The Nuances of Nitrogen Programs

BY KARL DANNEBERGER

Nitrogen, a critical component in turfgrass growth and health, is the most frequent and important nutrient applied to turf. It is also rather controversial regarding the rate, method and carrier used.

Historically, nitrogen rates have fluctuated across the spectrum from too much to too little. Appropriate nitrogen input is difficult to gauge because turfgrass managers don't measure success by yield.

Nitrogen is either applied as a liquid or granular formulation. Both methods are used quite successfully in golf course fertility programs. For putting green fertilization, liquid applications are popular.

Broad use of liquid nitrogen was instituted in the 1970s by the lawn care industry. Nitrogen in the soluble form could be dissolved into a spray tank requiring no agitation and applied from the lawn care truck. Besides the advantage of not requiring tank agitation, handling fertilizer bags was eliminated, and the cost of using a soluble nitrogen source was relatively cheap. From an agronomic perspective, a soluble nitrogen response (growth and green color) was observed within days, which satisfied the customer.

Disadvantages of soluble nitrogen included 1) a short lifespan, often not lasting the duration period between applications; 2) the use of higher rates resulted in a growth surge; and 3) the potential for fertilizer burn increased with higher given rate and the soluble nitrogen forms.

In the late 1970s and 1980s, liquid applications became controversial — in some cases — based on misleading information. It was not uncommon to hear or read that continual liquid nitrogen application would lead to root system "atrophy" because of a lack of "nutrient exercise" by the root system.

Unfortunately, this reasoning ignored two basic facts. The first was nitrogen is mobile in the plant — upon entry it freely moves through the plant. The second was the misconception that liquid meant foliar uptake, which was not the case. Liquid nitrogen applications can be root absorbed. Interestingly, I now come across almost the same logic for granular applications — the root system is incapable of taking up and transporting nitrogen under stress, and granules can't be foliar absorbed.

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In golf, primarily greens management, the liquid evolved into low rates of nitrogen (minimize/eliminate growth surge and burn potential) applied frequently. The term spoon feeding is used to describe this process. The essence of spoon feeding is just-in-time fertilization. It is an intensive practice, often requiring weekly applications due to the rate, soluble source and difficulty or risk in judging if enough nitrogen is being applied for desired turf health.

Given these concerns, the practice is extremely successful and efficient for greens under summer stress conditions. Although spoon feeding is associated primarily with liquid application, I believe the term is becoming independent of the application method because of new granular technology coming to the market.

Foliar feeding is a popular term for liquid spoon feeding. By definition, however, foliar fertilization is the uptake of nutrients by the foliage or leaf. An advantage to strict foliar absorption is it provides nutrients to the plant when the root system is incapable because of unfavorable soil or environmental conditions. Foliar fertilization, however, is not an efficient process.

Fertilization terminology can be confusing. What a term means to one might not mean the same to another. My suggestion is to focus on rate, frequency of application and carrier/product for developing your fertilizer program.

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