# Some Like It Hot and Some Like It Cold

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Sooner or later a plant pathologist will start talking about the tripartite nature of plant disease (so here I go). The three sides of the triangle all need to be there for a plant disease to occur. The three sides of the triangle are the susceptible host, a hungry pathogen and a favorable environment. As our seasons change so does the list of evil pathogens that turfgrasses must battle. Some pathogens like it hot (e.g. pythium blight, summer patch and brown patch) and some pathogens like it cold (e.g. snow molds). This clearly illustrates that there is a turfgrass disease for every season.

There was a wide range of turfgrass disease samples that came into the UW-Madison Turfgrass Disease Diagnostic Lab from August 1 to October 10, 1995 (see table 1). *Poa annua* decline (PAD) was common throughout the state of Wisconsin in the month of August. To let you know that Wisconsin wasn't the only state which suffered, Dr. Randy Kane, a turf pathologist in the Chicago area, believes that their *Poa* losses were of historic proportions. I am not sure how our losses stack up with past ones, but it is safe to say that they were big. The high summer temperatures played a vital role in this phenomenon. PAD is believed to be caused by a combination of high soil temperatures and minor parasites/pathogens that feed on the weakened *Poa annua* root system. The roots of *Poa annua* start to die at elevated soil temperatures and the root losses decrease the foliage's ability to cool itself through transpiration. When this happens the canopy temperatures can exceed air temperatures and the entire sprig can die out.

High nematode populations were associated with one case of PAD. The other PAD sites were not assayed for presence of parasitic nematodes because nemas were assumed to be of minor significance in Wisconsin. However, this summer did mimic the hot weather of the southeastern U.S. where nematodes are of major concern. Dr. Ann MacGuidwin, nematologist in our department, did the assaying for the nematodes and Dr. Doug Maxwell used this case as a learning tool for our *Introduction to Plant Pathology* course.

Nematodes are important parasites of turfgrasses and they hold the distinction of being the only animals to cause turfgrass disorders. Nematodes are microscopic round worms ranging in size form 1/50 to 1/8 of an inch long. They must feed on living plants to complete their life cycle and are thus called obligate parasites. They damage turf by puncturing root cells with a needle-like structure called a stylet. This stylet allows nemas to feed on the root cell contents. Some scientists estimate that nematodes are the most abundant multicellular animal in the world! Fortunately for turfgrass managers very few are parasites of turfgrasses (less than 1% of all nemas). However, plant parasitic nematodes may have combined with other stresses to cause severe *Poa annua* and bentgrass losses this past summer. If you had significant PAD this summer it might be wise to submit a soil sample for a nematode assay in the spring. If you are interested in submitting a sample, please give me a call for the correct way to take a soil sample.

Rhizoctonia blight was also a major problem this summer. There were a few cases where the atypical symptoms of tufting confused many superintendents and me, too. Instead of the usual brown patch with a smoke ring, tufts of off-white to brown mycelia were present in blighted areas. This tufting was probably a result of the high temperatures and high humidity that seemed to shorten the application intervals of fungicides.

Anthracnose basal rot of bentgrass was also diagnosed for the first time in Wisconsin. Dr. Houston Couch calls this disease a senectopathic disorder or a "biotically incited disease that can only develop after plant tissue is in advanced senescence." (1). After seeing the damage caused by this

disease, I am not sure I can agree with Couch's senectopathoic disorder classification. In general, late summer was stressful for the turfgrass manager as well as the turfgrass itself.

Fall brought us cooler temperatures and a beautiful display of color. Unfortunately, some turfgrass managers were formally introduced to take-all this fall. The cool and wet conditions of fall triggered the take-all fungus, *Gaeumannomyces graminis var. avenae,* to produce its fruiting structure, a perithecium, on one sample submitted to the T.D.D.L. Also, lawn care operators battled a very strong necrotic ring spot pressure.

Now that the leaves have fallen and need to be raked into a pile, you are probably thinking about snow mold management. Snow molds are the last turfgrass enemies your turfgrass will face this year (so you had better do it right). For those of you who are planning snow mold management strategies, I have included disease profiles for the two major snow molds encountered in Wisconsin (pink snow mold and Typhula blight). The profiles are intended for quick reference only. Please read the entire product label before applying any fungicide.

As our seasons change so does the list of pathogens that turfgrasses must face. Wisconsin turfgrass managers saw PAD and summer patch in the hot summer months. We battled take-all and necrotic ring spot in the cool and wet fall. Now we are wondering about the impending snow mold pressure. There is a turfgrass disease for every season because some pathogens like it hot and some pathogens like it cold. Don't let this get you down though, because as any good plant pathologist will tell you, "plant diseases are the exception and not the rule." I predict that most of your turfgrass will be healthy.

References


1. Couch, H. B. 1995. Diseases of Turfgrasses. 3rd Edition. Krieger Publishing Co. Malabar, Fla.

2. Turf and Ornamental Chemicals Reference, 1995 edition. Chemical and Pharmaceutical Press.


Table 1. Frequency of turf problems submitted by turfgrass professionals to the T.D.D.L. from August 1 to October 10, 1995.

| Problem | Number |
|---|---|
| Diagnosed | |
| *Poa* decline | 13 |
| Rhizoctonia blight | 11 |
| necrotic ring spot | 8 |
| cultural/environmental | 6 |
| anthracnose of *Poa annua* | 4 |
| pythium | 4 |
| unknown patch | 2 |
| melting out | 2 |
| anthracnose basal rot of bentgrass | 2 |
| take-all | 2 |
| summer patch | 2 |
| yellow ring | 1 |
| rust | 1 |
| localized dry spot | 1 |
| yellow tuft | 1 |
| thatch | 1 |
| bacterial wilt of Kentucky bluegrass | 1 |

**Pink Snow Mold**

Cause: *Microdochium nivalis*

Fusarium patch is a common disease of cool-season grasses, especially ryegrass and bentgrass. This disease occurs during cool, humid, to cold, wet conditions. Snow is not necessary for development of this disease.

Symptoms: Pink, circular patches of diseased grass of two to six inches in diameter develop during prolonged periods of cool wet weather. If severe, spots may coalesce to form large areas of diseased turf.

Control: Maintain balanced fertility, mow frequently at appropriate cutting heights and avoid fertilization during periods of slow turfgrass growth in winter. Preventative and curative fungicide applications may be made if disease problems develop and are severe.

| Fungicide* | Product Rate/1000ft² | Application Interval (days) |
|---|---|---|
| L439 cyproconazole 40WG | 0.33 | before 1st snow fall |
| L346 chlorothalonil/fenarimol | 16 fl. oz. | 1-2 applications |
| L273 mancozeb DG 75 | 6-8 oz. | 14-28 |
| L162 fenarimol | 8 fl. oz. | 1-2 applications |
| L213 chlorothalonil 90WDG | 4.5-8 oz. | 21-28 (X 2) |
| L571 iprodione 1.3% | 0.5-1.5 oz. a.i. | 14-21 |
| L436 iprodione 23.3% | 4-8 oz. | before 1st snow fall |
| L433 iprodione 50% | 2-4 oz. | 14-21 before 1st snow fall |
| L487 mancozeb 75% | 6-8 oz. | 14-24 |
| L491, L254 mancozeb 37% | 9.6-12.8 fl. oz. | 14-24 |
| L497, L121 mancozeb 80% | 6-8 oz. | 14-24 |
| L120, L588, L641, L673, L307 PCNB 75WP | 8 oz./5-10 gal. H2O | before 1st snow fall |
| L119, L587, L562, L672 PCNB 10G | 5-7.5 lb | before 1st snow fall |
| L260 triadimefon 1 G | 7.5-12 lbs. | before 1st snow fall |
| L124, L338 thiram 75 WDG | 8 oz | 2 applications |
| L124 thiram 42% | 12 fl oz | 2 applications |
| L605, L341, L46 vinclozolin 4.17F | 2 fl. oz. | 10-21 |
| L49, L603 vinclozolin 50% | 2 oz. | 10-21 |

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**Typhula Blight**

Cause: *Typhula incarnata* (gray) and *T. ishikariensis* (speckled). Typhula blight is Wisconsin's number one turfgrass disease problem. Usually, northern areas of Wisconsin have speckled snow mold while the southern areas have gray snow mold.

Symptoms: Symptoms are noticed as the snow melts in the spring. White crusted patches of grass in which the leaf blades are matted and bleached. These patches can be inches or several feet in diameter.

Signs: The best way to identify this disease is by the presence of small (1 to 4 mm), hard, round and seed-like structures called sclerotia. These sclerotia are the reproductive structures of this fungus. Gray snow mold has bigger sclerotia than speckled snow mold and this is one way to tell them apart.

Control: Avoid tall grass going into winter. Avoid snow accumulation and prevent drifts by erecting snow fences. Do not apply quick release fertilizer after the top growth has ceased growing (after 3 consecutive days of mean daily air temperature of 50° F). Usually where fungicides are needed, one application around Thanksgiving is efficacious. Applying fungicides in the spring after patches are present is of no benefit.

| Fungicide* | Product Rate/1000ft2 | Application Interval (days) |
|---|---|---|
| L77 propiconazole 41.8% | 1 packet/ 5,000 ft2 | before 1st snow fall |
| L73 propiconazole 14.3% | 4 oz. | before 1st snow fall |
| L209 chlorothalonil 40.4% (mix w/ iprodione) | 8-16 fl. oz. | before 1st snow fall |
| L361 triadimefon 25% WSP | 4 oz. | before 1st snow fall |
| L346 chlorothalonil/ fenarimol | 16 fl. oz. | 1or more applications before 1st snow fall |
| L162 fenarimol 11.6 % | 8 fl. oz. | 2 applications |
| L213 chlorothalonil 90WDG | 4.5-9 oz | before 1st snow fall |
| L571 iprodione 1.3% | 0.5-1.5 oz. A.I. | 14-21 |
| L436 iprodione 23.3% | 4-8 oz. | before 1st snow fall |
| L433 iprodione 50% | 2-4 oz. | before 1st snow fall |
| L439 cyproconazole 40%WG | 0.33 | before 1st snow fall |
| L120, L588, L641, L673, L307 PCNB 75WP | 8 oz./5-10 gal. H2O | before 1st snow fall |
| L119, L587, L562, L672 PCNB 10G | 5-7.5 lb | before 1st snow fall |
| L260 triadimefon 1 G | 7.5-12 lbs. | before 1st snow fall |
| L124, L338 thiram 75 WDG | 8 oz | 2 applications |
| L124 thiram 42% | 12 fl oz | 2 applications |
| L21 flutolanil 50% | 4-6 oz. | before 1st snow fall |
| L605, L341, L46 vinclozolin 4.17F | 2 fl. oz. | 10-21 |
| L49, L603 vinclozolin 50% | 2 oz. | 10-21 |
| L568 chloroneb 6.25% | 3 -6lbs. | before 1st snow fall |

* The L#s refer to the label pages from the Turfgrass and Ornamental Chemical Reference (2).

# Calendar of Events

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| Nov 8,9 | Wisconsin Golf Turf Symposium *Hyatt/Milwaukee* |
| Dec 11,12 | WGCSA/GCSAA Regional Seminar *Fond du Lac* |
| Jan 9-11 | WI Turfgrass and Greenspace Expo *Holiday Inn/Madison* |
| Jan 22 | WGCSA/GCSAA Technical Seminar *Fond du Lac* |
| Jan 30,31 | WNA Winter Workshop *Oshkosh* |
| Feb 5-11 | GCSAA Golf Course Conference & Show *Orlando, FL* |
| Feb 19-24 | School of Turfgrass Management *UW Madison* |
| Feb 25-27 | WLF Winter Convention *Kohler* |
| March 4 | WGCSA Spring Business/Education Mtng. *Fond du Lac* |
| March 11-15 | UWEX Regional Turf School |