



CHECK

A phosphorus deficiency often shows up as purple areas that resemble wilt. While this is more common on high-sand-content root zones, soil testing is the key to accurate diagnosis.

A Practical Approach to Putting Green Fertilization

Have you ever felt a little confused about how to fertilize putting greens?

by R. A. (BOB) BRAME

PUTTING GREEN fertilization is high on the list of potential agronomic pitfalls in golf course maintenance. There are many different types of fertilizers available and just as many thoughts on how best to use them. This situation makes it easy to understand how the subject can be confusing. To simplify the process, consider the fol-

lowing three-point approach to bentgrass/*Poa annua* putting green fertilization. The focus is on maintenance fertilization, not grow-in, and the target area is the central and northern part of the country.

Before a putting green can be properly fertilized, soil testing must be done. Regular, yearly testing has the greatest

value in monitoring soil chemistry. Testing every second or third year, and/or collecting samples from different areas each time, reduces the value of information collected. Samples should be submitted from each green on the course, or representative sampling may be appropriate. If all the greens are constructed the same, rep-

representative sampling should work well, while helping to hold down costs. Identify the best, worst, and one average green. Collect the samples at the same time each year and stay with the same laboratory. This process eliminates a few variables that can compromise the value of the data. Consistent soil testing will produce a database of information that can expose trends and/or potential problems that may be present. Soil tests make it possible to focus on needed nutrients and the proper ratio for applying them.

With soil tests in hand, the first step in a solid putting green fertilization program is pushing green plant growth in the fall. This should be initiated in late summer/early fall, when nighttime air temperatures moderate and soil temperatures decrease. The actual date will vary, but when growth accelerates from cooler nights, it's time to go to work. To achieve maximum push of plant growth, select fertilizers that contain readily available nutrients. Avoid slow-release fertilizers during the important late summer/early fall window. The first application should be made at or slightly below one-half pound of nitrogen per thousand square feet. Split the rate in half and apply in two directions, perpendicular to each other.

This should be lightly watered-in immediately after application.

Often, this application will coincide with early fall aerification. Aerification provides the space for root growth, and fertilization adds the food to make it happen. If the nutrients in the fertilizer are readily available to the plant, growth response will be conspicuous. Closely monitor clipping production and when it levels (or begins to drop) for two days in a row, make another application at the same rate. Using readily available nutrients, it is possible to allow the growth response from an application to dictate when the next feeding is needed.

As the fall season progresses and soil temperatures continue dropping (plant nutrient uptake slows), the time between fertilizer applications will increase. If there are different CEC (Cation Exchange Capacity) levels in various greens, monitoring growth response (on each green) will aid in determining application frequency. Lower CEC levels will require more frequent applications. Keep in mind, also, that the same package and analysis of nutrients may not be appropriate for all greens. Sometimes all the greens on a course can be fed the same; however, often this is not

possible. Regular soil testing and the use of readily available nutrients in the early fall are the keys to determining nutrient needs and application frequency.

Step Two is the application of a slow-release fertilizer in late fall/early winter, when top growth has nearly stopped. Natural organic fertilizers can work well as a late fall/early winter feeding, even though theory may suggest that other forms ought to work better. After the last mowing for the season (or what may be the last mowing for the season), a natural organic fertilizer can be applied at a high rate. Depending upon the actual product being used, a rate of between one and two pounds of nitrogen per thousand square feet should work well. Avoid mowing for a few days following the application. Recognizing there are differences in the natural organic fertilizers on the market, there would be value in establishing a few test plots to determine which works best for you. A synthetic slow-release fertilizer, at a lighter rate, could be an alternative to the use of natural organic materials.

The heavy feeding, in late fall/early winter, will trickle feed the turf through the winter (depending upon soil temperatures/microbial activity) and on



The presence of moss often indicates, as the Scottish say, "poverty in the soil." Surface moisture and low mowing heights can combine with hungry turf to enhance moss encroachment. The long-term control of moss will involve carefully reviewing soil tests to identify any deficiency and/or increasing overall fertilization.

into the spring season. The combination of pushing growth through the fall, with readily available nutrients, and closing out the season with a heavy application of a natural organic fertilizer, will help reduce (if not eliminate) the need for springtime applications of granular fertilizers. Excessive nitrogen fertilization in spring can result in the production of lush top growth at the expense of root development. Should mid-spring fertilization be needed (possibly with lower CEC levels, i.e., high-sand-content root zones), select slow-release fertilizers. Keeping spring fertilization to a minimum and focusing on fall and early winter feeding places the emphasis on root growth, while reducing the chances of lush top growth.

The third and final step is the use of soluble (readily available) fertilizers, applied through a spray tank, from mid-spring through the summer months. As soil temperatures increase, a grass plant (cool season) will not pull nutrients efficiently from the soil. Instead, to survive, it will use carbohydrates stored in the root system. This is one reason why roots normally shorten as the summer season pro-

gresses. Foliar feeding of the turf will help reduce root shortening. Soluble fertilizers, sprayed on the grass plant, are predominately absorbed through the foliage. This eliminates the need to depend upon roots to take up nutrients. The results, as the summer season progresses, are more stress-tolerant plants and deeper roots.

Select a soluble fertilizer containing N, P, and K. Soil test results can be a guide for the ratio of N, P, and K to use. However, even if soil tests show adequate levels of P and/or K, each should be present in the soluble fertilizer used. Often, field experience has shown a 1-1-1 ratio to work well. A little experimentation may be necessary to decide the best ratio of N, P, and K for your program. In most cases, minor nutrient applications should be done in the fall, via granular materials, as soil tests dictate. The exception could be an occasional application of soluble magnesium, especially on greens containing a high percentage of *Poa annua*, or iron for color.

Initially, target applications of soluble fertilizers at a rate of .10 pound of nitrogen per thousand square feet every seven to ten days. Well-maintained

and properly calibrated spray equipment is very important. If a growth surge occurs, reduce the rate. The intent is not to push growth, but to maintain plant development from previous fall and spring (if necessary) feedings. When applied at light rates, soluble fertilizers are safe even when it is hot. If there is apprehension during abnormally high temperatures, slightly lower the rate.

Commonly, soluble fertilizers can be tank-mixed with fungicide applications. To do this, first check the fungicide label(s) for compatibility. Even if it is necessary to apply a soluble fertilizer by itself, the benefits more than justify the cost. The key to achieving full value from spoon feeding with soluble fertilizers is consistency with the light and frequent applications.

We have all heard it said, "You are what you eat." In a like manner, the grass plant is what it is fed. Fertilization is a foundational component in the maintenance of healthy putting green turf. A healthy plant is more stress tolerant, providing a greater margin of safety when times get tough. Healthy turf also means more dependable playing surfaces.

This three-point approach . . .

(1) push growth in the fall with readily available nutrients

(2) close the season with a high rate application of a slow-release fertilizer

(3) light and frequent applications of soluble fertilizers from mid-spring through the summer

. . . will provide continuity from year to year while still permitting flexibility in managing traffic volume, weather conditions, and different soils.

Thin, hungry turf opens the door for Poa annua and other weeds to invade. Weak turf is also more vulnerable to stress factors of all types. Good playability is directly tied to good fertilization.



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