

# Disease control in cool-season turf

by GAIL L. SCHUMANN, Ph.D./University of Massachusetts

**D**ifferent years result in different disease problems. 1996 was a relatively cool and wet year in most northern areas, and the predominant diseases reflected that. The season began with a period of recovery from the se-

for many weeks, especially where late-season, excess nitrogen applications have prolonged the growth of the grass.

## Snow molds are different

*Fusarium* patch, in particular, is more severe at high soil pH. Fall lime applications can exacerbate this disease. *Fusarium* patch is also different from

*Typhula* blight in that it is more likely to result in crown infection and the death of turf-grass plants. It can also become active with the first cool, wet weather of fall and last throughout cool, rainy springs even in the absence of snow. In the absence of snow, the primary symptom of

*Fusarium* patch is small, greasy patches similar to those caused by *Pythium* blight in the heat of summer. The fungus can easily be streaked by mowers causing added injury and confusing symptoms.

## Tip blight not severe

A stress disease most commonly observed in hot weather appeared in early summer at our research field plots in 1996. *Leptosphaerulina* blight is usually a minor tip blight which is mowed away once drier weather conditions prevail. The prolonged wet weather in early summer 1996 seemed to favor



Raise height of cut to battle brown patch.

vere snow mold in many areas.

## Deep, lasting snows

In the fall of 1995, long lasting snow fell on turfgrass that had not yet gone dormant in many sections of the Northeast. This created perfect conditions for snow mold fungi. These fungi prefer moist conditions and refrigerator temperatures. Two different diseases are commonly found: *Typhula* blight (also known as gray snow mold) and *Fusarium* patch (also known as pink snow mold), but both diseases are more severe when snow covers green grass in moist soil

## FUNGICIDE ACTIVE INGREDIENTS AND EXAMPLE TRADE

Active ingredient	Trade names
azoxystrobin	Heritage (50WG)
captan	Captan WP, Captec
chloroneb	Proturf Fungicide V (6.25 G), Teremec SP (65WP), Terraneb SP
chlorothalonil	Chlorothalonil, Daconil 2787 (4F), Daconil Ultrex (82.5WDG), Daconil Weather Stik (6F), Daconil (5G), Echo (500F, 75WDG), Manicure (4F, DG), Thaloniil (90DG)
cyproconazole	Sentinel (40WG)
etradiazole	Koban (30WP, 1.3G), Terrazole (35WP)
fenarimol	Rubigan (1AS)
fenarimol + chlorothalonil	Twosome (4F)
flutolanil	ProStar (50WP)
flutolanil + triadimefon	ProStar Plus (50WP)
fosetyl-al	Chipco Aliette Signature (80WDG), Prodigy (80WDG)
iprodione	Chipco 26019 (50WG, 2F), Proturf Fungicide X (1.3G)
mancozeb	Dithane T/O (75WP), Dithane (WF, 4F), Fore T/O (80WP, 4F), Protect T/O (80WP, WSB)
maneb	Maneb Plus Zinc (4F), Maneb (75DF)
mefenoxam	Subdue Maxx (2MEC)
metalaxyl	Proturf Pythium Control (1.2G)
metalaxyl + mancozeb	Pace
myclobutanil	Eagle (40WSP)
PCNB	Defend (4F, 10G, 75WP), Engage, Lesco PCNB (10G), Penstar (75WP, 10G), Penstar FLO, Revere (75DG), Terraclor (75WP), Turfcide (400F, 10G)

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## FUNGICIDE ACTIVE INGREDIENTS AND EXAMPLE TRADE

Active ingredient	Trade names
propamocarb	Banol (6L)
propiconazole	Banner Maxx (1.24MEC), Banner (41.8GL)
thiophanate-methyl	Cleary's 3336 (50W, WSP, 4.5F), Fungo Flo, Fungo (50WSB), Proturf Systemic Fungicide (2.3G), Systec 1998 (4.5F)
thiophanate-methyl + chlorothalonil	Consyst (66WDG)
thiophanate-methyl + chloroneb	Proturf Fungicide IX
thiophanate-methyl + iprodione	Proturf Fluid Fungicide
thiophanate-methyl + mancozeb	Duosan (80WP, 80WSP)
thiram	Lesco Thiram (75WDG), Spotrete (75WDG, 4F)
thiram + triadimefon	Proturf Fluid Fungicide III
triadimefon	Bayleton (25DF, 1G), Accost (1G)
triadimefon + metalaxyl	Proturf Fluid Fungicide II
vinclozolin	Curalan (50DF, 4F), Touche (4F), Vorlan (50DF, 4F)

Note: trade names of products commonly available in the Northeast are included for convenience. No endorsement is implied, nor is discrimination intended against similar materials. Use of certain fungicides is restricted in certain states or areas. Each product has specific use rates and intervals. Read and follow label specifications.

SOURCE: DR. SCHUMANN

it, leaving some bentgrass areas with a reddish look similar to anthracnose.

### Anthracnose at low heights

Anthracnose was by far the most common complaint in the Northeast in the summer of 1996. This stress disease is com-



Snow mold can last in rainy spring.

mon when excessive moisture combines with factors which slow the growth of the turfgrass. Although it is more common on annual bluegrass, it can also be found on bentgrass especially at low mowing heights and in compacted, nutrient-deficient soils. Superintendents who skipped spring core aeration reported increased problems with the disease, so they should consider spring coring.

Anthracnose is probably one of the most misdiagnosed turfgrass diseases. A certain di-

agnosis requires observation of the tiny hair-like structures (setae) produced in the fruiting bodies of the causal fungus. In recent years, the crown rot form of anthracnose has become more common. This is probably related to the fact

that stresses continue to increase in modern golf turf with longer playing seasons, greater number of rounds, lower mowing heights and increased compaction. Even when a fungicide effectively stops the growth of the fungus, recovery will be slow,

if it occurs at all, for plants with anthracnose crown rot.

### Red thread may persist

Lawn care professionals continue to struggle to control red thread. The fungus that causes red thread prefers cool conditions, but can remain active throughout the year at moderate temperatures in prolonged wet weather. In past years, applications of nitrogen fertilizer seemed to reduce the disease to acceptable levels, but some turf managers now

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## FOLIAR DISEASES- CULTURAL AND CHEMICAL MANAGEMENT

These diseases all begin with infection of the leaf blades. Minimize the time water remains on leaf blades through dew removal, proper irrigation timing, and pruning of landscape plants for air movement.

### Diseases generally worse under low nitrogen conditions

Disease	Cultural control	Fungicidal control
Anthracnose	Reduce compaction, raise mowing height.	azoxystrobin, chlorothalonil, cyproconazole, fenarimol, propiconazole, thiophanate-methyl, triadimefon
Dollar spot	Reduce compaction, raise mowing height.	mancozeb, maneb, myclobutanil, PCNB, proiconazole, thiophanate-methyl, thiram, triadimefon, vinclozolin
Red thread	Reduce compaction, irrigate.	azoxystrobin, chlorothalonil, cyproconazole, fenarimol, flutolanil, iprodione, mancozeb, myclobutanil, propiconazole, thiophanate-methyl, triadimefon, vinclozolin

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### Diseases generally worse under LOW nitrogen conditions

Disease	Cultural control	Fungicidal control
Rust	Reduce compaction, irrigate.	chlorothalonil, cyproconazole, mancozeb, maneb, myclobutanil, propiconazole, triadimefon

### Diseases generally worse under HIGH nitrogen conditions

Disease	Cultural control	Fungicidal control
Brown patch	Raise mowing height.	azoxystrobin, captan, chlorothalonil, cyproconazole, fenarimol, flutolanil, iprodione, mancozeb, maneb, myclobutanil, PCNB, propiconazole, thiophanate-methyl, thiram, tyriadimefon, vinclozolin
Snow molds: Fusarium patch (pink) Typhula blight (gray)	Allow turf to go dormant, remove snow where practical, avoid lime apps where fusarium is a problem.	for fusarium only: mancozeb, thiophanate-methyl typhula blight only: chloroneb; flutolanil; both snow molds: azoxystrobin, chlorothalonil, cyproconazole, fenarimol, iprodione, PCNB, propiconazole, triadimefon, thiram, vinclozolin
Bipolaris and <i>Drechslera</i>	Mow at height recommended for turf species.	azoxystrobin, captan, chlorothalonil, iprodione, mancozeb, maneb, myclobutanil, PCNB, propiconazole
Leaf spots	Avoid surface drainage; do not mow or irrigate when disease is active.	axoxystrobin, chloroneb, etradiazole, fosetyl-AL, mefenoxam, metalaxyl, propamocarb
Yellow patch (cool-season brown patch)	Improve drainage.	azoxystrobin, flutolanil, propiconazole

## ROOT DISEASES

Cultural practices which enhance root growth will reduce the effects of these diseases including aeration, improved drainage, and higher mowing heights. Fungicides are most effective when used preventively.

	Notes	Fungicides
Necrotic ring spot	Try brief mid-day irrigation in hot weather, use resistant cultivars.	Preventive: azoxystrobin, cyproconazole, fenarimol, myclobutanil, propiconazole Curative: thiophanate-methyl
Pythium root rot	Improve drainage, raise mowing height.	Fungicides that are effective for Pythium blight may be helpful, but check labels for legal uses.
Summer patch	Maintain 5.8-6.0 soil pH in root zone, raise mowing height in hot weather.	Preventive: azoxystrobin, cyproconazole, fenarimol, myclobutanil, propiconazole, triadimefon Curative: thiophanate-methyl
Take-all patch	Maintain 5.8-6.0 soil pH in root zone, most common in newly planted bentgrass.	Preventive: azoxystrobin, fenarimol, propiconazole, triadimefon

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find that fungicides are necessary in severe cases.

#### Gray leaf spot in warm temps

The hot, stressful weather in the summer of 1995 led to the destruction of perennial ryegrass fairways in the mid-Atlantic states. *Pyricularia grisea* causes gray leaf spot of both ryegrass and tall fescue in hot weather and appears to be a new threat to these turfgrasses.

Gray leaf spot was reported in Kentucky in late August of 1996, but the rela-



Dollar spot in Kentucky bluegrass. Note mycelium in turf.

tively cool season probably prevented major epidemics. Turfgrass managers should learn more about this potentially damaging disease if 1997 brings hotter weather.

#### Rust in high, moist turf

The last weeks of August in the Northeast brought a surprising dry spell of weather which slowed turf growth. Even though there was little rainfall, some days were foggy and moist for many hours. This resulted in severe rust outbreaks, especially in lawns and other turf areas that are not mowed frequently.

Rust is easily diagnosed by the presence of pustules of powdery orange spores. These begin to show up 10 to 14 days after spores have infected the leaf blades. This explains why rust is uncommon on frequently mowed turf. The leaf blades are mowed away before the rust has a chance to develop. Rust may weaken plants, but rarely kills them. In northern areas, the spores will not survive winter, so the turf should begin spring with a fresh start.

#### Fungicide news

Some new fungicides and new formulations of fungicides are available for the coming season. When new formulations are produced, it is important to read the revised labels carefully for new application recommendations and new rates. For example, *Daconil Weather Stik* is formulated at a 6F rate, which has a higher concentra-

tion of the active ingredient, chlorothalonil, than *Daconil 2787* which is a 4F.

There are now five DMI (sterol-inhibitor) fungicides available—cyproconazole (*Sentinel*), fenarimol (*Rubigan*), myclobutanil (*Eagle*), propiconazole (*Banner*), and triadimefon (*Bayleton*). It is important to know the chemical group or family of all fungicides you use. Repeated

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use of fungicides from the same chemical group can result in fungicide resistance. **Banner Maxx** and **Subdue Maxx** have been reformulated from emulsifiable concentrates, which are oil-based, to microemulsion concentrates. **Banner Maxx** has some new diseases added to its label including take-all patch. **Subdue Maxx** has a new active ingredient, mefenoxam, which

is an isomer of the previous ingredient metalaxyl. **Chipco Aliette Signature** (fosetyl-AI) has also been reformulated to allow more compatible tank-mixing with other fungicides.

**Azoxystrobin (Heritage)** is a newly registered fungicide with a different chemistry from existing fungicides. University research reports have shown excellent con-

*Anthracnose is probably one of the most misdiagnosed turfgrass diseases.*

*A correct diagnosis requires observation of the tiny hair-like structures (setae) produced in the fruiting bodies of the causal fungus.*

trol of many important turfgrass diseases including anthracnose, brown patch, red thread, snow molds, and summer patch. **Heritage** also has activity against *Pythium* blight which is unusual in a broad-spectrum fungicide. Turf managers should be aware that this fungicide, like many current products, has potential for resistance with repeated use and does not control dollar spot. At this time, it is registered only for golf courses, not lawn care.

#### **Aeration, drainage a good defense**

It is always difficult to predict potential disease problems for the coming season. Many midwestern states have had record snowfall, while the Northwest has received record-breaking storms of rain and snow. In many parts of the Northeast, it has been a mild, almost non-existent winter. The groundhogs in those areas seem to be right in their predictions for an early spring. If the weather warms up quickly, we may see early problems with summer diseases and more time for potential heat stress. Some of our most difficult diseases to control are stress-related. Concentrate on spring aeration programs and improving drainage where it is needed. Try to give the turf optimal growing conditions to help it withstand any potential weather-related stresses that may come later on. **LM**

*The author is an associate professor of turfgrass pathology at the University of Massachusetts. Charts and photographs courtesy Dr. Schumann.*

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