

ably a ways away from that," Lonn says, "although it's evolving."

► **Governmental pressure and incentive** — Evolution is evident in New York, where state employees, per executive order of Gov. George Pataki, are required to limit their emissions by using alternative fuels.

"New York's a big buyer. New York, in doing this, means business," Lonn says. "Obviously, if New York was the only one in the world that was doing this, we wouldn't worry too much about it. But we believe they're on the leading edge of a trend that will continue, as opposed to a bunch of goofballs out on their own."

► **Fringe benefits** — With no laws or outside pressure to force the issue, the best way to attract the customer, Lonn says, is to attach eye-catching attributes to eco-friendly equipment. It's really not a big deal, Toro believes, if customers have ulterior motives — the desire for reduced noise, low maintenance, better control, easier diagnosis — behind the purchase of alternative fuel equipment.

"Customers are starting to ask more for the attributes than they are the actual products," Lonn says. "So you kind of get the best of both worlds — better products that happen to have better emissions. That's what is motivating us to put quite a bit of money into them today, because we think we can make products every bit as good and with lower emissions."

The majority of golf cars as well as a good number of light- and mid-duty utility vehicles are already powered by battery. Again, however, the switch from gas isn't necessarily environmentally motivated.

"The lighter-duty utility vehicles have evolved from gas because they're cheaper to operate and require a lot less maintenance," Lonn says. "(Environment) in most parts of the country is the third factor."

Cost will continue to be a concern as fuel prices continue to rise, although the environmental factor should not be forgotten, according to Mike Packer, the vice president of utility vehicle and international sales for Club Car.

"In some of the lighter-duty products we see today, electric product is certainly beginning to make sense," Packard says. "Environmentally, it's the right thing to do when you can. You do have fuel prices continuing to creep up, so if there are opportunities to decrease fuel consumption, it's certainly a way to go."

The superintendent's biggest com-

plaint against electric vehicles has always been a perceived lack of power and range. In many cases, it's not so much perception as first-hand experiences with second-hand golf cars.

"By the time those products are handed down, they may be a little tired anyway," Packer says. "It really gives the electric

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Eco-Friendly Route

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vehicle a bad name because you may have a product that has a couple of cells that are weak, and they're not going to hold a charge. And quite honestly a golf car power train is not well suited for a mid-duty type cycle on a golf course that a superintendent would subject a vehicle to."

If heavy-duty utility vehicles are to be successfully powered by batteries, hybrids or fuel cells, they likely will have to follow in the tracks of mowers, Lonon says.

"The utility vehicle runs less than two hours a day. There really isn't any mowing machine out for less than two hours," Lonon says. "But on the other hand, what we're doing is not exclusive to mowing machines. Traction drives and hybrids and fuel cells can really be applied to any product. It's really a matter of deciding which one makes sense to do first."

In addition, utility vehicles, fair or not, are considered "second-tier products," Lonon says, when compared to mowers.

"They're the kinds of things you need to do your job, but your greens committee and the golfer couldn't care less what vehicle you got," Lonon says. "They're worried about what the greens look like or what the fairway looks like."

In August, Club Car released an electric-powered utility vehicle that it considers anything but lower tier. Powered by eight six-volt batteries rather than six eight-volt batteries, the vehicle provides a best-in-class top speed of 17 mph and a category-leading useful range. The vehicle also has a weight capacity of 1,200 to 1,500 pounds.

"In my opinion ... this electric (mid-duty) vehicle will do everything that a gas vehicle can do," Packer says. "The primary difference is that you could still run a vehicle out of power at the end of a day if you're working it real hard. So, is it for 100 percent of the population? I would say no. But we're to the point where 75 to 80 per-



Mowers are already operating on electric power, as Toro's Dana R. Lonon explains.

cent of the population should have a very good reason to look at this product."

As for that necessary demand to inspire research and development, Packer says it's coming.

"The market will continue to look electric once it understands there are viable electric options out there that will give them the performance and reliability that they are looking for and have become accustomed to with gasoline products," he says. ■

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Gaining Appeal

More superintendents are using
biostimulants and trusting in
them, companies say

BY LARRY AYLWARD, EDITOR IN CHIEF

Biostimulants sound like a category of relatively new and cool products used to treat turf. They are . . . but they aren't.

Joe Lara, the product manager for horticulture and specialties at Becker Underwood, points out that what the industry knows today about biostimulants and their benefits to growing turf plants isn't all that new.

"Seaweed extracts, for example, have been used by turf professionals for more than 75 years, originally in the form of composted kelps," says Lara, whose company first developed and offered its line of biostimulant products to the turf and horticulture specialty markets in the mid 1990s. "And the renewable benefit to soils derived from the addition of humic substances is certainly nothing new to agriculture."

That said, there have been dramatic evolutions both in market acceptance and in product diversity and sophistication of biostimulants, says Bill Byrnes, president of Floratine Products.

"Relatively few superintendents were using biostimulants in the early 1990s," Byrnes says. "Today a vast majority of superintendents apply

them for both day-to-day and high-stress management. Today biostimulant use is a mainstream management practice as far as most superintendents are concerned."

Joel Simmons, president of Earthworks, says the biostimulant market has grown significantly over the past 10 years mostly because superintendents have discovered the real significance to using a soil-based program and the value that a quality liquid and dry organic product line can provide.

Unfortunately, the growth has led to a surge of new products that are trying to capitalize on the sector's growth, even though they are de-

veloped with little understanding of the agronomic importance that a quality biostimulant can provide. "This helps to perpetuate the stereotype of smoke and mirrors," Simmons adds.

Speaking of the smoke and mirrors, John Sedivy, Novozymes' global business manager for Roots Plant Care Group in Salem, Va., says Roots conducted several focus groups with superintendents in 2004 and learned that the snake-oil perception was alive and strong.

"The situation has gotten better over time, but it still persists," he says.

Biostimulant products, some with exaggerated claims, have come and gone from the market for many years, Lara points out. But the research conducted in the past 15 to 20 years has helped move the turf industry forward with biostimulant use, Lara says. Hence, there has been a growing trend to re-evaluate and subsequently use true biostimulant products, Lara says.

Sedivy says a key to success in the biostimulant market place is reliability.

"We're not going to put out a product that we know doesn't work," he says. "And we're not going to make marketing claims on products that go above and beyond what we believe those products can do."

Product consistency is another key, Sedivy points out.

"We're consistent in the way we produce a product," he adds. "We make sure that every time we put product in a jug, it's the same product. "Because Novozymes is a science-based company, the formulas and manufacturing processes our team has developed ensure we're consistent in the way we produce and package every product."

It's also vital that a biostimulant company's personnel know how to market its products appropriately. Byrnes says that Floratine invests "an incredible amount of time and money" into training associates so they can provide users

with appropriate product-use and result expectations.

"Many would say that we have been pretty successful, but it remains our biggest challenge," Byrnes says of the training. "We feel our representatives must be competent to understand what is going on with the turf before offering a solution from the available product choices."

Lara says Becker Underwood "encourages all end-users to know and fully understand what is in the product, demand and expect only the highest quality ingredients, and not be misled by exaggerated claims that seem too good to be true — because in all likelihood they are."

Simmons agrees that education is Earthworks' biggest challenge. "There is so much bad information in the market about what a biostimulant is to begin with, not to mention how and when they should be used," he says, adding that too many manufacturers are trying to call a

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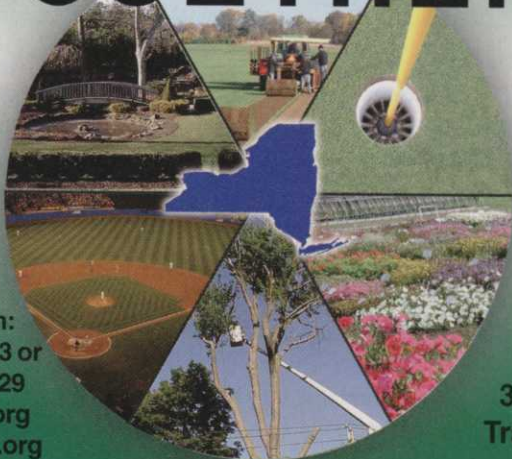
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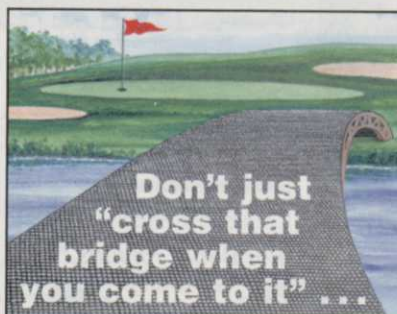
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Gaining Appeal

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fertility product a biostimulant, "when in reality these products do little to feed microbial activity and often actually have a negative effect on their survival."

Below are many biostimulant products on the market and their descriptions:

Foliar products

Milliken Turf Products offers True Foliar NPK Phosphite 10-20-16. It contains more macronutrients and a phosphite source derived from phosphorous acid. True Foliar NPK Phosphite contains a minimum of 10 percent of the company's proprietary seaplant extract.

The company also offers SeaBlend, a blend of high-quality organic and synthetic ingredients to product a rich turf color.

Dry-soluble combination

Becker Underwood offers VigaROOT, used in spray application programs to reduce stress and stimulate root growth through enhanced water and nutrient uptake and correct micronutrient deficiencies.

VigaROOT is a dry-soluble combination of iron-chelated manganese, chelated zinc, natural humic substance, seaweed extract, yucca, and a proprietary blend of natural sugars, vitamins, amino acids and beneficial bacteria.

VigaROOT biostimulant programs are most beneficial applied at two-to-three week intervals during stressful summer conditions and as an establishment boost during overseeding.

Composted chicken manure

EarthWorks Natural Organic Products has been formulating and manufacturing dry and liquid organic soil amendments since 1988. Its products include Replenish 5-4-5 — Formulated Organic Fertilizer. The foundation of the product is composted chicken manure with 40 percent of the product made of rock minerals and carbon activators. Turf is a cover crop, one that is constantly de-mineralizing the soil, and 5-4-5 is a good way to replenish this mineral content and provide the plant with a sustainable supply of needed macro and minor nutrients, the company says.

Meal-based fertilizer

Nature Safe fertilizers are constructed meal-based fertilizers derived from feed-grade pro-

teins such as meat, bone, blood, poultry, fish and feather meals as well as bakery by-products and humates, not waste by-products. The fertilizers promote strong turf color and build stress tolerance. Some of the company's products include: 8-3-5 Stress Guard Fertilizer, which is for new or established turf or can also be used during renovation and overseeding; and 10-2-8 All-Season Fertilizer, which enhances root and shoot stability with controlled plant growth. It also improves overall disease management by increasing the efficiency of fungicides.

L- amino acid-based fertilizers

Nutramax Agriculture offers products that feature only biologically active L-form amino acids obtained through enzymatic hydrolysis of natural protein. Included is MACRO-SORB foliar, a biofertilizer based on amino acids. It allows for greater absorption and transport of nutrients through the leaves into the plant. The action of L- amino acids and substances with phytohormonal effect in MACRO-SORB foliar helps to regulate the opening of the stomata, increase water potential, regulate osmotic pressure, slow down photorespiration, and increase net photosynthesis.

MACRO-SORB foliar is a true systemic with no phytotoxic effects and is tank-mix compatible with soluble fertilizers, fungicides, insecticides, plant growth regulators, and herbicides.

Organic fertilizer

Milorganite's organic fertilizer is versatile and can be used anywhere a superintendent or groundskeeper deems necessary. Milorganite is ideal for a variety of applications: greens; fairways and roughs; tee boxes; trees; planting beds; and flowering shrubs.

Foliar auxiliary nutrients

Floratine Products offers a variety of foliar auxiliary nutrients designed to address the photosynthetic and chlorophyll requirements of turfgrasses. The products include Astron, Per "4" Max, ProteSyn, Knife, Renaissance, Perk-Up and others.

The company also offers value-added foliar nutrients to provide linear sustenance and support even, consistent growth.

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Gaining Appeal

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Microbial-based products

Novozymes Biologicals, ROOTS Plant Care Group says its endoROOTS granular, a mycorrhizal rooting stimulant for turf and plants, now includes patented high-impact microbes. Designed to increase root development, accelerate plant establishment, increase drought and stress tolerance, and convey nutrients more efficiently from the soil, endoROOTS granular can be used in aerification, sod and seeding.

Combination products

Bio Basics LLC markets natural-based granular fertilizers using Pasteurized Poultry Manure from Perdue Farms as the base for both the stand-alone product and the ALLY product line. PPM 4-2-3 alone provides excellent carbon and calcium sources for the plant and soil while performing as a slow-release fertilizer.

The alliance of PPM and regionally specific blends of synthetic fertilizer allows the customer to apply sufficient N-P-K requirements along with organic carbon and mineral sources at the same time.

Micronutrient delivery system

Clawel Specialty Products offers Specialized Nutritional Formulas that are a combination of nutrients and other compounds which contain hormone precursors, natural plant amino acids, plant vitamins and anti-stress (antioxidants) substances. A proper combination of nutrients and biostimulants will enhance photosynthesis, negate toxic levels of stress-producing substances (oxidants) and enhance root production.

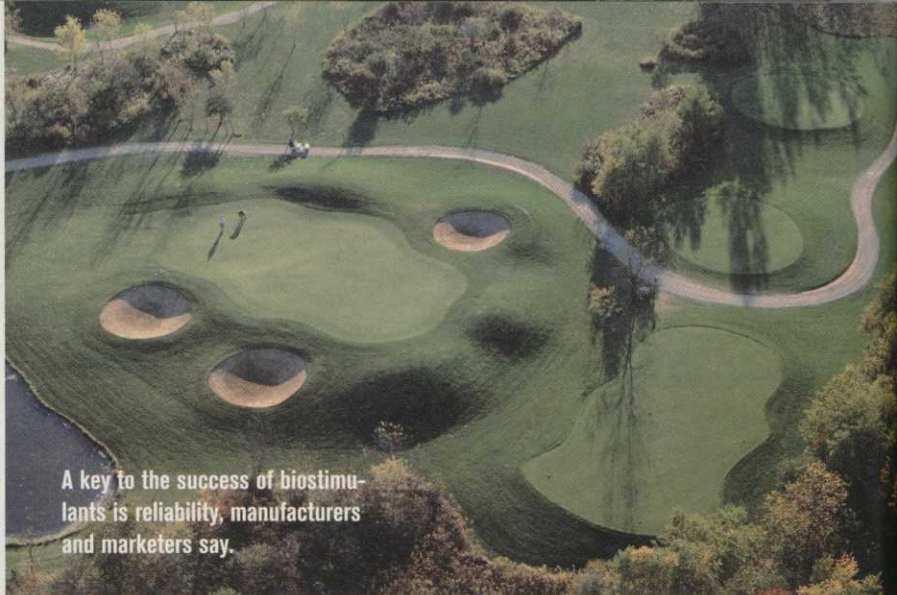
Clawel also offers Premium Fertilizers, a combination of different nutrient formulations designed for specific needs.

Fertilizers

PRO-SOL offers its turf fertilizers Chameleon and Transition intended for direct application.

Chameleon contains iron with a combination of eight essential macro, secondary and micronutrients.

Transition contains potash with a combination of four essential secondary and micronutrients.



A key to the success of biostimulants is reliability, manufacturers and marketers say.

Remineralizer and bioinoculant

Soil Technologies Corp. introduces TurfTech Bio-Min, a new re-mineralizer and bioinoculant. The patented technology combines three agronomic tools in one easy-to-use formula. Research on TurfTech Bio-Min has demonstrated that the product reduces fertilizer requirements, suppresses common turfgrass pathogens and improves water infiltration.

One of the unique contributions of TurfTech Bio-Min is the addition of a micronized volcanic rock powder that delivers more than 60 trace elements not found in conventional N-P-K fertilizer. When applied to soil and plants, TurfTech Bio-Min strengthens the cell wall and activates enzyme activity. The result is turfgrass that resists damage by diseases, mowing, frost and drought.

Microbial inoculant

Growth Products offers Companion, a microbial inoculant that contains *Bacillus subtilis* GB03 microbes, which quickly colonize the root zone. It is good for use with sterile soils, as well as with high-sand-content tees and greens. A vigorous beneficial microbe population means healthier soil and plants.

The company also offers Essential Plus, a root stimulator that contains plant extracts such as humic acid, L-amino acids and a natural wetting agent not found in standard NPK fertilizers.

Foliar absorption

Grigg Brothers products have been specifically designed for foliar application and foliar absorption. All product contains "facilitators" which aid penetration into plant cells, effectively translocate to sites of action, and provide all or most of the nutrients needed by

plants to chelate minerals.

In addition to special facilitators, Grigg Brothers products contain an organic base, consisting of natural organic compounds that function metabolically and are found naturally in the plant.

Liquid irons

PBI/Gordon offers biostimulants and micronutrients. Its liquid irons include RROMEC and FeRROMEC AC. The former provides fast, dependable green-up, usually within 24 hours of application, and corrects chlorosis due to iron deficiency. The latter is an amine-compatible formulation for FeRROMEC green-up that can be tank-mixed with other turf care products.

The company also offers turf biostimulants, including FOCUS, which contains high concentrations of turf-beneficial materials extracted from humic acid and help in precise ratios for optimum turf response for resistance and recovery from stress.

Soil conditioner

Gro-Power Premium Green 5-3-1 is a multi-purpose homogeneous fertilizer/soil conditioner. Using the company's Matrix technology, the product was developed for greens, tees and any other areas where fine-bladed bent and hybrid bermuda turf grasses are utilized. The particle size will ensure even distribution, rapid penetration into the root zone and minimum mower pick-up.

The basic material in Gro-Power Premium Green 5-3-1, as in all the Gro-Power products, is humus. Humus promotes bacterial propagation, which tends to improve soil structure, helps to increase the moisture-holding capacity and helps in breaking up compacted soils. ■

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