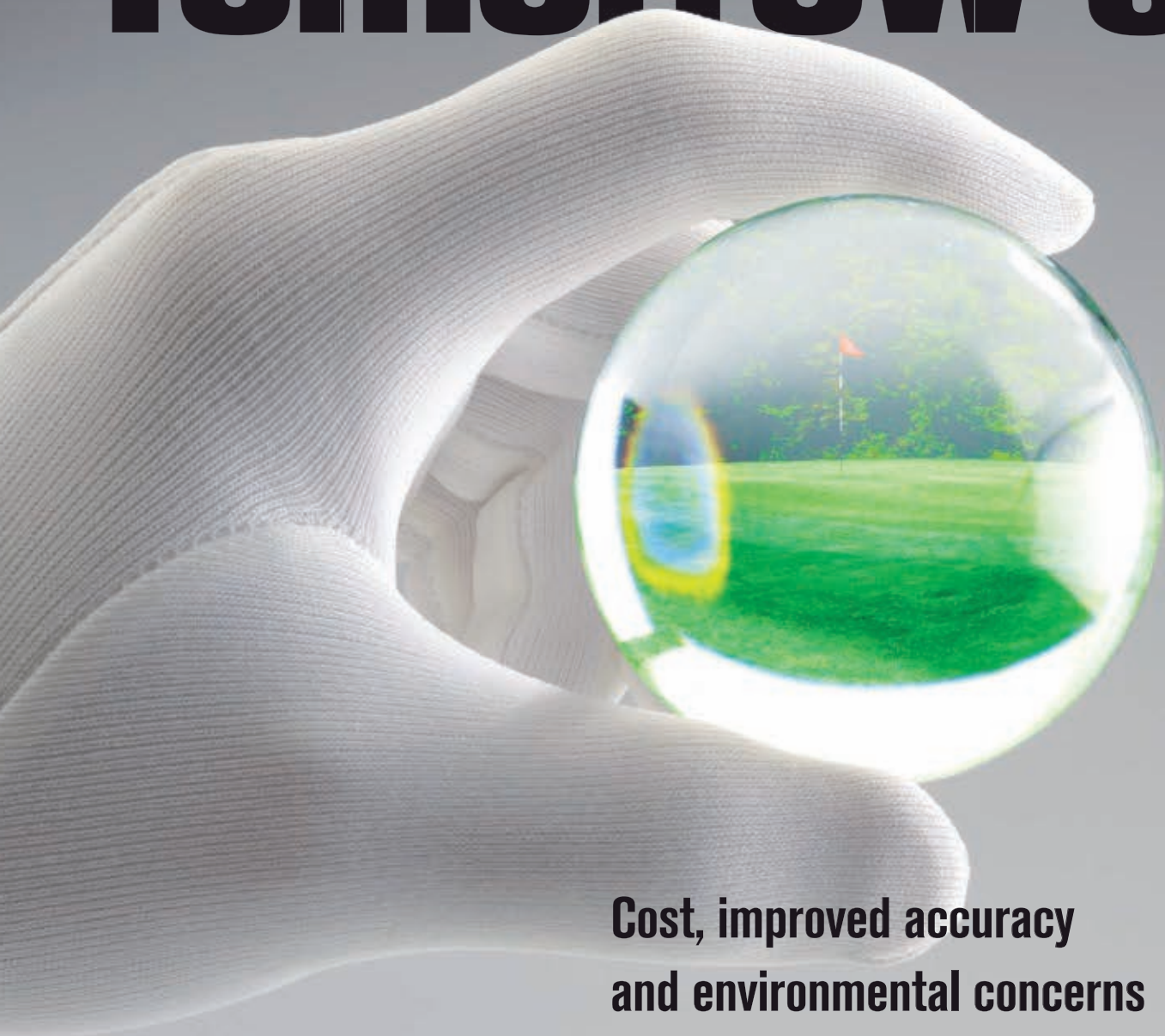


Tomorrow's



**Cost, improved accuracy
and environmental concerns
shape the future of fertility**

BY JOHN WALSH, CONTRIBUTING EDITOR



Fertilizer

GENERALLY, FERTILIZATION hasn't changed much through the years. It's still about getting basic elements to turfgrass plants to help them survive. Fertilization is a necessity for plant health, considering all the stress that's put on turfgrass, including the amazing things golf course superintendents can do, like mowing a putting green so low that it runs about 12 feet on the Stimpmeter.

When it comes to predicting the future of fertilizer, not many in the industry have a clear crystal ball. Generally, superintendents have all they need to feed turf. So, what will change in the future?

Up ahead

With something as fundamental as human health, did people know years ago that blueberries have antioxidants that are good for them? Well, the industry is at that same point with turf, says Roch E. Gaussoin, Ph.D., professor and extension turfgrass specialist in weed science at the University of Nebraska – Lincoln.

"We're barely scratching the surface," he says. "We have a better knowledge of how plants grow. However, I don't have much of a vision for the future."

However, Gaussoin does know there are some products used today that won't be used in the future. In many ways, it's a cycle based on research and knowledge.

Even though turf plants are under unbelievable amounts of stress, researchers won't genetically engineer a plant that doesn't need the 17 basic nutrients, Gaussoin says, adding that a turf system is always young because of mowing.

The future of fertilizer will incorporate nitrogen stored in organic matter released over time, says Frank Rossi, associate professor of turfgrass science in the department of horticulture at Cornell University in Ithaca, N.Y.

"We won't supplement it," he says. "This will significantly alter fertility programs."

For Cale Bigelow, associate professor of agronomy at Purdue University in Lafayette, Ind., the future of fertility holds potential for biologicals, a focus on improving uptake and rooting and a more holistic approach in general.

"We're now feeding the plant less than we were 20 years ago," he says. "We're using more liquid products, but with the low height of cut, especially on greens, the liquid products are needed."

The right price

No matter the aspect of golf course maintenance, cost is always a factor for many superintendents. Fertilizer is no different. The bottom line is superintendents want inexpensive fertilizer.

"Nobody cared about fertilizer five years ago because it was cheap," Rossi says. "Now everyone is looking at its cost and saying, 'So, maybe I don't need certain things.'"

For example, the cost of phosphate, which is more expensive than urea, has increased. A 50-pound bag of urea rose from \$8 to \$30, and now it's back down to about \$16. Much of the fertilizer market has been, and most likely will continue to be, affected by the global food market as a result of an increasing population.

"It's a big, twisted web," Bigelow says.

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– TODD VOSS
Double Eagle Golf Club



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Todd Voss, superintendent at Double Eagle Golf Club in Galena, Ohio, wants affordable fertilizer. But he says the golf market is behind the ag market in terms of pricing.

“Ag can take advantage of the fluctuation in the market better,” he says. “It seems it takes a long time for potassium prices to come down before I purchase fertilizer. Recently, they came down in the commodities market but not in the golf market.”

Better products

It’s safe to say improved slow-release products will find their way to market amid a more restrictive (legislatively) environmental climate, as well as more precise applications in general. It’s a technology that will continue to be improved upon.

However, Rossi doesn’t think the industry will see any significant advances in fertilizer technology, like something akin to dispersible granular technology. Neither does Bigelow.

“A few new products are interesting, but nothing is earth-shattering,” Bigelow says, adding that some fertilizer companies, via their products, are taking the fertilizer approach down to one or two applications, yet some superintendents want more control throughout the course in different areas.

There are only so many ways to package urea, which is plants’ basic nitrogen source, Voss says.

However, encapsulated fertilizer will be more predictable with its slow release to avoid nutrient deficiencies, says Mike Richardson, Ph.D., professor of turfgrass management and physiology in the department of horticulture at the University of Arkansas in Fayetteville.

“Additionally, some companies are looking at biological (microbial) additions to fertilizer to enhance nutrient uptake,” he says. “They’re not fully tested yet, but there’s potential.”

The market also is seeing nitrification inhibitors, which slow down the breakdown of nitrogen and urea inhibitors. “It’s new technology outside what we were playing with in the past,” says Charles Peacock, Ph.D., pro-

fessor and extension turfgrass specialist in the department of crop science at North Carolina State University in Raleigh.

Academics still are conducting research to make recommendations about the use of high-grade foliar products. “Are they worth the extra money? I don’t know,” Peacock says.

Breaking fertilizer down further, micronutrients are more tricky than macronutrients because they’re difficult to detect via research, Peacock says. “I don’t think there will be more research about micronutrients because the plant overcomes low levels of micronutrients and are efficient at nutrient uptake,” he adds. “Costwise, it’s not that expensive to add micronutrients.”

Micronutrients such as amino acid and humates don’t have a measurable benefit and are difficult to measure, Rossi says.

Still, there’s definitely more research needed about micronutrients, Voss says.

Improved accuracy

As with other cultural practices, superintendents are becoming more precise with their fertility programs, and soil and tissue tests are the main reason for that. However, the industry needs more information about soil and tissue testing methods and interpretations, Rossi says.

“We need to develop good and reliable tissue-testing methods,” he says. “Right now, interpretable tissue testing is questionable at best. We don’t really know what the nutrient baseline is. The baseline we’re using is artificially high.”

Nonetheless, superintendents save money in the long run by basing their fertility programs on soil tests. Voss, for example, tests soil twice a year.

Technology, too, will help determine nutrient needs via satellite. The ag market already is using this on a larger scale.

“Can we get it down to 1,000 square feet versus 1,000 square acres?” Voss asks.

“Are we going to save money fine-tuning fertility in smaller areas with precision mapping? That’s to be determined,” Peacock says.

Superintendents are applying smaller



quantities of fertilizer more frequently. But the bottom line is more applications in the future will be based on need (via soil tests) and be more precise than they are now, collectively. There will be fewer broad applications of nutrients.

The future is prescription turf, Voss says, citing the different growing conditions and soil profiles throughout a golf course.

“It’s fine-tuned,” he says. “It’ll be critical to do soil testing, if it’s not already. We will only be putting down what the plant needs because of the economy or regulations.”

Environmental concerns

Amid the discussion of better products, cost and accuracy is, of course, the environment. Environmental stewardship is a common goal for superintendents, no matter what they do, albeit it’s more important for some. Voluntarily or legislatively, the environment will impact the fertility programs in the future.

As a result, Richardson foresees more companies developing organic-based fertilizers.

“As more people are concerned about the environment, we’ll see more organic-based fertilizers,” he says. “It’s a good thing to use waste or other by-products from other industries to show how turf can help use the waste of other industries.”

And you can’t talk about the future of fertilizers and the environment without talking about phosphorus, which has been restricted in Wisconsin.

“There’s a lot of pressure with the environment,” Bigelow says, citing talk about banning phosphorus use to improve waterways in Michigan, for example. “But there’s not a lot of proof lawn fertilizer was the reason for the damaged water ways. There are a zillion different sources of phosphorus out there.”

Amid concerns about phosphorus use in North Carolina, Peacock conducted research that didn’t find any phosphorus problems with runoff. “We’ll continue to battle those concerns,” he says.

Turf does a good job of retaining phosphorus, and superintendents have gotten better about using lower rates, Gaussoin says.

“Phosphorus should be monitored, but we shouldn’t go cold turkey,” he says. “A lot of the concern has resulted in knee-jerk reactions from environmental groups who don’t understand the biology of plants. There’s a disconnect with science and the public. We can’t pull this essential nutrient. Data shows the plant needs phosphorus.”

An important part of fertilizer development is that there will be more requirements from companies who make fertilizer to get them approved, such as providing runoff data, Richardson says.

But if a nutrient problem exists, superintendents will have to do better, Voss says. Still, research has shown that when fertilizer is applied properly, there’s no negative impact to the environment, he says.

In Illinois, there’s discussion about phosphorus bans, but nothing has been decided, says Jon Jennings, certified superintendent of the Chicago Golf Club in Naperville, Ill., adding that superintendents need to stay abreast of the situation, which is different in each state. The phosphorus level at the Chicago Golf Club has been consistent throughout the years, so Jennings hasn’t had to add any. And, at five-hundredths of a pound per spray, the potential for fertilizer runoff is zero.

“We have very high nutrient soil and are lucky the grass grows tremendously,” Jennings says, adding that he rarely uses phosphorus. “Plus, I don’t have a lot of play so I don’t deal with wear issues (which might require additional fertilizer use).”

Jennings emphasizes that superintendents need to educate the public that golf courses aren’t the waste dumps some people portray them to be.

“We’re going to have to be vocal about why we use fertilizer and not get run over by legislation geared toward other industries,” he says.

Considering all the difference aspect of fertility, some want more clarity.

“I hope the future gets a heck of a lot simpler,” Rossi says. ■

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— JON JENNINGS
Chicagog Golf Club



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