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Check the chart of comparative fungicide costs and you'll see for yourself why Daconil 2787 Flowable Fungicide is more economical to use than the other leading products.

Using a typical tee and green spray schedule, Daconil 2787 gives you greater savings on a per 1000 sq. ft. basis when it comes to delivering superior control of your most serious diseases — dollar spot (including benomyl-resistant dollar spot), Helminthosporium (leafspot and melting-out) and large brown patch.

In fact, Daconil 2787 has a proven record of providing the most effective control of 10 major turf diseases.

And here are more reasons why it pays to use Daconil 2787. There's no need to add a costly spreader/

sticker. Daconil 2787 already has it built in to assure you of full and even coverage for maximum disease protection.

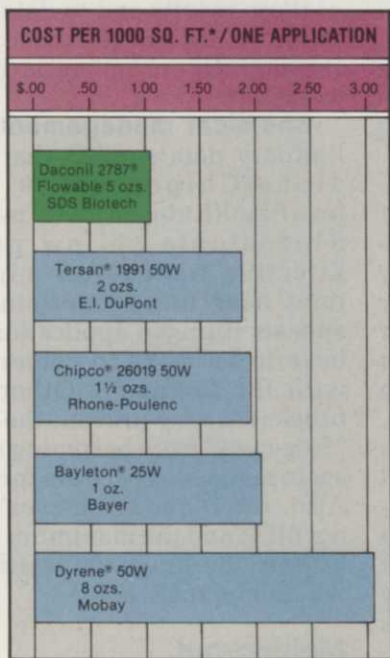
Daconil 2787 resists wash-off. Which means it keeps on working during heavy rains or watering.

What's more, in over 15 years of continuous use, there has never been a documented case of resistance with Daconil 2787. Even on courses where it was applied at weekly intervals over many years.

The facts are there. The proof is plain to see. Daconil 2787 gives you both effective and economical disease control.

So this season, make it Daconil 2787 on your tees and greens. Because the best costs less.

Daconil 2787 from SDS Biotech.



* Costs based on manufacturer suggested retail unit price as of January, 1984.

Daconil 2787® Flowable Fungicide



Always follow label directions carefully when using turf chemicals.



Agricultural Chemicals Business
SDS Biotech Corporation
7528 Auburn Road, P.O. Box 348
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tively or preventively.

The fourth fungicide, triadimefon (Bayleton), does not have to be drenched in to be effective. However, it does have to be used preventively. This means it has to be applied before the disease becomes active during the current season. This does not mean Bayleton cannot be used on turf areas that had the "Fusarium blight syndrome" the year before, only that it must be used before the disease becomes active this season.

Since more than one fungus appears to be involved in this syndrome, future research may indicate a difference in the effectiveness of these fungicides on the various fungi causing "Fusarium blight syndrome".

Yellow patch

Yellow patch is caused by *Rhizoctonia cereales* and is a newly recognized disease of Kentucky bluegrass. This is a cool weather disease that occurs in September through November, depending on your location.

The initial symptoms are red to purple leaves on the infected plants. The disease is characterized by "frog-eyes" which resemble the "Fusarium blight syndrome". Consequently, the disease is often mis-identified as Fusarium blight. The main differences between the two diseases are "Fusarium blight syndrome" occurs in warm weather and is characterized by wilting turf in the active spots, whereas yellow patch occurs in the cool weather of the fall and is characterized by the red blades on the infected grass plants.

Cultural management Nitrogen fertility during the growing season is necessary for recovery of the older yellow patch "frog-eyes" that were formed in previous seasons. The effect nitrogen has on development of new yellow patch "frog-eyes" has not been determined.

There are some products which claim to change the chemical and

biological activity of soil and thatch to make it a better environment for biological activity of beneficial microorganisms and healthier plant growth. Several products were tested for their management of *Rhizoctonia* yellow patch and some promoted excellent recovery of older yellow patch "frog-eyes" and prevented new ones from forming. They were Lawn Keeper and Green Majic. It is important to point out these are only preliminary findings and further research is needed to check the repeatability of these results and to determine rates, timing and the exact effect the products are having on disease reduction.

Chemical management Preliminary data suggest that iprodione (Chipco 26019) and fenarimol (Rubigan) will manage *Rhizoctonia* yellow patch. Effective timing and minimal rates have to be determined. It appears nitrogen application will have to be made in conjunction with the fungicide. Otherwise, fungicides may prevent the older "frog-eyes" from becoming active again and new ones from forming. Also, the older "frog-eyes" will not fill in and the maximum benefit from the fungicide treatments will not be realized.

Melting-out

This disease is often incorrectly referred to as leaf spot. To be correct, melting-out is caused by *Drechslera poae* (formerly *Helminthosporium vagans*) and is a disease of Kentucky bluegrass that occurs in the cool, wet weather of spring. The disease starts out as spots on the leaf blades and in a 2-3 week period, rapidly moves down the leaf sheath and into the crowns and roots. The entire grass plant is often killed or severely damaged during this period, which is where the term melting-out arises. The entire stand of Kentucky bluegrass seems to melt away.

Leaf spot, on the other hand, is

a warm weather disease of many grass species caused by the fungus *Drechslera sorokinianum* (formerly *Helminthosporium sativum* and sometimes currently referred to as *Bipolaris sorokinianum*). Are you thoroughly confused now? Don't feel bad, you're not alone.

There are many Kentucky bluegrass cultivars that are resistant to melting-out. The first resistant cultivar was 'Merion' which had excellent resistance to melting-out. Some of the newer Kentucky bluegrass cultivars, i.e. Parade, Baron, Cheri, Majestic, etc., have some resistance to melting-out, although it is not the same excellent resistance 'Merion' had. Consequently, stands of some of the newer Kentucky bluegrass cultivars may be thinned by melting-out in the spring, allowing for invasion by crabgrass, quackgrass, tall fescue and/or broadleaf weeds. This means cultural, biological and chemical management practices to reduce the severity of melting-out will have to be incorporated into your turf management programs.

Helminthosporium melting-out is one of the oldest, most written about, turfgrass diseases. Unfortunately, much of what has been written about the disease, is based on "folk law" and not good scientific data.

First, much of the older literature refers to melting-out having a "leaf spot stage" in the spring, during the cool, wet weather and a "melting-out stage" during the hot weather of the summer. Anyone who is familiar with the disease knows all the damage is done during the cool, wet weather of spring. With the arrival of warm weather the turf begins to recover.

Secondly, practically all the literature says to avoid spring nitrogen, because it will increase the severity of *Helminthosporium* melting-out. It appears the research that led to the erroneous conclusion was based on greenhouse data and not field. At Michigan State University, data from

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the last four years suggests just the opposite. Nitrogen in the spring actually reduces the severity of *Helminthosporium* melting-out. We recommend two nitrogen applications during the spring period to help manage *Helminthosporium* melting-out. Each application should be between 1/2-1 lb. of actual nitrogen/1000 sq. ft.

The third management practice is biological in nature. It consists of daily irrigation to keep the mat or thatch moist, to encourage the build up antagonistic microorganisms that prevent the fungus *D. poae* from sporulating, or germinating, or infecting. There is also a possibility that these antagonistic microorganisms may even destroy *D. poae*. While the details have not been worked out, the results have shown a dramatic reduction in the amount of *Helminthosporium* melting-out, where light daily irrigation has been applied.

The actual concept may be hard to grasp since the disease occurs under cool, wet weather conditions, but apparently just a few days without rain, allows the top of the thatch to become dry and allows the *D. Poae* fungus to grow and infect these grass plants. You aren't irrigating the turf, you are irrigating the thatch to keep it moist.

Following good cultural and biological practices will help improve the disease management obtained with the fungicides. For the people in the lawn care business, there are now three excellent fungicides which will manage *Helminthosporium* melting-out during the 3-4 weeks it is normally a problem in the spring; iprodione(Chipco 26019), vinclozolin(Vorlan), and chlorothalonil(Daconil). There is a possibility that anilazine(Dyrene) may also manage the disease for the desired period of time, although more research is needed. Remember, applying these fungicides with a little nitrogen will make them more effective.

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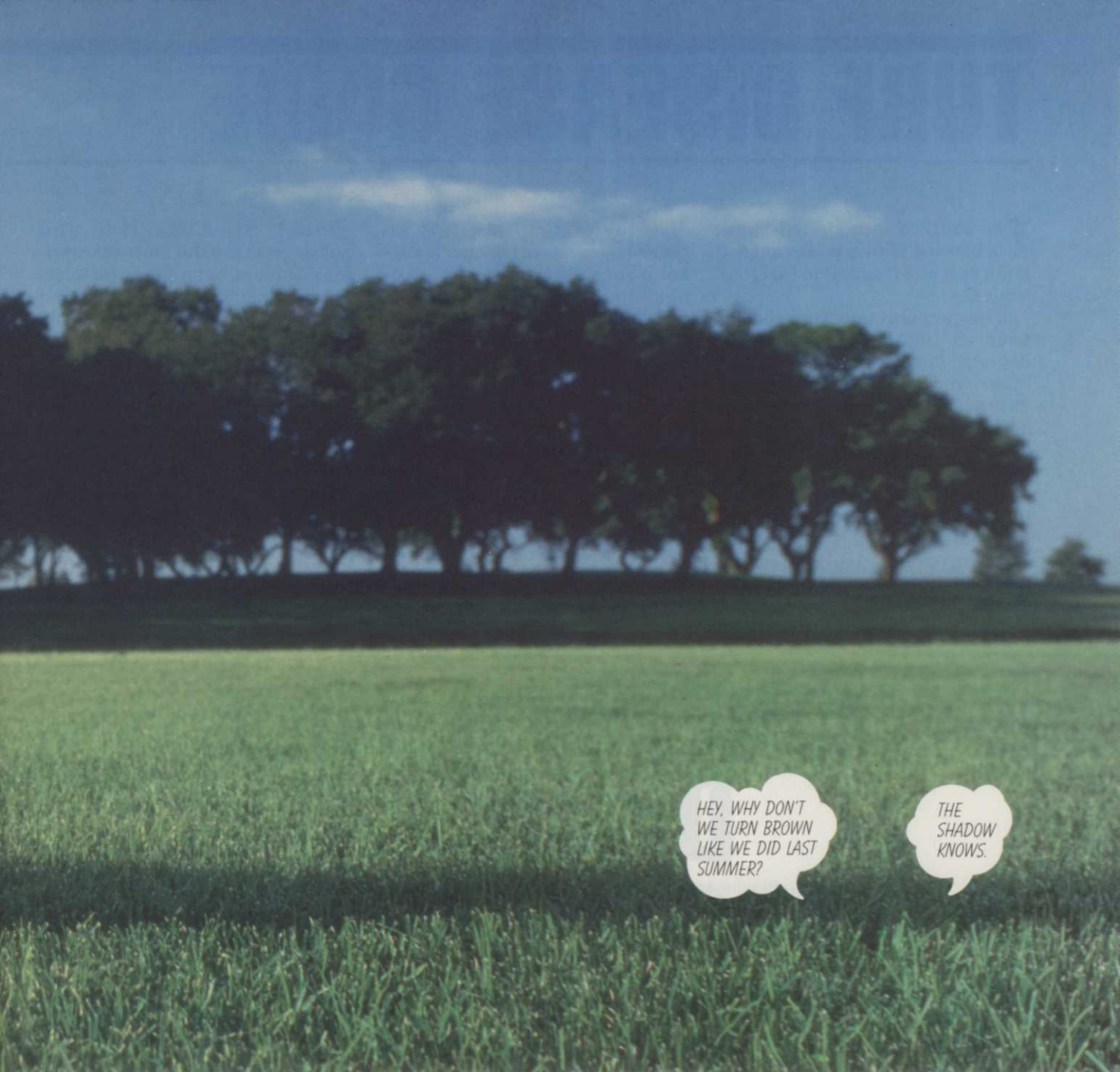
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TURF DISEASE GUIDE

The southeastern United States is blessed with a wide range of choices when it comes to turfgrass varieties.

The predominant turf species used in this region is bermudagrass; however, there are five other warm season grasses used extensively for turf purposes. These include St. Augustine, zoysiagrass, centipedegrass, carpetgrass and bahiagrass.

During the winter months, when warm season grasses are brown and dormant, various annual and perennial turfgrasses are used as temporary overseeded grasses.

Although most of the serious

diseases of southern turf are caused by fungi, other agents such as bacteria, viruses, and nematodes can cause serious problems to certain grasses.

Turf producers in the south cannot depend solely on fungicides for disease control. Good variety selection, cultural and fertility practices are very important in disease control. No amount of fungicide will compensate for poor fertility and cultural practices.

Brown patch

Brown patch is the most common turf disease occurring in the southeastern United States. Al-

though St. Augustine and zoysiagrass are the most susceptible cultivars, even the more tolerant centipede, bermudagrass and ryegrass are frequently damaged by this fungus.

Brown patch is favored by warm, moist weather when nighttime temperatures are relatively cool. Therefore, in certain areas of the south, brown patch can and does occur any month of the year.

In the upper regions of the south the most favorable conditions for disease development usually occur from late April through mid-October.

Symptoms of brown patch on warm season grasses are some-

Southern Turf Diseases

by Don Blasingame, extension plant pathologist, Mississippi State University



what different from the symptoms that are described for cool season grasses. Even though the grass is usually killed in a circular pattern, many times the characteristic smoke ring is not seen on southern turf. Also, under certain environmental conditions the fungus may cause a gradual thinning of the turf over a rather large area instead of killing in a circular pattern.

There are several factors that tend to make the grass more susceptible to brown patch. One of these is the excessive application of nitrogen fertilizer. This promotes a lush growth of grass that is readily attacked. Another condition that leads to severe disease development is watering late in the afternoon and allowing the grass to remain wet for long periods of time. The excessive accumulation of thatch creates a most favorable environment for development of brown patch and many other diseases that are caused by fungi.

Fungicides are best used on a preventive schedule. Once symptoms develop control can be difficult.

Dollar spot

Dollar spot is a fungus disease common in the southeast on many species of grasses, particularly on bentgrass, bermudagrass, zoysiagrass, and annual and perennial bluegrasses.

Dollar spot is a disease in which symptoms are different on certain warm season grasses than those noted on cool season grasses.

On the finer textured grasses, such as bermudagrass and zoysiagrass, the grasses are killed in small patches two to three inches in diameter. Under severe conditions these patches may coalesce so that the turf has a mottled appearance. Blades of grass at

Spring dead spot attacks

bermudagrass and zoysiagrass while dormant, becoming evident during spring greenup.



Brown patch is the most common turf disease in the Southeast. It affects primarily St. Augustine and zoysiagrass in the South and bentgrass and perennial ryegrasses in the North. It is prevalent during warm, moist days with cool nights.

the outer edges of the infected area develop tan spots with reddish-brown margins.

On the coarser warm-season grasses the turf is killed in larger patches that may range up to a foot in diameter.

Dollar spot is prevalent during periods of mild weather during the spring and fall months. Unlike brown patch, dollar spot is retarded by high levels of nitrogen fertilizer.

Because excess nitrogen tends to favor the development of brown patch and other diseases, discretion must be used in applying nitrogen. Watering should be performed only in the early morning so the foliage can dry quickly. Fungicides can be used to help bring the diseases under control once it gets established.

Leaf spots

There are a number of fungi that cause leaf spots on many of the southern grasses. Regardless of the causal agent, these leaf spots on southern grasses are similar

and so are the control measures.

Helminthosporium leaf spots (Melting Out) Bermudagrass and ryegrass are most severely affected by helminthosporium infections, although the fungus can survive on centipedegrass and St. Augustine.

Infection can occur over a wide range of temperature but usually is more severe when temperatures are 70° to 95°. Milder temperatures in the spring and fall are more favorable for infection.

Helminthosporium causes small, dark colored spots or flecks on the leaves and sheaths. Leaf spots are usually more numerous near the collar of the leaf blades. Severely affected leaves wither and die and the turf frequently becomes brown and thin.

Symptoms on overseeded ryegrass are altogether different. Although leaf spots may occur, this same helminthosporium can cause severe crown rot. This causes a yellowing and discoloration of the grass and a general

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thinning of the turf.

Fertilize with adequate levels of nitrogen and potassium if helminthosporium diseases become a problem. With careful management, apply fungicides recommended for helminthosporium blight control.

Gray leaf spots St. Augustine is the primary host for gray leaf spot. The disease occurs throughout the lower south during warm, humid weather.

Spots on the leaf blades are the most visible symptom but sheath and stem lesions also occur. Leaf spots begin as olive green to brown, water-soaked spots as small as a pin head. These enlarge rapidly and form a circular to elongate lesion that are brown to ash colored with purple margins.

The disease occurs during moderate to warm weather accompanied by high relative hu-

midity. Severity of the disease is enhanced by applications of nitrogen fertilizer and is more of a problem in shaded areas where the grass remains wet from dew.

Treatment with a fungicide may become necessary if the disease outbreak is severe and accompanied by prolonged periods of wet favorable weather.

Rust

Puccinia species infect a number of grasses grown in the south, including ryegrass, zoysiagrass, bluegrass, fescue, bermudagrass and St. Augustine. Zoysiagrass and bluegrass are the most often affected grasses.

Susceptibility varies with the variety. Fungus infection is favored by minimum and maximum temperatures of 50° to 70° F. respectively. For this reason, the disease does not usually cause

severe damage over an extended period. It is likely to be more severe in shaded areas during rainy, humid weather. Affected turf will appear unthrifty and begin to thin.

The disease is characterized by the presence of pustules on the leaf blades. These pustules range from bright orange to cinnamon-brown in color depending upon the species of fungus present.

Certain varieties of ryegrass are extremely susceptible to rust and sometimes severe damage can occur. On warm season grasses, zoysiagrass, especially Meyer and Emerald varieties, are most severely affected by rust.

Fertilize to stimulate grass growth, mow on a four to five day schedule and catch clippings. If necessary, a fungicide may be applied to help reduce the amount of disease present.

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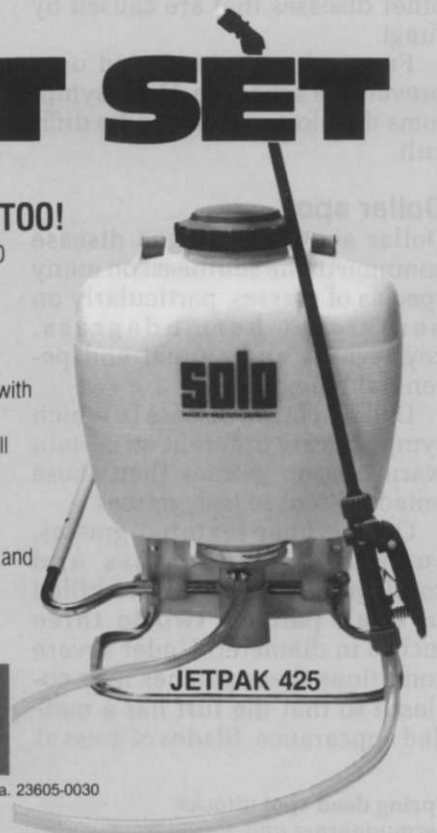
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