



We're Learning More About Take-All Patch

By Dr. Gayle L. Worf
Department of Plant Pathology
University of Wisconsin-Madison

Take-All Disease in 1990. Several courses in Wisconsin experienced bentgrass patch disease — or take-all patch — this past growing season. Formerly known as Ophiobolus patch, and sometimes called Gaeumannomyces patch after the causal fungus (*G. graminis* var. *avenae*), it occurs primarily during cool wet seasons. So it's no surprise that we encountered some of it this year after a lapse of several warm years. It also was reported to be very prevalent in the greater Chicago area.

What's new, at least for us, is the fact that it was found on several older sites, on courses that were established many years ago. Our experience until now has been primarily with new courses, where the turf is maybe three to six years old.

The major damage that we saw still was associated with new turf. Some observers associate greatest vulnerability with new courses that have been carved out of woodlands or forests. It also seems to be associated with newly-established sand-based greens. The possible explanation for this, assuming these observations to be correct, is that these sites are new to turfgrass production. There has not been ample opportunity, under these conditions, for competitive and beneficial microorganisms to evolve, and so the take-all fungus can grow and attack the turf without natural competitive restraint.

But what about the older courses? Why did they show disease this year? The literature suggests that take-all patch will be more severe in poorly drained areas, and where the pH is high. My best guess is that when we encountered these conditions on fair-

ways this past cool, wet spring, the fungus simply outdistanced the competitive organisms.

What is interesting to me is the kind of symptoms that were produced. Affected areas were not small, as is often encountered on new greens. Some were several feet in diameter, suggesting the fungus had been around for awhile. In other words, it was not recently introduced. Nor was the turf killed on any of the older infected turfs that I saw. Damage in individual spots on the old courses was usually not nearly as severe as on new courses. To my eyes they gave an appearance very similar to localized dry spots! Except, of course, the soil was moist, and usually there was no evidence of a thatch layer, either. The fungus was not into the crown tissues. If it had been, the plants would probably have died. But the roots were diminished, giving the same effects as a droughty condition. To me, it suggests we should check strange patches and "dry spots" in the future for this fungus, which was readily isolated from the roots.

What can we do about take-all? On fairways, the options are limited. Improving surface and subsurface drainage may be possible in some instances, and it would certainly make sense to avoid overliming. Try to keep the pH below 6.5. Maryland suggestions call for use of ammonium chloride fertilizer, at a total of 3 to 4 lb N and K/1000 square feet for at least two years. Sulfur treatments have helped sometimes, but not usually. On greens you can use PMA in October and November for snow mold control, which also reportedly helps to control take-all.

We tried several sterol inhibitor fun-

gicides in a replicated trial at the Black River Falls golf course this spring, where the disease was appearing for the second year on new greens not yet open to the public. Results were not encouraging, except for one experimental compound. Rubigan, which is labeled for the disease, and Banner, not registered for take-all, were no better than the checks after three treatments. The chemicals were irrigated in thoroughly after two of the treatments. What was most encouraging was the eventual disappearance of symptoms, chemically treated or not, after mid-summer. The superintendent provided excellent irrigation, aeration, fertilizing practices.

I can't encourage wholesale fungicide treatment of this disease with these kind of results. Maybe fall applications would have been more useful. We still need development of a dependable treatment that we can apply at first symptoms. Maybe one or more of the new compounds, combined with wetting agents and the right cultural treatments, can be found to do the job.

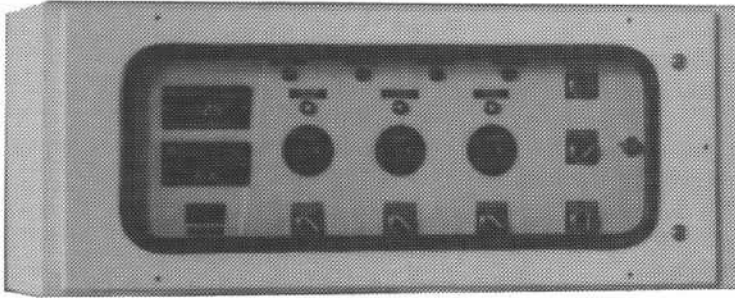
Editor's Note:

Worf assumes another job

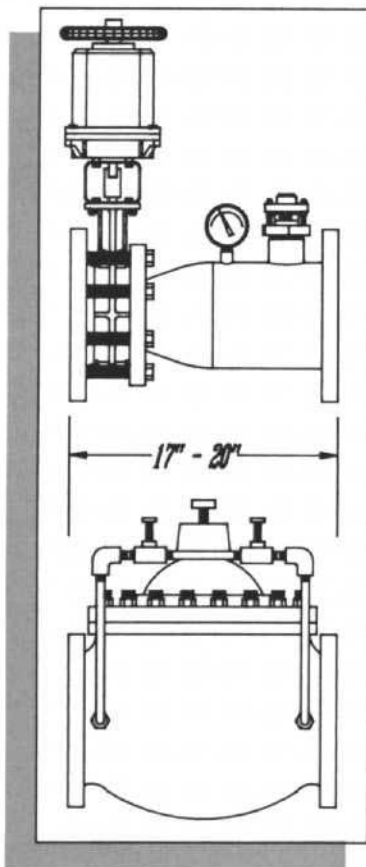
Many of you will recall Donald Peterson, Associate Dean of the College of Agricultural and Life Sciences, in charge of CALS extension programs. Don has retired, and Professor Worf is serving as Acting Associate Dean through June, 1991. Worf still retains a 25 percent appointment in the Department of Plant Pathology, and plans to appear on the winter turf programs. However, his other plant pathology duties will be restricted.

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Presentations on new product development, product safety, the use of plastics in design, and mulching will all be part of the first annual Lawn and Turf Equipment Program to be held on January 17th at the Sheraton Hotel in Fond du Lac, Wisconsin. The program, which is being sponsored by the Wisconsin Section of the American Society of Agricultural Engineers (ASAE), begins at 1:30 p.m. with plant tours of Giddings & Lewis, Inc. and Wells Manufacturing Corporation. Program attendees can choose which tour they wish to take. Giddings & Lewis is a world leader in the production of automated manufacturing systems. Wells Manufacturing Corp. specializes in the manufacture of electronic ignition components for the small gas engine and automotive industries.

At 4:00 p.m., concurrent technical sessions will be held at the Sheraton. Attendees can choose between a session on (1) Safety Issues, (2) New Products, or (3) Plastics for the Lawn and Turf Equipment Industry. The Safety Issues session will include a presentation by Jim Hawkins and Roger Mayhew of Weasler Engineering entitled "Component Suppliers Role in Safety" and a presentation by Ed McCause of McCause Engineering, Inc. entitled "Engineering and Management Obligations for Product Safety." In the New Products session, Jim Hardzinski of John Deere Horicon Works will talk on the "Development Program of a Rear Engine Rider" and Jim Myers of Simplicity will discuss "Taking the Team Approach Toward the Development of a Riding Mower." The third technical session will feature Mike Coffey from Dow Chemical. Highlighted in Mike's presentation "Plastics in Design" will be Dow Chemical's Concept Plastic Mower.

The concurrent sessions will be followed by a 5:00 p.m.

social hour and a 6:00 p.m. meal served family style. Included on the menu will be baked ham and turkey with stuffing.

The program will be capped off with a 7:15 p.m. presentation by keynote speaker Dr. Phillip Colbaugh, an Associate Professor of Plant Pathology at the Texas Agricultural Experiment Station in Dallas, Texas. The title of Dr. Colbaugh's presentation will be "Thin Layer Composting: Opportunities for the Future." Dr. Colbaugh will explore the possibilities, advantages, and disadvantages of mulching leaves and other biomass along with grass, and leaving the mixture to decompose where it was mulched. Dr. Colbaugh has worked with urban crops and cropping systems for 16 years, and is part of a group of Texas A&M researchers involved in urban agriculture.

While this program has been put together for engineers, anyone with an interest in lawn and turf equipment, or who regularly purchases and/or uses such equipment is urged to attend. One of the intents of this program is to provide a forum where interaction between designers and end users can lead to product improvement. This meeting should result in the largest single gathering of lawn and turf equipment engineers. Come get your questions answered, pay your compliments, or air your frustrations.

Cost of the entire program is only \$14 per person. If you wish to attend, send \$14 (make checks payable to the Wisconsin Section AWAE) to: Cal Siegel, Modern Pole Builders, 654 East Oshkosh Street, Ripon, WI 54971. Additional information (primarily directions) will be sent out upon receipt of reservations. If you have any questions regarding the program, contact: Dave Bohnhoff at 608-262-9546.

GREATEST SHOW ON TURF COMES TO LAS VEGAS

Attendance is expected to top 17,000 at the 62nd International Golf Course Conference and Trade Show, scheduled Feb. 5-12, 1991, in Las Vegas, Nev. The golf course industry's main event, hosted by the Golf Course Superintendents Association of America (GCSAA), will include nearly 50 educational sessions and seminars, a two-and-one-half-day trade show, a gala banquet featuring a performance by Neil Sedaka, the association's annual meeting and election of officers, and the 1991 GCSAA Golf Championship.

Conference week opens with the annual GCSAA Golf Championship, scheduled Feb. 4-5 at five Scottsdale, Ariz., golf courses. A field of about 600 will compete for individual and chapter team honors in the national tournament.

Topics ranging from turfgrass disease control to environmental regulations will be covered in 41 one- and

two-day seminars that will be offered during the first four days of the conference, Feb. 5-8. Six concurrent education sessions are slated for Saturday, Feb. 9. Mark H. McCormack, sports marketing entrepreneur, will keynote the Opening Session on Friday, Feb. 8, at The Riviera, the GCSAA Conference and Show headquarters hotel. McCormack is chief executive officer and chairman of International Management Group, a 14-company, multinational conglomerate, and the author of *What They Don't Teach You At Harvard Business School*.

More than 500 manufacturers and distributors of golf/turf industry products, supplies and services are expected to exhibit at the trade show, which runs Feb. 10-12 at the Las Vegas Convention Center.

Legendary pop singer/songwriter Neil Sedaka will perform at the formal closing banquet on Tuesday, Feb. 12.

The versatile performer penned some of the biggest hits of the rock-n-roll era, including, "Breaking Up Is Hard To Do", "Laughter In The Rain" and "Happy Birthday Sweet Sixteen".

The highlight of the gala evening will be the presentation of the Old Tom Morris Award, CGSAA's highest honor, to William C. Campbell. Campbell is the only American ever to have served both as president of the United States Golf Association and as captain of the Royal & Ancient Golf Club of St. Andrews, Scotland.

Last year's conference and show, held in Orlando, Fla., drew more than 17,300 people. Nearly 1,600 of those attending were international visitors and guests, representing 39 countries outside the U.S. Attendance for the Orlando show broke GCSAA's attendance record, set in 1989 at the conference and show in Anaheim, Calif.



He'd Rather Talk Turf

By Lori Ward Bocher

Egon Herrmann, affectionately known as "Mr. Turf" to many in the industry, was supposed to be telling me his life story during an interview for this GRASS ROOTS Personality Profile. Instead, he was telling me how to overseed the bad sections of my lawn at home.

With his German accent, he carefully instructed me as to how to prepare the lawn, when to overseed, the proper grass mixture and application rate to use, when to fertilize and the proper N-P-K ratio for the fertilizer.

This, I soon discovered, is typical of Egon Herrmann, Executive Vice President of Kellogg, Inc., a Milwaukee-based seed and supply company. He'd rather talk about turf than himself. He'd rather use the interview time to campaign for the O.J. NOER Center for TURFGRASS RESEARCH at the University of Wisconsin-Madison than discuss his own accomplishments.

At 63 years of age, an enthusiastic Egon shows no signs of early retirement. "I wouldn't be doing this if I didn't like it," he says. "Otherwise, I would have been gone a long time ago. I don't want to retire. As long as I can, I'm going to be around."

A native of Germany, Egon was born in the northern city of Kiel in 1927. He remembers the pre-war period when his father was imprisoned for a while for being a Social Democrat. Still a boy when war broke out, he was old enough to serve in the German navy the last year of WWII. His only brother died in Africa.

"After the war, the opportunities in Germany were not great," Egon recalls. "We wanted to do something with our lives. I was too old to wait for things to bet better."

Before he could immigrate to the U.S., Egon needed to find a sponsor in this country. So he visited Milwaukee to meet with a friend of his father who had immigrated in 1923; the man agreed to sponsor him.

In 1953, Egon came to the U.S. as a 25-year-old single man. "I learned my



Egon Herrmann, Wisconsin's "Mr. Turf".

English by reading and writing," he remembers. A year later he was joined by his bride, Anita. For three years he worked for his sponsor, a masonry contractor in Milwaukee. "And I've been here ever since," Egon adds.

The next five years found Egon working in a Sears & Roebuck garden shop. "That wasn't my love," he recalls. "I get off the grass and I'm lost."

So in 1961 he bought himself a lot of grass — a 60-acre sod farm near New Berlin. Egon had been saving to buy his own business, and he claims it happened to be a sod farm by chance. "I was buying sod from this farm and saw it was for sale. I like to be outdoors, so I bought it."

He sold the farm in 1974 because he didn't have enough land to support the machinery he needed and because his children were not interested in taking over the business.

In the meantime, he began his career at Kellogg in 1972 as a sales representative. He later assumed some public relations responsibilities, and the combination kept him on the road a lot and took him to almost every major university in the country. "I'd rather be out among the people," Egon says. "I have a lot of friends all over."

The Loft Seed Co., which had owned Kellogg, sold the firm to general man-

ager Don Stein in 1980. Shortly thereafter, Egon was promoted to Executive Vice President.

With sales of \$13 million, Kellogg, Inc., is divided into three areas, according to Egon. Kellogg wholesales supplies to garden centers. It manufactures bird seed. And it wholesales grass seed — the division with which Egon is most involved. Grass seed is sold to sod farmers, golf courses, construction firms, highway departments and landscapers — mainly in Wisconsin, Minnesota, Illinois, Indiana and southern Michigan.

Egon especially enjoys working with golf course superintendents. "They're really good people," he says. "It's a professional group. Generally, they're better educated than the other people I sell to."

Although he never had any formal education in turf management, few know more about the subject than Egon, and people often call on him for his advice. "I listened to lots of sessions at universities," he explains. "You get exposed to that for a few years and something has to rub off.

"I am up on all the research," he adds. "You have to be. If you want to sell grass seed, you have to know the product." He also has an extensive library of technical journals devoted to turf management.

His love for and knowledge of anything that's related to turf prompted Egon to be a catalyst and one of the founding members of the Wisconsin Turfgrass Association in the early 1980's. He also served as vice president. Turf is important to Wisconsin's economy. As a crop, it ranks just behind alfalfa and corn.

"The primary goal of the Wisconsin Turfgrass Association always has been to build the O.J. NOER Center for TURFGRASS RESEARCH," Egon points out. The center now is being built adjacent to the new University of Wisconsin Golf Course.

As a supplier to the turf industry, Egon is involved in many other professional organizations. He currently is a director of the Wisconsin Landscape Federation and he previously was a director of the Wisconsin Sod Producers Association. He also is a member of the Illinois Sod Producers Association, The Wisconsin and Illinois Golf Course Superintendents Associations, the American Sod Producers Association, the Sports Turf Managers Association

and the Golf Course Builders Association.

Along with his work, family is the most important thing in Egon's life. He and Anita have four children: a daughter who teaches at Milwaukee Area Technical College; a son who is a CPA and senior manager for Price Waterhouse in Denver; a son who is vice president of the Orion Insurance Co. in Milwaukee; and a daughter who will graduate from college in December with a speech pathology and audiology major.

He also enjoys reminiscing about the eight trips he and Anita have taken to their native Germany. Although their parents are now deceased, they still enjoy making regular visits.

When the interview with Egon Herrmann came to an end, I realized that we had spent more time talking about my lawn, the NOER Center and Germany than we had about "Mr. Turf" himself. But I had thoroughly enjoyed my two hours with this friendly and enthusiastic supporter of the turf industry. I can easily see why he has so many friends.

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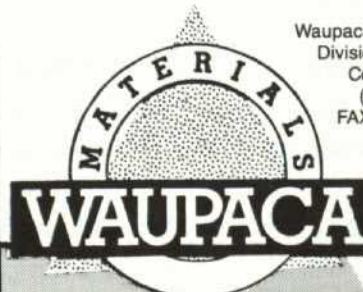
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Course Description

The turfgrass management short course is both an entry level course into turfgrass management and a review course for practicing turf professionals. The course deals with cool season turf grasses including both golf and home lawn situations. The unit covers selection of grasses for various sites and purpose and management practicing including:

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**RETURN BY
DECEMBER 14, 1990**



Poa annua and Phosphorus

By Dr. Wayne R. Kussow
Department of Soil Science
University of Wisconsin-Madison

For years, we have been told that generous supplies of phosphorus from soil or fertilizer enhance invasion of turf by *Poa annua* (PA). The reason, it seems, is that PA has a high phosphorus requirement. Satisfying this requirement gives PA a competitive growth advantage over other turfgrasses. How valid are these arguments?

The idea that PA has a high P requirement appears to have arisen from a number of field and greenhouse studies that date back as far as 1937. Let's examine some of these research findings, but without the usual citation of names, dates, places, research methodology, etc. Anyone wishing a list of the references drawn upon here can receive it for the asking.

To begin, let me list some observations that are often used to support the notion that PA is a P-loving plant:

1. Application of the equivalent of 5.9 lb plant available P/1000 ft² (hereafter cited as lb P) as bone meal or 3 lb P as 5-10-5 fertilizer each year for eight successive years increased PA populations in bentgrass 12 to 15% over the unfertilized control treatment.
2. Applying up to 90 lb P to "medium P" pots of soil then seeded to PA increased PA populations 22%, while application of P to a "very high P" soil had no effect on PA populations.
3. Application of P to a pH 4.5 loamy sand soil increased PA growth in pots, but not when the loamy sand was limed to pH 6.5 or when the P was applied to a silt loam soil adjusted to pH 4.5 or 6.5.
4. Application of 1.8 lb P along with 6, 10, or 20 lb N and 1.1 or 3.4 lb S for seven years on colonial bentgrass greens increased the area invaded by PA by an average of 20%.
5. Application of 4.5 to 18.0 lb P over three years on creeping bentgrass and then observing changes in PA over the three succeeding years revealed population increases of 3 to 7%.
6. Application of zero to 3.6 lb P and 3 lb N for two seasons on a golf fairway resulted in PA populations of 63 to 77% the first year and 75 to 83%

the second year. Leaf P concentrations in the PA ranged from 0.42 to 0.60%. These contrast with reports that healthy Kentucky bluegrass contains 0.12 to 0.24% P.

7. The optimum P level in PA leaf tissue has been shown in greenhouse studies to be about 0.52%.

On the surface, these research observations constitute some pretty convincing evidence that P application imparts a growth advantage to PA. But let's examine these lines of evidence in more detail and cite some other sources of information. As a general observation, note that in three of the preceding instances we are getting excited about PA population increases averaging 1.5 to 2.8% each year. Recent detailed studies of PA population shifts in turf have revealed natural population changes in the range of 70% over a single season. Clearly, then, the time of season when PA populations are observed is very critical as far as the results of field research studies on PA are concerned.

In the first research study cited above, it has to be recognized that this work pre-dated soil testing. Hence, we have no way of knowing whether or not annual applications of 3 or 5.9 lb P constituted what today would be considered reasonable rates of application. In any event, application of 117 lb bone meal or 70.2 lb 5-10-5 by no means constitutes a realistic fertilization program for bentgrass.

The next two studies cited were conducted with monostands of PA. Without the inclusion of other grass species for comparison purposes, there is simply no basis for concluding that these studies support the contention that P application imparts a growth advantage to PA. In summarizing their work, the authors themselves concluded that "there is no suggestion that annual bluegrass differs from other bluegrasses in its responses to the major elements, N, P, or K."

In the fourth study previously cited, whether or not P application truly enhanced PA in the bentgrass is difficult to judge. No statistically significant difference levels were reported. Hence,

which treatment effects can reasonably be expected to be reproducible rather than the result of random events cannot be ascertained. Perhaps of even greater interest in this study is the fact that application of .1 lb. S per season led to an average increase of 92% in the area infested by PA, while P application increased the PA-invaded area by only 20%.

The fifth study actually involved variable rates of K as well as P. Increasing K rates had as great an influence on PA populations as did P. If one takes the time to read the discussion section of this report, it becomes evident that the authors recognized factors such as dollar spot infection as being a contributing factor in PA invasion of the bentgrass.

The sixth reference suggests major increases in PA populations over one year (63 to 77% PA the first year and 75 to 83% PA the second). Three interesting features of this study are: (1) the original PA population was estimated at 95%; (2) N scheduling had as great an impact on PA populations as did P application; and (3) when averaged across the different N schedules, P applications did not significantly influence PA populations recorded at the end of the study.

References 6 and 7 provide bentgrass tissue analyses that have been interpreted as evidence that PA has a high P requirement. In one such study, at fertilizer P rates where Kentucky bluegrass and bentgrass were still showing growth responses to the fertilizer P, leaf P contents ranged from 0.40 to 0.53%. Thus, the optimum tissue P concentrations for these two grasses appear to be as high or higher than the 0.52% optimum tissue P level reported for PA. If one studies existing literature carefully, it is not difficult to find reports of bentgrass tissue P levels ranging as high as 0.8% in plots where recommended P fertilization practices have been employed.

So what do these research data really tell us regarding the influences of soil or fertilizer P on PA encroachment into turf? My conclusion is that the ef-

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Reinders

TURF EQUIPMENT

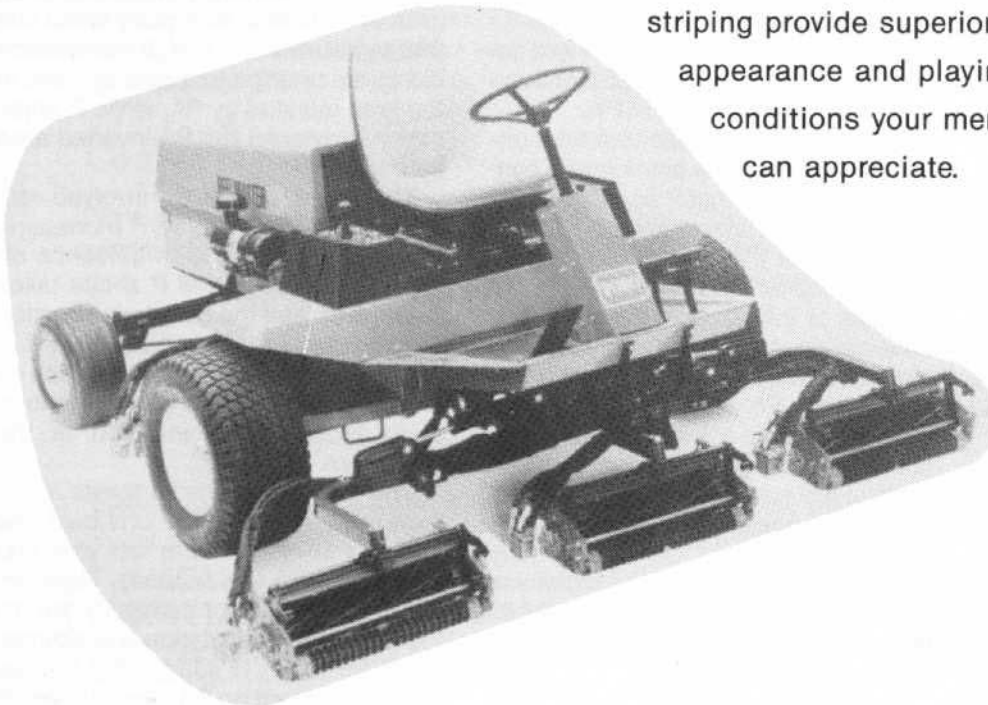
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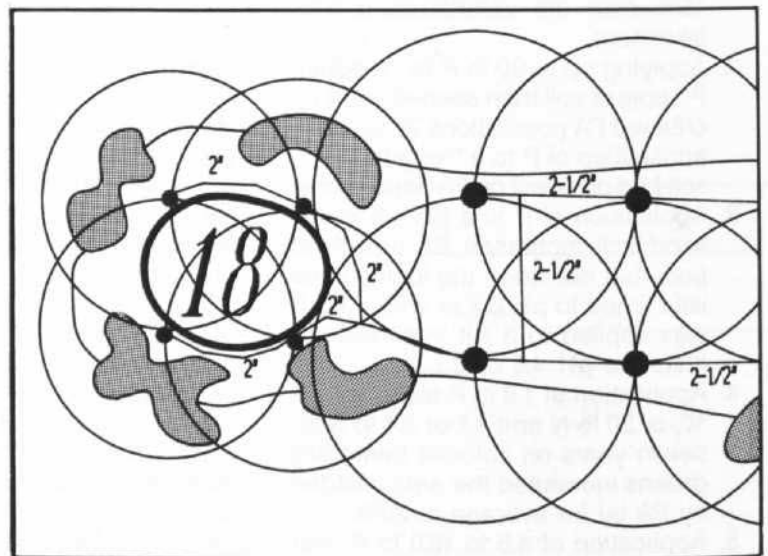
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(continued from page 17)

fects of P have been badly overstated. The influences of P cannot be readily isolated from factors such as soil pH, N scheduling, and applications of other nutrients such as K and S. What appears to be of primary importance is the total fertilization package employed, not whether or not P application is a part of that package.

This brings us to some recent observations on this subject. A study reported in 1986 suggests that:

1. Germination of PA in perennial ryegrass turf is determined by the numbers and sizes of invasion gaps that exist in the turf. This makes sense in that PA seed germination requires an abundance of light.
2. Survival of PA seedlings once germination has taken place is determined by their success in competing for nutrients in the root zone. Application of N overcomes the root zone competition while P and K

applications have little or no effect.

A second recent study entailed meticulous recording of PA populations in a bentgrass fairway. The data presented support the authors' conclusion that "P did not exercise the dominant role that N does in determining species composition in a bentgrass-annual bluegrass community." Thus, these two recent studies compliment one another and relegate to P a secondary influence on PA invasion of turf.

Finally, I am now in the process of finalizing my report on a three-year study of N source effects on PA invasion of creeping bentgrass turf. In plots where soil test P ranged from 65 to 225 lb/acre, the soil P levels bore no relationship to PA populations in the turf. Rather, under the conditions of the study, indications were that PA invasion and spread were controlled by the combined effects of earthworm activity and the verdure of the bentgrass. Large numbers of earthworm casts and

low verdure apparently created the invasion gaps required for PA encroachment in the bentgrass.

In summary, I firmly believe that the time has come to lay to rest the idea that ample supplies of P from soil or fertilizer inevitably result in higher PA populations in turf. A corollary statement is that starving turf for P is not an effective PA control measure. Rather, anything that creates invasion gaps in turf favors invasion by PA. A radical statement? Hardly. Let me end with a quote from a pioneering and classical 1937 report on PA and its growth requirements:

"The abundance of this pest in golf greens is apparently due largely to the loss of vigor or actual death of the permanent grass in critical periods, which furnishes opportunity for new plants of (annual) bluegrass to invade or completely occupy the injured area."

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Otterbine Floating Aerators are self-contained units which range in pumping capacity from 16 to 3,100 gallons per minute. Unit sizes are available in 1/6 to 10 horsepower. Minimum pond size can be as small as 8 feet in diameter and 13 inches deep. These aerators can also beautifully illuminate fountains with low voltage light kits and timing systems.

For more information on Otterbine Floating Aerators contact:



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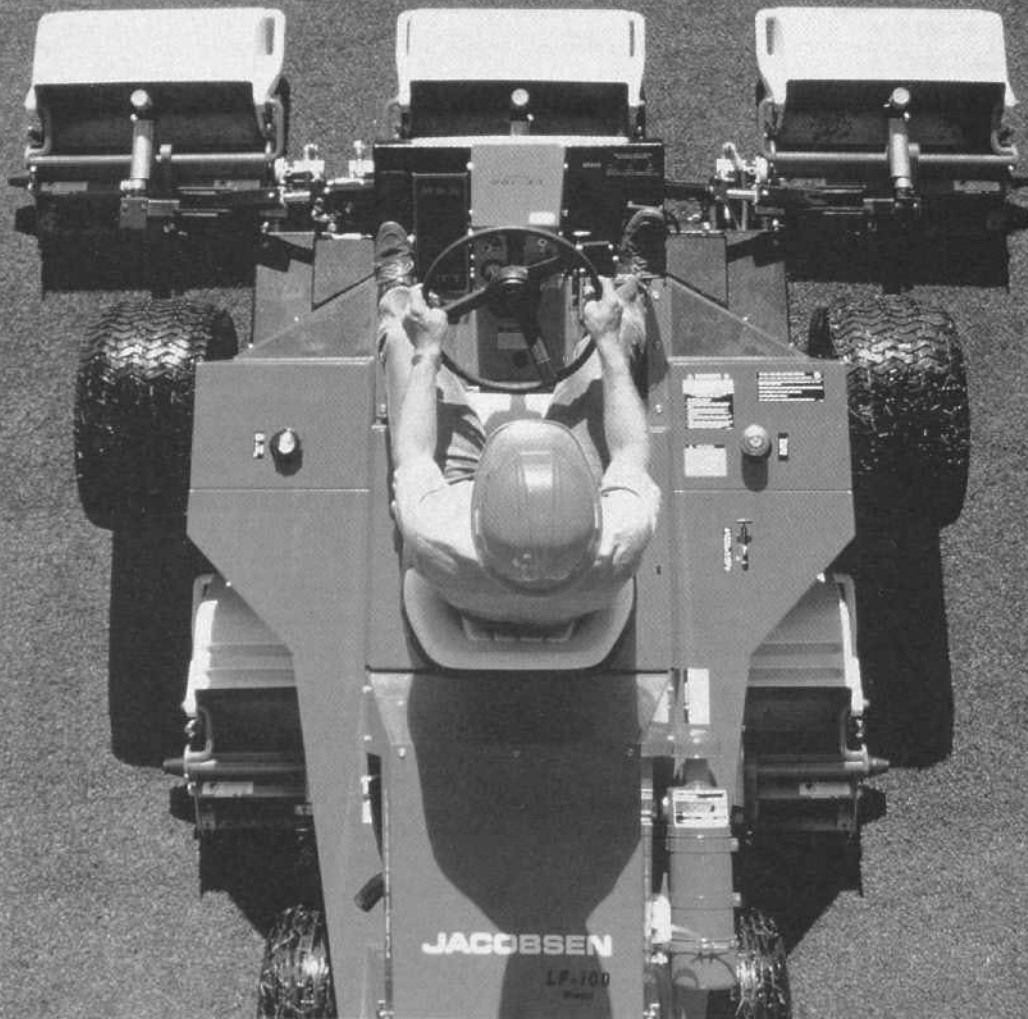
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WISCONSIN TURF EQUIPMENT CORP.

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