Questions From The Floor

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Q: I'm getting underway at a new golf course and I need to establish a lot of baseline information. What method(s) would you recommend for determining the area of irregular shapes like golf greens?—FOND DU LAC COUNTY

A: You could go hi-tech with aerial photographs, geographic positioning, etc., but I prefer a long-standing technique that can be used in-house with nothing more than a piece of plywood and a tape measure. Start with a good tape. Nylon tapes stretch and become inaccurate over time. For under $100 you can get a 100-foot plastic-coated steel tape. I prefer one marked in feet and tenths of an inch rather than feet and inches it's easier to work with.

Start by drilling a small hole in the center of about a 3 ft x 3 ft piece of plywood. Using a protractor, carefully draw lines out from the hole every 10 degrees. You should end up with 36 lines. Place the plywood in the approximate center of the green and secure it in place with a large spike pushed through the hole in the middle, leaving enough of the spike extending out so that the end of the tape can be placed over the spike. It is at this point that some forethought can be very helpful in the future. As we all know, golf greens have a nasty habit of shrinking over time. If you place the plywood in a position to which you can accurately return to some years later and you keep a record of that position and all your measurements, you can accurately determine the original boundaries of the greens. To locate a point to which you can return at a later date, I suggest use of irrigation heads as reference points. Pick out two heads on approximately opposite sides of the green. Run the tape between them and record the distance between them. Center the plywood over the mid-point between the sprinkler heads. Clearly, there is information here that needs to go into a permanent record. Which irrigation heads? The distance between them?

The next step is for two people to measure the 36 distances from the spike to the edge of the green. It takes two because one must properly position the tape along each line drawn on the plywood. Once all the numbers are recorded, the area of the green is calculated. Sum all of the distances and divide by 36 to get the average radius of the green. The area = (average radius)^2(3.14). In other words, multiply the average radius by itself and that number by 3.14. The answer is the area in square feet.

Q: It appears the green committee at our club is going to insist that I begin rolling greens-keeping up with the Jones and all that. I'm worried about compaction; has experience with this procedure shown that I have nothing to worry about?—MILWAUKEE COUNTY

A: There is no pat answer to this question. It depends on the type of root zone mix, how wet you keep the greens, what you're mowing with, and so on. The real issue seems to be what the committee understands to be the virtues of rolling and how often they expect you to roll the greens. Rolling will increase green speed by 8 inches or so for 2 to 4 hours, depending on the status of the turf and weather. The problem one encounters with rolling is generally not that of compaction per se, but wear and tear on the turfgrass. Research has shown that thinning may occur if you roll more than 3 times a week. With this thinning comes algae and all sorts of ancillary problems. Thus, if you must roll, have the committee decide what the key times are (e.g., men's day, weekends) and only roll at those times.

Is rolling here to stay? I've talked with some superintendents in those parts of the country where rolling first became the thing to do. What I've heard is that more and more rollers are being relegated to the rear of the storage building.

Q: The pH of our greens, tees and fairways seems to be rising a little over the years. Two questions:

A. How much error is there in pH meter readings from year to year?

B. Could irrigation water from an adjacent lake—the source of our water—possibly be adding enough $CaCO_3/MgCO_3$ to increase soil pH?—GRANT COUNTY

A: If you're seeing a long-term trend in rising pH, the reason is not likely to be the readings themselves. Soil pH is affected by the amount of soluble salts present. The more soluble salt, the lower the pH reading. Thus, if you took your soil samples within a week or so after fertilization one year and 3 to 4 weeks after fertilization the next year, chances are the pH readings would be somewhat higher the second year. This does not, however, account for a long- term trend in rising pH.

The pH of Wisconsin lakes ranges from about 4.5 for northern bog lakes to 8.5 for so-called marl lakes that occur in regions with limestone bedrock. Have the pH of your lake water checked. If it's above 7.0, this is the most likely reason why your soil pH is gradually rising.

Q: My USGA greens are now 3 years old and isolated dry spots are epidemic. We buy wetting agent by the 55-gallon drum, literally. Will this condition ever improve or go away? I can't take it much longer. Any advice? —DODGE COUNTY

A: Welcome to the world of sand-based putting greens! I'm being a bit facetious in making this statement, but have you ever seen localized dry spot in a 3-year old push up green? I haven't. Localized dry spot is a widespread problem that perplexes researchers as well as superintendents. The problem seems to arise when humic acids coat sand grains, causing them to become hydrophobic—that is, they resist wetting. Exactly why sand-based greens are so prone to development of this condition is not known. I can tell you from our own experience that there is a definite relationship between the moisture retention capacity of the root zone mix and its tendency to develop localized dry spot. We're seeing the problem whenever the mix retains less than about 13% water at 40-cm tension. Where we've used organic amendments that result in the root zone mix retaining more than about 13% moisture, these greens are free from localized dry spot after 4 years.

I have some unconfirmed suspicions about what favors localized dry spot. One, as I've already alluded to, is the use of root zone mixes that do not retain adequate amounts of water. This can be easily remedied, but probably not by staying within current USGA specs. As we've done, you can improve moisture retention by using peats that contain less than the 85% organic matter called for by the USGA. Another approach is to increase the peat content of the root zone mix above that recommended

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based on root zone mix percolation rates. While some may see this as a heretic statement, I must ask "Why in the world do we in the upper Midwest need perc rates of 6 to 12 inches per hour?" Another suspicion I harbor is that straight sand topdressing is a quick route to localized dry spot. With straight sand topdressing, you lose moisture retention at the putting green surface and, if I'm correct, create the condition necessary for development of the problem. The third and final suspicion I have is that irrigation practices are to blame as well. Deliberately keeping greens "on the dry side" or drying down the greens for tournament purposes is an invitation to localized dry spot.

Will the judicious use of wetting agents ever eliminate localized dry spot? Not in my experience or judgment. I've tried a few of the products where I've been able to observe the effects on greens with and without the problem. The wetting agents lessen localized dry spot, but green quality is not as good as where localized dry spot does not exist. It takes continual use of the wetting agents just to improve the situation. I view localized dry spot in the same vein as *Poa;* once you have it, the problem can never be entirely eliminated with current technologies.

Q: I'm involved in building a new golf course and we are considering native soil greens, based on success of native soil greens all over Wisconsin and the cost of USGA spec greens. Am I (we) crazy or is there merit in this consideration? — COLUMBIA COUNTY

A: As long as you're not anticipating something in the realm of 30,000 rounds plus of golf per year and have access to a sandy loam or loamy sand soil with at least 70% sand, I say "Go for it!" There is a caveat to this statement, however. I still recommend construction that includes tile drainage in a bed of pea gravel. We don't want to recreate some of the bath tubs of earlier years. You will have to give careful thought to future cultural practices, particularly core cultivation and topdressing. I'd try to make sure of long-term access to the native soil and use it for topdressing. If this is not an option and you need or wish to go with straight sand, then I recommend a rather intensive core aeration program for a few years to minimize creation of a distinct soil-sand interface.

Q: I'm a devoted user of Milorganite. My enthusiasm is based on years of success. A salesman from another company suggested I'm flirting with trouble in the form of micronutrient toxicity. Does he have a valid point? — IOWA COUNTY

A: Let's examine the facts. There are four micronutrients of concern: boron, copper, manganese, and zinc. The contents of these in Milorganite are approximately 0.0014% B, 0.019% Cu, 0.0062% Mn, and 0.033% Zn. By comparison, turf fertilizers with micronutrients added typically contain 3 to 15 times higher concentrations of these nutrients. Factoring into our thinking the N content of Milorganite vs. other higher analysis fertilizers leads to the conclusion that exclusive use of Milorganite will, at most on an annual basis, supply less micronutrients than a single application of a typical micronutrient-enriched turf fertilizer. Does it say somewhere on the labels of these fertilizers that repetitive use can lead to micronutrient toxicities? Of course not. In this light, the claim made by the salesman is pure bunkum.

Q: Like more and more golf course superintendents, I'm seeing algae on a few of my greens. Any advice? — LACROSSE COUNTY

A: Algae are photosynthetic plants. Their basic growth requirements are light, water, nutrients and a favorable soil pH. On putting greens, nutrition is not a growth-limiting factor. The extensive use of calcareous sands for greens construction ensures an optimum pH for algae. Light and water can be limiting. Low mowing heights allow more light penetration to the soil surface and favor algae. The same can be said for continuously moist soil surfaces. Combining low mowing with soil surfaces that do not dry on a daily basis adds up to algae invasion. Culturally then, these are the two points of attack. Increase mowing heights and turf density to reduce light at the soil surface and take whatever measures are necessary to dry the soil surface on a nearly daily basis. Tree pruning and removal have to be considered, as does the abandonment of rolling. Frequent, light spiking to maintain a loose soil surface favors drying. Sound like impossibilities? In many cases they are, and we're faced with chemical control. But there is no single type of algae that populate putting greens and one chemical does not work for all types. You'll have to do some experimentation. I'd start with chlorothalonil and get the dual action of disease control. If this doesn't seem to work, the next choice would be quaternary amines. There seems to be general agreement among all who have and continue to fight the algae battle that regardless of what approach you take, reestablishment of a dense turf cover is vital.