

Summer Patch

[*Magnaporthe poae*]

SYMPTOMS

The symptoms of summer patch appear in circular patches or rings, ranging from 6 inches to 3 feet in diameter. Turf within these patches is initially off-colored, prone to wilt, growing poorly, or sunken in the turf stand. Over a period of one to two weeks, the turf continues to decline, turning yellow or straw brown and eventually collapsing to the soil surface. The outer edges of the patch are usually orange or bronze when the disease is actively developing. Affected plants are easily pulled up from the turf, and visual examination reveals that the roots, crowns, and rhizomes are black and rotten. The patches recur in the same spot annually, and expand at a rate of 2 to 4 inches per year. Resistant grasses, such as creeping bentgrass, fescues, or weedy species, are often present in areas damaged by summer patch.



In temperate climates, creeping bentgrass is resistant to summer patch and often remains completely healthy when surrounding annual bluegrass is attacked. Creeping bentgrass can become prone to the disease when grown in high-pH soils (>7.0) and subjected to persistent heat stress. Several cases of summer patch have been documented on bentgrass putting greens in the transition zone of the United States.



summer patch crown rot on bentgrass

Characteristic	Description
Host Grass Species	creeping bentgrass, annual bluegrass, Kentucky bluegrass, fine fescue
Month(s) with symptoms	June to September
Stand Symptoms	spots, circles, patches (4 inches to greater than 3 feet), rings
Foliar Symptoms - Location/Shape	dieback from leaf tip, blighting of entire leaves
Foliar Symptoms - Color	tan, yellow, orange
Root/Crown Symptoms	roots, stolons, rhizomes, and/or crowns dark brown or black
Fungal Signs	none

Note: Still not sure if this is the right disease? The [Turfgrass Disease Identification](#) program may be helpful. Or consult the experts at the [Turf Diagnostics Lab](#). Check the TurfFiles [glossary](#) for definitions of unfamiliar terms.

FACTORS AFFECTING DISEASE DEVELOPMENT

The summer patch fungus begins to attack the roots, stolons, and rhizomes in the spring when soil temperatures reach 65°F. Summer patch symptoms are rarely seen during the early stages of disease development, instead, the symptoms appear in mid-summer after considerable damage has been done to the root system. Heat, drought stress, and nutrient deficiencies are the main factors that encourage the expression of summer patch symptoms. In North Carolina, the symptoms typically appear in early to mid-July.

Summer patch is most severe when soil pH is 6.5 or greater. In addition, any factor that restricts root growth will also enhance the disease. Excessive nitrogen in the spring, potassium deficiencies, poor soil drainage, over-irrigation, excessive thatch accumulation, and soil compaction have been shown to encourage summer patch development. Most of these factors reduce the growth and/or survival of turfgrass roots, thus causing the turf to be more susceptible to the disease.

CULTURAL CONTROL

Maintain soil pH between 6.0 and 6.5 to minimize summer patch development. Bluegrasses are less tolerant of low soil pH than other turfgrasses, so use caution when adjusting pH. Soil pH is best reduced slowly over time through use of an acidifying nitrogen source, such as ammonium sulfate or sulfur-coated urea. Avoid excessive nitrogen in the spring and fall, and mow at recommended heights to maximize root growth.

Frequent irrigation in the fall and spring will inhibit root development and increase the severity of summer patch. Use the [Turf Irrigation Management System](#) available on TurfFiles to schedule irrigation based on weather conditions and turf needs. Deep and infrequent watering will encourage the development of a deep, dense root system that is able to better withstand fungal attack.

Reduce thatch buildup and relieve soil compaction through aggressive aerification, vertical mowing, and topdressing. Frequent aerification is especially important in high traffic areas where the disease is most severe. When summer patch symptoms appear, increase mowing heights and the frequency of irrigation and fertilizer applications to minimize stress and compensate for damage to the root system.

CHEMICAL CONTROL

Fungicides are available for summer patch control, but they are most effective when applied on a preventative basis. For best results, fungicide applications should begin in spring when soil temperatures reach 65°F. Two to three applications on 28-day intervals provide excellent summer patch control in most situations. Fungicide applications should be made in a high volume of water (5 gallons per 1,000 square feet) or watered in with 1/8" to 1/4" inch of irrigation immediately after application.

Fungicide	Efficacy ⁽¹⁾	Resistance Risk ⁽²⁾	Class ⁽³⁾	Products ⁽⁴⁾
pyraclostrobin + boscalid**	++++	3	carboxamide + Qol	Honor
azoxystrobin + propiconazole	++++	3	DMI + Qol	Headway
fluoaxastrobin + myclobutanil	++++	3	DMI + Qol	Disarm M
chlorothalonil + fluoxastrobin**	++++	3	nitrile + Qol	Disarm C
azoxystrobin	++++	3	Qol	Heritage
fluoaxastrobin	++++	3	Qol	Disarm, Disarm G
mancozeb + myclobutanil**	+++	2	dithiocarbamate + DMI	Manhandle
metconazole	+++	2	DMI	Tourney
myclobutanil	+++	2	DMI	Eagle, Myclobutanil
propiconazole	+++	2	DMI	Banner MAXX, Kestrel, Kestrel MEX, ProPensity, Propiconazole, Propiconazole G-Pro, Propiconazole Pro, Savvi, Spectator, Strider
tebuconazole**	+++	2	DMI	Torque

Fungicide	Efficacy ⁽¹⁾	Resistance Risk ⁽²⁾	Class ⁽³⁾	Products ⁽⁴⁾
triadimefon	+++	2	DMI	Bayleton, Granular Turf Fungicide, Systemic Fungicide
triticonazole	+++	2	DMI	Trinity, Triton
chlorothalonil + propiconazole**	+++	2	DMI + nitrile	Concert
chlorothalonil + propiconazole + fludioxonil**	+++	2	DMI + nitrile + phenylpyrrole	Instrata
triadimefon + trifloxystrobin	+++	3	DMI + QoI	Armada, Tartan
trifloxystrobin	+++	3	QoI	Compass
thiophanate-methyl	++	3	benzimidazole	3336, Fungo, Systec, T-Bird, T-Storm, Tee-Off, TM
flutolanil + thiophanate-methyl	++	3	benzimidazole + carboxamide	SysStar
iprodione + thiophanate-methyl**	++	3	benzimidazole + dicarboxamide	26/36, Dovetail, Fluid Fungicide
chlorothalonil + thiophanate-methyl**	++	3	benzimidazole + nitrile	Spectro, ConSyst, Peregrine, Tee-1-Up, TM/C
fenarimol**	++	2	DMI	Rubigan
fludioxonil	++	1	phenylpyrrole	Medallion
pyraclostrobin	++	3	QoI	Insignia

** Not for application to residential lawns.

Footnotes:

(1) **Efficacy Codes:**

++++	excellent control when conditions are highly favorable for disease development
+++	good control when disease pressure is high, or excellent control when disease pressure is moderate
++	good control when disease pressure is moderate, excellent control when disease pressure is low
+	good control when disease pressure is low
0	does not provide adequate control under any conditions
?	cannot be rated due to insufficient data

(2) **Resistance Risk:**

- 1 Rotating and tank-mixing not necessary, but recommended to avoid potential side effects from continuous use of same chemical class.
- 2 Rotate to different chemical class after 3-4 applications; tank-mixing not necessary.
- 3 Rotate to different chemical class after 2-3 applications; tank-mixing not necessary.
- 4 Rotate to different chemical class after 1-2 applications; tank-mixing not necessary.
- 6 Rotate to different chemical class after 1-2 applications; tank-mixing with low or moderate risk product recommended.
- 9 Rotate to different chemical class after EVERY application; tank-mix with low or moderate risk product for EVERY application.

- (3) Continual use of fungicides with similar control mechanisms (modes of action) can result in fungi that are resistant to some chemicals. Poor or ineffective disease control can be expected when this occurs. Managers can reduce the chances of this happening by mixing or alternating fungicides belonging to different chemical classes.
- (4) Recommendations of specific chemicals are based upon information on the manufacturer's label and performance in a limited number of trials. Because environmental conditions and methods of application may vary widely, performance of the chemical will not always conform to the safety and pest control standards indicated by experimental data. When more than one brand name exists for an agricultural chemical, the name of brand that first came onto the market is listed first. Otherwise, brand names are listed in alphabetical order. The order in which brand names are given is not an indication of a recommendation or criticism.

Recommendations for the use of agricultural chemicals are included in this publication as a convenience to the reader. The use of brand names and any mention or listing of commercial products or services does not imply endorsement by North Carolina State University or discrimination against similar products or services not mentioned. Other brand names may be labeled for use on turfgrasses. Individuals who use agricultural chemicals are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Be sure to obtain current information about usage regulations and examine a current product label before applying any chemical. For assistance, contact your county's Cooperative Extension agent.

Useful links:

Glossary: <http://www.turffiles.ncsu.edu/Glossary.aspx>

Turf Diagnostics Lab: <http://ncstateturfdiagnostics.com/TDL/Home.html>

Turfgrass Disease Identification Program: <http://www.turffiles.ncsu.edu/diseaseID/>

Turfgrass Disease Management Program: <http://www.turffiles.ncsu.edu/diseasemgmt/>

Turf Irrigation Management System: <http://www.turffiles.ncsu.edu/tims/>

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