

CHALKBOARD

TIPS FROM THE PROS

BALANCE MICRONUTRIENTS FOR SOIL FERTILITY

By Mark Altman

The quality of turf directly reflects the fertility of the soil in which it grows. Even a perfectly maintained golf course or athletic field will have mediocre turf if proper soil fertility is ignored. Correct amounts of micronutrients are integral to superior soil fertility, yet so often they are forgotten. Let's take a look at three of the basic keys to understanding micronutrients, and use them to open the door to high-quality turf.

Proper Sampling: An accurate soil analysis is the first, vital step toward understanding what the soil does and does not need. An accurate soil analysis should include major and minor nutrients, because you need both groups to make intelligent fertility decisions. Base saturation and NPK alone are not enough.

The amount of soil samples and their depths depend largely on the particular area you're sampling. On golf fairways and greens, for example, I like to take at least 15 samples to a depth of six inches. However, 15 samples would be a bit much for a tee, because you're not working on a very big area. On football fields, I like to take at least 25 to 30 samples. On baseball fields, I sample the infield and outfield separately, because of their respective high- and normal-use characteristics.

Create A Balanced Fertility Program: Once you have the results of your soil analysis in hand (and tissue analysis from a random sample of grass plants is not a bad idea for fine-tuning), you can begin to create a balanced fertility program.

First, take a look at NPK and base saturation of calcium and magnesium. Optimum ratios between these two nutrients will differ with factors such as clay and sandy soils and grass type, but until they are correct there is no need to worry about micronutrient fertility. You need to address the major nutrients first before you move into micronutrients such as boron, iron, manganese, copper, and zinc. These are measured in parts per million (ppm).

When attempting to balance micronutrients in the soil, it's helpful to have a basic

knowledge of what they do, as well as the causes of their deficiencies. Let's start with two that I rarely see problems with: copper and boron.

Copper is an enzyme activator. It functions in the respiration of the grass plant and inhibits frost. High pH, excessive zinc and phosphate levels, and compacted wet soil create copper deficiencies. The main function of boron is seed set, but it also has other functions in plants such as protein synthesis. It affects nitrogen and carbohydrate metabolism, as well as the water relationship within the plant. High pH, extremely leachable soils, and low organic soils create boron deficiencies.

Now let's talk about iron, manganese, and zinc, which superintendents must deal with on a daily basis. Deficiencies of these three micronutrients are common.

Iron, a chlorophyll activator, is essential for chlorophyll production. It has a pronounced effect on shoot and root growth. High pH soils, excessive levels of phosphate, manganese, and zinc, and compacted soils can all cause iron deficiencies.

Manganese aids in the plant's breakdown of carbohydrates, is active in metabolic chlorophyll products, and increases the availability of calcium, magnesium, and potassium. High pH soil and iron levels, as well as compaction in wet or dry soils, contributes to deficiencies of manganese.

Zinc plays a very small role in chlorophyll production. It also helps regulate sugar consumption, is essential for the transformation of carbohydrates, and affects plant respiration. High pH and phosphate in soils and low organic matter can create zinc deficiencies.

By now, you've probably recognized a common denominator in micronutrient deficiencies: High soil pH. As pH levels increase in the soil, the availability of micronutrients decreases. Also, micronutrients are interrelated. Excessive levels of one can lead to deficiencies of another. Again, this points to the need to balance pH and major nutrients before you focus on micronutrients.

The Law of Minimums: Another less obvious, yet equally important, rule of thumb to keep in mind when addressing micronutrient deficiencies is known as the "Law of Minimums." Simply stated, it means that plant quality is limited by the nutrients in least supply, even when other essential nutrient levels are sufficient.

Let's say you've had a soil analysis performed, have addressed the major nutrient deficiencies, balanced the soil to the best of your ability, know the micronutrients you need, and have a basic idea of how they function. You still have to select products to address those micronutrient deficiencies, and there are plenty of them out there. Micronutrients are available through both inorganic and organic sources.

Inorganic sources include sulfates, oxides, and fritted products. Sulfates and oxides are two of the most commonly used forms of trace elements. They are fully water-soluble, available in all minor metals in granular or solution form, can be used in either soil or foliar application, and are effective in acidic to neutral soils. The downside, however, is that they are relatively immobile in soil. Where you put them is where they stay.

Fritted inorganic micronutrient sources are rarely seen these days. They use what is called a "glass carrier," an extremely fine matrix of glass, and are very insoluble. Fritted potassiums were once very popular, and there are still instances in which I would love to have them, but some sulphur-coated potassiums also work really well.

Organic sources of micronutrients are synthetic chelates. They are mobile in the soil and readily move into the root zone. They mix easily with all fluid fertilizers, as opposed to inorganic products. The downside is that they are not efficient in acidic soils and leach readily in sandy soils.

There are also all-natural organic complexes. They have a lower cost than synthetic sources, are effective on neutral soils, and can be safely applied to plants through foliar applications. Their disadvantages are that they cost more than inorganic sources,

are readily decomposed by microorganisms, and are not at all compatible with NPK fertilizers. They also suffer from reduced efficiency in alkaline soils.

The three basic keys to balancing micronutrients for high quality turfgrass—proper sampling, a balanced fertility program, and the Law of Minimums—are the winning combination for creating and preserving superior golf course and athletic field conditions. You should always assess why you are having a deficiency. Is it an epidemic, or is it simply seasonal? You need to look at that deficiency, figure out how you are going to treat it, and select the proper products.

Editor's Note: Mark Altman is a soil fertility specialist who consults golf courses, parks, and professional and amateur sports complexes. His office is located in Marshall, MN.

RANSOMES/CUSHMAN ANNOUNCE APPOINTMENTS

Ransomes America Corporation and Cushman, headquartered in Lincoln, NE, have announced three recent appointments.

Gregg W. KinKade has been named director of Creative Support Services for Ransomes America Corp. He will be responsible for overall direction of corporate communications programs, including marketing communications, for all Ransomes-owned companies in North America. Besides Cushman/Ryan in Lincoln, those companies include Ransomes, Inc., Johnson Creek, WI; Brouwer Turf Equipment, Keswick, Ontario; and Steiner Turf Equipment, Orrville, OH.

Most recently, KinKade was senior account executive with Miller Friendt Ludemann advertising in Lincoln, where he handled the Cushman/Ryan account. Prior to that he was director of marketing communications for Flexible Steel Lacing Company in Downers Grove, IL, and before that he was national sales promotion manager for Schwinn Bicycle Company in Chicago, IL.

KinKade holds bachelor's degrees from Western Illinois University, Macomb, and attended graduate school at Northwestern University in Evanston, IL.

Clarke Staples has been promoted to director of sales and distribution for turf and lawn care products at Cushman, Inc.



Gregg KinKade

He will be responsible for sales of Cushman and Ryan products throughout North America and Japan, plus supplying support to Ransomes Sims & Jefferies of Great Britain in pursuit of international markets. He will direct the North American network of more than 105 dealers of Cushman Turf, Cushman Front Line, and Ryan lawn care equipment.

Staples has been in the turf and lawn care equipment industry for 29 years, 17 of those with Cushman. He was named market manager for Cushman and Ryan turf care products in 1988. A graduate of Boston University, he served as a medical technician with the U.S. Army's 101st Airborne Division from 1953-1955.

Staples is a member of the Sports Turf Managers Association and the American Sod Producers Association. He is also on the Industrial Advisory Board for the Golf Course Superintendents Association of America.

Daniel L. Hedglin has been appointed vice president of marketing at Cushman, Inc. He will be responsible for all marketing operations for Cushman and Ryan products in North America. He will also be responsible for the company's international promotions through Ransomes plc of the United Kingdom.

Hedglin attended both the University of Nebraska and the University of Maryland. He also served two years with the U.S. Army in Washington, DC, with the Office of Research and Development.

He is a member of the American Management Association, the National Golf Foundation, Golf Course Superintendents Association of America, Professional Lawn Care Association of America, and the American Sod Producers Association.

BEAM CLAY OPENS NEW DISTRIBUTION CENTER

Beam Clay, a producer of dirt mixes for infields, pitcher's mounds, home plate areas, and red warning tracks, has opened a distribution center in Orlando, FL. The facility is designed to service the southeastern portion of the United States.

"The new distribution center enables us to reduce shipping costs," says Jim Kelsey, company president. "We pass these savings on to our customers. We hope to announce another distribution center on the West Coast in the near future."

LESCO OPENS NORTH CAROLINA FACILITY

Lesco, Inc., has opened a regional distribution center and warehouse in Charlotte, NC. It will serve golf course and lawn care customers throughout the mid-Atlantic states.

The 38,400-square-foot facility has six loading docks and is served by a rail spur. Dave Alexovich, previously manager of purchasing at the company's headquarters in Rocky River, OH, is manager of the facility.

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