# ‘Leveling’ With You About Nitrogen Use

BY KARL DANNEBERGER

Maintaining proper nitrogen fertility levels is the cornerstone to turfgrass health. The soils present on most golf courses are generally buffered, allowing for relatively considerable leeway with nitrogen applications. The exception is the high sand content soils or rootzone mixes, specifically on tees and greens. In these relatively low-buffered systems, designing a program that maintains the necessary nitrogen to the plant and the system is critical and often the most difficult to accomplish.

I’ve never been an advocate of using nutrients, specifically nitrogen, in an extreme manner to manipulate a turf system — for example, using nitrogen at ultra-low rates to discourage annual bluegrass invasion or enhance green speed. The goal of a nitrogen fertility program as an essential and macronutrient is to maintain an adequate level in the system that promotes the desired growth and plant health of the turf. Given that statement: What is the desired nitrogen level, and what benefits can you expect to see?

I need to add a qualifying statement before proceeding to address these questions. Factors like soil type, length of growing season, climatic conditions, irrigation source, amount of play, expectation of green’s quality and green speed are just a few of the factors involved in developing a fertility program. Also, I’m going to restrict my conversation to creeping bentgrass/annual bluegrass. Now let’s pull some recent work together to help develop a nitrogen program.

Researchers at the University of California-Riverside (Green, et.al, 2008) found in Southern California that 3 pounds of nitrogen (N) per 1,000 square feet per year was inadequate for maintaining turf quality and recovery on creeping bentgrass/annual bluegrass greens, while 6 lbs./1,000 sq. ft./yr. was found to be optimum. These rates accounted for the effluent irrigation water and were applied as a liquid on a three-week interval.

Other researchers have found that annual nitrogen rates of about 3 lbs./1,000 sq.ft./yr on predominantly annual bluegrass fairways in northwestern Ohio/southern Michigan had less foliar anthracnose than the 6 lbs./1,000 sq.ft./yr. regardless of carrier type (Danneberger et al., 1984). Accounting for the difference in climate conditions, these two studies, as examples, substantiate those optimum ranges for turfgrasses found in turfgrass text books. Those ranges reported are an excellent place to start to build your fertility programs.

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Building on the annual rates, the timing and frequency of nitrogen applications can influence plant health. Researchers at Rutgers University reported that nitrogen had the greatest influence on the severity of anthracnose (Inguagiato, et al., 2008). The greatest reduction of anthracnose occurred when soluble N was applied 0.10 lbs./1,000 sq.ft. on a seven-day schedule from late spring through summer compared to a 28-day schedule.

Regarding fall applications, a previous study found that nitrogen programs containing a late-season application had less anthracnose than a program where late-season fertilization was excluded (Danneberger, 1984). Although the explanation is rather brief and uses anthracnose as the primary benchmark for plant health, the take-home message is that application rate and timing influence plant health.

Finally, as you develop a nitrogen program for the coming year, stay balanced and use all the tools (carrier, application technology, etc.) available to you. Remember that as you manage turf on the edge, you do not want to fall off by drifting to the extremes.

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