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*David Muessel and Cathy Thrash took Inner Gardens Landscape from a small interior plant leasing company to a full-service interior and exterior horticulture management firm where expansion is always on the agenda.*



In this issue:

**Slow-Release Fertilizers**

**Recovering from  
Hurricane Andrew**

**Computer-Aided Design**

**Reliable  
Irrigation Installation**



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# Lawn & Landscape MAINTENANCE

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AUGUST 1993

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Ogden Robertson, Houston

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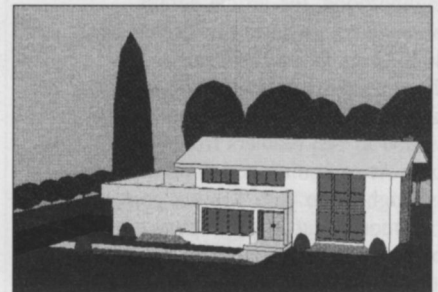
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# Editor's Focus

WITH THE DELUGE of rain and flooding across the Midwest, it's hard to believe that some areas of the United States are experiencing drought-like conditions.

And in those abnormally dry areas — to the East and Southeast of the United States' newest "Great Lake" — a good dose of rain is needed to revitalize turf and plant materials that have taken on a brown pallor.

But a lack of rainfall and an increased desire to water landscapes is a bad mix for the green industry. Confusion reigns because no one can agree what constitutes a waste of water, leading instead to sprinkling restrictions and outright irrigation bans.

For example, in Palm Beach, Fla., residents are not permitted to water their lawns between 9 a.m. and 9 p.m. The town council is considering amending the law between the hours of 9 a.m. and 5 p.m. to accommodate those without automatic sprinkler systems. The town also wants to institute water audits to reduce the amount of water used in maintaining landscapes.

The water issue, whether an area is saturated or dry, needs to be resolved. Lawn and landscape professionals can play a role by becoming visible proponents of proper water use.

---

*The New York Times Syndicate* recently released an article to all member papers "Why Blow When You Can Rake?" Through the eyes of a wealthy pianist living in an upscale Greenwich, Conn., neighborhood, the article derails homeowners for hiring landscape firms that use blowers instead of rakes.

For the most part, this column took a comical look at one man who is on a mission to ban blowers from his neighborhood. At one point, he is said to be so distraught as to yell "I'm not going to take it anymore," but it would have constituted noise pollution. If he had his way, blowers would be banned from May 15 to Oct. 15.

But the tirade doesn't stop there. He formed "Project Quiet Yards," an organization trying to maintain serenity in Greenwich. The group took out an ad in the local newspaper offering to pair homeowners with lawn services that have promised not to use leaf blowers. Fifty to 100 residents called in response.

He is also spreading his version of how blowers are not only an "ear sore," but a disservice to the landscape: "Having air whoosh through a leaf blower at speeds of more than 100 miles an hour is not a good idea for grass cuttings."

While it may sound like folly, the ease with which erroneous information relating to the hand-held blower — a vital tool in



the landscaper's arsenal — is dangerous. Even more so when a reputable newspaper like *The New York Times* publishes this sort of news based on one person's travails.

And that's usually how these things start. In California, more than one dozen communities have banned the machines, several cities in the Midwest have followed suit and the Southeast has had its share of blower-related legislation.

As long as the issue is taken lightly — by city councils, media and yes, landscapers — the ignorance will continue to spread. It's a shame that simple common sense can't put this issue to rest.

---

With the Clinton Administration focusing on the deficit, a jobs package and foreign trade, we haven't heard much about the new government's view on pesticides.

But that's sure to change as three lead agencies — the federal Environmental Protection Agency, the Food and Drug Administration and the Department of Agriculture — have formed a newfound alliance.

The groups' cooperation was announced just prior to the release of the National Academy of Sciences report recommending changes be made in pesticide regulation to protect infants and children because of their unique sensitivity to pesticide residues.

Although the report made little mention of non-agricultural pesticides, the specialty pesticide industry needs to stay close to these agencies. We're not the ag market, but it's a well-known fact that manufacturers develop products for the agricultural market first, then adapt those products for various niche markets, like the lawn and landscape maintenance industry. — *Cindy Code* ■

## EDITORIAL

*Cindy Code*  
Editor/Co-Publisher

*Cathy Hoehn*  
Associate Editor

*Julie A. Evans*  
*Bob Gitlin*  
Contributing Editors

## GRAPHICS/PRODUCTION

*Charlotte Turcotte*  
Art Director

*Jami Childs*  
Production Manager

*Helen Duerr O'Halloran*  
*Tracy Green*  
*Carolyn Badger*

*Richard J. W. Foster*  
President

*Christopher W. Foster*  
General Manager

*John Roddy*  
Controller

*Rosalie Slusher*  
Circulation Manager

*Mark Fosse*  
Market Research Manager

*Fran Franzak*  
Books Manager

## ADVERTISING/MARKETING

*Maureen Mertz*  
Co-Publisher/National Sales Manager  
1723 South Hill  
Milford, Michigan 48381  
313/685-2065  
Fax: 313/685-2136

*Tim Yedinak*  
Midwest Sales Manager

*Dave Miethke*  
West Coast Sales Manager  
4012 Bridge Avenue  
Cleveland, Ohio 44113  
216/961-4130  
Fax: 216/961-0364

## ADVISORY BOARD

*Karl Danneberger, Tom Garber*  
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## EDITORIAL OFFICES

4012 Bridge Avenue  
Cleveland, Ohio 44113  
Phone: 216/961-4130  
Fax: 216/961-0364

Subscriptions and Classifieds:  
216/961-4130

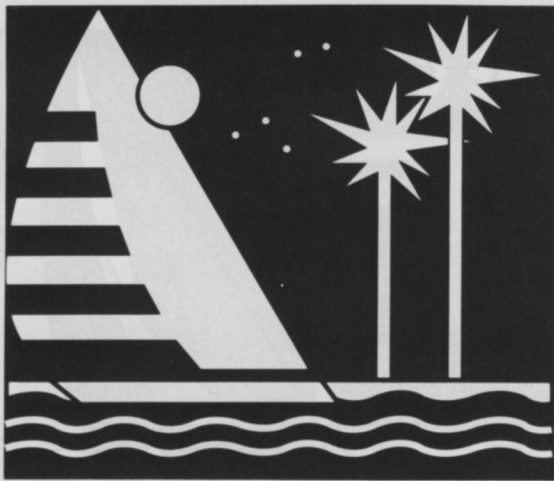
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# Business Watch

BUSINESS ACTIVITY increased "at a slow to moderate pace" through early summer, according to a Federal Reserve survey of its 12 district banks.

Sales and construction of single-family homes upturned slightly throughout the South and West, except in California. Non-residential real estate activity was mixed, but Minneapolis and parts of the San Francisco area showed improvements.

Job growth slowed in June after strong showings in April and May. Businesses surveyed by the Fed reported delayed investment and hiring due to uncertainties about federal tax increases and national health care reform.

Manufacturers of building materials and transportation equipment reported sales gains nationwide. Demand for construction equipment increased in Chicago and Dallas, but weakened in Atlanta.

Overall, slow growth is expected to continue. Manufacturers anticipate moderate expansion. Forecasts call for slight improvements in energy and retail markets, and home builders anticipate a good third quarter.

## CONSUMER PRICE INDEX\*

MAR.	APR.	MAY	JUN.
+0.1	+0.4	+0.1	0.0

\*Percent change from preceding month (seasonally adjusted).

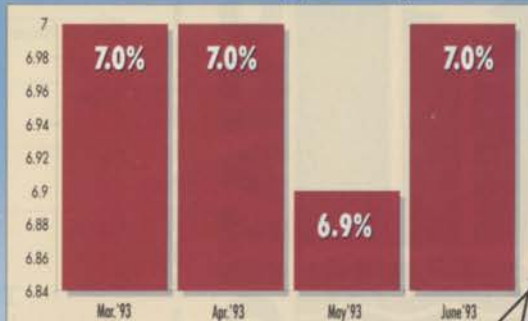
## PRODUCER PRICE INDEX\*

MAR.	APR.	MAY	JUN.
+0.4	+0.6	0.0	-0.3

\*Percent change from preceding month (seasonally adjusted).

## STEADY AS SHE GOES...

The surf has remained calm on the U.S. unemployment front through the first half of 1993.



Source: Bureau of Labor Statistics

## HOUSING STARTS\*



\*Percent change from preceding month

Source: Bureau of the Census

## EXISTING HOME SALES\*



\*Percent change from preceding month

Source: National Association of Realtors

## ECONOMIC REPORT: MIDWEST MARKET "SATURATED"

THE QUESTION "How's the weather?" posed to a Midwest lawn and landscape contractor in the Mississippi River region, anymore elicits a "You-have-to-ask?" snicker, followed by a heavy sigh.

"It's raining" is the standard reply.

After a particularly cold, wet and short spring, summer sprung with an onslaught of rainstorms and devastation, swelling the Mississippi, Missouri and Iowa rivers, breaking dams and levees and forcing evacuations in Illinois, Iowa, Missouri and Minnesota. The storms also caused electricity outages, damaged or destroyed more than 7,500 homes and contaminated water supplies. Reports of damage topped \$1 billion.

"It's been real stressful," said Gene Mennoh, owner of G&L Lawn Care, Audobon, Iowa. "We had seven guys in the garage...waiting for the rain to stop. The equipment was oiled and ready to go. We just couldn't do anything, it was so saturated."

Companies with buildings under water were forced to relocate. Bob Lenc Landscaping and Lawn Care, Des Moines, Iowa, moved offices to a home garage, and relocated 20 trucks and about 100 pieces of equipment. "We had about 12,000 square feet under water. Fortunately we had upper locks where we could store

chemicals and fertilizer," said company president Bill Bishop.

The company, which grows and sells nursery stock as well, had about 19 acres of trees and shrubs worth \$250,000 under water, he said. The lawn care division remained unaffected but landscaping slowed considerably.

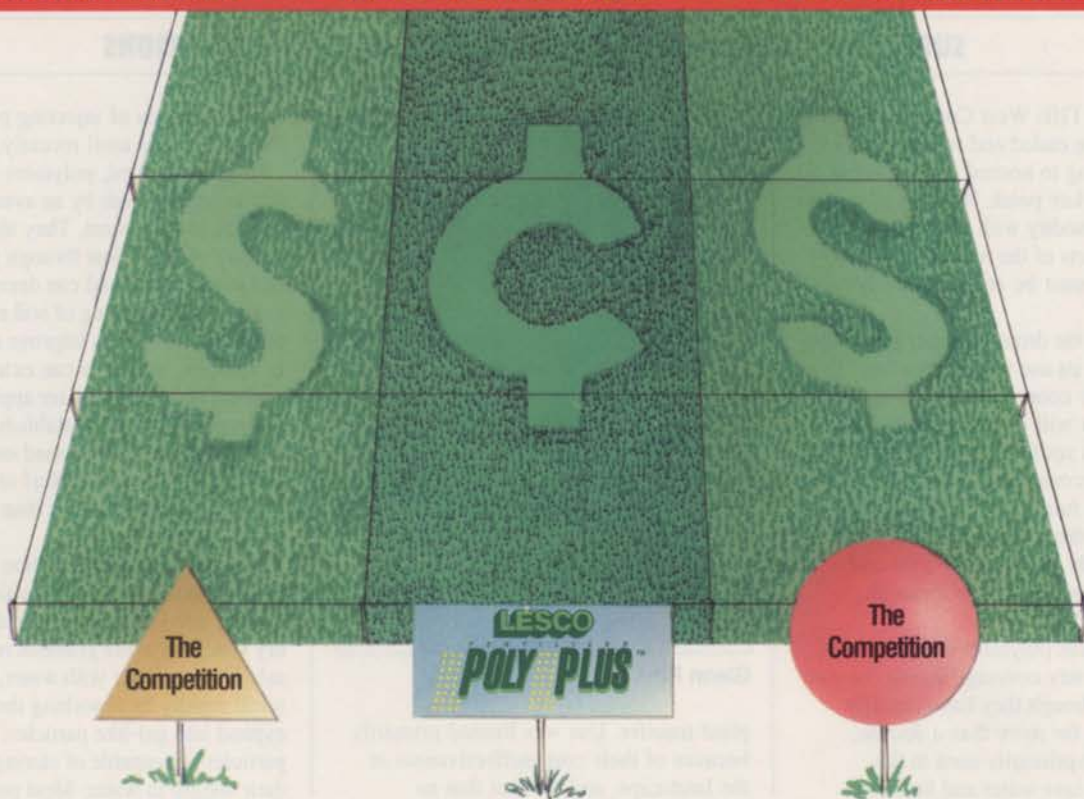
For the most part, lawn and landscape businesses throughout the area reported time losses up to four weeks, mostly for add-on services such as sodding and construction.

Central Landscaping in Forest Lake, Minn., which does seeding and sodding, had difficulty shipping, not only because of major highways and bridges closing, but because the drenched sod became too heavy. "It's a real large problem," said Sue Ostman, office manager. "I guess we're a little worried. We may have to write off this year and hope it gets better next year."

Continuous rain prevented Greenspace Associates in Davenport, Iowa, from finishing landscaping jobs scheduled for completion last October.

"As long as it keeps raining, it will put us further in the hole," said Margo White, office manager. She noted a large increase in call-backs to replace water-logged plant material.

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# Industry Viewpoint

## SUPERABSORBENT POLYMERS PROVIDE WATER-SAVING SOLUTIONS

ALTHOUGH THE West Coast drought appears to have ended and water levels are slowly returning to normal, the crisis has underscored a key point: Water is a precious commodity with limited availability in many parts of the nation. That's why this resource must be conscientiously conserved.

Even before the drought, water prices and restrictions on its use were increasing throughout the country; devastation caused by the drought will only exacerbate the situation. As a result, turf maintenance promises to become more expensive and difficult in the future.

Fortunately, there is an effective, proven solution already available to lawn and landscape maintenance professionals — superabsorbent polymers.

Superabsorbent polymers have received extensive industry coverage during the past few years. Although they have actually been available for more than a decade, polymers were primarily used in the greenhouse to save water and facilitate



**Glenn Rink**

plant transfer. Use was limited primarily because of their cost ineffectiveness in the landscape, and the fact that no

efficient means of injecting polymers into the soil existed until recently.

Properly applied, polymers can reduce turf watering needs by an average of 30 percent to 45 percent. They also reduce the amount of water lost through percolation and evaporation, and can decrease the potential for leaching of soil nutrients and pesticides as well as improve soil aeration. In addition, polymers can extend the interval between fertilizer applications. Finally, polymers help establish a stronger root zone and increase seed emergence, enabling newly seeded turf to be used a number of weeks earlier than non-treated turf.

Polymers are a combination of natural and synthetic compounds which can be formed into various sizes. In their natural dry state, the white granules resemble table salt. Upon contact with water, the granules swell rapidly by absorbing the water and expand into gel-like particles. These particles are capable of storing many times their weight in water. Most polymers are



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sodium-based, but some are potassium-based granules.

The manner in which polymers work is simple. Turf roots grow into moisture-swollen polymers, tapping available water and nutrients. Moisture and nutrients are provided directly to the plant — in 95 percent available form. As moisture is extracted, the granules dehydrate and return to their original form where they wait to absorb moisture again when it becomes available. This absorption and release cycle can be repeated for up to 10 years, depending on soil conditions.

To operate effectively, polymers must be correctly injected into the soil. In an effective polymer system, the injection method and installation techniques are just as important as the type of polymers. Previous polymers often haven't performed as promised because they were not installed with the necessary specialized equipment or techniques.

Past installation efforts included adapting standard or modified tilling machines, seed drills, water jet injectors and coring machines to inject the polymers. All of these attempts were unsuccessful for one of three reasons: They disturbed the topsoil and

turf; they did not distribute the polymers evenly, thoroughly or in the most advantageous locations in the soil; or they damaged the polymer granules.

Manufacturers have worked diligently, however, to develop the highly specialized installation equipment and specialized installation techniques necessary to place the polymer granules correctly into the soil. As a result, today's subsurface injection equipment is specifically designed to permit economical spreading of polymers throughout the root zone.

The installation machinery used in the process ranges from simple walk-behind injectors to units that can inject wide swaths of polymer granules. The polymers are placed in the applicator machine's hopper, the applicator blade passes through the soil at a selected depth and the polymers are air-blown into the soil for proper distribution at the appropriate depth.

This equipment can be used with existing turf, sod or newly planted turf. The installation process distributes the polymers in the optimum position within the root zone. In new plantings, this creates a "moisture wrap" effect that

enhances seed germination, sprout emergence and plant growth. The moisture wrap continually provides water and nutrients to the turf roots. The process also aerates the topsoil, creates minimal surface damage and causes no significant growth shock.

In sandy soil, polymers are extremely efficient and can increase the holding capacity of sand by as much as six times. In clay, polymers allow air access to the turf's root system while increasing water intake and drainability.

Contrary to what many people believe, the polymer granules themselves are harmless to the environment. In fact, some polymer products have been approved by the Occupational Safety and Health Administration as non-toxic because they break down into carbon dioxide, ammonia and water.

Superabsorbent polymers can make a significant contribution to lawn and landscape maintenance programs by slashing watering costs while providing a number of benefits. In fact, the many satisfied users of this cutting edge technology are amazed they ever lived without it. ■

*Glenn Rink is president of HydroGrowth Technology Inc., Tucson, Arizona.*



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## NEWS DIGEST

### **Davey Acquires The Big Tree Co.**

The Davey Tree Expert Co., Kent, Ohio, acquired majority ownership of The Big Tree Co., a 400-acre nursery with about 45,000 trees in Jacksonville, Fla.

The Big Tree Co. has offered tree planting and moving services in Jacksonville, but with the new affiliation will offer tree care, pruning and related services.

### **Pennington Named Barricade Formulator**

Sandoz Agro Inc., Turf and Ornamental, named Pennington Enterprises a formulator of its Barricade fertilizer products, with primary distribution in the southern United States.

Ron Fister, director of Sandoz's specialty business unit, said the firm views its distributors and formulators as full partners in the growth and success of Barricade, a preemergence herbicide for controlling crabgrass and other turf weeds.

### **Schering, Hoechst Form Agrochemical Agreement**

Schering AG, Berlin, and Hoechst AG, Frankfurt, have agreed to combine their agrochemical activities and set up a joint venture. NOR-AM Chemical Co., Wilmington, Del., is a wholly owned subsidiary of Schering AG.

The joint venture will run on a partnership basis, bearing the names of both firms, but Hoechst will hold 60 percent of the shares to Schering's 40 percent. The new headquarters are in Berlin.

### **Tree Spraying Law Bugs Residents**

A burdensome tree spraying law in Fairview Park, Ohio, may not be on the books much longer. That's because city residents are in an uproar over their inability to get their trees treated.

The city last year passed a law requiring tree companies to give one week's notice to neighbors within 150 feet of property being treated before initiating any work. Tree companies have begun turning down potential customers there, saying they aren't opposed to notification, but that the excessive planning and number of contacts needed before spraying go beyond the bounds of practicality.

In response, the city council is considering revoking legislation for a kinder, gentler ordinance — possibly a city registry.

## **Volunteer SWAT Team Takes on Zoo's Weeds**

WHO HAS TIME to treat weeds when you have a whole zoo to rebuild?

Well, the Miami Metrozoo received a three-week reprieve from its traditional weed control program thanks to a volunteer Roundup® SWAT team (Spontaneous Weed Attack Team) from Monsanto.

A team of 50 recently descended on the Miami Metrozoo to treat about 500,000 square feet with Roundup. Volunteers sprayed all viewing areas — mainly near chain link fences, sidewalks, etc., said Jorge Maura, parks maintenance supervisor. "It saved my crews a lot of time. Instead of spraying weeds, they were busy removing debris," he said.



Roundup SWAT team takes action.

The Roundup SWAT team toured 10 cities nationwide to eliminate unwanted and potentially dangerous weeds, and to initiate community beautification efforts.

The zoo was devastated by Hurricane Andrew, forcing an extended shutdown and the enormous loss of about 5,000 mature trees; 7,000 pine trees; 5 acres of eucalyptus, forcing the zoo to relocate its koala bears because it could no longer feed them; and hundreds of acres of grass and bushes. Such beautiful trees as *cassia nadosa*, with its pink cascading flowers, were defoliated beyond repair. The zoo covers 740 acres.

Weeds were a particular problem because of the loss of shade trees, ground covers and hedge materials.

What followed the hurricane was literally a zoo. Grounds crews had to tear down fences and trees and catch traumatized animals, not to mention deal with the 5,000 or so army troops stationed in the zoo's parking lot.

"It's pretty much back to normal now," Maura said. "However, we still have 5,000 square feet of sod to install and 6,000 new trees to plant."

The zoo also lost about 150 birds and a number of other animals due to the 200-mph winds. Some surviving animals are even said to be suffering from various psychological problems.

The zoo's landscape and maintenance grounds crew numbers 42. The entire zoo staff totals 300.

## **Calibrator Promises Consistent Flow**

It can be argued that correctly calibrating a sprayer is the most important aspect of applying pesticides. Pressure surges, differential nozzle wear and uneven application can make the pesticide application process a horrendous nightmare.

Not to mention spray drift which not only erodes the bottom line through excess pesticide use and lower operator productivity, but creates the potential that the pesticide will come into contact with the applicator or other unwanted objects.

All that may change as a newly developed automatic spray management valve for compression, backpack, boom or low-volume power sprayers has been introduced to the green industry which is

designed to reduce spray output by up to 25 percent. The new SMV provides constant and precise pressure and flow control. The pressure at the nozzle always remains constant so the flow, droplet size and coverage are the same regardless of the pressure in the tank. Among other things, this means low-flow, low-drift nozzles may be used effectively.

The SMV was developed in Australia and is now being distributed in North America exclusively by the Green Guard® division of H.D. Hudson Manufacturing Co. of Chicago.

The SMV continuously and automatically calibrates the spray and relieves the operator of the responsibility of trying to maintain even pressure.

"It's impossible to over or under spray a pesticide when this valve is in use," said Gene Short, sales manager of Hudson's

Green Garde division. "It simply takes a lot of guesswork out of applying pesticides."

While most hand-spray equipment offers little or no control of pressure, the SMV automatically shuts the sprayer off completely when the pressure in the tank drops below the preset amount. The calibrator is available in three models: one sets pressure at 15 psi, one at 30 psi and the third at 45 psi.

Some other characteristics of the SMV: It's a driplow valve, inherently one-way anti-siphon valve; it increases nozzle life, reducing spray pressure from 60 psi to 15 psi and increasing nozzle life by five times; it reduces applicator fatigue by reducing the number of times the compression or backpack sprayer needs to be pumped; it is self-cleaning and does not need to be disassembled to be cleaned, (it clears itself with each opening and closing of its mechanism); it has a pressure smoother which responds quickly enough to suppress pressure fluctuations from a pump; and the flow rate range of the SMV is from 0/6 to 3 liters/minute or 20.3 ounces to 101.44 ounces (3.17 quarts or 0.79 gallons) per minute.

Hand-held sprayers, in particular, leave a lot of variability and technique to the operator at the expense of desired flow — a flow which is not only important in the control of weeds, but also required by pesticide label directions.

Spraying at proper pressure settings is such an important element to true customer service, particularly when an operator is on a property applying a granular and comes across a weed patch that needs spot-treated with a liquid, said Kirk Hurto of TruGreen/ChemLawn.

"The SMV provides the right flow — no overapplications resulting in burns or underapplications resulting in retreating," Hurto said. "It also gives the operator more confidence."

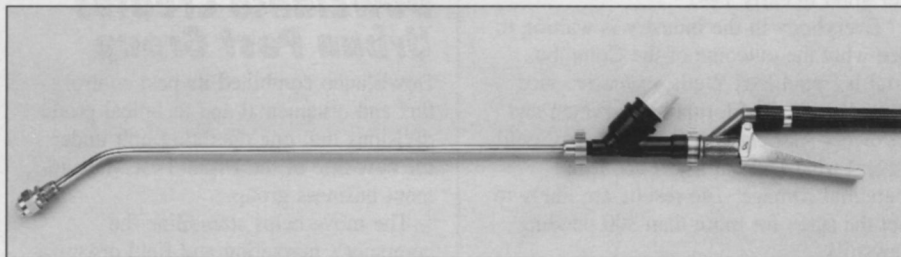
Jeff Lefton of Turf Grass Technology

Center, Carmel Ind., said the SMV has a real purpose in the green industry in letting the operator know he has enough pressure to get the job done.

"From a manager's point of view, it's very economical," he said. "But more importantly, it'll make sure hand sprayers are properly pumped out in the field without fizzling out at the end."

The life expectancy of the SMV has not been determined in the field because field failure has not occurred in more than three to four years of use. In wear testing that has been done at more than 1 million cycles of on and off operation (the equivalent of five years normal use) there was no significant change in the accuracy of the valve.

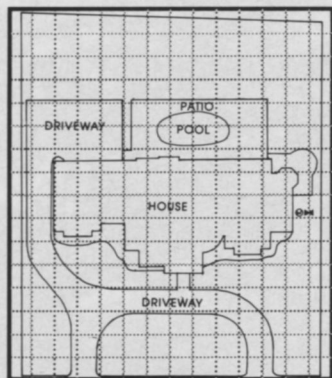
Within one year, Hudson will supply the valve to the entire industry.



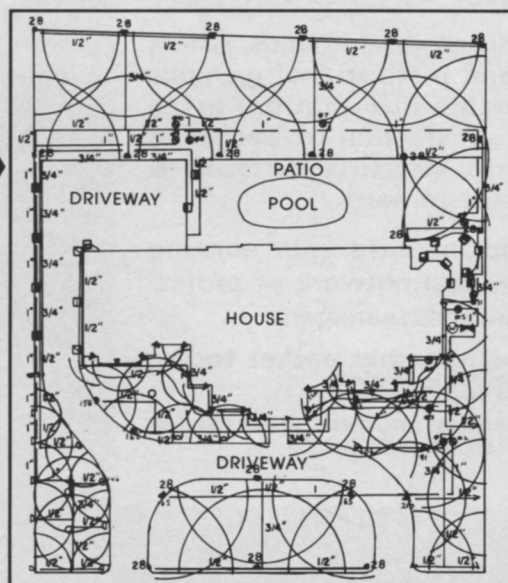
The spray management valve from H.D. Hudson automatically calibrates spray.

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**USE READER SERVICE #71**

## First Benlate Trial Opens

The most prominent and controversial Benlate lawsuit against DuPont opened in early July, and is expected to set precedence for hundreds of others nationwide.

Four growers are seeking \$158 million in U.S. District Court in Columbus, Ga., for damages allegedly caused by DuPont's Benlate DF fungicide. The trial judge has already fined DuPont \$1 million for withholding documents containing evidence.

Memos filed in lawsuits show DuPont suspected atrazine herbicide contamination when it recalled batches of the Benlate dry flowable product in 1989. Further traces of atrazine caused the company to recall DF for good in early 1991.

"Everybody in the industry is waiting to see what the outcome of the Columbus trial is," said Earl Wells, executive vice president of the Florida Nurserymen and Growers Association, Orlando. "It should reveal what DuPont knew about the potential damage. The results are likely to set the stage for more than 300 pending lawsuits."

Florida state agricultural commissioner

Bob Crawford claims he has seen proof that DuPont knew of Benlate's potential damaging effects early on, and has subpoenaed DuPont chairman Edgar Woolard. The chairman has said he won't appear, according to *Business Week* magazine.

DuPont paid up to \$500 million in damages, mostly to Florida growers, but halted payments in November, saying scientists had determined Benlate could not have caused the damage.

One California grower seeking \$2.5 million in damages against DuPont allegedly dropped his suit in July. The San Diego Court dismissed the suit "with prejudice, meaning it can't be reinstated, according to DuPont.

## DowElanco Creates Urban Pest Group

DowElanco combined its pest control, turf and ornamental and technical product divisions into one operating unit under the new title of the Urban Pest Management business group.

The move helps streamline the company's marketing and field organizations, according to Richard G. Holzschu,

general manager of DowElanco North American Specialty Products.

Holzschu said the move would create efficiencies within the markets it affects.

"With an expanding product line and new technologies coming, it's important we focus on priorities and make the best possible use of our marketing and field resources," he said. "This change is being implemented now to position our people and products with key customers so that we may aggressively pursue current and future business opportunities."

John Madia will continue as marketing manager for both turf and ornamental and technical products, and Vince Geiger will remain marketing manager for professional pest management products. The turf and ornamental unit encompasses lawn care, nurseries, landscaping, golf courses and greenhouse markets.

The reorganization is taking place three years after the creation of DowElanco, based in Indianapolis, as a joint venture of the Dow Chemical Co., Midland, Mich., and Eli Lilly & Co., Indianapolis.

The Urban Pest Management business reflects a maturing of that joint venture, Holzschu said.

(continued on page 68)

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Richard Quartier, Portland, OR., area manager for Northwest Landscape Industries, applied EMBARK to the 17-acre Fujitsu Corporation campus. He then renovated nine acres of the PGR-treated turf with a slicer-seeder, with the balance of the property to be overseeded this fall.



Steve Siegle of Three Rivers Landscape Co., Grants Pass, OR., says he had almost never been able to successfully renovate a heavily shaded, sloping terrain like this until he began using EMBARK® PGR. He says being able to stay off the new grass for a full month makes all the difference in the world in a challenging overseeding situation.

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Everett Mealmen, Chairman and Chief Executive Officer, PBI/Gordon Corporation



If you have never considered using a plant growth regulator (PGR) as a lawn renovation tool, it might pay you to listen to someone who has. Landscape professional Steve Siegle of Three Rivers Landscape Co., Grants Pass, Oregon, can give you some valuable tips.

"We have a perennial rye lawn that had been a real challenge to overseed because we were never able to stay off the lawn long enough for the new seedling to get established. Embark PGR proved to be the solution.

"First of all, we sprayed the lawn with Super Trimec® to completely clean out the weeds. A month later we sprayed the entire yard with Embark, and the following week we mowed the

grass as short as we could and seeded the bare patches.

"Because the Embark-treated turf wasn't growing very much, we were able to stay completely off the lawn for a full month; and because the new grass wasn't competing with weeds and established turf, or getting trampled on, it grew and thickened up in great shape.

"In the meantime, the old grass got darker green and, poking around later, we believe it had rooted down better than usual. The whole lawn looked beautiful! So beautiful the people next door had us do the same job on their lawn."

Another Northwest PGR enthusiast is Steve Quartier, the area manager for Northwest Landscape Industries in

East Portland, Oregon, one of the largest contractors in Oregon and Washington.

Quartier has had three years experience in using PGRs. Last spring he decided to use Embark and a slicer-seeder when renovating half of the 17-acre corporate headquarter grounds of the prestigious micro-chip maker, Fujitsu Corporation.

Quartier originally had tried Embark to reduce mowing and clippings. "Last fall we treated 60% of our total acreage with Embark," says Quartier. "And we found that where we normally got two to three baskets of clippings per 10,000 sq. ft., we were able to cut it down to one basket." This low volume of clippings can be left in the lawn, where desired.

"Using Embark as a renovation tool is a major plus," says Quartier. "The spring program was so successful that Fujitsu has asked us to renovate the other half of the property this fall."

\*14 days in California. Fall treatments must be timed according to the target planting date in your area.

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# Association News

THE **Associated Landscape Contractors of America** attended the Building Owners and Managers Association trade show in Baltimore in a pilot program to promote landscaping within related industries, said Dee Ann Lalouani, ALCA's Public Relations Committee liaison.

Lalouani and other ALCA representatives manned ALCA's booth at the June show, distributing literature on landscaping, including ALCA's "Who's Who In Landscape Contracting" directory.

The show enabled ALCA members and staff to interact with the people responsible for hiring landscape contractors.

"It's a great feeling when a property owner thanks you for providing industry contacts," Lalouani said. "Our presence at the show validated our need to be there as well as the value of landscape contractor services to property owners."

ALCA is considering attending the National Association of Industrial and Office Parks trade show and others.

The **American Association of Nurserymen** plans to review draft noxious weed legislation, and to push for a "balanced

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approach to addressing noxious weed problems," said Craig Regelbrugge, AAN director of regulatory affairs and grower services.

Congress is considering amending the Federal Noxious Weed Act to strengthen the U.S. Department of Agriculture's Animal and Plant Health Inspection Service's authority on regulating weeds. APHIS regulates the introduction and interstate shipment of plants, and has added to the federal noxious weed list.

APHIS defines a noxious weed as "any living stage of plant which is of foreign origin, that is new or not widely prevalent in the United States, and can directly or indirectly injure crops, other useful plants, livestock or poultry or the public health."

AAN officials fear the amended act will regulate many common and important exotic nursery landscape plants, such as the Japanese bloodgrass, *Imperata cylindrica* Red Baron.

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USE READER SERVICE #77

**The Composting Council** plans to continue helping with the establishment of model compost regulations for yard trimmings and mixed waste, and monitoring evolving California Green Compost regulations for yard trimmings.

The council's midyear update outlines ongoing projects, including urging California regulators to streamline facility regulations and eliminate elaborate testing and permitting requirements for yard trimming composting.

In other areas, the council formed an alliance with the **American Sod Producers Association** and **American Association of Nurserymen** to collaborate on research efforts, and will work jointly with Winrock International and the USDA's Soil Conservation Service to develop composting operator's certification and training programs and compost use guidelines.

The **Professional Grounds Management Society** plans to help its branches establish regional meetings modeled after the July PGMS/MAPPA seminar held jointly with the Midwest Association of Physical Plant Administrators of Colleges and Universities in Oxford, Ohio. Plans

are under way for a mid-Atlantic regional seminar in 1995.

PGMS will provide specific promotional materials for regions and branches, including exhibitor/sponsor and attendee solicitation packets. The material will include two newsletter articles, one-page promotional flyers and two promotional postcards.

PGMS acting executive director John Gillan hopes the move will strengthen the association's ties with MAPPA and other groups.

"We're finding that a lot of organizations out there like MAPPA have members with interests in grounds management related activities, but the organizations have not formally addressed that in the past," he said.

PGMS is also fostering a relationship with the American Public Works Association. Bob Rubel, PGMS' first vice president from Fort Worth, Texas, will speak at the APWA's September conference in Phoenix. The two groups are considering developing joint programs and publications.

The **Florida Turfgrass Research Foundation** plans to open its Envirotron

laboratory at the University of Florida in late September. The 3,100-square foot, enclosed research field is designed for studying and developing new turfgrass technology.

The foundation is seeking donations or funds for equipment, including a forced air lab oven, pH/mV meter, autoclave and high-pressure liquid chromatography.

**IN BRIEF...**Dr. Kenneth Blanchard, author of the *One Minute Manager* and other management publications, will deliver the keynote address at the **Irrigation Association's** 1993 International Exposition and Technical Conference Oct. 31 to Nov. 3 in San Diego...The **Association of Professional Landscape Designers** recently named Margaret Connors of Duxbury, Mass., as its president. Connors, who previously served as first vice president, succeeds Joel Lerner...The **Fertilizer Institute** and the **Professional Lawn Care Association of America** produced "Healthy Turf, Healthy Earth," a brochure for lawn care customers that highlights environmental benefits derived from proper fertilizer use. The brochure fits into letter-sized envelopes for customer mailings. ■

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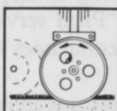
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# Experiencing The Great Outdoors

*Inner Gardens Landscape was a small interior plant leasing company in 1986. Through customer referrals and quality service, the company has evolved into a full-service interior and exterior horticultural management company, and they haven't stopped there.*

By Julie A. Evans

IN 1986, DAVID MUESSEL received a rather rude welcome to the landscape industry. Only three months after purchasing Inner Gardens, a then-\$40,000 interior plant leasing company, the local economy nose-dived; and within six months, the small Houston company lost one-half of its accounts.

"Companies were simply trying to stay in business," Muessel explained. "Plant services became almost a non-entity to companies that were trying to cut costs."

Rather than bow to market pressures and call it quits, Muessel stood by and nurtured his struggling business. The wager paid off — and then some. Inner Gardens Landscape is a full-service, interior and exterior horticultural management company with 24 full-time employees and 1992 sales of about \$700,000.

Inner Gardens could not have reached its present stature without the addition of exterior landscaping services, including maintenance and installation, but they were never part of Muessel's initial game plan. In fact, Muessel nearly rejected his "big break" into the exterior market, when in 1987, one of Inner Gardens' major clients pre-

sented Muessel with the opportunity to provide landscape maintenance services at a large office complex.

"At first we said no; it required a different investment," Muessel said. "But we thought about it again and said yes, six months later, because the interior business was hurting.

"We were fortunate to land that contract," he added. "Through our relationship with the building manager, we were able to assure that we had a profitable job from the beginning." The company added its second account within the month.

The move to include exterior landscaping proved to be vital to the company's long-term survival. First-year exterior revenues totaled \$70,000, with combined interior and exterior revenues of \$165,000. Today exterior revenues total more than half a million dollars, accounting for 80 percent of the firm's revenues.

"With exterior, companies are less able to cut it out of their budgets," Muessel explained. "If they want to maintain tenants, then they have to maintain the appearance of the exterior."

The addition of exterior services also made Inner Gardens more appealing to its interior clients, Muessel said. It allowed property managers to hire one company for both jobs. Currently, about 30 percent of clients require both services.

**MANAGING GROWTH.** Under Muessel's ownership, Inner Gardens rebounded quickly from its first-year losses and began building business







with established and new accounts. Muessel uses two words—customer service—to describe why his company not only survived its initial losses, but prospered.

"When we lost that 50 percent, I got together with my employees and said 'We have to provide better service than before, and we have to be more responsive than before. If something needs to be replaced, we don't ask questions, we just do it,'" Muessel explained. "I figured, we aren't going to

make any money the first year in this business anyway. If we built a good reputation, I thought success would follow, and it did."

In 1987, Muessel moved the office out of his home and into the company's first facility, a 1,000-square-foot office/warehouse in central Houston.

Many changes occurred the following year, beginning with the establishment of the first landscape maintenance crew. The business also moved to larger facilities to accommodate growth.

Muessel took a cautious approach to the landscape maintenance business, purchasing only used equipment for his new exterior accounts. To establish name recognition and keep his crews employed until this segment grew, Muessel took on some mowing accounts for a mortgage company and its foreclosed residential properties.

"Maybe we didn't break even, but it did help us develop a name and good field procedures. It also allowed us to make additional

## INNER GARDENS LANDSCAPE

**HEADQUARTERS:** Houston

**BRANCHES:** None

**FOUNDED:** 1979. Purchased in 1986 by David Muessel.

**PRIMARY SERVICES:** Exterior landscape design, installation, turf care, plant and bed maintenance, tree and shrub care, seasonal color and construction. Interior plant leasing and maintenance. Greenhouse.

**EMPLOYEES:** 24 year-round, 12 seasonal 1992

**SALES:** Approx. \$700,000

## EXECUTIVE SUMMARY

**THE CONCEPT:** Provide interior and exterior landscape services to commercial clientele; operate a greenhouse.

**5-YEAR OUTLOOK:** Plans to add full-scale construction and irrigation and reach revenues exceeding \$2 million.

**HURDLES:** Sluggish and competitive interior market.

## PRESIDENT

### DAVE MUESSEL

**AGE:** 40

**FAMILY:** Married, 2 children

**EDUCATION:** B.A., archaeology, State University of New York, Binghamton; MBA, Northeastern University, Boston

**LAST JOB HELD:** Financial manager, oil field business

**ACHIEVEMENTS:** Responsible for company's growth from a one-employee interior plant leasing company to a 24-employee exterior and interior horticultural management company.

Cathy Thrash and David Muessel. Photo: Ogden Robertson, Houston.

inventory that year. During a record December freeze, temperatures dipped to 4 degrees Fahrenheit and power was cut to the greenhouse. All inventory was destroyed by the freeze and insurance did not cover the loss.

"It simply wiped out profit for that year," Muessel said. "It took us a while to get back on our feet."

A year of deliberate, slow growth followed in 1990. The company spent a lot of time that year redefining its focus and shifting to more profitable work. As Muessel explained, "We wanted to make sure that we weren't growing beyond our ability to grow effectively. We looked at developing relationships where we would have quality, and culled out jobs where we weren't making enough money. We also started building the facility where we are now."

The new headquarters, a one-acre office/greenhouse/storage facility, offered shorter drive times to job sites, lower fuel bills and increased visibility in the market-



place, Muessel explained. It also provided for enough space to meet the company's needs for the next 10 years.

Until this time, the company managed to remain loan-free, and all growth resulted from internally generated funds. But Muessel required a loan for some of the changes he began implementing.

Two major decisions were reached in 1991, both of which would help the company grow beyond its present size and services. First, one-half of the existing greenhouse space was converted to bedding plant production in an effort to reduce landscape material costs.

"Growing our own bedding plants has been very economi-

**Customer requests led Inner Gardens to expand into the exterior market, a move which has solidified overall business.**

cal," Muessel said. In-house production reduced bedding plant costs by more than 60 percent per plant.

Also, Muessel hired an outside sales representative, Cathy Thrash, to increase the company's exposure throughout the Houston property management market. With Thrash heading up sales and marketing the company doubled its exterior sales from \$250,000 to \$500,000.

"I simply cold-called. I made a lot of phone calls, networked with friends and used contacts (gained) from my previous business. That's how a lot of growth started," Thrash said.

She also attributed the firm's exterior success to attendance at local trade shows such as the Houston Apartment Association and the Building Owners and Managers Association.

*(continued on page 22)*

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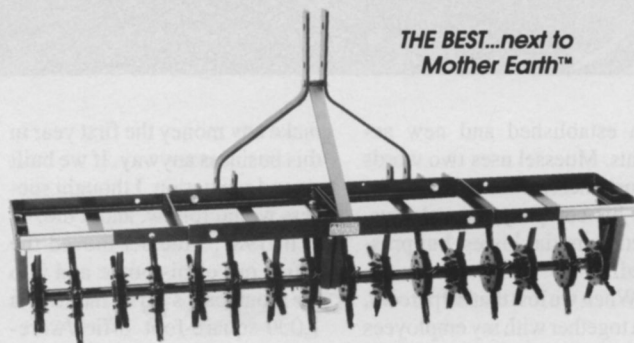


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USE READER SERVICE #67

## Cover Story

(continued from page 20)

"I also want to emphasize that no matter who you are going to call on, first impressions always last," she said. "It's critical to be at your best, and if your attitude is not there, you better forget it."

**CUSTOMER SATISFACTION.** With Thrash heading up sales and marketing efforts, the company was better prepared to focus on customer service and quality issues.

"I think it's important that you have good relationships with customers as well as employees," Thrash said. "I spend a lot of time in person and on the phone with existing customers, and a lot of time chit-chatting with the guys who work for us. Your employees have to be happy to make customers happy."

Added Muessel, "We stress to our guys that we don't set quality standards—the customer does. The other thing we try to express to our guys is that they don't work for us. We're the conduit. We just collect money and pay them. They really work for the customers. Their ultimate boss is not me or Cathy. It's that guy that works in that office complex who sees the result of their work every day."

Last year, Muessel and Thrash implemented a quality control program to monitor on-site job performance and raise customer satisfaction. "We noticed that when we started spending more time with the customer, everyone's job got easier, including the customer's," Thrash explained.

As part of this program, Muessel and Thrash divide up their exterior properties and visit all accounts monthly. They bring with them an evaluation form that they complete, along with the foreman and property manager. Thrash and Muessel then compare their evaluations of the property with those of the foreman and property manager to make sure all parties are playing on the same field.

"This way, our customers are more confident in us and our ability to perform adequately," Thrash said.

The strategy also helps strengthen relations between the foreman and property manager by encouraging them to communicate, Muessel said. "We like our foremen to develop a good relationship with property managers because they're the ones who make or break us in the eyes of our customers," he explained.

**INTERIOR PRESSURES.** Muessel remains committed to his interior plant business, even though the segment now accounts for only 20 percent of revenues. He blames declining demand on changes in architecture and design.

"Given the competitive development market in Houston, owners are opting to have more space they can lease," Muessel said. "They don't build an atrium, they build a lobby that they can lease."

As for office space, Muessel sees another trend hurting the interior plant business. "In

the architectural world, the movement in office design has been supplanted by more minimalism where offices have more stark designs with a half dozen plants vs. 50 plants. That's an industry trend across the country."

The interior market has been complicated further by price wars among competitive companies. Muessel said his plant leasing business increased two and one-half times since 1986, but sales have been flat for the past two years. Company acquisitions and industry consolidation explain some of the price pressures. As an example, he cited Rentokil's acquisition of Tropical Plant Rentals.

"When a major company comes in, it needs to make a big return on its investment. Prices have dropped 10 to 30 percent. We're in a position now where we're being underbid 20 to 40 percent, yet we haven't raised prices in four years."

Despite the obstacles to growth in this segment, Inner Gardens will continue to offer interior plant services.

"When we first started doing this, only two other companies offered both interior and exterior. That has a real appeal to a number of property managers because it makes their jobs easier," Muessel said. "And it gives us the flexibility to move people inside and out."

**FUTURE PLANS.** This year, Inner Gardens closed in on its goal of becoming a full-service interior and exterior company when it added a permanent installation crew, as well as a chemical applicator spray crew and an in-house mechanic. Now, Muessel is looking into construction and irrigation services as well.

Muessel has high hopes for 1993 and beyond. He anticipates revenues between \$800,000 and \$900,000 this year and expects to surpass the \$2 million dollar mark within the next five years.

"In 1993, we're making more money than ever before," Muessel said. "We've gone through and cut out less profitable jobs. We've gone through and changed our maintenance practices and bought equipment that allows us to do jobs more efficiently. We've also changed our field techniques to make more money."

The company also is in the final stages of a major expansion to its facilities. Office space doubled and shop space tripled this year.

Muessel remains low-key about the changes that have come rather quickly to his company. When pressed for the secret to his company's success, Muessel always returns to the subject of customer service.

"We heard through the grapevine that one of our key customers who we use as a reference, said that 'Those guys aren't perfect. They make mistakes like everyone else. But if they do make a mistake, they do their best to make sure the problem is fixed,'" Muessel recalled. "That's the kind of reference that we like to hear." ■

*The author is a Contributing Editor to Lawn & Landscape Maintenance magazine.*

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USE READER SERVICE #16

# Slow-Release Fertilizers: When is the Price Right?

MANUFACTURERS have inundated the nursery market with high-tech, slow-release fertilizers, many of which are just reaching the lawn and landscape market. Even the product makers question whether the high costs of some fertilizers outweigh their value in the commercial lawn care realm.

Few refute the benefits slow-release fertilizers hold over quick-release—they provide nutrients over longer time periods, precluding repeat applications, reducing burn potential, providing more uniform growth and lessening any potential for leaching. The main drawback most often cited is cost.

"The disadvantage is that slow-release fertilizers are more costly. With some lawn and landscape contractors, that (cost) is the most important factor," said Dr. Jack Fry, assistant professor of horticulture at Kansas State University.

Nevertheless, most manufacturers and contractors agree slow-release fertilizers have staying power in commercial markets. Some believe public demand will ensure it.

"Through the 90s, a lot more companies will be forced to use slow-release products, whether they believe in them or not, and it will probably help us all out," said Brad Johnson, president of Green-Up Inc., Tulsa, Okla.

Hugh Kramber, president of



*Demand for slow-release fertilizers has led to the use of new nitrogen sources and more effective polymer coatings. But are these advanced technologies worth their steep prices for lawn and landscape applications?*

*By Cathy Hoehn*

Outdoor Environments, Minneapolis, Minn., noted a regional trend moving in the opposite direction. "Personally yes, we will continue using slow releases. But in the St. Paul (Minn.) market, people are going back to offering cheaper fertilizer applications. Quality isn't an issue. The competition uses the cheapest

stuff they can get by with," he said. "We lose a lot of proposals because we don't price so cheaply. We could bottom line, but that's not our marketing philosophy."

**WHAT'S IN A COAT?** Slow-release fertilizers depend on water, microbial activity or both to

Coated fertilizers and more accurately timed nutrient releases are gaining popularity.  
Photo: O.M. Scott

release nitrogen. Those that depend strictly on microbial activity release nutrients more quickly.

"If you go out in November when it's getting fairly cold, it might not be the best idea to use fertilizers requiring microbes, because they're not likely very active at that time. Activity depends on the amount of rainfall, soil temperature, etc.," Fry said.

Many new synthetic slow-release fertilizers contain quick-release agents coated with materials that contain the nitrogen until needed. Technology for the earliest of these products, including sulfur-coated urea fertilizers, methylene-coated urea, urea formaldehyde and isobutylidene diurea (IBDU), dates back to the 1950s.

Sulfur-coated urea fertilizers, at least in the lawn maintenance market, are by far the most popular and least expensive slow-release variety.

"Sulfur-coated will continue to be the most popular slow-release fertilizer unless there's some way they can bring the prices down on the others," said Jon Linn, operations manager for Four Seasons Lawn & Maintenance, San Jose, Calif.

Sulfur-coated products are

(continued on page 26)



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## Staying Power

(continued from page 24)

"quick-releases coated with sulfur and wax sealant," Fry said. "What it's done is extend the length of response from the urea. Within one bag of fertilizer, you may have several sizes of prills (fertilizer pellets that dissolve). Some have a thin coat and release fairly quickly. Others have a little bit thicker coat, and release a little later."

One drawback of sulfur-coated

products is that their fragile coatings often break or crack easily during transportation, blending and application. Some studies show as little as 18 percent of the total nitrogen remains in slow-release form after application.

A more recent trend, using polymer or plastic coatings, started in the nursery market probably 10 to 15 years ago. Resin coatings, which some researchers classify as polymers, are also being used. Both types provide a higher degree of control over the

release of nitrogen, driving up manufacturing costs and, thus, market prices.

Polymer-coated are considered more efficient in releasing nitrogen than earlier slow-release fertilizers. "You have to crack the sulfur coating prill (unless it's granulated). Either somebody steps on it, or weathering over time creates a hole," Fry said. "And microbes could degrade sulfur-coated and release urea. But with polymer-coated, you don't need that. Release is governed by

the polymer membrane."

Polymer-coated fertilizers release nitrogen through osmosis. The fertilizer prill laying under the field actually absorbs water. Nitrogen inside the prill dissolves, and the coating around the prill governs how quickly the whole solution exits the prill.

"It's like a pain reliever's time-release capsule. Over time, depending on that membrane on the outside of the prill, how it's put together, will affect how quickly

(continued on page 28)

## LATE-SEASON APPLICATIONS

MANY PEOPLE think of spring as the ideal time to provide turf-grasses with nutrients, but applying fertilization in the fall also offers a number of advantages. The most critical factor in fall fertilization is timing. For best results, nitrogen should be released after above-ground growth stops.

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- Continue to spread applications throughout the year.
- Determine how much nitrogen is needed. Too much nitrogen in the fall can be wasteful and lead to snow mold, winterkill, leaching, denitrification and mineralization.
- Beware of excessive thatch buildup.
- Analyze the feasibility of keeping seasonal employees on the job longer for such a program.

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## Staying Power

(continued from page 26)

the solution moves out to the plant," Fry explained.

Use of polymer-coated fertilizers is increasing, particularly on golf courses, Fry said. "Manufacturers are kind of targeting golf course markets because the products cost more."

Harry Mathis, national sales manager, lawn and landscape products, for Lebanon Turf Products, Lebanon, Pa., agreed polymer-coated fertilizers will play a lesser role in commercial lawn and landscape markets than in others. "They're a niche type product and will remain so until they are justified from a cost standpoint," he said.

There essentially is no "wrong" fertilizer to use, according to Fry. "When you get down to it, it's all nitrogen. And that's what we're looking at when we're dealing with slow-release nitrogen. Plants don't care all that much where the nitrogen comes from. Some fertilizers are better suited for cer-



tain situations. For example, a golf course putting green, if you use something with a real big prill the mower might pick it up. So

you use prills that are very small to avoid any trouble with people walking on them or mowers picking them up."

Spring and fall fertilization is big business in the lawn and landscape maintenance industry. Photo: CoRoN

Dr. Norman Hummell, associate professor of horticulture science at Cornell University, concurred that no one type stands out as the ideal slow-release fertilizer. "My feeling is that one isn't any better than the rest as far as performance," he said. "What you have to look at is that they are very different in release patterns. People have to get educated on those different patterns."

Quality of course plays a role in determining what products to purchase, but Fry bets that lawn and landscape contractors will continue to pay more attention to the price factor.

"The answer is going to be how much better overall the quality of lawn is if you use polymer-coated materials vs. sulfur-coated or some other slow-release materials. That expense is definitely going to have to be justified to the person using it."

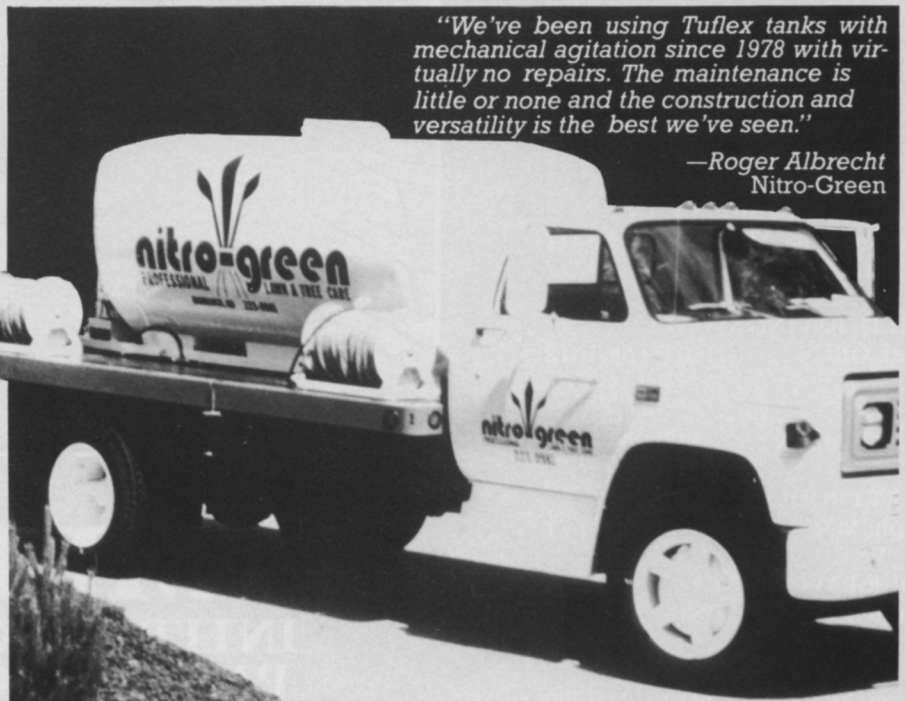
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## Staying Power

(continued from page 28)

**SLOW VS. CONTROLLED.** Many people tend to freely interchange the terms slow release and controlled release in describing the extended rate of nitrogen release, but some experts claim the terms hold different meanings.

The Association of American Plant Food Control Officials, an organization representing each state, Canada and Puerto Rico to form a consensus on model legislation, defines both terms as "a fertilizer containing a plant nutrient in a form which delays its availability for plant uptake and use after application," or which extends its availability to the plant longer than a quick-release fertilizer.

Greg Wahl, marketing manager for Grace-Sierra, Milpitas, Calif., differentiates between the terms, however.

"It depends on your definition of slow release. Mine — slow release is slow but not controlled, such as methylene-coated urea,

IBDU-type products," he said. "Controlled is a slow release into the environment. You can get beyond four months with a true controlled release of nitrogen, or you can release it within a day or two."

Fry questions the accuracy of being able to "control" the release of nitrogen.

"I don't know if controlled release is a very good term," he said. "I see it advertised a lot, but how much control do we have over the release? Once that fertilizer is applied, it's out of our hands. You have better control than in the past, but not full control."

Polymer-coated products definitely offer a more uniform release pattern, "but there is no such thing as controlled release," Hummell said. "It's very uniform when the conditions are right. You need moisture and heat. You have very slow release in cooler months."

**NEW TECHNOLOGY.** O.M. Scott & Sons, Marysville, Ohio, just

introduced a new, patented controlled-release technology using methylene-urea nitrogen. The Triaform™ granular fertilizer replaces highly water-insoluble nitrogen with short-chain methylene urea polymers to allow more efficient use of nitrogen, and provide faster particle breakdown on turf. O.M. Scott claims the homogenous Triaform™ fertilizer offers improved agronomic benefits.

Traditionally, slow-release urea formaldehyde-based fertilizers used inefficient "long-chain" nitrogen polymers to reduce surge growth while providing residual activity. In an effort to improve the release of nitrogen available to plants, however, Triaform technology is said to provide a more consistent, predictable response in an eight- to 12-week time frame since nitrogen is less influenced by soil temperature, moisture or pH.

"Triaform technology is a highly efficient alternative to traditional fertilizers," said Susie Calhoun, marketing manager for

O.M. Scott. "Triaform is chemically homogeneous with all the nutrients contained in each particle. The new technology also offers improved physical characteristics in terms of better spreadability and improved particle breakdown."

Little more than a year ago Scott introduced its Poly-S technology as an alternative to sulfur-coated fertilizers, with extended release, flexible release rates and more predictable response.

New technology from Pursell Industries' includes Polyon polymer-coated fertilizer bearing an ultra-thin, non-porous membrane coating which encapsulates the urea granule. The granules are released through osmosis, which means they dissolve inside the capsule and diffuse slowly and continuously through the membrane. The technology, released early last year, is available in a number of blends.

Most manufacturers chose not to reveal what new technologies they are working on, though sev-

(continued on page 32)

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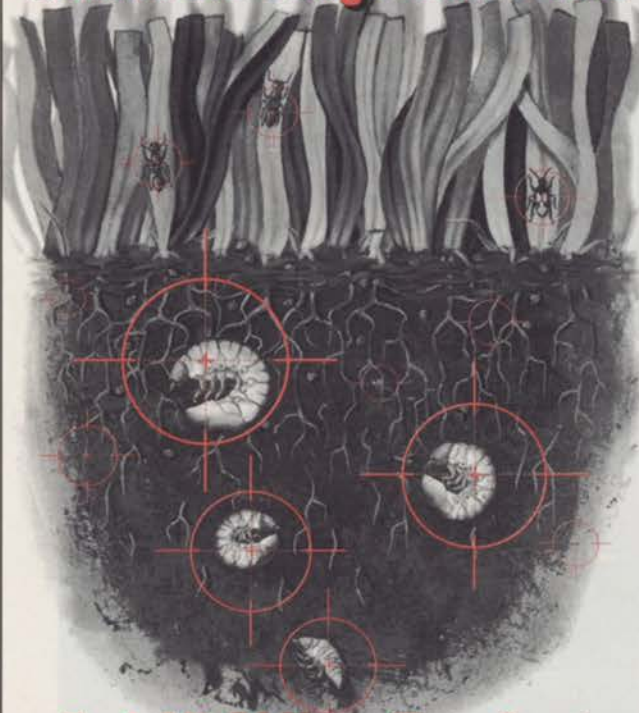
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### Staying Power

*(continued from page 30)*

eral claim to hold a card or two up their sleeves.

"We continue to change formulations using urea triazone as a potential process. We have group analogues that have not yet been brought to market. We don't yet know when they will be released," said Jerry Higdon, president of Arcadian Corp., Triazone Division, Memphis, Tenn.

NOR-AM Chemical Co., Wilmington, Del., is conducting research combining polymers with various coatings, according to George Raymond, marketing manager, specialty products division. He declined to comment on specifics.

Mathis said Lebanon is working with blended sulfur-coated fertilizers and evaluating new polymer-coated products.

In general, the direction slow-release fertilizers take will be determined not by new technology but by the innovative uses of the products out there, said Mike Agnew, extension turfgrass specialist at Iowa State University. "Products on the market have excellent release rates. It's how the users take and formulate them."

Researchers are looking at adding higher amounts of potassium and other cations to provide a good fertilizer combination, as well as looking at other nitrogen sources, Agnew said. Hummell noted that many new technologies mix talcum or other materials in with the coatings to regulate their thickness.

One trend noted in the nursery container market, which many believe will shift slowly into turf maintenance, is extending the period of nitrogen release from one application to up to two years, eliminating the need for repeat applications and reducing surges of growth.

Grace-Sierra offers a slow-release fertilizer to golf course maintenance and landscaping markets that it claims only needs to be applied once a year. The product, called Once, uses a resin coating made from soybean and other oils. Landscapers in "some pockets" around the country use the product on steep hills where they hope to eliminate the need for repeat applications, Wahl said.

"It's a catch-22 for us. We're still feeling our way in the landscape market," he said. "The tonnage of landscaping will always be in the shorter-term releases."

Four Seasons is experimenting using Once. Linn spread 15 pounds per 1,000 feet on a small turf area about three months ago. "It's holding up pretty well. The grass looks green and healthy," he said.

If the product works out, Linn will consider using it on clients' turf. "It will cost more money to use at first, but we'll save money in the long run. We have one guy that applies fertilizers and pesticides. Fertilization is part of the overall program, so we don't make money by making additional applications. Actually we save money."

**MARKET TRENDS.** Manufacturers note a number of trends landscape contractors seem to be following, and continually revamp products to meet market demand. One noted trend is reducing the total nitrogen release rate by using 50 percent slow-release and 50 percent quick-release. It's more efficient in terms of feed, said David White, director of marketing for CoRoN Corp., Souderton, Pa.

Doug Masters, sales and marketing manager for professional products of the lawn fertilizer group, The Andersons, Maumee, Ohio, finds landscape contractors are cutting phosphorus out of summer applications. "Phosphorus is very present in most soils. So they use 30-0-10 or 30-0-15 fertilizers with a lot of nitrogen and potassium," he said.

Masters also noted that many lawn care operators who used to ask for 30 percent or more sulfur-coated urea are eliminating sulphur from initial spring applications to actually step up the need for repeat applications.

White sees more companies combining CoRoN's liquid, controlled-release fertilizers with growth regulators. Green-Up Inc. tank-mixes CoRoN with Primo, Ciba's growth control regulator, on a monthly basis.

"It slows down the growth. We seem to get pretty good color with it," Johnson said. "It was tough getting started, as far as spraying. We had a real cool spring, as most

*(continued on page 68)*

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# Seed Suppliers

## Throw Out the Welcome Mat

*If you're looking for information about seed, the annual seed field days is the place to be. Find out how the industry's seed suppliers get their message out.*

By Cindy Code



SEED FIELD DAYS have become a tradition in the West.

Every June, dealers, distributors, suppliers, the media and anyone interested in seed research and development, new seed varieties, endophyte, certification and just enjoying the turf plots, flock to the Willamette Valley, Northern Idaho and Washington, to gain

**Ron Cook, seed certification specialist from Oregon State University, discusses efforts to ensure varietal identity.**



**Touring Seed Research of Oregon plots in Corvallis. Photos by Dave Miethke.**

first-hand knowledge about the dynamic seed industry.

This year was no exception. Crowds viewed greenhouses, distribution centers, warehouses and turf plots. Throughout, the rains held off. Good for the tourists — unfortunately it didn't last.

Suppliers are now voicing mixed feelings about about this year's seed harvest. Although the rain doesn't compare to the torrential downpour in the Midwest, the moisture could be enough to change the entire outlook of seed availability. (An exact harvest report was not available at press time. Watch for it in our September issue.)

Starting the field day tradition 11 years ago was Turf-Seed Inc. of Hubbard, Ore.

"We want people to take a look at our program from the inside out, meet our personnel and make up their own minds what kind of company we are," said Tom Stanley, marketing manager. "If they take a good look at our program, they will purchase their turf needs from our company."

While research and development are very important, Turf-Seed is trying foremost to be a marketing company, Stanley said. "From research and development to customer service to warehousing, Turf-Seed wants to be marketing oriented." Particularly in marketing the varieties the industry is asking for, he added.

Seed Research of Oregon prefers to hold separate field days for distributors, advisory committees and the media, but it all comes down to promoting current and future research.

"We wanted to show everyone what we're doing with our research," said Mike

Robinson, president. "It's a seed school type of thing in which attendees can understand the business and production aspects."

And if you're wondering if there's enough discussion to warrant annual seed field days, it's become common for companies to rotate the personnel they send out West.

"We bring people out here who are selling our seed to keep them in touch with our new products and new innovations we're coming up with to develop new varieties," said Doug Brede, Jacklin Seed Co.'s director of research. "We hold it every year, but we get a different group of people here every year."

**HARVEST.** A preliminary look at the harvest elicits mixed feelings. But if the rain keeps up, it doesn't bode well for this year's seed supply.

At the time of this report, Robinson said the majority of his crops were still in the field, but were looking good.

"It's normally dry this time of year. We cut the crops when the moisture content is 42 percent and begin combining when it reaches about 10 percent," he said. "If conditions turn around and dry up, it could be a normal to above average year. Combining will give us a better handle."

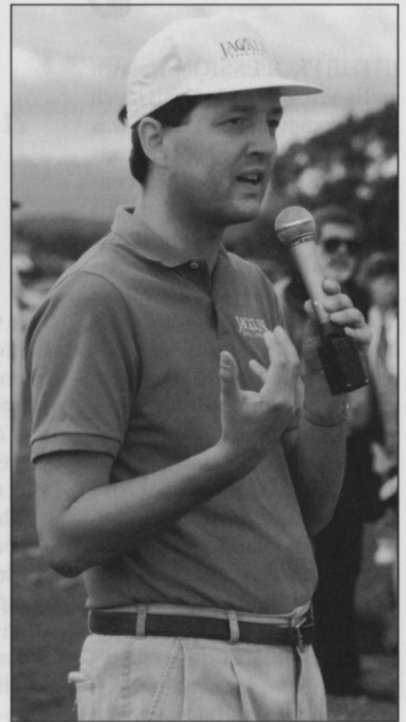
Brede said Northern Idaho has been getting a half-inch of rain every day, making it difficult to predict this year's yields.

"We send crews out to flop the piles over, but it's been so wet we can't even walk in the fields. It's a regional-wide thing in the Willamette Valley," Brede said.





Reviewing turf plots at Jacklin Seed in Post Falls, Idaho (left). Below, Doug Brede, director of research, discusses some of Jacklin's latest developments and prospects for new varieties.



"We're still anticipating a good supply of everything, but the premium varieties."

**HOT TOPICS.** A consensus is slowly growing in the seed industry to do away with "variety not stated" seed mixes.

Generally, VNS seed is that which for one reason or another a company doesn't want to sell under its trade name. More often than not it's the result of a supplier having more seed than it can sell under a particular variety name in a specific market.

In essence, when the seed industry is flooded with VNS products, it lowers the asking price of seed, eventually depressing the market.

"If we stop the use of VNS by requiring the variety name to be part of the sale, then the whole problem will go away," Stanley said. "It's a hot political issue. The longer we look at it and understand it, to put a name on the



Wendy Boles, a research technician for Jacklin, provides a greenhouse tour.

seed is the right thing to do."

In the long run, it's going to happen anyway. Five states — South Carolina, Florida, Georgia, Alabama and Mississippi — already outlaw VNS seed and more are considering it.

Field burning, a hot issue the past several years, has smoldered out. The industry is burning less and less every year. For instance, near the end of this decade, Oregon will only burn about 40,000

acres compared to the average 250,000 acres burned in its heyday.

Additionally, endophyte is still a hot seller in the seed business, particularly where new varieties are concerned. Brede said Jacklin has had success moving endophyte into fine fescue and a breeder seed should be available next year.

Internationally, buyers are interested in increasing the levels of endophyte in tall fescues. ■

*The author is Editor/Co-Publisher of Lawn & Landscape Maintenance magazine.*

# Landscape Design By Computer

*CAD is becoming  
a required tool to compete in the  
design/build market.*

*By Bob Gitlin*

IF THE PROFESSIONAL lawn and landscape market isn't much more computerized than it was five years ago, it should come as no surprise. The traditional contractor still has calluses on his hands and prefers being in the field. It's bad enough that a computer would chain him to an office, but the contractor who prides himself on learning myriad skills unaided becomes disheartened, even frustrated, at the prospect of needing help running a computer.

That's one reason computer-aided design of landscapes isn't more widespread, according to both professional lawn and landscape contractors and those selling CAD systems.

"Landscape contractors and design people are using computers a lot more for certain tasks, such as routing and budgeting, but there isn't a lot being done with computer-aided design yet in the landscape world," said Gary Thornton of Thornton Gardens in Maineville, Ohio.

Another deterrent is the prohibitive training required.

For the most part, it's the landscape architect who uses this technology, which heightens speed, efficiency and professional presentation. The contractor's function is primarily to install that plan and make sure it comes out right.

"We're a marriage of those two functions," said Rick Spalenka, owner of Rainbow Gardens, a Virginia Beach, Va., design/build contracting firm and retail garden center, and a landscape architect by trade.

"I no longer fall in

love with my drawings," he said. Customers change things in the interests of budget, aesthetics or just plain caprice. And with CAD, you don't have to tear up a big piece of paper and redraw a design on a new white sheet."

The first design/build landscape contractor in his area, Spalenka noted that most of his competitors continue to shy away from using CAD. "The landscape industry is really dominated by small firms that are generally of a blue-collar-level education. And they are pretty computerphobic."

The advantages of designing a landscape with CAD are evident

to Kathy Miller, a landscape designer with Miller Landscape Inc., Troy, Mich. On a recent job, she couldn't have achieved the requisite precision — which involved actually counting and measuring every brick on a patio — without the computer, she said.

**COMPUTERPHOBIA.** Landscape architects are gravitating toward CAD, albeit slowly. "People who have spent all those years and all that training are unwilling to put the pencil down, Miller said. "It's a hefty investment, and totally dependent on who you hire to run it. If they get good and get

hired away and you don't have someone else training on it ... you're done."

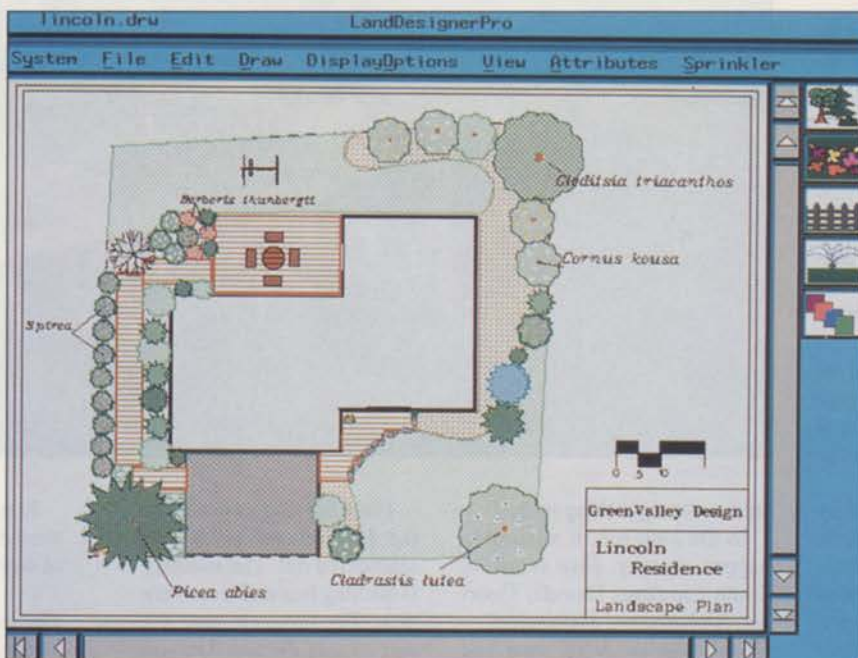
"CAD lets me turn around a design project faster," said John Gettman, landscape and irrigation designer at Mill Brothers Landscape & Nursery, Fort Collins, Colo. Changing plans no longer occasioned huffy exasperation on his part. "We allow our customers three or four revisions to landscape drawings now. We would not be able to compete as we do if we had to draw all this stuff by hand."

LANCADD made menial counting tasks easy, said Steve Estrada, landscape architect and owner of Estrada Land Planning, San Diego. "Say you have to change a tree symbol. If you do it manually, you have to go in and actually redraw every single one. Just a couple keystrokes on the computer and I redefine the tree to make it look different. You have 300 trees in your drawing; they all end up looking the same."

And you can get crucial estimates as you go along, Estrada said. "If you want to know how many trees you have now, you simply plug in a few things. You don't have to sit there with a mat measure or a counter and count every tree. And do it three times because you get a different number every time. Also, the computer tells you exactly how many lineal feet of whatever it is you want information on."

## LEVELS OF SYSTEMS.

One widely used CAD landscape system is of-



Computer-aided design offers detailed innovation. Photo: Green Thumb Software

(continued on page 40)



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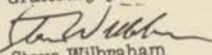
One of my employees—a 20-year old—seemed a hopeless goof-off. Numerous verbal requests, notes in his paycheck, even reducing his pay each week got me nowhere.

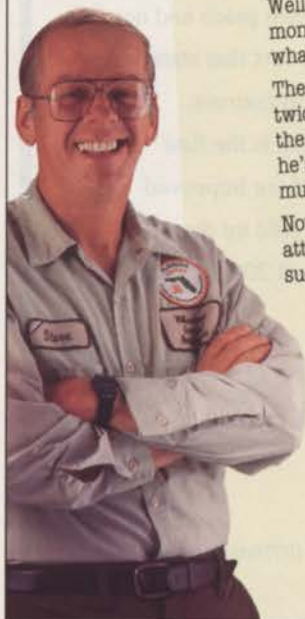
Well, we bought a new walk-behind and spent a lot of extra money to have hydraulic drive instead of belts and "Oh so what, while we're at it throw in a Velke."

The results were more than I hoped for. My guys now get twice the work done. And my problem kid—he won't get off the thing! He thinks he's lawn skiing. All I know is that he's become one of my top performers. He's producing so much I've not only given him back his lost pay, but a raise.

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## Cad Systems

*(continued from page 38)*

ferred by LANDCADD International, Englewood, Colo. LANDCADD operates with AutoCAD, a drafting engine available from AutoDESK, Sausalito, Calif. Competing with LANDCADD is SoftDESK (they're in New Hampshire), which requires the customer to first spend roughly \$3,000 on AutoCAD.

LANDCADD and SoftDESK have come at the professional lawn and landscape market from opposite directions. LANDCADD started targeting landscapers and expanded to include civil engineers; SoftDESK started selling to civil engineers and now is making a run at landscape design professionals.

LANDCADD and SoftDESK sell software modules, working with AutoCAD, mostly to high-end engineering and landscape architectural firms.

"There are a couple modules I would call more (geared) for landscape architects — Site Planning and Landscape Design," said Scott Davies, project engineer at LANDCADD. "They give you parking routines, planting-design routines. You get all the plant symbols; we have symbols for elevation, view, etc. We offer three-dimensional viewing. You can go back and forth between plan view and 3D symbols."

At the high end, contractors can spend \$20,000 on setting up hardware and software. These systems operate on both Macintosh and IBM PC platforms. At the opposite end, through products from other companies, users can get in the door for \$100 by buying a simple software package that runs on an existing PC, but is not typically geared for the professional contracting market.

**IS TRAINING HELL?** One of the big complaints from landscape architects and contractors considering CAD is the time-intensive education process. There are varying schools of thought on just how long it takes to (1) be able to do the basics on the system and (2) achieve mastery.

Davies had a ready answer for this resistance. "How long did it take them to learn on the (drafting) board? That's a skill you don't master in a day either."

A responsive CAD supplier offers various learning-curve options such as:

- Tutorial manuals that come with the reference manuals.
- Training centers throughout the world.
- "Road warriors," or free-lance consultants well-versed in CAD for landscape designers, who visit an office, for a fee, to teach as many people as the firm wants to have brought up to speed.
- Some offer subject-specific classes at company-located training centers. One recent LANDCADD course was tailored to fairly proficient users who could enhance their skills

*(continued on page 42)*

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## Cad Systems

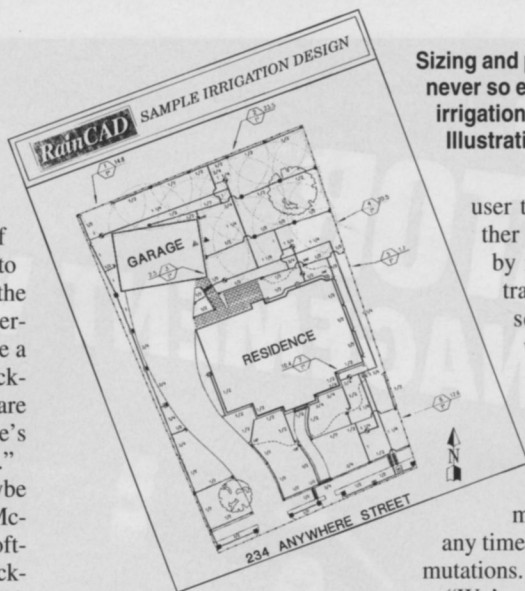
(continued from page 40)

even further in one-on-one sessions.

It's not all high-end operations spending in the tens of thousands of dollars who get into CAD, said Davies. "We have the one-man shop who's computerized to make himself look like a 20-man shop because he's kicking out these drawings that are very professionally done, and he's able to read the CAD formats."

"A lot of contractors maybe aren't good artists," said Judy McNary, whose Green Thumb Software, Boulder, Colo., sells a package called Land Designer. "A computer can generate something that's maybe not as good as what someone skilled can draw by hand, but for a lot of people who don't have the time to do that, or don't have the skills, it gives them a much higher-quality presentation."

At under \$400, Land Designer was conceived to run on a plain old off-the-shelf computer. "It's an



integrated solution that has the design, materials estimating, plant selection all built in," McNary said.

**PLANT SELECTION.** One major software program that works with these CAD programs is the plant database. For example, Plant Master, from Acacia Software, Westlake Village, Calif., allows the

**Sizing and placing pipes was never so easy as it is now with irrigation specific software.**

**Illustration: Rain Bird**

user to look for plants, either by characteristics or by name, to enable contractors to build planting schedules that work with the CAD system.

Some shops have virtually encyclopedic knowledge of plants loaded into the computer memory, accessible at any time, in all its various permutations.

"We've sold it all over the United States. We have fully regionalized databases; it works anywhere," said Gerry Kiffe, owner of the company, and a former design/build lawn and landscape contractor.

"We can print out a profile of each of the plants you've selected for that landscape or garden. You can produce a flower bloom report indicating what kind of

bloom, what color, what season. We give you a maintenance schedule, which lays out what should be pruned, fertilized and watered on a month-by-month basis. Every one of us — whether we're servicing commercial properties, high-end estates, middle America or just little perennial borders — needs to communicate better what we're going to do for people, in advance."

The system thus follows the user through the design process, calculating up plant costs. At any time a contractor can access total plant expenditure to see if it's within budget.

Kiffe, who on his own offers a landscape computer newsletter for lawn and landscape professionals, said the industry is fairly computerized insofar as basic business management systems are concerned. In time, the next step will be taken to a more general understanding and adoption of CAD, color-enhancement (see sidebar), and plant databases, he said.

(continued on page 44)

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USE READER SERVICE #13

**IRRIGATION DESIGN.** For the same reasons that CAD in the landscape profession creates more efficient production, it also boosts presentation and performance in irrigation design.

According to a Toro spokesman (Toro's design package is called IrriPro, and is purchased from LANDCADD), it's becoming more and more common for the industry to use computers to design sites.

Particularly with irrigation designs requiring hydraulic calculations, automated material take-offs and dozens of other calculations, CAD systems are becoming crucial to successful firms, according to Rain Bird, which offers the RainCAD.

Not all computer systems require a large initial investment.

"With our stand-alone program, you don't need AutoCAD," said John Prutzman, president of Eagle Design, Houston. In other words, his product, the Hydro-

AN ADJUNCT to CAD that is taking off in a big way is three-dimensional full-color enhancement of the image. Design Imaging Group, Woodland Hills, Calif., offers a package that enables the designer to take a symbol-laden drawing and transform it into virtual reality.

You superimpose scanned photographic textures and colors showing whatever kind of grasses or trees or shrubs you're specifying (these are culled from a pre-existing, prepurchased photo library or from your own shots), bringing the proposal to full-blown, breathing life.

"It transforms presentation," said Garry Galpin, DIG president. "The contractor can go out and present a CAD blueprint, but the homeowners still just see a bunch of squiggly lines."

Only 400 or so landscape designers were using the system as of yet, he added, but he anticipated increased interest. And not all high-end. His new package gets you in the door for \$800.

"I used to be a landscape contractor. When I gave a design to somebody, no matter how much I explained it — 'This is your front door, this is a Japanese maple,' etc. — by the time I was on the fourth plant, they forgot what the first plant was. This shows them so they don't forget."

So a picture is worth a thousand words?

"And probably four hours of your time."

CAD, is the low-cost alternative. "Our program costs \$1,250. The only requirement is that you have Windows 3.1. It's totally automated. You go in there, get your plot, diagram into the program and immediately start outlining irrigation components. The program immediately goes off and places the heads for you, auto-

matically places the pipe, sizes the pipe, creates a complete parts take-off list, makes the calculations, tells you how to set the controller, and makes the installation plot."

For the most part, professional lawn and landscape contractors testing computer-aided design seem to hold the misconception

that computers will make their jobs easier. In fact, computers are only as good as their users. They can't replace professional knowledge gained through years of experience. ■

*The author is a Contributing Editor to Lawn & Landscape Maintenance magazine.*



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# Hurricane Andrew: The Aftermath

*One year after the United States' most costly natural disaster ravaged southeast Florida, nursery growers have replaced most of their plant stock, but continue to pick up the pieces to rebuild their businesses.*

By Cathy Hoehn



Hurricane Andrew's devastation nearly killed South Florida's nurseries, but they've come back. Photo: FNGA

THE STORM'S over, but clouds still hang heavily over southeast Florida's nursery industry.

Plant growers in the region have replaced most of their plant materials wiped out by Hurricane Andrew. Now they face piecing together their businesses.

The hurricane, long on damage and short on rain, ripped across Florida's southeast coast Aug. 26, 1992, ravaging thousands of acres of plant materials, shade houses and greenhouses. Officials estimated Dade County alone lost interior and exterior plants worth \$245 million at wholesale value.

The Dade County area represents 15 percent of Florida's total nursery production, including

tropical and woody plant materials, and up to 30 percent of the state's foliage.

About six nurseries in the area combined export roughly \$15 million worth of plant material, but "I have not seen reports on how that program was impacted," said Earl Wells, executive vice president of the Florida Nurserymen and Growers Association.

Wells reported that small plant material, taking up to eight months to grow is completely replenished. Plants needing 10 to 12 months to grow are still in short supply in some areas. Trees with a growing time of one year or more won't be available until late fall.

"The outlook is good. We had good winter growing and mois-

ture conditions — almost too much moisture," Wells said. But it will still take tree growers one and a half to two years to get fully back into production, he added.

Wells contended that plant quality has not suffered due to hasty replanting and growing. "Reputable growers are going to be careful of what they sell because they want to maintain their client bases," he said.

**FINANCIAL LOSSES.** Though many nurseries were devastated by the loss of property and plant material, it's difficult to document the number that closed their doors due to the hurricane. The American Association of Nurserymen and the FNGA distributed financial contributions to nearly 400 members in southern Florida, but four companies were never located. "That doesn't prove they went out of business because of the hurricane, however," Wells said.

Bob Plyler, owner of Arvida Nurseries in Homestead, Fla., estimated he lost 50 percent to 60 percent of his plant material, worth \$1.5 million to \$2 million. The damage forced the nursery to close for three months, but "we're going great guns now," Plyler noted. "We're going to be here...if we don't have another hurricane."

Kraft Nursery and Garden Center in Deerfield, Fla., located just north of Fort Lauderdale, was forced to search in Orlando, Tampa, Fort Myers and Naples for plant material for its retail division.

"Availability was not good, but we weren't in dire straits," said Kathy Kraft. "We had the foresight to stock up, knowing there would be a shortage for awhile."

Some growers whose property was destroyed leased land in other areas until their own was restored. A number of them ended up renting booth space at fall and winter trade shows despite having nothing to exhibit.

"You take your name away from the public eye for a certain amount of time, it will really hurt

you," Kraft said. "So they at least made sure their names were still out there."

Financial aid is available to growers through a variety of grants and contributions, the largest of which is the Environmental Conservation Program. Wells recently learned the ECP will appropriate \$41 million to natural disaster victims in Florida, Louisiana and Hawaii. About \$20 million of that money goes to Dade County and other parts of Florida for a variety of recovery and restoration projects.

**STARTING OVER.** Now in the midst of yet another hurricane season, growers continue to pour money back into their nurseries and "wait for the day they get their homes and lives back in order," Wells said.

Henry Yanes, vice president and general manager of Lovell Farms in Miami, one of the United States' largest annual growers, said the company began shipping limited varieties after seven weeks, and had all its lines back by Dec. 15.

The 100-acre facility, which incurred \$8 million in damage from the hurricane, was rebuilt by Feb. 8, only to suffer another \$2.5 million blow from last March's storm. The latter destroyed about 60 percent of the company's shade houses and 20 percent of the plant stock. Both have been replaced.

Costa Nurseries in Homestead, an interior ornamental plant grower which used to maintain 200 acres, is still working to restore property damaged one year ago. Only an acre of plants remained standing after the hurricane.

"We have about 70 percent of what we had before, but we'll be back to the size we were in less than five years," said Jose Smith, general manager. ■

*The author is Associate Editor of Lawn & Landscape Maintenance magazine.*

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IRRIGATION  
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# PROPER IRRIGATION GOES A LONG WAY

*In part two of our series on irrigation installation in the landscape, the importance of firmly establishing the delivery system is reviewed.*

*By Larry Keesen*

**SAFETY AND LIABILITY** exposure should be top concerns for irrigation contractors. Unfortunately, many contractors are installing systems in a sloppy manner without regard for safety, quality, longevity, maintainability and efficiency.

Property owners and citizens have sued irrigation contractors for inadequately installed systems, and won. There's no need, however, for the situation to reach this critical point when it can be avoided by properly installing irrigation systems. Adhering to the guidelines detailed in this article should help eliminate potential troubles down the road.

*Photo: The Landmarks Group, Atlanta, Ga.*

**INSTALLATION DEPTHS.**

The biggest problem is setting heads and valve boxes to the finished grade. Millions of dollars a year are spent on irrigation system repairs due to mower damage. Most of this damage results from the heads and valves being set too high in the ground. Repeated damage often occurs to the repaired parts as well, because they were installed at the exact same height as the original.

Initially, most mower damage to irrigation equipment is the liability of the irrigation contractor. Later, the maintenance contractor becomes liable as he maintains the system and is responsible for proper repair and maintenance.

The finished grade in the turf area should be the surface at the base of the grass blades. The top of the head should be about an 1/8-inch below this level to avoid interference with mowers and pedestrians.

Sprinkler heads should always retract below grade, while spray heads in shrubs and ground covers should be 6- or 12-inch pop-up heads placed out of the way of pedestrian traffic and snow plows. Allow at least 2 inches, or three finger widths, between the heads and



the edge of a driveway or sidewalk where turf edging equipment will be used. Allow 6 inches in planting beds.

Place heads perpendicular to the finished grade (except on slopes greater than 3:1. See the January 1993 article on Sprinkler Head Selection and Placement). Always hand tamp soil firmly around the head to prevent movement and erosion and, when possible, install the head against undisturbed soil for greater stability.

Every time a zone is turned on there tends to be some surge in the lateral line. This surge potential is greater in systems without check valves in the heads because water drains out of the

lateral line after every operation.

For surge protection and water conservation, Keesen Water Management designs irrigation systems with check valves installed in the base of the sprinkler head. Lateral line surge can cause the heads to move in the soil and fittings to blow apart. Good compaction around the head will reduce the effects of surges, and will keep the head in place.

**MAKING CONNECTIONS.** The connection between the sprinkler head and pipe should be flexible enough to move if force is applied to the head without breaking or weakening pipes and fittings. Fittings should be durable and



*Two full rotor heads operating together. Instead of changing nozzle size or putting the second head on a separate zone, the contractor added a second rotor head. Photo: Larry Keesen.*

stronger than the pipe to which they connect.

Threaded connections are the weakest type of connection in the irrigation system. Use solvent welded joints whenever possible with PVC pipe. Use Teflon tape on all male threads to prevent leakage. Avoid oil-based compounds because they can weaken the PVC and cause leakage.

About 12 years ago, when I was a contractor, we started the season employing a new, easy-to-use pipe thread sealant. Three months later we were replacing valve manifolds on virtually every

job we installed. Needless to say, we didn't make a lot of money that year.

A 14-inch to 24-inch length of highly resilient pipe, connected between the head and the pipe, seems to be the best method for heads with 1/2-inch and 3/4-inch connections. Make sure the connecting pipe does not kink when a 12-inch length is formed into a ring.

Larger heads with higher flows require PVC swing joints. Several years ago we quit specifying the double swing joint made up of threaded street ells and nipples, and are now using a manufactured double-swing joint with "O-Ring" seals that provide flexibility without leaking.

*A distant view of the two rotor heads (from above) showing matched precipitation. Photo: Larry Keesen*

Avoid using PVC nipples or poly cutoff nipples as the only connection between the pipe and head. Properly designed residential systems with poly laterals can use a PVC nipple connected directly to an insert tee or pipe saddle.

Always install heads on flexible tubing or on manufactured swing joints to protect lateral pipe and head connections from damage by mowing equipment or other vehicular traffic.

**MAINLINE.** As a result of higher pressure and the potential for surge (water hammer) caused by fast-closing automatic control valves, install the mainline with more cover than the lateral lines.

Install the mainline pipe at a depth of 18 inches if the pipe is 4 inches or less, and at a 24-inch depth for larger pipes. Residential systems are smaller so the mainlines can be installed at a 12-inch depth. This placement provides adequate cover to keep the mainlines in place, and to avoid interference with the lateral lines which will cross above the mainline.

Maintain an even trench bottom that will continuously support the pipe on a uniform grade. If two or more pipes are installed in the same trench, provide a minimum of 4 inches between the pipes to allow room for repairs. Use clean, rock-free, backfill material around and

above (6 to 12 inches) the pipe to prevent damage.

Compact trench backfill to a density equal to the adjacent undisturbed soil. Flooding or "pudding" the trenches is a good method to achieve proper compaction along with light tamping when the soil dries out. Avoid compaction with trucks and large tractors.

Install wires on the side of the mainline pipe, and tape and bundle wire every 15 feet to help prevent wire damage should the area need to be excavated.

Provide 24-inch expansion loops whenever wire direction change is greater than 40 degrees to allow for the expansion and contraction of the soil during temperature changes. Install several spare wires to avoid future problems.

Lateral lines can be installed 8 inches to 16 inches deep. The depth of turf aeration determines how deep you will want to place the pipe, as 8 inches of soil is more than sufficient to hold a 2-inch pipe in position. Pulling pipe is acceptable if the soil is free of sharp rocks or other damaging conditions.

For polyethylene piping, use insert fittings with screw clamps or locking pinch clamps for smaller sizes such as 1 inch. Double clamp 2-inch and 1 1/2-inch pipes, and make sure the clamps are installed over the serrated edges of the insert fitting.

Once the mainline pipe is installed, and before the valves are installed, backfill the pipe — except for all fitting connections. Next, flush any debris from the line and in-



stall the control valves. Check all of the connections once the mainline is pressurized, and then backfill.

Another method for pressure testing uses a high-pressure force pump which builds the system pressure up to about 150 psi. If the pressure drops rapidly once the pump is shutoff, it's an indication that the valve is open or a leak is occurring.

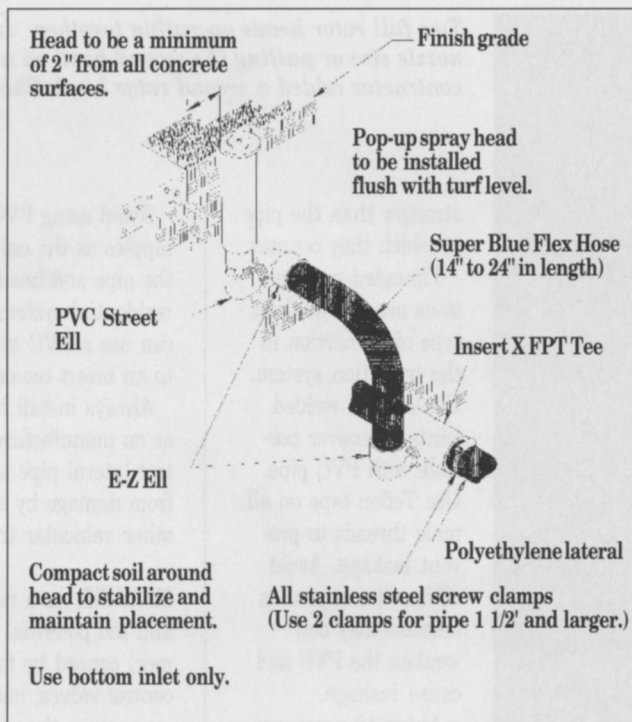
After the installation is complete, check the head coverage for distance, uniformity and alignment. Adjust radii and arcs to improve system performance.

When routing the pipe, stay outside of the drip line of any tree as much as possible.

*Pop-up spray head detail. (Not drawn to scale.)*

Two years ago, one of our renovation designs was installed in a large office site with many parking lot islands and existing mature trees. Today, many trees have died because the roots were cut and the trees went without water during the growing season.

Flush the lateral lines before install-



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ing any heads. Flush them a second time before installing the last heads on the lateral line, to remove soil residue from the previous installations.

As-built conditions should be noted on the irrigation plans as the work progresses, and transferred to a reproducible drawing at completion. The as-built plan should show the dimensioned locations of the following:

- Point of connection
- Mainline location (every 100 feet)
- Isolation valves
- Electric control valves
- Quick coupling valves
- Control wire routing
- Sleeves

Dimensions should be recorded from two permanent reference points such as buildings and streets. The irrigation legend should be changed if the equipment installed differed from what was shown on the plans. An operating and maintenance manual should be provided for every project, including the name, address and phone number of the designer, contractor and local distributor.

The beginning and duration of the warranty period is included along with an equipment list with the manufacturer's name, model or part number, and detailed operating instructions and maintenance guidelines.

Using the ideas in this article will help you install a more durable and efficient irrigation system and will help avoid future liability problems.

Next month's lesson will review irrigation system maintenance issues including preventive maintenance, winterization and operational reviews.



The author is vice president of Keesen Water Management, Aurora, Colo.

**IRRIGATION QUESTIONS**

1. What is the biggest problem with many irrigation systems?
2. What degree of compaction is required around sprinkler heads?
3. At what height should sprinkler heads be installed?
4. Will check valves in the base of the head reduce the surge potential in lateral lines?
5. What is the weakest type of connection in the irrigation system?
6. Should pipe be pulled into the ground with a pipe puller?

Answers appear on page 70 of August LLM.

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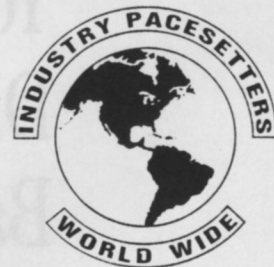
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# Compost Corner

## COMPOST VS. TOPSOIL: CHOOSING FOR LANDSCAPE PROJECTS

WITH THE ever-increasing availability of compost, more landscape contractors are replacing topsoil with compost for a variety of project uses.

Whether for general grading purposes, lawn establishment and renovation or tree and shrub planting, landscapers purchase and handle a tremendous amount of soil products. And with quality topsoil available in smaller quantities at increased prices, contractors are discovering the many advantages of using bulk compost.

**Wider Availability.** Topsoil availability has always been spotty. Some areas of the country are more likely to have it than others. Even within small geographic areas topsoil availability and price vary considerably, especially given the high cost of shipping.

Contractors have most difficulty finding topsoil in metropolitan areas. In fact, some city and county governments ban the shipment of topsoil across city or county lines to limit the stripping of topsoil before

construction or new development.

Compost, on the other hand, is becoming increasingly available. A growing number of cities and towns, private composters and even landscape contractors are composting, leading to a greater supply at reasonable prices. More material is available these days as a result of landfill bans on the disposal of yard waste, leaves and grass, as well as a dramatic rise in tipping fees for disposal at landfills and incinerators.

Today, landscape contractors can buy compost from private composters, municipalities or bulk and rewholesale yards.

**Superior Quality.** Even the best available topsoils contain rocks and sticks which need to be removed, and weed seed is invariably a problem when topsoil is used for new lawn establishment. Properly managed compost should avoid each of these problems. Rocks and sticks should be screened out, and the vast majority of weed seeds are killed by the

extreme heat generated during composting.

Compost consistency offers the contractor numerous advantages over topsoil. Compost provides a fine, uniform texture which makes it easy to handle. Topsoil, depending upon the sources, can vary widely in consistency (although sewage sludge and solid municipal waste compost can as well). Everyone would always like to be able to put down a high-quality loam topsoil, but the delivered material often looks more like gravel or contains large clumps of clay.

Compost also provides labor and transportation savings over topsoil. Compost weighs less — some 1,200 to 1,300 pounds per cubic yard, compared to topsoil's 1,900 to 2,000 pounds per cubic yard — meaning it can be shipped more cheaply than topsoil because more packed in a truck load. At the job site, less labor is required to handle, shovel and rake compost, and less wear and tear is placed on the contractor's equipment.

*(continued on page 56)*

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## Compost Corner

(continued from page 54)

**Agronomic Value.** Compost offers many advantages over topsoil from an agronomic prospective, such as high nutrient value, increased organic matter, nutrient and water-holding capacity and neutral reaction.

Compost contains more nutrients than topsoil, which reduces fertilizer requirements at the time of establishment. This is true for primary as well as secondary and trace elements.

Compost varies in nutrient content. Material derived from animal manures or sewage sludges, for example, contains higher nutrient levels than yard waste compost. Therefore, when using yard waste compost as a soil amendment, landscape contractors reduce normal fertilization rates at the time of establishment up to 20 percent, while rates for animal manure or sewage sludge compost can be reduced up to 40 percent.

Compost typically contains 20 percent to 30 percent organic matter, while most topsoils contain less than 3 percent. Organic matter helps improve clay and sandy soils. Results include improved

aeration, better soil structure and higher water and nutrient holding capacity. Compost also lowers irrigation and fertilization requirements.

It is well-known that microorganism activity in organic matter reduces thatch development. Recent research shows high levels of microorganism activity also reduce soilborne pathogens such as *Pythium* and *Rhizoctonia*, as well as help release micronutrients, making them available to plants.

Most composts provide a neutral to slightly alkaline reaction, with pHs generally ranging from 6.5 to 8. Compared to the acid topsoils found in many regions, composts require less limestone to correct acidity.

**Compost Quality.** Before using compost, landscape contractors need to ensure the material they purchase is mature and fully stable. Otherwise, plant growth problems may result, particularly if sufficient fertilizer is not added at the time of establishment. Mature and stable compost is only assured by dealing with reputable suppliers.

The source of compost is another consideration. Yard waste and animal

manure compost are generally high quality. Compost made from sewage sludge and municipal solid waste, however, may contain contaminants. Users of these composts should know the producer, check with others who have used the products and ensure the compost meets all local, state and federal regulations. Producers should provide test results for heavy metal and pathogen contamination in sewage sludge and municipal solid waste compost.

Compost made from sewage sludge or animal manure should be incorporated into the existing soil before planting or seeding. These materials often initially contain high levels of salt as well as nutrients. Both could hinder seed germination, but incorporating the compost into the subsoil minimizes that chance.

Compost continues to gain favor over topsoil for use by landscape contractors. Superior quality, lower prices and easier handling will lead to further compost use in the future. ■

*James F. Wilkinson Ph.D., is vice president of professional sales and research and development for Earthgro Inc., Lebanon, Conn.*

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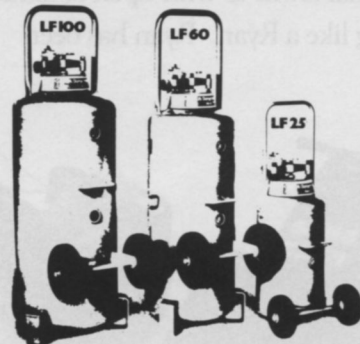
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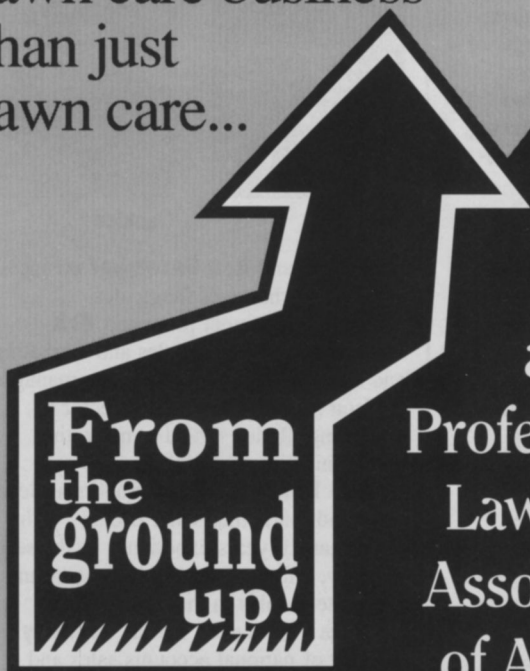
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# People

PENNINGTON SEED appointed **Kevin Gaskins** marketing director, responsible for marketing each of the company's distribution divisions; and **Andy Hancock** as Western regional turfgrass specialist, in charge of the specialty turfgrass distributors program in the West.

Datcon Instrument Co. appointed **Roger Miller** director of outdoor engine monitoring sales. Miller manages major industrial accounts throughout North America.

**Debra Porter** joined ISK Biotech Corp. as secretary, regulatory affairs.

BSI Consultants named **Gene Ginther** district manager, responsible for supervising the firm's new Los Angeles office.

Color Spot appointed **Don Hinshaw** president and chief executive officer. Hinshaw most recently served as president and CEO of M&B Window Fashions.

Turf-Seed announced the following promotions: **Duane Klundt** as sales representative and customer service agent, responsible for handling new accounts and tracking seed orders from contract distributors; **Jim Enyart** as field management manager, a new position for coordinating grower contracts, seed planting,

certification inspections, chemical tool applications and harvesting procedures; and **Alex Muraviov** as plant manager of the company's facilities near Hubbard, Ore., responsible for supervising seed shipping, receiving, blending and storing, as well as overall maintenance of warehouse space.

Rain Bird named **Eric Bescoby** director of its golf division. Bescoby previously served as marketing manager for the company's consumer products division.

Jacklin Seed named **Erin O'Regan** traffic manager, responsible for all aspects of domestic shipping. O'Regan was formerly community outreach coordinator with The Arc of Spokane. In addition, **Chris Claypool** joined Jacklin's international marketing department, assisting in export sales of turfgrasses, foragegrasses and legume seed.

Sostram Corp. named **Robert Hopkins** sales representative for Florida, Alabama, Georgia, North Carolina and South Carolina. Hopkins previously served as national accounts manager for Oil Dri Corp. Sostram also appointed **Jim Bryan** business manager, responsible for



O'Regan



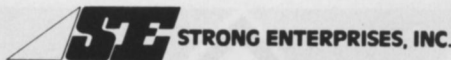
Gaskins

herbicides, and **Ron Dezember** business manager in charge of fungicides.

PRIME Equipment promoted **Bob Hodson** to director of sales and marketing, and **Jacque Redus** to marketing manager. Hodson formerly served as director of marketing; Redus served as marketing communications specialist.

**Lance Dickey** joined International Seed's sales and marketing staff. Dickey, with more than 10 years experience in the seed industry, will be responsible for turf and forage seed sales in the United States.

Garden Way named **Kevin Connolly** director of national accounts sales and service, and **Gene Chesser, Ron Pettifer** and **John Stephens** as territory sales managers. ■



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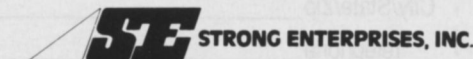
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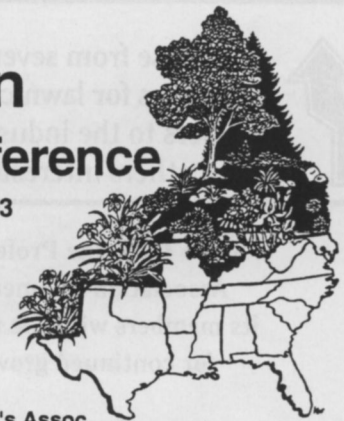
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# Buyers' Market



Comparison study of low fertilization. Pixie turf-type tall fescue is in the upper left.

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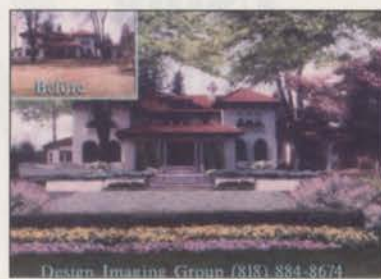
PIXIE shows excellent resistance to brown patch, and has the ability to maintain its very dark-green color under low fertilization and low water requirements, making it an excellent choice for areas with limited water availability.

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■ Design Imaging Group introduces a new "lower cost," Windows-based computer imaging product for landscape designers, contractors and architects. Easy-to-learn and flexible for making design changes, it requires only a Super-VGA Board and monitor to operate on your PC. Known as the "Wizard," this imaging software comes with training videos, written tutorials and a more than 1,000-item database of trees, shrubs, sod, hardscape, pools, surface textures, images, etc. Just take a picture of your customer's site and hand them back a photo-realistic rendering of your design plans. They can see what it looks like before the job's installed.

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■ Amsoil Inc.'s AGGRAND natural and organic sprayable liquids are effective, convenient and economical.

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AGGRAND Natural Organic Fertilizer is a complete nutrient package. Bioactivator. May be applied as a foliar spray for quick green-up.

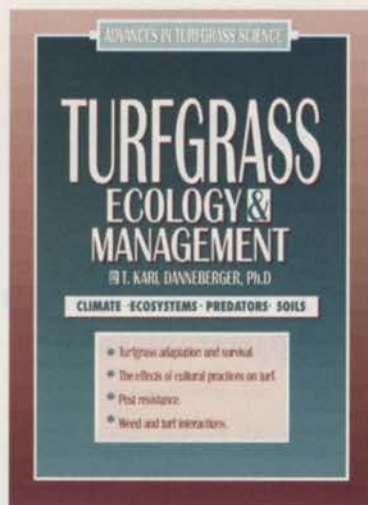
**Circle 143 on reader service card**



■ The EAGLE 44, manufactured by AmeriQuip, is a trailer-mounted, articulated aerial lift with a 25-foot side reach and 44-foot working height. It features positive bucket leveling, 360-degree continuous rotation and offers outstanding portability for easy access for a variety of maintenance tasks. An electrically operated proportional control valve featuring joystick operation with neutral position interlock allows simultaneous two-function operation and complete feathering capability. Heavy-duty, quick-adjust outriggers are an integral part of the lift. Ease of operation and portability make the EAGLE 44 ideal for most maintenance tasks requiring aerial access.

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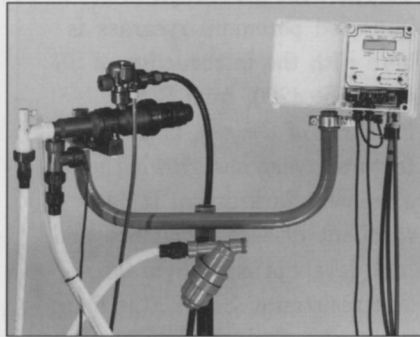
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USE READER SERVICE #29

**AMIAD FILTRATION** Systems offers a chemical/fertilizer injector system which retrofits to existing irrigation systems. The "fertigation" system delivers controlled amounts of fertilizer through irrigated water to root tips of plants.

Amiad injectors can be permanently installed on pipes 3/4-inch to 16 inches in



size, or used with mobile tanks. The portable system can easily be moved from field to field.

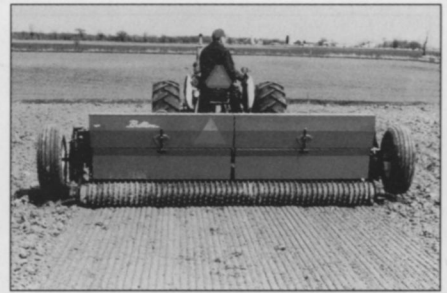
The Amiad Duplex Injector is designed to inject larger quantities of fertilizer or chemicals into the irrigation water system. Although made up of two injectors, it uses only one water-drive line, one chemical feed line and one injection outlet.

**Circle 126 on reader service card**

The 12-foot-wide Turfmaker Seeder from **Brillion Iron Works** offers 20 percent more seedbox capacity than the 10-foot model. The larger, 9-bushel seedbox reduces seeding time, allowing growers to plant more acres before refilling.

Brillion's micrometer adjustment has an infinite number of settings for precision metering of small seeds.

The Turfmaker Seeder is available with an acremeter, agitator, front scraper, speed-up kit, S-tine wheel track remover, safety



chain kit, coil tine wheel track leveler and larger tire.

**Circle 127 on reader service card**

Aquasand, a natural mineral soil additive from **Creative Curb**, retains water and nutrients in its honeycomb structure, reducing the need for watering.

The pH-neutral, porous crystal granules are billed as retaining up to 300 percent more water in soils; helping prevent root rot and fertilizer leaching. The product can be used in soil mixes for lawns, trees and shrubs.

**Circle 128 on reader service card**

Barenbrug's Bardur hard fescue is an advanced generation cultivar based on germplasm collected throughout Europe.

Features of the hard fescue include high seedling vigor, resulting in dense turf year-round, medium-dark green color and fine leaves. Bardur maintains its color and texture under stress, tolerates heat and drought, has good winter hardiness and resists diseases such as redthread, summer patch and anthracnose.

Bardur is suitable as a monoculture or in a turf mix.

**Circle 129 on reader service card**

**Weegy Mowers** bills its commercial reversible mulching blade the first of its kind for walk-behinds. The blades feature

## PRODUCT SPOTLIGHT

THE HURRICANE 5 from Parker Sweeper is an all-purpose walk-behind blower designed to easily remove leaves, loose debris and standing water.

It has a 5-h.p. Briggs & Stratton engine, a front-mounted swivel turf caster, semi-pneumatic rear tires and a plow-type handle with throttle control. These features provide easy maneuverability on rough terrain.

The Hurricane 5 is constructed with an 11-gauge steel housing and a 6-blade aluminum-magnesium impeller fan producing 2000 CFM at 150 mph. The air force is released from a front or side discharge. The Hurricane 5 is backed by a two-year parts/one-year labor warranty.

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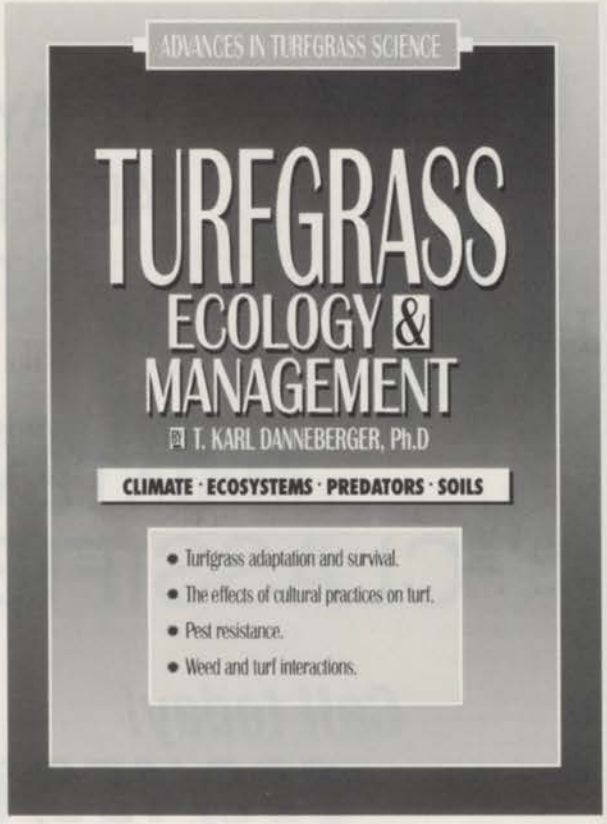
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two cutting levels to reduce grass at least twice with each revolution. The mulching blades can be attached to 24 brands of mowers including Hustler, Jacobsen, Bobcat, Bunton, Encore, Gravely, Exmark, Snapper, Toro, Kubota, John Deere, Scag and Walker.

The Weegy blades sharpen easily, mulch leaves as well as grass and incorporate a high-lift design for stripping.

**Circle 130 on reader service card**

**TOPSITE 2.5G** from **American Cyanamid** is a broad-spectrum granular herbicide used to control annual and



perennial broadleaf weeds and grasses. The herbicide is labeled for more than 100 plant species including johnsongrass, bermudagrass, foxtail, quackgrass and tough-to-control kochia.

TOPSITE is geared for use at electric utility substations, industrial facilities, railroad signal and light posts, equipment yards, petroleum and grass wellheads and similar sites.

**Circle 131 on reader service card**

**Rain Bird** released a working demonstration program for its RainCAD Irrigation Design Software, allowing users to test the RainCad program before buying it. The demonstration program's three modules serve as a practice session with full-function CAD capabilities in free-form mode.

A third-party equipment database is also available, enabling users to access equipment from other manufacturers.

**Circle 132 on reader service card**

### **Correction**

Espoma Bulb-Tone was improperly identified as a Scientific Marketing Services product in the June issue. The manufacturer of the product is **The Espoma Co.**

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USE READER SERVICE #62

**SEPT. 1-3** Pan Pacific Green Industry Conference and Trade Show, Waikiki Sheraton, Honolulu, Hawaii. Contact: Karen Bento, Landscape Industry Council of Hawaii, 1085 S. Beretania, Suite 203, Honolulu, HI 96814; 808/545-1533.

**SEPT. 9-10** Southwest Horticultural Trade Show, Phoenix Civic Plaza, Phoenix, Ariz. Contact: Arizona Nursery Association, 1430 W. Broadway, Suite A-125, Tempe, AZ 85282; 602/966-1610.

**SEPT. 10-12** Responsible Industry for a Sound Environment Third Annual Meeting, Ritz Carlton Tysons Corner Hotel, McLean, Va. Contact: RISE, 1155 15th St. NW, Suite 900, Washington, DC 20005; 202/872-3860.

**SEPT. 21-23** Virginia Tech Turf and Landscape Field Days, Virginia Tech Campus, Blacksburg. Contact: J.R. Hall III, Virginia Cooperative Extension, Department of Crop and Soil Environmental Sciences, College of Agriculture and Life Sciences, Virginia Tech Campus, 426 Smyth Hall, Blacksburg, VA 24061-0404; 703/231-9736.

**SEP. 23** Landscape Expo, Lion's Club, Burtonville, Md. Contact: Landscape Contractors Association, 9053 Shady Grove Court, Gaithersburg, MD 20877; 301/948-0810.

**SEPT. 26-29** Florida Turfgrass Association 41st Annual Conference and Show, Tampa Convention Center. Contact: Charalyn Cole, FTGA, 302 S. Graham Ave., Orlando, FL 32803; 800/882-6721 or 407/898-6721.

**OCT. 2-5** American Society of Landscape Architects Annual Meeting, Chicago Hilton & Towers, Ill. Contact: Jan Rothschild, ASLA, 4401 Connecticut Ave. NW, Washington, DC 20008; 202/686-8319.

**OCT. 5-7** Horticulture From Around the World Annual Convention and Trade Show, Tulsa, Okla. Contact: Oklahoma State Nurserymen's Association, 400 N. Portland, Oklahoma City, OK 73107; 405/942-5276.

**OCT. 5-8** 1993 Interstate Professional Application Association Convention, Salishan Lodge, Oregon. Contact: IPAA, P.O. Box 1377, Milton, WA 98354-1377.

**OCT. 6-7** 33rd Annual Southern California Turfgrass Expo, Orange County Fairgrounds, Costa Mesa, Calif. Contact: Linda Knoche, Southern California Turfgrass Council, 1092 Tanya Lane, Unit B, Fallbrook, CA 92028; 619/723-0947.

**OCT. 11-13** Northwest Turfgrass Conference, Holiday Inn at Yakima, Washington.

Contact: Northwest Turfgrass Association, 206/754-0825.

**OCT. 26-28** Atlantic Seedmen's Association Convention, Radisson Hotel, Niagara Falls, N.Y. Contact: Dr. John Baylor, ASA, 298 E. McCormick Ave., State College, PA 16801; 814/237-0330.

**OCT. 31-NOV. 3** International Irrigation Exposition and Technical Conference, San Diego Convention Center. Contact: IA, 1911 North Fort Myer Drive, Suite 1009, Arlington, VA 22209-1630; 703/524-1200.

**NOV. 1-2** Southwest Outdoor Power Equipment Show, Arlington Convention Center, Arlington, Texas. Contact: The Service Dealers Association, 1946 S. IH-35, Suite 100-A, Austin, TX 78704-3693; 512/443-7999.

**NOV. 1-3** National Institute on Park and Grounds Management Grounds Show, Sheraton Denver Tech Center, Colorado. Deadline for reservations is Oct. 10. Contact: National Institute, P.O. Box 1936, Appleton, WI 54913; 414/733-2301.

**NOV. 7-9** Sports Turf Manager's Association Annual Conference and Exhibition, Oriole Park, Camden Yards, Baltimore. Contact: STMA, 401 N. Michigan Ave., Chicago, IL 60611; 312/644-6610.

**NOV. 9-10** Hoosier Turf and Landscape Expo, Indiana Convention Center, Indianapolis. Contact: Indiana State Lawn Care Association, P.O. Box 481, Carmel, IN 46032.

**NOV. 9-12** Turf and Grounds Exposition, Rochester Riverside Convention Center, Rochester, N.Y. Contact: New York State Turfgrass Association, 800/873-TURF or 518/783-1229.

**NOV. 14-18** Green Industry Expo, Baltimore, Md. Co-sponsored by the Associated Landscape Contractors of America, the Professional Grounds Management Society and the Professional Lawn Care Association of America. Contact: GIE, 1000 Johnson Ferry Road, NE, Suite C-135, Marietta, GA 30068-2112; 404/973-2019.

**NOV. 22-25** 1993 Brighton Conference — Weeds, Brighton Centre, Britain. Contact: Sherrie Simpson, Conference Associates and Services/British Crop Protection Council, Congress House, 55 New Cavendish St., London W1M 7RE; 071 486 0531.

**DEC. 6-9** Ohio Turfgrass Foundation Conference and Trade Show, Columbus. Contact: Phyllis Selby, OTF, 2021 Coffey Road, Columbus, OH 43210; 614/292-2601. ■



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## News in Brief

(continued from page 14)

### **LESCO Names New President**

After a lengthy search, LESCO, Rocky River, Ohio, named William Foley its new president and CEO.



**William A. Foley**

Wall Covering Inc., a subsidiary of Collins & Aikman. At one time, he was a vice president of general consumer products at O.M. Scott & Sons in Marysville, Ohio.

Much of LESCO's growth of late has come from its service centers, which have been around since the mid-1980s, and speculation is that Foley will try to grow these centers even more.

LESCO founder James FitzGibbon will remain as chairman, and Robert Burkhardt will remain vice chairman.

Previously, Foley was president and CEO of Imperial

### **NAS Report Urges Regulation Changes**

The federal government should gather data on what children eat and how to go about setting tolerance levels for pesticide residues for children, according to a report by the National Academy of Sciences.

The report says changes are necessary in pesticide regulations to protect infants and children because of their unique sensitivity to pesticide residues. "Infants and children differ both quantitatively and qualitatively from adults in their exposure to pesticide residues in foods," it reads, because they consume more calories per unit of body weight and eat fewer types of food than adults.

The report acknowledges the necessity of pesticides to increase the amount of fruits and vegetables available for public consumption, but it recommends that the U.S. Environmental Protection Agency modify its decision-making so that health considerations, rather than agricultural production, are foremost.

This represents a significant shift in policy. In determining tolerance levels for pesticide residues, EPA now factors in economic benefits along with risks to human health.

The report further urges that pesticide testing be conducted on juvenile animals, whose systems are more similar to chil-

dren's than are adult animals.

The report concludes: "Children should be able to eat a healthful diet containing legal residues without encroaching on safety margins."

The NAS report came on the heels of a joint announcement from the EPA, the Food and Drug Administration and the U.S. Department of Agriculture that the three will coordinate their efforts to "create incentives for the development of safe pesticides" and to "remove those pesticides that pose the greatest risk from the market."

Until now, there had been no coordinated effort among the various agencies, except when concerns about individual pesticides have raised public alarm. In general, EPA has been responsible for analyzing pesticides' safety, the FDA for food residues testing and the Department of Agriculture for fostering farm production and income.

Although the report made little mention of non-agricultural pesticides, the Responsible Industry for a Sound Environment is keeping a close eye on the situation.

"Our industry will work with the EPA other government agencies, scientists and public policy makers to maintain and strengthen its commitment to the safety of children and their environment," said Allen James, RISE executive director.

Other national green industry associations work with RISE to convey accurate information about pesticides. ■

## Staying Power

(continued from page 32)

folks did, on bermudagrass. With slow release, it was not releasing quickly enough, in May and even in early June. The bermudagrass was really slow to come out. So we had to go back and put a little soluble fertilizer on those lawns. But then once it turned green and got going, the liquid fertilizer did the trick as far as providing a nice color without that surge of top growth."

Green-Up also uses the liquid fertilizer in tree and shrub applications. "We have a large tank set up now where we have the capability of getting it in bulk, rather than getting it in 35-gallon drums. The cost really goes down.

"Even in our supplemental applications of Primo we still tank-mix in about a half pound of nitrogen of CoRoN, just to supplement granular fertilizers we already have down in the soil," he added. "The extra cost — about half a pound of nitrogen — is not that much. Maybe 40 cents per 1,000 square feet." ■

*The author is Associate Editor of Lawn & Landscape Maintenance magazine.*



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All classified advertising is 75 cents per word. For box numbers, add \$1 plus six words. All classified ads must be received by the publisher before the first of the month preceding publication and be accompanied by cash or money order covering full payment. Submit ads to: *Lawn & Landscape Maintenance* magazine, 4012 Bridge Ave., Cleveland, OH 44113. Fax: 216/961-0364.

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Needed: Must have supervisory experience and some horticultural knowledge. Send resume and salary requirements to: Horticultural Consultants Inc., 3701 Gribble Rd., Matthews, NC 28105.

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Blanket, new patent product with exceptional erosion and vegetation growth properties. National opportunities to market this product through existing distributor. Must be financially secure and have the ability to provide own start-up selling expenses. BS degree, industry contacts and landscaping and erosion control experience. Reply with resume to P.O. Box 66, Greenville, SC 29602, Attn.: N.S. Cash.

### MANAGEMENT

Leading franchisor of lawn and tree care services seeking a self-motivated, people person to fill a franchise support rep. position. Must have a college degree and be willing to travel. Benefits include: good base salary, major medical, life ins., 401K and bonus opportunities. Mail resume to: Spring-Green Lawn Care Corp., P.O. Box 2828, Naperville, IL 60567.

## IRRIGATION TRAINING SERIES LESSON FOURTEEN

Answers to questions on page 53.

1. Mower damage to heads and valve boxes due to improper installation.
2. Compaction similar to the undisturbed adjacent soil.
3. The top of the head should be about an 1/8-inch below finished turf grade.
4. Yes, the surge potential is greater in systems without check valves in the heads because water will drain out of the lateral after every operation.
5. Threaded connections.
6. Pulling pipe is acceptable if the soil is free of sharp rocks or other conditions that may damage the pipe.

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USE READER SERVICE #18

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