CORNELL UNIVERSITY TURFGRASS TIMES

CUTT

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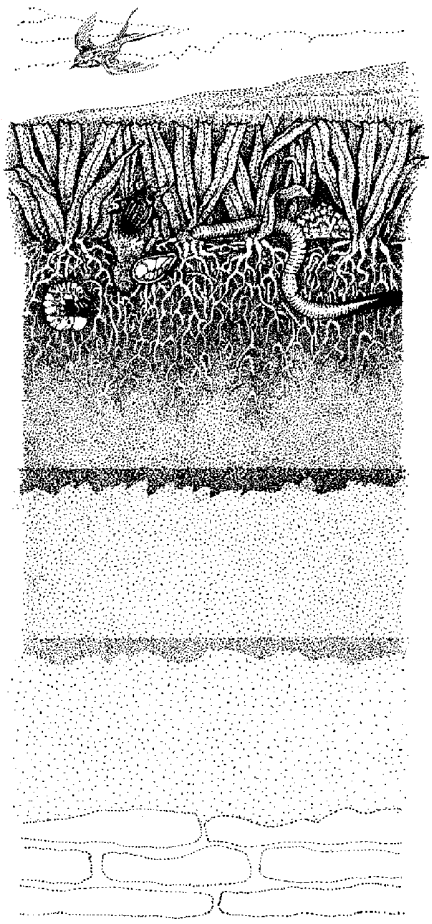


Does Bentgrass Overseeding Work?

Player expectations continue to increase for superior playing conditions. In particular, the putting green is the most scrutinized, managed area on the golf course. It follows then that golf course superintendents regularly strive to utilize all available technology to produce the highest quality product.

The golf course construction boom of the 1990's resulted in hundreds of new putting surfaces across the country, built with the aid of the latest technology in rootzone and plant materials. In addition, superintendents are becoming more aware of the advantages of using the "new generation" of bentgrass cultivars. This has occurred because golfers are playing on the new surfaces and pressuring superintendents (a phenomenon that has increased following the U.S. Open Championship at Pinehurst where the greens were converted to a new cultivar), or as a result of research on cultivar performance. In either case, there is significant appeal to providing acceptable quality at mowing heights below 0.125" with the ability to produce ball roll distances in the 11 to 13 feet range. ■

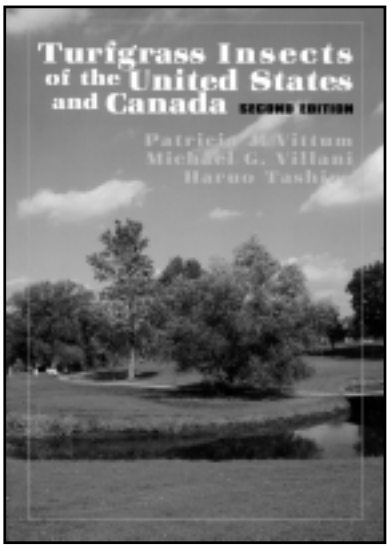
Most golf facilities are not in a position to reconstruct the putting greens, however, they would like the benefits of new technology, especially increased ball roll. As a result, golf course superintendents at established facilities have been interested in introducing the new cultivars into existing putting greens. This desire to alter the species composition of the putting green is not new. For years, superintendents have attempted to increase populations of bentgrass in mixed stands of annual bluegrass (*Poa annua*) and creeping bentgrass. The major obstacle to successful population shifts has been the obtrusiveness of the practices required to affect a noticeable change. Simply, it has been a challenge to shift populations in a way that is transparent to the golfer. Herein lies the ecological principles that govern shifts in populations of organisms.

continued on page 4

This Times

Short Cutts

Rave reviews are being received from the turfgrass community about the new edition of Dr. Haruo Tashiro's "Turfgrass Insects of the United States and Canada."



Insect Bible Revised by the Killer V's

Up until 1987 there were few if any reference books on turfgrass insects. As a result, many students in turfgrass science and professional turf managers were utilizing general insect texts to learn about issues that were very different from what they were reading. Fortunately, Dr. Haruo Tashiro ("Tash"), devoted the years just prior to retirement to providing the definitive turfgrass insect reference text, or insect bible in 1987. In short order, *Turfgrass Insects of the United States and Canada*, became the choice of turf managers from Pebble Beach to the National Golf Links. However, in recent years, Tash knew that the advances in biocontrol and IPM warranted a new edition and some assistance from leading entomologists.

It seemed a natural to enlist Drs. Pat Vittum and Mike Villani (*the Killer V's*) for the second edition. Dr. Vittum was Tash's last graduate student and Dr. Villani was the person who assumed the position vacated by Tash. According to Villani, "The book was a true collaboration. Pat Vittum was the first author because she tended to tackle those distasteful tasks that go with the glory and responsibility of first authorship." Next, the three sent the original chapters out for review by other leading entomologists. As the reviewed chapters returned, the "Killer V's" improved readability, reorganized and added new citations. In addition, graduate students and Cornell Turfgrass Team Members, Paul Robbins and Jennifer Grant, provided significant input in their areas of expertise.

Still, in Tash's own words, he is "most pleased" with the new color photographs that were shot by himself, Joe Ogrodnick, a photographer at the Experiment Station in Geneva, and from images provided by leading entomologists. The new edition contains over 550 color images of the various insect life stages. Almost every insect found in North America, north of the Rio Grande, Hawaii and southern Canada is covered by the book.

Rave reviews are being received from the turfgrass community about the new edition. "It's a must have for any serious turfgrass manager." "If you only have one book as a reference for turfgrass insect management, this should definitely be the one." The book is "extremely readable." The second edition is available from Cornell University Press; New York State Turfgrass Association members receive a special discount.

Get Ready for 2000 With the Turfgrass ShortCUTT Almanac!

What will you remember the 1999 growing season for? The worst drought in a decade, followed by a tropical storm that flooded turf areas? Poor crabgrass control, gray leaf spot or chinch bugs? However you remember it, the best way to deal with these challenges in the future is to be armed with the latest research based information, not what a *friend* tells you.

The Cornell Turfgrass Team offers a weekly electronic newsletter called Turfgrass ShortCUTT that addressed all the issues of 1999. Subscribers truly know the importance of timely information. Now for a limited time, we have accumulated all the weather information, cultural practices, when pests arrived in 1999, the latest in control strategies and information from international experts on the hottest topics from how to irrigate, to how to control nematodes and gray leaf spot, protecting water quality, and managing *Poa annua* in one resource.

The ShortCUTT Almanac is fully indexed for easy searching. The Almanac has a complete weather summary to help predict when pests might become a problem. The 1999 season in review predicts how last season might influence what you see in 2000. To reserve your copy, available in January 2000, contact Evie Gussack at (607) 257-8481 or eg21@cornell.edu. Or, look on page 15 for a subscription form for the 2000 ShortCUTT Newsletter, your link to the most current turfgrass information.

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Made in the Shade: Using PGR's on Shaded Turf

Estimates are that approximately 25% of all turfgrass areas are managed under some type of shaded conditions. When a turf is shaded by vegetation, such as a tree canopy, not only is the amount of light reduced, but rather the quality of light is reduced. For example, because tree leaves are green, they remove almost all the light that is useful for photosynthesis. The remaining light that penetrates the turf canopy is significantly altered and triggers certain plant hormones that result in a unique growth response.

Researchers at Michigan State University have been investigating growing turf under low light, but not under a tree canopy. Drs. John Stier (now at the University of Wisconsin, Madison) and John (Trey) Rogers have been working on growing grass in indoor stadia, similar to their project for the 1994 World Cup. Under these conditions, the challenge is not only reduced light, but also intense traffic from sports such as soccer.

A covered stadium simulator facility (CSSF) was constructed to determine if the plant growth regulator (PGR), Cutless (flurprimidol), applied to a Kentucky bluegrass stand and known to influence specific plant hormones, could enhance turf quality. Cutless was applied above, at and below the labeled rates after placing the turf into the CSSF and again at 6 weeks. Fertilizer applications were made to supply 4 lb. of nitrogen per 1000 square feet per season. Simulated traffic was applied to determine traffic tolerance and general turf quality assessments were made to evaluate the length of time the turf provided acceptable quality under low light. Surprisingly, results indicated that the below label rate afforded high quality turf without traffic up to 70 days. When supplemental lighting was supplied with Cutless treatment, the turf provided acceptable quality for 100 days. Additional rooting and tiller data suggest that the PGR is able to alter the hormonal response and improve the elasticity of the shoots to allow for improved clipping quality. Therefore it appears that the average shady turf, with limited traffic, could benefit from light rate applications of a PGR to improve quality, however, research is continuing into the relationship between PGR's and fertilization.

(From: Stier, J.C., J.N. Rogers, J.R. Crum, and P.E. Rieke. 1999. Flurprimidol effects on Kentucky bluegrass under reduced irradiance. Crop Science 39:1423-1430.)

Do Winter Covers Work?

Throughout the northern climates, there is considerable concern regarding turfgrass winter injury. It is estimated that many northern turf areas will suffer some form of severe winterkill at least once every 3 to 5 years. This is particularly problematic on high value areas such as golf putting greens where snow cover is inadequate to protect the turf from temperature extremes. Consequently, golf turf managers have been using various types of protective covers to essentially mimic the protective effects of snow cover, with literally no scientific data to support any benefits.

To address this important issue from a scientific perspective, researchers at Laval University in Canada, investigated the influence of various winter protective covers on turfgrass winter injury, soil and crown level temperatures. The study was conducted at locations in Quebec City, with thick, stable snow cover on creeping bentgrass, and in Montreal with thin, unstable snow cover on annual bluegrass. Five covers plus an uncovered plot were tested including, 1) permeable and 2) impermeable Evergreen covers, 3) a curled wood-shaving mat (AKA, Excelsior Mat); and 4) 2 inches of air space plus an impermeable cover, and 5) 7 inches of straw with an impermeable cover. Covers were applied in early to late November prior to snow cover.

The Quebec site that sustained deep snow cover resulted in no significant difference in injury or measured temperatures, however significant injury was noted from snow mold disease. In contrast, the Montreal site demonstrated a clear benefit of the protective covers that maintained an air space below an impermeable cover. In fact, covers without the air space resulted in significant winterkill of the annual bluegrass. Therefore, it can be concluded that under prolonged snow cover the most important aspect of survival is disease prevention, yet under fluctuating snow cover, insulating materials such as curled wood mat, straw or air space under an impermeable cover can reduce soil temperature fluctuations, minimize the influence of freezing temperatures and thin snow cover consequently enhancing the winter survival of golf greens.

(From: Dionne, J., P.A. Dube, M. Laganiere, and Y. Desjardins. 1999. Golf green soil and crown-level temperatures under winter protective covers. Agronomy Journal 91:227-233.)

Scanning the Journals

A review of current journal articles

The below label rate of Cutless afforded high quality turf without traffic up to 70 days. With supplemental lighting, the turf provided acceptable quality for 100 days.

Under prolonged snow cover the most important aspect of survival is disease prevention, yet under fluctuating snow cover, insulating materials enhance the winter survival of golf greens.

Bentgrass Overseeding

continued from front cover

Consequently, if high populations of annual bluegrass exist on surfaces where new bentgrass cultivars are to be introduced, techniques must consider altering the niche for the surface vegetation while taking into account contributions from the seedbank, likely to exploit a highly disrupted surface.

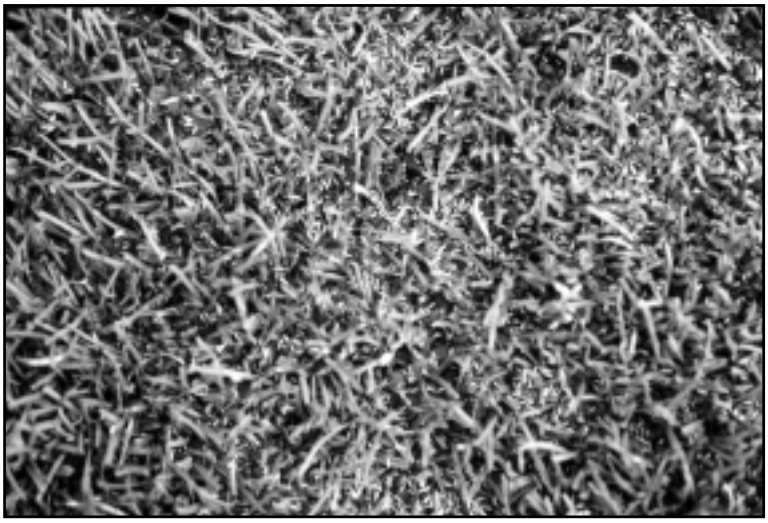
It was implied that the existing cultivar would always have the competitive advantage because it is established and already utilizing the resources that a new cultivar being introduced would also require.

Competition for Resources

In the early years of golf course management, it was common to manage weeds through the drastic manipulation of soil pH. For example, large amounts of elemental sulfur or lime would be applied to alter the pH so that the weeds could not be successful. This is a practical example of "altering a niche."

A niche is described as the range of conditions that are required for a species to survive and reproduce. In the example above, by drastically altering the pH, the niche is altered to the point that the resource needs of the weed are unable to be met. In addition, while severely weakened, the turf is still able to exploit the available resources so that it will successfully compete with the weeds and survive. The result is a population shift in favor of the turf.

Researchers have suggested that there are significant similarities among the resource requirements for bentgrass cultivars. It was implied that the existing cultivar would always have the competitive advantage because it is established and already utilizing the resources that a new cultivar being introduced would also require. Therefore, it appears that without substantial alteration of the niche, the conversion seems a formidable challenge.



Simply distributing the seed will limit success.

The conversion process is similar to previous work conducted to investigate techniques for population shifts of bentgrass/annual bluegrass surfaces. Research on the conversion from annual bluegrass has been primarily conducted on fairway height turf. While it might seem an easier task to convert from annual bluegrass to bentgrass, based on the previous assertion that different species may have different niches, annual bluegrass is well adapted to disturbed environments. Therefore, not only must practices address existing plants, but also must consider the contribution from the seedbank when the surface is disrupted.

Researchers have identified several important aspects of the species conversion process that involve cultural practices. These cultural practices, such as clipping removal, were suggested to result in altered soil fertility, potential allelopathic effects of clippings and reduced

Conversion Techniques
Annual Bluegrass Conversion

The process of conversion begins with recognizing the necessary requirements for altering the niche. This has been shown to include timing of procedures, chemical suppression of existing vegetation, mechanical surface disruption, introduction of the new cultivar, and post-plant care. Individually or collectively, these techniques are used to weaken the existing vegetation, establish a seedbed and implement practices that favor seedling growth.

Stock up on "new generation" bentgrasses?

Slit-seeding could improve soil-seed contact.

contribution to the seedbank. Furthermore, our research here at Cornell University indicates that annual bluegrass population shifts occur naturally in response to environmental factors and independent of conversion management procedures.

The types of cultural and environmental influences observed with annual bluegrass and bentgrass are not likely to exert a significant influence on existing bentgrass stands. In addition, the surface disruption on putting greens is more frequent and intense than what would occur on a fairway. Consequently, if high populations of annual bluegrass exist on surfaces where new bentgrass cultivars are to be introduced, techniques must consider altering the niche for the surface vegetation while taking into account contributions from the seedbank, likely to exploit a highly disrupted surface.

Should the process be transparent to the golfer?

Bentgrass Conversion

Without the competition from the seedbank, it appears that weakening the existing vegetation combined with mechanical surface disruption could lead to successful conversion. However, several issues remain to be resolved such as, will this be transparent to the golfers? What are effective post-plant procedures that do not weaken seedlings? And finally, how is cultivar conversion determined?

Research funded by the GCSAA and the USGA has involved conversion of existing Penncross greens to either Crenshaw, L-93, or Penn A-4. In each case, a significant amount of effort went into determining a precise method for distinguishing among cultivars, so that conversion could be quantified. The researchers developed genetic marking techniques that allows for separation of the cultivars. Unfortunately, in some cases the cultivars are so closely related genetically that it is difficult to find marker differences. Nevertheless, sufficient data were available to make some conclusions based on the conversion techniques that were investigated.

Dr. Richard White at Texas A & M University conducted experiments at the Extension Center and at the Dallas Country Club. Plots were interseeded in April 1995 and evaluated for up to 14 months. It was concluded that mechanical disruption did not substantially influence species conversion and that topdressing following seeding was all that might be needed. This is not surprising when the size of a bentgrass seed is considered. In addition, chemical suppression with glyphosate resulted in a 95% increase in Crenshaw population. However, it was observed that recovery of existing vegetation and the seedlings was not

continued on page 6

While it might seem an easier task to convert from annual bluegrass to bentgrass, based on the previous assertion that different species may have different niches, annual bluegrass is well adapted to disturbed environments.

Preliminary results are similar to previous reports, however, a one year 20% increase in Penn A-4 using a shallow surface cultivation procedure (Jobsavers) and low use rates of trinexepac-ethyl (Primo) was demonstrated.

Bentgrass Overseeding

continued from page 5

These practices, "put a priority on the post-plant watering and fertility of the seeding procedures, and not on everyday golf play." Therefore, it could be concluded that this is not transparent to the golfer, and why should it be?

A well articulated action plan that informs the golfers of the transition expected during the conversion process and the likelihood of long term success without significant short-term reductions in playability is required.

sufficient to be a practical option. Interestingly, at the Dallas Country Club, initial (4 week) evaluation indicated a significant conversion; by the 6 month evaluation Crenshaw made up less than 10% of the stand.

Drs. Sweeney and Danneberger at Ohio State University observed conversion of a Penncross green over a 4 year period. Mechanical disruption and seeding followed by alteration in mowing heights to possibly encourage the new cultivars that are more adapted to close mowing, resulted in little if any new cultivars being introduced. These researchers utilized the genetic marker methods similar to those employed in the Texas study.

Dr. Dan Bowman at North Carolina State utilized combinations of mechanical disruption, chemical suppression and seeding to convert Penncross greens to either L-93 or Penn A-4. Preliminary results are similar to previous reports, however, a one year 20% increase in Penn A-4 using a shallow surface cultivation procedure (Jobsavers) and low use rates of trinexepac-ethyl (Primo) was demonstrated. It was concluded that subsequent years will include more aggressive mechanical disruption procedures.

Altering the Niche

Mark Wilson, CGCS of Valhalla Golf Club in Louisville, KY has been attempting to convert 12 year old greens for the past several years and serves as a good example, both of the practical aspects of conversion and the principles of ecology (how plants respond to the environment), specifically altering the niche. Conversion begins by weakening the existing vegetation and allowing the greens to thin during the summer months by reducing fertility. Next, chemical suppression is utilized to further weaken existing vegetation, followed by aggressive mechanical disruption (2 or 3 passes with a core cultivator). Seed is applied then managed to favor seedling growth over existing vegetation by reducing mowing, topdressing and light, frequent watering. These practices, "put a priority on the post-plant watering and fertility of the seeding procedures, and not on everyday golf play." Therefore, it could be concluded that this is not transparent to the golfer, and why should it be? Success of these practices at Valhalla may not be as precisely determined as in the controlled research studies, however, Mark has indicated that there is improved quality of the surfaces, whether the new cultivars are present or not.

Summary

Altering a niche in a way that favors one species over another, such as annual bluegrass versus bentgrass, has been shown to present a formidable challenge. In addition, where there has been success reported, severe reduction in quality is followed by a significant alteration of management. Therefore, based on the latest information available, without severe suppression (or kill) of existing bentgrass surfaces, the overlap in resources required (similarity of niches) make successful conversion a formidable challenge. This will require a well articulated action plan that informs the golfers of the transition expected during the conversion process and the likelihood of long term success without significant short-term reductions in playability. In essence, bentgrass overseeding can work, but not without significantly altering the playing quality of the surface.

It was put best by Goethe, "One must obey nature's laws even while he denies them; he is forced to produce with her aid even when he imagines that he is able to work against her."

Frank S. Rossi
Cornell University Turfgrass Team

Favoring seeding success over playability is key.

How to Write More Powerful "Help Wanted" Ads

The goal of any sound employee recruiting effort is to attract a pool of applicants which will include at least several highly qualified people. Historically, turf managers have used employee referrals and word of mouth as other recruiting methods fail to generate enough applicants. Employers often resort to writing help wanted ads and placing them in a local newspaper to help attract job applicants.

In today's labor market, it's important to sell your position. Aggressive marketing of open positions can pay off handsomely if done carefully.

However, it is not unusual to pick up a local newspaper and find an ad that reads, "Landscape worker wanted, call 333-4444." This approach is hardly one which sells the position or provides the applicant with enough information to make a decision about whether to apply. In a perspective applicant's mind, it doesn't create an appealing image of the job they may be applying for.

To recruit the best applicants, a want ad must sell the position and provide information important to the applicant. A little time and creativity will go a long way toward improving the quality and attractiveness of your ad.

Recruitment advertising has many advantages: it can focus on the positive aspects of the business; it can create interest among people who otherwise would not be contemplating a job change and it can help overcome the effects of some other employers recruiting efforts.

A good "help wanted" ad is not a panacea. It won't make poor working conditions or a deserved bad reputation of an employer disappear. There are no guarantees of how many applicants will respond or how qualified they will be.

To help ensure success, write and place the ad carefully. The ad-writing checklist on this page provides a step-by-step approach. Using this checklist in preparation to writing an ad will help stimulate your thinking and creativity and improve your ability to write an ad that will sell both the business and the job.

The objective of writing effective help wanted ads that sell the positions is to generate the best pool of applicants possible. Extra time spent in this process can have a big payoff in terms of future performance and reduced turnover.

The following checklist is a guide for preparing an effective "help wanted" ad. Respond to the following points regarding the vacant position when writing a balanced, attractive ad. Also refer to the job description if one has been developed.

Ad Writing Checklist

1. Give the job title, if appropriate. Examples include landscape crew managers, assistant golf course superintendent, lawn maintenance technician, and so on. Note: job titles are not required; use them only if they are helpful.

2. List as many positive things about your business as you can. The ad not only should sell the job, it should promote your business. Example phrases may include growing family business, line of new equipment, modern facilities, progressive practices, fourth-generation business and so on.

3. Describe the job. The ad should specifically describe the work to be done. Examples: Lawn mower operation, tree and shrub pruning, tree and shrub installation, turf maintenance, pest control and so on.

4. List as many positive working conditions as you can. Attractive working conditions can make a big difference to potential employees. Examples: flexible hours, opportunity to work independently, use of modern equipment, opportunity to work with a committed successful team, opportunity to learn and grow with the business and so on.

5. Provide information on wages and benefits if appropriate. Highlight parts of the wage and benefit package that you feel are particularly attractive. Examples include: seasonal bonus, medical insurance, retirement plan and use of business vehicle. Use phrases such as attractive benefits and competitive wages, for example.

6. Indicate how to apply. A manager who would prefer to screen applicants over the phone may wish to provide a phone number. Another option is to direct recruits to come by and fill out an application during business hours or have applicants apply to a blind post office box.

Here is an example of an ad which considers the steps in the ad-writing checklist and helps to sell the position to the best advantage.

> Golf Course Maintenance Position: Historic, local country club seeks individual for general golf course maintenance. Duties include mowing, trimming, raking sand traps and other similar responsibilities. Competitive wages, 50 hours per week, overtime pay. Work with a modern line of well-maintained equipment. Fill out application at Successful Valley Country Club, 123 Country Club Drive, Successful Valley, N.Y. 54321

The ad clearly sells the position and makes it clear to applicants what the requirements are

continued on page 11

Human Resource Update

To recruit the best applicants, a want ad must sell the position and provide information important to the applicant. A little time and creativity will go a long way toward improving the quality and attractiveness of your ad.

Editor's Report

On the other hand, society has decided, as it often does with scientific illiteracy at an all-time high, to push the envelope and explore the possibilities. So, this could be a good thing in spite of the motivation.

While we debate organic vs. synthetic nutrition, the plant simply absorbs the nutrients it needs for growth regardless of the source. An exclusively organic program presents challenges in providing a balanced nutritional program

Organic Turf Management: Direct Route or Detour to Sustainability?

A recent court ruling in Suffolk County, NY could have substantial implications for golf development in the US. The State Supreme Court in Riverhead, NY ruled that the feasibility (financial practicality) of an "organic, pesticide-free" golf course must be explored before further development can proceed. This includes issues such as the use of composted organic waste as a soil amendment, exclusively using organic fertilizers and no chemical pesticides.

On the one hand, there are aspects of this decision that run counter to scientific principles, including practical water quality concerns relative to phosphorus loading and runoff. On the other hand, society has decided, as it often does with scientific illiteracy at an all-time high, to push the envelope and explore the possibilities. So, this could be a good thing **in spite** of the motivation.

Beyond this development issue, lies the broader question: Can we manage a golf course with only fertilizers derived from natural organic sources and without the use of synthetic pesticides? As my good friend Jim Moore, the Director of Construction Education Programs at the USGA, always tells me: It depends!

Evolution of Expectations

The unaltered linksland of coastal Scotland provided a golfing habitat as early as 1414. The native sandy soils afforded exceptional drainage and an occasional hazard. The primary means of fertilization was organic waste from an animal or composted leaf mould. The vegetation was already adapted to the harsh conditions of the land, so that regular care for the purpose of turfgrass survival was not required.

The modern American golf course has evolved in both spirit and substance to become a judiciously managed landscape in an increasingly urbanized society. Player demand has been met with advances in technology from biological and chemical to mechanical, capable of being deployed to provide a unique recreational experience. Still, while much has changed about the golf course in the last 500 years, the constant is that the plants still need to be fertilized, however now the turf must provide so much more than the grasses of the linksland.

Our Daily Nitrogen

Turfgrass fertilization has not been immune to the evolution of "golfer expectations." Organic fertilization persisted as a primary means of feeding turf through the 1950's. The advent of synthetically processed fertilizer that relied on energy to "trap" nitrogen became a common means of supplying nutrients in a more "controlled" fashion. The golf course superintendent now had the ability to more precisely manage turfgrass growth.

The synthetic slow-release fertilizers of today are technological marvels in that they provide all the benefits of controlled nutrient release that is similar to, but more complete than the natural organics. They can be designed to release over a 4 to 16 week period, independent of microorganism activity. Comparatively, small amounts of liquid fertilizer applied on a frequent basis (spoon-feeding) to putting greens enables superintendents to more precisely manage growth, efficiently utilize resources and provide consistent playing quality. The concept of spoon-feeding has a parallel in human nutrition. Instead of eating one big meal each day, we eat a few smaller meals to make nutrients available to our body as we need them.

Continuing with this thought, exclusively organic fertilization might parallel vegetarianism. As a former vegetarian, I remember how much more I thought about my nutrition and occasionally had to supplement my diet with vitamins or other minerals. It took many months to learn what my body required and I had to eat very deliberately. As time passed, I realized I could still eat healthy, adding meat products to my diet in moderation. Herein lies the challenge: the *best* fertility management program on golf courses likely utilizes both organic and synthetic sources of nutrients.

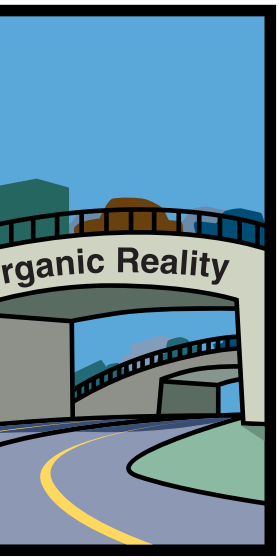
Do the Plants or the Microorganisms Care?

Turfgrass plants derive nutrition from a pool of resources in the soil. While we debate organic vs. synthetic nutrition, the plant simply absorbs the nutrients it needs for growth regardless of the source in which they are supplied. An exclusively organic program presents challenges in providing a balanced nutritional program. In addition, in northern climates where soils are cool for longer periods, microorganism activity that breaks down the organic sources to release the nutrients are not active. Subsequently, nutrients, and in particular nitrogen may not be available to the plant. Therefore, in the shoulders of the season (spring and fall) when soils are cool,

plants not supplemented with synthetic fertilizer will be weak and less able to withstand traffic or other stress.

Invariably, people who claim that exclusively organic approaches are beneficial to the soil microorganisms, imply that synthetic materials "sterilize" the soil. In fact, there is a significant amount of evidence that suggests the measurable microorganism population in the soil is unaffected or enhanced by synthetic fertilizers and pesticides (both are good carbon and nutrient sources). In addition, except in the most troubled soils, there is limited impact of synthetic materials on the physical properties of the soil.

Still, there are many benefits to using natural organic fertilizer sources. Clearly the addition of organic matter in these fertilizers benefits many soils both physically by enhancing soil structure and chemically by introducing a complex pool of nutrients that can become available to the plant over time. In addition, studies at Cornell University have demonstrated that some composted materials provide disease suppression. This suppression can be short term in a similar fashion to a fungicide, or longer term, by enhancing populations of microorganisms that antagonize and suppress turf diseases for many years. This type of work is encouraging and holds much promise, however, the study of microorganisms (the linchpin of the organic approach), is in its infancy and highly site specific.



Trade-Offs

I have found that there are very few aspects of life in a modern society without trade-offs. When we want something, it seems that there is always something else that raises concern. Organic fertilization is more costly on a per unit nitrogen basis (5 to 10 times that of synthetic fertilizers). The amount of phosphorus applied can be 10 to 20 times that supplied with a commercially available synthetic source. This phosphorus, not only may not be needed for turf growth, continuous application may saturate the system resulting in an increased risk of off-site movement that can compromise surface water quality.

Synthetic fertilizers with a higher proportion of readily-available nitrogen are more likely to leach through coarse textured soils then slow release sources. There is considerable amounts of energy (fossil fuels) that go into producing synthetic fertilizers and move the industry further from sustainability. Of course, while this discussion has focused on fertilization, the use of synthetic chemical pesticides has well documented concerns regarding human and wildlife exposure as well as water quality issues.

Therefore, the answer to the initial question; Can we manage a golf course with only fertilizers derived from natural organic sources and without the use of synthetic pesticides? Yes, but not without trade-offs. Clearly, the more reasonable our expectations and the more rigorous and precise we are in the integration of all available resources, the more we maximize the benefits of each product and minimize any drawback.

Parting Shot

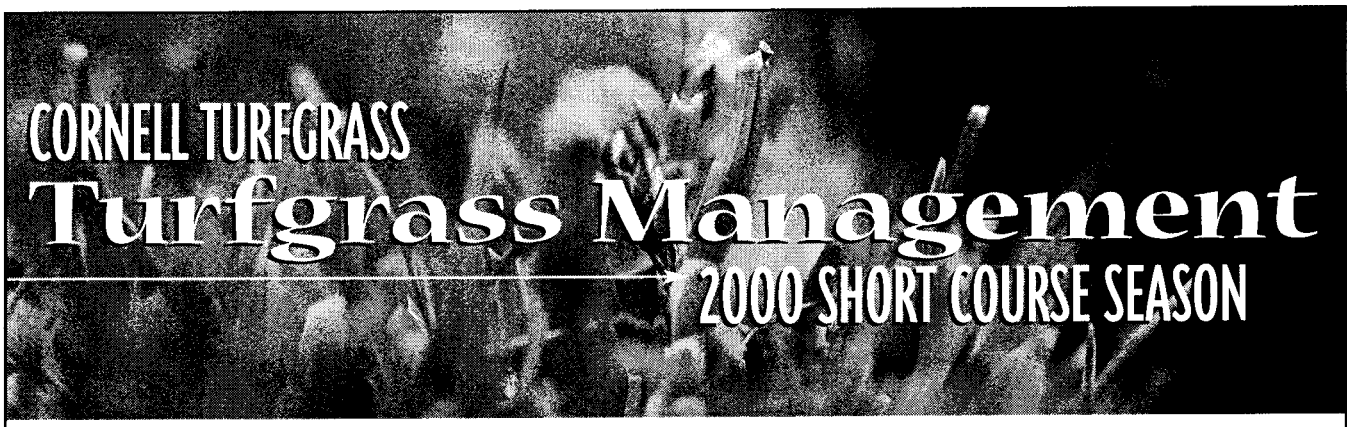
Throughout my career, I have been actively involved with environmental advocacy groups. This has included coauthoring a grant to the Great Lakes Protection Fund to work towards elimination of pesticide use on lawns in the Great Lakes Basin. In addition, I have been outspoken at the national level regarding the means that golf course superintendents are "forced" to employ in an effort to meet the increasingly unreasonable aesthetic and functional performance expectations of the American golfer. Therefore, while I share the spirit of the "organic" movement confronting the golf industry, attempting to "ratchet down" expectations, I cannot in good conscience dismiss scientific principles.

Some might say I am hiding behind the "conservative ivory tower of science." To them I say: provide the funding to address these concerns, so that we can put some science behind the "organic" process. To those in the golf industry who dismiss those "who think otherwise," I challenge them to face the fact that energy intensive golf turf management is not sustainable and the first step is maintaining reasonable expectations. The golf course superintendent is one of the most service-oriented, environmentally responsible professionals I have ever known. When the tools are made available to maintain championship conditions that are more sustainable (organic or otherwise) they will be employed. In the meantime, I believe that the road to sustainability is cleared by an open and robust discussion of the issues based on scientific principles.

FRANK S. ROSSI
CORNELL UNIVERSITY TURFGRASS TEAM

In fact, there is a significant amount of evidence that suggests the measurable microorganism population in the soil is unaffected or enhanced by synthetic fertilizers and pesticides (both are good carbon and nutrient sources).

Some might say I am hiding behind the "conservative ivory tower of science." To them I say: provide the funding to address these concerns, so that we can put some science behind the "organic" process. To those in the golf industry who dismiss those "who think otherwise," I challenge them to face the fact that energy intensive golf turf management is not sustainable and the first step is maintaining reasonable expectations.



Find out everything from Why to How at Cornell's Original Turfgrass Short Course for Turf Professionals, in the Hudson Valley. The wealth of expertise of the Cornell Turfgrass Team joins with industry experts and Cooperative Extension Educators to give you the latest research-based information, helping to solve your major turf challenges.

Tuition:

Tuition for each course is $600 per person and includes instruction, resources, breaks, class luncheon and certificate upon course completion.

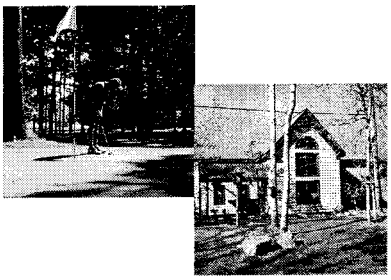
Registration:

Choose the easy payment plan if you wish! Reserve your spot with a $200 payment and send with the enclosed registration form. Then make 2 additional payments of $200 by January 15th and February 15th. You may pay by check or credit card.

The Original Turfgrass Management Short Course
February 21-25, 2000, Hudson Valley

MON 21	TUES 22	WED 23	THURS 24	FRI 25
Introduction Soils	Grasses Grass Lab	Fertilizer Math Irrigation	Turf Diseases	Final Exam Case Studies
				Class Luncheon
Soils	Establishment and Renovation	IPM Turf Insects	Turf Weeds Weed Lab Review Session	Industry Presentations Course Certificates and Awards
Soils Lab	Nutrition	Insect Lab		

This Turf Management Short Course is given in partnership with: The New York State Turf and Landscape Association.



Accommodations:

The host hotel for the Turf Management Short Course is the Holiday Inn, Fishkill, New York. A block of rooms has been reserved for Short Course students. To obtain the discount rate of $69 per night, mention that you are attending the Turf Short Course. To secure this low rate be sure to make your reservations by January 20th (call 914-896-6281).

Learn from members of the Cornell Turfgrass Team, Industry Experts and Cooperative Extension Educators.

CORNELL Turfgrass

If you would like information on the Turfgrass Management Short Courses, contact: Joann Gruttadaurio, Director of Turfgrass Education at 607-255-1792 or jg17@cornell.edu.

Human Resources

continued from page 7

and the type of employer to which they are applying. It costs more to place a longer, more descriptive ad, but it is worth the investment when top quality applicants are attracted to the job.

Creativity is also important. Consider the following ad written by a golf course superintendent in South Carolina.

> Shortstop needed for Springdale Country Club Softball Team: Looking for motivated team player who likes outdoor work. Requires golf course maintenance work during non-game days. No previous softball experience necessary. Call for more info 704-235-8451.

This ad is unique, attention getting and sends the message that "this is a fun place to work."

Proper ad placement is the next step. The ad should be advertised for a length of time and in the appropriate local papers that will reasonably cover the appropriate labor market.

For high-paid, high-skilled positions, it may pay to do a regional or national search in regional or national magazines and publications.

Be prepared to screen inquiries or applications at your convenience and at times that do not disrupt your work. Use of application forms and clear statements of the minimum job qualifications in the ad can help keep screening time to a minimum.

Some employers also have found that screening time is reduced by using a blind post office box instead of having applicants inquire directly and interrupting them and employees as they are working. With this approach, you may end up with fewer, but better, applicants.

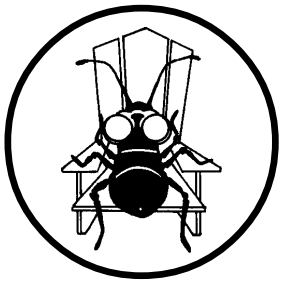
THOMAS R. MALONEY
CORNELL UNIVERSITY TURFGRASS TEAM

Creativity is important for an effective help wanted ad. Here's a good example:

> Shortstop needed for Springdale Country Club Softball Team: Looking for motivated team player who likes outdoor work. Requires golf course maintenance work during non-game days. No previous softball experience necessary. Call for more info 704-235-8451.

Members of the Cornell Turfgrass Team, industry experts and Cooperative Extension educators will teach you everything from Why to How at Cornell's Original Turfgrass Short Course for Turf Professionals, in the Hudson Valley, February 21-25, 2000.

The Continuing Pythium Root Rot Problem in the Northeast



Pest Watch

Symptoms may appear as early as immediately after snow melt in the spring, but are most common in the mid-spring to early summer (Apr.-June) during periods of cool soil temperatures and prolonged periods of excessive soil moisture. High stress areas tend to show symptoms earlier than non-stressed areas.

Pythium root and crown rot on creeping bentgrass or annual bluegrass putting greens continues to be a serious problem throughout the Northeast United States. This disease continues to be most damaging on putting greens constructed from heavy native soils and not as significant a problem on sand-based greens. Symptoms may appear as early as immediately after snow melt in the spring, but are most common in the mid-spring to early summer (Apr.-June) during periods of cool soil temperatures and prolonged periods of excessive soil moisture. High stress areas tend to show symptoms earlier than non-stressed areas.

Symptoms may first appear as small diffuse yellow or reddish brown patches of turf approximately two to three inches in diameter, often closely resembling the early stages of pink snow mold (*Microdochium nivale*) damage. Plants may be slow to come out of dormancy and growth may be less vigorous than in uninfected plants. Under severe conditions, patches of infected turf may coalesce and large areas may appear yellow and in a general weakened condition. Commonly, affected turf responds poorly to the application of fertilizers. As the season progresses and plants become increasingly exposed to stress conditions, large areas of turf may wilt, turn yellow to brown and then die. Root systems of heavily-infected plants are greatly reduced in volume and vigor and may be extensively discolored. Roots may be devoid of root hairs. Crown areas may also appear water-soaked and greatly discolored. Oospores and sporangia may be frequently observed in root and crown tissues. However, much of the root and crown damage can occur as a result of *Pythium* growth inside the plant in the absence of oospore production but usually in the presence of sporangium production.

Pathogenic as well as nonpathogenic species of *Pythium* can be isolated readily from healthy as well as diseased turfgrass roots and crowns. Strains of *P. graminicola*, *P. vanterpoolii*, *P. torulosum*, *P. aphanidermatum*, and *P. aristosporum* are generally more damaging under cool (45-60 ° F) conditions and are the principal species implicated in epidemics in the Northeast (*Pythium graminicola* being the most important). Some strains of *Pythium aphanidermatum*, *P. graminicola*, *P. myriotylum*, *P. aristosporum*, *P. periplocum*, *P. vanterpoolii*, and *P. arrhenomanes* can damage turfgrass roots under warm (75-85 ° F) conditions. These are not as common in the Northeast as in other parts of the country.

Current Control Methods

Cultural

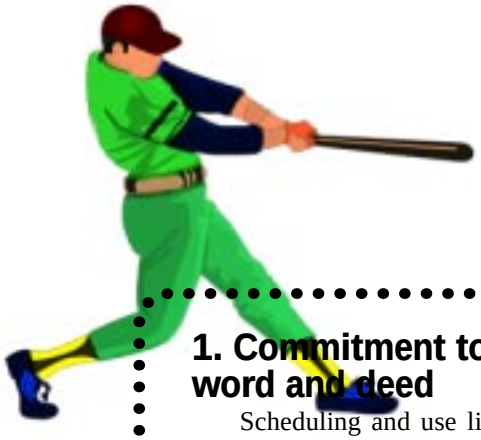
- Water, temperature, and plant stress are key determinants of disease development.
- Water management is most amenable to manipulation.
- Disease may be enhanced under excessive but not inadequate fertility situations.
- Organic amendments that stimulate high microbial activity will reduce disease severity.

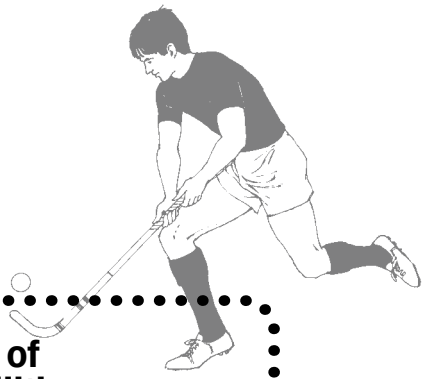
Fungicidal

- In the Northeast, Banol®, Signature® and Fore® have been most effective in controlling *Pythium* root rot.
- Koban® and Terrazole® may also be effective. These are probably the only fungicides effective in reducing soil inoculum of *Pythium.*
- Subdue® has been effective in some locations but has failed in others.
- Fall fungicide applications (mid-October–mid-November) are recommended on sites with a history of severe *Pythium* problems. This is usually followed up with another application in the spring. Resistance could potentially be a problem. Precautions should be taken to delay resistance development.

ERIC NELSON
CORNELL UNIVERSITY TURFGRASS TEAM

Twelve Steps to Safe Sports Turf





1. Commitment to safety in word and deed

Scheduling and use linked to quality and care

"duty to be responsible, duty to care and duty to provide standard of care"

2. Trained and dedicated staff

Invest in hiring and educating sports turf managers

3. The right tool for the job

Invest in accessing to equipment to maximize efficiency, performance and safety

4. Build partnerships!

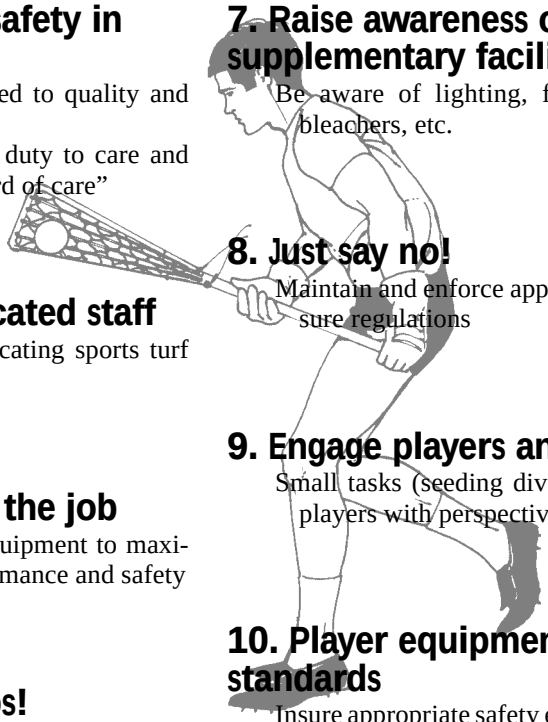
Field staff, coaches, players, administration and community invested in field safety

5. Get it right from the start

Properly site and construct field with the help of qualified soil and turfgrass practitioners to maximize economic resources without compromising safety

6. Maintain reasonable care

Implement nonnegotiable management plan to maximize turf and soil health



7. Raise awareness of supplementary facilities

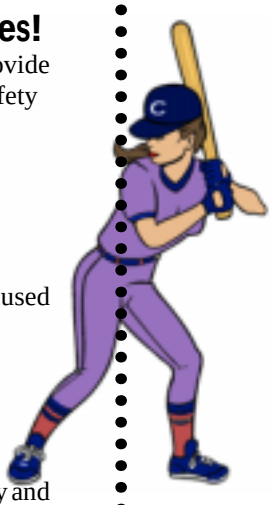
Be aware of lighting, fencing, signage, bleachers, etc.

8. Just say no!

Maintain and enforce appropriate field closure regulations

9. Engage players and coaches!

Small tasks (seeding divots, etc.) provide players with perspective on field safety



10. Player equipment standards

Insure appropriate safety equipment is used during play

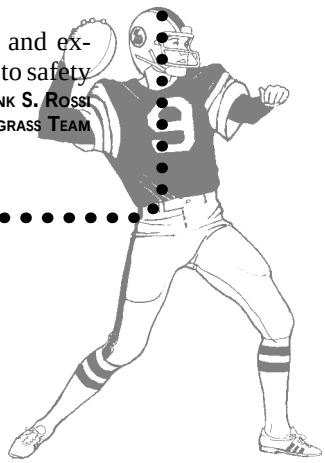
11. "Dear Diary"

Accurate recordkeeping for consistency and historical management systems.

12. Attention to detail.

Poor infield lips, depressed areas and exposed rocks negate commitment to safety

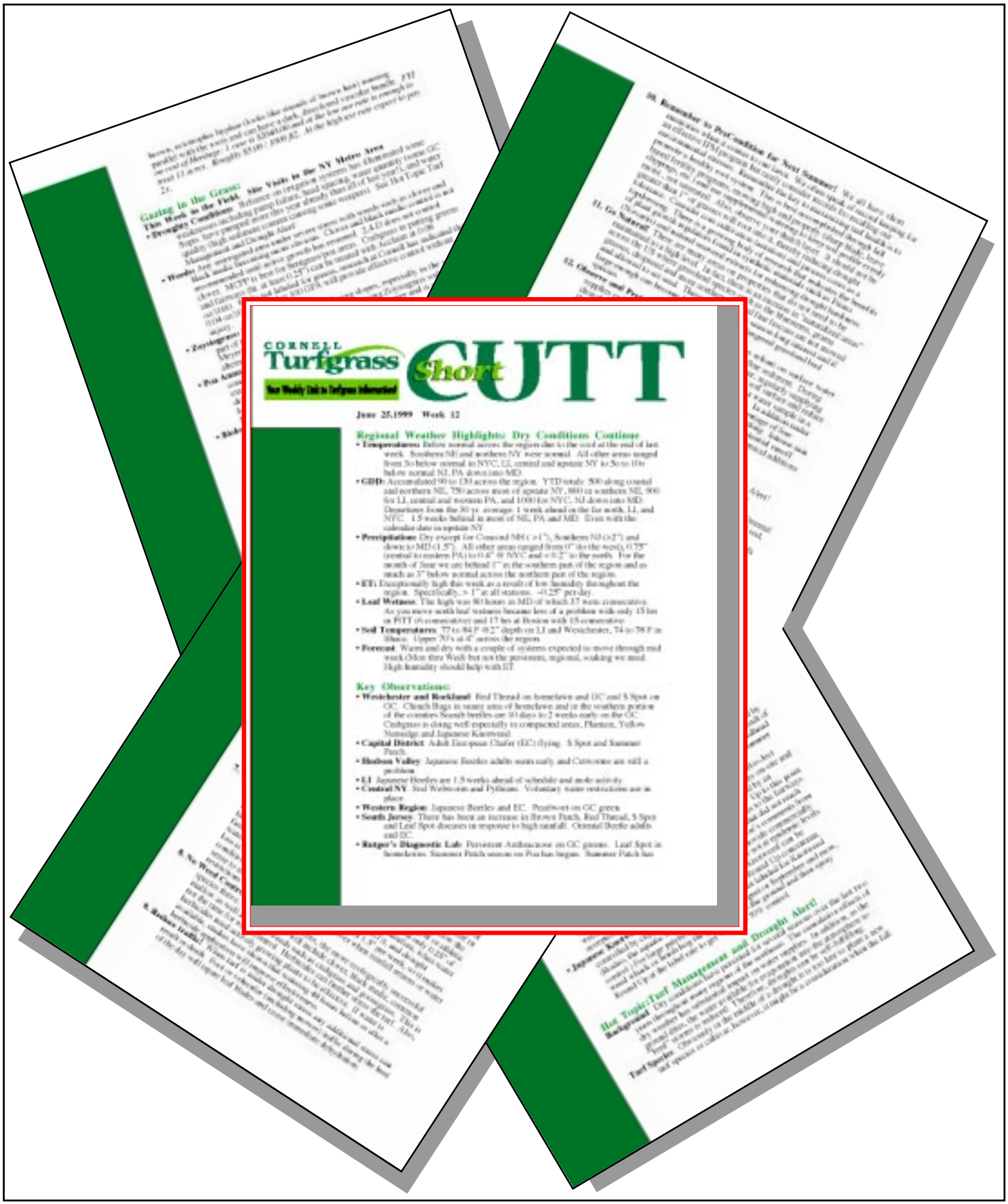
FRANK S. ROSSI
CORNELL UNIVERSITY TURFGRASS TEAM



Copy and post on a bulletin board or give to management.

C U T T

A Sample of the New Weekly Turfgrass ShortCUTT



CORNELL Turfgrass ShortCUTT

Your Weekly Link to Turfgrass Information

June 25,1999 Week 12

Regional Weather Highlights: Dry Conditions Continue

- **Temperatures** Below normal across the region due to the cool at the end of last week. Southern NE and northern NY were normal. All other areas ranged from 3o below normal to NYC, LI, central and upstate NY to 5o to 10o below normal NJ, PA down into MD.
- **GDD:** Accumulated 90 to 130 across the region. YTD totals: 500 along coastal and northern NE, 750 across most of upstate NY, 800 in southern NE, 900 for LI, central and western PA, and 1000 for NYC, NJ down into MD. Departures from the 30 yr. average: 1 week ahead on the far north, LI, and NYC. 1.5 weeks behind in most of NE, PA and MD. Even with the calendar date in upstate NY.
- **Precipitation:** Dry except for Concord NH (.>1"), Southern NJ (>2") and down to MD (1.5"). All other areas ranged from 0" (to the west), 0.75" (central to eastern PA) to 0.4" @ NYC and < 0.2" to the north. For the month of June we are behind 1" in the southern part of the region and as much as 3" below normal across the northern part of the region.
- **ET:** Exceptionally high this week as a result of low humidity throughout the region. Specifically, > 1" at all stations. ~0.25" per day.
- **Leaf Wetness:** The high was 80 hours in MD of which 37 were consecutive. As you move north leaf wetness became less of a problem with only 15 hrs on PITT (6 consecutive) and 17 hrs at Boston with 15 consecutive.
- **Soil Temperatures** 77 to 84 F @ 2" depth on LI and Westchester, 74 to 78 F in Ithaca. Upper 70's at 4" across the region.
- **Forecast**: Warm and dry with a couple of systems expected to move through mid week.Odcn thru Wed but not the persistent, regional, soaking we need. High humidity should help with ET.

Key Observations:

- **Westchester and Rockland**: Red Thread on homelawn and GC and S Spot on GC. Chinch Bugs in sunny areas of homelawn and in the southern portion of the counties.Seasnb beetles are 10 days to 2 weeks early on the GC. Crabgrass is doing well especially in compacted areas. Plantain, Yellow Nutsedge and Japanese Knotweed.
- **Capital District**: Adult European Chafer (EC) flying. S Spot and Summer Patch.
- **Hudson Valley**: Japanese Beetles adults seem early and Cutworms are still a problem.
- **LI**: Japanese Beetles are 1.5 weeks ahead of schedule and mode activity.
- **Central NY**: Sod Webworm and Pythium. Voluntary water restrictions are in place.
- **Western Region**: Japanese Beetles and EC. Pearlwort on GC greens.
- **South Jersey**: There has been an increase in Brown Patch, Red Thread, S Spot and Leaf Spot diseases in response to high rainfall. Oriental Beetle adults and EC.
- **Rutger's Diagnostic Lab**: Prevalent Anthracnose on GC greens. Leaf Spot in homelawns. Summer Patch season on Poa has begun. Summer Patch has

Turfgrass ShortCUTT

continued from back cover

and synthesize the information into a two page format. We received some grant money to get the project going. Now, as the grant funds are expiring and the publication must become self-supporting, we are offering annual subscriptions for the turf industry. Currently, our pricing is $75 per year via email, $100 per year via FAX. NYSTA members enjoy a 10% discount.

As an added bonus, we compile and index all 32 to 35 weeks of *ShortCUTT* for easy reference into an Almanac that serves as a diary of the growing season (see page 2.) The Almanac also includes a complete set of weather charts and graphs to compare current conditions with historical information. It is also useful during the current growing season to refer back to information to compare management strategies. The Almanac is a $50 value.

For a limited time, we are offering a year of *ShortCUTT* and the Almanac for $100 if we receive your subscription form by March 15, 2000. FAX subscribers add $25 to discounted price. Again, NYSTA members receive a 10% discount. Now is the time to take advantage of this exciting and innovative approach to having the latest research-based information at your fingertips during the growing season. Act now, send in the subscription form with your payment to secure the Almanac and weekly *ShortCUTT*.

For a limited time, we are offering a year of ShortCUTT and the Almanac for $100, if we receive your subscription form by March 15, 2000. Now is the time to take advantage of this exciting and innovative approach to having the latest research-based information at your fingertips during the growing season. Act now!

CORNELL Turfgrass ShortCUTT

Your Weekly Link to Turfgrass Information!

YES! Sign me up for the weekly Cornell Turfgrass ShortCUTT

- ☐ $75 enclosed for one year EMAIL subscription (NYSTA members $67.50)
- ☐ $100 enclosed for one year FAX subscription (NYSTA members $90)
- ☐ $100 enclosed for one year EMAIL subscription plus Almanac (NYSTA members $90)
- ☐ $125 enclosed for one year FAX subscription plus Almanac (NYSTA members $112.50)

Name: _____

Address: _____

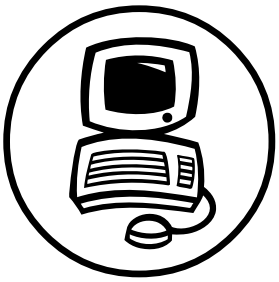
City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

Email: _____

Please send check or money order and return this form to: Cornell Turfgrass ShortCUTT 20 Plant Science Bldg., Cornell University, Ithaca, NY 14853

Turfgrass ShortCUTT: Timely, Easy-to-Use, Research–Based Information



New Resource

ShortCUTT *is a weekly newsletter delivered each Monday during the growing season via email or fax.* ShortCUTT *includes comprehensive weather information, a weekly forecast, pest observations from turf educators throughout the Northeast, and cultural and pest management recommendations based on the latest research available from around the world.*

As we reflect on another growing season in the books we are mindful of the chal lenges we faced in the turf industry with drought, new diseases (bentgrass dead spot, gray leafspot, etc.) and the ever-present environmental debate. In each case, the most efficient means of dealing with these issues begins and ends with information and experience. It seems to me that each year there is more new information than we can keep up with. Yet, day in and day out, we have to make informed decisions as maintenance standards increase and the margin for error gets razor thin.

The Cornell Turfgrass Team has established a long tradition of conducting important fundamental scientific research focused on turfgrass management. We have scientists who are recognized as ***the*** experts in their field. This includes biological control, soil insect management, turfgrass ecology and environmental quality. Still, much of this information is not effectively transferred to you, the end-user, in a form that makes it easy to implement. Interestingly, Cornell's Turfgrass Program is not unique in this sense. It seems an almost insurmountable task to communicate the information in a way that makes sense to the golf turf industry.

In the last few years we have committed significant resources to addressing this information transfer need. Specifically, in 1998 we initiated the Turfgrass Hotline, now known as *Turfgrass ShortCUTT* (CUTT=Cornell University Turfgrass Times). *ShortCUTT* is a weekly, two page newsletter delivered by noon each Monday during the growing season (see Figure 1) via electronic mail or FAX.

ShortCUTT includes comprehensive regional weather information, including a weekly forecast; regional pest observations available from turf educators throughout the Northeast, including USGA Northeast Regional Agronomists; cultural and pest management recommendations based not only on current weather patterns, but also on the latest research available from around the world; finally, each week a national expert is interviewed on a relevant topic such as nematodes, cutworms, bentgrass deadspot, annual bluegrass decline, etc.

Notable guest contributors have included Pat Vittum, Paul Vincelli, Bruce Clarke, and other key researchers. In fact, our subscribers in 1999 were the first to know when gray leaf spot was diagnosed, the first to learn of the best strategy for bentgrass deadspot control and were armed with the latest on drought management and water restriction information.

In an effort to get this research-based information into your hands when you can most easily use it, without taking your valuable time, we utilize electronic delivery via email or FAX

continued on page 15

CORNELL Turfgrass

Cornell University Turfgrass Times
20 Plant Science Building
Cornell University
Ithaca, NY 14853