to the turf in adequate quantities.

For example, when potassium is limited, there is a probable reduction in stress tolerance—including potential for low temperature injury to turf during winter. Some evidence also suggests an increase in susceptibility to snow mold when potassium is limited.

Dr. Rieke says you should supply N after growth ceases, but while soil still warm.

Use a soil test for medium and fine-textured soils to be sure there is adequate potash in the soil. If it suggests potash is needed, appropriate rates should be applied based on recommendation and common sense. For turfs on sands, soil tests for potassium are usually low in spite of a potash fertilization program. Regular, light applications of potash at frequent intervals (spoon feeding) should be made on sandy soils, particularly on sand greens.

At the time of late-fall fertilization, about half as much potash should be applied as nitrogen on finer-textured soils. On sands, use equal quantities of nitrogen and potash.

If soil tests show a phosphorus deficiency, it can also be applied in the fall, normally in a complete fertilizer. Seldom is phosphorus limited on turf. An exception is when no phosphorus has been applied and clippings are routinely removed.

Another potential exception is on sand greens, which have little capacity to hold phosphate. We have seen several cases of phosphorus deficiency on sand greens, more commonly on new greens, but also on older greens where no phosphorus has been applied for some time. Soil tests must be used to determine the need for phosphorus.

N in the fall— 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. Weather changes in late- summer, shorter days, cooler nights and more regular rainfall cause the turf plant to grow at a less rapid vertical rate than it will during the spring. More lateral growth results in better turf density after the rigors of the summer. So fertilization in the fall deserves top priority. Carbohydrates manufactured at this time of year will be more likely to be stored, building up the plant for next year.

Appropriate rates of nitrogen applied during the fall period depend on a number of variables, ranging from ½ to 1 lb. N/1000 sq. ft.

A higher rate may occasionally be justified at times such as:

- on a newly-established turf which has suffered serious thinning over the summer due to injury from diseases, insects, traffic or moisture stress;
- in areas where an extensive weed population has been controlled, leaving open areas.

On general turfs (lawns, grounds, etc.) all the nitrogen can be applied in one application. For greens and other high maintenance turfs, you can use two split applications if the higher rate of nitrogen is needed. An alternative is to use a fertilizer which contains more slow-release nitrogen. Or, a spoon feeding program with weekly applications of soluble sources can be used, particularly on greens.

Normally, it is best to withhold nitrogen applications during October to permit the turf to "harden off." This permits the turf to accumulate carbohydrates and reduces the potential for frost injury if the turf softens before a major freeze.

Timing—In part because of differences in climatic zones and variations in the severity of seasons, there are many opinions as to how and when to apply nitrogen in late fall.

From my perspective, the objective is to supply nitrogen to the turf after growth has ceased. The root system is still active, as the soil is warmer than the air, and nitrogen can still be taken up and used by the plant.

If N has been applied properly in September, the turf should still be green and active. 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 spring.

The rate of nitrogen application will again vary with turf conditions and the philosophy of the turf manager.

- For greens, ½ lb. N/1000 sq. ft. may be sufficient.
- If tees are still thin from traffic, especially on par 3 tees, ¾ to 1 lb. may be needed.
- Fairways could receive ½ to ¾ lb.
- Lawns and general grounds can receive ¾ to 1 lb. N.

Some turf may perform better without late fall nitrogen. Some lawn care companies cannot justify the cost of late-fall nitrogen for customers who may not continue with their services the next year. However, turf quality the next spring should be excellent about the time spring sales begin.

Snow mold caution—Snow mold was severe on many turfs over the winter of 1992-93. Some of the greater infestation was aided by late fall nitrogen applications.

If turf is hit hard by snow mold nearly every year, and no snow mold prevention program is followed, it may be best to avoid late-fall nitrogen. In most years, the late fall N may increase the amount of snow mold, but there is a much quicker recovery from injuries.

Late fall nitrogen: pros and cons

PROS

+ Good carbohydrate levels in the turf next spring.
+ Good early spring root growth.
+ Good fall and spring color.
+ Good turf density; less spring weed establishment.
+ Good turf color in spring.

CONS

– Nitrogen may leach.
– More mowing, affecting snow mold and other winter injury.
– May increase susceptibility to thatch formation to some degree, based on evidence from Ohio State University.
– Small increase in mowing in spring.

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 with late-fall nitrogen.

For the Great Lakes region, we suggest applying the nitrogen after growth has ceased for all practical purposes.

This does not mean there will be no need to further mowing, but regular mowing will not be needed.

An additional mowing or two may be required before growth ceases entirely. This occurs anywhere from the last week of October to the second week of November.

Avoiding early spring nitrogen has the advantages of reduced carbohydrate loss caused by excessive growth, less mowing, potential reduction in several diseases and greater moisture stress tolerance during the summer.

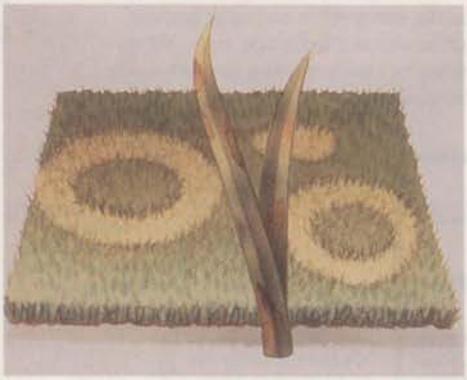
—Dr. Paul Rieke is a turfgrass specialist at Michigan State University. This article is excerpted from a paper he wrote for Hole Notes.

Take the bite out of summer patch

■ Summer patch is one of the most destructive diseases of cool-season turf in North America. Prior to 1984 it was an unidentified component of the disease Fusarium blight. Summer patch has been reported on annual bluegrass, Kentucky bluegrass and fine fescue.

The symptoms—In mixed stands of annual bluegrass and bentgrass maintained under putting green conditions, patches are circular, 1 to 12 inches in diameter. As annual bluegrass yellows and declines, bentgrass species frequently recolonize patch centers. On fairways, rings or patches may not develop; symptoms may appear as diffuse patterns of yellowed or straw-colored turf that are easily confused with heat stress, insect damage or other diseases.

Infection commences in late spring when soil temperatures stabilize between 65-68 F. Symptoms develop during hot (86-95 F.) rainy weather or when high temperatures follow heavy rainfall. Patches may expand through the summer and early autumn and are often still evident the following growing season.



To reduce summer patch

✓ raise the height of cut
✓ aerate in spring and fall
✓ fertilize with acidifying N sources
✓ convert from annual bluegrass to bentgrass

Chemical control—Systemic fungicides such as fenarimol (Rubigan), propiconazole (Banner), triadimeton (Bayleton), and the penzimidazoles (i.e. Tersan 1991, Fungo 50, and Cleary 3336) are most effective applied at label rates. Begin preventive applications in late spring or early summer when the maximum daily soil temperature exceeds 60° F. for four or five consecutive days. Monitor soil temperatures at a two-inch depth during the warmest part of the day. Repeat fungicides two to three times at 21-28 day intervals. Control is enhanced by applying products in 4-to-5 gallons of water per 1000 sq. ft. Post-treatment irrigation does not seem to increase control.

Cultural control—Because summer patch is a root disease, cultural practices

that alleviate stress and promote good root development to reduce disease severity. Avoid mowing turf below recommended heights, particularly during periods of heat stress. Summer patch is stimulated at high soil pH. Maintain soil pH between 5.5 and 6.0 with the application of ammonium sulfate or a slow-release nitrogen source such as sulfur-coated ureas. Conversion of golf areas from annual bluegrass to bentgrass will further reduce disease incidence.

Good cultural practices such as aeration, raising the height of cut, and fertilizing with acidifying nitrogen sources can reduce the use of fungicides.

Although these practices may take two to three years to reduce disease severity, they represent an environmentally sound means to improve turfgrass vigor and reduce fungicide rates 25-50 percent. Acidifying fertilizers and systemic fungicides have also been used on golf greens to effectively control summer patch and increase the population of bentgrass 11 to 20 percent over a three-year period.

Clarke: Maintain soil pH between 5.5 and 6.0.

—Bruce B. Clarke, Ph.D., Rutgers, presented this information at the 1994 Turf-Seed Field Day, Hubbard, Ore.

CORRECTION

■ The systemic vs. contact fungicides "definition" debate has returned, after an article in our July issue.

A reader called to say that the article on page 29—which was supplied to LM—misidentified thiophanate, Chipco 26019, Vorlan and Curalan as contact fungicides.

We spoke with Scott Werner of Lincolnshire Fields, about whom the article was written. He agreed that thalonil was the only "true" contact fungicide mentioned in the article, which was also the opinion of our caller.

Werner explained there has long been a difference of opinion as to how the product action of fungicides should be described. Werner said there is no danger in combining these products, but agreed that some clarification was in order.

We spoke with Dr. Bruce Clarke of Rutgers University. He describes thalonil, Vorlan and Curalan as contact fungicides, while thiophanate and Chipco 26019, he says, are systemic fungicides. Others may prefer to call them "penetrants," while many turf pathologists will say the only "true" systemic is Aliette.

If you have questions on fungicides, contact your supplier or an extension turfgrass pathologist.

LANDSCAPE MANAGEMENT regrets any inconvenience this may have caused.