

Dollar Spot Management: Summary of Dollar Spot in 2000 And a Look to the Future

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This disease is known to be a problem on both cool and warm season grasses. In Ohio the disease is commonly found on creeping bentgrass and on bluegrass. A major concern is the severity of the disease on golf courses on the creeping bentgrass and annual bluegrass. The disease can impact turf usability/playability, the aesthetic quality, and if left unchecked dollar spot may result in death of infected plants.

Back to Basics of Plant Pathology

By reviewing the basic requirements for disease develop and the principles of plant pathology, it may be helpful to understand why dollar spot was such a severe problem last year, why the disease was so wide spread, and why management was so difficult. Remember the three requirements for disease development are: 1) a susceptible host, 2) presence of the pathogen, and 3) conducive environment. This is very simple and yet the interrelationship of these three elements is quite complex.

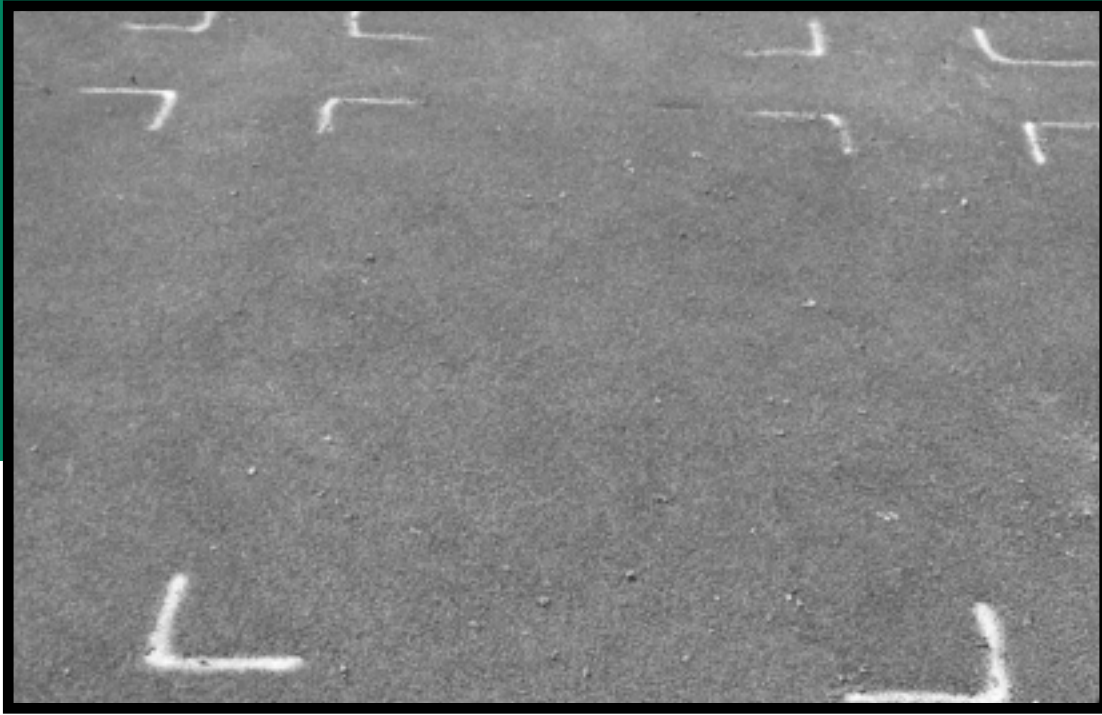
The Host—At this time there is no known “totally” resistant creeping bentgrass to dollar spot. In the future with genetic engineering, great advancements may be made in this area. When selecting a creeping bentgrass or Kentucky bluegrass give serious consideration to information available about the susceptibility to dollar spot. One resource is the National Turfgrass Evaluation Program (NTEP), check www.ntep.org for more information.

The Pathogen, is ambiguous and is present on all golf courses in Ohio. There is no shortage of the fungus and there is no practical way to eliminate it from turf. There have been questions about the development of new strains or races of the dollar spot pathogen. This may be occurring, however, at this time it is speculative. The OSU turfgrass pathology team is pursuing advances in DNA “fingerprinting” to identify different pathogens and changes in the pathogen population.

The Environment, this is often the crucial factor that tips the balance from manageable dollar spot to epidemic conditions. In 2000 there was nearly ideal weather conditions for the growth and development of the dollar spot pathogen. These conditions were stated early and were sustained most of the summer and into the fall.

Disease Development

New infections usually occur in late spring, early summer and again in autumn. Spots or damaged areas often fade over winter as the turf recovers, however, these infectious sites can reappear under spring conditions that are favorable for growth of the pathogen. Once the primary symptoms occur, there is often a rapid build up of disease. If the leaf tissue is invaded, and the disease becomes well established and advances into the stem tissue and crowns, often dead spots will develop. If this coincides with poor growing



Overview of dollar spot fungicide evaluation trials at OSU.

conditions for turf, recovery is slow and diseased areas fail to heal and the disease lingers for long periods of time. These damaged areas also provide inoculum for further spread of the disease. The pathogen has also been shown while actively growing to produce a material that is toxic to roots of bentgrass.

Favorable temperatures, growth is initiated at approximately 60°F with peak growth of the organism reached between 70–80°F. Remember these temperatures refer to the microclimate of the turf canopy. There are variations with different biotypes from different parts of the world.

Relative humidity at night greatly influences expansion of the disease. If night time relative humidity is 85% or higher, then conditions are ideal for rapid pathogen growth.

Excessive thatch levels provide an ideal site for the pathogen to be harbored. Research done by Halisky, Myers and Wagner, support the contention

that the fungus persists vegetatively in plant debris, and seasonal outbreaks are the result of favorable conditions for the pathogen. The mycelium grows from thatch and debris up into the turf canopy.

A Review of 2000

Average temperatures were milder than normal, and rainfall was above normal (see the following table for details of data for central Ohio). These moderate temperatures and long periods of wet turf, were nearly ideal for disease development through much of the summer and fall. Continuous favorable weather explains why the disease appeared to be out of control and so aggressive last year. In “normal” years high temperatures and dry conditions in mid summer would slow or suppress pathogen growth and advancement. June was warmer than normal and may have accelerated the onset of the disease.

Summary of weather in Columbus 2000	JUN	JUL	AUG	SEP	OCT	NOV
Average High Temperatures	81.9	82.3	82.3	76.1	69.8	49.5
Average Low Temperatures	61.0	61.8	60.6	55.0	46.2	33.4
Average Temperatures	71.7	72.4	71.5	64.5	56.9	41.4
Normal Average Temperatures	70.4	74.2	72.6	66.1	54.5	42.6
Total Monthly Precipitation	3.0	4.4	4.8	6.6	4.9	2.2
Normal Monthly Precipitation	4.5	4.7	3.7	2.9	2.4	3.1

Management

The following are some comments and general recommendations to keep in mind while planning a dollar spot management program. Now is the ideal time to implement a total turf health care management program. Some may refer to this as an IPM management program for dollar spot. The name is not important, but rather that all management factors are considered and the disease is addressed in a broader scope than just applying fungicides.

- 1. Fertilization Programs:** In many situations fertility programs are too low. Sand vs native soil is a key consideration. The turf needs to be growing to outgrow the disease and to recover from damage. If there is minimal growth, increase the fertilization.
- 2. Water Management:** These are two separate issues. First, make sure that there is adequate soil moisture to promote growth and vigor of the turf. Turf growing under moisture stress has been clearly demonstrated to be more susceptible to dollar spot. Secondly, minimize the time frame that the leaves are wet.
- 3. Dew removal** will dry the turf and reduce disease activity. Many techniques can be used. If irrigation is used assess the impact on water management and turf health. Many have implemented dew removal on fairways and report reduced disease.
- 4. Use of PGR's (Plant Growth Regulators):** Many individuals and researchers have noted no significant increases in dollar spot with the use of PGR'S on turfgrass. Others feel that they have seen increase diseases. The key factor with PGR's is to not use when turf is damaged or when there is a high likelihood of stress or damage to occur.
- 5. Thatch Management:** High or excessive levels of thatch will increase dollar spot severity. The thatch level impacts the survival, growth, and expansion of the pathogen.
- 6. Mowing:** Clipping removal may help remove some of the pathogen but also removes nutrients. Be sensitive to mowing schedules in relationship to the application of fungicides. It would be recommended to delay mowing for 24 hours after fungicide applications.
- 7. Genetic Susceptibility:** At this time there is no completely resistant or immune creeping bentgrass to dollar spot. However, there is a considerable variability in susceptibility. A more resistant bentgrass will not eliminate the need for fungicide applications but is an important tool for management of dollar spot.
- 8. Chemical Applications:** The misapplication or over use of various chemicals (herbicides, wetting agents, insecticide, etc.) used for turf management often will increase stress on turf and may increase dollar spot severity. Carefully consider what is used, what the material is doing to the turf, and proper application procedures.
- 9. Fungicide Programs and Applications:** Much has been written and said about proper fungicide applications for the most effective management of diseases, the following are just some items to keep in mind
 - Use common sense.
 - Read the label!!! There are more label changes all the time. The label contains key information for the successful use of the product.
 - Start applications before there is a wide out break of disease, once there is an epidemic it is very difficult to bring under control and for the turf to recover.
 - Rates, if there is active disease use the high label rate.
 - Time interval between applications, when diseases are active keep short and frequent.
 - Volume of water, low volumes often result in poor coverage. The ideal is 2 gallon per 1000 sq ft.
 - Nozzles, remember to select for complete coverage. This is especially important if using a contact fungicide.
 - Coordinate other maintenance activities, such as mowing, watering, etc to maximize turf health and the effectiveness of the fungicide application.

Summary: These are a few thoughts to consider in dollar spot management. Some items may be more applicable to your situation than others. If there are additional suggestions or comments please contact us.

Dollar Spot Control on Creeping Bentgrass (*Agrostis palustris* 'L-93')

The Ohio State University–Columbus, Ohio–2000

The impact of fungicides and fertilizer applications were evaluated on the curative and preventative control of dollar spot in creeping bentgrass. The test was conducted at The Ohio State University Turfgrass Research Center, Columbus, OH on a stand of creeping bentgrass established in 1997. The mowing height was 0.19 inches, clippings were removed, and the area was irrigated as needed. The condition of the turf was good with fair color, no thatch and good density. Fertilizer was applied on May 5 at 0.5 lb N/1000 sq ft with a 18-4-18. No other fertilizer was applied except for the treatments as noted in the results table. The soil was Crosby B silt loam with a pH 7.3. Individual plots measured 3 ft x 5 ft, with three replications, and were arranged in a randomized complete block design. All treatments were started on June 22 and ended on September 7.

Favorable environmental conditions for dollar spot occurred in late June to late July and again in mid August through the end of the study. These two periods of disease activity provided an opportunity to evaluate the treatments for both curative and preventative control of dollar spot. Relatively uniform disease symptoms were present over the area. Many of the fertility treatments had a significant reduction of disease. Even though the fertilizer treatments were not to the acceptable level for disease control, these treatments demonstrate the important role of fertilization in the management of this disease. It is important to note that any rating of 2% disease or greater was considered unacceptable. Curative data shows the importance of high rates when addressing active disease. Only one treatment resulted in some turfgrass phytotoxicity and that was Banner MAXX at the 2.0 oz with repeated applications.

Dollar Spot Control on Creeping Bentgrass (*Agrostis palustris* 'L-93')—2000

Treatment and rate/100 sq ft	Application Interval (days)	% of plot area infected with dollar spot					
		Curative ²			Preventative ³		
		06 JUL	12 JUL	20 JUL	31 AUG	07 SEP	14 SEP
Check (untreated)	—	4.3	3.3	2.0	5.0	9.0	14.0
710-132 5.0 fl oz	7	3.0	1.7	0.7	3.3	2.0	2.7
Turf Vigor 18 fl oz	7	2.3	1.3	1.0	3.3	6.0	5.0
Turf Vigor 18 fl oz	14	3.3	1.7	1.0	7.0	8.3	11.7
Urea (46-0-0) sprayed 2.8 oz (0.8 lbN/1000)	7	4.3	3.0	1.7	5.3	6.7	20.0
Touche 50EG 1.0 oz	14	2.3	1.3	0.7	0.7	0.0	1.0
Chipco 26GT 2SC 4.0 fl oz + Chipco Signature 80 WG 4.0 oz	14	0.3	0.0	0.0	0.3	0.3	0.3
Chipco Signature 80 WG 4.0 oz + Daconil Ultrex 82.5 WG 3.8 oz	14	1.0	0.3	0.3	0.3	0.0	0.0
Daconil Ultrex 82.5 WG 3.8 oz	14	0.3	0.3	0.7	0.3	0.0	0.0
Eagle 40 WP 0.6 oz	14	4.3	2.0	0.3	0.0	0.0	0.0
Fore Rainshield 80WP 8.0 oz	14	1.7	1.3	1.0	6.3	4.7	9.3
Bayleton 25DF 0.5 oz	14	3.7	1.7	1.3	0.0	0.0	0.0
Daconil Ultrex 82.5 WG 3.2 oz	14	1.0	1.0	1.0	0.7	0.0	0.3
Banner MAXX 1.24MEC 0.5 oz	14	1.7	1.0	1.0	0.0	0.0	0.3
Banner MAXX 1.24MEC 1.0 oz	14	1.3	0.7	0.3	0.0	0.0	0.0
Banner MAXX 1.24MEC 2.0 oz	14	0.3	0.0	0.0	0.0	0.0	0.0
Banner MAXX 1.24MEC 2.0 oz	21	0.3	0.0	0.0	0.0	0.0	0.0
Chipco 26GT 2SC 4.0 fl oz	14	0.3	0.0	0.0	0.7	0.3	0.0
Compass 50WG 0.15 oz	14	1.7	1.0	0.7	3.7	3.3	3.3
Heritage 50WG 0.4 oz	28	5.0	2.3	2.3	7.0	8.3	14.3
Compass 50WG 0.15 oz + Banner MAXX 1.24MEC 1.0 oz	14	5.0	4.3	2.7	0.0	0.0	0.0
Urea (46-0-0) 34.8 oz (1.0 lbN/1000)	56	2.3	1.3	0.7	5.3	6.7	6.3
Urea (46-0-0) 34.8 oz (1.0 lbN/1000)	28	2.3	1.7	0.7	3.7	5.7	6.3
Urea (46-0-0) 34.8 oz (1.0 lbN/1000)	14	4.0	1.7	1.0	3.3	5.0	4.0
Urea (46-0-0) spray 3.5 oz (0.1 lbN/1000)	7	5.3	2.7	1.7	5.7	5.7	10.7
LSD (P=0.05)		2.3	1.8	1.2	2.9	2.3	6.5

¹≥2% disease is unacceptable

²Diseases pressure was decreasing through the curative rating period.

³Diseases pressure was increasing through preventative rating period.