

The
Penn
Pals:
Right
on
Course

Paul R. Latshaw, Superintendent
Wilmington CC, Montchanin, DE

The latest 'word' in bentgrass is PennLinks.

Paul Latshaw is spreading the word.

Paul Latshaw holds the distinction of being the only superintendent of golf clubs hosting 3 major tournaments. With Paul's reputation, expertise and candor, he's a powerful promoter for PennLinks.

"I know PennLinks to be the finest creeping bentgrass available. I know it's been time-tested on the North Course greens here at Wilmington Country Club since fall of 1984.

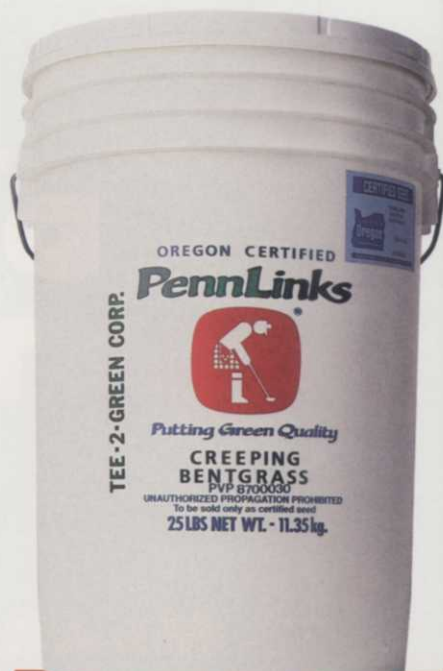
"I know PennLinks has an extensive root system, heat tolerance, and requires very little grooming or verticutting because of its upright growth.

"The upright growth habit convinced me to oversee the fairways at Wilmington. I know time will prove I made the right choice. And I like that, too.

"PennLinks. Spread the word."

Paul Latshaw

Circle No. 126 on Reader Inquiry Card



Tee-2-Green Corp.

PO Box 250
Hubbard, OR 97032
1-503-981-9574
FAX 503-981-5626
1-800-547-0255

LANDSCAPE MANAGEMENT

is a proud member of these
green industry professional
organizations:

ALCA

Associated Landscape Contractors of
America, 405 N. Washington St., Falls
Church, VA 22046; (703) 241-4004.

American Sod Producers Association, 1855-
A Hicks Rd., Rolling Meadows, IL 60008;
(708) 705-9898.



Golf Course Superintendents Association of
America, 1421 Research Park Dr., Lawrence,
KS 66049-3859; (913) 841-2240.

International Society of Arboriculture, P.O.
Box 908, Urbana, IL 61801; (217) 328-2032.

International Turfgrass Society, Crop & Soil
Environmental Sciences, VPI-SU,
Blacksburg, VA 24061-0403; (703) 231-9796.

National Arborist Association, The Meeting
Place Mall, P.O. Box 1094, Amherst, NH
03031-1094; (603) 673-3311.

National Golf Foundation, 1150 South U.S.
Highway One, Jupiter, FL 33477; (407) 744-
6006.

Ohio Turfgrass Foundation, 2021 Coffey
Rd., Columbus, OH 43210; (614) 292-2601.

PGMS

Professional Grounds Management Society,
10402 Ridgland Rd., Suite 4, Cockeysville,
MD 21030; (301) 667-1833.



Professional Lawn Care Association of
America, 1000 Johnson Ferry Rd., NE, Suite
C-135, Marietta, GA 30068-2112; (404) 977-
5222.

Responsible Industry for a Sound
Environment, 1155 15th St. NW,
Washington, D.C. 20005; (202) 296-6085.



Sports Turf Managers Association, P.O. Box
98056, Las Vegas, NV 89193-8056; (702)
739-8052.

Turf and Ornamental Communicators
Association, 8500 Normandale Lake Blvd.,
Suite 1200, Bloomington, MN 55437; (612)
831-8515.

AS WE SEE IT

JERRY ROCHE, EDITOR-IN-CHIEF



Sales: so detestable a function of our jobs?

Our company's version of Willy Loman was a crusty old coot (long since retired) who never once attended a sales seminar, for two reasons:

1) he believed there was nothing those high-priced consultants could tell him that he didn't already know; and

2) seminars tended to take away time that was usually—and better—spent with customers.

When you walked into his office, the first thing you had to see was a large sign that hung behind his desk. It read:

"Sales is not the entire company, but everybody in the company had better be in sales."

Or something to that effect.

At the time, it was considered trite. But now it's a sign of the times.

Salesmanship is a function of every person in your organization, from the very top to the very newest line-level hiree. The current economy dictates it—whether you like it or not.

Salesmanship extends beyond the scheduled encounter between your senior sales representative and a potential customer. Most times, in fact, the "hard sell" might get the customer—but it's the "soft sell" that keeps the customer.

● It's the seasonal employee mowing a lawn or golf hole who goes out of his or her way to smile and tell the customer or golfer to "Have a nice day."

● It's the company president or golf course superintendent who makes an unscheduled stop at the customer's or greens chairman's home. Just to ask, "How can we do our job better?" or say "Thanks for your business."

● It's the secretary who sends out the Christmas cards and writes a personal note on each and every one.

● It's the customer service manager who doesn't get rattled when someone calls with a complaint, but instead gets to the root of the problem and immediately

solves it to the customer's satisfaction.

Every day of the year, thousands of sales consultants give thousands of companies thousands of seminars. But what it always comes down to is this:

The customer is No.1. Keep him or her happy, you keep your job, you keep your profits.

This, of course, is not always an easy thing to do. Especially for many of us who would rather just crank up the mower and walk lawns, enjoying the fresh air all day.

But the sooner we realize that positive personal contact—with people who count—is the key to doing our jobs better, the sooner we'll be more secure in our positions and more profitable to boot.

We have to remember this all the time, especially when we're hiring new personnel.

The tendency is to hire the applicant who may not be acquainted with all the latest personal hygiene techniques, but who can mow 15 acres a day. The kind of person who gets on the grass, mows the hell out of it, and gets on to the next job. We tend to overlook the more presentable, outgoing person who can only mow, say, eight or nine acres a day.

But the latter person—the kind of person who will take a few minutes to just say hello or ask the customer how the property looks—is one who will ultimately be the savior of your business or your department.

It's not an easy thing, selling your services in this economy. But having everyone on staff helping you sure makes the job easier!

Jerry Roche

**NO
INTEREST
FINANCING 'TIL APRIL 1**

On all new John Deere Golf and Turf equipment.
Then finance as low as 5.75% APR. An impressive
lease package is also available. See your distributor
for details. Offer expires April 30, 1992.



This decision has them smiling at Semiahmoo

Quality maintenance is critical to the success of any golf course. That's why the owners of the Palmer-designed Semiahmoo golf course in Blaine, Washington, decided to go from contract maintenance to an in-house operation this year. Gordon Kiyokawa was their choice for superintendent. His choice of equipment was John Deere.

"I worked at PGA West, Carmel Valley Ranch and Hood River before this, so I knew what it would take to put

together a top-notch maintenance operation," says Kiyokawa. "One of my first jobs was purchasing the kind of equipment we'd need to get that job done. I went with John Deere because I had seen how it performed at some of these other courses.

"We now have 14 pieces of John Deere equipment including two 1200 Bunker



The 3325 Professional Turf Mower is one of 14 pieces of John Deere equipment that help Gordon Kiyokawa deliver top-notch conditions for players at the Palmer-designed Semiahmoo golf course in Blaine, Washington.

Rakes, one 3325 Turf Mower, two 2243 Triplex Greens Mowers and five AMT® 626 utility vehicles.

"Traction advantages were one of the reasons we went with the 3325. It rains 40-45 inches a year here, yet with the weight transfer and differential lock on the 3325, there hasn't been a day when it was too wet for it to work.

"Service support was also a big factor in my decision to go with John Deere. It's nice to know when you purchase something that you won't have to worry about it."

For the name of your distributor or free literature on John Deere Golf and Turf Equipment, call 1-800-544-2122 or write John Deere, Dept. 956, Moline, IL 61265.



NOTHING RUNS LIKE A DEERE®

LANDSCAPE MANAGEMENT

INCORPORATING LAWN CARE INDUSTRY

JANUARY 1992 VOL. 31, NO. 1

COVER FEATURE

8 Cover Story: Diagnosing turf problems

Facts and observations must be correlated to determine the causes of most turf problems.



14 LM Reports: Power blowers

More and more, anti-power blower feeling is surfacing in neighborhoods—affluent ones usually. The problem isn't with the machine, it's with the inconsiderate or careless operator.

Ron Hall

20 Mower care for quick spring starts

Don't just park 'em and leave 'em. Now's the time to get your mower fleet ready for storage, and ready for spring.

Terry McIver

22 Calculating mowing costs

Don't forget to add in your desired profit margin when calculating what to charge the customer!

26 Spring annuals for the landscape

Improved annuals have more color, uniformity and disease resistance. Your biggest concern is proper plant selection.

Dr. Lois Berg Stack

30 1991 Article Index

Feature articles which appeared in LANDSCAPE MANAGEMENT magazine during calendar 1991.

31 Tifton 57: re-inventing the wheel?

Although athletic fields will benefit mostly from this grass, other turfgrass areas suffering from intensive use might be wise to try it.

Tom Mascaro

32 National standards for public ball fields?

Beyond lining fields, filling holes, and reseeding, facility and parks/recreation managers must take a more critical look at the whole picture.

Ron Hall

33 Public relations through community education

Providing information on lawn chemicals to children, adults and community groups is a smart PR practice.

E.T. Wandtke

38 Fertilizing to protect water quality

Fertilizer product knowledge and familiarity with the site may help minimize or eliminate adverse impacts on water quality.

*Robert J. Mugaas, Michael L. Agnew,
Nick E. Christians*

40 The function of turf micronutrients

These small but mighty turf components control important plant functions. Deficiency symptoms are easy to spot.

42 Proper size, proportion of root balls

This article and chart, courtesy of the National Arbor Day Foundation and the American Association of Nurserymen, shows nursery stock buyers what to look for.



20

44 Lobbyist says 'keep writing'

PLCAA passes the hat and prepares for 'Day on the Hill' pilgrimage to meet with Washington, D.C. lawmakers.

Ron Hall

46 Determining customer wants

Do your front-line people spend 'quality time' on clients' lawns? That's one of the services most customers want.

Jerry Roche

48 Fewer entry-level prospects on horizon

Two of every three former corporate climbers re-enter the job market through small business, says Gerald Sweda, corporate training manager for O.M. Scott & Sons.

48 O.M. Scott into waste recycling

Getting rid of lawn and landscape waste is less of a problem for green industry professionals in some areas because O. M. Scott & Sons Company sees gold in black yard-waste compost.

Ron Hall

48 Maryland offers video training

DEPARTMENTS

1 As We See It

6 Ask the Expert

50 Hot Topics

56 Customer Service Tips

56 Events

58 Info-Center

60 Jobtalk

64 Product Spotlight

64 Product Showcase

69 Classified

70 Ad Index

LANDSCAPE MANAGEMENT

Edgell Communications, Inc.,
7500 Old Oak Blvd., Cleveland, OH 44130
(216) 243-8100 or (216) 891-2718
Fax: (216) 891-2675

EDITORIAL STAFF

JERRY ROCHE, Editor-in-Chief
TERRY MCIVER, Managing Editor
RON HALL, Senior Editor
MAUREEN HREHOICK, Group Editor

BUSINESS STAFF

JON MIDUCKI, Publisher
ROBERT EARLEY, Group Vice President
CAROL PETERSON, Production Manager
ROSY BRADLEY, Senior Production Manager
DEBI HARMER, Production Director
DAVE LYNAS, Graphic Design
DAVID KOMITAU, Graphic Coordinator
MARILYN COPP, Senior Circulation Clerk
GAIL PARENTEAU, Reader Service Manager
ADELE TOROK, Administrative Coordinator

ADVERTISING OFFICES

JON MIDUCKI, Publisher
ROBERT EARLEY, Group Vice President
JUDY ALLEN, Group Marketing Manager
ANN LANGHENRY, Central States Sales Manager
CYNTHIA GLADFELTER, Sales Manager
ADELE TOROK, Administrative Coordinator
7500 Old Oak Blvd., Cleveland, OH 44130
(216) 826-2855 (216) 826-2873
FAX (216) 891-2675
DICK GORE, East Coast Sales Manager
3475 Lenox Road NE Ste. 665
Atlanta, GA 30326
(404) 233-1817 FAX (404) 261-7422
ROBERT MIEROW, West Coast Representative
1515 NW 51st St., Seattle WA 98107
(206) 783-0549 FAX (206) 784-5545

EDGELL COMMUNICATIONS

Richard Swank: Chairman
Richard Moeller: President
Arland Hirman: Vice President/Treasurer
James Adler: Vice President
David T. Mayer: Vice President
Brian Nairn: Vice President
Phil Stocker: Vice President

LANDSCAPE MANAGEMENT is published monthly by Edgell Communications, Inc. Corporate and editorial offices: 7500 Old Oak Blvd., Cleveland, OH 44130. Advertising offices: 3475 Lenox Rd. NE, Suite 665, Atlanta, GA 30326 and 7500 Old Oak Blvd., Cleveland, OH 44130. Accounting, advertising production and circulation offices: 1 East First Street, Duluth, Minn. 55802. Subscription rates: \$30 per year in the United States; \$55 per year in Canada. All other countries: \$75 per year. Current issue single copies (pre-paid only): \$3.00 in the U.S.; \$6.00 in Canada; elsewhere \$8.00; add \$3.50 per order for shipping and handling. Back issues, if available, \$10; add \$3.50 per order for shipping and handling (pre-paid orders only). Office of publication: Edgell Communications, Inc., 1 East First Street, Duluth, Minn. 55802 and additional mailing offices. Copyright © 1991 by Edgell Communications, Inc. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the publisher. Canadian G.S.T. number: R-124213133. POSTMASTER: Send address changes to Landscape Management P.O. Box 6269 Duluth, Minn. 55806. Date effective: December 27, 1990.

VBPA

ABP

ASK THE EXPERT

DR. BALAKRISHNA RAO



Eliminating weeds in walkways

Problem: What can be used to manage weeds in cracks of driveways and sidewalks? (Ohio)

Solution: To manage existing weeds, a non-selective herbicide like Roundup is needed. To manage the future weeds from seeds, a pre-emergence herbicide like Surflan is needed. Therefore, if the weeds are already present, use a combination of Surflan plus Roundup. Avoid spraying or contacting any of the non-target, desirable plants, because Roundup can affect any plants it contacts.

Many weed seeds can remain viable in soil for 10-20 years; therefore, repeat applications may be needed after the residual effect of the pre-emergence herbicide is gone.

Read and follow label specifications for better results.

Soil test needed on new sod farm?

Problem: I am starting a sod farm. I've been told I don't need to test my soil; just use fertilizer containing trace minerals, etc. What do you think? (New York)

Solution: The best time to apply pH-correcting materials and immobile fertilizers such as phosphorus is before establishment. Only a soil test can determine the proper amount to apply for your soil conditions.

Pine bark beetles out in force

Problem: We are experiencing a pine bark beetle problem. We feel it is the Ips beetle. From our literature, we were unable to find any recommendations to manage these insects. Is there anything we can do to protect the healthy trees? (New York)

Solution: We have been getting many calls regarding pine bark beetle problems this year compared to past years. This is believed to be due to the exposure of these plants to moisture stress during the 1988 drought and again this year. These weakened trees are susceptible to beetle attack.

Ips beetle is one of the major insect problems reported from many parts of the northeastern states. To provide proper management, make sure that you are dealing with Ips beetle. Contact your local cooperative extension service to help identify the pest.

Ohio State University publications suggest the use of insecticides such as Dursban 4E (2 gal./100), or Dursban 50WP (16.5 lb./100 gal.); Lindane (20 percent liquid 3 gal./100 gal.) or Sevin SL (4 gal./100). They suggest treating the trunk surfaces when adults are active.

Engraver beetles (Ips beetles) may require several seasonal treatments. Healthy trees are usually not attacked. Spray trunks one to four times at one month intervals beginning in mid-May. In the North, Ips beetle has more than one generation, therefore

at least two treatments should be made—one in late May and again in late July.

Since there are no treatments found in Cornell University publications, check with your cooperative extension service personnel.

Infested trees should be promptly removed. Bury, de-bark or burn cut logs to prevent further spread of these insects. Provide proper watering, fertilizing, mulching and pest management as needed to help improve plant health.

Read and follow label specifications for better results.

Treating for millipedes

Problem: How do I eliminate millipedes around homes? (Michigan)

Solution: Millipedes are generally a nuisance pest. They are normally found outdoors in damp places under leaves and mulch. But sometimes they invade homes, particularly ground floors. Unlike centipedes, millipedes have round bodies and two pairs of legs for almost each body segment.

Since millipedes take their shelter under debris near home foundations, sanitizing by maintaining clean surroundings and/or hand picking is one way to manage them. If the population is too high for mechanical methods, apply insecticides such as malathion, Dursban or Sevin.

Read and follow label specifications for better results.

Managing Euonymus scale.

Problem: What is the best way to manage scales on Euonymus? The plant is severely covered with scales and leaves are showing yellowish discoloration. Are they worth keeping? (Ohio)

Solution: To manage Euonymus scales, use 2 percent Superior horticultural oil as a dormant treatment in the spring.

When the crawlers are emerging, usually around late May through mid-June, use insecticides such as malathion, Orthene, Dursban or Sevin and repeat two more times at 10-day intervals.

If the scale activity continues, repeat treatments as needed.

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

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

THE COMPLETE COMMERCIAL MOWING SYSTEM FROM "A" TO "Z"

Kubota has introduced a complete new mowing system, the FZ2100 Front Mower. From "A" – Auto Assist Differential (AAD) to "Z" – Zero Diameter Turning Radius (ZDT), it increases your power and mobility to handle all your mowing needs.

Equipped with 20 horsepower and four-wheel drive, the new FZ2100 Front Mower's zero diameter turning radius gives you the agility and power to get into the tightest spaces effectively. You can mow around trees, hedges, flower beds and other obstacles much more precisely and in less time. And, with the Auto Assist Differential drive system the machine automatically switches between 2WD and 4WD to match operating conditions and terrain, providing more traction and eliminating slippage. This increased productivity in all mowing conditions, and the FZ2100's ability to turn com-



Kubota's FZ2100 with Auto Assist Differential and Zero Diameter Turning Radius.

pletely around in one spot without damage to the turf, cuts way down the time spent on labor-intensive hand trimming jobs.

The FZ2100's front wheels rotate freely through your tightest turns, and Kubota

has designed round shoulder tires that virtually eliminate turf damage. And, the FZ2100 offers all the durability and innovation commercial operators have come to expect from Kubota. Like our powerful Kubota liquid-cooled diesel engine, hydrostatic transmission, 55 degree tilt deck for easy access and blade maintenance and optional grass catcher.

Your authorized Kubota dealer can show you the complete commercial mowing system with the power and maneuverability to handle your tough jobs from A to Z. For more information write to:

Kubota Tractor Corporation
P.O. Box 7020-Z
Compton, CA 90224-7020.



Kubota®

Dr. Harper:
Turf problems
may have
'roots' in the
past



COVER STORY

Diagnosing turf problems using Penn State's method

Facts and observations must be correlated to determine the causes of most turf problems.

■ Some turf problems have their "roots" in maintenance practices of previous years, making their diagnosis difficult, says Dr. John Harper II, professor emeritus at Penn State University.

"Seldom does the homeowner or the poorly informed part-time turfgrass superintendent recognize that there is a problem until considerable damage has occurred," says Harper. "It is virtually impossible to accurately diagnose the initial cause of some problems because the damage occurred so long ago that there is no identifiable symptom or causal agent present."

Dr. Harper says that, for correct diagnosis of turfgrass problems, a sturdy pocket knife, a good quality hand lens and a soil probe are *de rigueur*. Optional—but valuable—tools are a portable pH meter, a

portable microscope and a vial of pyrethrum to use as an insect irritant.

Turfgrass personnel at Penn State have devised their own checklist to help diagnose problems. Here is what they recommend:

1) Observe site conditions. Check the exposure and severity of slopes, the location of sidewalks, driveways and patios, drainage patterns, traffic distribution and locations of buildings and other structures.

Note the location, size and types of trees, how much shadow they cast, and their rooting pattern. Check prevailing winds, orientation of buildings in relation to the sun, and play areas.

2) Observe community symptoms. Note overall color of turf, any mottled appearance, patterns of dead or damaged turf, presence of weeds, conditions of adjoining turf areas, and general vigor and density of overall growth.

3) Determine the species and—if possible—varieties of grasses. Remember these levels of susceptibility:

- Some Kentucky bluegrasses are very susceptible to take-all diseases and/or stripe smut.

- Kentucky bluegrass and fine fescue varieties vary in leafspot susceptibility.

- Kentucky bluegrass (except Glade and Bensun) also has poor shade tolerance, and is powdery mildew-susceptible in the shade.

- Turf-type ryegrasses are very susceptible to brown patch and pythium.

- Fine fescues are very susceptible to red thread.

- Kentucky bluegrass varieties vary in chinch bug resistance.

- Tall fescue is highly resistant to chinch bugs.

- Grass species vary in drought resistance.

- Some Kentucky bluegrass varieties are highly rust-susceptible.

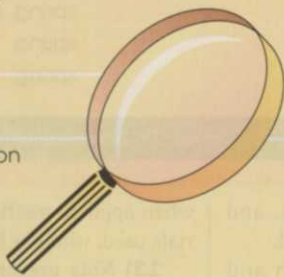
4) Evaluate vigor, density, amount and type of cover. Note whether growth is sparse or dense, the color, presence of chlorosis. Note types of weeds present and whether they are acid-loving plants.

5) Examine overall pattern of damage. (See chart.)

6) How did damage appear to spread? (See chart.) Note if it's most prominent on well-drained or poorly-drained areas, or

DIAGNOSING TURF PROBLEMS

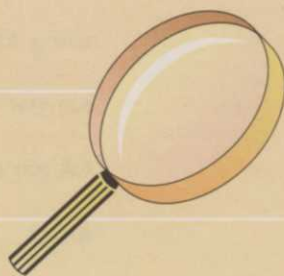
Symptom or conditions	Possible diagnosis	Prime season
Pattern of damage		
circular	disease	growing season
ring with undamaged grass on both sides	fairy ring	growing season
damage spread equally in all directions	fairy ring	growing season
straight lines or skips	over-application	growing season
	toxic material	growing season
follows drainage pattern	disease, especially pythium	summer
haphazard spread	sod webworm	growing season
Plant leaves		
white bands with brown margins	dollar spot	growing season
coral red strands at leaf tips	red thread	spring
pink cotton candy-appearing mycelium	pink patch	spring
red pustules full of spores	rust	summer
curled midvein covered with black spores	stripe smut	spring
irregular circular areas, purplish-black smoke ring at margins	brown patch	summer
acervuli with spines on leaves	anthracnose	summer
small white speckles on leaves	ozone or air pollutant	growing season
frog-eye appearance (dead circles with green centers)	necrotic ring spot or summer patch	summer
purple-red, straw-colored spots with brown margins	leafspot	spring, fall
purple-red, straw-colored spots with brown margins	crown and root rot	summer
circular patches of bleached matted grass with pink cast	pink snow mold	fall, spring
circular patches of bleached matted grass and black sclerotia	gray snow mold	spring
blue-green small circular patches of wilted grass	take-all disease	growing season
large silvery-tan bleached areas as snow melts	winter grain mite	early spring
surface runways, leaves chewed off as snow melts	field mice, voles	early spring
individual tufts of yellow grass	weevils	spring
yellow or dead leaves under trees	greenbugs	summer
powdery substance on Kentucky bluegrass, especially in shade	powdery mildew	growing season
chewing damage	bluegrass billbugs	spring, summer
	sod webworms	growing season
	hyperodes weevil	spring
sucking damage	chinch bugs	spring, summer
	greenbugs	growing season
burn or dehydration	fertilizer damage	growing season
	pesticide damage	growing season
	high temperature scald	summer
	wet or dry wilt	growing season
	dog damage	growing season
	gasoline spill	growing season
water-soaked or greasy appearance	disease, especially pythium	summer
	oil spill	growing season
torn or shredded tips	dull mower	growing season



Source: Dr. John Harper II, Penn State University

DIAGNOSING TURF PROBLEMS

Symptom or conditions	Possible diagnosis	Prime season	
Plant roots			
dark, discolored	water problem	growing season	
	physiological problem	growing season	
severed	white grubs	spring, late summer	
Soil and thatch			
bird holes	insects, especially cutworms, sod webworms, armyworms	growing season	
sod torn up	skunks, racoons, bears	spring, summer, late fall	
	vandalism	anytime	
mounds of soil	ants or moles	growing season	
excessive thatch	wetting and drying problems	growing season	
	poor air exchange	growing season	
	poor root development	growing season	
	abnormal growth habit	growing season	
	reduced chemical efficacy	growing season	
	insecticide binding	growing season	
Weather conditions			
cold, wet	snow molds	early spring	
	leaf spot	spring, fall	
	red thread	spring	
	low-temp. pythiums	spring	
	low-temp. brown patch	early spring	
	dollar spot	growing season	
hot, dry	chinch bugs	spring, late summer	
	white grubs	spring, late summer	
	dry wilt	growing season	
	take-all diseases	growing season	
	hot, wet	brown patch	summer
		pythium	summer
slime molds		late summer	
wet wilt		growing season	
scald		growing season	
sod webworms		growing season	
cool, moist shaded areas	greenbugs	growing season	
Unmowed areas			
presence of lawn moths	sod webworm	growing season	
Japanese beetles	grub damage	spring, late summer	
chafers	grub damage	spring, late summer	
black turfgrass weevils	grub damage	spring, early summer	
Hyperodes weevil	grub damage	spring	
June beetles	grub damage	spring	



Source: Dr. John Harper II, Penn State University

where thatch is heavy or minimal, or whether it appears to follow mower or foot traffic patterns.

7) Examine plant leaves. (See chart.) Note lesions, fruiting structures, symptom appearance.

8) Examine plant roots. (See chart.) In particular, note their color and health level.

9) Check soil and thatch. (See chart.)

10) Check mowing program. Determine height of cut, frequency of cut, sharp-

ness and adjustment of equipment, and whether a rotary or reel mower is used.

11) Check soil. Measure depth and determine type. Also note drainage, compaction or presence of buried materials.

12) Question materials application. Determine the fertilizer analysis, type of nitrogen, pre- or post-emergence herbicides, insecticides, fungicides, combinations and "miracle" products.

Note rates of application, conditions

when applied, method of application, materials used, whether they are watered in, etc.

13) Note presence of insects on ornamentals or in unmowed areas. (See chart.)

14) Note whether soil test has been made in past three years.

"The final step, of course, is to correlate all known facts, observations and weather conditions, and make the judgment of causes of damage and corrective measures to be taken," Dr. Harper concludes.