

LANDSCAPE MANAGEMENT

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Insect Control Guide

**'The best greens I
ever putt on'**

Harry Anderson, Greens Chairman
Wilmington CC, Delaware



David Kroll, CGCS, inspects one of 18 PennLinks greens at Wilmington CC, Delaware

PennLinks creeping bentgrass — working wonders at Wilmington

New bentgrass variety provides a truer putting surface at Wilmington CC.

When David Kroll, CGCS, was dealt the problem of bentgrass

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deterioration on the greens of this prestigious country club, he called in the experts to help. The greens could not be salvaged, so they were treated with methyl bromide and completely re-greened.

Dr. Joe Duich, Penn State University, suggested seeding with a bentgrass coded PSU 126.

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Harry Niemczyk

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Industry needs to join forces

■ Words from Larry Scovotto, executive vice president of the American Association of Nurserymen:

"A great deal of work needs to be accomplished on behalf of the landscape industry. The residential landscaper, the landscape contractor and the interior landscaper need to join forces in a unified business and marketing effort to make the commercial sector and the general consumer more aware of the value and necessity of landscaping.

"On the national level, there is a big job to be done in residential, commercial and governmental business promotion on behalf of landscaping. People at all levels need to be educated to perceive both the need and value of landscaping. The expectation of landscaping throughout our daily lives must become a part of a new national culture."

Governmental sales growing?

■ Sales of turf supplies to landscape managers in the government sector will be a growing area in the next few years, according to James I. FitzGibbon of Lesco Inc.

"Government, school and institutional sales has the potential to be a big revenue-producer for us in the near future," he told company employees and suppliers recently.

FitzGibbon made the comments at the company's annual sales meeting in Sebring, Fla. which featured two days of trade show exhibits. Seminars were conducted by Ciba-Geigy, American Cyanamid, Elanco, Hoechst-Roussel and Mobay.

Construction up, down

■ A construction boom is seen on college campuses in the next five years, but the overall construction outlook for 1988 doesn't appear as rosy.

According to *The Chronicle of Higher Education*, "a survey of college planners found that about 60 percent saw the need for new or modernized facilities on their campuses as 'extremely urgent' or 'very urgent.'" Why? Because the facilities built during the first post-war baby boom in the 1960s are reaching the end of their 25-year life expectancy.

However, the overall 1988 construction picture is not good, according to George Christie, vice-president and chief economist for McGraw-Hill Information Systems. "Lower interest rates, more than anything else, will make the difference between a shallow and a steep decline of construction activity" this year. Projection is that the total 1988 construction contract value will drop three percent lower than last year's \$248.4 billion.

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GOLF

Keeping your course secure

Vandals used to be a problem at Chicaw Country Club in the Memphis, Tenn., area. No longer.

Jim Harris, Chicaw superintendent, has some tips on how to keep undesirables off golf courses, especially in urban areas. They focus on "preventing rather than apprehending and prosecuting."

- If an incident takes place and the culprit is not apprehended, keep it out of the media. This takes away his satisfaction.

- Have members keep valuables at home or in the locker. A number of players on his course had been robbed during rounds.

- Hire highly visible, uniformed security guards.

- Cover drain ducts with grates to keep people from crawling in through them and enclose the course in fencing with barbed wire on top if possible.

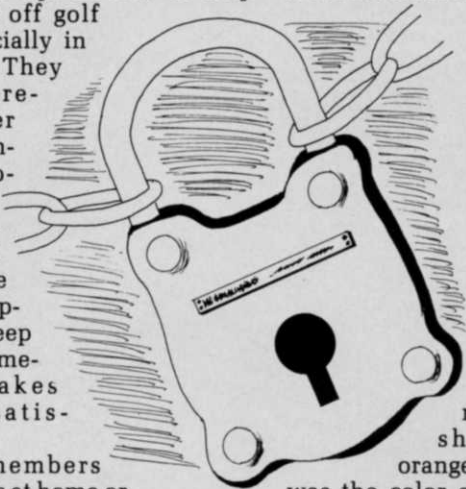
- Make sure everyone on the

course can be identified: members, maintenance crew and caddies. Uniforms for maintenance crews are a good idea, Harris says. Question any unaccounted for people on the course.

- Control all course entrances and hire 24-hour security for the front gate, closing almost all the gates.

There are, of course, some problems in taking these measures.

"Locked gates meant vendors had to go to the front office and then be let in," Harris says. Also, the pro shop couldn't sell orange shirts because this was the color given to the maintenance crew.



COMING IN JUNE

- Aquatic weed control
- Warm-season disease guide
- Aerification/dethatching



Dr. Robert Shearman

RESEARCH

Potassium prominence growing in turf care

As more research is conducted, results are showing more benefits of potassium use.

Within the turfgrass plant, potassium helps with sugar transporting, starch formation and enzyme activity. It also influences the opening and closing of stomata.

Studies conducted at the University of Nebraska on Fylking Kentucky bluegrass show that potassium increased root density and depth. "With increased potassium, wilting tendency is lower because of the decreased water use rate and deeper rooting," explains Robert Shearman,

continued on page 18

LANDSCAPING

'Million Dollar List' led by Environmental

Sixty-seven companies made Lawn Care Industry's second annual Million Dollar Mowers List, representing more than \$170 million in mowing/management revenue in 1987.

Mowing/management revenue is that which is billed for mowing, trimming and clean-up services. Billings specifically for chemical applications, landscape installation, design and tree/shrub care are not included.

Fourteen companies joined the list this year. Two companies dropped off. Environmental Care (Calabassas, Calif.), The Brickman Group (Long Grove, Ill.) and Lancaster Landscapes (Arlington, Va.) held their respective first, second and third place rankings

LAWN CARE INDUSTRY

Serving lawn management and chemical lawn care professionals

from last year. The rest of the top 10: 4. Northwest Landscape Industries (Tigard, Ore.), 5. Oyler Brothers (Orlando, Fla.), 6. (tie) Maintain (Dallas, Texas) and Cagwin & Dorward (Novato, Calif.) 8. Las Colinas Landscape Services (Dallas, Texas), 9. AAA Lawn Industries (Tucker, Ga.), 10. (tie) Shearon Environmental Design (Plymouth Meeting, Pa.), Pampered Lawns (Houston, Texas).

The companies averaged approximately 20 percent growth over 1986.

Company representatives attribute the growth to a continually wider demand for their services.

"I think developers are more aware of the need for curb appeal, selling their project as the people are walking in the door," says Scot Davis of Davis Landscape Contractors.

"Maintenance is a market that's really growing," adds Wayne Richards of Cagwin & Dorward.

—Elliot Maras

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102	116	130	144	158	172	186	200	214	228	242	256	270	284	298	312	326
103	117	131	145	159	173	187	201	215	229	243	257	271	285	299	313	327
104	118	132	146	160	174	188	202	216	230	244	258	272	286	300	314	328
105	119	133	147	161	175	189	203	217	231	245	259	273	287	301	315	329
106	120	134	148	162	176	190	204	218	232	246	260	274	288	302	316	330
107	121	135	149	163	177	191	205	219	233	247	261	275	289	303	317	331
108	122	136	150	164	178	192	206	220	234	248	262	276	290	304	318	332
109	123	137	151	165	179	193	207	221	235	249	263	277	291	305	319	333
110	124	138	152	166	180	194	208	222	236	250	264	278	292	306	320	334
111	125	139	153	167	181	195	209	223	237	251	265	279	293	307	321	335
112	126	140	154	168	182	196	210	224	238	252	266	280	294	308	322	336
113	127	141	155	169	183	197	211	225	239	253	267	281	295	309	323	337
114	128	142	156	170	184	198	212	226	240	254	268	282	296	310	324	338

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MAY 1988

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 0030 ☐ Industrial & office parks/plants
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hotels/resorts
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 0060 ☐ Military installations & prisons
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- 0105 ☐ Landscape contractors (installation & maintenance)
 0110 ☐ Lawn care service companies
 0125 ☐ Landscape architects
 0135 ☐ Extension agents/consultants for horticulture
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LEGISLATION

Diazinon banned on golf courses, sod farms

Portions of the green industry were dealt a blow early in April when EPA administrator Lee Thomas ruled to immediately ban use of the insecticide diazinon on golf courses and sod farms. The chemical is still available for use on home lawns.

"The disappointing thing," said Zach Grant, GCSAA manager of government relations, "is that we were repeatedly assured by EPA there would be no immediate ban."

Thomas stated in a 50-page opinion that Ciba-Geigy presented "inadequate" data regarding the safety of diazinon on golf courses and sod farms. Ciba-Geigy is the primary producer of diazinon and the chief company involved in the fight to retain diazinon registration.

An earlier ruling amended diazinon's label to Restricted Use, which cut the previously-recommended application rate in half.

Ken Weinstein, a Ciba-Geigy attorney, stated: "The administrator has issued a final decision. (Ciba-Geigy)



Bill Liles



Doug Fender

has 60 days to appeal."

"We are assessing whether we want to file an injunction and take it to the U.S. Court of Appeals," added Bill Liles, director of specialty product sales for Ciba-Geigy.

It should be noted that golf courses and sod farms account for about 10 percent of all the U.S. diazinon use.

GCSAA government relations committee chairman Bill Roberts, superintendent at Lochmoor Golf Club in Grosse Pointe Woods, Mich., was miffed by the EPA ruling. "It's beyond me how EPA could cancel registration

on diazinon for golf courses and sod farms and leave it available to the landscape industry."

Doug Fender, executive director of the American Sod Producers Association (ASPA), was equally incensed. "The damage of losing diazinon is the loss of a very effective broad-spectrum insecticide," Fender said. "There are some other chemicals but probably not as broad spectrum. It's gonna hurt us."

GCSAA's Grant noted, however, that superintendents could find alternatives to diazinon. "One thing we're hoping is that Triumph (a lawn insecticide from Ciba-Geigy) gets labelled for golf courses," Grant said.

Fender further questioned the reasoning that attached sod farms to golf courses in the ruling. "One of the damning things in all of this is that (EPA) had an 18-year history of bird kills (related to the case) and none occurred on a sod farm," he said. "But they decided that birds would view sod farms the same as golf courses."

READERS RESPOND

How have the new postal rates affected your business?

Effective April 4, 1988, third class postal rates increased 25 percent. Despite the fact that the increase came after many spring direct mail campaigns, we asked some landscape managers what impact that would have on their direct mail marketing.



"Aside from the Yellow Pages, Chem Turf relies entirely on direct mail for its advertising. We're in the process of sending out a mailing of 10,000 pieces (contacted just after the rate increase) The added cost for the mailing is about \$1,000. We'll probably end up raising the basic service rates because of insurance, so we'll just incorporate the new postage rate into that."

—George Meeley
Chem Turf
Anaheim, Ca.



"We can't stop that. There's not a hell of a lot you can do about it. It's just going to be passed on to the consumer eventually. We did our direct mail already (cost: upwards of \$3,000) so we got the bulk of it out of the way. We're in a rural area and mailings work well for us, but we may have to go to one mailing and do more advertising in the other media. We try to maintain a good mix. TV is still the best."

—Steve Nuss
Highland Park Lawn
Grand Island, Neb.



"Every time something like this happens, it raises prices. Maybe not immediately, but when you figure it out at the end of the year, it contributes to a price increase. It all adds up."

—Bill Thornton
Thornton Landscaping
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POTASSIUM from page 11

Ph.D. of Nebraska.

With this comes the ability to manipulate irrigation strategies, he says. Watering daily in light amounts lowered root density while watering deeply twice a week helped rooting. Adding potassium increased root density with both watering methods, Shearman says.

Recommendations are to apply potassium at equal rates with nitrogen. "Potassium uptake is proportional to nitrogen application," Shearman says. The lower the nitrogen application, the lower the potassium uptake.

"Potassium remains in the ionic form in the plant cell," says Shearman. He notes that evidence of potassium deficiency include older leaf tip and margin burn, reduced root and foliage growth and lower leaf tensile strength.

In addition, plants show an increased tendency to wilt and higher water use rate, which makes the plant more susceptible to stress. "In the end, it will affect the playability of golf turf," he says.

LM technical advisor Shearman spoke on potassium benefits at the Western Pennsylvania Turf Conference in February.

PESTICIDES

Kelthane returns to the shelves in 1988

Kelthane 35 miticide from Rohm and Haas is returning this year for use on ornamentals, flowers and turf, the company announced. EPA restored registration on Dec. 31, 1987.

EPA originally withdrew registration in 1986 because of DDT-related impurities in the miticide, according to the company. Concern arose over the affects of the miticide on birds. However, after an environmental impact study of Kelthane products, EPA concluded that the miticide posed no unacceptable risk to avian species.

In complying with EPA requirements, Rohm and Haas invested in manufacturing improvements to keep DDT-related impurities in Kelthane production under 2.5 percent, according to the company.

TURF

Is biological disease control imminent?

If research continues at its current

rate, dollar spot might be controlled by a bacterium, not a chemical. "I think there will be a breakthrough soon," says Lee Burpee, Ph.D., at the University of Guelph in Ontario, Canada.

Burpee defines biological control as "the suppression of a plant disease through activity of an organism other than man." Biological control falls into two categories:

1. The application of an organism to a plant, such as a bacteria, fungi or virus.

2. The manipulation of the soil and plant environment to enhance the development of suppressive microbes.

Burpee's research has focused on bacterium control of dollar spot and fungi control of snow mold. Burpee tracked down the fungus by finding what appeared naturally on turf leaves.

"What you may be seeing is suppression in the field," Burpee says. "It could be worse without the fungus."

With the fungus, Burpee got a great deal of disease suppression. "There wasn't a significant difference from the use of a chemical control."

The future of biological control is strong. The two areas for improve-

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ment over current research, according to Burpee, are to select better strains of microbes and to improve formulations.

"If we collect enough strains, we'll probably find some that are better than others," he says. Right now, the fungus is applied through pellets about the size of a sulfur-coated urea pellet. They are moistened, then applied to the plant. The fungus stays alive within the dry pellet.

"We hope to replace some of the materials lost from the market in the past few years.

Burpee spoke at the Canadian Golf Course Superintendents show in Toronto.

INDUSTRY

Lawn Doctor hosts 500 franchisees

About 500 Lawn Doctor franchisees, employees and their guests started off the 1988 season with three-day seminars designed to boost productivity.

Seminars were held in Las Vegas (Jan. 19-21) at the Golden Nugget and Atlantic City (Feb. 2-4) at the Trump Plaza.



Ewald Alstadt, Lawn Doctor field representative supervisor, conducts a workshop on servicing optional sales, one of the nine different workshops that attracted nearly 1,100 attendees at the Lawn Doctor eastern regional seminar.

"We changed from small meetings throughout the 23 states in which we operate," said Russell

Frith, president and CEO, "to two large meetings."

The meetings, he said, "give our

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equipment around. (Our model T-25, for example, generates 1.4 hp from just 24.1 cc.)

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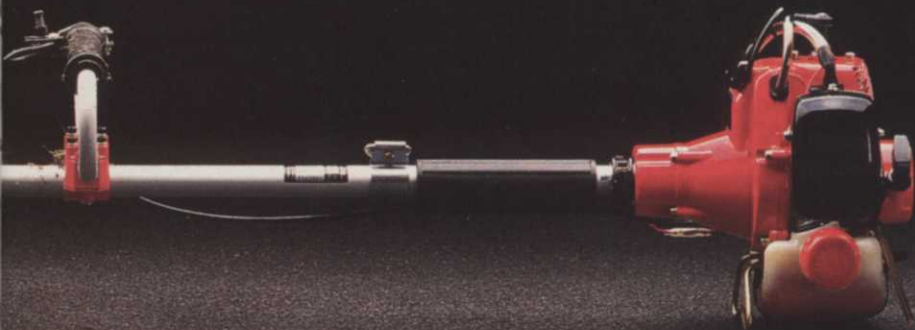
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WE SIMPLY MAKE THEM BETTER.





Landscape Concepts is proving to Houston property managers that immaculately manicured premises are the best advertisements in the world to attract new tenants and investment capital.

Left to right: Gary Stovall and Vincent Morales, Jr., owners of Landscape Concepts, show Everett Mealman, president of PBI/Gordon Corp., their handiwork at Houston's Columbia Centre.

This Houston landscaper uses Pestroy® to reduce labor & insecticide cost.

BROAD SPECTRUM INSECTICIDE

...and to prove that Pestroy can deliver these same benefits to you, we are making a special introductory offer of a \$100-value SP-1 Sprayer for only \$25 when you buy Pestroy.

Everett Mealman, President
PBI/Gordon Corporation

Landscape Concepts in Houston, Texas discovered Pestroy insecticide several years ago during their struggles to cope with a changing business climate.

Historically, Landscape Concepts, which is owned by Gary Stovall and Vincent Morales, Jr., concentrated exclusively on professional landscape design and installation. As a result, an impressive percentage of Houston's most prestigious suburban office complexes and residential clusters owe

their exterior charm to Landscape Concepts.

"The reservoir of new prospects seemed bottomless," says Stovall. "Like most other Texans, we thought that the birth of new construction would go on forever."

"But things changed very abruptly in 1984," says Morales. "Not only did new construction stop, but the newly completed projects found themselves in an overbuilt climate."

Both Landscape Concepts and their best customers were between a rock and a hard place.

The obvious solution was for Landscape Concepts to convert from design and installation to maintenance. It goes without saying that premises needed to sparkle to attract new tenants. It also goes without saying that this sparkle needed to be maintained with maximum efficiency in deference to the economic climate.

And thus it was that Landscape Concepts started to focus on maintenance, indeed on the total landscape concept, not only to preserve their own cash flow but also to help their friends in real estate management keep up the level of exterior appearance that is necessary to attract new tenants and investors.

"Efficiency became our middle name," says Stovall. "We measured everything in terms of the bottom line. It caused us to pioneer the use of



The reflection of the sun off a glass building creates temperatures in Houston that insects love and, if left untended, they'd ruin these Hawthornes. But a Landscape Concepts workman knocks them out with Pestroy, much to the delight of Morales, Mealman and Stovall.



Everett Mealman, center, shows Stovall and Morales the SP-1 sprayer that is being offered to introduce Pestroy. "We already have 20 of these sprayers," says Morales. "And now we have 21," laughs Stovall, "because we're never going to give this one back."

Embark® PGR to reduce mowing costs; the use of Atrimmec® Plant Growth Regulator to reduce trimming costs; and the use of Pestroy to reduce insecticide costs."

"Pestroy is the only insecticide we use," says Morales. "It has such a broad spectrum that we do not need to spend time and money tank mixing it with other insecticides in order to achieve control."

"Our major problems are bagworms on junipers, and aphids on photenias . . . and Pestroy really does a number on them."

What universities say about Pestroy

Over a period of eight years, the efficacy of Pestroy has been compared to other insecticides at universities and experimental stations in the U.S.A. These studies clearly show that Pestroy is superior for controlling the following insects in certain trees and shrubs: Bagworm, Balsam Gall Midge, Citrus Mealybug, Citrus Whitefly, Eriophyid Mite, European Pine Sawfly, Fall Cankerworm, Forest Tent Caterpillar, Gypsy Moth, Hawthorn Lacebug, Pine Needle Scale, Rose Aphid, Southern Pine Beetle, Southern Red Mite, Yellow-necked Caterpillar, and many other economically important insects and mites.

Why landscape managers like Pestroy

Pestroy is surely the most rapidly grow-

ing insecticide in the U.S.A. today. It isn't surprising when you know the facts.

. . . Pestroy has such a broad spectrum. In most instances, it is the only insecticide you'll ever need. Thus you can eliminate the expense of tank mixing several insecticides in order to get control.

. . . Pestroy requires such a small amount of active ingredient; it does not accumulate in plants, water and soil; it is relatively safe to pets and birds. Thus it is an ideal insecticide for office complexes and residential clusters where there are numerous people, pets, and birds.

. . . Pestroy is so effective. It has been marketed worldwide for many

years under the name Sumithion, but it was only four years ago that PBI/Gordon brought it to the U.S.A. Consequently, while many insecticides are petering out because of insect immunity, Pestroy is fresh and ready for the battle.

Special introductory offer

We are confident that, once you try Pestroy, you'll use it from then on. So, to help you decide to try your first gallon, we're offering you a \$100-value SP-1 Sprayer for only \$25 when you buy Pestroy.

If you have any questions about Pestroy or the sprayer, call us toll-free.

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To get this \$100-Value SP-1 Back-Pack Sprayer for only \$25.00, buy one gallon or more of Pestroy from your distributor between now and October 1, 1988 and send us proof of purchase (a sales receipt). Limit one offer per customer. No requests honored after October 31, 1988. Please include your name, address and your check for \$25.00; mail them to PBI/Gordon at the address below.

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BROAD SPECTRUM INSECTICIDE
703-488

SHORT CUTS

BORN AGAIN...Bob Peterson, after 21 years with E.F. Burlingham and Sons, has decided to start his own business. When Peterson's good friend **Miller Ritchie**, a former president of Pacific University, asked Peterson why he doesn't retire to play golf and travel, the reply was: "I'm a lousy golfer, and I've traveled over a million miles by air. For my new company, I'm still traveling all over the U.S. I don't need to retire to travel!" Says Dr. Ritchie, "I think he's hooked on the seed business."

ASK YOUR NEIGHBOR...It may sound a bit corny, but **Don White**, Ph.D., of the University of Minnesota told his audience at the Canadian Golf Course show to turn to the person sitting next to him or her and ask, "What have you learned about turf in the past year?" Everyone came away with even more turf knowledge. **LANDSCAPE MANAGEMENT** learned that the pesticide/lawn care controversy is as rampant in Canada as it is in the U.S.

THIS MONTH'S STARS...A tip of the **LANDSCAPE MANAGEMENT** cap to **Jim Watson** of the Toro Co. and **David Minor** of Minor's Lawn Care, Fort Worth, Texas. Watson was named winner of the most recent Fred V. Grau Turfgrass Science Award for significant career contributions in turf science. The award was given by the Crop Science Society of America. Minor, meanwhile, appeared in the December 1987 issue of *Inc.* magazine for having one of the 500 fastest-growing private companies in America. Minor's Lawn Care ranked No. 446 with sales growth of 572 percent from 1982 to 1986. Minor's was founded in 1980 and finished 1986 with sales of \$1.4 million.

PVP FOR AN ALL*STAR...A plant variety protection certificate was awarded to All*Star perennial ryegrass. Certificate No. 8300059 was awarded to International Seeds, which has sold international marketing rights for All*Star to J&L Adikes. All*Star, which contains insect-resistant endophytes, is also marketed by Jacklin Seed, Vaughan's Seed and Rothwell Seed in Canada.

A GOOD FOLLOW THROUGH...GCSAA and the Professional Golf Association has begun a cooperative effort to get golfers to replace divots, repair ball marks and rake bunkers. The campaign, with the theme "After you follow through, don't forget to follow through," is bolstered by the participation of pro **Tom Watson**. He is featured on a 17-by-22-inch color poster which is being distributed to all members of both organizations, about 25,000 total, according to **John Segui**, president of GCSAA. Notes **Jim Awtrey**, executive director of PGA, "Today's golfer must understand his responsibility to help maintain the conditions of the course." Four-color ads in various publications will support the posters.

people the opportunity to share common experiences with LCOs from throughout the country."

Talks by Lawn Doctor support personnel and guest speakers covered a number of subjects geared toward better business practice. Guest speakers included Fred Langley, regional manager of public affairs for Dow Chemical, and William Bleuel, Ph.D., of Pepperdine University.

AWARDS

Heyser receives county award

Heyser Landscaping, Inc., Norristown, Pa., received the Outstanding Land Development Award from Montgomery County in March. Heyser received the award for the Montgomery Hospital Expansion project done in 1987.

The company implemented a landscape design around a 600-space parking garage, street-level retail shops and the Montgomery Professional Building.

William Heyser recalls that the company had a space of sidewalk approximately 400 feet long and 25 feet wide to put beds in. The design allowed a minimum of five feet each on the curb side and store-front side of the beds for pedestrian traffic. In the process, Heyser took an area that could have ended up with some ordinary planting beds and injected some imagination into the design.

"The beds are all free form," Heyser says, no two alike, each with different types of plant material, some with boulders, mounds and benches.

Plant material included ornamental grasses, annuals, hybrid rhododendrons, various types of juniper, Japanese hollies, dogwoods and birch, among others.

Beds ranged in size from 10 to 12 feet wide and 45 feet long. "Beds were arranged so there would be easy access to shops," Heyser says. He and his staff studied pedestrian traffic patterns to determine the shape and pattern of the beds. "They're attractive for both pedestrians and hospital employees," Heyser says.

The project was completed in three stages over the course of about three weeks.

The Montgomery County Planning Commission began the annual awards program to stimulate better quality development. The Outstanding Land Development Award is given to the project that best implements site design techniques.

LM

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THE 3rd ANNUAL



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October 22-24, 1988

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**The Green
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ATHLETIC TURF

ASTM to review field safety

The American Society of Testing Materials will hold a symposium on the safety of natural and artificial playing fields. Although the conference will take place in December, the deadline for submitting abstracts on research is June 1.

The purpose of the symposium is to provide a forum for technical information on artificial and natural playing surface characteristics and safety. ASTM is inviting researchers to present papers on physical and functional properties; construction; maintenance; safety; economics; research; injuries; and comparisons of surfaces. Priority will be given to papers emphasizing research, case studies and information on how to choose the most appropriate type of turf for a particular application.

Related topics include:

- Case studies of injury data relating to artificial or natural turf.
- Turf characteristics, selection and best use and safety most likely to be encountered in the end application; and interpretation of those results.
- Unusual testing programs that incorporate several of the various environmental considerations encountered.
- Research on turf improvements.
- Field test methods for determination of field safety.
- Maintenance recommendations for playing fields.

The symposium, to be held in Phoenix, Ariz., on Dec. 6, 1988, is being sponsored by ASTM Committee F-8 on Sports Equipment and Facilities.

For more information on submitting and presenting papers at the symposium contact: Theresa Smoot, ASTM, 1916 Race St., Philadelphia, PA 19103; (215) 299-5413 before June 1, 1988.

Hardness measurements continue

The task of quantitatively measuring the hardness of athletic fields continues. "When people can see a number, they can make a measurement," says Trey Rogers, a graduate student at Penn State University.

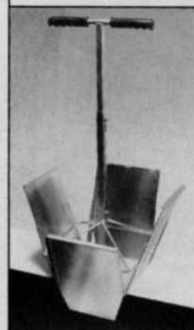
Studies conducted by Rogers are beginning to provide some data. From it, he came to some general conclusions:

- practice fields are harder than game fields;
- fields are harder inside the hashmarks;
- and there is a strong association between management practices, construction and hardness levels.

Rogers collected data at 12 test schools, testing two locations per field—inside and outside the hash marks. Testing was conducted in November 1986, March 1987, June 1987, August 1987 and November 1987.

Factors included in the testing were compaction, aerification, moisture, cutting height, vegetation, species, test hammer weight and thatch. Rogers presented preliminary data at the GCSAA Convention in Houston.

THE RIGHT TOOLS FOR THE JOB.



9" Turf Doctor

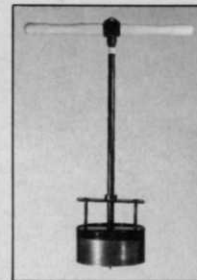
Replaces damaged sod quickly & cleanly. Provides "invisible" sod replacement.

Simply step 4 razor sharp blades into ground to remove wedge-shaped block of sod.

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Cuts sod plugs fast & easy, to any depth, with simple twisting motion.

Eight-inch plug ejects with easy-to-use foot ejector plate.



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Makes top soil or top dressing easier, more consistent than ever before. Perfect for removing small stones from soil, breaking up small clods of sand or loam, smoothing soil for planting.



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SG-158



A Breakthrough



There's an armed struggle going on out there. Man versus machine. In this case, it's operators just like you battling it out with old-fashioned "pistol grip" type steering. But now there's a way for you to gain the upper hand. T-bar steering exclusively from Toro.

Toro's patented T-bar

steering system makes commercial walk behind mowers easier than ever to operate. So much so that users prefer it 8 to 1 over pistol grips.

The first area of superiority is manpower. All that squeezing and wrestling with pistol grips can fatigue even the heartiest operator. But with the T-bar, you simply push forward on the bar itself for easy, controlled mowing. That minimizes fatigue and keeps operators going longer.

T-bar steering also improves maneuverability. Now



In Arms Control.

you can get around any obstacle easier, faster and cleaner. Just move either end of the bar forward or backward and the machine changes direction.

T-bar steering offers you more control, too. That's because the T-bar handle itself is your traction control. Let go, and the handle



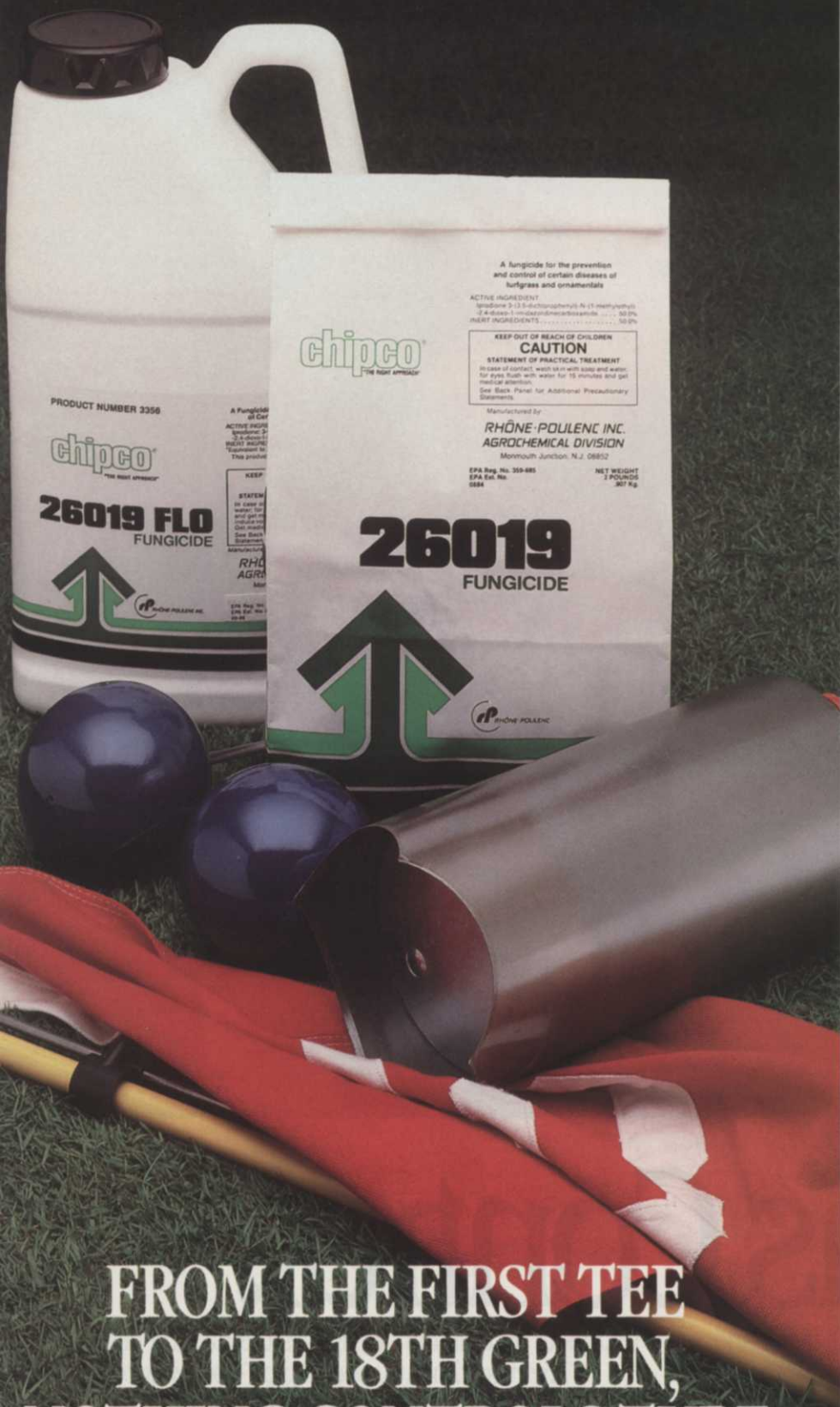
returns to neutral and disengages the traction belts.

The next time you see a Toro T-bar walk behind mower, stop and ask the operator how it performs. We expect you'll want to contact your local Toro distributor for a thorough demonstration. At which time you'll see firsthand just how important arms control is to your future. "Toro" is a registered trademark of The Toro Company. ©1987 The Toro Company.

TORO

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TO THE 18TH GREEN,
NOTHING CONTROLS TURF
DISEASES LIKE
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When it comes to season-long, full-course protection, more and more superintendents are building their disease control programs around CHIPCO 26019 fungicide. That's because CHIPCO 26019 fungicide offers more important features than any other turf fungicide.

First of all, CHIPCO 26019 fungicide provides unsurpassed control of all major turf diseases: Helminthosporium Leaf Spot and Melting Out, Dollar Spot, Brown Patch, Fusarium Blight and Red Thread. Plus, CHIPCO 26019 fungicide protects against Pink and Gray Snow Mold as well as Fusarium Patch.

Secondly, CHIPCO 26019 fungicide delivers the longest-lasting disease control you can buy. Just one application protects your turf up to four full weeks.

Based on cost per day of control, CHIPCO 26019 fungicide ranks as your best fungicide value. That makes it the ideal replacement for fairway disease control.

You'll also like the fact that CHIPCO 26019 is easy on the environment, with no phytotoxicity. And now you can choose between two convenient formulations—wetable powder or flowable.


This season, cover your course with the best in disease control. CHIPCO 26019 fungicide.

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COOL-SEASON INSECT CONTROL

Here's what's new in cool-season insect control: Triumph has finally received a label; diazinon cannot be used on golf courses; and nematodes may control insects biologically.

by Harry D. Niemczyk, Ph.D., Ohio Agricultural Research & Development Center

Finally, after more than 14 years of research and evaluation, Ciba-Geigy's Triumph 4E (isazofos) received EPA registration on Jan. 25. A restricted use product, Triumph may be used by certified applicators only.

The registration covers use only by commercial lawn pest control personnel on home lawns. Registration for use on golf courses is in progress but may be a year or two away.

University research has shown the insecticide to be rapidly effective against a broad range of pests, including grubs, chinch bugs, sod webworms, cutworms and billbugs. A maximum of one application per year is permitted for the 2 lb. AI/A rate. A maximum of two applications per year at least 60 days apart is permitted for the 1 lb. AI/A rate.

Status of diazinon

EPA administrator Lee Thomas has taken diazinon off the board for use on golf courses and sod farms, though it is still available for use on home lawns.

Thomas, last month, stated in a 50-page opinion that Ciba-Geigy (major producer of the product) presented "inadequate" data regarding the safety of diazinon on golf courses and sod farms.

At presstime, Ciba-Geigy was still considering a visit to the U.S. Court of Appeals, which would be the next step in the judicial process. (See "Green Industry News"—Ed.)

Nematodes for insect control

Two species of nematodes parasitic on the larval forms of insects such as sod webworms, cutworms, billbug larvae and grubs, continue to show promise.

The Biosis Co. of California, producer of the nematodes, reports continued progress in producing the nematodes and devising forms in which they can be shipped. Tests in Ohio in 1987 showed a single application in June gave 79 percent control of billbug larvae. This form of biological control appears to have real promise.

AD?

AD is an abbreviation for accelerated degradation, a phenomenon whereby microorganisms (fungi, bacteria, actinomycetes) adapt to the presence of pesticide residues to the point where they actually use the pesticide as a source of energy.

Research at OARDC/The Ohio State University, Wooster, Ohio, has confirmed that AD is, in large measure, responsible for the reduced effectiveness of Oftanol experienced by users of the product over the past two years. Investigations at OSU continue in order to determine how much the AD phenomenon affects the effectiveness of other pesticides used on turfgrasses.

Life cycle is still key

Knowing the life cycle of pests is at least as important as selecting an insecticide for their control. This guide points out the seasonal occurrence of some important cool- and warm-season pests to be alert for in 1988, when their vulnerable stages occur, and some suggested insecticides that may be used to control them. No endorsement of products is intended, nor is criticism implied for those not mentioned.



A golf course superintendent applies parasitic nematodes to the green.

continued on page 26

CALENDAR

Late Winter (March)

Chinch bugs and billbugs—In northern zones chinch bugs and billbugs both overwinter as adults in thatch or sheltered sites near buildings. They can become active during warm days in March. Infestations of hairy chinch bug and bluegrass billbug also occur in zoysia, Kentucky bluegrass and fine fescues.

Grubs—The larvae of this group of pests normally overwinter six inches or deeper in the soil. If spring comes early, grub activity can be expected along with skunks and raccoons which will tear up the turf searching for the grubs. Moles, which feed on grubs and earthworms, also become active at this time.

Black turfgrass ataenius—This golf course pest overwinters as an adult in the soil under debris in roughs or other protected areas. A few may be seen flying about on warm afternoons in early March. Usually this activity begins when crocus starts blooming and intensifies as the bloom of red bud appears.

Greenbug—The only stage of the greenbug known to overwinter in northern states is the egg. Shiny black eggs deposited the previous fall may be found adhering to grass blades, fallen tree leaves or other debris.

Sod webworms—The most common sod webworm species overwinter as larvae in the thatch or upper inch of soil. Feeding does not resume until hibernation (diapause) is broken by early spring warmth.

Spring

Chinch bugs and billbugs—As warm days of spring approach, movement of chinch bug and billbug adults increases rapidly. Generally, egg laying begins the first week



Pulling back the turf on a green can reveal hidden cutworms.

of May, but can begin in mid-April if spring arrives early. Occasionally adult billbugs can be seen on sidewalks on warm afternoons.

Generally, application of insecticides to prevent infestations of chinch bugs and billbugs should be completed by the first week in May in cool-season areas. Applications may begin as early as the last week of March. Such applications must be made before significant numbers of eggs are laid. This time may vary as much as a week or more depending upon the spring weather.

Grubs—Overwintered grubs return to the surface and begin feeding on turfgrass roots in April. Increased activity and damage from birds, moles, skunks and raccoons foraging on grubs can also be expected. Feeding by birds, mammals and grubs continues through May.

Treatment should be delayed until grubs are in the top one-inch of soil. Irrigation or rainfall should follow such applications to aid in moving the insecticides to the target grub as soon as possible.

Although milky disease products for control of Japanese beetle grubs may be applied anytime there is no frost in the soil, spring is a good time for such applications. The soil is open and frequent rains move the disease spores into the soil and thatch. Milky disease products are primarily effective against Japanese beetle larvae. Infection in other species is low.

Incidents of large grub infestations (larvae of June bugs) have been increasing in cool-season areas. Locations of such infestations should be identified because reinfestation is likely every three years.

Eggs are laid in May and June, therefore treatment should be made in late summer, early fall of that year or the next spring while the larvae are small. Later applications against full-grown larvae have given inadequate control.

Black turfgrass ataenius—Adults of the black turfgrass ataenius can be seen "at wing" in April and are often found in clipping catchers after early mowing of golf course greens. These adults begin laying eggs in early May, or about the time Vanhoutte spirea firs come into bloom. Diazinon, applied to fairways at this time, kills adults and prevents summer infestation of larvae. Check with local extension entomologists for precise time if needed.

A word of caution: diazinon applications

SUMMARY OF GRUB CONTROL TESTS IN OHIO - 1971-86¹

INSECTICIDE	LB AI/A	MEAN % CONTROL	(NO. OF ² TESTS)
ethoprop (Mocap)	5.0	92	(5)
isazofos (Triumph)	2.0	91	(15)
bendiocarb (Turcam)	2.0	85	(15)
isofenphos (Oftanol)	2.0	83	(33)
carbaryl (Sevin)	8.0	81	(9)
trichlorfon (Proxol)	8.0	80	(20)
diazinon	5.5	61	(12)
chlorpyrifos (Dursban)	4.0	34	(9)

¹ Includes Japanese beetle, *Cyclocephala* spp., *Phyllophaga* spp. only.

² Each test replicated 3 or 4x. Generally, treatments applied late summer or early spring. Irrigated (1/4-1/2 inch) after application, thatch - 1/2 inch, readings taken ca. 4-8 weeks after treatment. H.D. Niemczyk & K.T. Power.

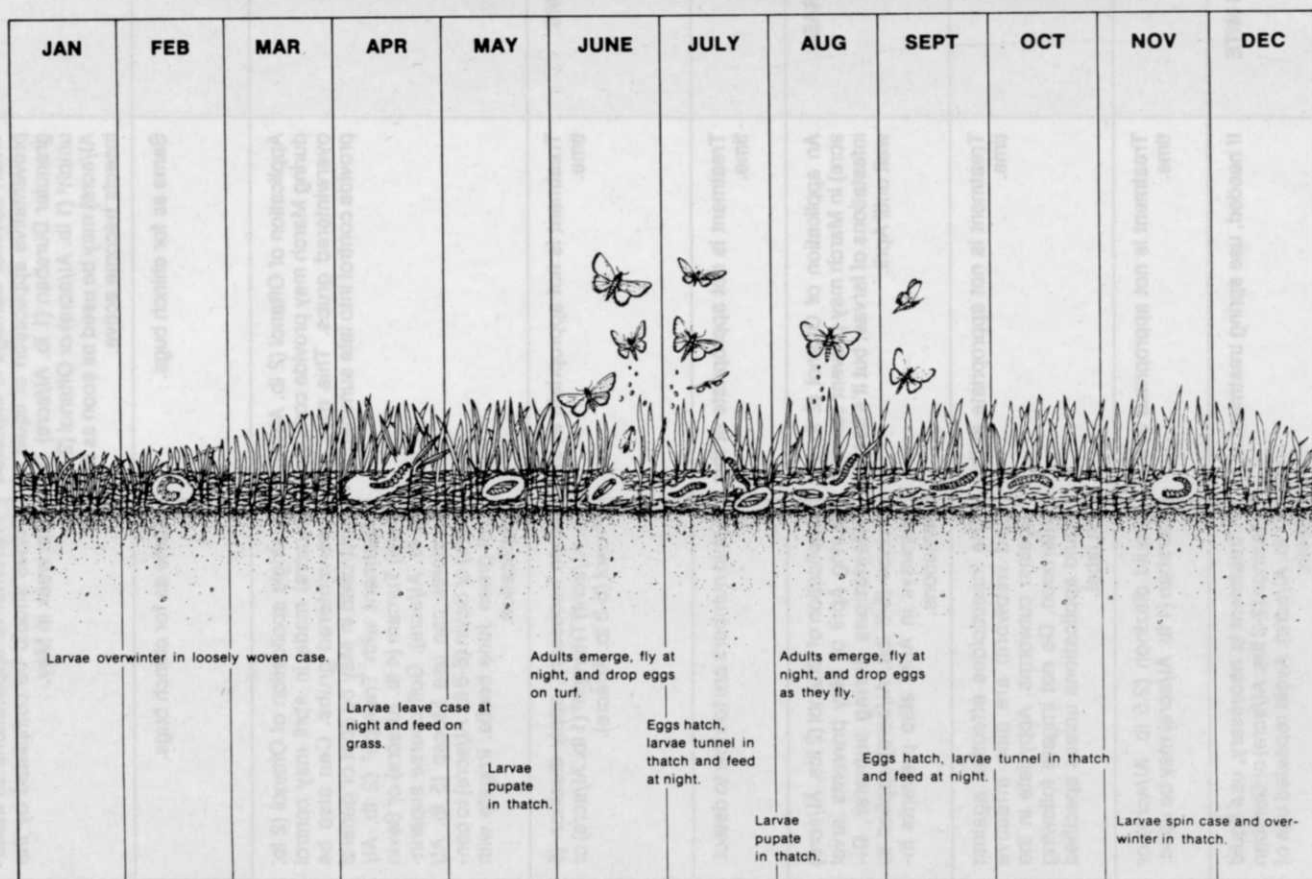


COOL SEASON*	LATE WINTER (March)	SPRING (April-May)	SUMMER (June-Aug.)	FALL (Sept.-Oct.)
CHINCH BUGS	When summer damage is expected preventative application of liquid or granular Dursban (1 lb. AI/acre) Triumph ¹ (1 lb. AI/acre) or Oftanol (2 lb. AI/acre) may be used as soon as the insects become active.	Preventative applications of insecticides should be completed by the first week in May.	Treat before injury is severe with Dursban (1 lb. AI/acre), diazinon (2.5-5.5 lb. AI/acre), Triumph ¹ (1 lb. AI/acre), Sevin (6-8 lbs. AI/acre) or other labeled insecticides.	Treat if necessary, but generally, infestation levels are not high enough to warrant using insecticides.
BILLBUGS	Same as for chinch bugs.	Same as for chinch bugs.	Treat infestations at same rates as grubs with diazinon, Turcam, Proxol or Sevin. Irrigate following application.	Treatment is usually not appropriate at this time.
GRUBS	Application of Oftanol (2 lb. AI/acre) during March may provide control of overwintered grubs. This may not provide control into late summer.	A single application of Oftanol (2 lb. AI/acre) made in April may control overwintered grubs. Can also be controlled in May by spot or general treatment with Triumph ¹ (2 lb. AI/acre) Turcam (4 lb. AI/acre) or Sevin (8 lb. AI/acre). Golf course superintendents can use Mocap (5 lb. AI/acre) or Sevin (6-8 lb. AI/acre) to control green June beetle. Irrigate with application.	Existing infestations found in July or Aug. may be treated with Triumph ¹ , Proxol, Turcam, Oftanol, Sevin or Mocap (commercial turf only) at rates used in spring. Treat green June beetle with Sevin (6-8 lb. AI/acre).	Treatment can be made as late as mid-September. Irrigate first if thatch or soil is dry.
SOD WEBWORMS	Treatment is not appropriate at this time.	When necessary, apply diazinon (5 lb. AI/acre) Triumph ¹ (1 lb. AI/acre) or Proxol (6-8 lb. AI/acre).	Make application when larvae are present or two weeks after peak moth flight. Use Dursban (1 lb. AI/acre), Triumph ¹ (1 lb. AI/acre), diazinon (5 lbs. AI/acre), Sevin (6-8 lbs. AI/acre) or Proxol (6-8 lb. AI/acre).	Larvae are small and cause little damage at this time. Treatment in September reduces population for next spring.
GREENBUGS	Treatment is not appropriate at this time.	Aphid numbers are too low to detect.	Use Orthene (1 lb. AI/acre) or Dursban (1 lb. AI/acre) or diazinon (2.5 lb. AI/acre).	Severe infestations may occur as late as December. Use the same insecticides as in the summer.
BLACK TURFGRASS ATAENIUS	An application of Oftanol (2 lb. AI/acre) in March may prevent summer infestations of larvae, but it's best to wait until April.	Application of Oftanol (2 lbs. AI/acre) during April or May prevents larval infestations during summer. Diazinon (5-6 lbs. AI/acre) applied to fairways in April also prevents infestations.	If preventative applications were not made, spot or generally treat with Proxol (8 lbs. AI/acre), Turcam (2-4 lbs. AI/acre), Sevin (8 lbs. AI/acre) or Mocap (5 lbs. AI/acre), as needed.	Undeveloped larvae die with frost.
CUTWORMS	Treatment is not appropriate at this time.	The insecticides effective against sod webworm are also effective against cutworms. Apply late in the afternoon. Do not irrigate following liquid applications unless specified on label.	Use Dursban (1 lb. AI/acre), Triumph ¹ (1 lb. AI/acre), Proxol (8 lbs. AI/acre) or Sevin (6-8 lbs. AI/acre). Do not irrigate following liquid applications unless specified on label.	Same as for summer.
COVER MITES	Treatment is not appropriate at this time.	Liquid diazinon (2.5 lb. AI/acre) or Dursban (1 lb. AI/acre) may be used.	Treatment usually is not necessary.	Treat as needed with liquid diazinon (2.5 lbs. AI/acre) or Dursban (1 lb. AI/acre).
WINTER GRAIN MITE	If needed, use spring treatment.	If treatment is necessary, use liquid diazinon (2-3 lbs. AI/acre) or Dursban (1 lb. AI/acre). Avoid repeated use of Sevin.	Treatment is not appropriate, since mite is in egg stage.	Treatment is not appropriate since mite is in egg stage.

¹ For use only by commercial lawn pest control personnel. A maximum of one application per year is permitted for the 2 lb. AI/acre rate. A maximum of two applications per year at least 60 days apart is permitted for the 1 lb. AI/acre rate.

* See accompanying text for details; always follow label directions.

LIFE CYCLE OF THE COMMON SOD WEBWORM *PARAPEDIASIA TETERRELLA* (ZINCH)



may be toxic to waterfowl such as geese feeding on the treated turf.

Sod webworms—Overwintered larvae of the sod webworm begin feeding as soon as the grass begins to grow. Usually damage is insignificant, but areas that do not green up may be infested. These areas frequently have probe holes from starlings feeding on the larvae.

Moth flights begin in May in northern areas. Young larvae are usually present about two weeks after the spring moth flight peaks, so treatment of young larvae can be done in May in some areas.

Cutworms—Moths of cutworms begin laying eggs on golf course greens and other turf areas in the spring. These eggs hatch producing larvae that feed on grass blades during the night. The black cutworm is the most common species on cool-season turf.

While visible damage is uncommon on home lawns, damage can be significant on golf course greens in late May.

Greenbug—Greenbug eggs begin hatching as early as April, but significant infestations do not develop until later in the year. Greenbugs are also brought into the region from the south on upper air winds. Aphid numbers are too low to detect in lawns at this time.

Winter grain mite—Damage from this

mite is often first noted in April when turf areas are receiving spring fertilizer applications. Winter grain mites are identifiable for eight bright red legs and a dark body. By late May, the mites will have laid their eggs and died. Mites do not appear again until the eggs hatch in October.

Clover mites—Incidents of visible damage to home lawns are often seen in April in several Ohio cities and Denver, Col. Usually a nuisance pest in and around homes, the clover mite occurs in large numbers (5,000 per sq. ft.) across entire lawns and on turf next to building foundations. Symptoms of injury were the same as the winter grain mite. Turf next to foundations may be killed.

The clover mite has a slightly pink body and eight pale-colored legs. The first pair of legs are extremely long and protrude well out in front of the mite. The absence of bright red legs distinguishes the clover mite from the winter grain mite.

Summer (June-August)

Chinch bugs—Chinch bug eggs continue to hatch into June. Bright red nymphs with a center white band appear. The number of chinch bugs increases rapidly in June. Their populations peak in July and August, when northern lawns can receive severe

damage. This damage is often masked by summer dormancy of turf caused by drought. Hot, dry conditions are ideal for chinch bugs.

During August the nymphs molt into adults that mate, lay eggs, thus producing a second generation. Some northern areas have only one generation per year.

Billbugs—Bluegrass billbug larvae feed in grass stems during June and move to the plant crowns, roots and rhizomes during July. This feeding causes brown spots that frequently resemble the symptoms of some fungus diseases. Symptoms are also often masked when the turf is dormant from drought. The larvae usually move deeper into the soil under dry soil conditions. During late July and August the larvae burrow deeper into the soil to pupate and transform into adults.

Grubs—By June, grubs have stopped feeding and are in the pupal stage three to four inches in the soil. Beginning in mid-June and continuing through mid-July, the adults of various species emerge and burrow into the soil to lay eggs. Hatching and appearance of young larvae occur during July and August.

Extreme heat and drought during the summer may cause some grubs to move deeper in the soil. Under such conditions, irriga-

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Quiz yourself or your crew to see how much training is needed.

1. All stages of chinch bugs, except eggs, damage turf.
true false
2. Generally, insect specimens sent to an entomologist for identification should be sent _____.
dry in formaldehyde in alcohol in distilled water
3. The rastral pattern of which of the following insects has spines arranged in the shape of a small "V"?
European chafer Japanese beetle Northern masked chafer
4. Sod webworms and cutworm moths lay their eggs _____.
at night early in the morning on bright days
5. Which of the following turf moisture conditions is most conducive to the development of damaging populations of chinch bugs?
excess adequate droughty
6. Turf with small or large damaged spots breaks off at the soil line when pulled, and shows evidence of a sawdust-like material at the base of the stem, probably was damaged by _____.
white grubs billbugs sod webworms chinch bugs
7. The rastral pattern of which of the following is scattered (no pattern)?
European chafer Japanese beetle Northern masked chafer
8. Liquid soap in water applied to turf is a good way to tell if the turf is infested with _____.
grubs billbugs cutworms chinch bugs
9. Bluegrass billbugs pass the winter as _____.
egg larva pupa adults
10. During January, the Japanese beetle is in which stage of development?
egg larva pupae adult
11. The chinch bug has _____ generations a year in your area?
one two three
12. The Japanese beetle completes its life cycle in _____ year(s).
one two three
13. The big-eyed bug is a _____.
pest predator parasite
14. The adult cutworm is larger than the adult sod webworm.
true false

Turn the page upside down for the answers.

ANSWERS: 1. True 2. in alcohol 3. Japanese beetle 4. at night 5. droughty 6. billbugs 7. Northern masked chafer 8. cutworms 9. adults 10. larva 11. one or two 12. You should know your area! 13. one 14. parasite 15. True
If you got:
14 right—Super!
13 right—Well done
12 right—Not bad
11 right—OK
less than 11—Training needed
Turn the page for the answers.

tion several hours before treatment and a thorough soaking afterward is advisable.

Black turfgrass ateniensis—Eggs laid by beetles during May hatch in June and the larvae immediately begin feeding on the turf roots and thatch.

From late June to mid-July, symptoms of injury include wilting in spite of irrigation. In July, larvae move deep into the soil, pupate and emerge as adults. These adults

lay eggs during August, producing a second generation in states such as Ohio. The second generation larvae are capable of damaging turf.

Sod webworms—Damage from sod webworm larvae occurs occasionally in most of the cool-season turf region. Injury is more common in midwestern states, usually in July and August. Older sod fields and heavily thatched turfs are good

candidates for infestation. There are generally one or two generations per year, depending upon the species.

Cutworms—Cutworm larvae continue to cause damage to golf course greens from June through August. These larvae pupate in the soil or thatch and emerge as moths that lay eggs for additional generations.

Fall armyworm—The fall armyworm is seldom a problem of cool-season turf.

Greenbug—Damaging populations of greenbug can occur from June through August. Populations and incidents of damage frequently vary from area to area even within a city.

Symptoms of injury include turf under the dripline of trees and in open areas having a burnt orange color. When symptoms are seen, numerous aphids (40 or more) may be seen on a single grass blade. Close examination of damaged turf is necessary because the aphids are small. If left untreated, a heavy infestation can kill the turf.

Fall (Sept.-Oct.)

Chinch bugs—In the northern U.S. the second generation of chinch bug is at peak numbers in September. Nymphs complete their development to adults in late October. Most chinch bugs overwinter in the turf, but some move to protected areas before winter.

Generally, infestation levels at this time are not high enough to warrant the use of insecticides. Early fall rains and infection by a parasitic fungus (*Beauveria* spp.) usually provide sufficient control.

Billbugs—During September, billbug adults that developed from summer larvae are often seen on sidewalks, driveways or other paved surfaces. Before winter, these adults seek shelter in thatch, along sidewalk edges or near foundations and overwinter there. Many, if not most, overwinter in turf.

In some areas (Cincinnati, Ohio) a partial second generation may occur. Larvae of this generation have been known to cause visible damage in September and October.

Grubs—Most species of grubs are in the third of their three stages of development and are feeding actively. When soil temperatures decrease in late October, the larvae burrow deeper into the soil to overwinter. If soil temperatures remain warm, larvae stay at the surface and continue feeding. Severely cold winters have little effect on survival.

Black turfgrass ateniensis—By September, adults of the current generation begin to fly into protected areas, such as golf course roughs, to overwinter. Larvae that have not completed development to adults before frost are killed.

Sod webworm—Northern sod webworm larvae are small and cause little if any damage in the fall. Late in the fall the larvae construct a cocoon-like shelter in which they overwinter.

Greenbug—Severe infestations of greenbug have been known to occur as late as the first week of December. Areas having a history of infestation should be re-examined when mild temperatures extend late into the fall. Heavily infested turf will not survive through winter. **LM**



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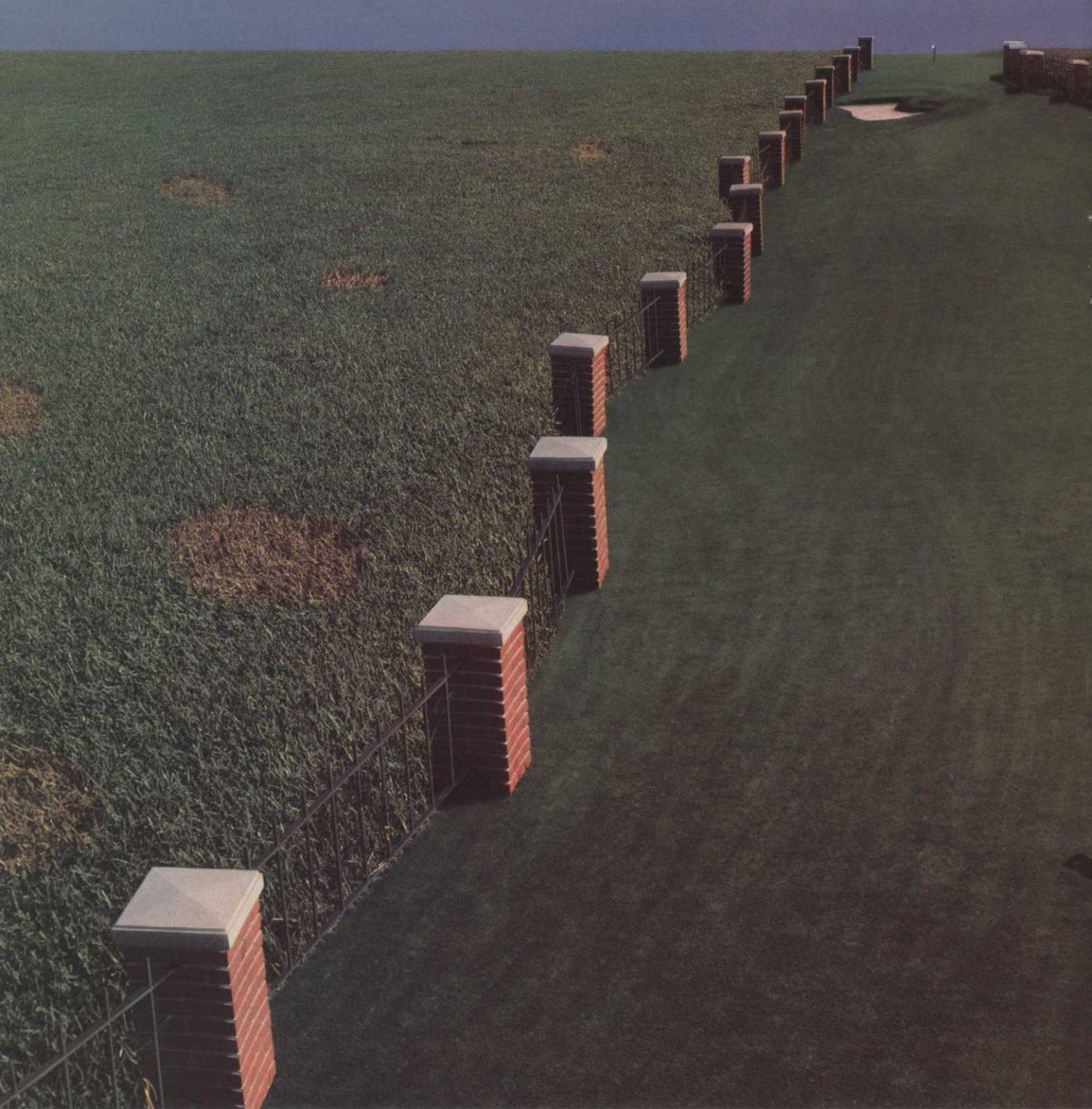
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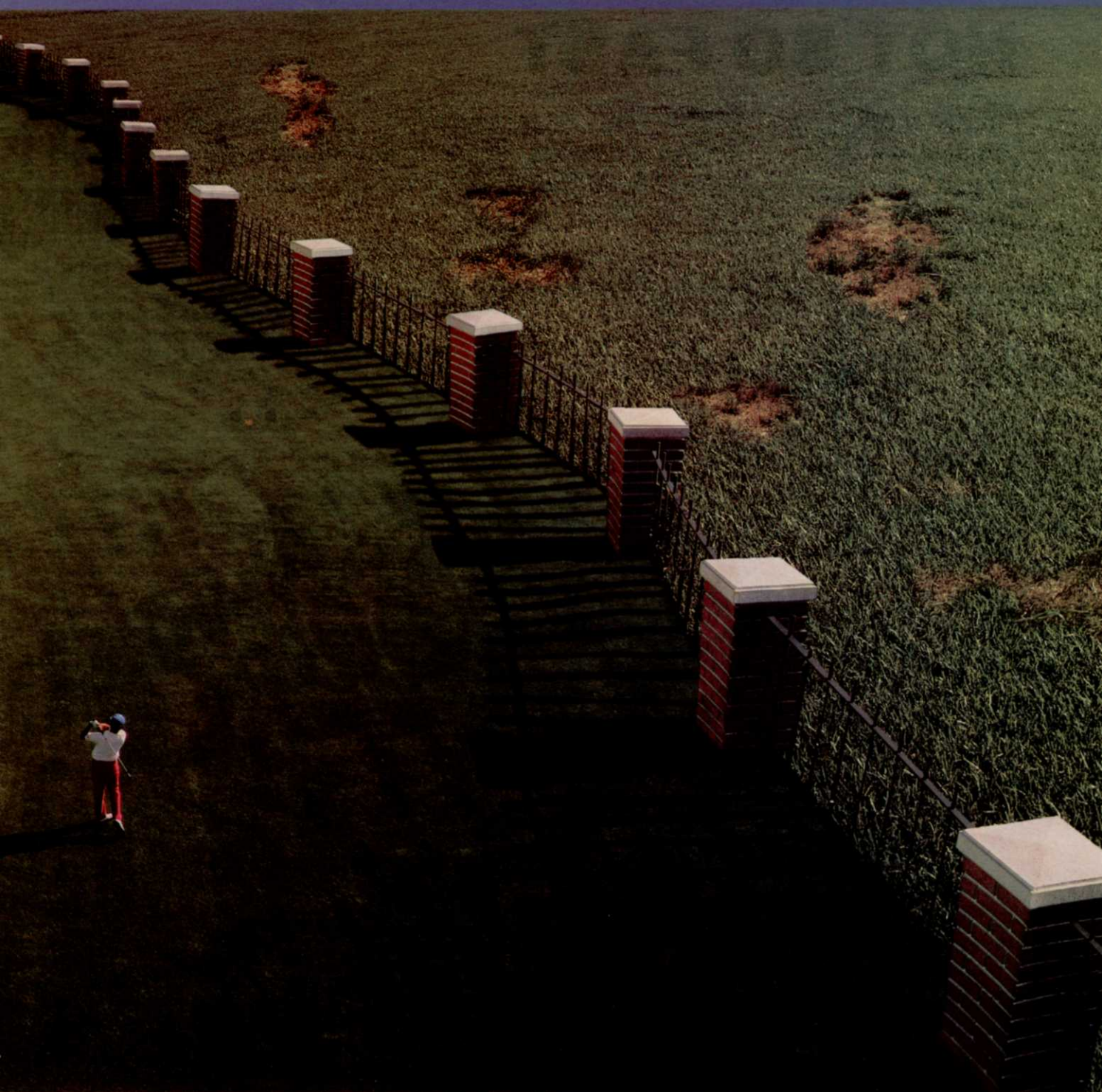
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MAY 1988/LANDSCAPE MANAGEMENT 31



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NOT SO FAST

Opinions on green speeds vary as much as the management practices themselves. In the following, a few superintendents reflect on the trials and tribulations of managing greens in the face of pressure from players.

by Jeff Sobul, associate editor



Superintendent Mike Phillips (standing) and assistant Carl Rygg use a stimpmeter to check green speeds at The Links at Spanish Bay, the only fine fescue putting surfaces in the U.S. They cut the greens at an uncommonly high $\frac{5}{32}$ of an inch.

Recent trends have sent golf course greens cutting heights down and green speeds up. But somewhere along the way, some people forgot about that little fellow, the grass plant.

Tired of being walked all over, the little green (and sometimes brown) plant started retaliating at the players who wanted those lightning speeds. Unfortunately, the superintendent was pretty much the recipient of abuse from plants and players alike.

The lower you cut turf, the more susceptible it is to disease and stress. Then, by reducing fertilization—as some courses did to improve speed—the plant is denied nutrients needed to sustain healthy growth.

Jim Hippely, superintendent at Salem (Ohio) Golf Club, provides a good example of what many supers face. “We mow at $\frac{1}{8}$ of an inch because the membership requests it,” he says. That, he adds, results in many sleepless nights.

Another Ohioan, John Spodnik at Westfield Country Club, finds himself in a similar situation. He also mows his greens at $\frac{1}{8}$ of an inch at member request. “The ‘hot 100’—June, July and August—puts a strain on the grass,” he notes. “Needless to say, the turf manager must perform accordingly at his best. Sometimes that is not good enough!”

Are superintendents being forced to worship the almighty stimpmeter? Or are they finding ways to keep the faith without offering sacrificial turfgrass?

Scott Niven at the Stanwich Club in Greenwich, Conn., seems to have found some middle ground. “We used to cut at $\frac{1}{8}$ of an inch, nine cuts a week,” he notes. “Greens were fast but deteriorated in quality. Values in excess of 10 on the stimpmeter were too fast to be fair on greens with slopes like mine.

“Now we cut at $\frac{9}{64}$ of an inch. Greens are a bit slower (8.5-9.5),” he says, “but healthier, better looking and easier to manage.”

Sometimes it's situational, with speeds and height varying according to the time of year or occasion. Such is

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Golf course architect Mike Hurdzan incorporates knowledge of golf design history into his present designs matching green slope to putting speed and skill.



The Stanwich Club members sacrificed a little speed so that Scott Niven could adjust management techniques to keep greens healthier and playing more honestly.

the case at the prestigious Greenbrier in White Sulphur Springs, W.Va.

In the past, executive director of golf and grounds Robert Mitchell has had speeds as high as 12 to 13 on the stimpmeter for the 1979 Ryder Cup matches. For other tournaments, Mitchell keeps greens at around 9.5.

Otherwise, he says, "my opinion is that the guests who come to play the Greenbrier enjoy our courses with a puttingspeed of 8.5. Thus, I try to keep speeds between eight and nine on our three 18-hole courses."

That means a swing away from scalping. Mitchell believes a 1/8-inch cutting height is too low for bentgrass/poa greens in his region.

"I prefer verticutting, top dressing, judicious use of fertilizer and chemicals, and even double cutting," he explains.

Also, recent technological advancements are making their way onto the market. That will improve speed and texture without lowering cutting height. Most notable are the turf groomers.

Jacobson's Turf Groomer was the first to enter the market and was followed shortly thereafter by Toro's Grooming Reel and Lesco's groomer. Since these are pretty new to the market, their collective effect is yet to be felt.

Variables

Most superintendents will continue to use existing equipment and techniques to manage greens.

Chuck Clark of The Broadmoor in

Colorado Springs, notes, however, that adjustments are a constant necessity. Weather conditions, he says, can change stimp readings from morning to afternoon. "When weather conditions don't cooperate, speeds which may begin the day at around nine may end up at 11 before the day is over."

To help keep his greens (and himself) out of stress during uncooperative weather, he has added a syringing system around all the greens to help preserve them with little inconvenience to the golfer.

Good intentions

The original intent of the stimpmeter



Superintendent Robert Mitchell integrates several management techniques to keep green speeds constant and turf healthy for guests at The Greenbrier.

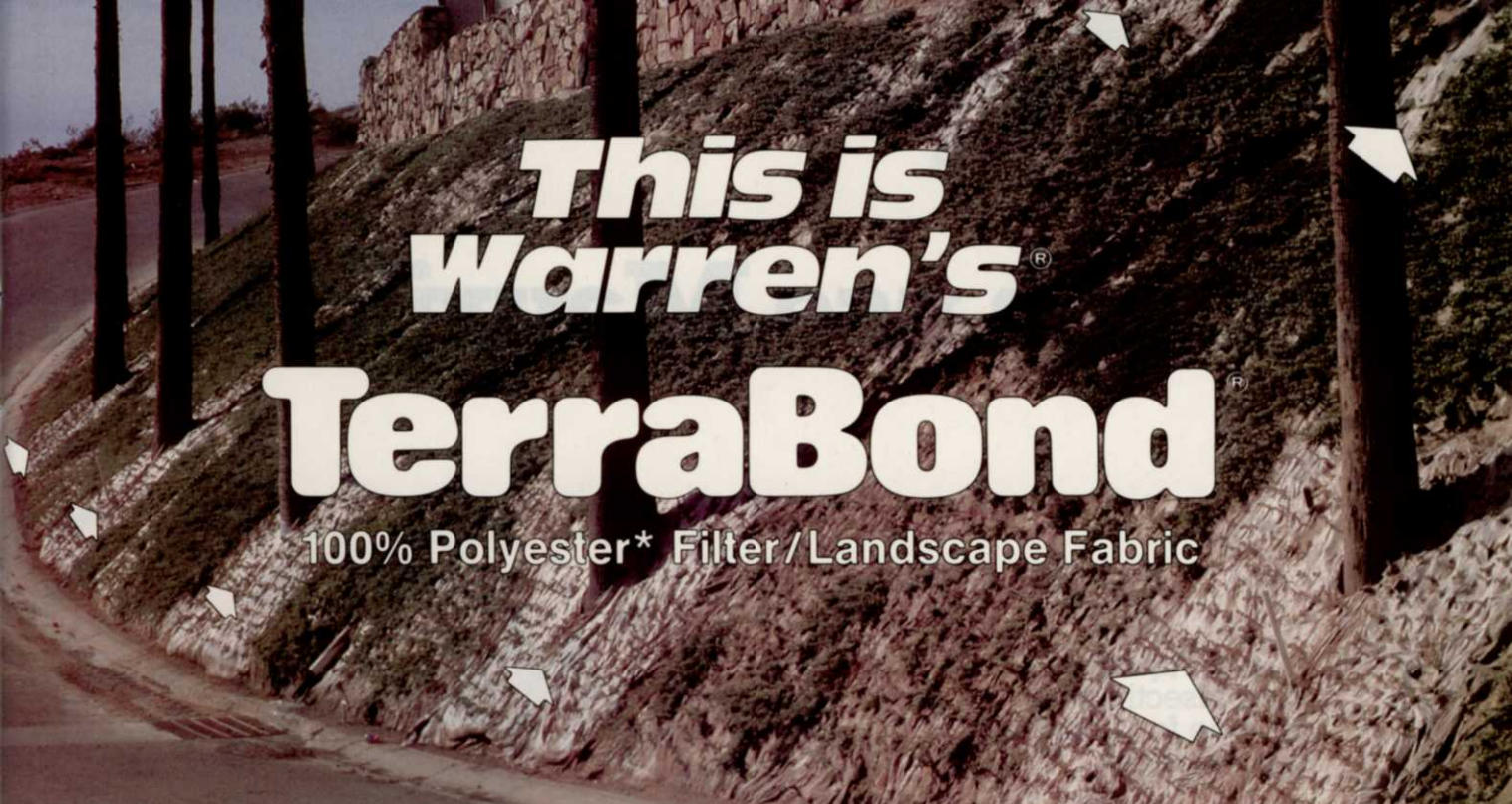
was to determine consistency of green speed from one green to the next and act accordingly to keep them consistent, thereby introducing skill into holing a putt.

Golf course architect Mike Hurdzan, Ph.D., would like to see skill returned to putting. He finds it ridiculous that the best players in the world would three- and four-putt from 10 or 12 feet, as they did at the 1982 Masters—the year Augusta switched to bentgrass "on slopes designed for Bermuda," he says. "Putting became luck, not skill." Hurdzan points out that Alister MacKenzie designed Augusta's green contours with Bermudagrass in mind.

"The point is," Hurdzan believes, "if putting is to be a skillful pursuit, then speed and slope must be matched."

Accomplishing this will take some time. Some help from the PGA and its members would be a good start. Playing pros are the most visible and influential people at pointing the way, as they did with higher speeds. They can do the same by moving back toward Hurdzan's three S's: speed, slope and skill; and a return to proper stimp-meter use.

"The stimpmeter can be a useful tool only when everyone has been properly educated to its intended use and an agreement has been struck as to how it will effect our management practices," The Broadmoor's Clark concludes. "It won't be the pro or the club manager who will be moving on when the greens die." **LM**



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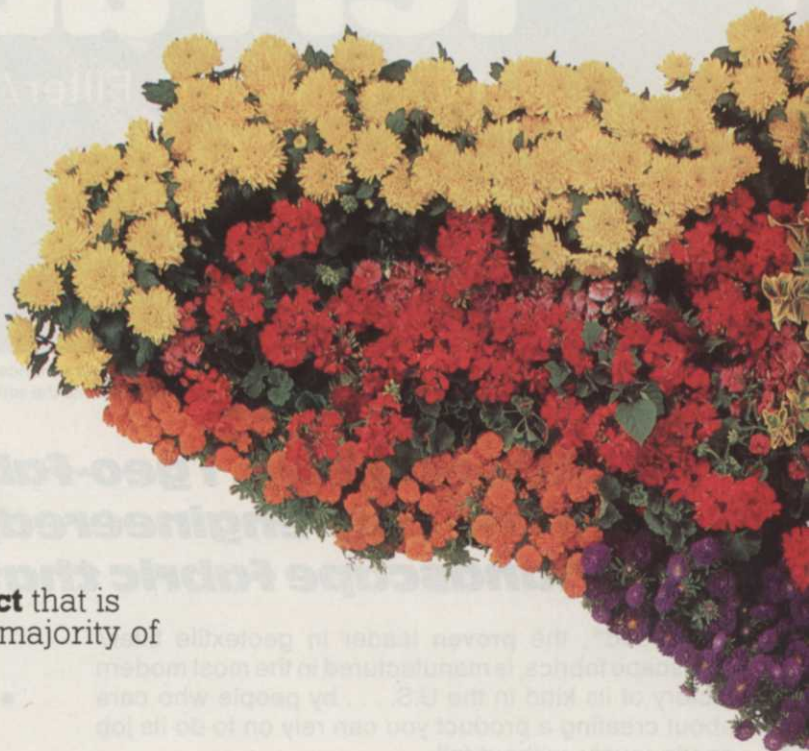
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LAWNGRASSES

Confused about which new turf varieties will work best for home lawns? The executive director of The Better Lawn and Turf Institute tells what to look for in choosing good grass.

by Eliot C. Roberts, Ph.D., The Lawn Institute

The new generation of improved lawngrasses is well recognized for helping lower maintenance costs and increase quality and persistence of the turf throughout cool, humid regions of the country.

Grasses bred to have darker green foliage are not likely to be over-fertilized in an attempt to improve color. So turf is maintained without stimulation leading to excess growth. This only weakens the grass and requires more frequent mowing. Savings on fertilizer costs can be significant.

New grasses developed for disease resistance are far superior to common types. Since disease conditions come and go, the task of chemical control is difficult and costly. Use of blends and mixtures of lawngrasses with improved resistance to one or more of the several common fungus pathogens builds hardiness and added beauty into a lawn. It also saves money.

Cultivars are now available with greatly increased insect resistance. Some even contain endophytes. These organisms live within lawngrass plants without harming the grass in any way. They cause the turf to be undesirable for insect infestation.

These types of biological insect control are permanent with the establishment of the sod. They may well eliminate or at least greatly reduce the need for some insecticides. Improvements of this type are meaningful in our attempt to reduce pollution and improve environmental quality.

Weeds cannot get a seedling start in a turf that has formed a good, dense stand and maintains that stand through the growing season. The new proprietary named grasses that have

been selected and bred for this kind of growth habit and vigor are the first line of defense against weeds.

Sod produced from these grasses is like "money in the bank" when it comes to savings on the cost of herbicides for lawn maintenance.

The Lawn Institute supports a Variety Review Board to evaluate the relative performance of new varieties of lawngrass marketed throughout


the United States and Canada. Each year, 40 to 50 of the best cultivars are selected for special recognition. With some 300 cultivars under evaluation in the United States and Canada, there is a wealth of superior germ plasm available.

Consumer interest in new grasses is taken into consideration. As turf-type perennial ryegrasses and tall fescues have become more popular, in-



Use of blends adds beauty to a lawn.

Turf Guide for Improved Turfgrasses



Species	Growth Habit	Establish Rate	Nitrogen Requirement	Mowing Frequency	Close Mowing Tolerance (1/2" or less)	Traffic Tolerance	Drought Tolerance	Competitiveness	Thatch Formation	Shade Tolerance	Cold Tolerance	Seeding Rate/1000 sq.ft.
Improved Turf-Type Kentucky Bluegrass	Spreads by rhizomes	Slow	Medium	Low to medium	Fair	Good	Good	Medium	Medium to high	Fair to good	Very good	2-3 lbs.
Improved Turf-Type Perennial Ryegrass	Bunch type	Very fast	Medium to high	High	Very good	Excellent	Very good	High	None	Fair to good	Fair to good	5 lbs.
Improved Hard Fescue	Bunch type	Slow to medium	Low	Low	Poor	Good	Excellent	Medium	Medium	Very good	Very good	4-5 lbs.
Improved Chewings Fescue	Bunch type	Medium	Low to medium	Low to medium	Good	Fair	Good	High	Medium to high	Very good	Very good	4 lbs.
Improved Creeping Fescue	Spreads by rhizomes	Medium	Low to medium	Low to medium	Poor	Poor	Good	Medium	Low to medium	Very good	Very good	4 lbs.
Improved Tall Fescue	Bunch type	Medium	Medium	Medium	Poor	Very good	Excellent	Medium	Low to none	Good	Good	6-9 lbs.
Improved Creeping Bentgrass	Spreads by stolons	Medium	Low to medium	Low to medium	Excellent	Good	Poor to fair	High	High	Fair	Excellent	1/2-1 lb.

Compiled By: SEED RESEARCH OF OREGON, INC

creasing numbers of these grasses have been listed. This helps to provide better cultivar availability on a broad geographic base since not all cultivars are marketed uniformly across the country. As interest and use of a lawngrass declines, fewer cultivars are listed. Those remaining are the ones readily available in regions of the country where these grasses are best adapted.

No one cultivar will perform equally well under the wide variation of soil, climate and use found across the United States and Canada. Cultivars are selected to provide as

wide a range of adaptation as possible. Local trials and cooperative extension recommendations, of course, are helpful in making a final selection. For this reason, several of each type cultivar; i.e., bluegrass, fine fescues, perennial ryegrass, turf-type tall fescue, bentgrass and specialty grass are listed.

Weed-free bluegrass

Of all lawngrasses, none are better sod forming than the Kentucky bluegrasses. Underground stems grow through the soil and send up new shoots at intervals to form the tightest,

most dense turf possible.

Since a seedling weed and a Kentucky bluegrass plant cannot both occupy the same spot at the same time, weeds fail to become established in a healthy, vigorous bluegrass turf. The new named bluegrass varieties found in premium seed blends and mixtures have been developed with more heat and drought tolerance and with greater insect and disease resistance to make the turf persistent in crowding out weeds through the entire year.

With an abundant supply of weed seed always present in the soil, a vigorous bluegrass lawn is needed

Lawn Institute lists favorites

Here are the Lawn Institute's 1988 preferred variety selections, as made by its Variety Review Board:

KENTUCKY BLUEGRASSES: Adelphi, Estate, Sydsport, Merit, Huntsville, Nassau, Glade, Fylking, Baron, Ram I, Arboretum, Monopoly, America, Nugget, Rugby, Eclipse, Gnome and A-34 Bensun.

TALL FESCUE: Pennant, Houndog, Arid, Rebel II, Galway and Mustang.

PERENNIAL RYEGRASS: All*Star, Pennant, Regal, Gator, Derby, Delray, Fiesta II, Manhattan II and Ranger.

FINE FESCUES: Banner, Koket, Ensylva, Reliant and Jamestown.

(Turfgrass managers should always be sure to check with local extension agents concerning adaptability of certain varieties to their area.)

fine fescues give way and provide needed room; as other conditions may reduce growth of bluegrasses, fine fescues move in and fill in the space so that a high quality ground cover is maintained.

Versatile perennial ryegrass

The new turf-type perennial ryegrasses are the most versatile of any lawngrasses available. They germinate rapidly, can be used by themselves or with other grasses in seed mixtures. They are used successfully to establish a new lawn or to improve an old one by overseeding into a poor quality turf. They are truly a do-it-yourself lawngrass.

These grasses do not form thatch and are easy to maintain on low budgets.

Disease and insect resistance help to eliminate need for use of pest control chemicals. And, when something does go wrong, it's easy just to let the disease or insect infestation run its course and then start new turf, simply by seeding over the injured areas.

Hardy tall fescues

Turf-type tall fescues have established a fine reputation for hardiness

throughout spring, summer and fall to prevent weed seedlings from getting a start.

Fine fescues to start

Spring and fall are the best times to seed lawngrasses. And, premium seed mixtures will contain from 30 to 50 percent fine fescues to see that all grasses get off to a good start. Fine fescues germinate quickly and establish rapidly in either sun or shade. They have low fertilizer require-

ments and thus do not compete adversely with other slower growing grasses in the mixture.

Fine fescues separate grasses of different species and create a population of plants with improved vigor and disease resistance. They function as good companion grasses in lawn establishment, and then develop into a permanent component of the sod that helps create a high degree of hardness and ease of maintenance.

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in development of lawns where growth conditions are less than ideal. They take heat down through the transition zone and even into the upper South. Whereas the old Kentucky 31 fescue made an open, often weed-infested lawn, the new turf-type tall fescues create a more dense weed-resistant turf.

These grasses do not develop thatch and feature improved insect and disease resistance. Thus, they have desirable low-maintenance characteristics. Perhaps the most im-

portant asset of the turf-type tall fescues is their ability to grow deep roots through a large volume of soil. These roots use water and nutrients efficiently and make the lawn trouble free and easier to maintain. Most uniform turf is produced when turf-type tall fescues are seeded alone.

Some mixtures with other grasses are available. Blends of two or more fescues are popular. When starting a new turf-type tall fescue lawn, prepare the soil well and then use either seed or sod.

Specialty lawngresses

Some residences are so located that soils and climate make use of a specialty lawngress desirable.

- Lawns in cool, moist climates—Exeter colonial bentgrass from Pickseed West makes a beautiful, uniform lawn where summer night temperatures are cool and natural rainfall or irrigation provides frequent light watering.

This grass can be clipped closer than any other lawngress— $\frac{1}{2}$ -inch—and by means of above-ground runners, makes the densest turf possible. Seeded with as much as 75 percent fine fescues, Exeter establishes quickly and is easy to maintain. Turf is tolerant of acid soils and cold winters.

- Lawns in moist shady loca-

Senior citizens all over the country find it easy to scratch in a little ryegrass seed from time to time, put on a little water and then enjoy watching the lawn turn green.

tions—Sabre Poa trivialis from International Seeds is the ideal grass for moist shade. Whereas fine fescues do well in dry shade, Sabre is better on wet soils. Seed germinates rapidly to produce a fine textured turf. It blends in well with other lawngresses.

- Lawns with alkaline soils—Fults alkaligrass from Northrup King is a low-growing, bunchgrass with excellent salt and high pH tolerance. Plants are leafy and leaves are narrow. For lawns on alkaline soils or where roadside salting during winter months results in sodium chloride contamination of parking and lawn soils, Fults is ideal.

- Lawns for low maintenance semi-turf—Some soils are so poor and some growth conditions so inferior that lawngresses cannot be grown without costly soil modification. Reubens Canada bluegrass from Jacklin Seed can be used to produce a semi-turf ground cover with essentially no maintenance needed, only occasional mowing.

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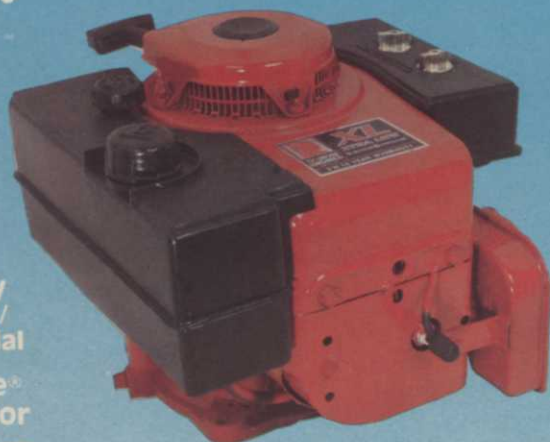
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The central controller utilizes an IBM personal computer as the hub of the operation, including keyboard, color monitor, matrix printer and a "mouse" for easy access to all functions.

This non-dedicated central is capable of "transparent" multiple function, which provides for *simultaneous* business and irrigation program

operation. It's like getting two important pieces of equipment for the price of one!

Network 8000 provides automatic adjustment of irrigation system operation, responding to such key factors as rainfall, evapotranspiration rate, plant materials, soil types, soil compaction, geographic location, terrain slope, Ph factor and system design. A manual override is provided for all factors.

The central programmer will operate any station, set the running time, assign it to any program and set up to three repeats for any station. It can operate up to 800 satellites of 32 stations each, for a total of 25,600 stations.

Toro's new Network 8000 central provides two-way communication: it "down-loads" information to the satellites and "up-loads" information from the satellites.

Also, with this central station you enjoy the advantages of water-budgeting by means of percentage increase/decrease control (by station, by program, by CSG, or the total system), from 1% to 900%.

But this is only the beginning of the story. You have to see it perform to fully appreciate exactly what it can do for you and your irrigation. Call *The Man from Toro* for a no-obligation demonstration.

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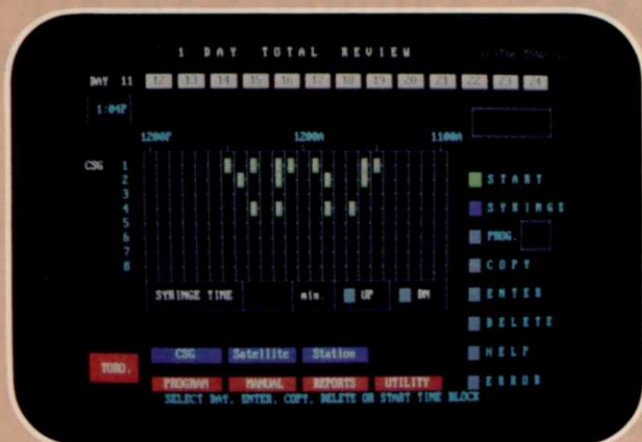


Key components to Network 8000 are the IBM personal computer, with color monitor and keyboard, operated with handy "mouse" and/or keyboard. Shown in the middle is Toro's Delay & Distribution Unit. On the right, IBM matrix printer and stand.

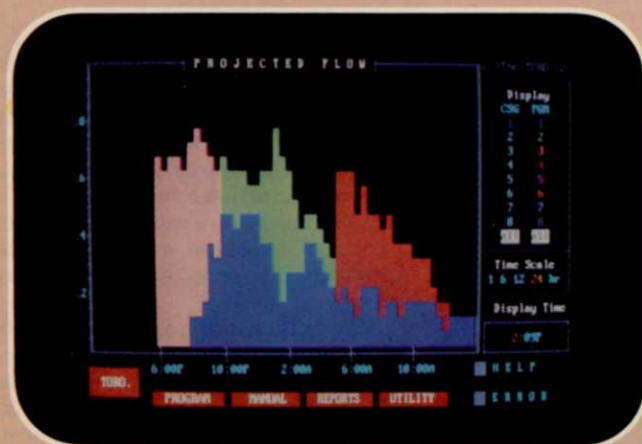


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As with the central, this new satellite offers two-way communication. It receives, stores and sends all commands generated by central. At the same time, it up-loads to the central such key factors as satellite status, air temperature, changes made in station timing at the satellite, and valve wire failure sensing.

Each station is capable of minute and hour timing, from 1 minute to 4 hours and 15 minutes per station, in one-minute increments.

Toro's new Network 8000 Satellite also provides water-budgeting capability, with percentage increase/decrease from 1% to 900%.

The combination of the equally amazing new satellite and central controllers make Network 8000 your first step into the 21st Century, with pay-off *now* in terms of better turfgrass at lower costs.



DISEASES OF COOL-SEASON TURF

No fungicide offers a complete spectrum of turf disease control. But, for most diseases, a range of reliable products is available and (in spite of enormous development costs) the introduction of new materials continues.

by Noel Jackson, Ph.D., University of Rhode Island



Necrotic ring spot on Kentucky bluegrass is a serious problem for the lawn care industry.

Managing high quality turf is an exacting task due, in no small measure, to problems associated with fungal disease.

Each year, the potential exists for a succession of turf diseases. Resting structures of fungal pathogens present in previously-infected plant parts, in thatch or in the soil, resume vegetative growth and generate new inoculum. Each of the varied disease-causing fungi responds to particular environmental conditions that are

conducive to renewing this activity.

Even under adverse conditions, sufficient new fungal growth and/or sporulation occurs. These ensure the survival and carry-over of each species. Given optimum condition, then, a large-scale build-up of inoculum can occur. Large amounts of inoculum, however, do not inevitably mean widespread disease.

Specific environmental conditions (not necessarily the same as those favoring inoculum build-up) are

needed for infection of susceptible grass plants and for consequent disease symptoms. The disease-causing fungi invariably are present in turf. But unless the appropriate environmental conditions favorable to all these processes are met, outbreaks of a particular disease will be minor or apparently absent for the growing season.

The interactions involving grass hosts, fungal pathogens and environmental factors ultimately determine whether particular pathogens are favored at the expense of the grass host, so allowing disease to develop. The turf manager must anticipate these situations and make timely management decisions to maintain the balance in favor of the grass host.

Contributory factors

Factors which may contribute to reducing the incidence of disease are:

- judicious changes in irrigation and fertilizer practice;
- modification of soil pH;
- improvement of soil aeration and drainage;
- removal of thatch and clippings;
- adjustments in mowing height and mowing frequency;
- dew dispersal and improved air drainage;
- restraints on the amount of wear;
- incorporation of organic amendments;
- weed control;
- insect control;
- nematode control; and
- use of resistant varieties.

But even the most skilled turf manager cannot rely entirely on cultural tactics to eliminate the risk of disease

The choice is yours. Whether your customers need season-long preemergence weed control by itself or on fertilizer from leading formulators, Team fits.

Either way, you can control crabgrass and goosegrass season-long with just one application. Or even a split application, if need be, to better fit your program.

Team granular also fits your high standards of annual grass weed control. University tests show it's outstanding. Team gets to the ground and stays put to form a zone of protection that keeps weeds out all season long.

And Team does all this without hurting your turf, including sensitive bentgrass.

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in high quality turf. This must be supplemented with chemical control measures.

Preventive, rather than curative, measures afford the most effective protection against turf diseases. No fungicide offers a complete spectrum of turf disease control. But, for most diseases, a range of reliable products is available and (in spite of enormous development costs) the introduction of new materials continues.

Fungicide arsenals

With fungicide tolerance on the increase, the arsenal of turf fungicides must be as large as possible. This ensures that control programs can involve the alternate use of several effective products and so lessen the risk of tolerance build-up.

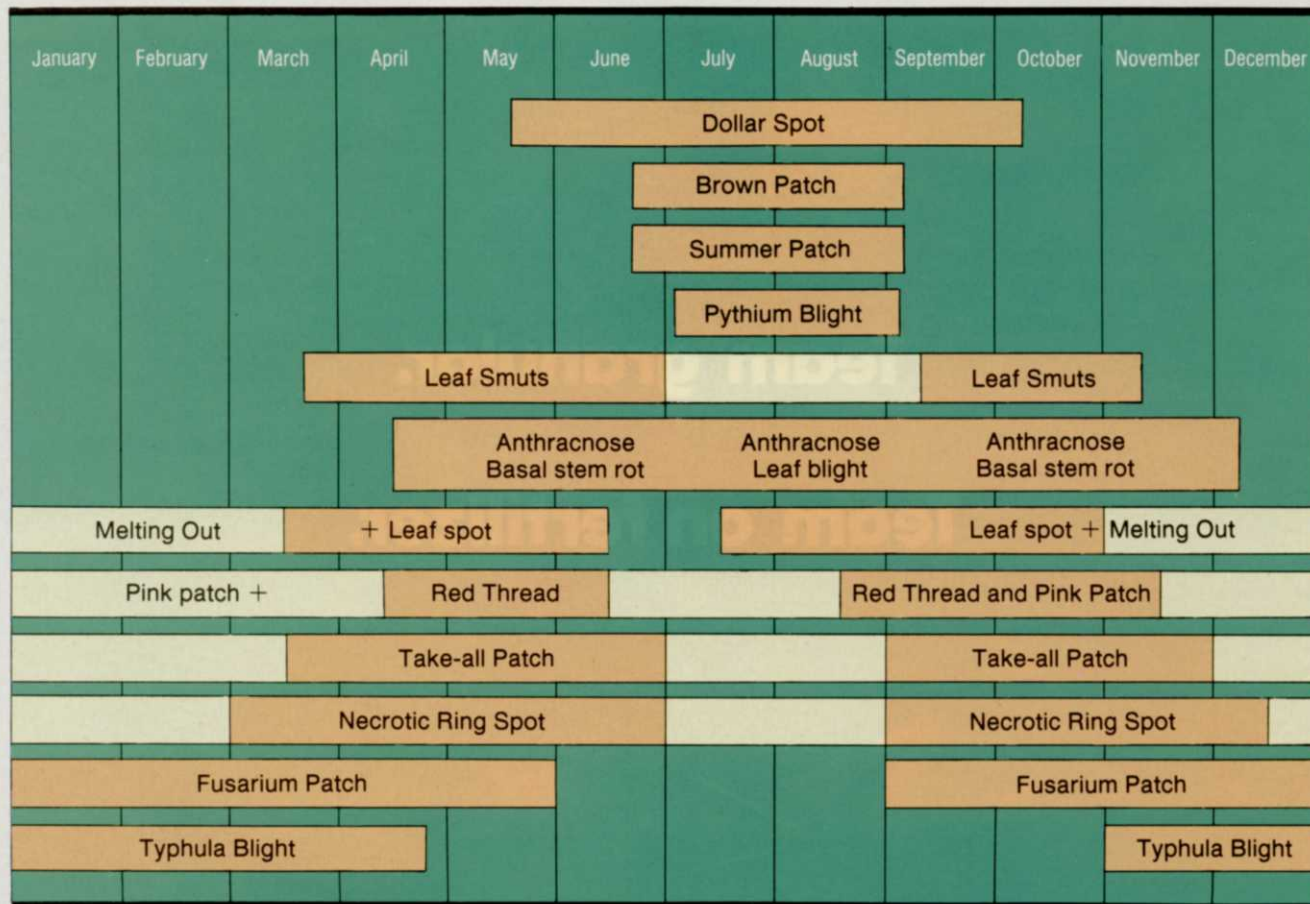
In the absence of a chemical cure-




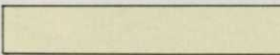
Take-all patch, which has destroyed this Pennncross creeping bentgrass, is a serious problem on sand greens.

CALENDAR

Common Diseases of Cool-Season Turf



 Persistent symptoms often still visible.

 Pathogen most active.

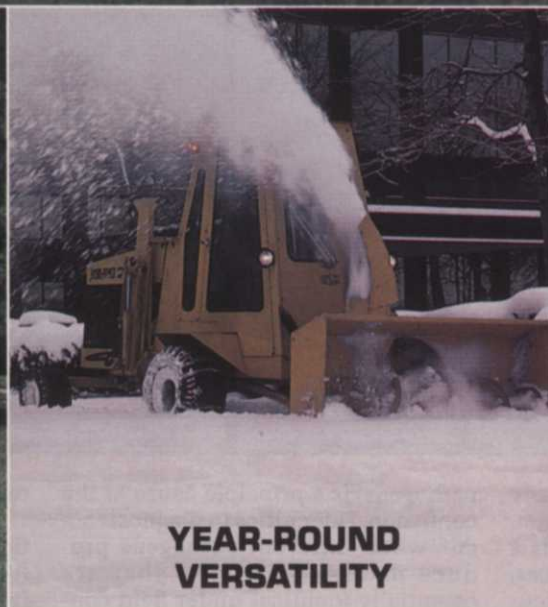
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COOL-SEASON TURF DISEASES

TURF DISEASE AND CONTROLS

Disease	Causal Agent	Hosts	Biological and Cultural Control	Chemical Control
Anthrachnose	<i>Colletotrichum graminicola</i>	Annual bluegrass Fine-leaf fescue Kentucky bluegrass Perennial ryegrass Creeping bentgrass	Adequate nitrogen. Cool grass by syringing.	Maneb plus zinc sulfate, chlorothalonil, benomyl, thiophanate-methyl, thiophanate, thiophanate-methyl + mancozeb, triadimefon, propiconazole
Brown patch	<i>Rhizoctonia solani</i>	All major turfgrass species	Reduce nitrogen. Remove "dew." Increase air movement.	Mancozeb, maneb + zinc sulfate, chlorothalonil, vinclozolin, benomyl, thiophanate-methyl, thiophanate, thiram, thiophanate-methyl + maneb, thiophanate + thiram, PCNB, iprodione, propiconazole
Dollar spot	<i>Lanzia spp.</i> <i>Moellerodiscus spp.</i> (<i>Sclerotinia homoeocarpa</i>)	Annual bluegrass Creeping bentgrass Colonial bentgrass Fine-leaf fescues Kentucky bluegrass Perennial ryegrass Tall fescue	Increase nitrogen. Remove "dew."	Benomyl, thiophanate, thiophanate-methyl, chlorothalonil, anilazine, fenarimol, cadmium compounds, thiophanate + thiram, thiram, thiabendazole, benomyl, iprodione, thiophanate-methyl + maneb, vinclozolin, triadimefon, propiconazole
Summer patch	<i>Magnaporthe sp.</i>	Annual bluegrass Kentucky bluegrass	Light, daily watering during the summer.	Fenarimol, thiophanate-methyl, thiophanate, triadimefon, iprodione, benomyl propiconazole
<i>Helminthosporium</i> Diseases Brown blight Leaf spot and Melting-out Net blotch Read leaf spot Leafspot, root and crown rot Zonate Leaf spot	(<i>Drechslera</i>) <i>D. siccans</i> <i>D. poae</i> <i>D. dictyoides</i> <i>D. erythrospila</i> <i>Bipolaris</i> <i>D. sorokiniana</i> <i>Bipolaris</i> <i>D. gigantea</i>	Ryegrass Kentucky bluegrass Fescue Creeping bentgrass All major turfgrass species All major turfgrass species	Remove clippings. Raise cutting height. Plant resistant cultivars. Moderate spring nitrogen. Daily irrigation.	Mancozeb, chlorothalonil, iprodione, anilazine, maneb + zinc sulfate, PCNB, vinclozolin

all, accurate diagnosis is crucial to any successful disease control program. Prescribing the wrong fungicide is a waste of resources. In some instances, it may promote or aggravate a particular disease problem. Regional and even very local differences in the effectiveness of fungicides, when employed on ostensibly similar turf disease symptoms, have puzzled both pathologists and turf managers alike. Recent and ongoing research at several locations nationwide has helped resolve some of these inconsistencies.

Misidentification or failure to identify the primary pathogen (or

pathogens) is a principle cause of the confusion. Difficulties in diagnosis occur when different pathogens produce disease symptoms that are essentially identical under field conditions. The situation is compounded when two or more pathogens are involved concurrently in disease complexes with similar symptoms.

Multiple pathogens

Multiple pathogen involvement has been demonstrated for Corticium disease, now split into red thread and pink patch, with *Laetisaria fuciformis* and *Limonomyces roseipellis* as the

respective causal agents.

Dollar spot presents a similar situation but has to date defied attempts to identify conclusively the inciting fungi. Additional species of *Rhizoctonia* may accompany or replace *R. solani* in causing brown patch in some locations. *Colletotrichum graminicola*, the anthracnose fungus, may act alone or, frequently, in combination with *Helminthosporium* species (now called *Drechslera* or *Bipolaris*), or with the take-all patch fungus *Gaeumannomyces graminis* var. *avenae*.

Take-all patch and other similar



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COOL-SEASON TURF DISEASES

TURF DISEASE AND CONTROLS

Disease	Causal Agent	Hosts	Biological and Cultural Control	Chemical Control
Take-all patch	<i>Gaeumannomyces graminis</i>	Creeping bentgrass Colonial bentgrass Velvet bentgrass	Reduce soil pH. Avoid liming, Use acidic fertilizers, Sulfur	Fenarimol
Pythium blight (cottony blight)	<i>Pythium spp.</i>	Perennial ryegrass Creeping bentgrass Annual bluegrass	Improve soil drainage. Increase air circulation.	Chloroneb, ethazol, metalaxyl, propamocarb
Red thread	<i>Laetisaria fuciformis</i>	Creeping bentgrass Colonial bentgrass Kentucky bluegrass Annual bluegrass Perennial ryegrass Fine-leaf fescue Tall fescue	Increase nitrogen.	Anilazine, iprodione, triadimefon, vinclozolin, chlorothalonil propiconazole
Pink patch	<i>Limonomyces roseipellis</i>	as for red thread	Increase nitrogen.	Iprodione, triadimefon
Snow molds Typhula blight Fusarium patch	<i>Typhula spp.</i> <i>Fusarium nivale</i>	Annual bluegrass Colonial bentgrass Creeping bentgrass Fine-leaf fescues Kentucky bluegrass Perennial ryegrass Tall fescue Velvet bentgrass	Avoid early fall nitrogen fertility that leads to lush growth.	Mercury compounds, PCNB products, chlorothalonil, chloroneb. These products may have to be used in combination for effective snow mold management. Benomyl, iprodione, or mancozeb will control Fusarium patch where it occurs alone
Necrotic ring spot	<i>Leptosphaeria korrae</i>	Kentucky bluegrass Annual bluegrass Fine leaf fescues	Nitrogen to promote recovery. Light daily irrigation. Organic amendments.	Iprodione, fenarimol, benomyl, thiophanate, thiophanate- methyl propiconazole
Stripe smut Flag smut	<i>Ustilago striiformis</i> <i>Urocystis agropyri</i>	Kentucky bluegrass Creeping bentgrass	Reduce nitrogen. Prevent summer dormancy.	Fenarimol, triadimefon, benomyl propiconazole.

patch diseases caused by soil-borne, root infecting fungi, generate the symptoms that are most commonly misdiagnosed.

Fusarium blight is a prime example. Over the years, the designated name became a catch-all for any of the summer-season patch disease symptoms in Kentucky bluegrass turf. It is now recognized that at least two additional diseases can be separated out: necrotic ring spot (causal agent *Leptosphaeria korrae*), and summer patch (causal agent a species of *Magnaporthe* and not *Phialophora graminicola*).

Necrotic ring spot bears a striking resemblance to yellow patch caused by *Rhizoctonia cerealis* and has un-

doubtedly been confused with this disease. In any event, it now figures as one of the major headaches for the lawn care industry wherever Kentucky bluegrass sod is employed.

Summer patch is similarly damaging to Kentucky bluegrass turf but is also commonly encountered on the annual bluegrass component of golf greens. There it produces symptoms similar to take-all patch.

The latter is a serious disease of bentgrasses. It is increasingly common on newly-established creeping bentgrass greens built with sand as the growing medium. *Fusarium blight*, incited by *Fusarium colmarum* and *F. poae*, is still out there somewhere. But, after nearly 25 years of

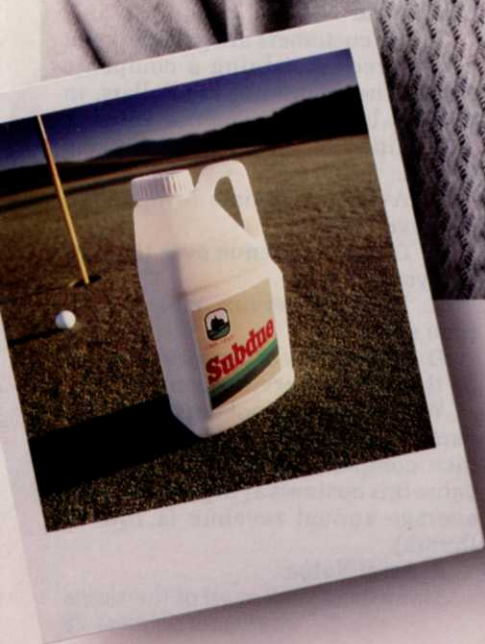
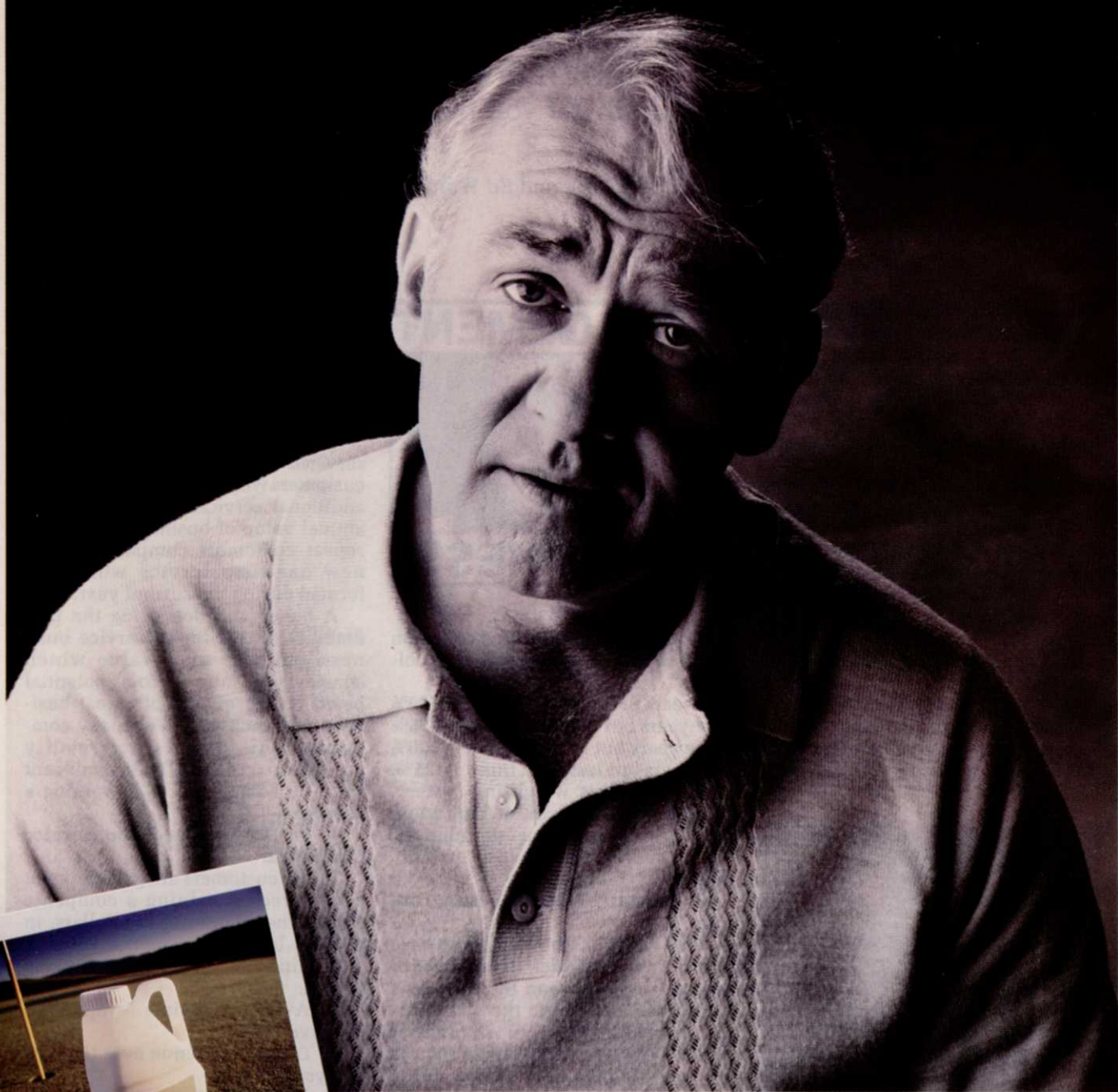
confusion, the incidence and severity of this disease needs to be re-evaluated.

The key

For all of these patch diseases, more definitive diagnostic techniques are needed. Careful microscopic examination of the diseased plants followed by isolation and culturing of the causal agents provide the only certain means of identification and the key to any control measures. **LM**

Next month: disease of warm season turf.

"One of my employees ran the mower into the lake. My wife totalled our new Volvo. And my daughter just dyed her hair purple. But what really concerns me is Pythium."



There's one sure way to avoid worrying about Pythium. Use Subdue® fungicide. Subdue stops Pythium on contact. And once absorbed by grass roots, Subdue protects your turf against further attack for up to three weeks. So don't let Pythium get you down. Get Subdue. Because you've got other things to worry about. **CIBA-GEIGY**

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VALUING YOUR COMPANY

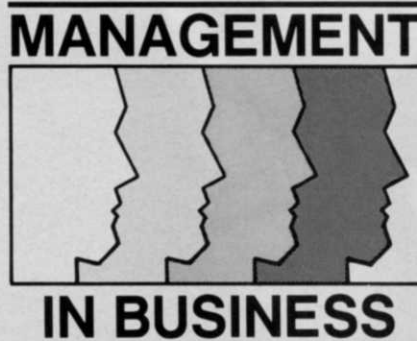
If you are thinking about selling your landscape or lawn care company, how do you determine how much to ask? Or to expect from the potential buyer? These formulas should help get you in the ballpark, anyway.

by Rudd McGary and Ed Wandtke

With the acquisition and merger mania prevalent across the country today, many green industry firms are being approached about selling their companies. A question that we have been hearing discussed at various industry meetings is, 'What is a fair value to receive for your company?' Although the question appears simple, many variables determine the final price a seller pays for a company. The following are the various factors that will be weighed differently in determining what price to ask for a green industry company:

1. Repetitive Customer Base, no contract.

The value of repeat customers in chemical lawn care, mowing or maintenance is determined by calculating the average length of time a company has been retaining its customers. Gen-



erally a formula weighs the retention factor over a five-year period as follows:

five years or longer 100%
four years but less than five . . . 75%
three years but less than four . . . 50%
two years but less than three . . . 25%.

In using this weighting system, some purchasers look at individual account profitability or—in other instances—average revenue per account.

2. Repetitive Customer Base, contract.

The value of the customer base that is under contract, the number of contract renewals and the contract's length will determine these customers' purchase value to a potential buyer. Generally, the formula considers the account's profitability, unbilled contract add-ons and the length of the contract.

One such formula that has been used recently is determined as follows:

- A. Length of the contract (years remaining).
- B. Profitability of the contract (percentage).
- C. Value of the basic contract per year.
- D. Value of the add-on contract extras.

E. Average extras based on the years the contract has been serviced.

Take $(A \times B \times C)$ plus $(A \times B \times E)$ to determine the total value of these contract repetitive customers.

3. One-Time Serviced Customers.

The value of customers who are serviced only once (e.g. design/build customers who return periodically for additional services) is based on the annual value of business from these repeat customers compared to the new one-time service work performed during the current year.

A buyer will determine the profitability of this repeat service business and will set a value which considers the future income potential based on the quality of repeat business sold each year. For many companies, this data is not readily available; consequently no significant value is assigned to it in valuing a company.

4. Partial or One-Time Service Customers.

These customers are generally not considered in valuing a company. Rather the amount of the dollars, in total, is looked at. Then, a value is determined based on the following factors:

- A. Average one-time revenue the past five years.
- B. Trend in revenue over the past five years.
- C. Business service mix of one-time services.
- D. Profitability of the service based on the types of services being sold.

While there has not been one standard formula employed by many service company buyers, many firms value this business at 10 percent of the average annual revenue (a rule of thumb).

5. Asset Value.

Many firms look at all of the assets

continued on page 78



Wandtke and McGary are senior consultants with All-Green Management Associates in Columbus, Ohio. Dr. McGary focuses on marketing and management issues. Wandtke focuses on operations and financial questions.

bobcat 2400 MTC

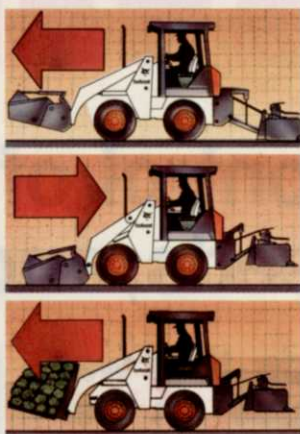
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Trimec Plus is a major breakthrough in post-emergent herbicide for ornamental turf. It not only controls the widest range of broadleaf weeds, including the toughies like spurge, oxalis and ground ivy — but it also controls grassy weeds such as crabgrass, barnyard grass and dallisgrass as well as nutsedge.

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What is Trimec Plus?

To understand the composition of

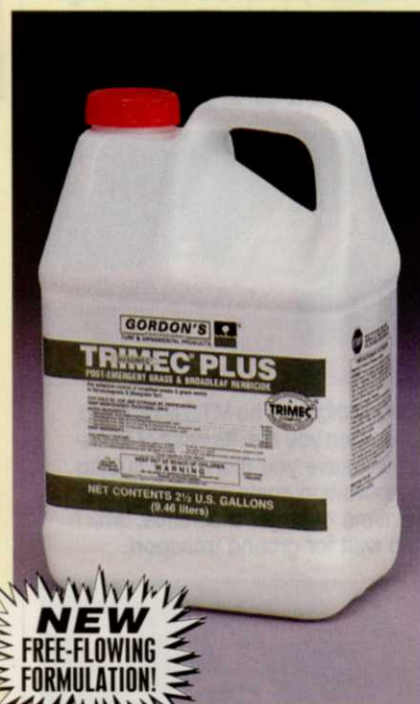


Everett Mealman
President
PBI/Gordon Corp.

Trimec Plus, it might be helpful to start off by saying that it is *not* merely a formulator tank mix of Classic Trimec and MSMA. Rather, it is a specially compounded amine complex of 2,4-D, MCPP, dicamba and MSMA . . . in a stable, uniform suspension that is as easy to work with as any other Trimec complex.

It not only has the synergistic and eutectic power of Trimec for controlling tough summer annuals, but the complex enhances the effectiveness of the MSMA so that in most instances only one treatment is necessary to eliminate crabgrass and nutsedge.

Trimec Plus was tested for several years under the name *Quadmec*, and was introduced in the South last year for use on Bermudagrass. The re-



ports from users and researchers have been very positive. And why not! There has never been anything like it for the grooming of Bermudagrass.

Characteristically, the pre-emerge on Bermuda begins to peter out just about when the hot summer annuals are beginning to be a problem. The result is often a hodgepodge of all sorts of grassy weeds, broadleaf weeds, and nutsedge.

With a broadcast spray of Quadmec (now called Trimec Plus) groundskeepers soon found they could clean up Bermuda in one fell swoop.

New name and formula

But there were two problems. Number one, the original formulation

post-emergent herbicide

PLUS



had too much viscosity and required premixing if it was to be used in cold water. Number two, our friends didn't cotton to the name Quadmec, and instead kept referring to it as *that Trimec plus MSMA*.

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FLUENT

On Design



The entranceway at the Oak Run housing development in Ocala, Fla. needed an attention-getter. After looking over the arid area, landscape architect Michael Pape decided a waterfall would add lushness and vitality. Pape designed the 1400-acre project and the 1/2-acre waterfall entranceway. Urdl's Waterfall Creations completed the hydraulic and structural design and constructed the pond and waterfall using their lightweight rocks. Pape and Urdl's worked closely together to fit the falls into the natural setting. "Rather than creating a small, out-of-scale water feature, we placed the emphasis on the scale and size of the area," Pape says. "We used predominately native plant materials to keep in harmony with the area." The waterfall uses pumps moving 2400 gpm into three source ponds. The tallest pond is 13 feet high, about 22 feet long. The other two cascade and free fall into the bottom pond. The falls are lighted at night to provide a spectacular view. The Urdl's rocks are hollow, molded fiber reinforced concrete panels, which were bolted and mortared onto the concrete superstructure. The plants in the area, installed by Kinswood Nurseries of Ocala, Fla., are Florida coontia ferns, Indian hawthornes, weeping yaupon and 14- to 16-foot laurel oaks. The entranceway cost about \$400,000. The project won a 1987 Florida Nurserymen and Grower's Association Award of Excellence for water features.

Urdl's Waterfall Creations: Circle No. 200 on Reader Inquiry Card
Michael Pape and Associates: Circle No. 201 on Reader Inquiry Card

Kinswood Nurseries: Circle No. 202 on Reader Inquiry Card

FALLS

by Heide Aungst



The Hyatt Regency Ravinia in Atlanta gets its name from the steep ravine located in the 42-acre wooded site. Landscape architects Roy Ashley & Associates and Clark-Morrell landscape contractors, both of Atlanta, worked with the natural surroundings in designing the property, which opened in 1986. The central design element is a three-story greenhouse atrium lobby which looks out over a 10-acre forest. A cascading waterfall originates in the atrium lobby and continues through the greenhouse to the outdoor garden, where it culminates into two waterfalls. The falls drop approximately eight feet at the highest point. More than 2,000 gpm are pumped through the water feature. The water feature connects with Ravinia Creek and meanders through the deciduous forest. Cost of Wisconsin set the steel reinforcement for the stone walls along the sides of the water feature. Sullivan Stone of Lithonia, Ga. supplied the Tennessee Mountain stone used in the feature. The large boulders create water variety through bounce and movement. Surrounding the water feature is a variety of trees including dogwood, crape myrtle, weeping cherry and red maple and a juniper groundcover. Summer plantings of annuals add color to the area.

Cost of Wisconsin: Circle No. 203 on Reader Inquiry Card
Roy Ashley and Associates: Circle No. 204 on Reader Inquiry Card
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Sullivan Stone: Circle No. 206 on Reader Inquiry Card
Hyatt Regency Ravinia: Circle No. 207 on Reader Inquiry Card

Insurance problems concerning the design of lakes, ponds and water retention areas

by Jim Leatzow



Landscape managers with lakes and ponds on the property must take extra precautions when designing and maintaining water areas.

If you are responsible for designing public areas that contain lakes, ponds or water run-off retention areas, keep certain important insurance considerations in mind.

First, understand that water-filled areas are always viewed as an "attractive nuisance." That is—especially in the case of children—people will have a hard time avoiding such areas, even if they are trespassing.

Merely putting up a "No Trespassing" sign and assuming your job is done is not enough. Instead, you need to examine multiple design factors.

First, you need to consider the ultimate use for the specific water-filled area you are designing. If, in fact, people are encouraged to swim or boat, then you must proceed with caution to identify those areas where activities will take place. Facilities like docks, piers and location of emergency and lifesaving equipment must also be considered.

More commonly, though, is the design of lakes, ponds and retention areas for aesthetic purposes—areas not intended for public use. One of the biggest concerns with such a project is to make sure that the grade or shoreline slope precludes people—more importantly, children—from losing their footing. This is a consid-

Jim Leatzow is president of Leatzow & Associates, Glen Ellyn, Ill. He specializes in green industry matters.

eration especially on wet grass or other surfaces so they do not tumble into the water.

Furthermore, you will want to consider using an expert in storm water drainage, when necessary, to assist you on such a project. Nothing will get you in trouble faster than overselling your capabilities and not using experts when you get into specific areas for which you have not had ample training.

It is better to make less profit on a project, but to have a plan that is safe and workable. Such an approach will not come back to haunt you in the form of a lawsuit from an injured person.

Along with the proper design of such areas comes the need to include some maintenance factors in your plan. You should make the owner of any facility you design provide periodic safety inspections so the facility continues to be safe.

In a lake or pond setting, this may include inspecting drains which are often installed for overflows. Such drains should include covers secure enough that kids cannot remove them.

Once a storm occurs, overflow drains become important factors in keeping the rising waters from overflowing the banks. If the overflow pipe is blocked with debris, and not checked periodically, one could allege improper design.

Conversely, overflow pipes become uncovered because grates were

removed, storm drains can become life-threatening whirlpools that can drown even a strong person, given the right circumstances.

As mentioned before, maintenance applies to other areas such as fencing and signage. Although you may not have any direct responsibility for the project once it is constructed, you go a long way in adding meaningful safety provisions. You should stress the owner's obligation to consider the maintenance needs once the project is built.

Depending on the type of project, erosion of the banking material is a potential source of design error claims. If water undercuts the banks, over time the ground will become considerably less stable. Thus, the chances of injury increase dramatically.

It is imperative to make on-sight observations while construction work is in progress, whether or not such is called for in your work agreement. I would even encourage liberally using a camera to make a periodic record of the construction phase.

That kind of documentation would be of utmost importance if a claim were to arise. Such measures, along with written confirmation of any changes to the plan, should be considered normal, customary documentation included in every job file.

When it comes down to "your word against theirs" in court, the design professional often comes up on the short end of the stick.

In short:

- Estimate the purpose of the water-filled area.

- Analyze who, if anyone, will be using the facility.

- Put in the necessary safety considerations. (Too much margin of safety is always preferable.)

- Employ other design professionals if you get into areas beyond your expertise.

- Stress the maintenance factors to the owner of the project.

- Visit and record the actual construction while in progress.

- Document, document, document your file as though you expect a claim. Because of some frightening recent interpretations of the Statute of Limitations, plan on being held responsible for your design for the rest of your life. **LM**

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Late fall fertilizing and groundwater quality

by A. Martin Petrovic, Ph.D., Cornell University

The late fall period is becoming both an extremely popular and important time to apply a nitrogen fertilizer to cool-season turfgrass. Considerable research has been done at Ohio State University (see Feb. 1988 *LANDSCAPE MANAGEMENT*) on the response of turfgrass to late fall-applied N.

In general, it has been shown that there is improved late fall, winter and spring color over spring and summer N application. Also, spring root growth is enhanced by late fall N applications.

To date, the only negative aspect is a slightly higher potential for thatch development. This is thought to be a result of the increased rooting associated with late fall N application.

When one considers the environmental impact of late fall-applied N, there is one major point to consider. Potentially, this could be the worst time of the year to fertilize in terms of having a negative impact on groundwater quality. That is, if the following factors are true.

1. For your location, does the greatest amount of water reaching groundwater (referred to as recharge) occur from precipitation in late fall, winter or early spring?

2. Cool and cold temperatures of this period related to limited plant uptake of N.

3. With cool soil temperatures, there is little chance of gaseous N loss by either ammonium volatilization or denitrification.

When all three conditions are found, nitrate leaching potential is very high. There are areas of the country where these conditions naturally occur, such as the cool-season zone of the Atlantic Coastal Plains.

Also, any inland site on sandy soils could potentially be considered part of the problem areas. A perfect example of a location with these conditions is Long Island, N.Y.

Research continues

A research project was initiated in the fall of 1985 to study the impact of late fall-applied N on groundwater quality. Two sites on Long Island, N.Y., were chosen for this experiment.

The first site was St. Charles Cemetery in Pinelawn, which was established in 1982 as a mixture of Kentucky bluegrass (Adelphi and Glade) and perennial ryegrass (Citation, Manhattan and Derby).

The second site was at the Long Island Horticultural Research Laboratory in Riverhead, which contained three cultivars of Kentucky bluegrass seeded in 1980. After establishment, little or no N was applied to either site. The surface soils at each site were sandy loams; however, the subsoil at the St. Charles site was considerably more gravelly.

In November of 1985 and 1986, ion exchange resin bags were buried

determined. With collecting nitrate on an area basis, the information presented can be related to the percent of N applied.

The results

In the table with this update are the results averaged over the two years of the study. These results revealed that the highly water soluble N source urea was suspect to considerable leaching, especially at the Pinelawn location. However, slowly available N sources of ureaformaldehyde, plastic-coated ureas and activated sewage sludge had little or no potential for nitrate leaching. The other N sources—sulfur-coated ureas and flowable ureaformaldehyde—were intermediate in nitrate leaching potential.

Conclusions

From these results, several conclusions can be drawn.

- Applying a highly water soluble N source at a high rate in late fall can result in considerable nitrate leaching. As pointed out before, this could be a "worst case scenario."

- The degree of leaching is very manageable based on the source of N used (i.e. less leaching with slow release sources).

- Factors found at each site affect the degree of leaching. The factors that were different between Pinelawn and Riverhead were

grass species used, soil type of the subsoil and possibly climatic factors, like the amount of precipitation. At this point, which one(s) responsible can only be speculated on.

The general concern over the protection of groundwater quality is important to all turfgrass managers. The results of this project show that there is potential for groundwater contamination. However, as managers, you have options available to reduce or eliminate any nitrate leaching from late fall applied N. **LM**

The percent of fertilizer N applied that leached as nitrates passed the root zone.

Nitrogen Source	Manufacturer	Long Island, NY Location	
		Pinelawn	Riverhead
		% fertilizer	N that leached
Sulfur-coated urea	Scotts	21	14
Ureaformaldehyde	Noram	1	3
Plastic-coated urea (150D)	Estech	0	0
Activated sewage sludge	Milorganite	2	2
Flowable ureaformaldehyde	Cleary	9	5
Urea		42	27

about 12 inches below the surface or below the depth of rooting.

Generally, it is believed that once nitrogen has gone deeper than the root zone, it will eventually end up in groundwater. This is especially true for the fall, winter and spring period because little or no water will move up from below the root zone.

Each November, six different N sources were applied at a rate of 2 lbs. N/1000 sq.ft. The following April, the ion exchange bags were removed and the amount of nitrate collected was

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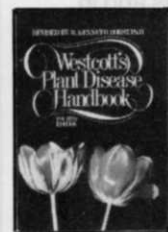
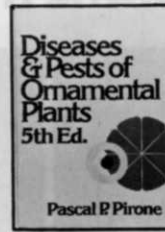
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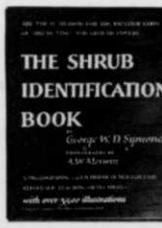
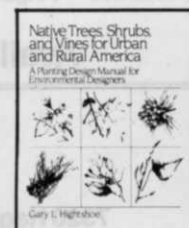
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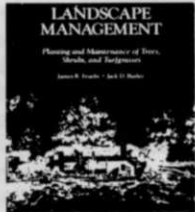
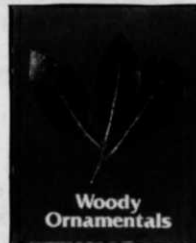
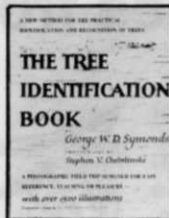
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760 - TREE MAINTENANCE

by Pascal Pirone
The fourth edition of this guide for anyone involved in the care and treatment of trees. Special sections on tree abnormalities, diagnosing tree troubles, non-parasitic injuries and assessing the suitability of different trees. **\$49.95**

405 - WOODY ORNAMENTALS

by Partyka, Joyner, Rimelspach, Carver
Illustrates plant identification characteristics. Organized in two basic sections: plant identification and plant disorders, this text utilizes 430 color photos, 430 line drawings and 45 black and white photos to simplify identification. **\$32.50**



345 - COST DATA FOR LANDSCAPE CONSTRUCTION 1988

Kathleen W. Kerr, Editor
An updated unit cost data reference for designers and cost estimators. Developed to fill the tremendous need for detailed landscape construction cost data. Laid out in easy-to-use CSI format. Annual. **\$35.00**

300 - LANDSCAPE DESIGN: A PRACTICAL APPROACH

by Leroy Hannebaum
Geared for the commercial designer/salesperson, this is a one-stop guide to the landscape design process. Covers the entire highly competitive field including design analysis techniques, pointers on land forms, specialized business landscaping methods, environmental design guidelines, specifications, estimations, bids. **\$37.00**

305 - LANDSCAPE MANAGEMENT

by James R. Feucht and Jack D. Butler
Planting and Maintenance of Trees, Shrubs, and Turfgrasses. Describes the basic principles of cultural management of installed landscapes. The important factors of plant growth, soils and fertilizers, improved planting techniques and new pruning techniques, integrated pest and disease management, and spray-equipment calibration and care are all featured. **\$29.95**

370 - LANDSCAPE OPERATIONS: MANAGEMENT, METHODS & MATERIALS

by Leroy Hannebaum
An in-depth examination that combines technical training in landscape science with methods of accounting, business management, marketing and sales. Discusses effective methods for performing lawn installations, landscape planting and maintenance. Step-by-step accounting calculations are explained in simple terms. **\$34.00**

365 - LANDSCAPE PLANTS IN DESIGN

by Edward C. Martin
An annotated photographic guide to the design qualities of ornamental plants and their aesthetic and functional use in landscape designing. Over 600 trees, shrubs, vines, ground covers and turfgrasses are described in nontechnical language. Over 1900 photographs. Provides a basis for selecting the best plant materials for any particular use in landscape design. Contains detailed indexes that provide quick reference to particular design qualities and growing conditions. **\$58.95**

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by Gregory M. Pierceall
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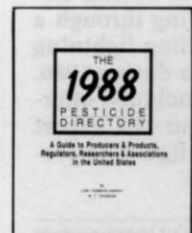
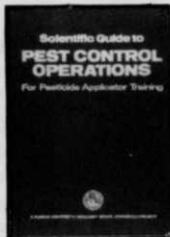


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by Truman, Bennett, Butts
Provides a sound basis for studying the technical aspects of pest control. Covers pesticides, safety, health and environmental concerns, equipment, flies and mosquitos, rats and mice, birds and much more. **\$35.00**



500 - THE 1988 PESTICIDE DIRECTORY

by Lori Thomson Harvey and W.T. Thomson
A Guide to Producers and Products, Regulators, Researchers and Associations in the United States. For the person who needs to know anything in the United States pesticide industry. Includes Basic Manufacturers and Formulators with their products, key personnel, managers, district/regional offices and other pertinent information. For United States pesticide information in one place, this directory is a must. **\$75.00**

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Protecting trees from lightning shock

by Robert E. Cripe

Bill Graham Jr., chief horticulturist with the Morris Arboretum in Philadelphia, decided to include tree lightning protection in one of the arboretum's workshops two years ago.

He wished to include classroom instruction and an actual installation of lightning protection in several trees. I became interested and decided to help with the workshop.

The 175-acre Morris Arboretum at the University of Pennsylvania, consists of rolling hills, rose gardens, greenhouses, statues, ponds, step waterfalls where trees, shrubs and other plants are grown and preserved for scientific and/or educational purposes.

Installing a tree system

The tree we chose for the installation was a stately Bender Oak approximately 80 feet high with a 75-foot spread.

To design this system in accordance with codes, the tree needed two standard download cables and two separate grounds, since the tree trunk was more than three feet in diameter.

Three climbers ascended to the uppermost branches of the three main trunk extensions to install three main or standard air terminals and download conductors. They were to terminate at the base with two grounds leading from the trunk below grade 180 degrees apart out some 40 feet beyond the tree's drip line.

To provide the tree with umbrella protection, four miniature air terminals and miniature cables were installed on four of the main branch extensions.

Air terminals were fastened to the ends of the standard conductors. They were then pulled up into the main trunk extensions by the three workmen. The air terminals were fastened to main trunk extensions as close to the upper ends as safety would permit, to provide secure fastening.

Drive-type cable fasteners were used to fasten these standard cables to the main trunk extensions every three feet. Cables were not pulled tight but allowed to flow in a gradual downward course following the contour of the trunk extension branches. After the standard cables were brought down to the main crotch of the tree, the climbers ascended to the main branch areas and started installing the miniature air terminals on the uppermost parts of the branches. They then secured the miniature cables down to the branches where they interconnected with the main standard conductors.



With ropes and copper lightning conductor cable in place, the workmen are ready to climb the tree, drop a rope and pull the standard copper cable with point attached to one of the top main trunk branch extensions.

Copper vs. aluminum

Copper air terminals and cables are always used in tree systems. Aluminum conductors or cables are not used for several reasons, the first being that codes and specifications recommend copper cables because of their tensile strength. Aluminum conductors become brittle from the bending and swaying motion of trees.

Another factor is corrosion. Aluminum cables and accessories, when in contact for extended periods with moisture from decaying leaves, moss or just from the moisture absorbed by tree bark, could eventually cause corrosion and deterioration of the system.

Aesthetics are another factor. Copper materials tend to discolor with age and eventually blend in with the bark of the tree, whereas aluminum materials are always bright and shiny and tend to draw attention to the aluminum system rather than the aesthetic beauty of the tree itself.

Grounding

While the climbers were installing the air terminals and tree conductors, workers on the ground were installing the grounding system. Each ground terminal consists of a minimum 1/2-inch diameter by 10-foot length copperweld ground rod driven 10 1/2 to 11 feet into the ground out beyond the main root area and beyond the drip line. The ground cable is laid in either a trench six to 12 inches below grade. Or in the case of sodded areas, a spade may be inserted into the ground and a small slit or envelope-type insertion made, allowing the cable to be slipped into the pie-shaped insertion and the sod tamped back in place.

For driving the 10-foot length ground rods, we used a special ground rod driver consisting of a three-foot length of a 1/2-inch steel pipe open on one end. A heavy steel weight is welded onto the other end, similar to a fence post driver used by farmers.

As we drove the ground rod, we periodically measured the ground resistance, since several of those assisting with the ground aspect of the system were not familiar with measuring resistance. This resistance was measured by an ohm meter, providing a direct calibrated reading which eliminated further calculations or interpolation. Code requirements and standards in the lightning protection field state that a newly-driven ground should be in the neighborhood of 50 ohms or less—the lower the ohms resistance reading, the better the ground.

At three feet deep, we took a reading of 450 ohms resistance. At six feet, the resistance was 375 ohms. At eight feet we hit rock or shale and could not drive the ground rod deeper. This gave us an opportunity to use an alternate grounding method—multiple grounds, as provided for in the code.

At a distance of six to 10 feet from the eight-foot-deep ground rod, we drove another ground rod interconnecting the two in parallel fashion. The reading was 50 ohms ground resistance at that point. The 10-foot grounding electrode on the opposite side of the tree was driven to its full depth without difficulty. The ground resistance reading on this ground was 25 ohms. Both standard download conductors were tied to their respective grounding electrodes and the three standard main download conductors interconnected at the base of the tree. Then, the ground resistance on the entire tree lightning protection system was less than 15 ohms. Additional grounding virtue was obtained by interconnecting the system with an underground abandoned irrigation pipe located near the base of the tree about four feet from one of our ground cables. By 4:30 p.m., the installation was completed.

Bill Graham, Harold Rosner, Lewis Randall and the staff of Morris Arboretum received funding through a federal grant for installing lightning protection on four trees during 1986. The grant application included offering to train arborists and tree expert firms on how to install lightning protection systems in trees.

Robert E. Cripe is president of Independent Protection Co., Goshen, Ind.

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PROBLEM MANAGEMENT

by Balakrishna Rao, Ph.D.

For early green-up...

Problem: At our University in New York State, we have two problems with the spring fertilizer application for athletic fields. One problem is that our groundcrew's workload in April and May is extremely heavy with preparations for Commencement and other spring activities. The second problem is one of wet conditions in certain areas of our athletic fields which we cannot, at this time, afford to drain. As a result, I would like to apply our spring granular fertilization while the ground is still frozen. We use a granular blend with a 50 percent slow-release nitrogen. What is the earliest date of application that could still be effective?

Solution: One solution to your problem is to consider applying fertilizers in the fall. If your late fall fertilization coincides with the last mowing, which is ideal timing, we have seen response from that application the following spring until the first of June. Similar observations have been reported from several universities and several other green industry personnel.

For early green-up, enhanced root development and density in the spring, it would be necessary to apply at least 1¼ lbs. of nitrogen per 1000 sq. ft. during the late fall fertilization. Since late fall fertilization may hold color response through the month of May, ideally it would be necessary to treat again in late May to maintain turf quality. Reports also indicate that a light application of fertilizer in very early spring would help recuperation from winter injury and/or injury from low-temperature diseases.

From your comment, I understand that it would be difficult to fertilize in early spring due to spring school activities. Therefore, your planned approach of applying fertilizers in early spring with a slow-release fertilizer would be an alternative choice. Assuming that you will continue to get green-up response from your late fall fertilization, an application of slow-release fertilizer in early spring (February/March) should help maintain turf quality.

In my opinion, since you would be applying in early spring, it would be necessary to apply at least 50 percent or higher of slow-release nitrogen to obtain sufficient residual. If late fall fertilization was made last year, consider using 50 percent slow-release nitrogen with 50 percent or less of quick-release in February/March to get some immediate green-up response.

Remember that soil type and exposure to extremes in moisture and temperature can also partially contribute to turf color, density and overall quality.

Concerning your wet areas, installing drainage tiles is the most effective remedy, although the system is time-consuming and expensive. If this is too expensive or impractical, consider installing vertical drainage systems. Drill vertical holes two to three ft. deep with a post-hole digger or an augur, and fill them with pea gravel, covering the top with soil and turf. It would be necessary to drill holes beyond hard

pan in order to drain the excess moisture out of the surface area.

Pruning elm trees

Problem: We have an American elm in need of pruning. When is the best time of year to do this? Are disease-carrying elm bark beetles attracted to pruning wounds? When is the best time to spray for these pests?

Solution: The best time for pruning elms would be in the late fall or winter. Reports indicate that elms pruned during July, August or September are more apt to get Dutch elm disease which is spread by elm bark beetles. Beetle emergence and number of brood per year may vary from one geographic location to another.

In general, adults emerge in late spring and may have two to three broods. Therefore, it is best not to prune during beetle activity period which may be from May to September, depending upon the region.

The answer to your second question is yes: the beetles are attracted to pruning wounds. As far as the timing for managing these pests, an understanding of beetle life history and their activity would be helpful. The European elm bark beetle and the native bark beetle are the two most important vectors in transmitting Dutch elm disease through their feeding activity. European elm bark beetles feed primarily on smaller branches on the upper crown. They overwinter as larvae in dead or dying trees and stumps, pupate in the spring and emerge as adults in late spring. Native bark beetles primarily feed on larger branch crotches, overwinter as an adult in dead or dying plants or stumps and emerge in spring.

It is important to provide target sprays where these beetles are feeding on the tree. A good coverage is very important.

Reports suggest that severely infected trees should be removed by May 1 and the remaining healthy trees should be protected by spraying for bark beetles and providing fungicide injections. Insecticide sprays should be applied prior to beetle emergence in spring. This would be before May 15 in most places. In addition, repeat applications may be necessary to manage the future broods (generally around July). Read and follow label specifications for best results.



Balakrishna Rao is Manager of Technical Resources for the Davey Tree Co., Kent, Ohio.

Questions should be mailed to Problem Management, LANDSCAPE MANAGEMENT, 7500 Old Oak Boulevard, Cleveland, OH 44130. Please allow 2-3 months for an answer to appear in the magazine.

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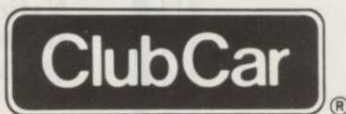
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Circle No. 106 on Reader Inquiry Card

PRODUCTS

Utility vehicle is a 'work-a-haulic'

The new Mule 1000 from Kawasaki is said to be a "work-a-haulic with lots of pizzazz to boot."

The machine is a cross between an all-terrain vehicle and a pick-up truck with a total load capacity of 1000 pounds. It will travel at speeds up to 25 mph.



The machine has applications on golf courses, schools, colleges, airports, city parks, resorts, hotels, sports stadiums and more.

A dual-mode differential is optional. With one flip of a dashboard lever, the operator can lock the differential so both rear wheels turn to-

gether for maximum traction. Unlocked, the wheels provide a tighter turning radius and minimal soil disturbance.

Circle No. 190 on Reader Inquiry Card

Disease detection kit enhances fungicide ability

Getting the jump on brown patch this year will be easier with Agri-Diagnostics' Turf Disease Detection Kit for brown patch. Catching the disease before visible symptoms appear increases the effectiveness Banner fungicide preventive applications.

Ciba-Geigy, producer of Banner, endorses the use of the brown patch and other turf disease detection kits in conjunction with an effective spray program. According to Ciba-Geigy, best results for Banner in 1987 resulted when applications were made before disease symptoms developed.

Agri-Diagnostics also makes pythium blight and dollar spot detection kits.

Circle No. 191 on Reader Inquiry Card

Turf fertilizer contains four nitrogen sources

Total fertilizer from the Doggett Corp. is a concentrated water soluble, liquid-applied formula containing four forms of nitrogen: nitrate for rapid uptake; ammonium and urea for moderately fast uptake and a percentage of ureaform for controlled release.

The formula also contains che-



lated iron and calcium. The formulation has a low salt index and is chloride free. The 35-5-6 formulation is designed for low-volume application.

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Circle No. 125 on Reader Inquiry Card

MAY 1988/LANDSCAPE MANAGEMENT 75

Sweeper line detailed on full color brochure

Parker Sweeper is offering a full color brochure detailing its Trailing Sweeper product line. The line includes the Hitch-N-Sweep, Arlington, Trailette, Suburbanite and Estate Master.

Trailing sweepers feature heavy-duty cast iron wheels, deep treaded tires, sintered iron pinion gears for added equipment life, tubular steel frame construction and heavy duty rear swivel casters for maximum basket support.

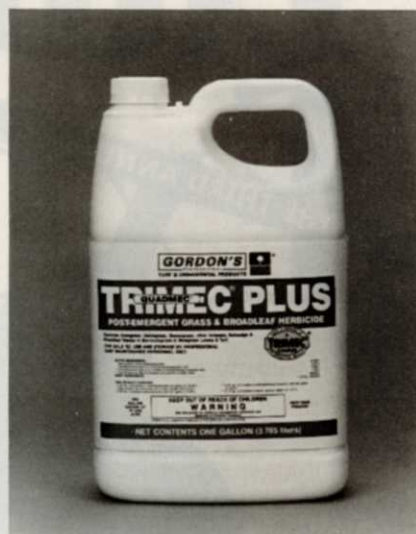
Three of the models feature the E-Z Dump basket. The basket is of tear- and mildew-resistant reinforced vinyl with a heavy gauge polypropylene bottom for long wear.

Circle No. 193 on Reader Inquiry Card

Post-emergent stops grassy, broadleaf weeds

Trimec-Plus from PBI-Gordon has post-emergence action on both grassy and broadleaf weeds. The Trimec/MSMA combination controls nut-

sedge, crabgrass, goosegrass, dallisgrass and other grassy weeds along with broadleaf weeds in turf.



The free-flowing formulation is labeled for use on Kentucky bluegrass and Bermudagrass lawns, and has tested safe on tall fescue and zoysiagrass, according to the company. It should not be used on St. Augustine, centipede or carpetgrass.

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Edger-Trimmer zooms up to 90 feet/min.

The Little Wonder Edger-Trimmer speeds along at up to 90 feet a minute with high performance cutting, according to its manufacturer.

With an easy adjustment, the blade



swings horizontal, converting the edger to a trimmer. Maximum durability is assured with a cast iron cutter head, rugged steel frame and a 10-inch hardened tool steel blade.

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Hand-Y-Kleen from Spectrum Technologies is a waterless hand cleaner designed to remove pesticide stains and residues. It also cleans grease, grime and oil stains.

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Hand-Y-Kleen is designed for pesticide applicators, growers and landscapers.



Circle No. 196 on Reader Inquiry Card

Forklift loads itself with landscape material

The Piggyback Material Handler from Teledyne Princeton lifts and loads sod and other landscape material and then loads itself onto a truck or trailer for transport home.



The Piggyback weighs 3,500 lbs. and can lift and load up to 5,500 lbs. It

turns quickly, carrying the weight between its drive wheels for stability on grades.

Options include two-stage mast, barrel clamp, scoop, concrete forks, hydraulic hole-digger and side-shifter.

Circle No. 197 on Reader Inquiry Card

Two-wheel lawn tractor improved for 1988

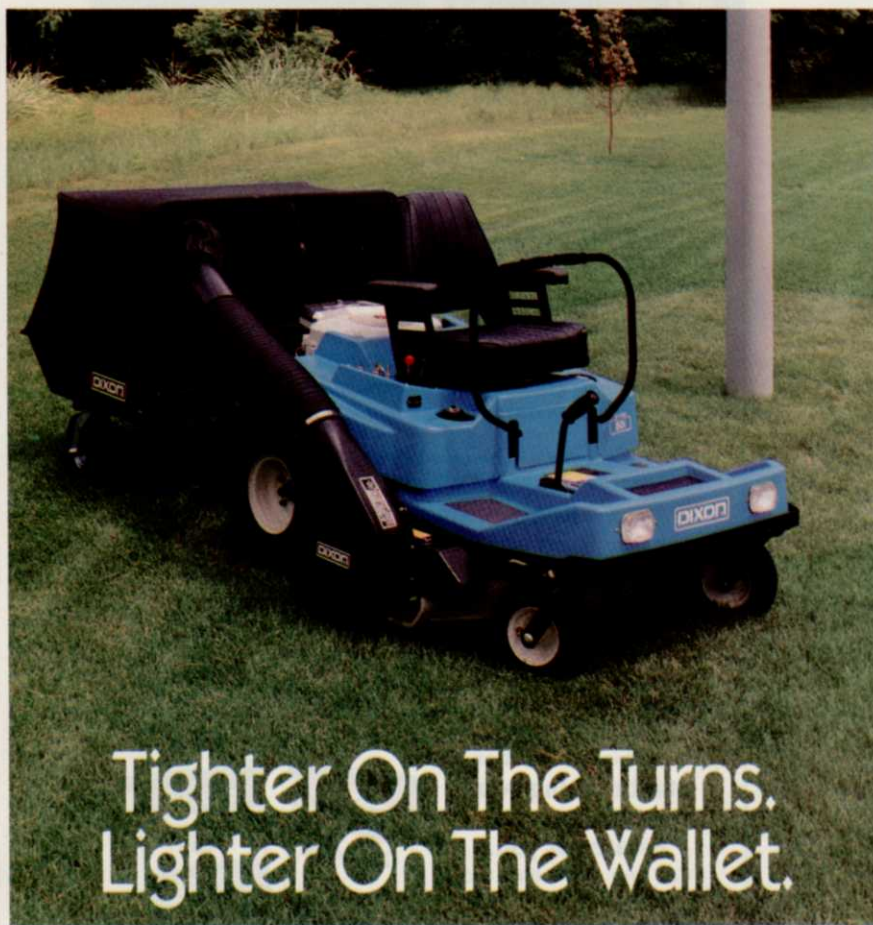
Gravely has improved its two-wheel lawn and garden tractor for 1988. Im-

provements include placing the control levers atop the handlebars, a PTO clutch brake and the addition of a positive shift two-speed range control.

The tractor also features a new positive shift PTO control, instrument panel grommets, and the option of an eight, 10, 12 or 16 hp Kohler engine. The warranty has been increased from one year to two years.

The electric start eight hp model features a slanted hood. All models have the option of an adjustable handlebar.

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Lebanon

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together when purchasing a business. A buyer, however, often will discount assets when purchasing a company for excessive usage or poor-to-no preventive maintenance practices. In addition, buyers often will discount assets in which they take no interest in owning. In this case, they are merely accommodating the seller by providing one source to dispose of the company.

In addition, a potential service company buyer who will not need your facility or assets will often propose a purchase price for the business

In using a weighing system, some purchasers look at individual account profitability or—in other instances—average revenue per account.

that is considerably below the market.

Individual assets such as inventory and accounts receivable are generally purchased at their current replacement or collection value. If you can sell the inventory above the price offered or feel that you can collect more of the accounts receivable than is being offered by the buyer in the deal, do not sell the assets.

Summary

The valuation of many service companies in the green industry requires more than just an accounting review of the numbers. An in-depth knowledge of the industry, the potential in the market place, the image and reputation of the company, the skill and quality of the employees, the valuation of the assets being offered for sale, all come together in determining the complete valuation of the company.

Determining the value for your company is a multifaceted project that should be done by a professional. The fee for these services usually ranges between \$1,000 and \$5,000 and will include a range of value for the company. This valuation is often referred to in the merger and acquisition industry as the floor or ceiling price for a company and should serve as a guide in the selling or buying of a company or in the setting of a value to transfer the ownership of a company for estate planning purposes.

LM

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HELP WANTED

Equipment Sales, New Jersey machinery manufacturer seeking aggressive individual with mechanical and horticultural aptitude for sales position. Primary responsibility will be inside sales, however, travel will be required. Company offers excellent benefits and profit sharing. Send resume to LM Box 450. 5/88

IRRIGATION DIVISION MANAGER: Relocate to beautiful Minnesota. Top Mpls. commercial landscape co. needs experienced irrigation professional familiar with all aspects of design and installation. Salary and benefits commensurate with ability and experience. Position immediately available. Send work/salary history to: Minnesota Valley Landscape, 9700 W. Bush Lk. Rd., Mpls., MN 55438. (612)944-1626. 5/88

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POSITIONS AVAILABLE for motivated individuals at all levels in growing landscape company. Full-time or part-time, seasonal or year round. Long Island Green, Inc., South Hampton, NY 516-283-8075. 6/88

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Corporate Recruiter
Ever-Green Lawns Corp.
1390 Charlestown Ind. Dr.
St. Charles, MO 63303

Landscape Supervisor: Established Michigan Contractor looking for self-motivated individual with 5 years minimum experience to manage crews and oversee landscape installation. Send resume and salary requirements to: DeAngelis Landscape Incorporated, 22425 Van Horn Road, Woodhaven, Michigan 48183. 5/88

IRRIGATION. General managers, foremen, installers. We seek ambitious people who want to move up the ladder. Our training schedule allows you to advance quickly. We have opportunities in five midwest locations. Send us your resume and objectives. The Lawn Pros Sprinkler Co., 3508B Roger B. Chaffee Blvd., Grand Rapids, MI 49508. 12/88

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Ideal candidate will have a college degree in horticulture or a related field and a strong desire to succeed. Previous sales experience is a plus.

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Orkin Lawn Care Division is looking for managers to manage in Florida. Orkin now has ten branches in Florida with plans to expand. Excellent opportunity to develop into multi-branch responsibilities. If you are an experienced green industry manager who seems stagnated in their present job or a person who is tired of the cold weather and seasonality of the business, we may have just what you are looking for. Excellent opportunities and advancement potential also for Service Managers, Sales Managers and Turf Specialists. Send your inquiries and resumes to Paul Ferrara at 957 1/2 N. Pennsylvania Ave., Suite 202, Winter Park, Florida 32789 or call (305) 740-6872. 6/88

JOIN THE AMERICAN TEAM - And go for the gold...Aggressive landscape company looking for aggressive career minded winners of landscape/irrigation sales; estimating; purchasing; supervision nursery production and sales. Salary and benefits commensurate with experience. Equal opportunity employer. Send resume to Mickey Strauss, American Landscape Companies, 7949 Deering Ave., Canoga Park, CA 91304 (818)999-2041. 5/88

Lawn sprinkler company needs experienced and dependable foreman. Year-round work. \$25,000 minimum salary with excellent benefits. Send resume to Trost Irrigation, Inc. 2551 W. Auburn, Auburn Hills, MI 48057 (313) 853-5151. 6/88

PERSONNEL: Hydro Lawn, a Mid-Atlantic full service lawn care company is accepting applications for Sales/Customer Service management positions. Applicants must be aggressive, responsible, neat and experienced in sales/customer service. Compensation from \$25-35,000 plus full benefit package. Send resume to: Hydro Lawn, Inc., 7905 Airport Road, Gaithersburg, Maryland 20879. TF

TRAINEES & FOREMEN: Washington D.C. area design-build firm is looking for career minded individuals who want to learn top of the line residential landscaping-construction, planting & landscape maintenance. We need professionals who are willing to work and can produce. We work a 4-5 day week and offer good pay with benefits. Send resume with references to: Garden Gate Landscaping, 821 Norwood Road, Silver Springs, MD 20904. Attn: Jim Seipel. 5/88

Established Central Florida landscape contractor has an opening for a highly qualified operations manager for its maintenance division. Ability to schedule, organize and manage people in a rapidly growing organization. Heavy field experience and a commitment to quality work required. Opportunity for an aggressive person to be a key member of a top-notch team. Excellent salary and benefits. Call Mr. Singh (305) 831-8101. 5/88

HELP WANTED - Fine Grade Box Operator - Expanding landscape firm in Northern Virginia area seeks knowledgeable individuals for permanent position. Salary commensurate with experience; many benefits plus bonus opportunities. Send resume with complete background experience to: S. Burton & Co., Inc., P.O. Box 147, Hartwood, Virginia 22471. 6/88

We are looking for a Landscape Foreman with experience in leading and working with installation crews. Duties include job estimating, reading blueprints, staking jobs, and pruning. We are located in the heart of the Blue Grass State of Kentucky. Family owned business since 1841. Benefits include paid vacation after 1 year, health insurance plus profit sharing. Your salary is negotiable depending on experience. Contact Stephen Hillenmeyer, C/O Hillenmeyer Nursery, 2370 Sandersville Road, Lexington, KY 40511. 5/88

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1987 Landscape
Manager of the year
Michael Hugg

Entry forms are now being accepted by the Professional Grounds Management Society and Landscape Management magazine for their second annual "Landscape Manager of the Year" award.

Purpose of the award is to recognize superior job performance among landscape managers, to challenge those involved in the industry to achieve higher standards of excellence, and to bring national recognition to deserving managers.

Any person directly responsible for the professional maintenance of one or more landscapes is eligible to enter. Applicants will be judged according to job performance, honors and awards, procedures and philosophies, and contributions to the green industry. Applicants will be asked, at the time of entry, to submit four 5 x 7 black-and-white glossy photos and 10 color 35mm slides of current work areas with a short narrative on each.

(clip and mail)

Applicant's name

Title

Applicant's company

Official entry form should be sent to:

Name

Title

Company

Address

City/State

Zip Code

Mail to: PGMS, Landscape Manager of the Year, 1201 Galloway Ave., Suite 1E, Cockeysville, MD 21030

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MAINTENANCE SUPERVISOR - Responsible for maintenance of grounds, athletic fields, and buildings within municipal system. Supervises 15-30 employees. Salary: \$22,200 - \$24,300. Inquire: John Presensky, 705 East State Blvd., Ft. Wayne, IN 46805. 5/88

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104	118	132	146	160	174	188	202	216	230	244	258	272	286	300	314	328
105	119	133	147	161	175	189	203	217	231	245	259	273	287	301	315	329
106	120	134	148	162	176	190	204	218	232	246	260	274	288	302	316	330
107	121	135	149	163	177	191	205	219	233	247	261	275	289	303	317	331
108	122	136	150	164	178	192	206	220	234	248	262	276	290	304	318	332
109	123	137	151	165	179	193	207	221	235	249	263	277	291	305	319	333
110	124	138	152	166	180	194	208	222	236	250	264	278	292	306	320	334
111	125	139	153	167	181	195	209	223	237	251	265	279	293	307	321	335
112	126	140	154	168	182	196	210	224	238	252	266	280	294	308	322	336
113	127	141	155	169	183	197	211	225	239	253	267	281	295	309	323	337
114	128	142	156	170	184	198	212	226	240	254	268	282	296	310	324	338

LANDSCAPE MANAGEMENT

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0050 ☐ Cemeteries/memorial gardens
0060 ☐ Military installations & prisons
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B. CONTRACTORS/SERVICE COMPANIES/CONSULTANTS:

- 0105 ☐ Landscape contractors (installation & maintenance)
0110 ☐ Lawn care service companies
0125 ☐ Landscape architects
0135 ☐ Extension agents/consultants for horticulture
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(please specify) _____

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- 0205 ☐ Sod growers ☐ Other supplier (please specify)
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Landscape Maintenance Operation Manager - Florida's fastest growing landscape maintenance firm with operations in 3 cities is looking for an experienced, quality conscious maintenance professional. Applicants must have proven management ability, ability to communicate well with clients and employees and strong technical background. Opportunity for growth and responsibility advancement. Excellent salary and benefits. Call Mr. Khalsa at 305-831-8101. 6/88

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SALES MANAGER - A very aggressive person currently active as sales manager is needed to develop sales for an established and progressive (design/build landscape firm located in the Chicago western suburbs) firm. This person will work closely with a principal of the firm and eventually take over the top management position of vice president in charge of sales. Good salary. Compensation package tied to performance. Equity/ownership possible for the right person. We are interested in only experienced highly motivated professional individuals. Send resume to LM Box 447. TF

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"Our mowers are the backbone of our business. We use only Buntons."

*Jack Roberts, President
Environmental Landscape Services, Memphis*

"We run 16 crews with 80 people to provide the best care possible for large commercial properties," says Environmental Landscape Services president Jack Roberts. "We depend on our equipment to help us maintain our reputation as one of the best."

Roberts has experimented with other commercial mowers over the years, but now uses only Buntons. At last count he had 29 of them. Here's what the company's supervisors say about Buntun mowers.

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"We get years of hard use out of our mowers. All of our equipment is two-cycle, so maintenance is simple, there are no fuel mix-ups, we get added torque, and we don't burn up engines when we run them on steep hills," says John Sumner.

Dependability

"The dependability of the mower is incredible," says Leslie Clark. "The design is well thought out and the workmanship is the best I've ever seen. We know our Buntons will start in the morning, run all day and be ready to work tomorrow."

Quality Cut

"We provide a weed-free, scalp-free turf for the highest profile clients in town," says Paul Summers. "We're known for our quality of cut. With Buntun we always get the good, clean cut we need, even under the most demanding conditions."

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"Year after year, Buntun has proven to be a quality piece of equipment," says Gary Smith. "Serious thought and continuous research goes into all of our purchasing decisions, and we only buy equipment that takes care of us and our customers."

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Parks and Recreation Superintendent - City of South Bend, Indiana population 109,000. Responsible for direction of 68 parks, (1400 acres), 3 golf courses, 1 zoo, 3 recreation centers, 1 ice rink and 2 outdoor pools. \$4 (+) million budget. Salary: mid 30's. Four year degree in park & recreation required and 7 years experience in park administration, public administration or a related field. Closing date 5-27-88. Send resume to: City of South Bend Personnel Department, 1200 County-City Building, 227 W. Jefferson Blvd., South Bend, Indiana 46601. (219) 284-9124. Complete job description available upon request. Equal Opportunity Employer. 5/88

WANTED - Aggressive Manufacturer's Reps - Manufacturer of agricultural, golf course, municipal and lawn & garden spraying equipment is seeking qualified reps with experience in sprayer sales. Seeking nationwide network, exclusive territory contract, excellent technical support and top of the line equipment. Send resume and current line card to: The Broyhill Company, P.O. Box 475-CB, Dakota City, NE 68731-0475. Phone: 1-800-228-1003. 5/88

SALES MANAGER - Central Jersey Chemical Company seeks take charge sales pro, minimum 8-10 yrs. experience selling in Turf/Ornamental/Agricultural markets. College degree(s) preferred. Coordinate overall national sales programs - reports directly to CEO. Competitive salary and benefit package. Room for professional and personal growth and rewards. Send resume, including salary history information to LM Box 451. 5/88

Southwest's finest landscape management company seeking enthusiastic, motivated individual for Landscape Maintenance Supervisors position. Degree in related field or experience in maintenance and or installation. Opportunities available in Dallas, Houston, Fort Worth. Send resume/work history to: Personnel Administrator, Maintain, Inc., 2549 Southwell, Dallas, TX 75229. 5/88

MANAGER OF SUPPORT SERVICES - Mid-Level Management position, responsible for equipment maintenance, personnel coordination, administrative assistance, and coordination of services within municipal park system. Salary: \$24,500 - \$28,500. Inquire: Dennis Noak, 705 East State Blvd., Fort Wayne, IN 46805. 5/88

Landscape Architects/Supervisors (project foremen) to join a nationally acclaimed firm looking to expand into its second generation Long Island area supports a high budget landscape industry. Year round employment, company benefits and continuing education available. Experienced and aggressive people send resume to: **GOLDBERG & RODLER, INC.**, 216 East Main Street, Huntington, New York, 11743. 6/88

Florida Landscape Contractor in business 15 years, has an opening for an experienced landscape architect or highly qualified sales person to handle design build sales and business development. Applicant must be a self-starter and possess strong sales skills. Unlimited potential in a growing firm with a top notch track record. Contact Mr. Singh (305) 831-8101. 5/88

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1—Geiger Field Day and Symposium. Harleysville, Pa. Contact: Craig Advertising, 420 Glenwyth Rd., Wayne, PA 19087; (215) 687-8230.

9-12—Florida Nurserymen & Growers Association Annual Convention. Tradewinds Beach Resort, St. Petersburg, Fla. Contact: Beth Rapp, FNGA, 5401 Kirkman Rd., Ste. 650, Orlando, FL 32819; (305) 345-8137.

11—11th Annual Northern California Tree Trimmers Jamboree. Golden Gate Park, San Francisco. Contact: Diane Palacio, San Francisco Recreation and Park Department, McLaren Lodge, Golden Gate Park, San Francisco, CA 94117; (415) 558-4268.

16—Turf Seed/Pure Seed Testing Annual Field Day. Hubbard, Ore. Contact: Tom Stanley, Turf Seed Inc., P.O. Box 250, Hubbard, OR 97032; (503) 981-9571.

16—4th Annual Troubleshooting Seminar. University Theater, University of California, Riverside. Contact: Hartley Bennett, U.C. Cooperative

Extension Seminar Coordinator, P.O. Box 414, Wickenburg, AZ 85358; (602) 684-7308 or Ted Stamen at (714) 683-6491.

19-22—36th Annual Outdoor Power Equipment Institute. Silverado Country Club, Napa Valley, Calif. Contact: Sharon O'Brien, OPEI, 1901 L St., Suite 700, Washington, D.C. 20036; (202) 296-3484.

21—The Lawn Institute Annual Meeting. Westin Hotel, Seattle, Wash. Contact: Eliot C. Roberts, P.O. Box 108, Pleasant Hill, TN 38578; (615) 277-3722.

26-28—Missouri Association of Nurserymen's Annual Convention. Lodge of the Four Seasons, Lake Ozark, Mo. Contact: Pat Klapis, 7911 Spring Valley Rd., Raytown, MO 64138; (816) 353-1203.

27-29—Illinois State Nurserymen's Association Summer Conference. American Club, Kohler, Wisc. Contact: Randy Vogel, Hilton Suite 1702, Springfield, IL 62701; (217) 525-6222.

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A little lesson in politics

Those of you who made it this far in the magazine may have noticed a piece in our Green Industry News about the EPA (Environmental Protection Agency) banning diazinon on golf courses and sod farms. In looking at the ruling, a few questions popped into my mind on how that fine example of a "working" bureaucracy handled the case.



For starters, why is the EPA attacking golf courses and sod farms in the first place? They account for about 10 percent of all the diazinon used in the country annually. Admittedly, some bird kills involved diazinon, mostly from misapplication. But the EPA had already put diazinon into the Restricted Use category, cutting its recommended application rate in half. Also, the EPA used an industry-wide case study of kills to determine the fate of the users of 10 percent of the material. And none of the kills occurred on sod farms. Not only that, the applicators affected by the ruling, sod farmers and superintendents, are some of the most experienced and best trained applicators in the industry. The safest, that is.

Incidentally, the other 90 percent of the material is used by crop farmers, lawn care operators and homeowners.

Not trained professional commercial applicators. Homeowners. Doctors, lawyers, salesmen, whatever. Generally, these people don't know their pesticides from a hole in the ground. Many reason that if two pounds of a product per 1,000 is good, four pounds must

be better.

But this is where the politics really kicks in. The homeowners are a much larger group (of voters) than commercial applicators. If the homeowners get regulated, they might complain. Then they might find out which people (our legislators) allowed current EPA employees into regulatory decision-making positions. Then somebody might lose a job (get voted out of office or fired if the person is appointed to a position like, say, the EPA administrator). If the EPA weren't so paranoid about those "environmentalists" representing at most one percent of the population (probably less), then maybe, just once, they'd make an intelligent decision regarding proper use of pesticides. But I guess it doesn't work that way, does it? Nope. So what happens? The pros get burned, the homeowners do damage and the bureaucracy lives happily ever after.

Now, I give credit to Ciba-Geigy, the American Sod Producers Association and GCSAA, among others. They put up a good fight. But, sometimes it just doesn't matter. Maybe the green industry just needs to complain a bit louder.

Jeff Sobul, associate editor

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