

was the Acti-dione program that came out in the late 1960s. Back then, dollar spot and leaf spot were considered the most damaging disease problems, and Acti-dione controlled both. But brown patch could not be controlled economically and there was nothing that could be used for Pythium. The early products were mostly contact materials that would last only seven days. Now, we're using long-lasting materials, so we make fewer applications and the amount of total product used is much less.

Back when I first got into the business, most of the formulations were wettable powders and emulsifiable concentrates. Products came in paper bags or steel drums. Now formulations and packaging tend to be more user-friendly, in the form of dry flowables or water-dispersible granulars. Companies sell products in water-soluble packages or closed systems, limiting worker exposure. Use rates of newer products are much lower than they were in the 1960s and 1970s. For instance, for vegetation management we see herbicides used in tank mixes at rates as low as half an ounce per acre.

Lightweight equipment

One of the biggest changes I've seen in the golf course industry has been the shift from heavy, tractor-driven or pulled mowing equipment to the use of lightweight mowing equipment on fairways. Weakened turf often resulted from mechanical damage caused by this heavy equipment, allowing invasion from the ever-opportunistic *Poa annua*. In the last decade or so there has been a tremendous shift from predominantly *Poa annua* or *Poa/bentgrass* fairways to mostly bentgrass fairways on northern courses. I feel this is due largely to improved management programs which include lightweight equipment, clipping collection, better irrigation practices, and broader-spectrum chemical spray programs.

Pick up the clippings

In my early days if someone had told me they were going to collect clippings on 30-40 acres of fairways, I would have thought that ridiculous. But now superintendents do this routinely. This accomplishes several things: removes some *Poa* seed, reduces heat buildup from clippings, which tends to stress turf, and eliminates a possible source of disease buildup. In addition, superintendents have reduced nitrogen usage, so that clipping production is minimized, and the grass is not as succulent.

Golf course appearance was much different then. Watch the *Golf Channel's* highlights of past tournaments and notice the mowing patterns, grooming and other conditions. With the popularity of Arnold Palmer, the public began watching golf on television, and the country club members began demanding better conditions.

Courses look better

Recently I saw footage from the 1964 U.S. Open at the Congressional Country Club in Bethesda, MD. The course was groomed much differently from when the Open was played there again this year. New equipment and methods allow shorter mowing heights, contouring and striping. Aesthetically, there's no comparison.

Mergers, acquisitions and consolidations have reduced the number of players in the turf product marketplace. Since I began working for TUCO, the company has merged and reorganized several times—changing into NOR-AM Chemical Company and now to AgrEvo Environmental Health. Today the registration process is more difficult, and it's more costly to bring a product to market. More money is required to defend registrations, diverting funds from new product research.

—Don Maske began with the TUCO division of The Upjohn Company in 1969. He now covers the Midwest for AgrEvo Environmental Health, Wilmington, DE.

1962:

"Weeds & Turf" debuts as the first magazine to cover the professional turf care industry. ALCA forms to serve the professional landscape contractor. Dan Dorfman's Lawn-A-Mat lawn care company on Long Island is one year old and starts offering franchises.

Millard C.

Dailey's

Liqui-Green

lawn care

program gains

increasing

homeowner

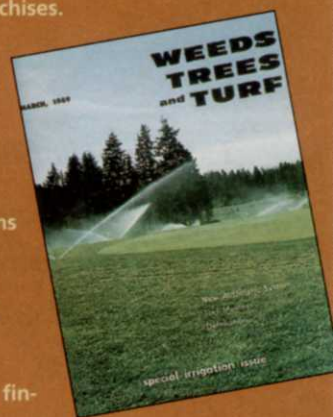
acceptance.

James Beard fin-

ishes first year of

15-year teaching stint at Michigan

State University.



1964:

John Deere's 110 model tractor

introduced nationwide after suc-

cessful pilot project to dealers east

of the Mississippi.



FERTILIZERS GROW: heavy grades to polymers

Turfgrass nutrition has gone from agricultural products to sulfur-coated ureas to polymer coats.

by EUGENE
MAYER/The Scotts
Company



Fertilizer is widely used by people growing any type of plant material, including turfgrasses and orna-

mentals. Like other items we frequently come in contact with, it's often taken for granted. Fertilizer users recognize the various types such as soluble, ag grade, organic, blended, homogeneous, and slow release. Slow- or controlled-released types indicate technologies such as methylene urea, ureaform, IBDU, SCU, and, recently, polymer-coated.

Few products to use in 1960

Do we remember (possibly a few do) or do we understand that there was a time when the fertilizers that we take for granted today were not available for us to manage plant growth and health? Time marches quite rapidly, but as recently as 35 years go many of the fertilizer technologies we routinely use were only just becoming commercialized or were not even on the drawing boards. In the early 1960s and before, the most readily available forms were agricultural-grade heavyweight fertilizers that were of poor physical quality and, with the slightest

misapplication, prone to burn and even kill the plant. The only safe and slow-release fertilizers were the natural organics such as manures, animal by-products, and grain meals.

These generally were difficult to handle, had a strong, unpleasant odor, were not easily accessible, and did not deliver good value for the consumer.

As other technologies have been invented or improved over the past few years, so have fertilizer technologies. Ureaform and methylene ureas were first manufactured for commercial use in the late 1950s and early 1960s. This itself brought on a revolution in fertilizer technology for the homeowner as well as the professional. It provided for lightweight fertilizer plus controlled or slow release, which would provide spoon speeding and predictable response rate to the plant.

Methylene urea arrives

One of the most memorable experiences of my younger years was working in Scotts' fertilizer plant when the first bag of homogeneous, lightweight, high-analysis methylene urea turfgrass fertilizer was produced on a commercial scale. There was only one prod-

uct, and this served the homeowner as well as the professional. Today there are many choices based on plant needs, both for the homeowner and the professional user.

Easier as tech improves

Other slow-release fertilizer types were soon to follow. IBDU was released in the mid 1960s, as was the first polymer-coated fertilizer, Osmocote. The sulfur-coated ureas started to surface on a commercial scale in the late 1970s and early 1980s. The polymer-coated fertilizers were at a standstill until the early 1990s, when new polymer coatings were developed that were more acceptable for turfgrass growth. These are now widely used in the turfgrass and ornamental industry.

What is in store for the 21st Century? New and better technology, I am sure, for research on plant nutrition and improved fertilizer efficiency continues at a feverish pace by industry, government agencies and universities. This builds on what has transpired over history and the last 35 years.

—Eugene Mayer is manager, training & technical support, The Scotts Company.

How tiny Beatrice, Neb., became a big player in the commercial turf mower marketplace.

By W. H. "DICK" TEGTMEIER

After high school I didn't have the financial ability to go to college and, therefore, at the age of 17 ventured into the construction field for four years. At the time I moved to and settled in Beatrice, Nebraska, in 1960, where I was able to find a position in the Engineering Department at Dempster Industry.

In 1966 I was employed with F.D. Kees and continued working there for 17 years. In 1976 I drew up their first entry into the commercial mower market on a contract basis. They have now merged with Yazoo Mfg. Co.

Due to personal reasons and opportunities I co-

'Mower city' U.S.A.

founded Exmark Manufacturing in 1982. I again developed a line of commercial equipment. Exmark grew to approximately \$50 million sales in 1997 and sold to Toro in 1997.

In 1988 I saw an open door or I felt an opportunity to start another company in the commercial mowing market and started Encore Manufacturing Company. Next spring we will celebrate our 10th anniversary. So now we at Encore are the only privately held lawnmower company in Beatrice, NE.

The positive impact to the Beatrice, NE, community (a community with approximately 13,000 residents) is significant as approximately \$70 million dollars worth of mowers have been shipped collectively from the three companies.

The first eight years of Encore our average growth was 22 percent annually. However, we showed a 49 percent growth this past fiscal that ended June 30, 1997.

—Dick Tegtmeier is founder and president of Encore Manufacturing, Inc.

1965:

The Lawn Institute, directed by Dr. Robert Schery, is 10 years old.

1966:

O.J. Noer, respected golf course consultant, and one of the developers of Milorganite fertilizer, dies at 76. ("If the greens turn yellow and the chairman is sore, what is the remedy? Ask O.J. Noer.") Michigan State offers 18-month course in Turf Management. ALCA moves headquarters from Berkeley, CA, to Washington D.C.

1967:

California boasts 665 golf courses, up from 234 just a decade earlier. American Sod Producers Association forms. Anthony Giordano and Robert Magda begin franchising Lawn Doctor, founded several years earlier in Wickatunck, NJ. About 2,200 people attend 37th annual GCSSA Turfgrass Conference and Show in Kansas City, MO.

Mowers get lighter, faster and more efficient as the years go by. Next step: plug in to efficient electrics.

For Jacobsen's and Bunton's take on equipment technology over the years, we have excerpts from interviews with Tony Saiia, vice president of customer service and technical support for the Jacobsen Division of Textron, Golf Course Equipment; and Joe Santangelo, Bunton's senior regional service manager. Jacobsen purchased Bunton in September of 1996.

turf damage."

Q. *How were fairways mowed 30 years ago?*

Saiia: "When I joined Jacobsen in 1971, the predominant method for cutting fairways was with gang mowers, pull-type mowers, and ground-driven mowers like the Jacobsen F-10 turf tractor. Everything was mechanical. There were no hydraulically driven lightweight fairway mowers like there are today. All greens were mowed by hand with



Tony Saiia: looks forward to electric drive technology.

Q. *Has cutting height and quality always been important?*

Saiia: "If you look at turf practices 30 years ago, a quar-

Mowers: lighter, more productive, better cuts

Q. *Tony, what has happened in the golf course equipment industry over the past 30 years?*

Saiia: "The entire industry has been evolving to meet changing demands in turf equipment and developments in turf practices. Key drivers in this have been the push toward higher productivity and the need to improve the life and reliability of the equipment.

"There have also been changes to make the equipment fit better with turf. Mowers have become lighter to prevent turf damage. Environmental concerns have also grown to affect the turf equipment market—including emissions from engines, noise pollution, the potential for equipment leaks, and anything that could cause

walk-behinds. Then Jacobsen introduced the first riding triplex greens mower, the Greens King, in 1969. We also later introduced the first diesel-powered Greens King. That wasn't as easy as it sounds because everyone was concerned with the amount of weight on the greens.

"Diesels were notorious for being very heavy. We could solve the weight problem on the gas-powered Greens King with large tires and lightweight components. With the diesel models, we had to pioneer the use of new lightweight, compact diesel engines."

ter-inch was a typical cutting height, even on greens. And maybe three-quarters of an inch on fairways. The demand for lower cutting heights on greens and fairways came from the golfer. If you want faster green speeds and a more manicured look on fairways, you need to cut lower.

"Mowing equipment had to meet that demand. And turf maintenance practices had to change, along with the development of aeration and vertical mowing equipment.

"The Jacobsen Turf Groomer is an example of an innovation that helps deliver



faster green speeds while providing relief for shorter and shorter cutting heights. The idea for the Turf Groomer came from the industry--from a superintendent who saw the need. We partnered with him to bring the product to market in 1987."

Q. How have walk-behind mowers changed in 30 years?

Sailia: "Now they have the capability to cut lower, to utilize attachments like brushes and the Turf Groomer, and they're quieter. Years ago, golf courses tended to be out in the middle of nowhere. Now they're part of housing communities. Mowers had better be quiet because they're running at 6 a.m. near someone's bedroom.

"This suggests the next logical step--the electric power triplex mower. It's one reason we developed and introduced the Greens King Electric this year. It answers the needs for a greens mower that's quiet, productive, and delivers a fine quality cut."

"Productivity will continue to be the driver, as well as the need for a better quality of cut.

Q. Joe, how has commercial landscaping equipment changed in the 12 years you've been with Bunton?

Santangelo: "Back then we were proud to sell a 52-inch walk-behind with an 11-hp engine. It did an excellent job and no one complained about it. Now, 11-hp isn't enough for a 36-inch mower. The industry is in a horsepower race now.

"There have also been changes in what we ask our mowers to do now. Ground speed, quality of cut, and mulching capability are much more important to the landscaper. All of these require a machine that has more horsepower.

"Productivity and quality depend on operator comfort. Bunton has gotten better at designing and building equipment.

Componentry is one factor. We went to overhead-valve engines, which are much more efficient in terms of ecology. They also put out more power per pound of engine. The torque curves are better, different types of hydraulic drive units are now available, and bearings are getting better."

Q. How have commercial riding mowers developed?

Santangelo: "Riding mowers have definitely gone through transitions. Fourteen years ago there were maybe three zero-turn riders in the industry and a number of out-front, rear-steered mowers. And there were still some tractor types.

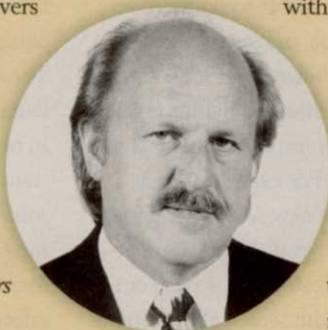
"The zero-turn riders have taken a pretty dominant position in the rider market today, along with large-area walk-behinds. And now we're stepping forward with 31-hp and 72-inch decks."

Q. What changes have you seen in the commercial landscape customer?

Santangelo: "Today, I see much larger landscape companies instead of two guys with a pickup truck and a trailer. I also see more consolidation of companies into larger and larger ones. These are professional organizations. They have corporate office buildings, fleets

of trucks, computers and cell phones. They're sophisticated and they're looking at profit margins and equipment costs.

"These companies demand more of manufacturers, which is why we keep working to develop better, more efficient products."



Santangelo: industry in a race for horsepower.

68:

Benzimidazole fungicides developed. Includes benomyl and thiofanate-methyl, first curative, systemic fungicides, can be used at lower rates. First Ohio Turfgrass Foundation Conference.

1969:

Widespread winterkill of Bermudagrass in Midwest. ChemLawn sales hit \$218,000. Musser International Turfgrass



Foundation is formed, by a group that includes Drs. Al Wilson; Joe Duich; Warren Bidwell; Fred Grau and Eb Steinegger. Joe Vargas named head of Turfgrass Disease Research at Michigan State. Joe Duich writes his doctorate on Merion Kentucky Bluegrass.

Jacobsen "Greens King" triplex greens mower is brought to the golf industry.



35th

ANNIVERSARY

Growing green

The John Deere Co. reports on advancements that have made mowers easier and safer to operate.



Many companies seek to meet or exceed ANSI safety standards in mower design features.

quickly and easily to switch over from one job to another efficiently.

Safety initiatives

Another area of primary concern to manufacturers of commercial grounds care equipment is safety. The American National Safety Institute sets safety standards for equipment manufacturers. These are not federal mandates, but many companies try to meet or even exceed the standards they set. For instance, John Deere includes a safety message in every advertisement, gives operational and safety videos in English and Spanish, uses bilingual decals on equipment, and equips machines with safety shielding. A variety of operator's presence controls are also present.

Manufacturers are challenged to design and build equipment that can be operated safely, at peak performance over its lifetime and is constantly improved to meet the ever-changing demands of the commercial customer.

Over the past 35 years the green industry has grown exponentially. Many changes have occurred with this growth, including the way commercial equipment is both built and used. Productivity, durability and versatility are major points that manufacturers consider when designing new machines.

Commercial mowing professionals are constantly seeking ways to mow larger areas in less time to save money. Manufacturers are doing their part to design machines that are higher in quality, more durable and have very little downtime. Enhanced customer support, which includes better trained technicians and parts services, are also increasingly important to commercial operators.

Generally, commercial equipment is being designed to be more powerful while being fuel-efficient and running quieter. It's also being designed to perform a multitude of jobs in a variety of conditions. Manufacturers are working their hardest to ensure that there's a machine on the market that can meet the challenge,

whether it's higher, thicker turf or moist conditions.

Capacity increase

To be able to do more in less time, mowers are now being designed with wider cutting widths and tighter turning radii for improved maneuverability. For example, John Deere's new wide-area front mower, available in summer 1998, features 11 feet of cutting width which allows operators to groom large open areas in half the time of traditional 72-inch mowers, saving both time and labor costs.

The variety of available attachments has also increased the commercial landscapers' productivity. Most tractors can accommodate attachments such as snow blowers, brooms, blades and tillers as well as side-discharge and/or mulching mower decks. Most of the attachments can be connected

For companies like Kubota Tractor Corporation that distribute "tools of the trade", the green industry has become an important growth segment.

KTC entered the U.S. market 25 years ago, at a time when major tractor manufacturers were in a horsepower race. KTC saw niche opportunities with the small farmer and rancher whose needs required a compact, durable and maneuverable tractor. At that time, under 40-hp tractors accounted for just 10 percent

Compact tractors filled a 'smaller' need



National Future Farmers of America (FFA) officers recently visited Kubota Tractor Corporation headquarters in Torrance, Calif. From left, Mike Heitman, Kubota director of marketing; Rachel Fehring, FFA western regional vice president; Robin Killian, Kubota senior vice president of sales and marketing; and Charlie Jones, FFA southern regional vice president. Kubota Tractor Corporation is a co-sponsor of the National FFA Nursery/Landscape Career Development Event and the Specialty Crop Production Proficiency Program.

of the tractor market. Today, because of the increased use of smaller models within the entire green industry, these compact tractors enjoy sales equaling almost 40 percent of the market.

The discovery of Kubota's trademark orange tractors wasn't by accident, however. Technological breakthroughs, features not available on any other tractors in the world, made people in the green industry take notice of this relative newcomer.

CARB certification

Kubota was the first manufacturer to receive CARB certification on its under 25-hp diesel and gasoline engines.

Kubota's 2- and 4-wheel drive F60 Series front-mount mowers (60" or 72") were developed specifically for the commercial turf maintenance market. Features include state-of-the-art Auto-Assist 4WD with Dual-Acting Overrunning Clutch System for exceptional maneuverability and a single-pedal operated hydrostatic transmission for easy directional changes.

Tomorrow's tractors for the green industry will be even more user-friendly, more efficient machines designed to handle bigger jobs with fewer people, all resulting in reduced overall costs by offering more production.

1970:

National Golf Foundation puts cost of building a new, 18-hole golf course at between \$200,000 and \$2 million. U.S. Plant Variety Protection Act. New England tree care firms battle ban on open burning of wood.

1972:

Federal Fungicide, Insecticide, Rodenticide Act (FIFRA) becomes law; it is hoped FIFRA will preempt duplicate local laws. Liqui-Green lawn care begins offering franchises.

1974:

The USGA revises its "Specifications for a Method of Putting Green Construction," originally published in 1960. More revisions appear in 1989



and 1990. First New Jersey Turfgrass Expo replaces annual January conference. ALCA has 400 members, PGMS reports 600, and GCSAA about 3,800 members. Robert Felix named executive director of National Arborist Association.

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—Gerald Sprague
Sprague's Lawn Service, Inc.
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Research milestones

*Better turfgrass varieties.
Land grant universities.
Stewardship. Many people
and their ideas have helped
the green industry grow.*

The most significant milestone in the green industry over the past 35 years was the removal of chlorinated hydrocarbon compounds, such as chlordane, as a means of controlling insect and weed pests in turfgrasses.

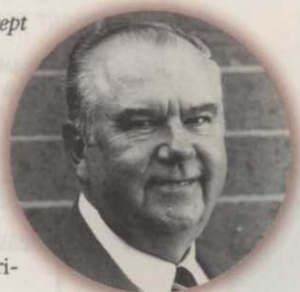
These persistent compounds had a long-term, negative impact on beneficial organisms, which, in turn, exacerbated thatch buildup and development of insects resistant to this class of compounds. Despite their efficacy, the environment is far better for them having been removed.

A second milestone would be the introduction of the *concept* of IPM, which among other things, created a conservative attitude toward the use of pesticides among turfgrass managers and created opportunities for the exploration and development of natural agents to suppress damage from a broad range of turfgrass pests. There is no question that the principles of IPM are sound, however, the concept must remain flexible to allow for integrating new methods and materials as they are developed.

New compounds

Finally, the recent EPA labeling of compounds such as imidacloprid (Merit) and halofenozide (Mach 2), which have a significantly reduced impact on the environment, and at the same time, have an extended residual activity. Compounds such as these should reduce the frequency with which insecticides need to be applied to control damage from insect pests of turfgrasses.

—Dr. Harry Niemczyk, Emeritus Professor, OARDC/The Ohio State University, Dept. of Entomology, 1997.



Niemczyk: a better environment.

Better turfgrass management

All Across America today, we enjoy the benefits of superior turfgrass management. Home lawns are more attractive, sports fields and golf courses are more playable and roadsides have less erosion.

It hasn't always been this way, and we

have many people to thank for the advancements made in turfgrass culture. But the group most responsible are turf scientists at our land grant universities. No two turf scientists would agree as to which findings have contributed the most to this ad-