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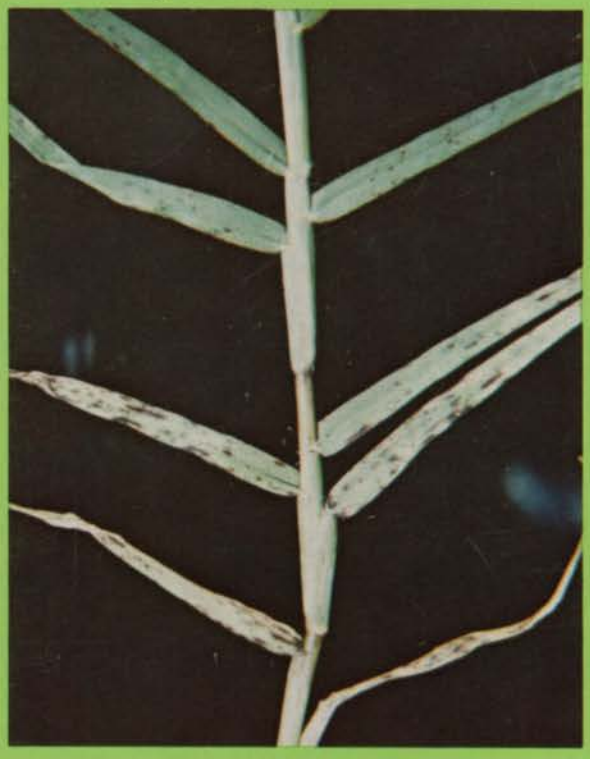

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Lawn Diseases in the Sunbelt

by T. E. Freeman, University of Florida

Dr. T.E. Freeman is a professor of plant pathology at the University of Florida in Gainesville. He joined this instituition after receiving his Ph.D. degree from Louisiana State University in 1956. Most of his professional career has been spent studying the causes and various factors affecting occurrence and control of turf diseases in the Southern United States. He is presently serving as coordinator of the turf research program at the University of Florida.

The Sunbelt is that region of the United States that roughly coincides with the area referred to as the bermudagrass belt by turfgrass agronomists. Population wise, it is one of the fastest growing parts of the country. The many new residents from outside the region are not familiar with either the warm-season lawngrasses or the diseases that affect them. In fact, many long-time residents may not be too well informed about the diseases that affect the grass in their lawns. This is because turfgrass diseases have not been as well publicized in the Sunbelt as they have in northern regions. Therefore, the commercial pest control operator is frequently called upon, not only for his or her services, but for advice and education on turfgrass diseases. It is hoped that information presented in this article will help with this task.

On a regional basis, bermudagrass (*Cynodon dactylon*) is the predominant grass. However, there are five other warm-season grasses that are used extensively for turf purposes. They are; bahiagrass (*Paspalum notatum*), carpetgrass (*Axonopus affinis*), centipedegrass (*Eremochloa ophiuriodes*), St. Augustinegrass (*Stenotaphrum secundatum*) and zoysiagrass (*Zoysia* spp.). In addition to these permanent grasses, the ryegrasses (*Lolium* spp.) are frequently used as temporary overseeded grasses to lend color to the turf area during the winter months when warm-season grasses are dormant. Collectively, these grasses are affected by over 100 diseases. Fortunately, only a few of these diseases are serious enough in nature to be of general concern. Most of these serious diseases are caused by fungi, but in certain areas, nematodes and viruses can cause severe damage to grasses. Anyone interested in growing fine turf in the Sunbelt should acquaint themselves with these serious diseases. They should learn to recognize them, determine the factors affecting their occurrence, grasses most likely to be affected and most importantly, their control. The most common diseases that occur on southern turfgrasses are listed in Table 1. The first nine of these are most important and will be discussed in more detail. Control practices for these nine are summarized in Table 2.

BROWN PATCH

Brown patch, caused by the fungus *Rhizoctonia solani*, is probably regionwide the most serious disease affecting

Rhizoctonia brown patch on St. Augustinegrass

Table 1: Diseases that commonly occur in the Sunbelt, their cause and grass affected.

Diseases in approximately descending importance	Causal agent	Grasses affected in descending order of susceptibility
1. Brown patch	*Rhizoctonia solani*	carpetgrass St. Augustinegrass ryegrass centipedegrass Bermudagrass bahiagrass
2. Dollar spot	*Sclerotinia homoeocarpa*	bermudagrass bahiagrass zoysiagrass ryegrass St. Augustinegrass centipede
3. Helminthosporium	*Helminthosporium* spp.	bermudagrass ryegrass St. Augustinegrass
4. Pythium blight and root rot	*Pythium* spp.	ryegrass bermudagrass St. Augustinegrass bahiagrass
5. Gray leaf spot	*Pyricularia grisea*	St. Augustinegrass ryegrass centipede bermudagrass
6. Rust	*Puccinia spp*	ryegrass zoysiagrass bermudagrass St. Augustinegrass
7. Fairy ring	fleshy fungi	all grasses
8. St. Augustinegrass decline (SAD)	virus	St. Augustinegrass
9. Spring dead spot	unknown	bermudagrass
10. Seedling blight	*Rhizoctonia* spp. and *Pythium* spp.	seeded grasses
11. Leaf spot	*Cercospora fusimaculans*	St. Augustinegrass
12. Fading out	*Curvularia* spp.	all grasses
13. Downey mildew	*Sclerophthora macrospora*	St. Augustinegrass
14. Anthracnose	*Colletotrichum graminicola*	centipedegrass bahiagrass ryegrass bermudagrass
15. Smuts	*Ustilago* spp.	bermudagrass St. Augustinegrass

Lawn Diseases in the Sunbelt

Table 2: Control of the serious diseases affecting turfgrasses in the Sunbelt.

Disease	Cultural control	Effective fungicide*
Brown patch	Fertilize moderately. Avoid applying excessive nitrogen. Irrigate so as not to prolong period grass is wet. Brush off dew. Remove clippings. Avoid thatch buildup.	Acti-dione Thiram Chipco 26019 Daconil 2787 Duosan Fore Fungo Terraclor Tersan Tersan LSR Tersan 1991
Dollar spot	Disease severity is reduced by application of nitrogen fertilizer. Irrigate so as to reduce period grass is wet. Avoid thatch buildup.	Acti-dione Thiram Chipco 26019 Daconil 2787 Duosan Fungo Tersan 1991
Helminthosporium diseases	Maintain even moisture level. Raise mowing height to reduce effects of disease and to maintain vigor.	Acti-dione Thiram Chipco 26019 Daconil 2787 Duosan Fore Tersan LSR
Pythium blight	Improve aeration and drainage. Take care not to spread disease with equipment and heavy irrication. Delay overseeding until onset of cool weather.	Banol Koban Subdue 2E Terrazole Tersan SP
Gray leaf spot	Maintain an even moisture level. Avoid excessive nitrogen fertilization especially during establishment. Plant more resistant strains of grass.	Acti-dione Thiram Daconil 2787
Rusts	Maintain adequate fertility level. Remove clippings. Plant more resistant strains of grass.	Acti-dione Thiram Daconil 2787 Dithane Z-78 Fore Tersan LSR
Fairy ring	Step up water and fertilizer programs to mask effect. Dig out and remove.	None
SAD	Avoid planting infected sod. Plant resistant varieties of St. Augustinegrass.	None
Spring dead spot	Avoid thatch buildup	None registered

*Follow label directions.

turfgrasses in the Sunbelt. Symptoms of brown patch on warm-season grasses differ somewhat from the so-called classical ones described for it on cool-season grasses. For example, even though the grass is usually killed in a circular pattern that may range from a few inches to several feet in diameter, the "smoke ring" phase is seldom seen. In addition, *R. solani* may cause a gradual thinning of the turf over a rather large area with no circular pattern discernible. This type of damage if frequently noted on St. Augustinegrass growing in moist shady locations. With this type of damage a root rot may be evident in addition to the characteristic sheath rot and foliar blight.

Brown patch is favored by warm (80°-90°F) moist weather when night temperatures are relatively cool (60°-70°F). Therefore, in certain areas of the South, brown patch can, and does, occur any month of the year. For example, in south Florida, it is often referred to as a winter disease. Grass that is highly fertilized with a readily available source of nitrogen is more susceptible to severe damage than is grass which has received moderate fertilization. This is especially true with St. Augustinegrass and centipedegrass, but is only slightly less evident on the other warm-season species. Grass that has been heavily topdressed with sand, as is the practice in many areas, is frequently severely damaged by *R. solani*.

Sheath rot caused by Rhizoctonia on St. Augustinegrass

DOLLAR SPOT

Dollar spot, caused by *Sclerotinia homeocarpa*, is another disease in which symptoms are different on certain warm-season grass than those noted of cool-season grasses. On the finer textured grasses, such as bermudagrass and zoysiagrass, the symptoms are typical. These grasses are killed in small patches that are 2-3 inches in diameter. Under severe conditions, these patches will coalesce so that the turf has a mottled appearance. Blades of grass at the outer edges of the affected area develop tan leaf spots with reddish-brown borders. These leaf spots usually radiate from the edge of the blade. On the coarser warm-season grasses, the turf is killed in larger patches that may be several inches in diameter. In the case of bahiagrass, the spot may become quite diffused and can be confused with brown patch. However, the typical leaf spots are present and serve as a marker for positive identification.

Sclerotinia dollar spot in bermudagrass

Bermudagrass, bahiagrass and zoysiagrass are the most susceptible to dollar spot although a high degree of variation in disease susceptibility occurs between varieties of these grasses. The bermudagrass varieties 'Ormond', 'Uganda', and 'Tifway' are more susceptible than others, while 'Argentine' bahiagrass and 'Meyer' zoysiagrass are the most resistant varieties in these two species. Dollar spot is prevelant during periods of mild weather such as occur during the spring and fall months, but

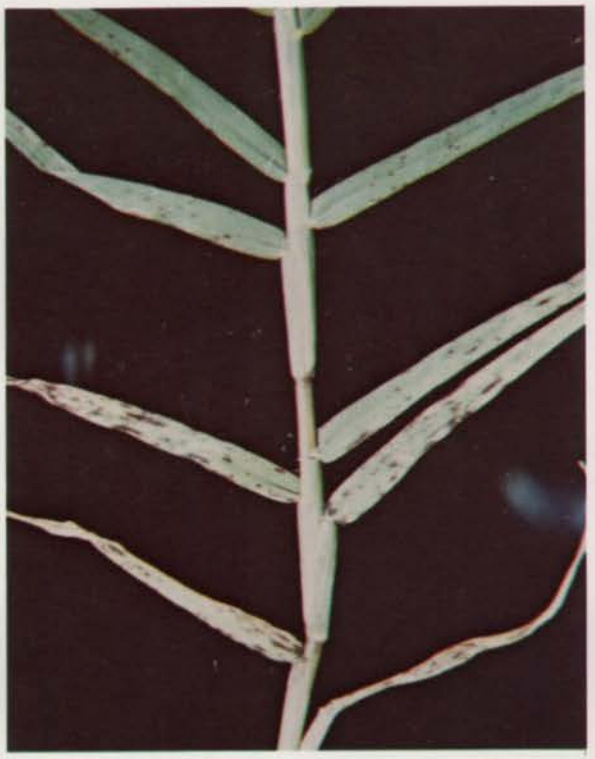
Lawn Diseases in the Sunbelt

it can occur any time the grass is growing. It can occur through the hot summer months in Florida where high temperature strains of the pathogen have been found. Unlike brown patch, dollar spot is retarded by high levels of a readily available nitrogen fertilizer. In fact, this has become the predominant method of control for dollar spot on golf courses in Florida. Such a method may not be as feasible with some of the coarser species such as bahiagrass.

HELMINTHOSPORIUM LEAF SPOTS

Helminthosporium leaf spots are caused by several species of fungi belonging to the genus *Helminthosporium*. In recent years, some researchers have

Most of the serious lawn diseases are caused by fungi



Helminthosporium leafspot on bermudagrass

divided this important genus of plant pathogens into two genera. Therefore, you may see these common leaf-spotting diseases reported as being caused by species of *Bipolaris* and *Dreschlera* in addition to *Helminthosporium*— a name still accepted and used by many plant pathologists. Regardless of what the causal agents are called, the symptoms they cause on southern grasses are similar and fortunately, so are the control measures. Leaf spots are small, oblong and purple to dark brown in color. Larger spots may have a tan center. Severely affected leaves will wither and die. Death of many leaves leads to the over-all symptom of a thinning turf. A severely affected planting may have a purplish cast when viewed from eye level.

Bermudagrass and ryegrass are the most severely affected by *Helminthosporium* spp. Infection can occur over a wide range of temperatures but the diseases are most severe during periods when temperatures are sub optimum for growth of the grass. For example, bermudagrass is most often severely damaged during the Fall when cooler night temperatures begin to reduce the growth rate of this warm-season grass. Conversely, ryegrass is more likely to be severely damaged during the Spring when warming temperatures begin to stress this cool-season grass. Fortunately, many of the improved turfgrass varieties are more tolerant of helminthosporium leaf spot.

Gray leaf spot on St. Augustinegrass

Pythium blight on ryegrass

PYTHIUM BLIGHT

Pythium blight, caused primarily by *Pythium aphanidermatum*, can be a devastating disease on overseeded ryegrass. Bermudagrass may also be affected but usually to a lesser degree. Affected grass is killed rapidly in spots 2-4 inches in diameter. These spots may develop into streaks of coalesce so that larger areas of turf are damaged. In the early stages of disease development, affected grass has a blackened-greasy appearance. It will later turn reddish brown, collapse and become matted together. At times the affected turf spots may have a cottony appearance due to the abundant growth of the fungus in them. For this reason, the disease is frequently referred to as cottony blight. This disease occurs during warm humid weather in poorly aerated and drained areas.

Pythium blight can be devastating on overseeded ryegrass

Certain species of *Pythium* can also cause root rot on turfgrasses. The affected roots turn brown and the cortex sloughs off. Due to the restricted root function, the plant becomes chlorotic, the turf begins to thin and affected grass may eventually die completely. These root rots occur in poorly drained conditions and may be associated with nematode damage. Positive identification of the condition usually requires laboratory diagnosis.

Lawn Diseases in the Sunbelt

GRAY LEAF SPOT

Gray leaf spot, caused by *Pyricularia grisea*, is primarily a disease of St. Augustinegrass, but other species may be affected under certain conditions. For example, severe outbreaks of the disease have occurred on ryegrass in parts of the South. The disease is characterized by round to oblong spots on the leaves and stems of affected plants. These spots are brown to ash colored with purple to brown margins. They may be covered with a gray mold during humid weather. When the disease is severe, the entire planting may have a scorched appearance.

Gray leaf spot occurs during warm-humid weather

Gray leaf spot occurs during warm-humid weather. It is more severe in newly sprigged planting than it is in established plantings. This is especially true when the grass is rapidly growing under a high level of fertilization with a readily available source of nitrogen. The yellow-green or common types of St. Augustinegrass are more resistant to gray leaf spot than are the blue-green or 'Bitter Blue' types. Grass that has been treated with either certain herbicides, excessive nitrogen, subjected to heavy traffic or moisture stress is more severely damaged than grass that has not been subjected to such treatment.

Rust on zoysiagrass

Fairy ring in St. Augustinegrass

RUST DISEASES

Rust diseases, caused by fungi belonging to the genus *Puccinia*, affect several of the turfgrasses used in the Sunbelt. They are characterized by the presence of pustules on the leaf blades. These pustules range from bright orange to cinnamon-brown to black depending upon the *Puccinia* sp. and the stage of development. Certain varieties of ryegrass are extremely susceptible to rust and are sometimes severely damaged. Damage can be especially acute if the grass has not been adequately fertilized. Of the warm-season grasses, zoysiagrasses, especially 'Meyer' and 'Emerald' varieties, are the most severely affected by rusts. Some bermudagrass varieties are subject to severe rust damage, but most of the widely used varieties are seldom severely damaged.

FAIRY RINGS

Fairy rings, caused by several species of fleshy fungi, are common in all types of grass planting during periods of warm-humid weather. Fortunately, the type II ring predominates in southern turf plantings. With this type of ring, the grass is only stimulated in a circular or semicircular pattern as opposed to the type I ring in which the grass is actually killed behind the zone of stimulation. Fairy rings are caused by fungi that are growing in the soil just below the surface. The toadstools or mushrooms that sometimes appear in the ring are the fruiting bodies of these fungi. The stimulation of the grass is due to the release of nutrients from organic complexes that are broken down by the growing fungus, and thus, made available to the grass. Once the grass has used these nutrients, it may go into a state of decline and be invaded by weeds.

St. Augustinegrass decline (SAD) virus (Photo courtesy of G. E. Holcomb

ST. AUGUSTINE DECLINE (SAD)

St. Augustine decline (SAD) is caused by a virus belonging to the panicum mosaic group of viruses. It causes a mosiac-type of chlorosis on the leaf blades that may resemble a nutrient deficiency or mite feeding damage. There are apparently several strains of the virus and symptoms may range from mild damage to severe damage resulting in death of affected plants depending upon the strain present. Thus far, this disease has only been recorded from Louisiana and Texas. It has caused extensive losses of turf plantings in this latter state. The 'Floratam' variety is resistant to SAD and should be used in areas where the disease is a potential problem.

SPRING DEAD SPOT

Spring dead spot is a serious disorder of bermudagrass in certain parts of the upper Sunbelt. For a thorough discussion of this disorder of unknown cause, the reader if referred to the article by Dr. Leon Lucas in an earlier issue of *American Lawn Applicator* (January/February 1981).

xxx

Motivating the New Breed Employee

by Walter D. Wasilewski, Management Consultant

Walter D. Wasilewski, President and Senior Consultant with C.O.L.A. Management Consultants, Inc., 53637 Wolf Dr., Utica, MI 48087, (818) 781-3290. Background includes 25 years of experience in administrative and personnel management.

How many times have you said that the new breed employee just does not want to work. They take time off from work for the least little excuse. Just give me a few of the older workers with the old work ethics, whose first objective was getting to work everyday and doing a good job. Are we, as managers, right in thinking that the new breed employee is not worth hiring? Before answering that question let us consider two basic but completely different schools of management thoughts:

(1) People, as part of their fundamental nature, have a strong distaste for work and will escape from it when possible. The only way to get a person to work is to threaten him or her with punishment. The ordinary human would rather be told what to do and therefore takes on little or no responsibility. Achievement or ambition has little value, but security becomes very important.

(2) Employees want and need work not only to fulfill their money needs but to belong and to achieve. They desire responsibility and will be motivated if this will result in recognition.

What school of management thought do you feel is more effective today? What school do you belong to?

We often wonder why employees act the way they do. Much research has been done and common sense theories have been developed to explain human behavior. The most useful theory simply states that a human being works at achieving the lowest level of need until he or she feels somewhat secure. The five step theory of need can be explained as:

SELF FULFILLMENT
Creativity, full potential, and self development

EGO
Self-confidence, self-esteem, and recognition

SOCIAL
Acceptance, belonging, and love

SAFETY
Protection from threat, deprivation, and danger

PHYSICAL
Hunger, thirst, and sex

Yes, the new breed worker is different from his parent but not necessarily a poorer candidate for employment. The older worker was, for the most part, motivated by the lowest two levels of needs. This was true because of the lack of security of job and the values that come with it. Even when such workers achieved these two needs, they still consider themselves insecure. Thereby, their motives were to hold their jobs at any cost; even if it meant accepting the abuse of a theory one manager. At the same time, everything possible was done to make the new generation secure concerning physical and safety needs. Government and parents alike make the poorest feel secure in these two basic needs.

The new breed of worker is different from his parent

This means that the need of the new-breed employee must be motivated by their motives and their individual needs. Many managers have found the theory two to be very effective in today's world.

Because the need is different for the new breed employee than it is for his or her older fellow worker, I have listed some positive approaches to fulfilling these needs.

(1) **Make them feel important.** Most young people desire to be accepted

on a par with others who are deemed important. They like to give the impression that they "are somebody." They like to be asked their opinions, to give advice, and to be looked upon as outstanding in their group.

(2) **Recognize their individual differences.** Psychologically there are differences among people. This fact is generally accepted, but sometimes failure occurs in applying it. Too frequently, it is erroneously assumed that the same desires, goals, and interests will appeal equally to all members of a group. Likewise, a management member may use an appeal which is very strong to him but may discover that it has a much different degree of intensity for a subordinate. It is vital to understand the makeup of the new breed employee.

(3) **Give adequate guidance.** The typical young employee wants some orientation but resents explanations and requests carried to excessive details. He wants to do some of the "figuring out" for himself. Yet extreme permissiveness frustrates him as much as too rigid instructions, orders, or supervision. He dislikes being goaded into solving his own problems; but after solving a problem aided by helpful guidance, he thinks more of the manager who prompted him to take hold and figure out the dificulty.

(4) **Practice participative management.** Employees like to be consulted about changes that might affect them. They want to be a part of and know what is going on. However, effective participation requires adequate knowledge by the employee on the subject discussed and willingness by him to accept responsibility.

(5) **Recognize most young people are inquisitive.** A human being wants his rightful share; he believes in getting what he can get within the limits of what constitutes a square deal. When difficulity arises in understanding a situation thoroughly, take time to explain, to answer questions, and to show that the action is justified based on the facts in the case.

Encourage voicing of opinions, then learn to listen

(6) **Be a good listener.** Greater understanding and more factual information are gained by listening, as well as impressing others with our interest and fairness. Many differences of opinion are mitigated when listening by one party is practiced. Permitting the other to talk himself out without interruptions and to tell his entire story often results in the talker seeing the errors of his views or in agreeing that perhaps there are other valid viewpoints. Troubles and hurdles to harmonious relationships are placed in the open when good listenership is followed.

(7) **Avoid arguments.** Many people dislike arguments for they well realize that to argue does not settle differences. The winner of an argument is a nebulous concept; nothing is won, and actually a great deal is lost. Very seldom is the loser of an argument convinced to the viewpoint or cause of the winner; usually the breach in the original differences is broadened.

(8) **Know deep feelings of others.** Human beings are usually quite sentimental about personal attachments, experiences and emotions which stem from their intimate experiences. A student feels his university is best, his home town is the most pleasant, and his team the fastest. These deep sentiments should be used to build up good relations, not destroy them. For a manager to ridicule a new breed employee about his sentiments or to tell him point blank that he is entirely wrong will convince the employee of one thing– that the manager is a very difficult person to get along with.

(9) **Employ questions to persuade.** This is an old, but effective technique; it brings excellent results. Most young people like to talk about those subjects in which they are well informed or interested. The question approach permits them to tell what they know and to impress others with their knowledge. Also, by carefully stated questions it is possible to get the other party to say "yes" to a number of minor points so that he will be inclined to say "yes" to the important. In other words, a "no" answer is avoided.

(10) **Provide effective supervision.** Whether employee motivation is good or bad depends in great measure upon the caliber of supervision provided. Viewing the new breed employee as a human being, knowing their strong likes, letting them know whether their work is satisfactory and how to improve themselves are illustrative of the

Motivating the New Breed Employee

types of things a supervisor can do in order to stimulate employees favorably.

(11) **Recognize the importance of the work environment.** The new breed employee's values and world pertaining to color, sound, space, dress, language, hair styles and food tend to be real job dissatisfiers. They see the typical physical environment as an over identification with older culture values and little respect for their values, life styles, norms, and counter cultures. They often see the work environment as symptomatic of organizational obsolescence, a cultural ghetto from which there is little chance to change or escape. Create a work environment and a personal leadership style which allows for the wide range of human values and needs in today's changing society. Develop a motivation and leadership style that achieves both organization and personal goals.

xxx

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1982 PENNSYLVANIA TURFGRASS CONFERENCE & Trade Show MARCH 1–4, 1982

The 1982 Pennsylvania Turfgrass Conference and Trade Show will be held at the Hershey Lodge & Convention Center, West Chocolate Avenue & University Drive, Hershey, Pennsylvania. Approximately 75 booth spaces have been reserved for the 1982 Trade Show.

The educational sessions this year will include:

GOLF COURSE MANAGEMENT
&
LAWN CARE AND GROUNDS MAINTENANCE

The General Sessions Monday afternoon and Tuesday will include discussions on Gypsy moth, water management, natural versus artificial turf, varietal resistance to insect attack, the effect of herbicide use on disease occurrence, and the preparation of Merion Golf Club for the 1981 U.S. Open.

Wednesday and Thursday will offer separate sessions for golf turf and lawn care and grounds maintenance. The golf turf sessions will have presentations on Poa annua-bentgrass competition, ryegrass-bluegrass competition, disease control, solutions to drainage problems, difficulties associated with highly modified greens, winter injury to perennial ryegrass, new insecticide results, goose grass control, and colonial bentgrass development.

The lawn care and grounds maintenance sessions will feature presentations on handling customer complaints, applicator training, customer communications, fertilizer programs, species selection and management in the shade, high school athletic field maintenance, managing for better wear tolerance, growth retardants, insecticides, renovations, and diagnosing turf problems.

Speakers who have accepted invitations to the Conference include:

Dr. James Watson, The Toro Company
Dr. Clinton Hodges, Iowa State University
Dr. Richard Ratcliffe, USDA, Beltsville
Mr. George Toma, Kansas City Chiefs and Royals
Dr. Robert Shearman, University of Nebraska
Dr. Keith Karnok, Ohio State University
Mr. Jim Samis, Monsanto Corporation
Mr. Ken Hinson, Sears Lawn Care

AND MANY OTHERS

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FOR MORE INFORMATION CONTACT: Christine E. King, Executive Secretary-Treasurer, Pennsylvania Turfgrass Council, 412 Blanchard Street, Bellefonte, PA 16823, (814) 355-8010

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Bulkkem is a joint venture of PBI/GORDON Corporation — the Trimec People — and Lattick Incorporated with headquarters in Normal, Illinois. The purpose of Bulkkem is to substantially reduce herbicide costs by delivery in bulk ... Betamec-4 (Betasan); Trimec; Amine 2,4-D; and MCPP.

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PBI/GORDON Corporation, on the other hand, is certainly the leading supplier of herbicides — like Trimec and Betamec-4 — to the turf industry. Gordon's experience in handling bulk is unmatched in the turf industry. Willis West, who has been in charge of lawn-care sales for PBI/GORDON, will now devote full time to Bulkkem, seeing to it that all the technical know-how of PBI/GORDON is made available to customers of Bulkkem.

What volume is required to justify BULKKEM?

Perhaps desire to grow and increase efficiency is more of a factor than present chemical usage, because Bulkkem is able to tailor bulk facilities to your individual needs. 220-gallon mini-bulk tanks, and stationary systems of any capacity are available. There are accurate metering systems for all sizes, and installations are supervised by the engineering staff of PBI/GORDON to help assure compliance with all governmental regulations.

Will BULKKEM customers be assured of Betamec-4 during 1982?

Yes, Sir! Bulkkem customers can place firm early orders which will guarantee delivery of Betamec-4 (Betasan) during the 1982 season. They will also be guaranteed a firm price all season long on Trimec. And these guarantees are backed up by PBI/GORDON.

With Dacthal out of production for 1982, guaranteed price can actually mean the difference between making 1982 a banner year, or a disaster!

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Bulkkem now has ten men in the field and three established bulk-delivery centers:

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2nd Annual PLCAA Convention & Trade Show

The second annual PLCAA convention and trade show held in Louisville, Kentucky November 18, 19 & 20, was another outstanding success for the association.

Booth space at the trade show was a complete sell out. One hundred and fourty-four exhibitors found the trade show most beneficial as the enthusiasm in the lawn care industry once again was brought to light.

This year's theme, "Managing Your Resources...Money, People, Products & Time" produced the following comments from some of the 774 registrants; "Excellent", "Very beneficial", "Worth every penny", "Informative and educational".

There are now 330 members in the association who are eligible for the PLCAA's Casualty Insurance Program which is being administered through Marsh & McLennon Inc., Chicago, IL.

At the annual business meeting the following officers and directors were elected to serve during the coming year. For the office of President, J. Martin Erbaugh, Lawnmark, Div. of Erbaugh Corp., Peninsula, Ohio; Vice President, Ronnie L. Zwiebel, Green Care Lawn Service, Birmingham, Alabama; and Secretary/Treasurer, Donald Burton, Lawn Medic, Inc., Rochester, New York.

New Directors are Paul Bizon, Pro-Grass Lawn Service, Inc., Hubbard, Oregon; Des Rice, The Weed Man Ltd., Mississauga, Ontario; William Fischer, Spring Green Lawn Care Corp., Plainfield, Illinois, and John Kenney, Turf Doctor, Framingham, Massachusetts. All will serve a three-year term.

J. Martin Erbaugh of Lawnman, Division of Erbaugh Corp., Peninsula, Ohio, was recently elected the new President of the Professional Lawn Care Association of America.

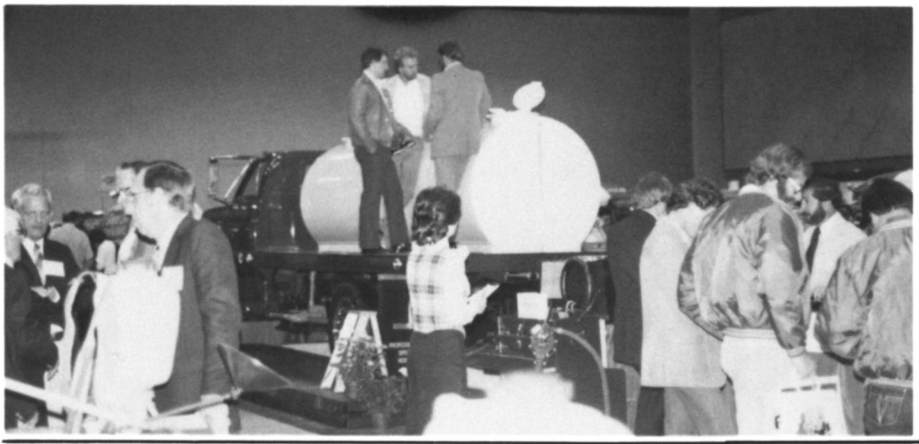
Remaining on the Board to complete their terms are: Richard L. White, Village Green Ltd., West Chicago, Illinois; John Latting, Lawn Groomer, Normal, Illinois; Douglas Baker, Leisure Lawn, Inc., Dayton, Ohio; Larry Brandt, Spray-A-Lawn, Cincinnati, Ohio; Gordon Ober, Davey Lawnscape, Kent, Ohio; and Robert W. Miller, ChemLawn Corp., Columbus, Ohio. Jerome R. Faulring, Professional Turf Corp./Hydro Lawn, Gaithersburg, Maryland, remains on the Board as Immediate Past President. Serving as the Associate Member Representative for the year 1982 is William J. Stinson III, O.M. Scott & Sons, Marysville, Ohio.

Our congratulations and best wishes to each and everyone of them.

During an interview with Marty, I asked him if he was pleased with the convention and what direction the PLCAA would be taking in 1982. Marty said he felt that the 10% increase in attendance at the convention and the fact that the booth space at the trade show doubled were both good signs that the association would continue its rapid growth. For 1982, Marty says the association will remain active in the

2,4-D coalition so as to educate its members as well as monitor legislation in general. With the association in its third year, and financial stability in sight, their plans are to concentrate on direct membership services such as increasing the number of regional meetings. Down the road, they hope to consider support of university research.

Good Luck Marty!



For more information about the PLCAA, contact Jane Stecker, PLCAA, Suite 1717– 435 North Michigan Ave., Chicago, IL 60611, or use reply card.

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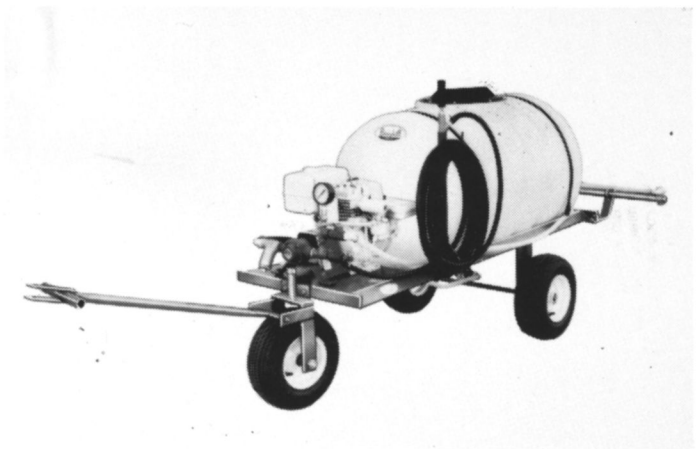

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Circle No. 6 on Reader Reply Card

Nigrospora Patch on Kentucky Bluegrass

by Cynthia L. Brown & Joseph M. Vargas, Jr., Michigan State University

Cynthia L. Brown is currently a graduate research assistant in the Department of Botany and Plant Pathology at Michigan State University under the guidance of Dr. Joseph Vargas. She received her B.S. degree in Botany from the University of Massachusetts.

Dr. Vargas received his Ph.D. degree from Oklahoma State University of Minnesota in 1968. He was assistant professor, botany and plant pathology, Michigan State University, 1968-74; assistant professor, Institute of Agriculture Technology, 1972-74; associate professor, 1974.

For the past two years, Michigan lawn care professionals and sod farmers have suffered considerable losses to what has become the newest disease of Kentucky bluegrass, *Nigrospora* patch. This new disease has been termed *Nigrospora* patch because *Nigrospora* is an organism associated with the symptoms and because patch best describes the overall symptomology.

A seemingly healthy stand of turf begins to show circular areas of yellowing grass and within several days the plants will die, resulting in the final characteristic patch *(Figure 1)*. The following article is a progress report on the research being conducted at Michigan State University.

DIAGNOSIS

One of the major problems with this disease has been its diagnosis. The gross symptoms are somewhat similar and may be confused with those found in association with various cultural practices, insect damage or the incidence of other diseases. *Fusarium* blight, sod-webworm or billbug damage, chemical burn and mole or dog damage are just a few examples of conditions that produce symptoms which may be confused with *Nigrospora* patch. Some critical points that are helpful in making the differentiation are:

1. The *Fusarium* blight symptom is the "frog-eye", which appears as a 6 - 24" ring of dead grass with the interior remaining healthy and

Figure 1: Gross symptoms of Nigrospora patch on sodded lawn in East Lansing, Michigan, August, 1981.

Figure 2: Fusarium blight "frog-eyes". August, 1973.

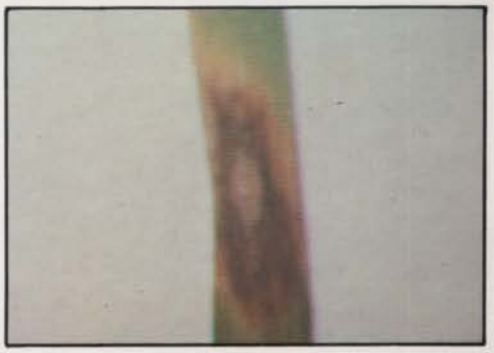

Figure 3: Necrotic lesion on leaf blade. August, 1981.

green *(Figure 2)*. In contrast, the typical *Nigrospora* patch symptom is a 4 - 6" circular patch of dead grass, without a healthy center.

2. The ring of dead grass present with a *Fusarium* blight infection is preceded by a wilting phase when the ring of grass is a purplish color. There has been no similar symptom observed with a *Nigrospora* patch infection.
3. Foliar lesions are present with a *Nigrospora* infection. Reddish-brown to black irregularly shaped necrotic spots appear on the blades or as streaks on the sheath *(Figure 3)*. Transverse white bands *(Figure 4)* and reddened blades may also be present. In comparison, *Fusarium* blight rarely has specific lesions and is seldom seen as a foliar blight.
4. The gross symptom of drought damage is usually a general browning of the grass *(Figure 5)*. It does not appear as distinct patches or spots. *Nigrospora* produces very obvious patches.
5. Sod webworm damage is characterized by pock marks in the turf. A close examination of these areas will reveal that the plants have been chewed or eaten by the insect. Often, green droppings (frass) can be found in the area. Billbugs make similar pock marks in the turf. However, these symptoms can be distinguished from *Nigrospora* patch by examining the damaged turf closely. Billbugs tend to chew the stems of the green plants, leav-

Figure 4: Transverse white band which may be present on blade. August, 1981.

Figure 5: Drought damage. August, 1972.

Nigrospora Patch

ing a "sawdust" like material behind.

6. It takes several days for symptoms to progress from the initial foliar yellowing to the final pock marked stage of *Nigrospora* infection *(Figures 6a & 6b)*. Within one turf area, the different developmental stages may be visible at the same time. In contrast, chemical damage is manifested within 2-3 days after application, with all of the damage appearing at the same time and the symptom development being at the same stage.

CAUSAL ORGANISM– NIGROSPORA?

When a fungus is suspected of being the causal agent, isolations are usually the first procedure performed when attempting to identify the organism causing a particular set of symptoms. This involves placing diseased tissue into a petri dish containing nutrient medium. When newly infected tissue and proper techniques are used, the suspected pathogen can usually be isolated as it grows out onto the medium.

When isolations were done on diseased Kentucky bluegrass samples, one of the fungi most commonly isolated was *Nigrospora (Figure 7)*. Upon viewing the necrotic blades with a compound microscope, the comparatively large *Nigrospora* spores were present on the surface and protruding through the epidermal layer of cells.

Nigrospora species have a history of pathogenicity on a variety of plants,

Figure 6: Development of symptoms:

Figure 6a: Initial foliar yellowing

Figure 6b: Final patch of dead grass August, 1981.

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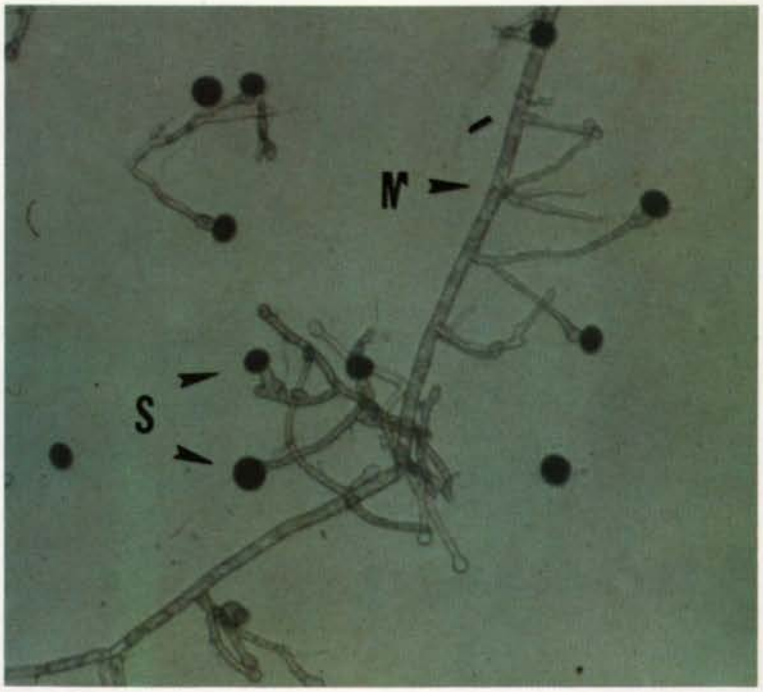

Figure 7: Nigrospora sp. isolated from crown tissue. Black spores (S) and mycelium (M). Magnification is 400X. July, 1981.

including cotton, maize, rice, tobacco and wheat among others. However, it is also a saprophyte, being able to derive energy from dead organic matter. In order to show it is pathogenic on Kentucky bluegrass, pots of Touchdown and Adelphi Kentucky bluegrass were inoculated (sprayed) with a suspension of *Nigrospora* spores in water. The same symptoms were produced *(Figure 8)* and the fungus was reisolated from the tissues. When compared to the original culture of *Nigrospora* it was found to be identical. The above work satisfies criteria that must be met before it can be concluded that an organism is a pathogen on a particular host plant.

The transmission electron microscope (TEM) is an instrument that allows small objects to be magnified as much as 300,000 times. A beam of electrons strikes an ultra-thin section of plant material and forms an image on a florescent screen. This makes it possible to look very closely into plant cells.

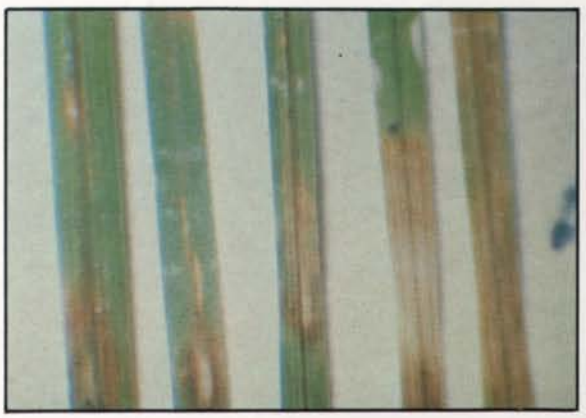

Figure 8: Foliar necrosis produced on healthy Adelphi Kentucky bluegrass plants inoculated with Nigrospora sp. Sept., 1981.

Nigrospora Patch

Pieces of diseased tissue were prepared and viewed under the TEM. Large, black *Nigrospora* spores were found to be abundant within the mesophyll (green, photosynthetic) cells of the leaf blades. They appear to be randomly oriented, however, none were found in the vascular bundles (conductive tissue) of the blades. *(Figures 9 & 10).*

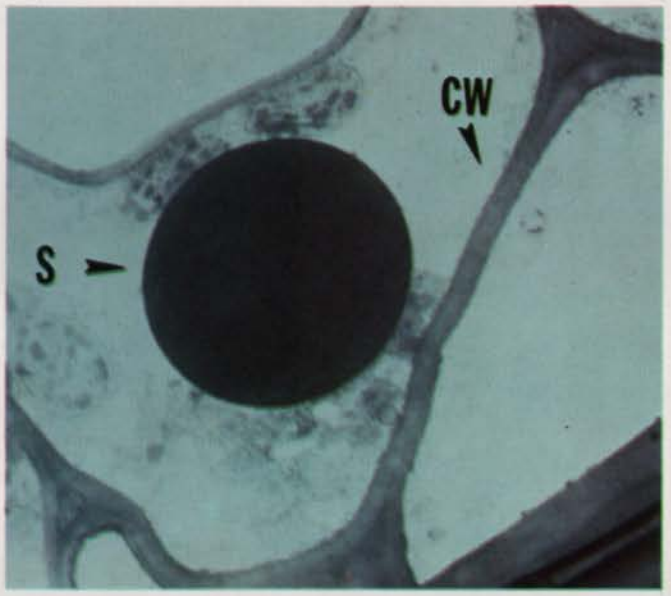

Figure 9: Nigrospora spore (S) inside mesophyl cell. Note cell wall (CW). Magnification is 7,000X. October, 1981.

PREDISPOSING FACTORS

It is probable that the factors influencing or predisposing a *Nigrospora* patch outbreak include a stressful environmental condition and a newer cultivar of Kentucky bluegrass.

Symptoms appeared in the summer of 1981 after an extended period of hot, droughty weather. The most severe damage has occurred where sod less than five years old has been laid on clay with little or no topsoil.

SUMMARY

In summary, this is a patch disease, with the foliar symptoms appearing as reddish-brown or occasional white lesions. It seems to be a stress related disease and is occurring on the newer cultivars of Kentucky bluegrass. It is possible that *Nigrospora* may act in a complex or be associated with other biological or physical factors in inciting disease.

At this time there are no cultural (fertility or irrigation) or chemical recommendations from Michigan State University.

xxx

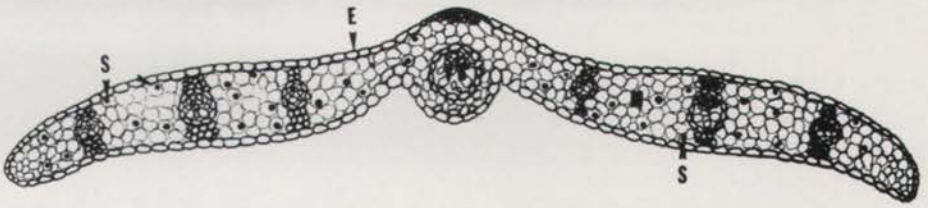

Figure 10: Cross section of Kentucky bluegrass blade showing orientation of Nigrospora spores (S) within mesophyll (M). Note that spores are not present in epidermis (E) or vascular bundles (VB). Spores were found only intracellularly (within cells) and not intercellularly (between cells). October, 1981.

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Mobay Turf Seminar

Five nationally recognized turf care experts recently addressed the attendees at the Mobay Turf Seminar in Kansas City. From left to right: Dr. Henry Tashiro, Dr. Harry Niemczyk, Dr. Dallas Nelson, Dr. Houston Couch, Dr. Richard Smiley and Dr. Joe Vargas.

Five nationally renown authorities in turf care were the primary speakers at the recently completed Mobay Turf Seminar in Kansas City.

The three-day seminar, sponsored by the Specialty Products Group of Mobay Chemical Corporation, Agricultural Chemicals Division, focused on current trends and innovations in the professional turf care industry.

Guest speakers included:

- Dr. Houston B. Couch, Professor of Plant Pathology, Virginia Polytechnic Institute, who discussed cool season disease control. Dr. Couch has been involved in chemical control on turf grass for 25 years.
- Dr. Harry D. Niemczyk, Professor of Turf Grass Entomology, Ohio Agricultural Research and Development Center, speaking on black turf grass Ataenius and other turf grass insect problems. His research on insects and other anthropods has been published in scientific journals, trade publications and in his new book, "Destructive Turf Insects".
- Dr. Richard W. Smiley, Associate Professor of Plant Pathology, Cornell University, lecturing of Fusarium Blight and Snowmold control. Dr. Smiley, who specializes in root diseases in turf grasses, is author of numerous published materials, including a chapter in "Advances in Turf Grass Pathology".
- Dr. Henry Tashiro, Professor of Entomology, New York State Agricultural Experiment Station, detailing the use of ®OFTANOL for Scarabaeid Grubs and Hyperodes. Dr. Tashiro, formerly with the United States Department of Agriculture, is currently developing a book on turf grass entomology to be published in 1983.
- Dr. Joe M. Vargas, Turf Grass Pathologist, Michigan State University, who spoke on the management of Annual Bluegrass. Dr. Vargas is credited for discovering that summer death of bluegrass is caused not by heat, but instead the disease anthracnose.

The speakers' audio-visual presentations were followed by fungicide and insecticide panel discussions with questions from the 75-plus in attendance.

In addition, George Toma, Manager of the Truman Sports Complex and head grounds keeper for all 15 Super Bowls, was the keynote speaker at the Seminar Banquet.

Among the attendees were turf chemical suppliers who received an update on Mobay turf management products including ®BAYLETON turf fungicide and ®OFTANOL insecticide.

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