

## MAGCS DIRECTORS COLUMN

### Late Fall and Dormant Nitrogen Fertilization

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The timing and rate of various nitrogen fertilizer sources is important to the health and survival of turfgrass plants. Nitrogen fertility stimulates turfgrass growth which is essential for recovery from mechanical damage caused by golfers and equipment. The growth stimulation should be slow and consistent throughout the growing season. Slow release nitrogen forms have enabled the superintendent to supply turfgrass with a "metered" amount of nutrients.

Through our past experiences we realize during summer months our rate of nitrogen fertility should be low to non-existent. High temperatures cause increases in foliar production, and higher nitrogen rates during this time will cause excessive topgrowth at the expense of root growth. The carbon budget within the plant is a function of rates of photosynthesis, respiration and growth. Golf course superintendents have a major input in the control of the carbon budget or "carbohydrate content" of turfgrass. After 100 days and nights of summer temperatures (80° to 100°F daytime and 60° to 80°F nighttime) most turfgrass is exhausted after surviving the stress. Plants with a higher carbohydrate reserve will better withstand higher temperatures and disease stress enabling them to produce more regrowth, i.e.: tillers, stolons, and rhizomes. When cooler day and night temperatures return in September (70° days and 50°F night), plants will begin to recover from summer stress. During this period, a total analysis fertilizer should be applied to help stimulate regrowth of these vegetative parts without a large increase in vertical leaf growth.

With the advent of shorter days and cooler temperatures in late October and early November cool season turfgrass has concluded most vegetative development. Vertical leaf growth has virtually ceased by November 1st with the last mowing usually during this time, but physiologically, the turfgrass plant is still very active. Photosynthesis, respiration and root growth continue until the soil temperature drops to 32°F. Late fall nitrogen fertilization should occur during this two week period when soil temperatures nears 40°F, usually between the last mowing and soil surface freeze. The nitrogen supplied should be a readily available source such as urea or ammonium nitrate. Plant uptake occurs after vertical shoot growth ceases yet early enough that nitrogen can be absorbed by roots. The rate must be in the range of 0.75 to 1.25 lbs. N/1000 sq. ft. depending on the type of turfgrass. Bentgrass and poa annua should receive the lower rate and bluegrass, ryegrass, and fescue the higher rate. Some of the advantages of late fall nitrogen fertilization are:

- allows photosynthesis to continue increasing carbohydrate levels and enhancing root growth until the soil freezes.
- provides a dark green color throughout the fall.
- increases turfgrass density in fall and spring with no substantial increase in top growth.
- provides earlier spring greenup.
- will have no effect on cool weather disease incidences.
- will not lower cold tolerance (in studies in Minnesota it was found to slightly increase cold tolerance).

I have made this application to greens, tees and fairways the past 6 years and obtained good results in every case. The

nitrogen is normally applied the first week in November and watered in before draining the irrigation system.

Dormant applications of nitrogen have also been tried in recent years. This application is made after the turfgrass has ceased all growth usually in late November or early December when the soil is frozen. A slow release form of nitrogen is recommended, i.e.: I.B.D.U. or S.C.U. so that the nitrogen is not lost through leaching or volatilization. Nutrients will remain in the soil or thatch layer until the plant breaks dormancy the following spring. The nitrogen must be in a water soluble form that is slowly available for plant absorption directly after the soil thaws out in March. Enhancement of color, density and root growth will occur throughout the spring without the problem of entering the golf course with heavy spreading equipment. Nitrogen sources such as urea formaldehyde, methylene urea, milorganite, etc. don't usually provide a desirable dormant feeding because of their dependence on warmer soil temperatures and subsequent microbial breakdown of the nutrient.

The application rate of dormant nitrogen is dependent on turf type and desired results. The past two winters I have experimented with coarse I.B.D.U. (31-0-0) at 1.5 lbs. N/1000 sq. ft. on bluegrass fairways applied December 15. The following spring the fairways were at least two and possibly three weeks ahead of the non-dormant fertilized fairways in respect to color, density and quality.

The past winter of 83-84 I applied approximately 1 lb. of S.C.U./1000 sq. ft. and again achieved excellent results. The turfgrass was green and dense at the time of soil thawing and remained green through May. There was very little top growth during this period, and our spring nitrogen application was not made until early June. We observed no increase in snow molds, or Helminthosporium leaf spot, no winter kill, burning, or desiccation with any of the fall or winter nitrogen applications.

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Dear Fred:

How I enjoyed the September 1984 issue! Each contributor furnished solid "meat" for intellectual and professional nourishment.

The President's Message was like a drink of cold spring water on a hot day. A roving turfgrass specialist is needed by every research worker. My thoughts drifted back 50 years when several Philadelphia "greenkeepers" convinced Penn State's administration that Bert Musser research and the golf clubs, needed a roving specialist. That launched the research/extension team of Musser/Grau, the first of its kind in the U.S.

How rewarding to see this happening in Illinois where previous efforts floundered. With a powerful force like the CDGA behind the move it will succeed!

Warren Bidwell must use the word "retirement" with tongue in cheek. He was one of the founders of the Musser Foundation and has been a Director ever since 1968. He is today one of the most respected roving ambassadors of good will for the turfgrass industry. Every word in his "Retirement" piece was fascinating. What a traveler! and a writer!

Thank you for sending **The Bull Sheet** to me. All the best to all in your association.

**Fred V. Grau**