

FEATURE II

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Economical Agronomical Thinking – Part 3 *Site Specific Fertility*



Q) What has the farming community been doing for 20 years that we in golf are just now beginning to understand?

A) Variable rate fertility.

So, what is variable rate fertility?

At its point of origin, variable rate fertility was and still is a process that farmers use in order to apply only the amount of nutrient needed to each spot in their fields. Sounds complicated but it's really not. While we in golf have only been using Global Positioning System (GPS) for a few years, the "ag" community has been using it for a long time to track yield data, soil type information, and so forth. The process begins with farmers taking soil samples in a grid pattern across their fields. They vary, but 2.5 or 5 acre grids are common. On the computer, each grid is assigned a recommend rate of application of phosphorus, potash, or lime. The prescription is loaded into a spreader which then drives across the field applying the fertilizer. As the spreader moves, flow gates are opened and closed and/or belts are slowed or sped up to increase or decrease the amount of fertilizer being applied. This entire process is controlled by GPS controllers on the spreader and the prescription loaded into the spreader from the computer.

The benefits are many. First of all, by applying what is needed, where it's needed, there is little to no waste. With 20,000 acre farms becoming the norm it is easy to see how dramatic the savings can be. Secondly, by applying only what is needed, less fertilizer (and money) is free to leach into streams and ponds. This is stewardship at its best! The other benefit is that all areas of the farm's production are optimized so that maximum yields are achieved. True, we don't harvest our courses and yield is not our objective, but the same principles apply. Our goal, no different from theirs, is to optimize the performance of every part of our course.

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So, are you ready to retrofit your spreading equipment to do the same on your course? Do you want to set up 5 acre grids and send out the floater? No takers huh? So how can we learn from our cousins on the farm and apply variable rate fertility on our courses?

Let's begin by renaming it site-specific fertility. Site-specific meaning that any site we can fertilize differently is worth sampling separately. For instance, the norm in our industry is to take a few random fairway samples and apply the data to the entire course. The fact is that there are many unique soil types and chemistries across our courses that are being mismanaged. Take, for instance, a par 5 fairway that crosses a creek, moves past the pond, up a 150 yard hill to a perched green. Not so hard to imagine is it?

Typically, the soil near the creek where it regularly floods will have a unique chemistry due to such things as silt or road salts that may be flushed in. It is also common to see varying chemistries during creek projects, where cleaning and widening often deposits silts from the bottom onto the surface prior to re-grassing. Second, the area around a pond is often affected by the subsurface material that was moved during the pond construction or often from the shoreline work or periodic dredging. Third, the rise in elevation on the approach to the green often has less topsoil and more clay left during construction. It is easy to see that the chemistry in each location can,

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and often is, affected by these construction and geographic changes.

From an application standpoint, applying the same fertilizer to this entire fairway either under-addresses the needs of one area or over-fertilizes another. Either way, money is wasted and the desired results are not achieved. This explains why so many applications do not provide the same visual or growth response across the course.

While you may not have many creeks or ponds and your course may not have great elevation changes, most courses will have a wide degree of change from hole to hole and from front to back nines so the same philosophy applies. If the 4th hole is very low on phosphorus but the 5th is not; if the 6th has high potash levels but the 7th does not; then applying a single maintenance product to the entire course will overfeed some areas and underfeed others. And, unlike many things, time will not correct this; it will only make it worse. Therein, prudent superintendents are beginning to employ both corrective and maintenance programs. One is intended to correct soil nutritional shortcomings and the other is intended to maintain turf health.

Now, before you say this is too much of a pain; before you say it's not worth it, check out a couple of examples. Club One is a large, private facility with about 70 acres of bentgrass fairways. Over a 4 or 5 year period they have employed a program that addressed the unique phosphorus and potash needs of each fairway in a fall **corrective program**. Lime is also addressed in this fashion. Throughout the growing season nitrogen is the only nutrient that is applied and no custom applications are necessary. Including dormant fertilizer and corrective potash, this club spent \$7,200 in 2008. Compare this to five years ago when fertilizers cost much less and the same club was doing a spring and fall custom app at about \$10,000 each and a summer treatment for about \$7,000. This club's fairways have never been better, and their savings allow for more intensive programs on greens or elsewhere.

Course Two is a high end, daily fee club, which typically does three custom apps per year. They are now down to one custom/corrective application. The rest is addressed with sprayable urea and ammonium sulfate. The cost per acre in 2008 was half of what it was just three seasons ago when fertilizers cost half as much.

The take home is simple: Divide your fertility program into two categories, correction and maintenance. Apply corrective nutrition as needed, where needed, and make sure that your maintenance program is synergistic with your correction program and not competitive with it. The long term, year-after-year savings are well worth the site-specific efforts that are required for a few short years. **-OC**

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