



CHIPS & PUTTS

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Late Fall Fertilization

By Pete Landschoot, Penn State University

Dollar for dollar, fertilization does more to improve turfgrass quality than any other single maintenance practice. The challenge in developing a good program is to apply the correct amount of fertilizer at the time of year that will most benefit turf health.

Although few people dispute the need for spring and late summer fertilization of cool-season turfgrasses, opinions differ on the benefits of late fall fertilizer applications. The following is a description of how late fall fertilization influences turf performance and which types of fertilizers and rates provide the best response.

Late fall fertilization defined: At least some of the different opinions about late fall fertilization stem from confusion about the meaning of this term. Some turf managers refer to late fall fertilization as simply "fall fertilization." It is important to realize that fall fertilization is not the same as late fall fertilization.

Fall fertilization could occur anytime from late September to just before Christmas. Most experts agree that late fall fertilization should take place when foliar growth stops (or slows to the point that turf no longer needs to be mowed); grass is still green; and before the soil freezes.

In Pennsylvania, this period usually occurs around Thanksgiving, however, it may occur later in transition-zone states and earlier in northernmost portions of the United States. Application timing also may vary from year to year depending on weather conditions.

Why fertilize in late fall? Fall is the time of year when cool-season turfgrasses recover from summer stress-related conditions, such as drought, heat, and disease. The cooler temperatures and moist conditions are conducive to good turf growth.

Although few people dispute the need for... fertilization.... opinions differ on the benefits of late fall fertilization.

Provided that plants are properly fertilized, turf begins to accumulate carbohydrates in stems, rhizomes and stolons. This reserve will help turf resist winter injury and disease and will be

tapped for root and shoot growth the following spring.

Late summer fertilization can aid in turf recovery and carbohydrate accumulation. However, by late fall the response to late summer applications has usually dissipated. Research has shown that if fertilizer applications are made while shoot growth is still active (during mid-fall), the turf may not harden properly, increasing potential for winter injury and disease.

Late fall fertilization has been promoted as a means of prolonging turf color into early winter without increasing the chance of winter injury and disease. Winter color will be

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President's Message.....

As you may or may not have heard, I moved on to another job. I am now at White Beeches Golf & Country Club in Haworth, New Jersey. I believe this is a good opportunity for my career, and I am very excited about it. During our recent Board of Directors meeting I asked the other directors to decide if they wanted me to finish my term as president. They decided it would be fine with them if I remained, and I am honored to continue as PTGA's president.

Now on to the next point. In my last message I got on salespeople who were not attending our monthly meetings, but attending meetings that were in more "profitable" areas. Now it is time for all the superintendents who do not participate in their own organization. I am going to need help understanding this, so please, any feedback will be greatly appreciated. Why would a superintendent pay dues and not attend a meeting? Not a single one! You know who you are. It cannot be price. We have had a wide range of meeting prices this year. Is it time constraints? Well get yourself a little more organized. Well anyway, I could go on and on about this, but it is really up to you to participate.

Have a Great Holiday Season! See you soon!

Gene Huelster

From the Editor's Desk.....

I find myself struggling with my first editor's message. I want to say something profound and immediately establish myself as a journalistic genius, but my pondering leads me to understand why I became a golf course superintendent and not a journalist. It also leads me to the point of my editorial. Each of us could easily limit our realm of responsibility to our jobs as turfgrass professionals, and no one person could rightfully expect any more from us based on the commitment and dedication that our careers already demand. But for those that have come before us and for those that will follow in this profession, we have a responsibility to support the Pocono Turfgrass Association and to see that it exists into the future. That means that we all have an additional responsibility, whether it be as simple as attending the meetings, hosting a meeting, or offering assistance on a committee or board. This is an association of people, and without our commitment, there will not be a Pocono Turfgrass Association.

I wrote this editorial to talk myself into being your newsletter editor, despite the fact that my wife will deliver our third child in two weeks and my board has once again refused to automate my irrigation system, but please take from it anything that you will.

Eric Reed



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Past President

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570-655-2383
rgarrison@golfsat.net

CHIPS & PUTTS STAFF

EDITOR

Darrin Batisky

Managing Editor

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PTGA Office
RR 1, Box 219
Harding, PA 19643
Phone/Fax: (570) 388-2167



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more noticeable in regions where winters are warmer (transition-zone states) and during mild winters.

Late fall fertilization can also enhance spring green-up without the excessive stimulation of growth that often accompanies early spring fertilization. This green-up often will last into mid-spring. A fertilizer application in mid- to late spring is usually required to provide additional nutrients to plants.

A small but potentially important increase in the plant's carbohydrate reserves occurs when fertilizer is applied in late fall instead of early spring. This increase may provide a slight advantage by promoting better stress tolerance and disease resistance.

Another reported effect of late fall fertilization is an increase in rooting, though precisely when and how this increase occurs is a source of some debate.

Maximum root growth of cool-season turfgrasses occurs in spring and fall, with early to mid-spring being optimum. Some root growth will occur in winter if temperatures are above 32 degrees. Little, if any, growth occurs in summer.

Most fertilizer applications are made in spring and late summer in attempts to promote root growth. One problem in using this approach is that much of the fertilizer is used by the shoots, sometimes preferentially over roots.

One reported advantage of late fall fertilization is that roots are still growing at a time when top growth has ceased, thus allowing the roots to make full use of the fertilizer. But the roots are growing very slowly, and if the soil is frozen, not at all.

Studies in Virginia have shown that moderate rates of soluble nitrogen (1 lb. N/1000 sq ft) increased rooting of creeping bentgrass without a noticeable increase in top growth.

In contrast, studies in Ohio showed no increase in Kentucky bluegrass root growth during late fall or winter following late fall fertilizer applications. However, when compared to early spring applications of nitrogen, late fall fertilization increased rooting in spring.

Presumably, this benefit was due to early spring green-up from a late fall application, which alleviated the need for early spring fertilization. When fertilizer was not applied in late fall but instead in early spring, excessive shoot growth occurred, depleting carbohydrate reserves that would have otherwise gone into root production late in spring.

One could derive from these studies that while the net effect of late fall fertilization on rooting is slight, application in late fall may be more beneficial than in early spring.

Late fall fertilization is occasionally blamed for increased winter injury, snow mold and annual bluegrass encroachment. A few studies have been designed to examine the influence of late fall fertilization on winter injury. But none has conclusively demonstrated detrimental effects.

Heavy fertilization in mid-fall—when grass shoots are actively growing—can enhance snow mold (presumably due to reduced

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hardening and increased succulence of plant tissue). But this should not occur with late fall fertilization. In fact, reports from several universities have shown that late fall fertilization may actually reduce winter diseases.

While some studies have shown increased annual bluegrass populations in fall, there is no good evidence to show that this increase is related to late fall fertilization.

Fertilizer sources and rates: Most late fall fertilization programs include moderate amounts of nitrogen, phosphorus and potassium. Rates of 1/2 to 1 lb soluble N/1000 sq ft are recommended over higher rates (assuming a late summer application was made) to avoid winter injury, excessive growth in spring and leaching or runoff.

A recent study at the University of Illinois showed that when nitrogen was applied at moderate rates in late fall—1 lb of N/1000 sq ft—both urea and sulfur-coated urea provided a better early spring color response than Milorganite.

However, when Milorganite or sulfur-coated urea was applied in late fall at a higher rate (2 lb of nitrogen/1000 sq ft), results as far as spring green-up were similar to those obtained from applying urea at a lower rate (1 lb of N/1000 sq ft in late fall and 1/2 lb of N/sq ft in early spring).

Slow or controlled-release nitrogen sources are better than soluble sources on sandy soils because of reduced potential for leaching. Nitrogen fertilizer should never be applied to frozen soil due to the increased chance of nutrient runoff.

Suggested rates of nitrogen fertilizers for late fall fertilization:

Bentgrass fairways and greens:

1/2 lb soluble N/1000 sq ft

1 lb slow-released N/1000 sq ft

Kentucky bluegrass/perennial ryegrass/fine fescue lawns and grounds:

1 lb soluble N/1000 sq ft

1-1/2 to 2 lb slow-release N/1000 sq ft

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Season's Greetings!



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Wish you and yours a
Very Happy Holiday Season!*



A Thank You

Pocono Turfgrass Association
Att: Gene Huelster
R.R. #1, Box 219
Harding, PA 18643

Date: November 19, 2001

Dear Members of the Pocono Turfgrass Association:

I would like to thank you for awarding me the Paterson Scholarship. Your generosity has been a tremendous help in defraying the cost of my education. It has been a great learning experience as well as a pleasure being associated with the Pocono Turfgrass Professionals and it is my hope that the relationships I've developed in the past three years will continue long into the future.

Thank you.

Dan Tanto



February 3-10, 2002
Trade Show: February 7-9
Orange County Convention Center





Effectiveness of Late Applications of Herbicides

We are fielding questions about how late postemergence herbicides, such as three-way broadleaf products, can be applied in the fall. Though these products work faster when the plants are actively growing, these herbicides will still work as long as the plants are green and photosynthesizing. Therefore, applications well into November will work, albeit slower. You may not even see any effect this year, but weeds will die over the winter. Try to apply on a dry, warm (55 degree F), sunny day to maximize effect. If you have problems with winter annual broadleaf weeds such as common chickweed, it makes more sense to apply a broadleaf herbicide as late as possible in the fall to control most of these late-germinating weeds.

Zac Reicher, Assistant Professor/Turfgrass Extension Specialist
Purdue University

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A message from your golf course superintendent and GCSAA



COMMITTEE APPOINTMENTS



Following are the new committee appointments for 2002. Anyone who would like to help out on a committee, please don't hesitate to call the appropriate chairman listed below.

Publicity/Editorial	Eric Reed
Finance/Fundraising	Mark Eisele
Allied/Government Relations	Darrin Batisky
Scholarship & Research	Duane Schell
Social & Welfare	John Downer
Survey & Response	John Downer
Membership	Duane Schell
Education	Jason Barndt
Golf	Tony Grieco
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Sergeant at Arms	Steve Chirip
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Visualize the future.*

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POCONO ROUNDUP

NEWS AND VIEWS FROM THE POCONO
TURFGRASS ASSOCIATION

Marital Bliss!



Shaun Henry of Wyoming Valley C. C.
was married on November 2, 2001.

Ed Keil of Lehman Golf Club will be getting
married on December 15, 2001.

Congratulations!

Board Members

We have a new member on the Pocono Turfgrass
Association Board of Directors—**Joe Henry**.

Job Changes

Ryan Batz is moving to East Hampton G.C. on Long
Island.

Gene Huelster is going to White Beeches in Bergen
County, NJ.

Adam Herman will be taking over at Pocono Farms
C.C.

Chris Butler (Center Valley Club) is taking over at
Woodstone C.C.

Darrin Batisky is taking charge at Chartiers in Pitts-
burg.

Welcome New Members

Chris Collins, Advanced Agro Tech., Inc., AF
Kenneth Givens, Eagle Rock Golf & Ski Resort, A
Tom Height, Fox Hill C.C., S

Ian Larson, Great Bear Golf & C.C., C

Jeremy Reph, Whitetail Golf Club, B

Michael P. Samulski, Blacklick Woods G.C., NR

John Shema, Eagle Rock Golf & Ski Resort, C



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