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MAY 1984

A PATCH of GREEN

Official Publication of the
Michigan & Border Cities Golf Course Superintendents Association

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This Month's Advertisers...

Development & Management of Gaeumannomyces Patch

BY J. M. VARGAS, JR., Principal Investigator

Supporting Investigators: MSU Turfgrass Faculty

Gaeumannomyces patch or take-all patch formerly known as Ophiobolus patch, occurs in many regions of the United States, but has typically been associated with the Pacific Northwest. Monteith and Dahl in 1932 implicated the fungus as an occasional turfgrass pathogen (5). However, it was not until 1960 that the disease was actually confirmed on creeping bentgrass turf in western Washington (3). More recently, the disease has been reported on creeping bent grass turf in Rhode Island and in the Washington D.C., Maryland area (2, 6). We have made similar observations on newly seeded "Penncross" greens in Michigan, although the disease has never been very serious.

Take all patch has been rekported to be most severe during wet years in poorly drained soil (7). In 1983, however, the Midwest had one of the warmest, driest summers on record. The disease is also most severe under conditions of high soil pH and low phosphorus levels (1). But many of the soils on which the disease occurred this summer has high phosphorus levels although the soil pH's were generally high which may have made the phosphorus unavailable. Sulfur has been reported to reduc the severity of take all patch (1,4) and is believed related to the effect of sulfur on the soil pH. The use of acidifying fertilizers, i.e. ammonium sulfate, has also reduced the severity of take all patch, presumably by reducing the soil pH (1,4).

Symptoms: The symptoms initially appeared in patches of yellow turf. The grass in the center of these patches usually becomes bronze as it dies completely or becomes severly thinned. The bare or thin areas become filled with broadleaf weeds, creeping bent grass or later on with annual bluegrass again. The initial spots may be 1 to 6 inches in diameter, but may grow to a diameter of several feet over a period of years (8). The plants in the disease patches had short and very poorly developed root systems. Examination of the roots under a dissecting microscope revealed dark cortical tissue inside the root and crowns from infection, and dark runner hyphae of a Gaeuman-

CONTINUED PAGE 17

'84 Conference in Review

The 1984 GCSAA Conference and Show is over and on reflecting back it could be termed the premier event for the Association. Well over 8,000 attendees participated in the educational program and the trade show. A Conference and Show such as this doesn't just happen. Many long bours of work and planning go into the Conference by your dedicated GCSAA staff, but without the help of members, industry people and friends of the Association this special occasion could not have happened. GCSAA sincerely thanks everyone for their interest and efforts that enabled the 55th International Turfgrass Conference and Show to be the success it was.

The Conference week began at the Opening Session with a keynote address given by prominent author and futurist, Dr. Leon Martel. Martel covered matters such as how population growth, food production, energy resources, raw material supplies and pollution will affect the golf course superintendent in the future. He also discussed ways golf course superintendents can plan realistically for the future in the context of their own specific environments.

Also during the Opening Session several individuals were recognized for outstanding service or effort on behalf of the Association and/or industry. GCSAA members Warren Bidwell and Keith Nisbet were presented with GCSAA's Distinguished Service Award. Both are long-time members ofthe Association and have dedicated their lives to this profession. Please refer to the January issue of GOLF COURSE MANAGEMENT for detailed information on these two fine gentlemen.

In addition to the presentation of the Distinguished Service Awards, the Leo Feser Award was presented to Gordon C. Witteveen, superintendent of the

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GOLF COURSE CONDITIONS

J. M. Vargas; K. T. Payne
Professors, Michigan State University

Not since 1946 has heat stress been such a severe factor in turfgrass management in Michigan. Under these pressures, the challenge to those responsible for maintaining high quality turf is many times greater than under more nearly normal circumstances. The cooperative efforts of many golf course superintendents, green committee members, and industry and university research and extension personnel resulted in minimizing the loss of turf. We would like to review here a number of the experiences of the summer, and indicate some of the lessons learned.

A cold, wet spring retarded root growth and resulted in shallow rooting of turfgrass plants. This predisposed subsequent excessive damage where coring (aerifying) or vertical mowing of fairways was attempted. Those who had applied soluable nitrogen last November found shallow root systems to be a less important problem (since root development is promoted by this practice).

Because of interference with invitational tournaments as well as with normal play, many superintendents did not core greens and collars after warm, dry conditions returned in June. Given a July and August of more nearly normal cool temperatures, this would not have been as significant an omission as actually did result when the hot weather developed.

There is a considerable compaction stress to which the collar of each green is subjected because of almost daily equipment pressures (i.e. turning of mowers). Consequently, collars should be cored at least as frequently as greens-if not more-in order to avoid loss of grass from compacted soil.

Sand top dressing of greens is one of the most rapidly accepted management practices of the last decade. Properly used, this can result in improved control of putting speed, control of thatch development, less injury, more rapid recovery from ball marks and improved drainage. Ideally a sand ranging in particle size from .1 to .5 mm provides good water retention as well as adequate aeration and drainage in the root zone. The sand should be applied every three weeks during the growing season at a rate of about three cubic feet per 1000 square feet. At least initially, coring should be done a minimum of twice a year with the cores being removed. A number of instances have been observed where sand has been applied at less frequent intervals, and often in heavier amounts. This may lead to a layering effect, a perched water table, the development of Pythium at the soil-sand interface, or an anaeobic condition just

CONTINUED PAGE 15

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Some Ecological Principles of Turf Management

by DR. DONALD B. WHITE
Dep. of Horticultural Science
and Landscape Architecture
University of Minnesota

It is often useful to take a non-traditional view of our turf situations. A new perspective often results in some new ideas. My objective is to apply ecological principles to turf management that may give some insights into why things happen in the turfgrass community. I've added a few principles to my list and hope that they are useful to you as guideposts in examining problems and developing programs.

1. The first principle is really a definition. It is my definition of Turf Management: "Turf management is the management of competition between desirable (turfgrasses, trees, etc.) and undesirable (weeds, etc.) vegetation".

This says we manage our turf to favor the plants we want while penalizing the plants we don't want. Mowing, for instance, favors turfgrasses while penalizing young woody plants and most coarse weeds that can't tolerate decapitation. The other principles are not definitions and are described below.

2. "All Plants are different in response to the major growth factors (light, water, nutrients, air) and mowing".

The differences allow us the opportunity to manage the copetition. Another example with mowing is that most turfgrasses respond to regular mowing in a way that increases the population of tillers. The turf becomes more dense,

capturing more light and crowding out or not allowing other plants to become established.

3. "There is and optimum set of conditions when considering the major growth factors, under which any plant type will be most productive and competitive". If we can discern the optimum level for light, water, nutrients, soil, air, mowing, etc., for the plants we desire and maintain these conditions, then our turf will always be functioning at the best level of quality. An important note here is that optimum is not meant to be maximum condition can only be maintained briefly and then a recovery period is required to bring things back to a sustainable condition (which some might call normal). It is something like running as fast as you can for as long as you can. The longer you run, the longer it takes to recover and catch your breath.

Optimum means the best or most favorable condition for continued reproducible performance. The lesson for us is that if we drive our turf as hard as it can go (say by mowing as close as possible) it will sooner or later fail and the harder it has been driven (the closer it has been mowed) the longer it will take to recover.

4. "There are limits of tolerance related to conditions under which turf can grow".

Shade and non-shade tolerant grasses offer an example. There is a minimum amount of light under which 'Baron' Kentucky bluegrass can maintain competitive growth. If the minimum is exceeded, 'Baron' will not be able to compete with say 'Glade' which (is different) utilizes light more efficiently and tolerates lower light levels. Another example is that elite type Kentucky bluegrasses tolerate a lower mowing height than common Kentucky bluegrasses. Lower the height of cut and you eliminate the "Common" types. Lower it some more and you eliminate the "Elite" types and end up with poa annua or bentgrass.

5. "There are interactions between growth factors and we must realize that when we change one condition we change them all".

An example might be if we increase irrigation, we increase leaching potential

CONTINUED PAGE 14

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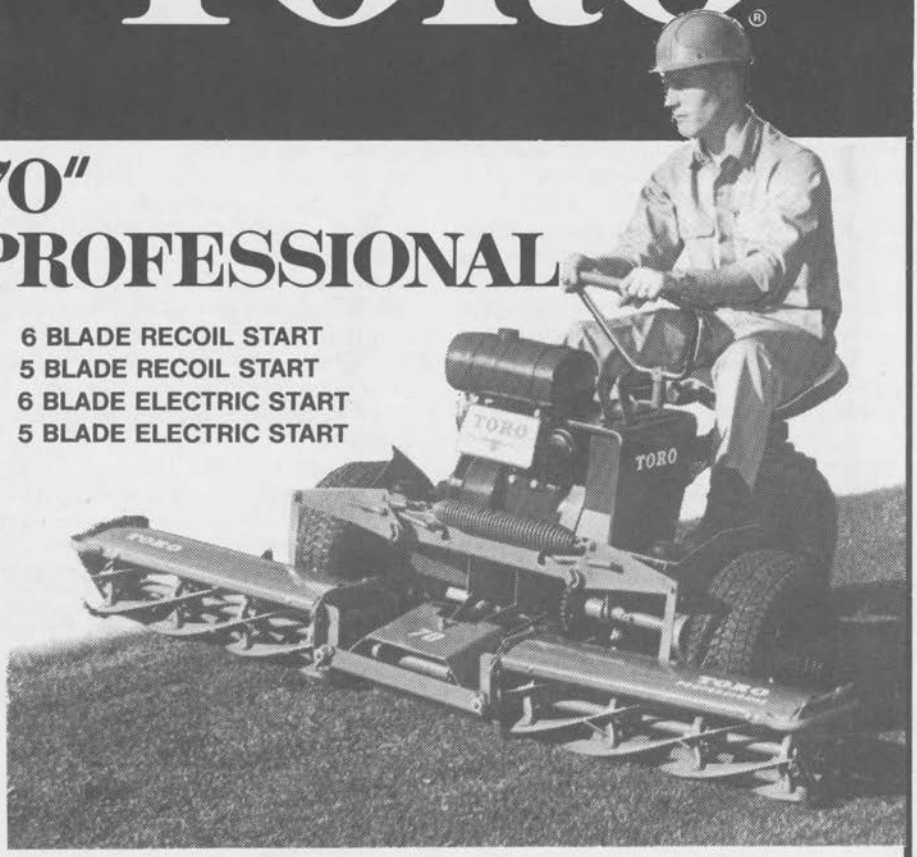

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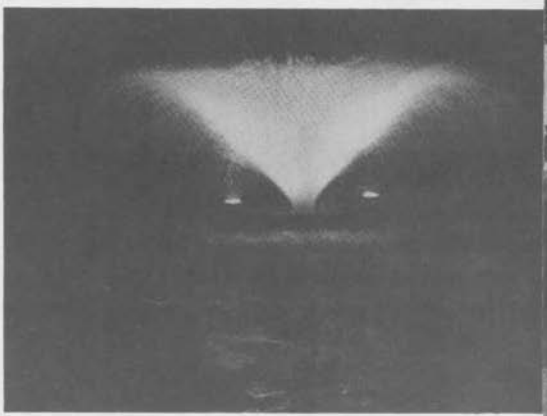

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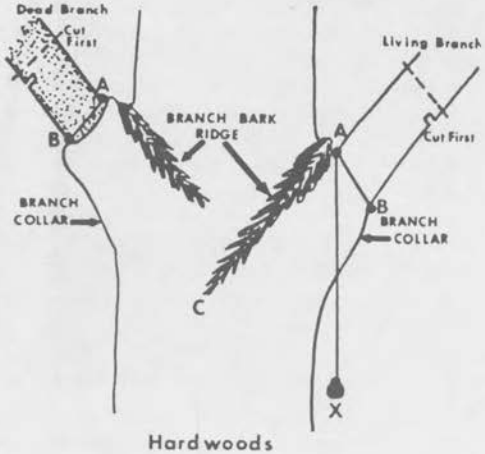

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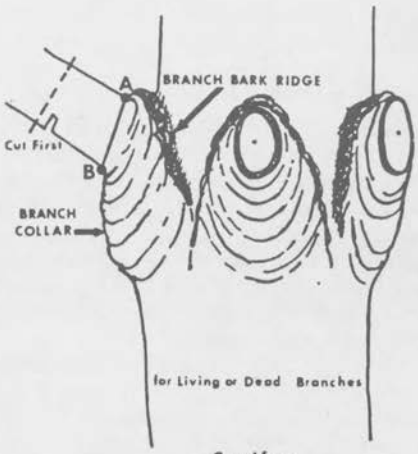
3. FIND <u>TARGET B</u> - SWELLING WHERE BRANCH MEETS BRANCH COLLAR
4. IF B IS HARD TO FIND - DROP A LINE AT AX. ANGLE XAC = TO ANGLE XAB.
5. STUB BRANCH TO BE PRUNED
6. MAKE CUT AT LINE AB



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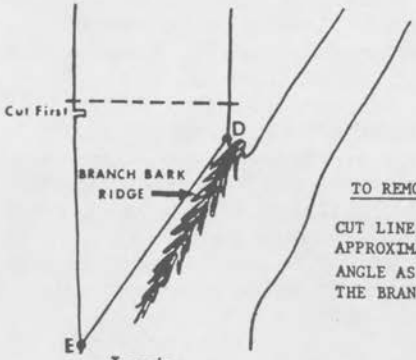

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To friends and Colleagues of the MBCGCSA,

For the last 4½ years I'vebeen selling for Tuco. I've covered our specialty Lines in the farm market, and also the golfcourse and Lawn Care Business. This teritory of two-plus states has offered me the opportunity to meet alot of people and learn alot about Golf Course and Farms.

As of April 1,1984, I have accepted a position with a Nationally Known Agricultural Chemical Company and will now concentrate solely in Agronomic field Crops. My new job will encompass Sixteen counties in southern michigan which allows me the flexibility to be home more evenings.

It's not easy saying "good bye" to a group that has given me much support, encouragement and friendship. You a "Classy bunch" of individuals and I'm proud I had the opportunity to be acquainted with you. I personally feal my life is "fuller" for what I have gained from the turfgrass industry. I hope you will give my successor the same graciousness that you have always shown me.

I'll be staying at my present residence so I hope to hear and see you in the future, or be a guest at an outing!

May your grass stay forever green. My best to you all

In sincere appreciation,
RUSS TILLER

Ecological Principles, cont.

(interaction of water with nutrients) and decrease air in the soil (interaction with oxygen and soil) and can change the pH, etc. The more we understand interactions the easier it will be to manage turfgrasses.

6. "There is an accumulation affect associated with constant or regular treatment applications".

If we constantly mow elite Kentucky bluegrasses at the normal height for common Kentucky bluegrasses, the effect will likely be to accumulate excessive organic matter, thatch. If we continually apply lime when it is not needed it will accumulate a higher pH which may lead to reduced availability of some nutrients. If we regularly mow a putting green at the lower limit of tolerance, the effect will likely be to accumulate a continuing reduction in not only top growth, but also root growth and consequently accumulate an increased susceptability to drought and wear damage.

7. "One shot treatments do not accumulate affects but tend to move things off center only briefly. Usually the tendency is for the situation to return to the original condition".

It is comforting to remember that nature is forgiving in many ways (just don't make the same mistake twice) and grass often grows in spite of us. Application of this principle allows us, for example, to mow shorter than is desired occassionally, say for overseeding, without doing a great deal of lasting damage. Conversely we must realize that in order to really change things we usually need to establish a program for continuing application of the change factor.

8. "When things are not going right, an effective strategy is to identify the factor or condition furthest from the optimum and correct it first".

This is a very important principle because it adds incentive to learn the others and occassionally allows us to perform seemingly magical things. The reason is that all factors interact and when the furthest from the optimum is corrected it usually interacts to shift responses to all the other factors closer to the optimum.

There are several more principles that are applicable to turf management situations. Maybe the best one to end with is 9) "If things are working well, don't fix them".

Best wishes for a good year in turf.

below the surface. Any of these could be detrimental to healthy growth of the grass plant.

In addition to high temperatures, many parts of Michigan experienced extended periods without rainfall. Under these conditions the inadequate distribution patterns of improperly designed irrigation systems became "abundantly clear" The lesson learned in this instance is identifying where correction of water distribution is indicated, and where slicing or spiking and the adding of wetting agents may be called for in 1984 to improve water penetration.

The rains of late July and August came often as cloudbursts and in large amounts. Poorly drained fairway areas often could not be mowed for several days with resulting tall growth of grass. Scalping of these areas was common if the cutting height was not reduced in steps - a practice not often popular with impatient golfers.

The heavy rains, combined with high temperatures, resulted in conditions conductive to the development of anthracnose and Pythium blight. While the former is common in Michigan, Pythium is usually a disease of more southern climates. Development is exacerbated by standing, water, and good management will result in identifying and improving drainage in low lying areas to reduce potential scald, suffocation, or Pythium in future seasons. It is important for the superintendent to have a readily available source of proper fungicides as Pythium spreads very rapidly.

In more nearly normal seasons, the cooler nights of mid-August bring relief to cool season turfgrass species. Temperature remained high at this time in 1983, and promoted the development of a disease not previously identified with turfgrass in Michigan. This disease, known as "Take-all" in wheat, is caused by the fungus Gaeumannomyces, formerly called Ophiobolus, and is referred to as "Take-all patch" in turf. Superintendents who had followed proper management practices were unable to control this new disease. Thus far, no cultural or chemical control has been identified; but your dollars provided for research through the GAM and the Michigan Turfgrass Foundation support efforts to develop solutions, as they have with anthracnose and Toronto bacterial wilt.

Board of Trade CC, Woodbridge, Ontario, Canada. The Leo Feser Award is presented to a golf course superintendent and GCSAA member who has, within the past year, authored the article in GOLF COURSE MANAGEMENT magazine that is judged to have been the most outstanding superintendent-written article. Witteveen is a regular contributor to the magazine and his primary submission this past year was "Fine Bowling Greens: Fast and Flat," September 1983.

The Opening Session is also chosen as the time to recognize outstanding newsletters published by GCSAA Affiliated Chapters. Winners for 1983 were:

10 Overall Best

Carolinas GCSA Newsletter, Dr. Landon C. Miller, editor

The Florida Green, Florida GCSA, Dan Jones, editor

Three Rivers Green, Greater Pittsburgh GCSA, Joseph G. Baidy, editor

A Patch of Green Michigan & Border Cities GCSA, Ted Woehrle, editor

Mississippi Turfgrass Association Newsletter, Dr. Don Blasingame, editor

Gateway Green, Mississippi Valley GCSA, Dennis J. Barron, editor

Turf Talk, New Hampshire GCSA, Ray Richard, editor

The Greener Side, New Jersey GCSA, Ed Walsh, editor

Rocky Mountain Reporter, Rocky Mountain GCSA, Mike Hair, editor

The Mountain State Greensletter, West Virginia GCSA, James Taylor Sr., editor

Best Masthead Design

Cactus Clippings, Cactus and Pine GCSA, Paul McGinnis & John Beckwith, editors

Best Cover

Florida Green, Florida GCSA, Dan Jones, editor

Best Use of Spot Color

Connecticut Clippings, Connecticut GCSA, Greg Wojick, editor

Best Original Editorial Content

Florida Green, Florida GCSA, Dan Jones, editor

Best Format and Readability

Turf Talk, New Hampshire GCSA, Ray Richard, editor

Best "Limited Resources" Product

Mississippi Turfgrass Association

CONTINUED PAGE 18

nomyces-like fungus lengthwise on the exterior of the roots.

Recent Developments: In recent years, our laboratory has received occasional turf samples from midwestern states that were infected with Gaeuman -nomyces-like organisms. This August, numerous annual bluegrass samples were received from eastern, mid-central and midwestern states infected with this organism. Annual bluegrass is the major component of golf course fairways in the northern United States, wheather it is desirable or not. A disease like "take all patch" destroyed large areas on many annual bluegrass fairways this summer and since no known control was available many superintendents felt their jobs were in jeopardy. This research proposal is being submitted for funds to try and identify the organisms involved, predict the environmental conditions under which the disease occurs, and to find cultural or chemical means of managing it.

Proposal

Modeling: There is no real quantitative data concerning the environmental conditions leading to the development of "take all patch". Does it start in the cool weather and remain a minor disease until the soil and/or air environment changes? Does it infect and become a severe problem in a short time? What are the environmental conditions under which it occurs? In short, there are many questions to be answered. The best way to do this is to develop a mathematical prediction model for the occurrence of the disease. The air temperature, humidity and rainfally will be monitored along with the soil temperature and soil moisture in developing the model. The positive identification of the organism or organisms involved in this disease will be determined as part of this study.

Cultural: Sulfur - While the addition of sulfur has been implicated in reducing the severity of the disease, no research has been done to determine if the effect is directly on the fungus or the soil pH or both. This will be determined both in the laboratory and in the greenhouse experiments.

Phosphorus - High phosphorus has

CONTINUED NEXT PAGE

IN MEMORIAM

William (Old Bill) Lyons, innovator, entrepreneur, agronomist and long-time member of N.O.G.C.S.A. passed away this past December.

Bill was the owner-operator of Lyons Den Golf Course in Canal Fulton. He first entered golf as a manager in the 1920's, spent a number of years as superintendent of Firestone Country Club before constructing his own golf course.

His many contributions to golf have included extensive turfgrass research projects. He had been a prolific contributor to various turf publications, Participant in scores of seminars and workshops. He was one off public golf's most beloved and respected spokesmen. Bill was the first selection to receive the National Golf Foundation's Outstanding Service Award, inaugurated this past year.

'84 Conference, cont.

Newletter, Dr. Don Blasingame, editor

The Conference came to a fitting finish at the annual Banquet and Show. The highlight of the evening was the presentation, by Arnold Palmer, of the "Old Tom" Morris Award to Bob Hope. Palmer and Hope are long time friends and their congenial bantering back and forth added a special dimension to an already exciting evening.

Gaeumonnomyces, cont.

been associated with disease reduction. The exact effect of phosphorus on disease development will be determined in the laboratory and in the field.

Chemical: The systemic fungicides may offer the best hope of chemical management because of their internal mode of action. The newer systemic fungicides will be screened in the laboratory, greenhouse and in the field in an attempt to identify those fungicides with the greatest efficacy. Fungicides may be economical to apply once the occurrences of "take all patch" can be accurately predicted.

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