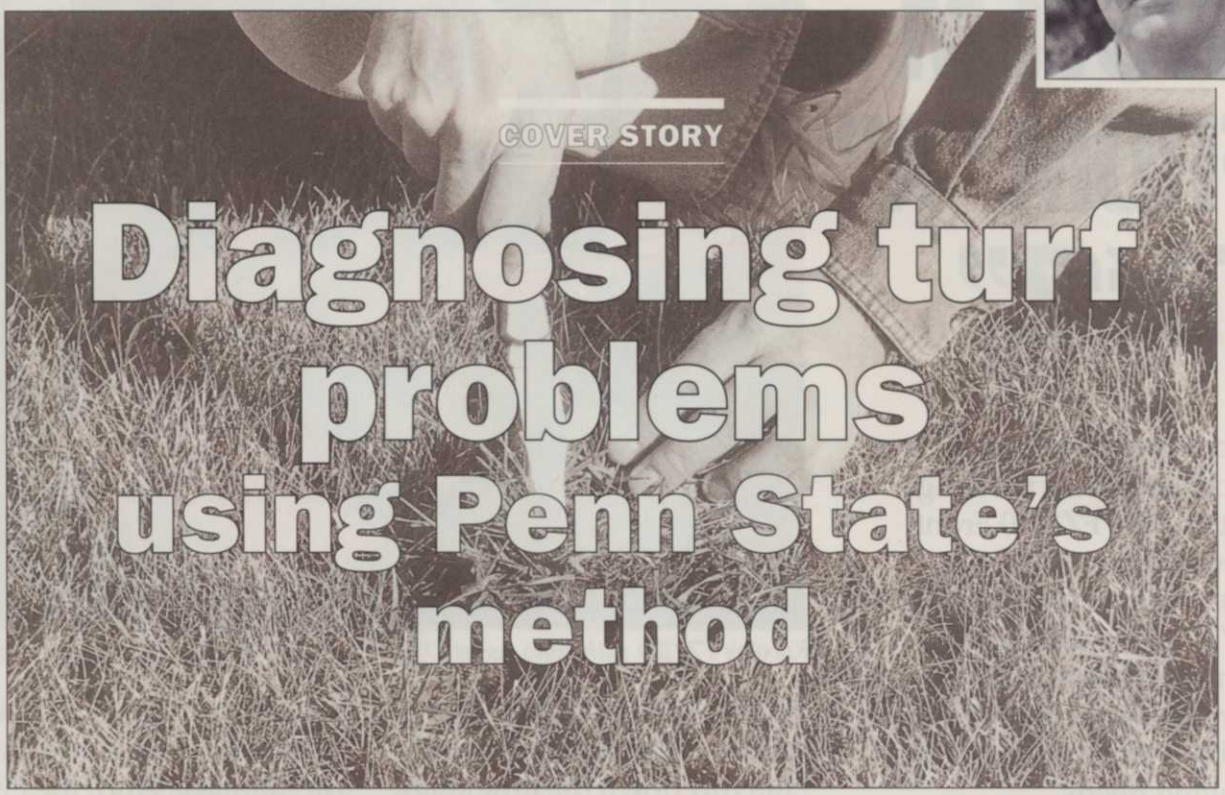
LANDSCAPE MANAGEMENT

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 rigeur*. Optional—yet 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.

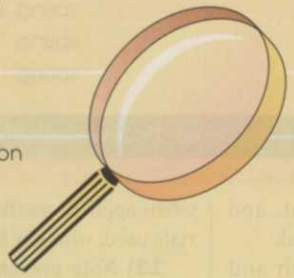
4) Evaluate vigor, density, amount and type of cover. Note whether growth is sparse or dense, the color, presence of chlorosis. Note types of weeds present and whether they are acid-loving plants.

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

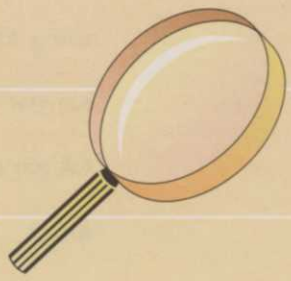
Symptom or conditions	Possible diagnosis	Prime season
Pattern of damage		
circular	disease	growing season
ring with undamaged grass on both sides	fairy ring	growing season
damage spread equally in all directions	fairy ring	growing season
straight lines or skips	over-application	growing season
	toxic 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



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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, sharpness 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.