The responsibilities of a golf course superintendent are many, but one of the most basic, and important, is turf fertility. Developing and maintaining a top-notch fertility program has always been an important prerequisite for a superintendent's success in growing and keeping quality golf course turf.

According to a cross-section of superintendents around the country, while much has changed in the use of fertilizers, much has remained the same. One common denominator of a well-planned and well-executed nutrient program is regular soil testing.

<table>
<thead>
<tr>
<th>Company</th>
<th>Trade Names</th>
<th>Region</th>
<th>Course Area</th>
<th>Liquid or Granular</th>
<th>Particle Choice</th>
<th>Micro-nutrients?</th>
<th>Homogenous?</th>
<th>Sulfur coated H</th>
<th>Fertilizer with I</th>
<th>Contact</th>
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</thead>
<tbody>
<tr>
<td>Aglukon Agri-Products</td>
<td>Wuxal, Viterra Gelscape</td>
<td>Nat'l</td>
<td>All</td>
<td>L</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>Back to Earth Resources</td>
<td>Greenskeeper</td>
<td>Reg'l</td>
<td>G</td>
<td>Organic</td>
<td>N/A</td>
<td>N/A</td>
<td>SM</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<td>Distributors Own Turf Sup.</td>
<td>DOTS</td>
<td>Nat'l</td>
<td>All</td>
<td>G</td>
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<td>Yes</td>
<td>Both</td>
<td>N/A</td>
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<td>No</td>
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<tr>
<td>Doggett Corp.</td>
<td>Tree, XL, Injecto Feed, Turf, Total &amp; Turf Special</td>
<td>Nat'l</td>
<td>All</td>
<td>L</td>
<td>N/A</td>
<td>Yes</td>
<td>H</td>
<td>N/A</td>
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<tr>
<td>EnP, Inc.</td>
<td>Fertile Grower</td>
<td>Nat'l</td>
<td>All</td>
<td>L</td>
<td>N/A</td>
<td>Yes</td>
<td>H</td>
<td>N/A</td>
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<td>Garfield Williamson, Inc.</td>
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<td>Reg'l</td>
<td>TFR</td>
<td>G</td>
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<td>Yes</td>
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<td>Both</td>
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<tr>
<td>Howard Johnson's Ent.</td>
<td>N/A (customize)</td>
<td>Nat'l</td>
<td>All</td>
<td>G</td>
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<td>Yes</td>
<td>Both</td>
<td>No</td>
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<td>J.R. Simplot Co.</td>
<td>Best Professional Pdts.</td>
<td>Reg'l</td>
<td>All</td>
<td>Both</td>
<td>Yes</td>
<td>Yes</td>
<td>Both</td>
<td>Non</td>
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<td>Lebanon Chemical Corp.</td>
<td>Country Club, Greenskeeper, Lebanon</td>
<td>Nat'l</td>
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<td>Lesco, Inc.</td>
<td>Elite, Mini, Standard</td>
<td>Nat'l</td>
<td>All</td>
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<td>Yes</td>
<td>H</td>
<td>Both</td>
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<tr>
<td>Milorganite Div. of MMSD</td>
<td>Milorganite</td>
<td>Nat'l</td>
<td>All</td>
<td>G</td>
<td>Yes</td>
<td>Yes</td>
<td>H</td>
<td>Non</td>
<td>No</td>
<td>No</td>
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<td>Moyer Products, Inc.</td>
<td>Lawn of Golf, Veroisol, Four Seasons, Superblend</td>
<td>Reg'l</td>
<td>All</td>
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<td>Yes</td>
<td>Both</td>
<td>N/A</td>
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plan for nutrients critical

The dominant trend in the past several years has been a dramatic reduction in the amount of applied nitrogen and an increased importance of phosphorus and potassium, according to professionals in the field.

Explaining why, Dr. John Street, associate professor of agronomy at The Ohio State University, said, "The industry became more aware of the detrimental effects that high nitrogen levels can have. For example, more disease problems—like pythium and brown patch—especially in the summer and the fact that very lush, succulent turf is less tolerant to stress factors like heat and drought. Another negative was that the heavy nitrogen was doing nothing to create deep root systems."

Steve Gipson, superintendent at Fairlawn Country Club near Akron, Ohio, reiterated the reduced emphasis on nitrogen and growing importance of the other major nutrients. "We now fertilize for the health of the grass rather than just color," Gipson said. "We're using substantially higher rates of potash—approaching the nitrogen levels used in the past. I would hope that the industry is getting away from the real high-analysis products that put down so much nitrogen."

Gipson also said lightweight fairway mowing has influenced fertilization.

Continued on page 22

Company | Trade Names | Region | Course | Liquid or Granular | Particle Choice | Micro-nutrients | Homogeneous | Sulfur coated | Fertilizer with | Contact
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
O.M. Scott | Scotts ProTurf | Int'l | All | Both | Yes-2 | Yes | Both | Both | Yes | Yes | Yes | Susie Calhoun
Old Fox, Inc. | Old Fox | Reg'l | All | Both | No | Yes | SM | Both | Yes | No | No | Bob Griffin
Par Ex Div. of Vigoro Ind. | Par Ex, IBOU | Int'l | All | G | Yes-2 | Both | No | Yes | Yes | Yes | Dotty Frazzari
Parkway Research Corp. | Micro-Mix, Viron, Green Up, Turf-Feed Plus | Nat'l | All | L | N/A | Yes | H | Both | No | No | No | Ray Kimmel
RGB Laboratories | Agri-Plex, For-X, Lawn-Plex | Nat'l | All | L | N/A | Yes | H | N/A | No | No | No | Kurt Winkler
Shemin Nurseries | Shemin | Reg'l | TFR | G | No | Yes | Both | Both | Yes | No | No | Jim Hespe
Sierra Crop Protection | Custom Blen, Peter's | Int'l | Both | No | Yes | H | Non | No | No | No | Mark Broxon
Sustane Corp. | Sustane | Int'l | All | G | Yes-3 | Yes | H | No | No | No | Tom Hunter
The Andersons | Tee-Time | Nat'l | All | Both | Yes-4 | Yes | Both | Both | Yes | Yes | Yes | Doug Masters
W.A. Cleary Chemical | Cleary's Fluf | Nat'l | GTF | L | N/A | Yes | SM | Non | No | No | No | Bron Zienkiewicz

Because turf fertility is so vital, Golf Course News surveyed the companies manufacturing fertilizers for golf course use. Response to the more than 25 surveys mailed was excellent and much of the information is highlighted here. This chart tells each company's 1) trade names; 2) the region it serves; 3) the areas of the course its fertilizers are used on: T (tees), F (fairways), G (greens) and R (roughs); 4) if it makes liquid or granular fertilizers, or both (L, G, or Both); 5) if it makes more than one size particle in its granular fertilizers, and how many sizes; 6) if it offers fertilizers with micro nutrients; 7) if it produces homogeneous or simple mix fertilizers, or both; 8) if its products are sulfur-coated, non-sulfur-coated, or both; 9) if it makes combinations of fertilizers with herbicides (H), insecticides (I) or fungicides (F); and 10) the contact person at the company whom a buyer should contact.
Continued from page 21

"Because we are now maintaining lower cut, denser fairways, we need smaller particle fertilizers that can readily filter down into the turf. This has broadened the product selection because more companies are now offering products in a wider variety of particle sizes," he said.

**Return to moderation**

Overall, the trend toward reduced nitrogen has been well received within the golf industry, and Street believes the industry is seeing a return to more moderate levels — "somewhere between the high levels of several years ago and the very low levels seen recently."

"Superintendents over the last five years or so have significantly reduced nitrogen rates and they have been pretty successful," Street said. "A few years ago it wasn't unusual to find annual rates of 10 to 12 pounds of nitrogen per 1,000 square feet on greens and now it's not unusual to find a superintendent putting down as few as one to two pounds and still doing a good job of maintaining quality putting surfaces."

"The programs of today are based more on the density, recuperative potential and growth of the turf. Color isn't as critical."

But despite the success of maintaining quality turf with less nitrogen, Street also pointed out that after a period of three years or so, the turf often begins to exhibit signs of stress. "Eventually, growth, density and the recuperative potential begin to suffer and when the superintendent assesses the problem, it may not even be immediately linked to nitrogen," Street said. "But basically, low nitrogen disease problems, like dollar spot, become more common and eventually the fungicides won't even do a good job because the nitrogen levels are so low. Although it will vary from course to course, I am beginning to see an upward adjustment to a more moderate level of three to six pounds of nitrogen per 1,000 square feet on greens."

Street said the increasing popularity of lightweight fairway mowing may hasten the return to more moderate fertilization levels. "Problems associated with low nitrogen levels are magnified by lightweight fairway mowing, especially when clippings are removed," he said.

As for the importance of phosphorus and potassium, Street agrees that changes are taking place there, too.

"In general, ratios of 3-1-2 to 5-1-2 have typically been considered acceptable," Street said. "But recent research from the University of Nebraska has started a trend to higher N-K ratios. The superintendents with N-K ratios approaching 1-to-1 or even 1-to-2. Research has shown these ratios increase the tolerance of cool-season grasses to summer stress and the tolerance of warm-season grasses to winter stress."

**No rules**

Although reduced nitrogen use may be the trend for many courses, it is not a concrete rule. Courses built on sandy soils characteristically have a low cation exchange capacity (CEC) and high percolation rate which means nutrients leach very quickly. On courses like these, high rates of applied nitrogen are still necessary.

At Moreno Valley (Calif.) Ranch, a 27-hole course owned by Landmark Land Corp., superintendent Murray Nonhof puts up to 16 pounds of nitrogen per year on his Penncross bentgrass greens. The course, open just a little more than a year, is located in a semi-arid area 45 miles from Disneyland and 60 miles from Palm Springs.

"We have greens built on four inches of pea gravel and 16 inches of sand," Nonhof explained. "Because of our low CEC and all the leaching, we have to put down a lot of nitrogen.

Nonhof tests the soil twice a year and bases his fertility program on the results. "I'm a firm believer that a good superintendent should base his fertilizer buying on what the soil tests show," he said. "It's not a monetary decision, but a decision based on soil chemistry. A 'by gosh or by golly' approach isn't going to work anymore."

Nonhof feeds the turf on his course with a slow-release granular, but is planning to install an injector system to supplement his fertilizer nutrition program. "We'll put iron, ammonium sulfate and straight nitrogen through the system, but it will be purely supplemental to our granular program," he said.

**Southern sand**

Although thousands of miles away from Nonhof's southern California tract, Dick Gray, superintendent at Loblolly Pines Golf Club in South Florida, faces much the same situation. Located in the town of Hobe Sound, in what Gray likes to term "Old Florida," the course opened for play in December 1988. It was built almost entirely on sand.

"We have less than 2 percent silt
Fla., was the first of the stadium courses. There are now 14 in the United States with another six in varying stages of planning and construction, according to PGA Tour Director of Public Relations Sid Wilson.

There is another in Bato, Japan, the site of a recent United States-Japan Seniors championship. Another 10 Japanese TPC courses are on the drawing board, Wilson added.

“We’re obviously delighted that the TPC network is being honored by its peers,” said the PGA Tour official. “The Tour has always taken great pride in its TPC courses. Our players become involved as consultants and work very closely with the architects. Yet while the pros play on the course one week a year, he is still very playable for the members the rest of the year.”

GCBA President Perry Dye of Dye Designs will make the presentation, which has become one of the highlights of the association’s annual meetings.

“We’re very proud of how this award has grown since it was first presented in 1984,” said Rossi. "There were just 40 people at the first awards dinner. Last year there were 225."

The National Golf Foundation was the inaugural award-winner. Following the NCF to the podium over the last seven years were the Golf Course Superintendents Association of America, Golf Course Architects of America, Professional Golfers Association of America, Club Managers Association of America and last year’s winner, the U.S. Golf Association Green Section.