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AUGUST 1988
VOLUME 9, NUMBER 8

ALA

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COVER

This month's cover story examines the implications of this summer's drought on the lawn and landscape maintenance industries. Find out how LCOs across the country are handling the sizzling heat.
(Cover photo by Barney Taxel)

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INSIDE STORY

If there's been one shining moment throughout this summerlong drought, it has to be the level of professionalism exhibited by industry professionals.

While the drought of 1988 has left devastating effects on the landscape, LCOs have not let the sizzling heat and lack of precipitation get the best of them.

In fact, applicator and maintenance professionals have taken the bull by the horns and set out to educate their customers on dormancy, watering, mowing and fertilization, as well as the need to continue a prescribed lawn care program. Proper care of the landscape in spite of the weather, can help minimize damage from the drought.

According to the Professional Lawn Care Association of America, it will cost the average customer \$300 to \$3,000 to replant a dead lawn. On the other hand, the cost of continued service — on the average \$35 to \$50 — is cheap in comparison.

Effort exhibited by LCOs when they take the time to inform customers that their lawn is not dead, but in a prolonged state of dormancy, can go a long way in promoting trust in a customer/professional relationship.



That relationship will be important this fall when LCOs must work with their customers to develop renovation plans.

Communication is also vital this year because no one knows what to expect once the drought ends. No one knows how long turfgrasses can remain in dormancy, and when or if they will recover.

That's where aeration, overseeding/slit seeding and fall fertilization will come in handy. Many LCOs are already promoting the services and buying necessary equipment to enhance turf recovery.

Because of high demand and price increases, it's important that LCOs make early commitments to added services. Prices for both equipment, because of higher steel costs, and seed, because of damaged crops, will run higher beginning this fall.

Industry professionals should be commended for the way they've handled the unfortunate effects of the drought.

Wrangler Tall Fescue is a new release from Jacklin Seed Co., LESCO Inc. and Turf Merchants International. A story in the June issue of *ALA* did not make it clear that the product was being marketed by all three companies.

Cindy Code

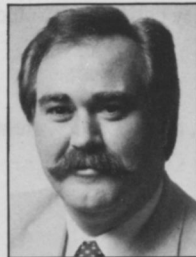
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Dr. John Street is an associate professor in the agronomy department at The Ohio State University. Dr. William Meyer is president of Pure-Seed Testing Inc., Hubbard, Oregon. Des Rice is president of The Weed Man Ltd., Mississauga, Ontario, Canada. Dr. Al Turgeon is professor and head of the department of agronomy, Pennsylvania State University. Dr. Joseph Vargas is professor of botany and plant pathology, Michigan State University, East Lansing, Michigan. Dr. Patricia Vittum is associate professor of entomology, University of Massachusetts, Waltham, Massachusetts.

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CALENDAR

Sept. 13-15

Virginia Turfgrass Field Days, Virginia Tech Turfgrass Research Center. Sponsored by The Virginia Turfgrass Council, Blackburg, Va. Contact: J.R. Hall III; 703/961-5797.

Sept. 14-16

New Jersey Nursery & Landscape Show, sponsored by the New Jersey Association of Nurserymen, Atlantic City, N.J. Contact: New Jersey Association of Nurserymen, Bldg. A, Ste. 3, 65 S. Main St., Pennington, N.J. 08534; 609/737-0890.

Sept. 28-30

The International Pesticide Applicators Association Annual Convention and Trade Show, Red Lion Inn, 300 112th Ave. S.E., Bellevue, Wash. Contact: Bill Harlan, P.O. Box 681, Kirkland, Wash. 98083; 206/823-2600.

Oct. 9-12

Florida Turfgrass Annual Conference and Show, Curtis Hixon Convention Center and the Hyatt Regency Hotel, Tampa, Fla. Contact: FTGA, 302 S. Graham Ave., Orlando, Fla. 32803; 407/898-6721.

Oct. 22-24

Third Annual Landscape Exposition, Nash-

ville Convention Center, Nashville, Tenn. Contact: Becky Lerew, show manager or Mary Sue Christoffers, sales manager at 203/853-0400; or write to Landscape Exposition, 50 Washington St., Norwalk, Conn. 06854.

Oct. 23-26

1988 Interior Plantscape Division Conference & Trade Show, Los Angeles Airport Hilton and Towers, Los Angeles, Calif. Contact: Martha Lindauer, ALCA, 405 N. Washington St., Falls Church, Va. 22046; 703/241-4004.

Nov. 6-9

1988 International Irrigation Exposition & Technical Conference, Las Vegas, Nev. Contact: Mark Williams, Irrigation Association, 1911 N. Fort Myer Dr., Ste. 1009, Arlington, Va. 22209; 703/524-1200.

Nov. 7-10

9th Annual Professional Lawn Care Association of America Conference & Trade Show, Superdome, New Orleans, La. Contact: Doug Moody, PLCAA, 1225 Johnson Ferry Rd., N.E., Ste. B-220, Marietta, Ga. 30068; 404/977-5222.

Nov. 8-11

New York State Turfgrass Association 42nd

Annual Turf and Grounds Exposition, Rochester Riverside Convention Center, Rochester, N.Y. Contact: Beth Seme, executive director, P.O. Box 612, Latham, N.Y. 12110; 800/873-TURF or 518/783-1229.

Nov. 18-20

Green Team Conference & Trade Show, Buena Vista Palace, Orlando, Fla. Contact: Martha Lindauer, Associated Landscape Contractors of America, 405 N. Washington St., Falls Church, Va. 22046; 703/241-4004.

Dec. 1-3

1988 NFSA Annual Convention and Trade Show, Cincinnati, Ohio. Contact: Lisa Scott, National Fertilizer Solutions Association, 10777 Sunset Office Dr., Ste. 10, St. Louis, Mo. 63127; 314/821-0340.

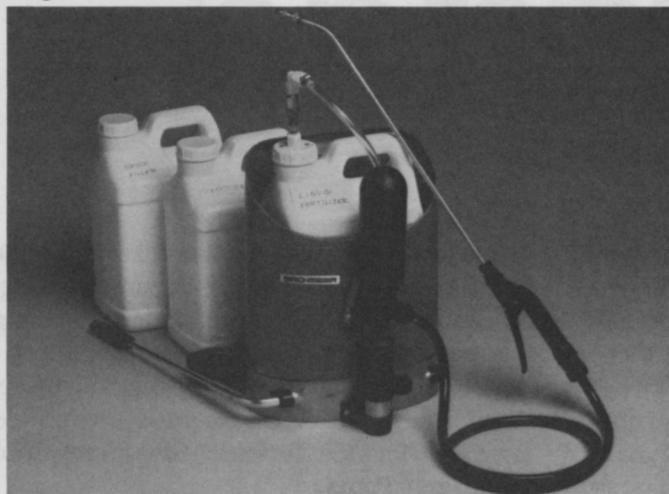
Dec. 6-9

1988 Ohio Turfgrass Conference and Show, Cincinnati Convention-Exposition Center, Cincinnati, Ohio. Contact: John Street, Ohio State University, 2021 Coffey Road, Columbus, Ohio 43210-1086.

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NEWS IN BRIEF

DACONIL FUNGICIDE CLEARED IN NAVY OFFICER'S DEATH

Daconil 2787® fungicide was not a factor in the 1982 death of Navy Lt. George Prior, according to a recent Arlington County trial court decision. Prior died from Toxic Epidermal Necrolysis — a disease caused by a viral infection, and not Fermenta Plant Protection's product Daconil 2787, according to the reports.

"Extensive evidence developed for the case, including product usage information from more than 18 years, clearly demonstrated that Daconil 2787 fungicide did not cause TEN, which resulted in Prior's death," according to Fermenta officials. A further review of all medical writings regarding TEN, confirmed that Daconil 2787 has never been associated with the disease — a rapidly progressive and often fatal ailment.

It was widely reported two years ago that Prior, then 30, died 16 days after he played on a golf course treated with Daconil. What followed was an anti-pesticide media blitz, including one-sided reports on the dangers associated with the use of lawn care chemicals.



Liza Prior



George Prior

On national television, Prior's wife Liza, claimed that Prior's skin "came off in sheets until he lost about 80 percent of his skin." "After that, one by one his organs began to fail, his kidneys, his liver," she added.

Before and after infrared photos of the golf course where Prior played and the golf balls Prior used, allegedly showed contamination by Daconil.

A CBS news reporter then stated that an autopsy conducted by Navy pathologists concluded Daconil had permeated Prior's clothing and killed him. At the time of that report, however, Prior's cause of death hadn't been made public.

Liza Prior had sought \$16 million in damages, claiming Prior died as a result of the Daconil exposure. Daconil 2787 has been used on golf course turf for more than 18 years, with more than three billion rounds of golf being played without any reported incidents of TEN, according to Fermenta.

Daconil 2787, formerly a Diamond Shamrock product, is now manufactured by Fermenta.



Briggs & Stratton executives inspect new flexible machining equipment.

BRIGGS & STRATTON DEBUTS VANGUARD ENGINE LINE

In a major venture, Briggs & Stratton Corporation recently launched its Vanguard line of overhead valve engines at its new "focused factory" — the first of its kind in the United States.

Briggs & Stratton, the world's largest producer of small air-cooled gasoline engines, has devoted 375,000 square feet of its Menomonee Falls, Wis., service and distribution facility for assembly of the new Vanguard line.

The plant will eventually be capable of making 600,000 engines a year, according to Greg Socks, Vanguard project manager.

Vanguard is Briggs & Stratton's first product line aimed specifically at a market which includes premium brand lawn mowers, snowthrowers and electric generators.

The focused factory is a plant designed from the ground up to build a specific engine model. The \$65 million Menomonee Falls project is comprised of four flexible manufacturing system cells, with four machine tools per cell. The cells can be arranged in different designs for flexibility and production capacity.

A standard production line may require a variety of tools dedicated to production of a specific part, however, the Vanguard line can produce a variety of different parts in each system cell. The focused factory concept processes by part, rather than by specific end product — allowing for greater flexibility and lower levels of work in process, according to Socks.

The Vanguard production line will provide more autonomy for workers, since the

manufacturing cell will become the worker's "personal" cell. Previously, employees would operate one machine one day and another the next.

TENT CATERPILLARS BEGIN ASSAULT ON CENTRAL ONTARIO

This spring's plague of tent caterpillars may cause long-term damage to millions of acres of forestland in central Ontario, particularly to trees already weakened by pollution and drought, according to scientists there.

The infestation, which is in the second year of a three-year peak, is expected to be even worse next year, causing more harm to trees in a wide band, Forester King Wright recently told the *Toronto Globe and Mail*.

Write, a tree expert with the Ministry of Natural Resources, said caterpillars are expected to defoliate more than 12 million acres of bush this year, up from last year's total of four million acres.

COPARR HEADS FOR COURT APPEARANCE AGAINST BOULDER

The battle is heating up in Boulder, Colo., as the city council there recently passed a revised prenotification ordinance, allegedly in an attempt to sway the outcome of a pending lawsuit.

Steven Day, president of the Colorado Pesticide Applicators for Responsible Regulation, said the council's passage of the pre-notification ordinance was designed to

(continued on page 10)



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NEWS

(continued from page 8)

convince the judge hearing COPARR's case against the city, that it places no burden on the contractors providing lawn care and outdoor pest control services.

The ordinance requires the "contracting party" — in most cases the homeowner — to provide prenotification at least 24 hours prior to any application. Day said the ruling is "ridiculous" because homeowners can't always determine what day an application will be made.

"According to the ordinance, it may be the homeowner's responsibility, but it will ultimately be the contractor's," he said. "If a contractor won't do it for them, then the homeowner will find someone who will."

The ordinance took effect Aug. 5, but will only be liberally enforced for the first 90 days, giving the contracting party time to become educated on the ordinance. Prenotification can be by written or verbal notice or by sign posting.

The feud between COPARR and the city of Boulder began last spring when COPARR claimed that only state and federal governments — not cities — could regulate pesticides. However, city officials contend that Boulder is exempt from such regulations because it is considered a

"home rule" city. Within home rule boundaries, the state takes a hands-off attitude, according to Day.

With no resolution in sight, COPARR filed suit against the city of Boulder, while Boulder filed suit against the state of Colorado and the Environmental Protection Agency.

The situation was at a standstill until Boulder's suit against the EPA and Colorado was almost thrown out of the court system because the council had not yet put an effective date on the prenotification ordinance. As a result, the council hurried the ordinance through under an emergency measure.

Public hearings on the ordinance were held, but were poorly attended, according to Day. "If the citizens of Boulder really knew what it (the ordinance) meant, they would let their feelings be known loud and clear."

COPARR members were set to appear in court this month, at which time a judge could issue a summary judgment ending the dispute. However, if neither side budges from its position, a trial date could be set for late fall or the winter of 1989.

In the meantime, COPARR is struggling to meet attorneys' fees for its legal battle. The group currently owes close to \$6,000

in attorneys' fees. Nearly \$10,000 of COPARR's \$19,000 annual budget is allocated for legal fees, Day said.

For those interested in contributing to COPARR, contact Steve Day, COPARR Ltd., 3895 Upham Street, Suite 150, Wheat Ridge, Colo. 80033.

RUBIGAN LABELED FOR EXPANDED PROTECTION ON TURF, ORNAMENTALS

With its newly expanded label, Rubigan AS® fungicide has added control of anthracnose and powdery mildew in turf, and is now approved for use in controlling powdery mildew on selected ornamentals.

In addition, the new Rubigan AS label has separate usage directions for "greens and tees" and "other turf" areas. It has revised application rates and application timing for a variety of turf patch diseases including necrotic ring spot, Fusarium blight, summer patch, take-all patch and spring dead spot. Directions for dollar spot control have also been revised.

According to company officials, Rubigan is the only fungicide labeled to control all five of these patch diseases.

For ornamentals, Rubigan AS is now

(continued on page 14)

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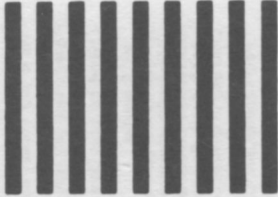
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NEWS

(continued from page 10)

labeled for use in controlling powdery mildew, rust and scab on flowering crabapples. In addition, it is labeled for prevention and control of powdery mildew in field- and landscape-grown roses and other selected ornamentals.

Rubigan AS can be tank-mixed with Daconil 2787 for enhanced control of large brown patch.

Both cool and warm season grasses can be treated with Rubigan AS. It has locally systemic action and, once dried on the foliage, is effective even if washed off by rain or irrigation, according to company officials.

GRAU RECOGNIZED FOR LIFELONG TURF COMMITMENT

Fred V. Grau has been recognized by The Musser International Turfgrass Foundation as honorary life chairman, after serving 20 years as president of the foundation from 1968 to 1988.

During that time, Grau was responsible for helping the foundation grant fellowships for graduate student research at several land grant universities. Grau's leadership has



Grau

not only been of benefit to the ongoing development of sports turf, but also to lawn care specialists throughout the world, according to the group.

The Musser International Turfgrass Foundation was developed to help students become teachers, to support turfgrass research and to help special groups join together through common interests and goals.

Grau is co-founder of the Musser foundation and co-chairman of the National Sports Turf Council, a former arm of the foundation.

EXXON CHEMICAL PLANS FRENCH CONNECTION

Exxon Chemical will initiate the design and engineering necessary for a polypropylene plant at its Notre-Dame-de-Gravenchon site in France.

Feedstock for the facility will come from Exxon's steamcracker at that site. The company will also begin market development activities, based on products imported from its facilities in Baytown, Texas.

According to J.P. Harris, Exxon Chemical worldwide vice president for TechPolymers, the company entered the European market for two reasons: to further strengthen its global organization while providing European customers with the same expertise and product offerings, and to develop new polypropylene grades and processing techniques.

Through the addition of the polypropylene plant in France, the company anticipates growth rates between 6 percent and 7 percent annually through the mid-1990s.

In the United States, Exxon Chemical is the major supplier of polypropylene in a number of specialty applications. In Japan, Exxon benefits from a diverse technology exchange, offering growth and substitution opportunities, according to Harris.



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PLCAA UPDATE

Ron Zemke, author of the best-seller "Service America! Doing Business in the New Economy," will give the keynote address at the 9th Annual Professional Lawn Care Association of America Conference and Show in the Superdome, New Orleans, La. The show runs from Nov. 7-10.

"Back to Service," the cornerstone of the lawn care industry, will be the theme of the show. Ways to refine, professionalize, customize and enhance those services to the customer will be topics of the educational sessions of the conference.

In his book, Zemke presents some startling ideas and success stories, stressing the changing nature of doing business today. In his keynote address, Zemke will present a workable approach for instilling service excellence into every niche of an organization. His talk will be held prior to the grand opening of the trade show.

Educational sessions will again be scheduled in three tracks: business management, agronomy and safety and landscape management. The sequences allow participants to easily target specific interests throughout

the conference.

Topics planned for the business management track include: Breaking Away From Standard Service, Employee Care, Customer Care and Retention, a Business Issues Panel and the Changing Customer.

In the agronomy and safety track, sessions will include: Focus on Training New Hires, The Role of Pesticides in the Urban Environment, Soil Insecticides and Insect Control, Ground Water Update, Pesticides — Is Less More? and Spill Containment.

In the landscape management track, participants will find sessions on: How to Price Landscape Maintenance Services for a Profit, Spring Aeration, Power Seeding/Overseeding, Integrated Landscape Management, Alternative Financing Methods and Reducing Downtime and Increasing Productivity.

A special earlybird workshop for dealers and distributors represents a new feature this year. Named "Yes Virginia, there is a Lawn Care Market," the session is designed as a panel discussion to bring together users, distributors, manufacturers, leasing companies and others to discuss how to

maximize sales and service opportunities in the lawn care industry.

In other news, the PLCAA board of directors is urging members to contribute financial support to the Pesticide Public Policy Foundation. The 3PF is the only national organization monitoring urban legislative/regulatory pesticide activity, and the only organization working with state coalitions for reasonable urban/suburban pesticide regulation.

Individual company financial support of 3PF and state coalitions will be critical in efforts to achieve a reasonable pesticide public policy. Members are also urged to join state and local coalitions where ever possible.

Other associations including the Associated Landscape Contractors of America, the Professional Grounds Management Society, The American Society of Landscape Architects and the National Pest Control Association are also being asked for support.

The collective goal of the organizations is to raise \$250,000 in contributions for 1988. ■

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WEATHERING THE DROUGHT

The worst drought in 50 years has turf experts trying to determine what long-range effects the excessive heat will leave on the turf. In the meantime, seed and equipment companies are gearing up for a fall spree on turf renovation.

When it first started last spring, no one ever imagined this short dry spell would turn into the Drought of 1988 — the worst the country has experienced in 50 years.

Fifty years ago, turf as we now know it didn't even exist. And strangely enough, the same can be said of many of the LCOs in business today.

So how do you fight drought conditions when the durability of turf has never been tested at such severe limits? When most LCOs and researchers in the industry have never had the unfortunate experience of studying turf under such extremely stressed conditions? How long can turf remain dormant without suffering partial or total loss?

These are some of the battles being waged against LCOs as the high temperatures and lack of precipitation continue across much of the United States. Forecasters predict the drought will linger into the fall in many regions.

Some parts of the country needed anywhere from 13 to 18 inches of rain to end the drought by midsummer. At that time, however, 1,880 counties in 37 states had been declar-

ed disaster areas, making residents of those areas eligible for drought assistance. The disaster count is most devastating in Ohio, Michigan, Illinois, Indiana, Wisconsin, Nebraska, Kentucky, Minnesota and North Dakota.

As the drought first crept through weeks and then months, shudders of despair echoed throughout the lawn and landscape maintenance fields. However, the morbid tone did not last, as quick action by LCOs led to customer education on the effects of the drought, and a substantial savings in customer skips and cancellations.

And Mother Nature hasn't been the only industry foe during the drought. LCOs have been busy trying to douse errant media reports telling consumers to cancel their lawn and landscape programs for the summer. Some LCOs claim a portion of this erroneous information was attributed, correctly or incorrectly, to turf experts at major Midwest universities.

Throughout the drought, rumors have abounded that a number of lawn care companies have or will have to shut down because of high customer cancellations. While some

companies have temporarily laid off workers or gone to four-day work weeks, no LCOs have reported closing for the summer.

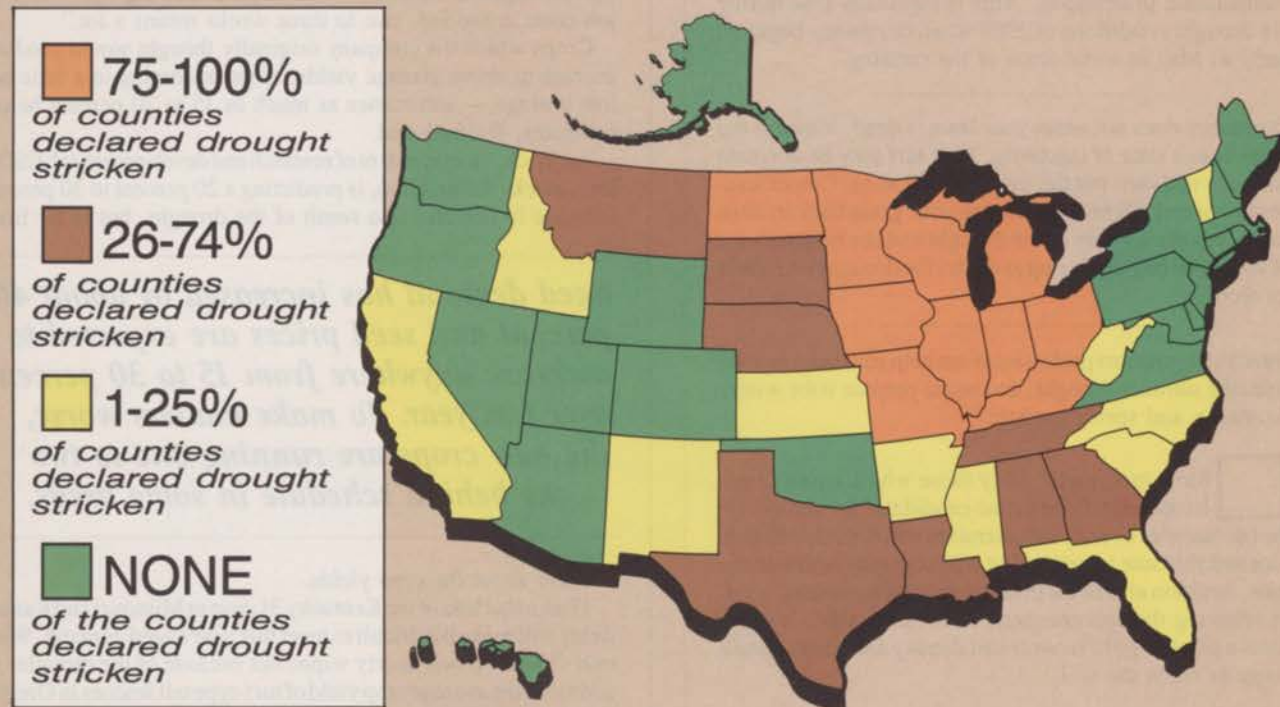
BUSINESS AS USUAL? For the most part, LCOs are still spraying, mowing and maintaining trees and shrubs, but under modified conditions in most instances. LCOs, like everyone else, are concerned about the drought, but have taken a chin-up attitude — fighting fire with fire.

"What are you going to do? You can't just sit around," said Rick Steinau, president of Greenlon Lawn Care Services, Cincinnati, Ohio. "We saw the writing on the wall and said 'We can make money in spite of the drought.'"

At the onset of the drought, Steinau's company immediately contacted any customer who was not scheduled to receive a fall fertilization or aeration. The last-minute blitz



STATES WITH DROUGHT-STRICKEN COUNTIES



Source: Agriculture Stabilization and Conservation Service, U.S. Department of Agriculture

The drought has left its most devastating effect on the Midwest, but the rest of the United States has not been void of extreme heat and low precipitation.

netted the company a high rate of acceptance among customers not previously scheduled to receive such services.

Like Greenlon, many LCOs are looking to the fall season to recoup some of their summer losses. Although no one can determine how extensive the drought's damage will be, university researchers are predicting that aeration, overseeding/slit seeding and fall fertilization will be needed to promote turf recovery and provide necessary renovation.

It's hard to predict exactly how the turf will come out of the drought because researchers are stumped on the question of dormancy.

"It's a learning experience for all of us," said Bruce Braham, assistant professor of Crop and Soil Sciences, Michigan State University. "Most articles on dormancy were done in the 1930s and 1940s. Turf was just getting started in the '30s — it was nothing like today."

The length of time turf can remain in dormancy also depends on its condition before the drought. The amount of traffic and exposure, not to mention the maintenance it received before the drought, can all contribute to how it will fare after the drought.

As the turf gradually becomes dormant, its crowns and rhizomes harden causing compaction as the water leaves the cell. The process reduces the metabolic activity of the turf, leading to dormancy, according to Branham.

Despite the dormant state of turf, watering cannot be completely forgotten. Once turf has been dormant for about 30 days, the turf needs about ½ inch of water every two weeks, according to Robert Shearman, a horticulturist from

the University of Nebraska.

This water is vital to the regrowth of the lawn. If irrigation can't be achieved, anticipate some thinning of the turf, and less than 100 percent recovery, he said.

Most turf, particularly those which haven't been irrigated, will be prime candidates for overseeding and aeration in the late summer or early fall, Shearman said. Aeration will not only enhance root and rhizome recovery, but will augment moisture uptake. Aeration also helps breakdown thatch accumulation.

It may be difficult to break through compacted soil in some locations, but aeration will give roots a place to go to try and recover some lost density, and enable the water to reach the soil easier.

Aeration with small-sized tines, about 1/4 inch to 3/8 inch, can also aid in the ability of the turf to retain water, according to Sal Rizzo, president of Salsco Inc., Cheshire, Conn. If runoff is occurring, as much as 50 percent of the water can be lost when using the larger tines.

SEED AVAILABILITY. Requests for some form of overseeding or renovation work may reach an all-time high this fall, and so will the price of seed. Because of the high demand and some average crop yields, most of the seed companies are predicting price increases, some as much as 50 percent higher than last year.

Harry Stalford, director of product development at International Seeds Inc., Halsey, Oregon, said the distributor seed network is virtually depleted, and any seed needed

TIPS TO BEAT THE DROUGHT

Keeping your landscape green and pest free is easier with regular maintenance and checkups from your lawn maintenance professional. This is especially true during the drought conditions of 1988 when dormancy began as early as May in some areas of the country.

Dormancy does not mean your lawn is dead, it means the grass is in a state of inactivity. Your turf may be dormant and browned-out, but the roots are still alive. Cooler temperatures and fall rains will bring your grass back in most cases, but the severity of the drought and the maintenance of your lawn before, during and after the drought will affect its recovery.

Here's how your turf professional can help your lawn recover from the summer drought, and better prepare it for winter dormancy and spring growth:

☐ Most turf, particularly those which haven't been irrigated, will be prime candidates for aeration in the late summer or early fall. Aeration will not only enhance root and rhizome recovery, but will augment moisture uptake. Aeration also helps breakdown thatch accumulation. In relieving the soil compaction, aeration will also give roots a place to go to recover lost density and better enable water to reach the soil.

☐ Another important service to help in your yard's recovery is overseeding. Seeding can help fill in areas left bare by the drought and make the turf stronger and healthier to survive the winter months. A healthier turf will also produce increased resistance to disease and insect damage.

☐ Drought damage can be deceiving. Browned-out turf may result from a lack of moisture, but can also be a symptom of insect damage. Continued lawn and landscape service can stop insect damage from spreading. Chinchbugs, billbugs and white grubs can cause severe damage during the summer -- damage which can easily be confused with drought stress.

☐ Light applications of fertilizer to cool season grasses will ensure that essential nutrients are available to the plant. This will improve drought survival and speed recovery when it rains.

Follow your professional's recommendations on watering, mowing, seeding and aeration.

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for the fall will have to come from the new crop — just now being harvested.

Stalford estimated that the company seed demand has increased by about 40 percent and that prices would increase from 15 percent to 20 percent over last year. To make matters worse, the crops are running one to two weeks behind schedule.

"That adds a two to three week delay in getting the seed to the marketplace," he said. "And when you're trying to get a seeding job done in the fall, two to three weeks means a lot."

Crops which the company originally thought would produce average to above average yields, are now coming in a little below average — sometimes as much as 15 to 20 percent below estimates, Stalford said.

Art Wick, vice president of research and development at LESCO Inc., Rocky River, Ohio, is predicting a 20 percent to 30 percent increase in demand as a result of the drought, but is far from

Seed demand has increased by about 40 percent and seed prices are expected to increase anywhere from 15 to 30 percent over last year. To make matters worse, the new crops are running one to two weeks behind schedule in some areas.

positive about the crop yields.

The virtual loss of the Kentucky 31 crop in Missouri and Kansas fields will make it difficult to meet this year's seed demand, Wick said. The crop was nearly wiped out because of the drought. In addition, the average crop yield of turf-type tall fescues in Oregon will not be anywhere near enough to cover the loss of Kentucky 31.

Expect the price of Kentucky 31 to double over last year's price and the cost of turf-types to increase by 25 percent, he said.

Those who haven't ordered seed for the fall may quickly find themselves short as availability decreases, he added.

George Rosenburg of Vaughan's Seed Co., Downer's Grove, Ill., expects the seed crops in the Northwest to be all right, and said they should be able to pick up some of the slack caused by the loss of crops in the Midwest. If need be, seed can also be imported from Australia and New Zealand.

Gayle Jacklin-Ward, Jacklin Seed Co. Post Falls, Idaho, said the drought hasn't affected their proprietary Kentucky Bluegrass because it's always under irrigation. As a result, they're looking at average to above average yields, with selective shortages on some varieties.

However, a 50 percent decline in yield can be expected on the common Kentucky Bluegrass as a result of the drought. Increased acreage of the bluegrass should help in keeping the price down, she said, but LCOs should still expect to see prices increase over last year.

"On paper, we're pretty much sold out already," Ward said.

In a few years, more drought tolerant seed may be available to the commercial industry. Researchers at the Georgia Experiment Station have been working for years to develop turfgrasses that will require 30 percent to 40 percent less water to thrive.

Bob Carrow, turfgrass researcher at the station, said in five or six years, new cultivars with lower water requirements will most likely be available. The increased number of people competing for water sources in addition to this year's lack of precipitation, makes the need for such cultivars more apparent than ever.

In Carrow's recent drought studies, he found that Zoysiagrass requires 25 to 40 percent more water than Bermudagrass or centipedegrass because it has narrow, upright leaves which allow for easy water evaporation.

Carrow said that while the drought is extra hard on cool season

(continued on page 22)

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DROUGHT

(continued from page 20)

grasses such as fescue, even the warm season grasses such as bermuda and zoysia can die during the winter months from summer drought stress.

In addition to seed, the price of aerators and overseeders may also increase this fall. Because of higher steel costs, the price of raw materials for manufacturers has increased anywhere from 15 percent to 30 percent.

Most equipment manufacturers contacted said they would hold prices through the end of August, or until their new year starts.

Robert Brophy, manager of lawn care product sales for Cushman/Ryan, Lincoln, Neb., said the company would pass on a minimum increase in August.

Rizzo said Salsco would try to hold off a price increase until Jan. 1.

In addition to Ryan and Salsco, Classen Manufacturing, Jacobsen, Hahn Equipment and Feldmann Engineering and Manufacturing all indicated they would have an adequate supply of equipment to meet the fall demand. Jacobsen and Hahn will pass minimum price increases on to their customers.

CONTINUING CARE. In addition to fall fertilization, Shearman stressed the need for some fertilization on both warm and cool

season grasses, even if the turf is dormant.

"If they're scheduled for an application, we recommend they receive it," he said. "Lawns recover from injury and damage more rapidly if fertilizer is present — even if it's not watered."

Shearman recommends using a slow-release nitrogen source to avoid fertilizing with a high salt index, which would increase the potential for fertilizer burn. Fast-release sources are not recommended because they have a high potential for volatilization.

John Street, an agronomist at The Ohio State University, also recommends the fertilization of dormant turf with a nitrogen source which is at least 50 percent slow-release. It won't have any immediate positive or damaging effects on the turf, but it will be present in the turf when the weather conditions return to normal.

Many LCOs who are fertilizing during the drought have moved away from liquid to granular products, like sulfur-coated ureas.

While turf has some ability to protect itself through dormancy, trees and shrubs are at the mercy of the weather and those more and more frequent watering bans.

All plant material, especially large trees, should remain on a specific watering schedule because grass generally gets the moisture it needs at the expense of trees and shrubs, according to William Eubank, a tree and landscape consultant, Houston,

Texas.

"Anytime we go for more than three or four days without rain, we should think about ornamentals — especially those growing in turf — because of the root competition between the two," he said. "When grass begins to wilt, you can bet the ornamentals are hurting."

By the time a plant has reached the wilting stage, it's often too late for that plant to survive. Wilting usually ends in root die back or severe drying out, Eubank said. The plant can't get enough moisture and will ultimately lose something in the canopy of the plant.

A soil probe or shovel stuck six to 10 inches in the ground can indicate the dampness of the soil.

When an ornamental begins dropping foliage, it may be a signal that the plant is not receiving enough moisture. The plant's leaves will usually turn yellow and drop off closer to the trunk of the plant. Eubank said this is particularly true of pine trees, junipers and evergreens, although deciduous trees will often do the same.

Large leaf trees such as poplars, maples and tulip trees, begin to show leaf scorch around the edges. Eubank said the leaf scorch is directly related to the amount of moisture in the root system. The stomates close off as moisture loss increases.

Stripping interior leaves from a plant will reduce the amount of evaporation from the

(continued on page 24)

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DROUGHT

(continued from page 22)

tree and reduce the pull from the roots. Eubank, however, doesn't recommend cutting back a plant in hot weather, because vital branches can mistakenly be removed. Instead, trim off a few dead branches and wait until the plant receives water and begins to grow again before removing foliage.

Anti-transpirant products are also available for spraying foliage to reduce transpiration.

Ornamentals surviving the long, dry summer will again be stressed in the winter as they struggle to survive the cold, often without adequate preparation. Depending on how stressed the plant was during the drought, it may or may not have had the opportunity to carry out photosynthesis, during which time a plant stores nutrients in its trunk and roots to get it through the winter.

"If we have a cold harsh winter, it would be devastating to trees and shrubs," Eubank said. "They may get frostbitten, severely frozen, suffer severe die back or be killed outright."

MOWING MISFORTUNES. Mowing maintenance contractors may be suffering the most from the drought. The ability of a contractor to mow often relates directly to the amount of watering a customer has done.

Terry Seebach, operations manager with R.B. Stout in Akron, Ohio, said his company has had to mow selectively depending on the irrigation capabilities of its customers. Tall or coarse fescues are still growing in many lawns and are mowed as necessary.

Seebach said his company has substituted pruning in place of mowing in many cases.

Bill Davids, vice president of operations at Clarence Davids & Sons, Blue Island, Ill., said they are doing a minimal amount of mowing in areas which have been irrigated.

In a non-dormant lawn, Street suggests mowing during the less stressful times of day, with the blade at least 2½ to 3 inches off the ground to avoid injuring the roots.

Although the industry has fared better than expected, good first quarter sales have been deflated in many cases by average summer sales.

Despite the worst drought in 16 years of business, Dave Sek, marketing manager for Monroe Tree & Lawntender, Rochester, N.Y., said he hasn't lost too many of his customers.

"We're in a situation where people look out the window and see brown everywhere not just at home," Sek said. "We've had limited production in some areas because of water advisories, and sometimes we show up at a door and get turned away, but we're hoping things will swing around."

Sek said he finished the first two rounds of the company's application program, but is losing some customers in the third and fourth rounds.

"When things turn around, they'll definitely need fertilizer for their thin turf," he said.

Sterling Heights, Mich.-based Atwood Lawncare Inc. lost about 5 percent of its customers due to the drought. But President Tim Doppel emphasized that most of the losses are service skips, rather than outright cancellations.

"When they called to cancel, they said see you next spring or that we plan on continuing in the fall," he said. "We're preparing for every contingency we can think of, because I suspect there will be a fair amount of turf loss this fall."

In some cases, dormancy appeared as early as mid-May in Michigan.

But all's not bad for Doppel, as he's managing to attract new customers in spite of the heat-plagued Midwest. In one morning, he sold programs to four of five people he offered estimates to.

J. Martin Erbaugh, president of Peninsula, Ohio-based Erbaugh Corp., said skips and cancellations are running slightly ahead of last year, but are not as dramatic as they could have been.

Erbaugh said it's been a "somewhat stressful" time for his employees, given the

(continued on page 52)

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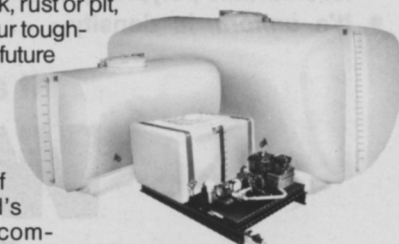
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SPECIALTY PRODUCTS

A newcomer to the lawn maintenance industry would probably immediately recognize items such as mowers, aerators, seeders and trimmers yet hesitate to identify with what they consider to be lesser known products, such as wetting agents, colorants, growth regulators and erosion control agents.

Nevertheless, the use of these products, often manufactured by a limited number of companies, is on the rise and have played a large role in the industry's growth.

To better acquaint our readers with the variety of specialty products available on the market, we contacted a number of companies offering such products and asked them to contribute stories identifying special or unusual applications of their product. What follows is a compilation of those contributions.

GREENER PASTURES THROUGH BLUE LAWN

Steve Shields may have cornered the market on blue in Memphis, Tenn., but his customers don't mind. In fact, 99 percent of Beauty Lawn's customers prefer to see blue.

Shields, and his brother Larry, have increased their customer count to 3,500 through their blue lawn marketing concept — created by using liberal amounts of Blazon® blue spray pattern indicator in their low-volume tank mix.

Beauty Lawn personnel were already wearing blue uniforms and driving blue trucks when Shields got the idea three and a half years ago to paint his customers' lawns blue.

The blue color originated as a training concept, so that new applicators could tell if they were overspraying or underspraying a lawn. Overspray into an unwanted area could then be immediately corrected.

Shields experienced such an overspray firsthand when his hose accidentally broke while talking to a customer, spraying all over the side of a freshly painted garage. Shields grabbed a garden hose and quickly rinsed it off, leaving no stain behind.

In addition to applicator benefits, a blue lawn immediately tells a homeowner that his lawn has been treated.

Shields originally followed the recommended rates of Milliken Chemical Co.'s Blazon — slightly tinting the solution. But after receiving such positive results, he beefed up the rates and had his customers

CONTROLLING EROSION UNDER UNCERTAIN CIRCUMSTANCES



Red clay erosion and Bermudagrass growth made this slope a challenge for grounds crews.

Establishing 675 one-gallon Elaeagnus plants, on five-foot centers was an interesting challenge for the grounds crew at Millsaps College in Jackson, Miss. — particularly when they were charged with tackling a 30-to 60-degree slope, speckled with red clay erosion and Bermudagrass growth.

The task was made even more difficult by the crew's need to intercept a water flow created by a natural spring in a portion of the slope. Bud Thigpen, grounds superintendent of the 100-year-old liberal arts college, was familiar with new erosion control and drainage technology through geotextiles, but had not used them in conjunction with plant establishment.

After discussing the challenge with a representative of Warren's Turf Professionals, he began using Warren's Type 1114 TerraBond® Polyester Geotextile Fabric to solve a potentially severe erosion, weed control and drainage problem along the school's new main entrance road.

The installation began in April 1986, using a six-man grounds crew to complete the project in three weeks time. They began by grading off the already severely eroded 15- to 60-foot wide by 376-foot long slope.

Next, five three-foot wide by 15-foot long trenches were dug back into the base of the slope in the natural spring area. Four to six inches of gravel were first placed in the trenches, followed by six-inch perforated PVC pipe and six inches more of gravel.

Then a filter/separator blanket of the terrabond fabric was placed over the gravel to permanently prevent contamination by the soil backfill placed above it, and to help "wick" the water to the front base of the slope. The pipes drained onto the roadside concrete gutter.

The terrabond fabric was then laid over the entire 15,000 square feet of the slope. The top edge was anchored by a water-diversion soil berm and the bottom edge extended out onto the concrete gutter, using the fabric's planar flow capability to move excess water off the slope.

After marking the five foot centers of the 675 plants, an acetylene torch was used to quickly and safely burn holes through the fabric the same diameter as the one-gallon cans. Being made of polyester, the fabric would not flame up.

To complete the installation, the crew then spread 3.5 to 4 inches of pine needle mulch (pine straw) over the entire area. For the first two months the area was irrigated for 60 minutes three times per week using a format of 20 minutes on, 20 minutes off, etc.

"If we had not put the Terrabond in, we would have lost the hillside," Thigpen said.

Now, more than two years later, the plants have canopied out to almost cover the entire slope. Being made of 100 percent virgin polyester, the terrabond is still 100 percent intact and suffers no deterioration from exposure to ultraviolet light, fertilizers or pesticides.

Circle 116 on reader service card

really seeing blue.

"Only a handful of my customers request that we don't use it (Blazon)," Shields said. "But actually we're noted in the city as the ones with the blue lawns, blue uniforms, trucks and caps. It's really been a boost to sales."

Blazon is biodegradable and disappears a few days after application, or rinses away after a rainfall.

Use of Blazon fit in nicely with Beauty Lawn's low volume outfit. The company sprays at the rate of 50 gallons per acre using a fan nozzle. Shields said Blazon is compatible with most herbicides.

Beauty Lawn tried a variety of colorants, but selected Blazon because of its non-staining capabilities.

The blue lawns have become such a hit in Memphis that Beauty Lawn is now team-

ing up with Welcome Wagon to reach the area's new homeowners.

Circle 115 on reader service card

TAILORING SERVICES FOR THE DEMANDING CLIENT

When I went into the lawn service business 12 years ago, my philosophy was to do the best job, using the best products," explained Christopher Sann, owner of Complete Lawn Service Inc. in Wilmington, Del.

Sann has managed to maintain those standards by serving a loyal residential and commercial customer base which demands excellence and is willing to pay for it. Using the best products available, he points out, gives him the confidence to guarantee the results.

"I wanted to be sure that when I promis-

ed a customer that a product would work — it worked," Sann said. His average client pays \$610 annually for his highly customized services, versus the average industry charge of less than \$200.

With only 100 customers, Sann routinely uses soil testing, and has adopted such innovative practices as creating a computerized service schedule for each lawn he services and integrating soil wetting agent applications on 90 percent of the lawns he treats.

"I began using Aqua-Gro® about seven years ago on a thatchy, Windsor Merion bluegrass lawn which was very prone to drought stress," he said. With virtually all the turf roots growing in the 1 1/2-inch thatch layer, Sann wanted to give the wetting agent a try before resorting to total

(continued on page 30)

INHIBITING ROOT GROWTH WITH HERBICIDES

The "heart of Silicon Valley" is at the cutting edge of technology, but it has relied on the traditional cutting edges of saws to keep roots from damaging sidewalks.

Now, however, Sunnyvale, Calif., city officials hope they have a high-technology solution that will let them trim some of the \$1 million they spend annually on repairing root damage.

Last year, the city began testing a Typar® Bio-barrier™ root control fabric which its manufacturer, Reemay Inc. of Old Hickory, Tenn., reports will deter roots from creeping under sidewalk slabs for decades.

Typar biobarrier is studded with herbicide-containing pellets that slowly, over a period of years, release a predictable amount of herbicide that deflects root growth without killing the plant. That would be good news to this Santa Clara County city of 115,049 people located 44 miles south of San Francisco.

Since the 1960s, the city has operated a street tree program devoted to planting trees in front of homes and commercial buildings adjacent to its 500 miles of sidewalks. Assistant City Manager Gene Rogers said the program was started to preserve the quality of life in the rapidly growing city.

The city's parks and recreation department maintains 27,743 street trees, according to city records. Maintenance includes preserving older, larger trees and pruning roots if needed to minimize sidewalk damage.

"We spend nearly \$1 million on repairs from damage to streets, gutters and sidewalks, mostly from root damage," Rogers said.

Traditionally, work crews planted trees in park strips — unpaved patches of earth — that were part of the sidewalks themselves. Recently, however, the city has switched to planting trees back from the sidewalk.

The 99 parks department employees nevertheless spend many hours trimming roots. In 1987-88, the budget allocated \$19,545 for root pruning, at an average cost of \$66.03 per tree.



Typar® Bio-barrier® root control fabric is installed between the tree and sidewalk.

Rogers said the city has tried a plastic sheet root barrier, but "the jury is still out on whether it's effective or not."

So he was interested when city officials heard about typar biobarrier from Peter Van Voris, a program manager and staff scientist at Battelle's Pacific Northwest Laboratories.

The root control fabric combines the widely used herbicide Treflan®, from Elanco Products Co., with typar, a nonwoven spunbonded polypropylene geotextile, made by Reemay.

Treflan inhibits root development by stopping cell division in root tissue it touches, without killing the plant. In typar biobarrier, the herbicide is contained in pellets that are spaced in a predetermined pattern on the geotextile. The pellets release the herbicide slowly until it forms a root inhibition zone about two inches wide in the soil.

Typar biobarrier installed around trees in Sunnyvale were engineered to remain effective for up to 30 years, according to Reemay officials.

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INHIBITING ROOT GROWTH WITH HERBICIDES



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 RHÔNE-POULENC AG COMPANY

SPECIALTY PRODUCTS

(continued from page 27)

renovation.

Over a period of about three years, Sann witnessed root penetration increase from zero to three inches, a reduction in the thatch layer from the bottom up of 50 percent to 75 percent and an elimination of dry spots, as a result of a program of verticutting and applying Aqua-Gro "S." The wetting agent was applied at the rate of 3½ pounds per 1,000 square feet, in both the spring and fall.

Sann, who bills himself as "a problem lawn specialist" has since expanded his use of Aqua-Gro "S." In addition to lawns with dense thatch, he uses the wetting agent on sloped areas to ensure water penetration. His general Aqua-Gro "S" program is a March or April application at full rate, and a follow up application in July at the same time he applies a soil insecticide.

Sann is confident that Aqua-Gro reduces the amount of watering his customers need to do to maintain their lawns, and it increases the effectiveness of fertilizer, insecticides and fungicides he applies. He also uses it regularly for seeding new lawns as well as when installing annuals and shrubs.

Convinced that Aqua-Gro helps him do the best job, while contributing to his bottom line, Sann offers the wetting agent application to his customers at a cost of \$10 per 1,000 square feet for a full rate application and \$5 per 1,000 square feet for a half rate treatment.

Circle 117 on reader service card

PAINT YOUR BROWN LAWNS GREEN

In many sections of the country, extreme droughts have eliminated or severely reduced water availability. Restrictions or rationing requirements on outdoor watering of any kind has left many homeowners with brown or yellow-colored lawns.

In some cases, this means loss of grass in its entirety or in large portions. Of course where the grass has died it will have to be replaced in order to have a lawn, but such replacement, of any kind, will generally have to wait for cooler temperatures and rain.

However, enterprising management in several companies have risen to the challenge and found a temporary solution. Noting that browned-out grass is at best unsightly during normal lush green summer months, they decided to color the dry or dead grass a rich, vital green.

Using TruGreen grass paint from Regal Chemical Co., lawn care operators can spray the off-color lawns and achieve a lush green color with no requirements for irrigation water.

With the normal spray equipment, TruGreen is added to water in the spray tank at a rate of approximately one gallon to 10

gallons. Good by-pass agitation is usually adequate to keep a uniform homogeneous spray solution.

The operator covers the lawn area in much the same manner as with a liquid fertilizer and/or pesticide application. However, the spray gun functions very much like an artist's air brush, and the applicator must take extra care to be sure to cover skips or light application strips.

With the proper application, off-color, damage or unsightly grass may be restored to a pleasing green appearance. Entire lawns or spot applications may be used. Repeat spray covers should be employed until the desired color density and uniformity is achieved.

TruGreen painted grasses will keep the green appearance indefinitely, as the color does not wash off or fade appreciably in sunlight. With traffic, the organic grass residue is worn down in time, but generally one TruGreen application will last for an entire season. Painting dormant grasses has long been a practice, but adoptions to drought conditions is the concept of enterprising, entrepreneurs of the lawn care industry. It is a way for many to continue in business and actually generate extra revenues.

Circle 119 on reader service card

DROUGHT SPARKS NEW PRODUCT

If a new product works under drought conditions, why not use it year-round? That's the logic behind Water Saver, tentatively named for a new formulation from Spring

Valley Turf Products.

The product originated this summer when drought conditions made previously infrequent dry spots fairly common on heavily trafficked golf courses.

To correct the water retention problem, Hydro-Wet,[®] already a familiar and preferred product to Spring Valley, was used more readily. Through increased usage and a little dabbling, a company representative developed a formulation to enable a fertilizer and Hydro-Wet to work together, according to William Vogel of Spring Valley.

As the drought lingered and it became more apparent that home lawns would be severely affected by heat stress, the company transferred the same idea to lawn care — helping the lawn efficiently use any moisture it does receive under these drought conditions.

Water Saver contains Hydro-Wet, a natural fertilizer base and a touch of nitrogen. The organic fertilizer is high in chelate iron, but low in nitrogen to prevent excessive growth in drought conditions.

Vogel said Water Saver is a natural product to accomplish two tasks at one time.

"We never had the need before, and this year it just slapped us in the face," he said. "This summer we used it as a rescue treatment. It would be better to use as a preventative and maintenance product. Why not use it year-round?"

Vogel suggested that the product be used in the spring and throughout the summer, so it gets into the soil and has a chance to prepare it in the event of a dry spell.

The principles behind the product are

(continued on page 32)

TOP OF THE MORNIN' TO YOU

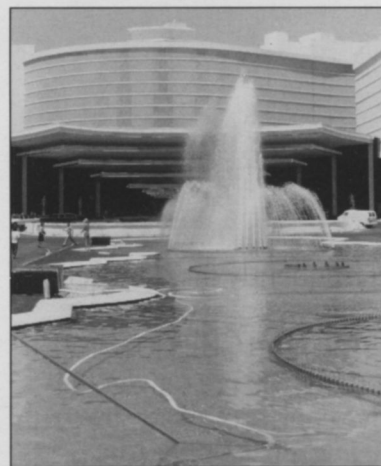
For those year-round Irishmen, Caesar's Palace in Las Vegas, Nev., is the place to be.

Traditionally, Caesar's Palace has been applying Aquashade[®] to their fountains year-round. But for the last two years, Caesar's has added a new twist to its Aquashade application, making others green with envy.

In the spirit of St. Patrick's Day, Caesar's Engineer Joe Esposito wanted to turn the blue fountain water green. After discussing the idea with Aquashade Inc., he simply added an additional dose of Acid Yellow 23 — an ingredient already used in the Aquashade formula — resulting in shades of Irish green.

The patrons of Caesar's Palace, as the many people who visit Las Vegas, are thrilled with this festive approach to water maintenance.

Aquashade aquatic plant growth control has been used as a water mainten-



Caesar's Palace.

ance tool by the turf and landscape industries for more than 16 years. Aquashade reduces light penetration, inhibiting weed and algae growth.

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Hydro-Wet®

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Hydro-Wet soil and turf wetting agent can improve your turf. After just one application, users across the country have noticed a marked improvement in the quality of their turf. Hydro-Wet increases water's ability to penetrate hard soil or dense thatch. The results are greener, lusher turf and healthier, more conditioned soil.



UNIVERSITY TESTING PROVES HYDRO-WET WORKS

Hydro-Wet was applied to the hard-to-wet soils of Boyne Highlands Golf Course in Northern Michigan.

PROBLEM: Localized dry spot development on the sandy soils.

SOLUTION: Hydro-Wet treatment was applied in mid-July.

RESULTS: 50% increase in moisture content and improved turf, grass quality.

HYDRO-WET IS NUMBER ONE

	Rate oz. / 1000 sq. ft. Applied 7/13	Evaluation Dates		
		Soil Moisture 8/14	Turfgrass Quality Rating (1 = Best, 9 = Poor)	
			9/20	10/26
Untreated	0	5.3%	4.6	5.7
Hydro-Wet	16	8.3%	1.6	1.8
Hydro-Wet	32	9.2%	1.5	1.6

And look at the carry-over results a year later!

		Evaluation Dates		
		Soil Moisture 8/07	Turfgrass Quality Rating (1 = Best, 9 = Poor)	
			8/07	10/18
Untreated	0	5.4%	5.2	4.2
Hydro-Wet	16	8.4%	2.6	1.9
Hydro-Wet	32	9.3%	1.3	1.3

Testing was also repeated using Hydro-Wet as one of nine different soil wetting agents. Hydro-Wet produced the best quality turfgrass and exhibited the greatest improvement in quality of all products tested.

With Hydro-Wet you will have an improved water flow in the soil up to 30 days after application. Soil will also hold a higher moisture content for up to two full years.

University research shows that from the initial application and over a long period of time, turf quality improves with Hydro-Wet.



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NEW DRAINAGE MEDIUM KEY TO LANDSCAPING PROJECT

It's said to be easy to handle and install, and provide better drainage than more traditional mediums. So architects commissioned to do the landscaping at the exclusive Mizner Village residential complex in Boca Raton, Fla., decided to use a product called Enkadrain to ensure that the abundance of tropical plants and trees had the most favorable growing environment.

"We had originally considered using six inches of gravel as our drainage medium in the courtyards," said architect Doug Kulig of William Cox Architects. "Using gravel is standard practice here in Florida. In the past, we have used round river rock gravel that had to be brought into the area from outside the state at considerable expense. Using gravel would have disturbed the site, because we would have had to bring in heavy trucks and equipment to deliver and spread it."

The rationale for using Enkadrain, manufactured by Akzo Industrial Systems Co., Asheville, N.C., went beyond reasons of economy and ease in handling.

"We were able to get the matting much quicker than we could have trucked in all the gravel," Kulig said. "By using Enkadrain rather than six inches of gravel, we were also able to add another five inches of growing medium."

Enkadrain is a resilient, lightweight nylon matting, heat-bonded to a polyester filter fabric. When placed between the soil and the planter base, its open construction allows water to pass through it into traditional drainage systems.

After the 18-inch retaining wall was built around the individual courtyards, a coat of waterproofing material was laid on the concrete base. A 90-pound felt protection board was then installed. The Enkadrain, with the filter fabric facing upward, was then applied. Thirteen inches of soil was ad-



Enkadrain filtering fabric acts as drainage medium.

ded prior to sodding and planting.

Both Kulig and John Fritz Sr., the Melrose Nursery representative who supervised the plant installation, stressed the value of Enkadrain as a drainage medium.

"If you let the water back up and you have nothing for it to drain through, the plants end up sitting in a puddle," Fritz said. "If that water becomes stagnant, it will kill the plants. The filter fabric on the Enkadrain keeps out the soil while allowing excess water to escape."

"We feel we will get better growth because of the extra soil we were able to add," Kulig said. "With the Enkadrain you get lateral as well as vertical drainage, which allows for bet-

ter plant growth in all directions."

The 4,000-pound palm trees that were placed in concrete boxes with the courtyards posed additional problems.

"If we had used rock as our drainage medium we were concerned that if we put the heavy trees on top of the rock, it would have ground the rock right into our waterproofing medium," said Mike Post, Arvida Builders' project manager in charge of construction at Mizner Village.

"We used Enkadrain not only on the bottom, but on the sides of the palm tree planter boxes," Kulig said. "This allowed us to get better drainage and plant growth."

The geomatrix matting is designed to promote improved root growth, protect against root rot and to eliminate the fear of overwatering. The product is also used against subsurface walls to prevent water and moisture from penetrating foundation walls causing wet, damp basements.

A total of 50,300 square feet of Enkadrain was used in the two Mizner courtyards.

Circle 121 on reader service card

SPECIALTY PRODUCTS

(continued from page 30)

sound judging from its use on golf courses, but still remain virtually untested on home lawns, according to Vogel. The product is being used primarily in the Midwest, but will soon make its way to the East Coast.

Before formulating the product, Spring Valley researched wetting agents to determine which had the characteristics it was looking for, including the lowest potential for phytotoxicity, he said. Hydro-Wet from Kalo Inc. had the qualities the company desired.

Vogel hopes data from university testing on home lawn usage will be available by next year.

Circle 122 on reader service card

PROTECTING ORNAMENTALS FROM HEAT SHOCK

The use of anti-transpirant sprays, which reduce moisture requirements of ornamentals and protect susceptible plantings against extreme heat and drought effects, has been growing for several years, but 1988 should set a record, according to PBI-Gordon Corp.

The Kansas City chemical firm reports that, as of June 30, sales of its Transfilm anti-transpirant were 78 percent greater than the same time the previous year.

Reducing transplant shock by coating the leaves with a clear, sprayable polymer film that temporarily seals off many stomata or "pores" through which vapor is lost, anti-transpirants are extensively used by nur-

serymen, applied as ornamentals are dug or loaded for delivery. Florey Tree Farm, an hour's drive east of Dallas, ships loads of big trees — 12 to 20 feet tall — including deciduous types loaded with foliage.

"The anti-transpirant, applied as trees are dug, has to hold vapor loss to a minimum until the transplant is able to get rooted and take in sufficient moisture at the new location," said Bud Deke, manager of the Wills Point, Texas, operation. He likes the Gordon product, indicating that it gives the leaf an attractive shine and enables it to last longer because the film resists cracking and peeling.

Marek Brothers, a Houston landscaping firm, hauls full loads of live oaks and purple plums from Oklahoma. The ornamen-

(continued on page 34)

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SPECIALTY PRODUCTS

(continued from page 32)

tals' first stop, once they are lifted off the truck, is to get sprayed with Transfilm.

The company's last shipment from Oklahoma arrived in 98 F weather, with the Houston sun probably heating the burlap another 10 degrees or so. "We could have lost foliage or lost trees, but instead we won compliments for making this site look good," said Gary Outenreath, Marek manager.

In Philadelphia's northern suburban area, Green Baron Inc. of Culpville, Pa., reports that anti-transpirant interest and usage is definitely higher than in previous years. The company services approximately 1,000 lawn care accounts, operates a retail garden center and, for the past three years, a wholesale distributorship.

Chuck Felix, in charge of sales to landscape installers, grounds maintenance managers, etc. says that transfilm and similar products are receiving serious consideration by new users, even for follow-up treatments in established beds.

Another wholesaler who serves a lot of Southeast geography severely affected by the drought is The January Co., Memphis, Tenn. "All the traditional uses are up because, otherwise, the risks this year are

simply too great," said Jack Cozart, sales manager.

The Memphis firm has shipped a good deal of this type of product into Georgia, Alabama and Florida, Cozart said. "We've heard they are applying Transfilm to corporate beds and established plantings in parks, cemeteries, etc."

A gallon of the Gordon product mixes with 20 to 40 gallons of water for spraying or dipping deciduous trees or shrubs. The one to 20 proportion is also used for "winterizing" putting greens and for sod, applied before cutting, to help prevent excessive transpiration during shipping and during any on-site delays.

In both ornamentals and turf, excessive transpiration occurs when the loss of water by transpiration exceeds the moisture being absorbed by the plant, mainly via the root system, explained Jim Armbruster, product development specialist at PBI-Gordon.

Deciduous trees and shrubs, as well as sod, lose most of their hair-like feeder roots as they are harvested. A minimum amount of moisture must remain in the plant in spite of heat, drought or drying winds, or it can become limp, desiccated and eventually die, Armbruster explained. "Uniform coverage of a film-forming, anti-transpirant helps retain moisture."

Polzin Lawn & Landscape, Merrill, Minn., maintains the landscape ornamentals for 16 restaurants operated by a national fast-food chain in Central Michigan.

"We apply about 30 gallons of Transfilm in October, using it to winterize pine, spruce, ewes and euonymus," said Frank Polzin. "I shouldn't fail to mention junipers, since we treat them too. The label of our previous anti-desiccant specifically exempted them, and in the spring of 1986, we discovered that 17 junipers failed to survive the winter. As a result, we decided to try a new anti-transpirant and Transfilm was our choice."

Circle 123 on reader service card

AQUATIC WEED CONTROL: BOON FOR LCOs?

Weed control services may be dropping in certain areas of the country because of the drought, but opportunists have found ways to put established products to work in new ways.

All it took was a phone call from his marina owner brother, and Ron Mau, a manufacturer's representative for Riverdale Chemical Company, was on his way to saving the vacations of a number of Iowans from the unusual outbreak of weeds.

According to officials at the Iowa Depart-

(continued on page 36)



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again this year. See the latest equipment in operation — all within walking distance of the Superdome.

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Super Location — Down South they call New Orleans "The Big Easy" — a relaxed way of life made up of Cajun cooking, southern hospitality, Bourbon Street Jazz, and warm nights. It's the ideal place to unwind, enjoy, and entertain.

Superdome — The Louisiana Superdome, site of PLCAA/New Orleans '88 is awe-inspiring outside and breathtaking inside. Home to 1988 Republican National Convention, the NFL Super Bowl, and college football's Sugarbowl, the Superdome offers an unmatched combination of spaciousness, facilities, and accommodations. Now the Superdome hosts the SuperShow — PLCAA/New Orleans '88!

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ALA

SPECIALTY PRODUCTS

(continued from page 34)

ment of Natural Resources, Lake Okaboji, in the northwest part of the state, has weeds growing in areas where they have never before grown. In general, it has created a weed problem like people have not seen in 30 years.

Whatever the reason, low lake levels, significantly warmer weather or slow water movement enhancing the penetration of the sun's rays in the water, the growth of unsightly weeds in Lake Okaboji was shocking.

Now, if you've spent a good deal of money on a lakefront property, but the kids won't go for a swim because of the weeds. Or if you can't take the boat out because of weeds collecting in the propeller, you would be a bit discouraged.

Such a weed situation could be devastating to all the commercial properties — marinas, restaurants and so on — who are counting on the summer tourist season to spark the economy.

After receiving a call of help from his brother, Mau reviewed several chemical product labels, and recommended Riverdale's 2,4-D granular product labeled for use in lakes and ponds for control of certain aquatic weeds. The label copy also sug-

gested that contact be made with the proper officials before application is made — in this case the department of natural resources.

After talking with representatives of the department and discussing who would apply the product, it dawned on Mau that it may be possible for LCOs to provide aquatic weed control services as an alternative to other services which may have been lost because of the drought.

In addition to summer applications, Mau said, easy applications can be made on ice surfaces just before spring thaw occurs. Not only could the LCO offer this service during the season, but during the off-season as well. (Rules and regulations governing such applications, as well as liability insurance requirements vary from state to state.)

For a homeowner with 75 feet of frontage with weed control 30 feet from shore, the granular 2,4-D could be applied to 2,250 square feet. Depending on the weeds to be controlled, this would require up to 10 pounds of product. For a marina with 500 feet of shoreline with weed control 20 feet from shore, (10,000 square feet) it would require up to 45 pounds of product.

The Riverdale label suggests that applications begin along the shoreline and proceed outward because this leaves untreated

areas into which fish will migrate. The untreated areas may be treated after the vegetation in the originally treated areas have been thoroughly decayed, about 2-3 months.

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PAINT YOUR LAWN?

The abnormal dry conditions that exist in many areas of the United States this year, has lead to the increased demand for colorants such as Green Lawngr.

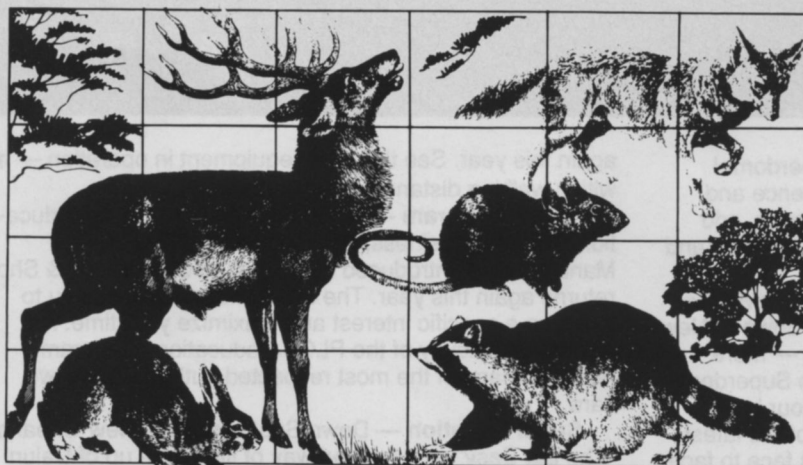
"Many cities currently are limiting irrigation. Therefore, an alternate and less expensive form of beautifying discolored turf is required," according to Dan Bergeson, turf manager of Becker-Underwood. "Clients may enjoy a plush green looking lawn by an economical application of the product."

Green Lawngr is not a dye, but light-absorbing pigment which is designed to restore a natural, healthy looking green color to dormant or discolored turf.

LCOs use the product as a beautifying agent to increase the aesthetic value of turf by covering any brown or discolored spots which may appear on a client's lawn.

Once applied and allowed to dry, Green Lawngr will not wash off or wear off turf. However, cleanup of equipment and skin is still easily performed.

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DISEASES OF COOL SEASON TURF

Despite increased fungicide tolerance, a variety of biological and chemical fungicides are available for the control of turf diseases.

Kentucky bluegrass, perennial ryegrass and tall fescue are the three most common cool season turfgrass species used on home lawns. The following will be a discussion of the various diseases that occur on each species, the symptoms and the time of year or environmental conditions under which each occurs.

KENTUCKY BLUEGRASS. *Melting-Out.* The Kentucky bluegrasses are generally classified into two categories: the common type and the improved types. The common types are susceptible to melting-out, often mistakenly referred to as leaf spot, whereas the improved types are resistant.

It should be noted that even the improved types will have a few spots on them in the spring, but this does not mean that melting-out is a problem. For melting-out to be the problem there would be a general all-over thinning of the entire turf area, not patches or small areas, and numerous large lesions would be evident on both the leaf blades and sheaths.

Management. The most obvious means of managing this disease is to plant resistant cultivars (the improved types). But if melting-out is a problem on an existing common Kentucky bluegrass lawn disease, severity can be reduced

Summer patch is a more serious problem on Kentucky bluegrass grown in the warmer areas of the cool season grass region.

by providing adequate levels of nitrogen through the spring period (1/2 to 1 actual pound of nitrogen per 1,000 square feet per month in the spring), maintaining the lawn at a cutting height between two to three inches and by irrigating daily with 1/10 inch water, if an automatic irrigation system is present.

NECROTIC RING SPOT. Necrotic ring spot (formerly misidentified as *fusarium blight*) caused by *Leptosphaeria korrae* is a patch disease especially on the improved Kentucky bluegrass cultivars. The disease is characterized by patches of dead or dying turf. When the fungus is attacking the plant in cool weather, reddish colored blades are evident in the patches where the fungus is active. When the patches occur in the warm weather of summer, the turf in

the patches will appear wilted even though there is plenty of soil moisture as indicated by the healthy non-wilting turf in the surrounding areas.

The fungus is usually not active at this time, but the plants wilt and die because the roots, which were infected earlier by *L. korrae*, have been reduced or destroyed. Patches that are one year old or older will often have green centers surrounded by dead or dying turf. This is due to the fungus moving out of the center of the patch to the outer margins. Once the fungus is no longer active in the center of the patch, the grass begins to recover.

Management. Nitrogen fertility is important in managing necrotic ring spot. A minimum of three pounds, preferably five pounds, of actual nitrogen per 1,000 square feet per season should be applied. This should be done even where fungicides are used to manage the disease to promote recovery.

To manage this disease, it is also important to maintain high levels of phosphorus and potassium based on a soil test. Remember, if the roots are confined to the sod or thatch layer during the summer stress periods, phosphorus and potassium reading bases on soil samples taken at six inches are meaningless. Soil samples need to be taken from where the root zone will be during the summer stress period. Daily irrigation approximately 1/10 to 1/5 inch per day applied preferably during the mid to early afternoon will greatly reduce the severity of necrotic ring spot.

Necrotic ring spot can be managed biologically with a product called Lawn Restore which contains beneficial microorganisms in addition to a complete fertilizer. The disease can be managed chemically with the fungicides listed in Table 1. For them to be effective they need to be applied early in the season; approximately six weeks to two months after green up in the spring.

SUMMER PATCH. Summer Patch (which was also previously called *Fusarium blight*) caused by *Magnaporthe poae* is a disease similar to necrotic ring spot. In both diseases, it is primarily the root systems of the grass plant that are destroyed.

Summer patch is a more serious problem on Kentucky bluegrass grown in the warmer areas of the cool season grass region. The patches are more irregular in shape than the circular necrotic ring spot patches. They first appear as wilted turf, later turning straw-colored. They are only evident during the warm weather of summer, though, like necrotic ring spot, the infection takes place earlier in the season.



Necrotic ring spot disease in Kentucky bluegrass during the summer.

Management. The management is also similar to necrotic ring spot, 1/2 pound per 1,000 square feet of nitrogen per month is needed during the warm weather with additional applications being applied during the remainder of the year. Daily irrigation during the midday period will help reduce the severity of the disease. Heavy irrigation that depletes most of the oxygen from the soil will make summer patch symptoms more severe. Lawn Restore will help manage the disease biologically. The fungicides listed in Table 1 should be applied six weeks to two months after green up in the spring if they are to be effective.

PERENNIAL RYEGRASSES. Pythium blight caused by *Pythium aphanidermatum* has primarily been considered a golf course disease but with the use of perennial ryegrass in home lawn turfs, especially where hydroseeding is used, it has become a major problem.

Pythium blight is one of the most devastating diseases of turf because it moves so rapidly. It can destroy an entire lawn in 48 hours if ideal weather conditions persist. The development of the disease is favored by high temperatures (90 degrees Fahrenheit) and high humidity during periods of rainy weather. The disease begins with two-to-four inch patches, usually copper in color with grayish white mycelium in the outer margins. The disease will continue to spread as long as the turf remains wet and can cover large areas of the turf very quickly.

Management. Culturally, other than avoiding perennial ryegrass in home lawn turfs, not much can be done to prevent pythium blight from being a problem if environmental conditions are correct. Reducing or eliminating nitrogen applications during warm weather months will help reduce the severity of the disease, but to actually manage it fungicides will be necessary.

The systemic fungicides like Subdue, Banol or Aliette should be used in a lawn care situation, because of the length of management they afford. Depending on weather conditions, these fungicides will provide protection from pythium blight for 10 to 21 days.



Red thread disease and a close-up of it (inset) in perennial ryegrass.

RED THREAD. Red thread caused by *Laetisaria fuciformis* is a serious disease of perennial ryegrass. The disease is characterized by small pinkish patches in the turf, initially three to four inches in diameter. They may quickly coalesce to cover large areas giving the appearance of melting-out, but in a confined area of the lawn.

A close examination of the turf will reveal pinkish strands of the fungus present on the foliage. These strands are especially evident in the early morning while the turf is still wet. As the turf dries the strands tend to mat the grass blades together.

Management. Management of red thread in perennial ryegrass will require fungicide treatment. Nitrogen fertility will help reduce the severity of red thread on perennial ryegrass, but not provide a satisfactory level of management as it does on Kentucky bluegrass or the fine leaf fescues. Fungicide treatments will be necessary to obtain satisfactory management of red thread on perennial ryegrass.

DOLLAR SPOT. Dollar spot, caused by *Moellerodiscus* and *Lanzia*, can be a serious problem on perennial ryegrass especially when it is maintained under a low nitrogen regime. If a lawn infected with dollar spot is viewed from a distance it appears very much like a turf infected with red thread. A closer examination reveals patches two to four inches in diameter that are more silver to white in appearance than the pinkish colored patches of red thread.

If viewed early in the morning, while the turf is still wet,

the white cottony like appearance of the fungal mycelium will be evident on the blades. A close examination of the blade will reveal white lesions the width of the blade with brown banding evident on the outer margins of the lesions.

Management. Nitrogen fertility will help reduce the severity of the disease and give acceptable levels of management in most seasons. Because the disease occurs in most areas in late summer with the return of the cool nights, increasing nitrogen fertility levels at this time of year should not increase the severity of diseases like brown patch or pythium blight. If fungicide applications are made to manage red thread or brown patch, dollar spot should not become a problem since most of the fungicides used to manage these two diseases are also effective on dollar spot.

BROWN PATCH. See tall fescues.

TALL FESCUES. Tall fescues have certainly

been the Rodney Dangerfields of turfgrass. It appears that many turfgrass researchers who went into what is known as the transition zone received their training further north, where they become enamored with Kentucky bluegrass and encouraged its use in the transition zone, where it is unsuitable.

They continued to encourage the use of the Kentucky bluegrass even when often times, the only turf that was alive by mid-summer, was the tall fescue. Fortunately, this is changing and the improved turf-type tall fescues are more widely grown and accepted in the transition zone where they are better adapted to grow than the Kentucky bluegrass.

Brown Patch. No grass is perfect and the tall fescues are no exception. The main limiting factor to the successful growth of the tall fescues is brown patch caused by *Rhizoctonia solani*. This disease occurs in the warm humid weather of summer. It begins to appear when the daytime temperature rises into the high 80s or 90s accompanied

by high humidity and the nighttime temperature consistently stays above 75 degrees Fahrenheit.

The patches range in size from six inches to several feet in diameter and are brown in appearance. They often have a shiny or water-soaked appearance when seen early in the morning while the turf is still moist. Brown patch is also a significant threat to perennial ryegrass and the management recommendations given below are the same.

Management. Nitrogen fertility during the warm summer months should be eliminated or severely curtailed. Fungicide application will be necessary to have a disease-free lawn. The best fungicides for the management of brown patch are the contacts like Daconil 2787, Fore and Formec. — J.M. Vargas, Jr.

The author is a professor of botany and plant pathology at Michigan State University, East Lansing, Mich.

DISEASE	SUSCEPTIBLE TURFGRASS	CULTURAL	CHEMICAL
Dollar Spot (<i>Lanzia</i> and <i>Moellerodiscus</i> spp.)	Fescues Bluegrasses Ryegrasses	1) Maintain adequate levels of nitrogen 2) Remove dew	Chlorothalonil (Daconil 2787), Propaconazole (Banner), Cadmate (Cadmate, Caddy), Benomyl (Tersan 1991), Anilazine (Dymec, Dyrene), Fenarimol (Rubigan), Iprodione (Chipco 26019, Proturf Fungicide VI), Thiophanate-E (Cleary 3336), Thiophanate-M (Fungo, Spot Kleen, Topmec, Proturf Systemic Fungicide) Triadimefon (Bayleton, Proturf Fungicide), Vinclozolin (Vorlan)
Helminthosporium melting-out (<i>Drechslera poae</i>)	Bluegrasses Ryegrasses Tall fescue	1) Remove clippings 2) Raise cutting height 3) Adequate levels of nitrogen	Iprodione (Chipco 26019, Proturf Fungicide VI), Chlorothalonil (Daconil 2787), Anilazine (Dymec, Dyrene), Mancozeb (FORE, FORMEC 80, LESCO 4), Vinclozolin (Vorlan)
Necrotic Ring Spot (<i>Leptosphaeria korrae</i>)		1) Adequate nitrogen 2) Light daily irrigation	Fenarimol (Rubigan)
Pythium Blight (<i>Pythium</i> spp.)	Bluegrasses Ryegrasses Fescues	1) Improve soil drainage 2) Increase air circulation by removing surrounding vegetation	Chloroneb (Terramec SP, Proturf Fungicide II), Ethazole (Korban, Terazol), Propamocarb (Banol), Metalaxyl (Subdue, Proturf Pythium Control), Fosetyl-Al (Aliette)
Red Thread (<i>Laetisaria fuciformis</i>)	Fescues Ryegrasses Bluegrasses	1) Adequate levels of nitrogen 2) Frequent mowings	Vinclozolin (Vorlan), Chlorothalonil (Daconil 2787), Mancozeb (FORE, FORMEC 80, LESCO 4), Thiophanate-E (Cleary 3336) Thiophanate-M (Fungo, Spot Kleen, Topmec), Triadimefon (Bayleton)
Brown Patch (<i>Rhizoctonia solani</i> = <i>Thanatephorus cucumeris</i>)	Ryegrasses Bluegrasses Fescues	1) Reduce nitrogen 2) Increase air circulation by removing surrounding vegetation	Anilazine (Dymec, Dyrene), Chlorothalonil (Daconil 2787), Mancozeb (FORE, FORMEC 80, LESCO 4, Manzate 200)
Summer Patch (<i>Phialophora graminicola</i>)	Bluegrasses	1) Light, frequent watering during dry periods to reduce heat stress 2) Adequate nitrogen	Fenarimol (Rubigan), Triadimefon (Bayleton), Propaconazole (Banner)

Table 1.

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DIAGNOSING DISEASES OF ORNAMENTAL PLANTS

Identifying diseases in ornamentals is often more difficult than finding insects, making early recognition and diagnosis of plant damage vital to the maintenance of good plant health.

When dealing with the health of ornamental plants, it's important to quickly identify the cause of the plant decline and/or failure. Insects are usually visual enough for a professional to see the plant damage firsthand, and their tell-tale damage is most often unmistakable. (See the July issue of ALA — Tools for Identifying Ornamental Insect Pests.) However, plant diseases are frequently much more elusive.

Before we get into a discussion on the diagnosis of plant diseases, it is only fitting that we define "plant disease." For our purposes, we will use the definition — an injurious process continuously interfering with the normal structure and activities of the plant and expressed by the display of distinct symptoms.

Plant diseases can be categorized into two broad groupings: infectious diseases and non-infectious diseases. Infectious diseases will be the subject of this article which includes diseases caused by fungi, bacteria, virus/mycoplasma and nematodes. Non-infectious diseases include conditions detrimental to plant health such as: improper light and watering; poor soil conditions; nutritional deficiencies; temperature and humidity extremes; damage from lightning; and people-related problems, such as construction damage, grade change, drainage change, etc.

Infectious diseases are usually spread from plant to plant rather quickly, often infecting all plants of the same species in a particular landscape planting. The method and success of spread depends upon the plant host, causal organism and environmental conditions at the time.

A weakened plant, which is suffering from one of the above non-infectious diseases, will be much more susceptible to the attack of an infectious plant disease than will one in a healthy condition. The presence of the disease organism in its infectious stage, along with optimum environmental conditions favoring the successful attack by the causal organism, is mandatory for a disease to gain entry into a plant.

The key ingredient for good plant health is the early recognition and diagnosis of plant damage and decline. The main damage/decline symptoms will be displayed in one or more of these structures of plant anatomy: leaves, flowers/fruits, twigs/branches, stems/trunks and roots. Let's consider each of these, as well as some of the symptoms to look for in identifying infectious plant diseases.

LEAVES. All infectious disease causing agents mentioned above can affect the leaves. Leaf spot *fungi* will attack the leaf causing symmetrically round spots on the foliage. Some leaf spot diseases may be severe enough to cause serious

defoliation or may only cause a few leaves to drop as the weather conditions change to become less favorable for disease development.

Powdery mildew, a fungi, is a real problem in humid micro-environments (at the leaf surface) and in shady, poorly ventilated areas. The white powdery fruiting structures of this disease can spread rapidly to other leaves and may also cause defoliation. Many disease organisms are host specific such as black spot on roses.

Most leaf spot diseases, including powdery mildew, can be controlled with a contact fungicide to help suppress the spread to new terminal growth. Older foliage, which has been attacked, will continue to display the spots or mildew appearance. Many people think that just because a fungicide is applied, the disease symptoms should disappear. They are often annoyed when they inspect the plants a week later to see the spots still there, not stopping to observe that the new terminal growth is unaffected because of the spray application.

Apple scab and anthracnose are other examples of the many leaf infecting fungal diseases. The former displays irregular shaped dark lesions, the latter displays twisted, crumpled leaf development with little color infraction.

Bacteria also causes leaf spots, but these spots generally have angular margins instead of the rounded, more symmetrical margins of the fungal leaf spots. Leafblights of Hawthorne or English Ivy are good examples. The total collapse of several leaves, showing first a water soaked appearance quickly followed by a browning, blackening, dried out condition when leaves hang onto the plant for long periods of time, are symptoms of a plant attacked by fire blight.

The best control for this bacterial disease is to spray with a bactericide at the time of bud break — early in the spring. On susceptible pear trees, pyracantha and photinia, repeat these applications every seven to 10 days as environmental conditions remain favorable for disease development. Pruning away affected foliage and branch material (see the twig and branch section) will help prevent spreading.

Viruses and *Mycoplasma* cause leaf malformations, mosaic coloration and wilt symptoms. Unfortunately, plant viruses are virtually impossible to control. Frequently, resistant varieties of susceptible plants have contributed more than any other means to overcome these plant disease causing agents. The leaf symptoms are usually the last to display the fact that the plant has a disease. Usually the virus is picked up in the root system (see root section) causing a delayed symptom of wilted or mottled leaves, most often too late to do anything about the disease. More often than not,



(Left) Photinia leaves showing Leaf Spot Fungus infection. Note symmetrical rounded margins of individual spots. (Top) A Fusiform Rust Canker on pine is quite visible here, showing the orange-yellow spores being disseminated. (Right) This photo shows the progression of Black Spot disease development on rose leaves — from healthy to severely diseased, which had previously dropped from the plant.

the recommended control is to remove the infected plant.

Nematode activity frequently causes stunted light green leaf development and encourages leaf wilting. This is caused by feeder root system blockage by these soil borne feeding invertebrates. As a population increases in density, all upward translocation of water and nutrients can be completely shut off, causing the plant to wilt and die quite rapidly.

FLOWERS AND FRUITS. Fungi, especially, are the incriminating causal agent producing disease symptoms on flowers and fruits. These symptoms may include a covering of the white mycelia of Powdery Mildew to the olive drab spots on the fruit of the crabapple, caused by the Apple Scab fungus. This disease causes fruit disfigurement and premature dropping. The bacteria-caused fire blight disease causes a black sunken lesion on the fruit stem causing the fruit to remain firmly attached to the plant, but taking on a blow-torch burned appearance. Control these flower/fruit related diseases using a contact fungicide every 10 days until disease suppression is obtained.

TWIGS AND BRANCHES. The fungus causing sycamore anthracnose is a twig/branch attacking disease. In early spring, the disease generates sunken cankers on small twigs, causing leaves to brown and die as if hit by a late frost. Dutch Elm disease carried into the tree by a small beetle as it bores into small twigs causing them to flag (die back), is

then translocated quickly to other parts of the tree. Again, the bacteria borne fire blight causes sunken lesions to separate healthy versus diseased wood.

All plant parts at the branch terminal side of this disease separation take on a burned/scorched appearance with affected foliage remaining firmly fixed to the plant. The best kind of control recommended for many twig/stem diseases is simply pruning away affected plant parts. Move into healthy wood at least three to six inches, soaking pruners in a solution of 75 percent clorox and 25 percent water between pruning cuts. This will reduce dramatically the spread of the disease on the same plant or to other plants.

STEMS AND TRUNKS. Cankers of various kinds, usually caused by fungi, are simply a localized lesion or swelling often resulting in an open wound. Crown Gall, Pitch Canker on Pine, Fusiform Rust on Pine, *Cytospora* Canker on Spruce, *Hypoxylon* Canker on Poplar and Oak and Crown Canker on Dogwood are just a few which affect trees.

As the canker disease gains foothold in the plant, the water-conducting vessels begin to die due to vascular system blockage. Eventually, girdling of the branch or trunk causes all plant parts above that area to die. Making incorrect pruning cuts can prevent proper wound closure, thus offering a perfect opportunity for canker development. Banging into trees and shrubs with a lawn mower or string trimmer also makes the plant susceptible to infectious disease organisms.

Often, disease causing organisms enter a tree at the soil level due to some type of physical damage. The development of the organism within the tree may then cause a cavity as interior heartwood is decomposed. Frequently ants and termites find a great haven there for food and shelter, further deteriorating the heartwood, making the tree a real safety hazard.

Most trunk diseases can be controlled through prevention. Especially prevention of any type of trunk damage which exposes the cambium or heartwood of the plant. Once a tree has contracted a trunk-related disease, there is not much that can be done to eradicate the problem short of pruning

out the canker and everything above it. Systemic and contact fungicides may be of help in delaying/deterring disease development and spread.

Damping off is a serious seedling disease attacking the stem of plants at the soil surface. The discolored, water-soaked stem cause the upper plant portions to wilt and die — with the whole plant often toppling at the site of the disease lesion. Soil sterilization and the use of contact fungicides incorporated into the soil prior to planting will often prevent this type of stem disease.

ROOTS. Root rot, root declines and root decay are hard to diagnose because the trou-

ble spot is hidden and symptoms are often delayed. Inspection of the roots of a dead or dying plant may reveal water-soaked, mushy, spongy roots with the outer layer easily sloughing off.

Wilt causing viruses, fungi (such as Texas Root Rot which enjoys a soil pH above 7.3) and Phytophthora Root Rot, are just a few of the many root-related plant diseases responsible for poor root health. Often, one symptom of root-related disease is that plants are dying in a circular pattern or are dying one next to the other in progression.

Another common symptom of root problems is a wilted, discolored foliar canopy. Single branches or entire canopies may be affected. The best diagnosis for root diseases is to take root and soil samples from affected plants and send them to your state horticultural extension service for a correct diagnosis. Frequently, root-related diseases are caused by root injury especially when transplanting or digging around plants.

Insects and nematodes can also play their part in opening the plant up to disease intrusion. "Wet Feet" or excessively wet soils will encourage root decline due to the filling of the soil pore spaces with water, replacing the much needed air. Many disease causing organisms are virtually omnipresent in the soil, so once a plant is weakened by one of the means previously noted, disease symptoms are sure to follow.

Root diseases are difficult to control. Soil sterilants are the best chemical means available to clean up an infected soil, especially for viruses. The only drawback is that any surrounding plant material with their feeder roots located in the area to be treated, are likely to be damaged. Using certain soil sterilants at less than sterilant rates will usually not harm existing desirable vegetation. But the eradication of the disease pest may not be as complete as desired at the lowered rate. Using certain fungicides labeled for root rot, applied as a soil drench, is one of the best treatments for fungal diseases.

Hopefully the information presented here will better prepare the reader to have a more knowledgeable grasp of plant problem diagnosis relating to infectious diseases. One must carefully inspect the entire plant, observing any disease evidence on all anatomical structures of the plant. Many plant diseases that will be encountered will have no chemical remedies available. However, as mentioned earlier, a plant receiving proper care and nourishment will be much healthier and will have a much better chance of overcoming the otherwise detrimental effects of any disease infection. — William P. Eubank ■

The author is a full-time tree and landscape consultant with William P. Eubank Consulting, Houston, Texas. He's also a registered professional entomologist providing a turf and ornamental consulting service for companies across the United States.

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AUGUST 1988

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CLIPPINGS

Wheeling before dealing. During Maine's summer months, when snow and frigid air are only a memory, Bill Weidner of Mil-bridge, Maine, takes to his recumbent bicycle and pedals off to work. Weidner is Solo Incorporated's products manager for Kelco Industries, an outdoor power equipment distributor.



The two-wheeled bicycle, a combination of spare bike parts and a creative imagination, also serves as a unique advertising vehicle for Solo.

Based in Newport News, Va., Solo is the U.S. subsidiary of Solo Kleinmotoren GmbH, West Germany, a leading worldwide manufacturer of chain saws, mist blowers, sprayers and other outdoor power equipment for commercial and home use.

New opportunities? *Entrepreneur* magazine's Catalog of New Opportunities listed lawn care service as one of about 200 new business opportunities with high income potential.

Because of success in both chemical lawn care and lawn maintenance, the magazine suggested that a person can enter the field relatively inexpensively and net a profit of \$50,000 or more within a few years.

For example, the magazine said, there are a number of one-person operations that started off with less than \$1,000 total capitalization — although minimum start-up costs run closer to \$12,000. With a broad base community coverage, net profit can easily reach more than \$50,000. Some established lawn care companies employing crews to maintain lawns are grossing more than \$1 million a year.

Another example reported by the magazine showed that one husband and wife team got started two years ago in a part-time chemical lawn care operation. They contracted with customers to come by five times a year to treat their lawns. The business now nets them \$250,000.

Among the other new business opportunities listed were pest control, tool and equipment rental, plastics recycling center, collection agency and software locator services.

Manufacturers form Olympic team. A sponsor of the 1988 U.S. Olympic Team, Briggs & Stratton, has teamed up with Ariens, Cushman, Gravely, Gustafson, Jac-

obsen, OMC Lincoln, Ransomes, Sarlo, Scag, Simplicity, Toro, Turfco and Yazoo among others, to present \$70,000 in equipment to the USOC for use at two of the Committee's Olympic Training Centers.

"We enjoy being a part of the U.S. Olympic Committee and supporting the 1988 United States team," said Frederick P. Stratton Jr., Briggs & Stratton chairman. "Thanks to the cooperation of our lawn mower manufacturing customers, we are



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AQUASHADE, INC. Endorses the "Proposed Constitutional Amendment."

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able to donate equipment that will maintain the athletes' training camps. We want to help them go the distance."

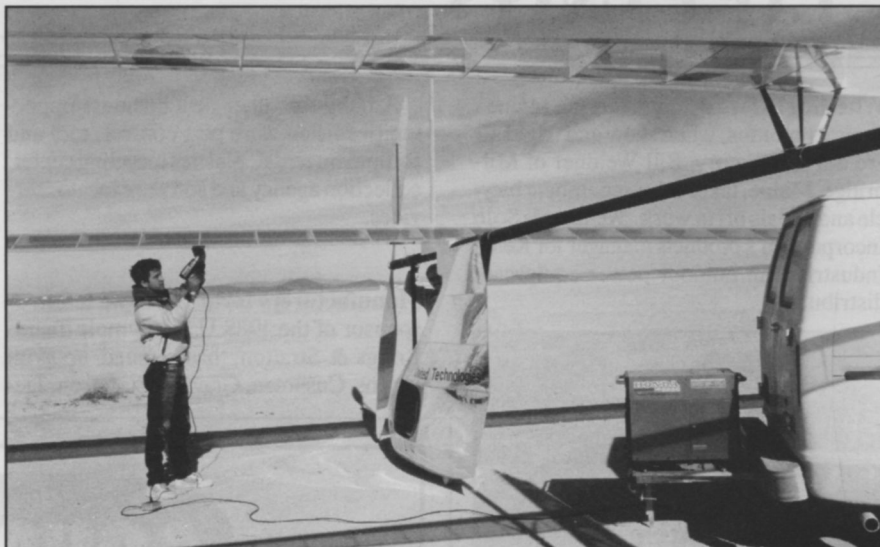
USOC President Robert H. Helmick said the machines would be distributed between the training facilities in Colorado Springs and Lake Placid, N.Y.

The equipment, all powered by Briggs & Stratton engines, ranging from three to 18 horsepower, include snowthrowers, golf carts, walking and riding mowers, edgers, aerators and push mowers.

Stratton said he hoped the equipment donations would add to the patriotic appeal of the U.S. Olympic effort. "The preparation for the Olympic Games is always an exciting time in this country," Stratton said. "We hope we can add to that excitement."

A piece of history. When the Massachusetts Institute of Technology needed a portable generator to help build the history-making "Daedalus 88" human-powered aircraft, its engineers turned to Honda Power Equipment.

When the engineers approached Honda about the project, they indicated that reliability and dependability were top concerns for the generator which would serve as the sole power source for lights, tools and



The Honda EX2200 super-quiet generator was the sole power source for the "Daedalus 88"

testing equipment at the team's remote testing facilities in the California desert and on the island of Crete.

In late April, the MIT team achieved its goal of recreating the mythical flight of Daedalus when a Greek national cycling champion kept the "Daedalus 88" aloft for the 74-mile, nearly four hour journey from Crete to the Greek island of Santorini, setting records for the furthest straight-line

human-powered flight; the absolute distance record for human power flight; and the duration record for human-powered flight.

MIT's "Daedalus" project began as a dream to recreate the mythical flight of the Greek craftsman Daedalus who is said to have flown to freedom from imprisonment on the island of Crete 3,500 years ago using wings made of wax and bird feathers.

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Optional accessories - 20-lb. quick-release weight bar for slicing machine and a 45-lb. quick-release weight bar for the plugging aerator.

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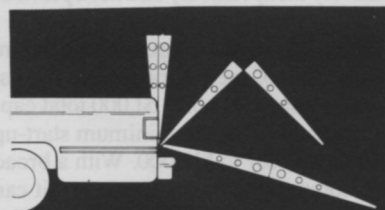
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FINANCIAL CORNER

CAN A SMALL BUSINESS BE PROTECTED FROM EMBEZZLEMENT?

"Show me a business with a very busy manager/owner and I'll show you a business that can be ripped off." So goes the song of the embezzler.

The bookkeeper, longing for an easy make, likes to work for an owner who says in words or attitude, "I don't want anything to do with the books — that's your department."

No business is too small to be exempt from embezzlement. In fact, small companies, because of the limited number of employees, have a serious problem. They don't have enough personnel to divide the money-handling functions among different employees. Usually the same employee opens the mail, prepares the checks, payroll reports, deposits, monthly billings, bank reconciliations, perhaps even the financial statements.

If you have employees handling money functions and you are not personally acquainted with the necessary safeguards, you should have a review of the internal control done by your accountant.

Some very simple embezzlement techniques used in even the smallest businesses are:

- Overpaying payroll taxes to the government, then applying for a refund and cashing the refund check.
- Establishing a checking account with the company's name which bears signature authority of the bookkeeper (often done in the same bank as the existing company account).
- Making duplicate payments on different dates for the same invoices, sending one to the real vendor and the other to a duplicate account with the same vendor name set up by the embezzler.

Even small businesses can benefit from the segregation of duties established in larger companies. This control is accompanied by the owner being involved in certain paper-handling activities.

Once your internal controls have been established, they should be reviewed annually to see that they are effective and that they are being followed by the appropriate personnel.

Miscellaneous tips. Heavy envelopes produce heavier responses in direct mail promotions.

In one test, response soared 40 percent when a 28- or 32-number envelope was substituted for the usual 24. A teaser, "please reply immediately" printed on the face reduced the response by 20 percent.

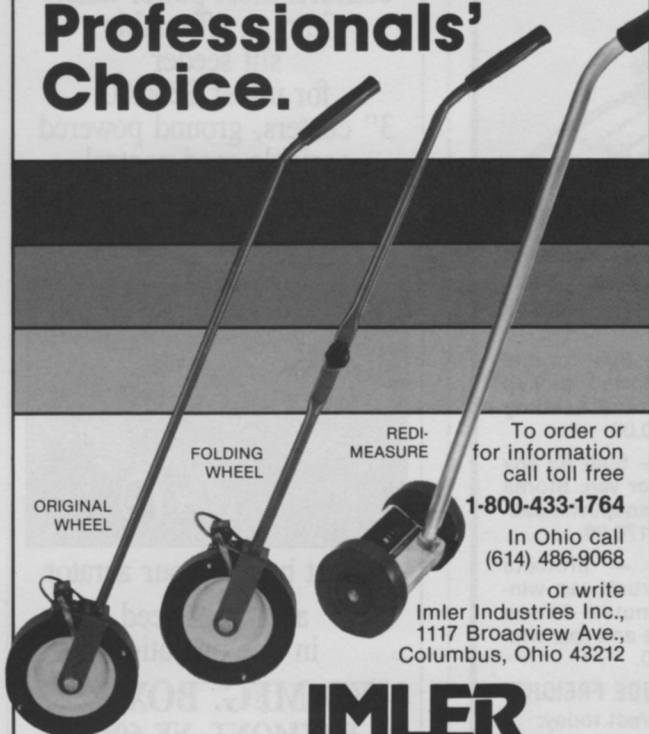
Electronic typewriters are useful transition tools for offices heading into full word-processing systems. Typists who master the electronic machines will then be familiar with many word processing features.

Hard computer disks that are going to fail will do so within the first 96 hours of use. When the storage drive is new, get it running and leave it on nonstop for two weeks. Some manufacturers now suggest that the drives be kept running all week and turned off only for the weekend.

The preceding information was provided by Wayne State University, Detroit, Michigan.

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PEOPLE

Catherine Thornburg was recently named personnel manager at Jacobsen's Arrowood production facility.

Thornburg has 13 years of experience in personnel and purchasing administration and served as personnel manager for Home-lite Division of Textron Inc. prior to her appointment with Jacobsen.

Jacobsen Division of Textron Inc. manufactures and markets golf course, professional and commercial turf care equipment worldwide.

Three jobs within Monsanto Agricultural Company's lawn and garden division were recently filled.

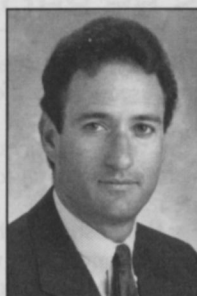
D.D. Harper was appointed manager, national sales for lawn and garden. He formerly was a manager in the animal sciences division.

Richard J. Raleigh was appointed manager of the company's new Greensweep line, and **Thomas G. Quigley** was appointed project manager of Greensweep.

Both Raleigh and Quigley come to Monsanto from The Andersons. Raleigh was formerly a marketing manager with The



Harper



Quigley

Andersons, while Quigley was national sales manager.

Harper joined Monsanto in 1976 and has held several positions, most recently in marketing food ingredients and specialty chemicals to the food industry. In his new position, he will have account management and regional markets responsibilities for Monsanto's Roundup L&G™ turf and weed killer and the Greensweep product lines.

Raleigh had worked for The Andersons since 1980 in both sales and marketing positions. As manager of Greensweep, he will be responsible for all marketing elements,

including long-range planning and transition management of the Greensweep line.

Quigley had worked with The Andersons since 1984. As Greensweep project manager, he will be responsible for special projects in connection with the transition of the Greensweep line, including projects in sales management and distribution contracts.

Kenneth W. Didion was recently named treasurer of LESCO Inc.

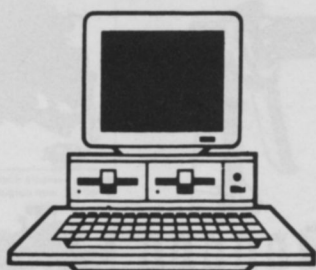
Didion is responsible for the overall financial and accounting aspects of the company. He began his career with LESCO in 1982 and served, to date, as the manager of financial accounting. Before joining LESCO, he spent 10 years with a regional accounting firm in Cleveland, Ohio.

Lebanon Chemical Corp. recently added **R. William "Bill" Marberger** to its Lebanon Total Turf Care sales staff.

Marberger joins Lebanon with more than 26 years of experience. He recently retired from a full-time sales position with a major Pennsylvania turf products distributor and will now act as a senior consulting representative in North and South Carolina.

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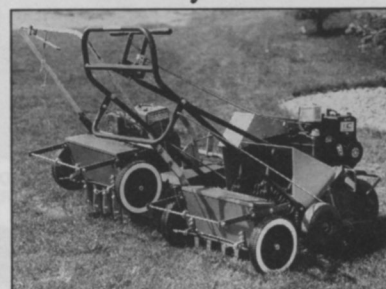
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Circle 9 on reader service card

PRODUCTS

Scag Power Equipment Inc. recently introduced two new additions to its line of commercial mowers at the Louisville Lawn and Garden Expo.

A 61-inch hydrostatic rider with an 18 horsepower Kohler electric start engine has been added to Scag's line of commercial riding mowers. The Eaton Series 850 hydrostatic transaxle provides smooth operation with a touch of the foot.

In addition, both drive wheels are driven by independent motors for a smooth transition through curves and better traction on hillsides and curves. An exclusive Scag-designed fluid cooling reservoir provides more cooling area to prevent overheating.

A new 72-inch walker has been added to Scag's line of commercial walkers. An 18 horsepower Kohler engine powers this walker through difficult conditions. A four-speed gear box gives the walker a faster ground speed. And the Scag Twin Power Belt doubles friction to pulley surfaces, so belts won't slip in normal cutting conditions, even when wet.

Circle 101 on reader service card

A new seeder attachment from **KB Manufacturing** is designed to fit most power rakers and walk behind aerators.

When attached to a power raker, it converts it into an affordable slit seeder. Three-inch spacing gives it a dense pattern for



Hahn's new spreader/top dresser.

one-pass application. With the seeder coupled to an aerator, it gives the operator the flexibility of aerating and seeding all in one operation.

The seeder is ground-powered, plants a wide variety of grass seeds, has a variable seed control and has a minimum number of moving parts.

Circle 102 on reader service card

Hahn Inc. recently introduced a spreader/top dresser as an attachment to its Multi-Pro 44.

The Hahn Spreader features a 17 cubic

foot steel hopper and a new drive system using a cog belt instead of chain drive. This spreader can distribute 600 pounds of dry sand per minute in a controlled pattern, adjustable from 12 to 20 feet. It will spread fertilizer up to 45 feet.

An optional P.T.O. kit is also available to adapt the spreader for use with a tractor's three-point hitch.

Circle 103 on reader service card

Three models of ramps for full size and mini-trucks and vans have been released by **Metko Inc.**

The Redi-Ramp line of semi-permanent and portable ramps and cab guard have been designed for heavy use in business or for weekend leisure activities.

The M-100 Standard Ramp is designed and built for standard American pickup trucks. Weighing only 125 pounds, it easily replaces the tailgate and attaches to the truck trunnions. The M-100 stores in the upright position for maximum visibility through the rear cab window.

The M-200 Mini Ramp is designed and built for imported trucks, trailers and vans. It attaches with fabricated brackets, also replacing the tailgate.

The M-300 Porta Ramp is designed for compact storage in a truck, trailer or van. Weighing only 45 pounds, it is easily removed for loading and unloading of equipment and material.

The M-400 Cab Guard mounts in minutes to the stake pockets of widebed pickup trucks or to the bed rails of mini pickups. Protection is provided to both the driver and the cab window. This 40-pound cab guard allows for maximum bed space and rear window visibility.

Safety and ease of installation are features designed and built into the Redi-Ramp line.

Circle 104 on reader service card

PRODUCT SPOTLIGHT

Chipco® Aliette® brand fungicide from **Rhone-Poulenc Ag Company** can now be applied on most woody, conifer and foliage ornamental plants, including ornamentals grown for indoor or outdoor landscaping, as a result of extensive label changes recently approved by the U.S. Environmental Protection Agency.

The changes do not apply in California where approval for expanded uses is pending.

Chipco Aliette is used by ornamental producers to control *Phytophthora* and *Pythium* diseases. The product previously had been OK'd for use on a limited number of ornamentals, including Azalea, Boxwood, Juniper and Japanese Holly.

The revised label will allow ornamental nursery and greenhouse operators to use an effective control material for protection against major root rot diseases, according to company officials.

The product translocates throughout the plant either up or down, so performance isn't limited to contact activity. Chipco Aliette is also designed to trigger the plant's own disease defense mechanism to guard against disease.

The product fits any management program because it can be applied as a foliar spray or drench for control of *Phytophthora* and *Pythium*.

Chipco Aliette may be used as a soil-incorporated treatment as well (except in California) for *Phytophthora* control on well-rooted plants such as Rhododendron, Azalea or Pieris.

It should not be mixed with any sticker, extender or wetting agent. Although extensive testing has shown good plant tolerance to Chipco Aliette on many foliage and woody species, the user should check for possible phytotoxic responses on other plants prior to commercial use.

Circle 105 on reader service card

DROUGHT

(continued from page 24)

amount of misinformation spread on the subject. To combat this, Erbaugh held training sessions to review most commonly asked questions from customers.

Tom Jessen of Perma-Green Supreme in Crown Point, Ind., said he feels lucky he hasn't had a horrible amount of cancellations, and fewer than expected number of skips.

But he has had his share of water restrictions to deal with. In one city, anyone caught watering gets their water turned off and must pay a \$1,000 bond to get it turned back on. A second infraction, they lose the bond. In one area the grass was so dry a backfiring mower caught a lawn on fire.

Like others, Jessen said, his company has started using a lot of dry fertilizer products to get the fertilizer down so it will be in the turf when the rains come.

INSECT INFESTATIONS. While you may not see them now, the drought is likely to cause increased insect activity — activity that probably won't be evident until after the grass becomes green again.

The dry weather is generally bad news for grubs, but welcomed by chinch bugs and bluegrass billbugs, according to Harry Niemczyk, an entomologist with The Ohio

State University.

The probability of eggs laid by grubs surviving in dry soil is reduced. On the other hand, the dormant grass provides the best possible conditions for chinch bugs, he said. Once the eggs hatch they can feed on the crown (even though it's dormant) and find enough food to survive.

In their weakened condition, plants are particularly susceptible to insect infestation and disease. For instance, when the turgor pressure of a pine tree's vascular system is reduced, the tree leaves itself easily accessible for the entrance of boring insects, Eubank said.

Under healthy conditions, a pine's turgor pressure will cause a borer to be repelled by sap flow.

"Some insects go out of their way to pick on trees in a weakened condition. If insect infestation does get started, it's just adding fuel to the fire," he said. "The same remedies apply wherever you are — be careful the trees and shrubs are not in a wilted condition."

Eubank recommended using bath water, if need be, to keep ornamentals moist.

Drought circumstances make it difficult to determine insect injury, because the injury is often masked by the drought conditions. The same goes for the bluegrass billbug, which is known for causing injury in June and July, but its damage will more

than likely be hidden by other stresses placed on the turf.

"In the fall, we'll see a lot of lawns showing injury and it will be difficult to diagnose whether the turf was killed from insect injury or heat stress," Niemczyk said. "There's not a whole lot you can do other than keep an eye out for chinch bugs and other insects."

He also suggested that a granular insecticide may be effective against insect injury if it can be lightly irrigated after application.

Overall, the industry has taken a positive approach to the unexpected drought, promoting customer education like never before. What the next year holds for the badly stressed landscape is still unknown, but LCOs appear ready to handle whatever the drought hands them. — *Cindy Code* ■

The author is Editor of ALA magazine.

Throughout the summer, the news has been full of stories about people trying to beat the drought. Rainmakers, water patrols and people who showered on their lawn in an attempt to conserve water, were just a few of the stories that made the news.

For more on a rainmaker who attempted to bring rain to Northwest, Ohio, see "A Plea For Rain" on the next page.

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A PLEA FOR RAIN

When all else fails in the middle of a drought, who do you turn to?

With their livelihoods at stake, thousands of residents of Northwest Ohio recently called on Indian medicine man Leonard Crow Dog, a proclaimed rainmaker, to bring a temporary halt to the summerlong drought.

With his sacred pipe and eagle bone whistle in hand, Crow Dog raised his instruments to the sky, pointing north, east, south and then west to open his 40-minute ceremony. The eagle bone whistle is designed to direct the winds and the clouds to bring rain, according to Crow Dog.

Crow Dog explained that the key to the ceremony lies in bringing together the pipe and the tobacco of the red willow bark. After the ceremony, Crow Dog predicted it would rain in four days, but was vague about the location and amount of rain that would fall.

Crow Dog claims his calls for rain have never failed, but he only brought a smattering of rain to the area. He has performed 127 similar ceremonies in 32 states since 1953.

A second ceremony has been planned for the near future.

With no end in sight to the drought, this act of desperation is just one example of how the sizzling heat is taking its toll on everyone — especially those who depend on the en-



Indian medicine man Leonard Crow Dog prepares his instruments for a ceremony designed to bring rain to Northwest OH.



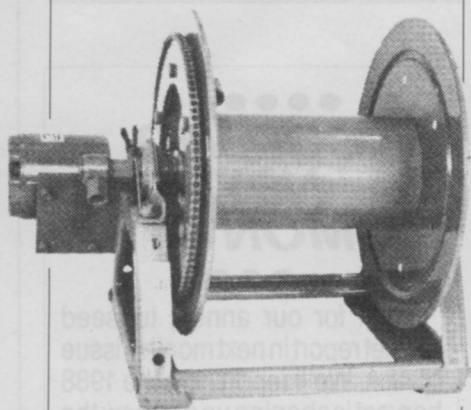
Swarms of residents and media pack the site where an Indian rainmaker was attempting to end the summer drought and bring rain to parched land. Photos by Terry Reimer.

vironment for their livelihood.

Another group in Cincinnati, Ohio, is arranging to pay a California firm thousands of dollars to seed the clouds over southern Ohio for rain. Whether this and other unnatural pleas for rain do the trick, still remains to be seen.

In any event, the weather has brought isolated rainfall to various parts of the United States in recent weeks, however, not enough to end the drought. The long-range forecast still calls for the drought conditions to continue through the end of the summer.

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•••••
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Look for our annual turfseed market report in next month's issue of ALA. We'll report how the 1988 harvest is shaping up and how the drought of 1988 has affected seed availability and pricing.

In September, we'll also bring you a feature on the selection of aeration equipment including discussion of tine diameter, tine spacing, tine durability and machine maintenance. The benefits of aeration will also be featured.

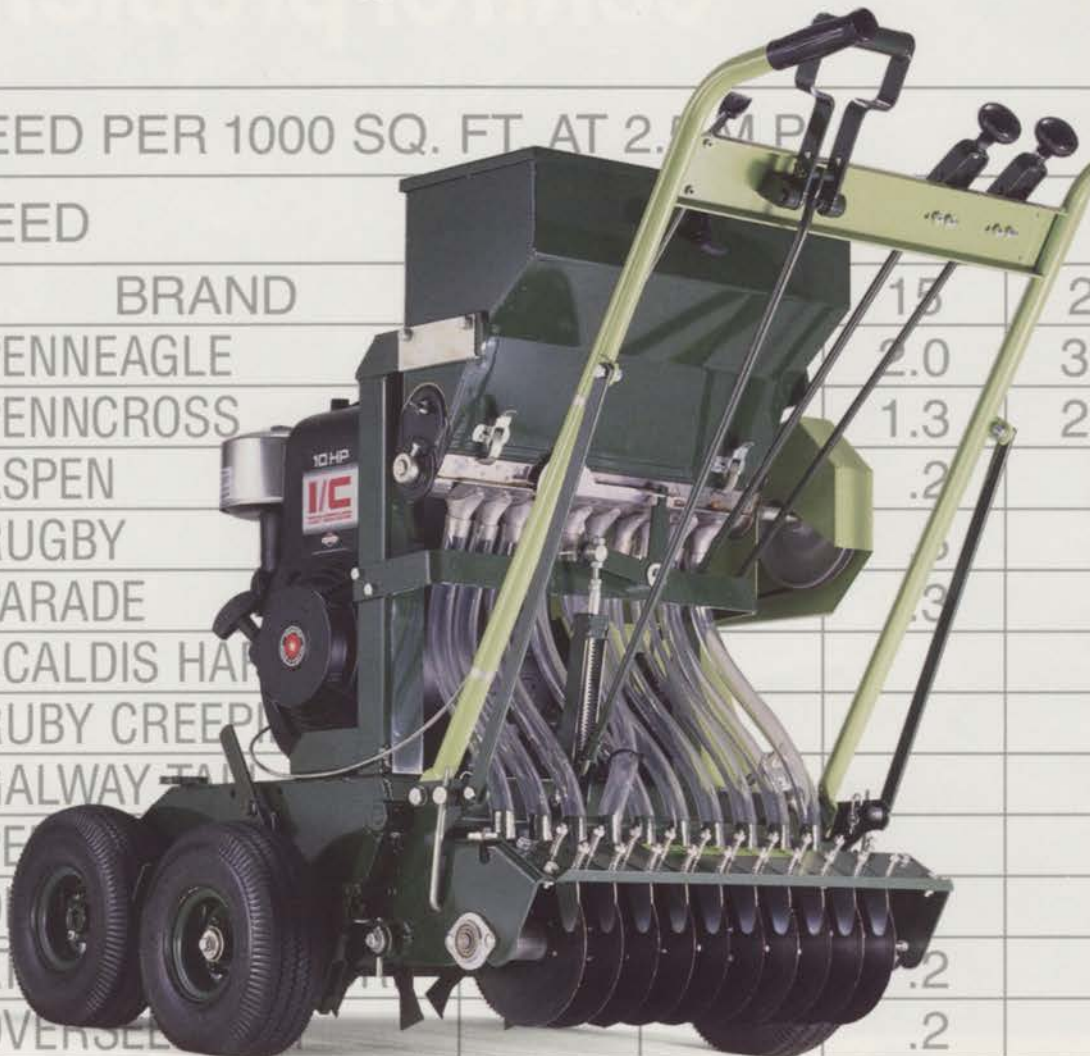
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