

LM REPORTS

Mower options: more than 'bells and whistles'

Optional attachments turn mowers into essential, year-round machines.

by Steve and Suz Trusty

■ When is a mower not a mower? When optional attachments have converted the base power unit to a backhoe, skid-steer loader, powered blade, aerator, blower, brush or snowblower.

How important are these optional attachments? How do they affect the need for additional pieces of equipment? How do they affect the cost effectiveness of the original mower?

Obviously, the answers to these questions will vary with each equipment owner. But often, optional attachments can make a major contribution to the bottom line.

● Consider snow removal. If a mower in the northern climates can be converted to a snowblower or equipped with a blade, the seasonal life of that machine is extended by three to five months annually. After the costs of the attachments and additional use hours are factored in, the overall cost of the equipment for mowing is offset by the added use. Expenses for hiring outside help or purchasing a dedicated piece of equipment for snow removal are eliminated.

● If a backhoe is used once every five years, purchasing such an attachment won't be cost effective. If a backhoe is needed frequently, purchasing an attachment may be justified.

If several attachments for the same basic power unit keep that equipment in use over a long enough period, it can justify the purchase of a much more powerful machine than would be needed for mowing only.

Use your calculator or computer to compare past use and equipment rental figures with equipment options.

● How many hours will be needed for mowing? How many hours for snow removal, trenching, clearing areas or other tasks?

● How do the costs of a dedicated piece of specialty equipment, current rental rates for the anticipated period, and the cost of the attachment compare?

● Can current personnel handle the proposed tasks, or could they, if taken through a minimum training period? Would assigning them to the task cut into efficiency in other areas of turf care?

Though the "bells and whistles" may be classified as optional attachments, they can turn a good mower into an essential, year-round machine.

—The authors, principals in Trusty & Associates, Council Bluffs, Ia., are members of the Sports Turf Managers Association.

**FOR ADDITIONAL MOWER PRODUCTS,
SEE PAGE 44**

John Deere: The F1145 front mower has a two-function four-wheel drive system. "On demand" four-wheel drive automatically engages and disengages as needed to improve fuel economy, reduce steering tire wear, and maintain traction when following landscape contours during trim work.

A "Full-Time" four-wheel drive can be engaged or disengaged en route, and works in reverse as well as forward drive.



Circle No. 300 on Reader Inquiry Card

Dixon's ZTR560 riding mower makes a 60-inch cut with three blades. Height of cut adjusts from one to four inches.

Other features include:

- electric blade clutch; ● hydrostatic transmission;
- 20-hp Kohler engine ● electric start
- 4.8 gallon fuel capacity

Circle No. 301 on Reader Inquiry Card



Encore's Pro-Line steerable sulky lets the operator convert a walk-behind mower to a riding model.

Advanced tracking features keep the mower's controls within the operator's reach and eliminate scuffing the turf.

The sulky ad-justs to terrain independent from the mower, and a quick-release hitch makes for easy conversion back to a walk-behind.

Circle No. 302 on Reader Inquiry Card

The **Exmark Explorer II** has a 52-inch floating cutting deck; TriVantage design for mulching, bagging or discharge.

A Micro-Mulch accessory recycles clipping into the turf and comes with rear utility box.

Circle No. 303 on Reader Inquiry Card



Grasshopper: Quik-D-Thatch Vac Grasscatching System uses a powerful vacuuming action to clean up clippings, leaves, debris.



It disconnects in seconds without tools. Five collectors are available, ranging from 8- to 25-cu.ft. capacity.

●Rotary Broom sweeps away dirt and debris and clears up to eight inches of snow.

●Dozer blade moves dirt, sand and gravel, and snow quickly and easily. It is available in 48- or 60-inch blades which operate straight ahead or 25 degrees left or right.

Circle No. 304 on Reader Inquiry Card

Jacobsen Division of Textron: a new five-gang fairway mower, the LF-33810, was released in September of 1992. The LF-



3810 features a 155-inch cut, with five, 7-inch diameter, 10-blade reels.

Jacobsen's down-pressure spring system follows ground contours for a quality cut, even with cutting heights as low as $\frac{3}{8}$ of an inch, at speeds up to 7.5 mph.

Circle No. 305 on Reader Inquiry Card

Kubota Tractor Corporation's GF1800E front mower is designed for maximum mowing performance and efficiency.

Equipped with a hefty 18-hp, liquid-cooled diesel engine and a variety of other

performance and safety features, the GF1800E is ideally suited to commercial mowing jobs.

The GF1800E is available in three shaft-driven, off-set mowers:

- 1) a 48-inch mulching rear discharge mower;
- 2) a 54-inch side discharge mower;
- 3) a 60-inch side discharge mower.

Circle No. 306 on Reader Inquiry Card



Lesco 42-inch and 52-inch commercial rotary mowers are high-productivity and easy to operate.

Their zero-turning-radius design lends extra maneuverability.



An exclusive dual-articulating deck simplifies mowing of hills, slopes and banks, and also provide better traction.

These Lesco mowers feature two hydraulic pumps and individual wheel motors.

Circle No. 307 on Reader Inquiry Card

Scag: The SSZ "Super Z" gives commercial cutters a zero-radius operation with a 48-inch floating deck.

Forward ground movement is to 6.8 mph.

Additional features: electric blade engagement clutch, durable taper roller bearingspindles, and a 5-gallon fuel tank.

Circle No. 308 on Reader Inquiry Card

The 35 hp version of **Gravelly's** Promaster 400 Series of diesel front mount commercial mowers has added a



differential lock to its list of attractive features such as:

- hydrostatic drive;
- hydraulic lift;
- "sharp turn" steering
- heavy duty battery;
- easy wheel brake lock,
- 8.75 gallon gas tank
- easy-to-reach points.

Circle No. 309 on Reader Inquiry Card



KUBOTA RELEASES ANOTHER BEST SELLER



Kubota Tractor Corporation's new compact, yet powerful GF1800E diesel front mower is a hit with professional mowing contractors. Ideal for commercial mowing jobs that demand maximum mowing performance and efficiency from a fuel-efficient, compact machine with outstanding maneuverability.

Equipped with an 18-horsepower, liquid-cooled diesel engine, the GF1800E offers a choice of three shaft-driven, off-set mowers – 48" mulching rear discharge mower, 54" side discharge and 60" side discharge. The three mower decks feature a cutting height from 1"– 4". The GF1800E has a hydraulic brake, clutch and lift system.

The sophisticated hydrostatic transmission features a single pedal to manipulate both speed and direction, eliminating shifting and clutching. Front-wheel traction, differential lock and rear-wheel steering for tight turns lets you work efficiently on all types of grass without turf damage.

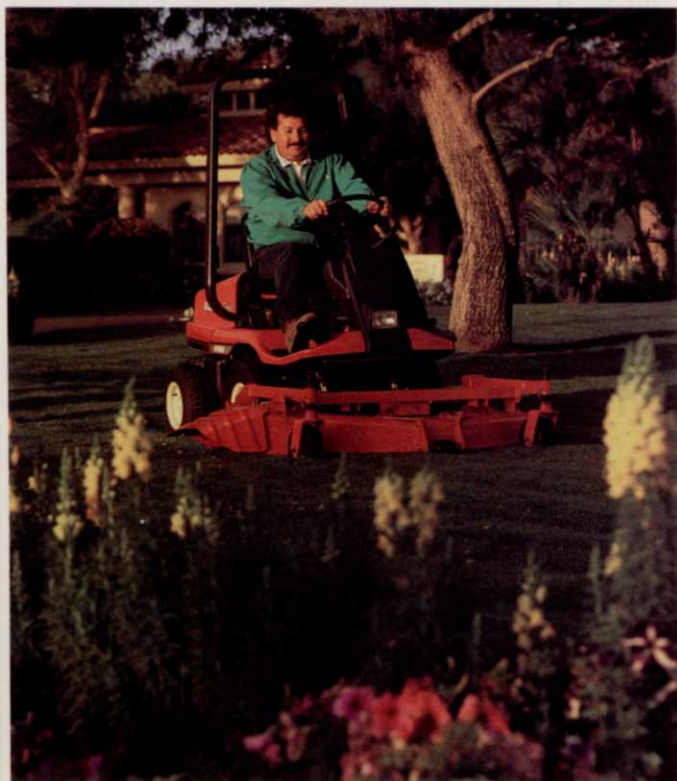
A 3-cylinder engine, "speed set control" hour meter, full-tilt steering wheel, one-touch seat adjustment, semi-flat deck and reverse air system are standard.

For the best quality cut, see your authorized Kubota dealer today.

Kubota

For information write to:

KUBOTA TRACTOR CORPORATION
P.O. Box 2992, Dept. LM, Torrance, CA 90509-2992
Financing available through Kubota Credit Corporation.



Making a place for turf in the desert landscape

'Everybody thinks desert landscaping means rock and cactus. In our designs, you're going to see the wildflowers and natural plants that grow here.'



This home landscaping project by Arterra shows how turf complements the dry, dusty look. The expanse of green turf replaced a bland stretch of river rock.

■ Landscape designer Peter Curé has lived his life in Arizona. He loves to be outdoors in the warm Arizona sun. And like many a cowboy who rode the plains before Curé began his life's work, he spends all of his time outside, putting together the pieces of desert landscaping.

President of Arterra, located in Scottsdale, Ariz., Curé's been in the landscape architecture/installation business for 25 years.

Arterra is a full service shop that can handle the A-to-Z of design and installation, with a little help from pool and paving contractors.

"We're not really a design/build firm," explains Curé, "since the initial idea is to sell the design alone. We'll meet with them again with a cost estimate. They pay us for the total design fee and then we give them a proposal to do the whole project. We end up building probably 80 to 85 percent of the projects we design."

Arterra designs both residential and commercial landscapes, but it installs only the home projects.

The Arterra company is four years old. Curé had a larger company during the 80's boom, then downsized when the recession hit. Business has been booming over the past three years, thanks to residential remodeling jobs. Real estate sales have been slow, so owners decide to stay put and add a pool or new landscape.

People may not be buying homes, but they sure are building them. The area's current new home construction market has taken off. Homes there are selling for a quarter to half a million dollars.

Green is good —Curé admires desert landscapes, but not to the exclusion of turf; he thinks the "desert style" is stereotyped.

"Everybody thinks it means rock and cactus,"

says Curé. "That's not what our designs are at all. In our designs, you're going to see all the wildflowers and natural plants that grow here."

Curé has found that growing plant material is easy and worthwhile if you can give it the time and space required. The Arterra crew has become expert at nurturing container-grown plants until they reach the desired size for a specific project, from seedlings all the way up to the 24-gallon-size.

Always in focus — A degreed landscape architect who learned his craft at Arizona State, Curé (pronounced *Cure-ay*) worked his way through design school



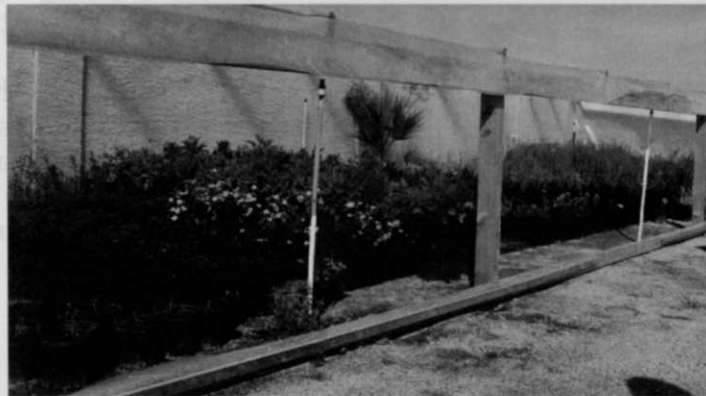
Peter Curé: When planting, stress the symbiotic relationship native plants have developed to survive. Some of them belong together.

by working at a local architectural firm. After graduation, he stayed with that company rather than apprentice himself elsewhere.

Curé most likely would have felt stifled starting off again as an apprentice, given the experience he had up to that time. Today, he has the look of a man who's always thinking, as if he's working on a blueprint in his head.

That focus has paid off. Business is based exclusively on referrals. Awards fill office tabletops, and Arterra projects are often featured in local and state association magazines and several home and garden journals.

—Terry McIver



A section of the Arterra nursery shows the volume of planting that's possible if given enough space.



Save a few lawns this year.

Treat for grubs with OFTANOL insecticide. It's about twenty cents less per 1,000 square feet than most grub control products. Which means you'll be saving more



than your customers' turf this year. For more information, contact Miles Inc., Specialty Products, Box 4913, Kansas City, MO 64120. (800) 842-8020.



It turns other



front runners into also rans

Making a wrong decision when buying a 4-wheel-drive front mower could put you on top of the heap sooner than expected.

That's why the smart money this year is on the nose of the durable John Deere

F1145. The F1145 is the only one

on the market built with heavy-duty real-tractor components.

The 2-speed axle, hydrostatic drive, differential lock, wet-disk brakes, and planetary final drives, for example, are lifted straight from our 855 Compact Utility Tractor.

And this 24-hp diesel is the only one that lets you switch from on-demand to full-time 4-wheel-drive, on the go.



This heavy-duty rear-wheel-drive axle is but one of many components taken straight from our 855 Compact Utility Tractor.

And that means more precise operator control and maximum fuel economy.

The F1145 will turn other front runners into also rans. See your dealer today. Or call 1-800-544-2122 for information.

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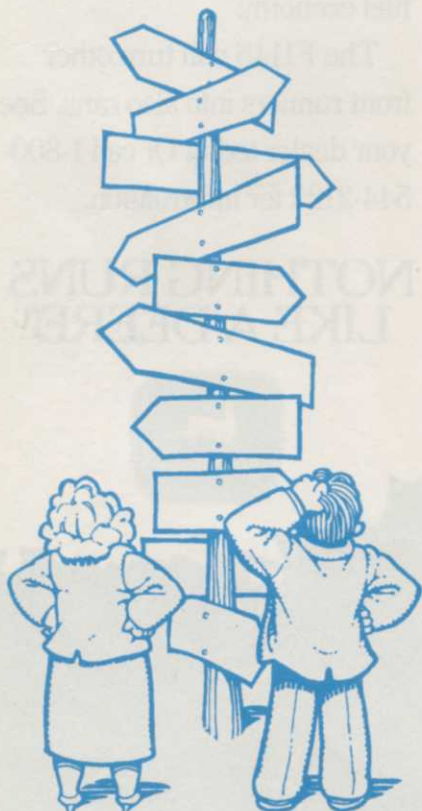


ORGANIZATION:

clear or confused?

WHO'S RESPONSIBLE HERE?

—A state of organizational confusion sends mixed signals to employees and can frustrate them.



by Ed Wandtke

■ Lawn/landscaping operations in the green industry continue to expand through an increased number of customers or services. However, many managers do not add administrative or supervisory personnel.

Some organizations don't even take the time to formally designate a person in charge of a new undertaking. Rather, they assume everyone else in the company knows who is in charge.

If this sounds like your company, read on. **Rapid growth**—One cause of an operation's inability to declare responsibility is the top manager. Many wait until the very last minute to see what segment of their operation will grow the most before making a decision.

These operations have fragmented leadership. Crew chiefs and lead technical personnel, in order to get the job done, take on responsibilities which they have not been assigned. If such is the case, what will force the manager to appoint someone the team leader? If judgment errors are made, who will be held accountable?

Managers often personally take care of marketing, finance and administration. As the operation starts to grow, additional people are not hired because management does not want to commit to fixed overhead expense. The solutions are often very confusing to employees.

When an organization is growing, many owners prefer to avoid hiring full-time employees if part-time individuals will do. Many, large and small, purchase the services of specialized consultants to supplement current employees rather than hire more full-time employees.

For example, instead of using a full-time payroll person, an operation could hire Automated Data Processing (ADP). However, this does not have to limit opportunities for employees seeking higher responsibilities, because these outside temporary employees are generally replaced when a full-time individual is needed.

Promote from within—Many managers say they will promote supervisors and other positions from within the organization, but they continue to advertise in

trade magazines or regional publications. This mixed signal confuses and further frustrates employees who are hoping to be promoted.

If your organization does not have a periodic evaluation plan where the manager discusses the employee's ambitions, employees will have difficulty growing.

Establishing such a plan is necessary and very beneficial. Goal-setting and training programs help employees grow into the positions that will be needed in the future.

Doing this during the busy seasons is often overlooked. When a manager reviews employees' goals with them during a busy season, they realize how important the goals are.

Long-range designs—It's difficult to develop a training plan if you haven't identified the various positions and skills that will be needed as the organization grows. By formalizing a long-range plan, the manager will be taking time to identify anticipated personnel needs based on probable future services and volume of business.

Stabilize morale—When an operation has no formal organizational design, employees often flounder—sometimes from lack of direction, sometimes from too much direction.

Employees like jobs where daily duties and assignments are very specific and predictable. They like a steady work environment. The smoother an operation runs, the more the employees enjoy coming to work. And, in many instances, employees work harder.

When their daily duties are predictable, employees tend to have a bounce in their actions. Their overall attitude is more relaxed. They tend to get along so well that they begin to socialize outside of the office. They often perform at a higher level than anticipated.

The bottom line—Allowing employees access to the organizational chart will help them to recognize who is in charge of various functions. Open communications mean higher morale and better feelings about an operation by its employees.

If you don't have an organizational chart now, develop one. If you do have an organizational chart, share it with all employees. Knowing where an individual stands will strengthen the lines of communication, and errors will be avoided.

—Ed Wandtke is a principle in Wandtke & Associates, 2586 Oakstone Dr., Columbus, OH 43231; (800) 966-3546.

Calif. superintendent breaks away from 'rescue chemistry'

'Feed the soil' are the words they live by at Lake Wildwood Country Club.

■ The maintenance crew at Lake Wildwood Country Club, in Penn Valley, Calif., has successfully incorporated a nutritional program into the daily turf care program.

At the center of the program is the belief that soil nutrition is the most essential factor to disease control.

The program at Wildwood is currently led by Mark H. Bunte, who earlier in his green industry career earned a degree in ornamental horticulture from Cal Poly State University/San Luis Obispo, and who also has experience in landscape construction.

But Bunte is quick to credit former superintendent, Dave Wilber—now with Brookside Labs—with laying the groundwork three years ago.

According to Bunte, Wilber believed—based on supporting research—that microbial activity in the soil was the key to healthy, disease resistant turf.

"Before," recalls Bunte, "all applications were synthetic, and fungicides were used in antici-

tion of disease problems."

Three years ago, Wildwood's greens and fairways suffered from poor heat and wear tolerance, shallow rooting, poor water infiltration and *Poa annua* encroachment. The belief was that the heavy use of fungicides on the greens were having a negative effect on microbial populations.

Competent soils analysis discovered that there were severe nutrient imbalances throughout the course.

A custom blend of 5-26-25 was needed for tees and fairways. Greens were treated with Scotts' starter fertilizer and Bests' 0-0-50.

Calcium levels were, as Bunte recalls, at a "critically low" level.

"We hired one of those lime trucks that spreads material in the rice fields



Lake Wildwood superintendent, Mark Bunte, uses a refractometer to measure sugar levels in leaf tissue.

to do the job," says Bunte. The truck spread 100 tons of sugar beet lime
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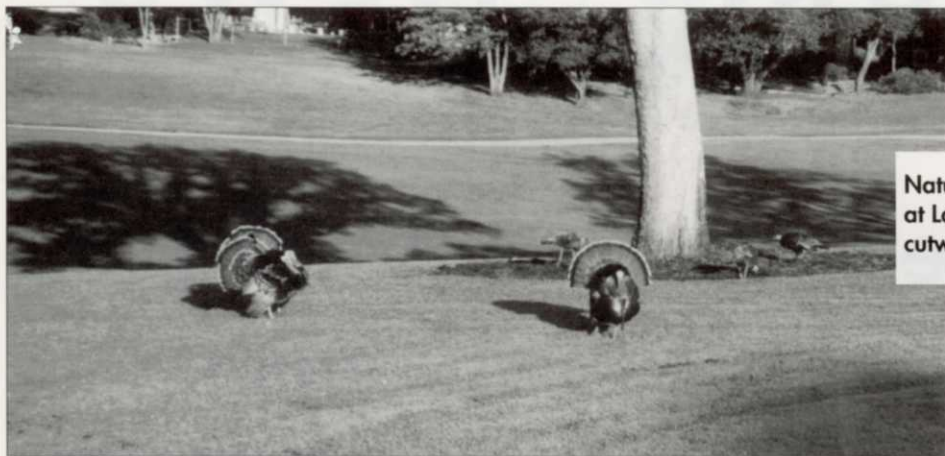
"We decided on a fertilizer based on what was needed, not on what was available."

Sugar beet lime is applied to fairways and roughs at a rate of one-and-a-half tons per acre.



IN THIS ISSUE

Synthetics and organics: how they can work together
Florida tries nematodes against mole crickets
A place for sludge: are forests the answer?



Nature's IPM: wild turkey flocks at Lake Wildwood help with cutworm control.

in about two-and-a-half-hours, at one-and-a-half tons per acre."

Bunte says the lime costs about \$3,500, and for three years they've made the applications to bring calcium content to the desired level.

Phosphorus was also found to be in short supply.

"The lab recommended 238 pounds per acre," says Bunte. "We had been using less than 80 pounds.

Irrigation is more frequent, but is operated manually. Now, 1650 gallons per minute are dispersed, down from 1800 gallons, and the system was fine-tuned for equal pressure from all heads.

Wetting agents are used for certain troublesome wet/dry areas. Greens are mowed six days each week. On the seventh day, dew is removed in the morning to "interrupt the fungus cycle," says Bunte. Drain tiles were installed in low-lying areas of the fairways and roughs to reduce the potential for disease there.

Impressive results. Bunte hasn't made one major fungicide application in 1993. A small dollar spot infection crept



Greens assistant Adam Richardson applies oyster shell lime to greens, collars and tees.

onto one green, and was corrected with Scott's FFII.

"We treated the worst part of the green and left the other part alone to see what would happen. The untreated turf grew out of the situation and looked fine."

Bunte believes potassium or other fertility applications help the turf "grow out" of the ailment. "Nature does the talking, and we listen," he says.

Walk-behind greens mowers have replaced riding units at Lake Wildwood. They're lighter, and they bring the operator closer to the green.

Walk-behind greensmowers have replaced riding units at Lake Wildwood, and turf density has improved "tremendously."

Fairways and tees are overseeded with endophytic ryegrass, and mowed with sharp reels. Appearance and playability of the golf course has improved.

Mowing heights are set at $\frac{19}{100}$ of an inch, or until the complaints are too much to bear.

Greens are verticut every 14 days during the growing season at $\frac{19}{100}$ of an inch and topdressed in lightly.

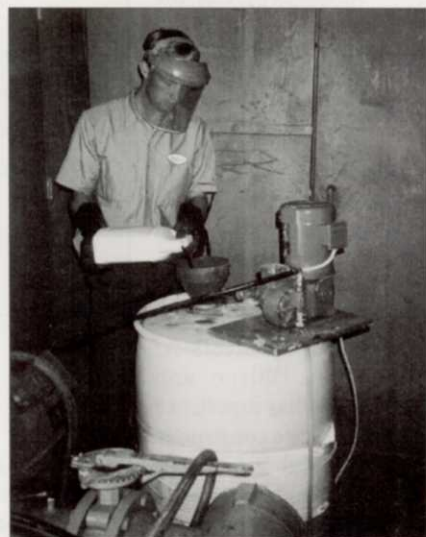
To maintain organic levels and consistency, turf cores are crushed and returned to the green.

Eye on the public eye. In a nod to public perception of a spray tank and suited applicators, the crews now use granular materials.

"In the years past the

spray rig used to go out every 14 to 21 days with fungicides for preventive controls," says Bunte. "In an effort for better public relations, we post information at the pro shop on those days we use the spray rig and tell the members what is in the tank. The spray rig is now used for humates, micronutrients and some foliar fertilization."

The goal of all this is to escape what



Assistant superintendent Stephen Leas pours micronutrients into a fertigation injector drum.

Photos courtesy Mark Bunte

Bunte describes as "rescue chemistry," and he has his fingers crossed for the remainder of 1993.

"I am fortunate to have gone through this wet winter and spring without fungicides," says Bunte. "The improvement in microbial activity has increased the stress buffering capabilities of my greens and the severity of outbreak is dramatically reduced."

Organic/synthetic product mix based on soil nutritional needs

Use synthetic control products and natural organics together for one goal: soil nutrition.

by Mark Nuzum

■ It may seem like a contradiction: using a chemical pesticide with an organic fertilizer, but it all depends on what you're trying to accomplish.

Certainly, chemical control products have no place in a 100 percent all-natural program, but few turf professionals have the opportunity—or patient customers—to follow that philosophy.

Many professionals will avoid incorporating organic fertilizer products into their current programs because they will still be using pesticides. There seems to be a common misperception that in order to use organic fertilizer products, you must change your whole way of doing business. Banning organic inputs because chemicals are being used has no sound agronomic basis at all. In fact the people who are using chemical pesticides may need organics even more.

Even though the goal of Integrated Pest Management is to gradually reduce the use of pesticides, they are a realistic part of turf care programs, necessary for an acceptable stand of turf.

The problem with pesticides—especially fungicides and insecticides—is that they drastically affect soil life, decreasing its natural ability to withstand pest problems. Therefore, bad soil leads to more susceptible turf, which must be treated again, bringing on a cycle of problems. We turn to artificial maintenance products when the soil alone can't sustain the plant. Each of these products or practices can also have negative effects on the soil environment, thus perpetuating the need for more artificial support.

Organic fertilizers play an important role when pest control products are used. They help to rebuild the soil and create an environment more resistant to pests and

disease. A big advantage of using organic materials to feed plants is that they do stimulate the activity and populations of living macro and micro-organisms. On the other hand, there is evidence that certain pesticides damage these same beneficial populations. Since this is the case, shouldn't our thinking be that when pesticides are used, organic inputs are essential to help rebuild and restore any detrimental effects the control product may have had on the soil?

Another factor to consider: what product is used to accomplish the pest control with minimal impact to the soil system. University tests have shown that some pest control products impact soil organisms much more than others.

Frequency of application is also an

important factor. If application of a low-impact pre-emergence product can prevent single or multiple applications of a post-emergent, the turf environment would be better off in the long run. Spot treatment of only those areas with a problem also reduces over-use.

Avoidance of chemical control products to achieve 100 percent natural organic programs has its philosophical, idealistic arguments, but not everyone can completely avoid pesticides. Yet, no one should avoid organics just because pesticides are used.

—The author is president of the Plant Products Division of Harmony Products, Inc., Chesapeake, Va.

Understanding soil structure

To understand and discuss organic fertilizer clearly, we must first understand the soil itself.

This complex, living environment is the most important factor affecting a plant, and the most important aspect of an organic-based turf care program. When the soil is in good condition, it is capable of supporting plants well. The soil is a thriving environment, a living system with food chains and checks and balances.

For example: the earthworms aerate the soil and create channels for water distribution and root growth. Bacteria and fungi are also needed for good soil balance: they break down organic and mineral nutrients; beneficial nematodes, bacteria and fungi help keep turf-damaging nematodes, bacteria and fungi in check.

The soil's condition and its ability to carry out its functions correlates directly to the health and vigor of the plants growing into it.

When the soil functions are decreased for any reason, the ability to support a healthy plant is also diminished. Poor soil conditions include compaction, low moisture retention, low microbial activity and low soil nutrient-holding capacity. When the soil is poor—which may be due to natural conditions or the overuse of chemical pesticides and fertilizers, artificial means of support are needed (irrigation, aeration, fertilization and weed/insect/disease control products) as a short-term solution.

We must focus on improving the soil by feeding it. Soil functions require energy sources because soil functions are carried out by living organisms that require energy. Fertilizers should contain energy-rich organics to support the soil life that will in turn make slow-release nutrients available to the plants.

—M.N.

Seeking sites to slip sludge

COLLEGE PARK, Md.—The state of Maryland produces about eight to nine thousand tons of wet sludge—every day.

About one-quarter of the sludge is used as farmland fertilizer.

But as farmland in the state disappears, new sites are being considered as sludge fills. Forest land is one alternative under consideration.

“A prime concern with sludge application to forest land,” says Marla McIntosh, from the University of Maryland, College Park, “is the fate of nutrients in the sludge, especially nitrogen.”

As part of a continuous regional project—supported in part by the Maryland Agricultural Experiment Station—McIntosh is examining how sludge can be scattered in forests without harming the surroundings.

Nitrate levels a clue. After applying

sludge to forest land, McIntosh measures the nitrate levels in the soil water, which is the water contained in the soil above the ground water level. The soil may be different from that used as farmland, says McIntosh, as the rich organic material in the layer of leaf litter may immobilize sludge-borne nitrogen, and decreasing the amount of nitrogen that can leach into the ground water.

Other advantages. According to Dr. McIntosh, sludge can be applied to forests year-round. Forest lands are more accessible than farmland and are not associated with public food supplies, McIntosh says.

The experiment station reports good results with sludge application in some

The advantages: sludge can be applied to forests year-round; forests are more accessible than farmlands, and are not near public food supplies.



Dr. Marla McIntosh, center, Dr. Robert Hill, left, and Dr. Scott Angle hope to put sludge to work in forests.

West Coast forests. The nutrients have helped the timber industry by improving tree growth.

However, results in one part of the country may not apply to another.

“You cannot generalize to other areas,” says McIntosh, who reports no improved growth from her study. Researchers in Pennsylvania and New Hampshire, also participating in the regional project, found different results.

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Raising nitrogen levels. Three different sludge concentrations—low, medium and high—were applied to a plot of trees at the Central Maryland Research and Educational Center in Clarksville.

Nitrogen increased slightly in the soil water containing low sludge concentrations and returned to normal after a short time.

The medium and high concentrations resulted in soil water with nitrogen levels well above acceptable levels. The nitrogen levels remained above normal after two years.

To be considered useful, research has to be able to predict nitrogen leakage under worst-case conditions.

These include instances where nitrogen is not being cycled into the ecosystem, leaving more to leach into the

groundwater.

Maryland experienced this worst-case scenario with its two-year drought in 1986 and 1987, where rainfall was half that of normal, says McIntosh, which may have caused the lack of growth as well as the varied results in nitrogen

Nitrate leaching into groundwater is the limiting factor for applying sludge to forest lands.

leaching. When water is scarce—as in a drought—two things can happen: plants do not take up as much nitrogen and denitrification—the process by which nitrogen is released into the atmosphere

as nitrogen gas, and occurs only under waterlogged conditions—does not occur.

The sludge was applied at a rate of 714 lbs./acre, twice the medium of 357 lbs. Leaching levels, however, were about the same for both rates.

McIntosh suggests that under more rainy conditions, leaching might not occur or might not be as high.

Nitrate leaching into the ground water is the limiting factor for applying sludge to forest land.

McIntosh says nitrogen levels must be watched closely, and be allowed to return to baseline levels before re-applying.

Sludge application on farmland is highly regulated, but no regulations exist for forest lands, according to McIntosh, who hopes her research findings will help establish such guidelines.

AgriDyne seeks foreign markets for neem

SALT LAKE CITY—AgriDyne Technologies, Inc. announced recently that it had filed foreign registration applications for its neem-based bioinsecticides.

The applications were filed in Italy, France, Spain and the Netherlands, as well as 14 Latin American countries, including Mexico.

AgriDyne has requested marketing clearance for three bioinsecticides:

- Azatin, for non-food crop application in the nursery and ornamental markets;
- Turplex, for lawn and turf application;
- Align, for food crop application.

The active ingredient for each bioinsecticide is azadirachtin, a natural insect growth regulator extracted from the seed of neem trees. Found in more than 50 countries worldwide, the tropical neem tree has long been recognized for its natural insecticidal properties.

AgriDyne received marketing clearance from the U.S. Environmental Protection Agency (EPA) for Azatin and Turplex in January 1992, and anticipates EPA registration for Align in 1993.

"The four European countries represent a significant portion of the

European market for insecticides," says Eric B. Hale, AgriDyne president and chief executive officer.

"Additionally, they are some of the more environmentally progressive nations in Europe.

"These foreign registration filings are part of our on-going strategy to broaden the market and grow our revenue stream, for our family of bioinsecticides."

AgriDyne had previously received marketing clearance for its neem-based bioinsecticides from the Dominican Republic.

Biosys buys AgriSense

PALO ALTO, Calif.—Biosys announced recently it had acquired AgriSense, a Delaware general partnership.

The acquisition includes the wholly-owned AgriSense European subsidiary, Biological Control Systems and the U.S. operations headquartered in Fresno, Calif.

Both divisions of AgriSense develop and market pheromone-based products for detection and monitoring of cockroaches and insect pests in high value crops and stored products. Other product and technologies include those that disrupt the mating of insect pests which attack rice and cotton crops.

AgriSense was sold for \$3.5 million in cash and 400,000 shares of biosys common stock. Additional shares may be issued under "certain circumstances."

AgriSense is commercializing products based on Phillips Petroleum's pheromone

synthesis technology and Dow Corning's micro-encapsulation/slow release technology developed for pheromone traps and lure applications.

The product range provides for non-toxic, environmentally compatible detection, monitoring and control of insects in agricultural fields and orchards as well as in residential and industrial sites. Integrated pest management regimes which minimize the use of chemical pesticides are made more effective through the use of such monitoring techniques which assist in timing and in minimizing the application of pesticides.

Florida supers try biocontrols to relieve scourge of mole crickets

GAINESVILLE, Fla.—Some Florida turf professionals are using nematodes and red-eyed flies to help control the mole cricket, one of the South's most hated pests.

Two University of Florida scientists, H. Howard Frank and nematologist Grover Smart, released parasitic nematodes (*Steinernema scapterisci*) and Brazilian red-eyed flies (*ormia depleta*) at two sites in 1985. They concluded their project last year after reportedly having been successful in establishing the parasites in several counties. They say they've recorded all-time lows in mole cricket trapping records.

"Mole cricket damage to the turfgrass industry could be devastating," to golf courses, sod producers and homeowners, says Robert J. Yount, executive director of the Florida Turfgrass Association. The cost to repair mole cricket damage is estimated at \$46 million per year.

The FTGA funded the University research with more than \$250,000 after state funding ran out in 1987.

Smart was awarded a patent late last year to use the Uruguayan nematode

against mole crickets. The patent has been licensed to BioControl, Inc., a new company headquartered in Tampa, Fla. BioControl markets the nematodes to golf course superintendents and other turf professionals in the Southeast.

BioControl

tions by the end of the year, including repeat treatments.

According to McCaskill, companies using the product include Augusta National and Bay Hill, site of the Masters and Nestle Invitational, respectively.

BioControl has treated several athletic fields in one Florida county, and

**"It's a high-tech approach and a very valid approach, but the industry itself wants to sit back and be sure that it does indeed work."
—Bob Yount**



founder, Cameron McCaskill, says at least 50 golf courses have been treated with the nematodes this year. The company expects to sell 200 applica-

about a dozen grazing pastures, which are also plagued by the mole cricket.

According to McCaskill, sod farms, seed growing acreage and vegetable crops can be targets of the crickets.

McCaskill says the nematode demand is far ahead of the supply. "If we could supply the demand that's out there, we could have a fair amount of business very quickly," says McCaskill.

Yount says about five percent of the state's 1,200 golf courses have begun using the biological control method as a standard maintenance practice, and predicts that figure will rise to 60 percent in 10 years.

"It's a high-tech approach and a very valid approach," says Yount, "but the industry itself wants to sit back and be sure, before they introduce a treatment like this on their very valuable land, that it does indeed work."



About five percent of Florida's 1200 golf courses have been treated with biocontrols as a standard maintenance practice. Up to 60 percent are predicted to be using some form of biological controls in 10 years.

PRODUCTS

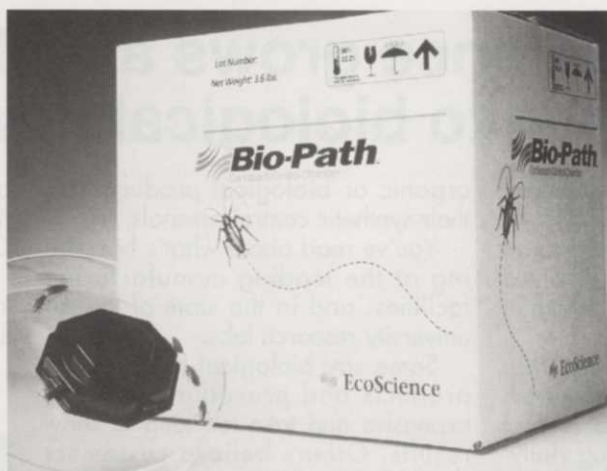
EPA gives okay to natural cockroach control product

A new patented biological cockroach control product is called BioPath.

The Cockroach Control Chamber is the first to use a naturally occurring microbial agent, instead of a synthetic chemical pesticide, to kill cockroaches.

The chamber technology is an application of a natural microbial agent to control household pests.

Although used like a bait station, the Bio-Path chamber has a dramatically different mechanism of action. Where traditional bait stations require the cockroach



to eat a chemical pesticide, the Bio-Path Cockroach Control Chamber is the first product to only require the cockroach to touch the microbial agent found within the chamber.

The exposed cockroach can then spread the microbial agent to other cockroaches through any direct contact, known as Horizontal Transfer.

For more information, contact Bio-Path's Kevin Devine, at (508 754-0300.

Bioinsecticide approved for crop protection purposes

Crop Genetics International, of Columbia, Md., announced in mid-May it had received EPA approval for its Spod-X bioinsecticide, as an active ingredient for future commercial crop protection products.

According to the company, Spod-X is the first virus-based product to be approved by the EPA in the last ten years.

Spod-X is a naturally-occurring insect virus which controls beet armyworm, a major insect pest on tomatoes, lettuce, cole crops, flowers and ornamental plants.

Insect viruses occur naturally in the environment, and are very specific in their ability to infect certain insects. The company reports the viruses present no known threat to crops, wildlife, humans or non-target insects.

Circle No. 311 on Reader Inquiry Card

Nematode strain has greater downward mobility, efficacy

A beneficial nematode from Nematoc, called BioMega reportedly has a greater tendency to move downward through the soil, with superior host seeking abilities.

According to Nematoc Biological Control Agents of Lafayette, Calif., the *Heterorhabditids* group of nematodes has three distinguishing characteristics:

- Greater attacking ability. A minute, tooth-like structure allows the Bioomega strain to penetrate directly through the

insects' skin, rather than being restricted to natural body openings.

- Greater vertical mobility. In studies conducted in sandy loam soil, infected juveniles of *Heterorhabditis* showed a greater tendency to move downwards to a depth of 30 inches from the surface.

- Greater reproductive rate. According to the company, nematode reproduction is dependent on an infective stage of each sex entering the host. In the *Heterorhabditids* strain, all infective juveniles develop into hermaphroditic females, thus establishing a breeding colony when a single nematode enters the host.

BioMega Turf and Lawn Bio-Insecticide is based on this strain, and is designed to provide a convenient, cost-effective means of controlling Japanese beetles in turfgrass.

In research conducted at the University of Rhode Island, control results of 46 percent and 55 percent were achieved using a concentration of 666 million nematodes per acre and 3.33 billion nematodes per acre.

BioMega is also labeled for masked chafer, May/June beetles, European chafers, cutworms, armyworms and billbugs.

Fifty million *Heterorhabditid* nematodes will treat an area of at least 2,200 sq.ft. of turfgrass or soil (one billion per acre).

BioMega Turf and Lawn Bio-Insecticide costs \$20.75 for 50 million nematodes, including priority overnight delivery service.

Circle No. 312 on Reader Inquiry Card

BIOTURF NEWS

For professional landscapers, lawn care operators and golf course superintendents interested in learning more about organic turf care supplements to existing chemical control.

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BIOTURF NEWS



Our audience grows as *LM* readers subscribe to biological news source

With our October premier publication of *Bioturf News*, we at *LANDSCAPE MANAGEMENT* magazine continued our commitment to give you the best possible coverage of green industry happenings.

Bioturf News—our bi-monthly review of current research and development in “biological, organic and natural” turf care—is growing daily. Response to *Bioturf News* has been overwhelmingly positive. Those who are using biological or organic products—even experimentally—are glad we’ve taken the lead in keeping you abreast of the latest developments.

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Maintaining infields

ways in Illinois

3

1

Attention to daily maintenance the key on Waukegan field:

by Mike Trigg
Waukegan Park District

■ Attention to detail gives Waukegan's Al Grosche Field its professional look, and helped win the 1989 Beam Clay diamond-of-the-year award. Specific infield care includes daily prep maintenance, edging and renovations.

Daily maintenance begins by raking back the infield mix into holes and low areas such as those around home plate and the bases. It's important to compact the mix, creating a firm, level surface. The skinned area is dragged daily. Prep crews drag 8 to 12 inches away from the arc edge so as not to push the infield mix into the grass area. After dragging, the grass edges are hand-raked to maintain a smooth transition between the mix and

the grass. Batters' boxes and foul lines are lined with a 2-inch chalk line, using a frame and string for accuracy.

Edging the infield grass occurs at the beginning of the baseball season, mid-season, and before major tournaments. Approximately two inches of the turf is trimmed back with a sidewalk edger. Infield mix is added to produce a level surface between the grass and the skinned area.

Renovations are scheduled at season's end to repair worn turf areas and remove the "lip" build-up along the arc edge. A sod cutter removes 18 to 24 inches of turf along the arc, along with four inches of underlying soil. New infield mix is added back to the newly-established grass edge and firmly compacted.

The success of any infield renovation is determined by daily maintenance procedures.



Mike Brouillard uses a sidewalk edger to trim about two inches of infield turf.

2

Conversions take the spotlight in Glenview parks:

by Mike Moorman
Glenview Park District

■ Eleven of Glenview's 46 ballfields have sodded infields, the rest skinned infields.

Park district maintenance crews receive assignment sheets each morning, along with an inspection report/itemized worksheet for each field. Line entries are made on all aspects of field maintenance. Face-to-face meetings are held with each crew member at day's end to make sure there are no missed ideas.

Skinned fields used for league play are lined with chalk, and base pegs are exposed for team members to set the bases, each weekday. Non-league-play skinned ballfields are groomed weekly. On weekends, needed equipment is stored on-site so that league members

can groom.

All field prepping is done in the fall. Lips are cut; sod is edged; the arc is measured; and bases are measured to assure they meet league specs. In the spring, fields are cleaned and raked, and any damage repaired. The fields are groomed and new base pegs and pitching rubbers are placed.

Conversions to sodded infields are slated for some fields in the fall. This will reduce crew travel time, allow more maintenance of remaining skinned fields, and create a more multi-use park setting. Our crews can now complete the conversion in about three days.

Infields to be converted are measured for area and volume of ballfield mix to be removed. The mix is transferred to another skinned field for topdressing. Approximately 35 to 50 bags of Turface

are applied to the infield prior to field mix removal, improving mix quality in one process.

Next, we apply pulverized topsoil to the area, grooming in a slight crown for drainage. We fertilize at 1 lb./1000 sq.ft. and then lay sod. We irrigate if necessary.

Sodded infields receive general scheduled park maintenance, including mowing, weed control and garbage collection.

Specific maintenance is scheduled during the fall. Turf at points of high wear—home plate, the pitcher's area and the bases—is removed with a sod cutter. They are backfilled with topsoil, firmed, leveled and new sod laid. Fencing protects these areas until the sod is established.

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important, we'll bring you up to speed.

