

Summer Patch

By Dr. Bruce Clark, Specialist in Turfgrass Pathology, Rutgers University.

Summer patch was first recognized as a disease of cool-season turfgrasses in 1984. Prior to that time, it was an identified component of Fusarium blight. Summer patch has been reported in North America on *Festuca glauca*, *F. longifolia*, *F. ovina*, *F. rubra*, *Poa Annua* and *P. pratensis*. The casual agent has also been isolated on occasion from *Agrotis palustris* and *Lolium perenne*. The disease generally occurs on turf that has been established for more than two years.

SYMPTOMS

On *P. pratensis*, symptoms first appear in early summer as small, circular patches of wilted turf 3 to 8 cm in diameter. Patches may enlarge to more than 60 cm, but generally remain in the 6 to 30 cm range. Affected leaves rapidly fade from a grayish-green to a light straw color during sustained hot weather (daytime highs 28-35C and nighttime temperatures exceeding 20C). Irregular patches, rings, frog-eye and crescent patterns may also develop and coalesce into large areas of blighted turf.

In mixed stands of *Agrotis* and *Poa* maintained under putting green conditions, patches are circular and range from 3 to 30 cm in diameter. As *P. annua* yellows and declines, *Agrotis* spp. frequently recolonize patch centers. On fairways and lawns, rings or frog-eye patches may not develop. In such cases, symptoms may appear as diffuse patterns of yellowed or straw-colored turf that are easily confused with heat stress, insect damage or other diseases. Infected roots, rhizomes, and crowns turn brown as they are killed. Examination of these tissues typically re-

(Continued on Page 9)



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Summer Patch—

(Continued from Page 7)

eals a network of sparse, dark brown to black, ectotrophic hyphae from which hyaline penetration hyphae invade the underlying vascular tissue. In the latter stages of infection, vascular discoloration and cortical rot are extensive. No fruiting structures have been observed under field conditions.

CASUAL AGENT

Magnaporthe poae Landschoot and Jackson, the casual agent of summer patch, is a newly described heterothallic fungus show anamorph had previously been misidentified as *Phialophor graminicola* (Deacon) J. Walker. The fungus forms dark brown to black, septate, ectotrophic runner hyphae on roots, crowns and rhizomes of turfgrass hosts. Perithecia, which have only been observed in culture, are black, spherical (252-556 um in diameter), and have long (357-756 um) cylindrical necks. Asci are unitunicate, cylindrical (63 x 108 um long), and bear eight ascospores. At maturity, ascospores are 23-42 um long and 4-6 um in diameter. Ascospores are tri-septate with two intermediate dark brown cells and two hyaline terminal cells.

On half strength PDA, mycelial growth is oppressed, olive brown to black, and curls back towards the center of the colony. Phialospores of the anamorph are hyaline, 3-8 um long, and 1-3 um wide. Hyphopodia are globose, dark brown and occasionally found in nature on stem bases and roots.

DISEASE CYCLE

The pathogen is believed to survive the winter months as mycelia in previously colonized plant debris and in perennial host tissue. Colonization and suppression of root growth has been shown to occur between 21 and 35C under controlled environmental conditions, with optimum disease development at 28C. In the field, infection commences in late spring when soil temperatures stabilize between 18 and 20C. The fungus moves from plant to plant by growing along roots and rhizomes, symptoms develop during a hot (30-35C), rainy weather or when high temperatures follow periods of heavy rainfall. Patches may continue to expand through the summer and early autumn and are often still evident the following growing season. Summer patch may be spread by aerification and dethatching equipment as well as by the transport of infected sod.

EPIDEMIOLOGY

Summer patch is most severe during hot, wet years and on poorly drained, compacted sites. Although heat stress plays an important role in disease development, drought stress is usually not a predisposing factor. Under ideal conditions, the casual agent can spread along roots, crowns and stem tissue at a rate of up to 3 cm per week. Symptom expression has been shown to increase with the use of arsenate herbicides, quick release nitrogen fertilizers and several contact fungicides. The disease is frequently stimulated when turfgrass is maintained under conditions of low mowing height and frequent, light irrigation. Soil pH, a major factor in the development of take-all patch, apparently does not affect the incidence of summer patch.

CONTROL

Because summer patch is a root disease, cultural practices that alleviate stress and promote root development will reduce disease severity. Since low mowing enhances symptom expression, avoid mowing turf below recommended heights, particularly during periods of heat stress. In the Northeast, symptoms are less apparent when lawns are maintained at a height of 5 to 7 cm, respectively. Fertilize turf with a slow release nitrogen source such as sulfur-coated urea. Irrigate deeply and as infrequently as possible without inducing drought stress. Syringing to reduce heat stress, aerification, improving drainage and reducing compaction are other practices that will aid in the control of this disease.

Overseeding affected areas with *L. perenne*, *F. arundinacea*, are resistant cultivars of *P. pratensis* represent one of the most cost-effective means of controlling

(Continued on Page 24)

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Fungicide/Growth Regulator Interaction

The use of related products can cause problems. In the past, use of three forms of a fungicide and low rates lead to the development of "Benlate Resistance." This is well documented and did occur in Minnesota, but I believe the development of resistant strains of Dollar Spot was not widespread and in many locations the MBC fungicides are still effective in controlling Dollar Spot.

The use of other related products can also result in problems and, after some calls about potential problems, I was able to determine that the concerns were about the use of the growth regulator TGR and Banner or sterol inhibiting fungicides. Ciba Geigy has data on very high rates of Banner on turf showing growth regulator effects. This rate is not labeled for use and would not be seen given the present label and use rates. The problem was reported when the growth regulator and the fungicide were applied at the highest rates at nearly the same time. With the use of these two products - Banner at the highest rate and TGR for Poa Control — a high rate is not compatible; however lower rates of both products, when used 5-7 days between applications, is OK. The use of Banner for Patch control, a high rate is recommended only with the low rate of

TGR with two weeks between application or if no TGR is being used. The recommended spacing of the application date is being studied this year.

The information on this interaction was provided by Ciba-Geigy and specifically deals with the two products Scott's TGR and Banner from Ciba-Geigy. I expect that an interaction of this type can occur with other related products also. Anyone using Plant Growth Regulators (PGR) and sterol inhibiting fungicides should carefully monitor the turf for symptoms and check with the supplier for the latest information. The development of symptoms in the northeast and DC area is believed to be mostly related to the PGR product at high label rate or above in environments that are stressful-hot and dry. The production of symptoms from fungicide application alone was very limited in tests this year and Banner did not kill *Poa annua*. I don't expect this interaction to be a problem in Minnesota and believe the danger of a similar outbreak to be very limited given our normal climate.

"Semper Graminis Morbidis"

— Ward Stienstra,

Department of Plant Pathology, University of Minnesota



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Jack Krech	Watowan Country Club	B to A
Kevan Tusa	Nordic Trails Golf Course	C to BII

Mike Olson, Membership Chairman

Summer Patch—

(Continued from Page 9)

summer patch. Use mixtures or blends of resistant turf cultivars or species for best results. Conversions of golf areas from *Poa* to *Agrotis* spp. will also reduce disease incidence.

Fungicides are available that can effectively control summer patch. Applications should commence on a preventative basis in late spring or early summer when soil temperatures stabilize between 18 and 20C. Systemic fungicides have proven to be most effective but must be applied at high label rates and repeated two to three times at 21-28 day intervals. Efficacy is enhanced when products are applied in at least 1600 L of water per hectare. Certain contact fungicides may stimulate symptom severity when used repeatedly at high rates.