Well Fed And Put To Bed

By Jim Skorulski, agronomist, Northeast Region

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A few very cold nights and leafless trees are about the only indications that we are in mid-November. The temperature patterns and fairly dry conditions have been ideal for plants acclimating to winter. Winter preparations should be underway at most golf courses, especially those in northern parts of the region. Facilities that use winter covers are beginning to pull the tarps out of storage and stage insulating materials near greens, all while keeping an eye on the long-range weather forecast. The window to make final fungicide applications and install cover systems is often short and tricky, so it is important to be ready to move quickly when the time is right.

Winter preparations are also underway in other parts of the region. Hopefully, maintenance practices have been shifted to promote vigorous turf growth for

Cold nights, thick frosts and dry conditions are ideal for turfgrass that is hardening off for winter.

maximum carbohydrate accumulation. The sugars produced now will be utilized by plants to maintain low levels of respiration during dormancy and protect cells from ice crystal formation. Accumulating carbohydrates is a primary function for turfgrass plants during fall as they harden off for winter.

I recently had an opportunity to speak with Katie Dodson, research scientist at the Prairie Turfgrass Research Center (PTRC) in Alberta, regarding a fall fertilizer study underway there. The study focuses on the impacts and interactions of nitrogen (N) and potassium (K) fertilizers during the hardening off process. The objective of the study is to determine the effects of N and K application rates and interactions on the cold-temperature hardiness of annual bluegrass. The work also examines the relationship between cold hardiness and N and K status in the soil and plant tissue. Data have been collected on 16 different N and K fertilizer rate combinations over the past two years. The plots were fertilized before the trial began to achieve basic soil nutrient sufficiency levels. Granular ammonium sulfate and sulfate of potash were then applied at rates of 0, 0.25, 0.5 and 1.0 pound per 1,000 square feet in various combinations. Application dates were Aug.15, Sept. 1, Sept. 15 and Oct. 1. Plants were collected and checked for cold temperature hardiness in late November. So far, the research has provided several results, including:

1. There is an interaction between N and K treatments. Plant uptake depends on both nutrients being present and available. Turf that didn't receive either N or K had lower cold-temperature tolerance than turf that received both N and K. Plants require both nutrients to obtain maximum cold-temperature hardiness.

2. Turf that received no N and the highest levels of K had a lower tolerance to cold temperature. This suggests that there may be an upper limit to K applications during the fall.

3. N application rates affected moisture content in crown tissue. Not surprisingly, higher N rates led to higher moisture content in plant tissues. K rates had no significant effect on tissue moisture content in this study.

4. Optimal cold-temperature hardiness for annual bluegrass at a temperature of 5 degrees Fahrenheit was obtained when N was applied in four applications at 0.25 pound per 1,000 square feet and K was applied in four applications at 0.25-0.5 pound per 1,000 square feet.

The work to date helps confirm the importance of maintaining sufficiency levels of K in the soil. Late summer and fall fertility programs that provide N and K in equal parts or in a 1:2 ratio of N:K should provide adequate levels of available K for annual bluegrass to effectively harden off. Of course, successful winter acclimation is based on temperature and moisture conditions as well. Future research goals at PTRC are to perform these studies with soluble fertilizers and further refine K application rates for optimum cold-temperature tolerance. Dodson also hopes to monitor nutrient levels, hydration and carbohydrate levels in plant tissues during acclimation and deacclimation phases. The final report on the fertility research should be available in the coming months.

The golf season is not over by any means, but reduced golfer traffic, shorter days and the coming holiday season should finally slow the pace. It was a challenging and busy summer, so hopefully this time can be utilized to catch your breath, become reacquainted with your family, appreciate all you have worked so hard for and finally relax. We hope to see you at one of the following conferences in the coming weeks:

Virginia GCSA, Dec. 5-6, Woodlands Conference Center, Colonial Williamsburg, Va.

New Jersey Green Expo Dec. 6-8, Borgata Hotel, Atlantic City, N.J.

New Hampshire GCSA Education Day, Dec. 8, Holiday Inn, Concord, N.H.

Northeast Region Agronomists:

David A. Oatis, regional director – doatis@usga.org

Adam Moeller, director, Green Section Education – amoeller@usga.org

James E. Skorulski, agronomist – jskorulski@usga.org

Elliott Dowling, agronomist – edowling@usga.org

Addison Barden, agronomist – abarden@usga.org

Paul Jacobs, agronomist – pjacobs@usga.org

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Contact the Green Section Staff