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ILLINOIS TURFGRASS RESEARCH REPORT

A COOPERATIVE EFFORT OF THE
University of Illinois, Southern Illinois University,
Illinois Turfgrass Foundation and the Chicago District
Golf Association

Introduction

Greetings from the turfgrass staffs at the University of Illinois and Southern Illinois University. This publication is an attempt to better inform you about research conducted in Illinois during 1995. The new format distills our research results into a more compact and readable publication. We hope you find it useful and informative. However, we still compile our complete results; if you would like more detailed information, please contact the appropriate researcher. Comments about this publication or any matter related to our turfgrass research, extension, and education activities are welcome.

Dr. David Wehner, who had been at the University of Illinois since 1980, left in November 1994 to become head of the Department of Environmental Horticulture at California Polytechnic Institute, San Luis Obispo. After a national search for a new faculty member, Dr. Bruce Branham joined the turf group at the Urbana-Champaign campus in late August. Dr. Branham, formerly with Michigan State University, has primary responsibilites in research and teaching.

The past year was one of the most stressful on record, and no turf manager would like to see a year like it again. Turf was lost in record amounts due to a combination of poor growing conditions. An exceptionally cool, wet spring that did not permit normal levels of turf growth was followed by record high temperatures in July. The hot July temperatures stressed the turf but the knockout punch came in early August, when temperatures dropped from the 100s into the 90s but humidity rose to unbearable levels. At the same time, night temperatures remained in the 70s and 80s, creating ideal conditions for fungal growth. The heat, humidity, and fungi were too much for many turfs, and significant amounts of grass were lost throughout the state. Unseasonably high temperatures continued through the end of August into September. These temperatures made it difficult for damaged turf to recover and gave us midsummer conditions during the primary seeding window. A drought began in late August that lasted through the middle of October, further complicating efforts to restore turf to good conditions.

The turfgrass programs at the University of Illinois and Southern Illinois University are committed to providing you with excellent information and support. The turfgrass industry has grown dramatically in the last two decades. We are excited about the excellent partnership that has developed between the universities and the turfgrass industry, and we look forward to strengthening that partnership in 1996.

Bruce Branham
Associate Professor, Turfgrass Science

Jean Haley
Editor

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Looking to the Future

Bruce Branham

Associate Professor,
Turfgrass Science

As a relative newcomer to the turf industry in Illinois, it is more appropriate to describe my goals instead of commenting on the research that I initiated when I arrived in late August. The program at the University of Illinois should reflect the strength of the turfgrass industry in the state. And Illinois, which includes the metropolitan area of Chicago, is one of the biggest turf markets in the country. The partnership between the University of Illinois and the Illinois turfgrass industry is critical to maintain. The University provides three services to the industry that, if not strong, will erode the quality of the industry over time.

First of all, the university must provide a research base. This base must range from applied, practical research to more discipline-oriented research that provides the framework for long-term advances in knowledge about turf problem solving. Research is, in essence, problem solving. Many turf managers saw the need for a strong research support group last summer. At such times, they should be able to view the university as their safety net. When a problem develops, such as the bacterial wilt problem in the early 1980s, the university should be the first resource in solving the problem. In order for the university to do this, it must maintain an infrastructure of research personnel who can address problems in a timely fashion. I plan to increase the capacity for conducting research at the University of Illinois and to increase the level of golf turf research.

A second important function of the university is to use its outreach programs to provide information to turf managers and the general public. Information gleaned through research is of little value if it is not communicated to turf managers so they can incorporate the information into their management plans in a timely way. We are also responsible for helping many individuals and groups with their questions about turf. In a state of this size, the demand for information sometimes seems insatiable. Our outreach programs must develop better and more efficient ways to communicate information to turf managers and the general public.

The third and most important service is training students for careers in turf management. Providing highly trained and qualified individuals to work in the turfgrass industry is a priority of our turfgrass program. It is important that the industry have highly skilled and motivated young people to ensure its continued vibrant growth and dynamic nature. And, from the viewpoint of our program, we want to produce as many alumni of the University of Illinois as we can because loyalty to your alma mater is something that can't be bought.

In conclusion, we must continue to improve our program in the three main categories in which universities operate: teaching, research, and outreach. In order to increase our research base at the university, we must upgrade our facilities. Already this fall, we have established 23,000 square feet of creeping bentgrass and perennial ryegrass fairway turf. But much more needs to be done. Our irrigation system is obsolete; and, although many golf-course superintendents are faced with similar problems, good research requires excellent facilities. We plan to install modified sand facilities at the research center so we can conduct "real-world" research. I would like to see the university acquire at least 8,000 square feet of greens constructed by the USGA method and some sand-based athletic fields.

I am excited to be back home in Illinois. I look forward to working with the state's turf industry and building an effective, responsive turf research and education program.

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Do Turfgrass Growth Regulators Affect Plant Sugar Levels?

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Sang-Wook Han

Graduate Student

Golf course greens remain the primary real estate on any golf course, but fairways are catching up. As the desire for higher quality turf and a more uniform playing surface increases, the level of maintenance applied to golf-course fairways is spiraling upward. Such maintenance is made possible partially through lighter mowers that permit lower fairway mowing heights. Lower mowing heights require the use of creeping bentgrass—once thought of as an alternative turfgrass species—for current use on fairways. Creeping bentgrass is becoming the most popular species for providing championship-caliber fairway surfaces.

This quest for high quality, low mowing height, and uniform playability has also helped to promote the use of turfgrass growth-regulating (TGR) compounds such as Cutless™, Scott's TGR™, and Primo™. These materials provide a more uniform surface through reduced vertical growth of the bentgrass. In general, all three products inhibit the production of one or more gibberellic acid compounds in the bentgrass plant, altering its hormone balance. This change reduces the degree of cell elongation, resulting in miniature or dwarf plants. This phenomenon is physiologically based and generates the question of whether changes in hormone balance also affect the plant's metabolism. You may wonder if this will make any difference. I wondered at first whether any changes in metabolism had greater impact when regulators were applied more than once during the season. Do single high-rate applications of a TGR have a similar or greater impact than multiple small applications? From a visual standpoint, lighter multiple applications generally have less overall visual impact. Is the same true for plant sugar reserves or other components of metabolism?

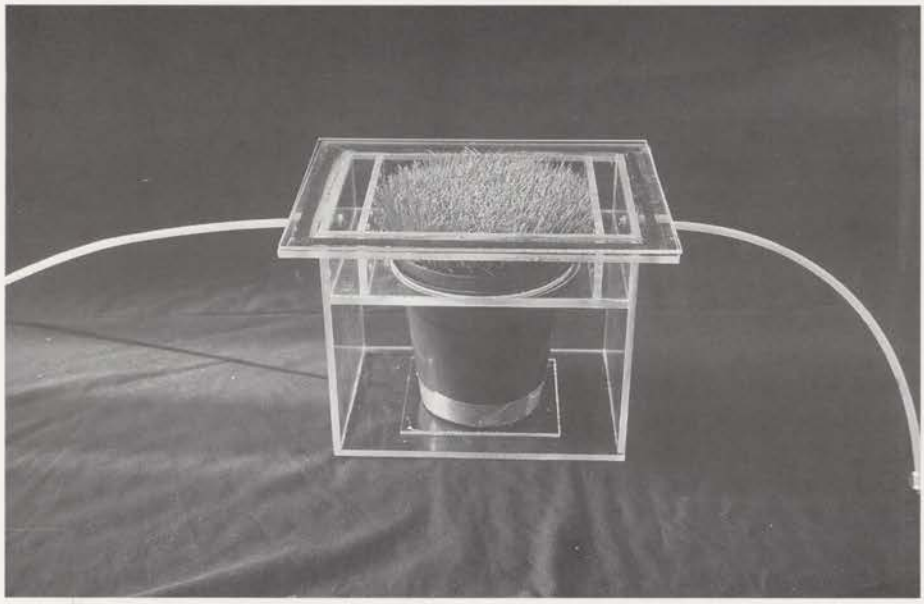
With these questions in mind and with the generous support of the Illinois Turfgrass Foundation, we embarked on a four-year study to determine how TGRs affected the level of nonstructural carbohydrates (TNC). Nonstructural carbohydrates are sugar and sugar-related compounds that constitute the food reserves for the plant when it recovers from stress, injury, or general growth. It is important, therefore, to maintain relatively high levels of TNC to ensure rapid recovery from any summer maladies.

Experiments were conducted in the greenhouse to determine the long-term nonstructural carbohydrate dynamics when creeping bentgrass received multiple applications of TGR at different application intervals and total rates. Growth retardants were applied to a three-month-old Penncross creeping bentgrass turf over a period of 8 weeks. Turfs from each treatment were harvested at two-week intervals for 18 weeks and analyzed for TNC in either roots or verdure.

In the first greenhouse experiment, Primo, Cutless, and Scott's TGR significantly increased the TNC content of creeping bentgrass verdure at two weeks after the initial treatment. This accumulation was probably due to growth suppression, which reduced the demand for carbohydrates. However, TNC levels began to decrease at four weeks after treatment (WAT), compared to the control, probably due to a postinhibition growth response. And they remained lower than the untreated control during the remainder of the sampling dates. Even plants continually suppressed by frequent applications, which might not have a chance for a postinhibition growth spurt, failed to reach a normal carbohydrate level. Available carbohydrates may have been utilized for something other than vertical growth. Plants treated with growth retardants had dark green color and thicker stems and roots compared to the untreated turfs.

Pots of 'Penncross' creeping bentgrass treated with turfgrass growth regulators.

In a second greenhouse experiment, only Primo was examined to obtain more detailed information on its effect on the TNC content of creeping bentgrass. In addition to a 0.75 oz per 1,000 sq ft (0.25 lb ai/A) treatment of Primo at different application intervals, Primo treatments were applied every week at 0.08 oz per 1,000 sq ft for nine weeks, every two weeks at 0.15 oz per 1,000 sq ft for a total of 5 applications, and every four weeks



Chamber used to evaluate the rate of photosynthesis of 'Penncross' creeping bentgrass treated with turfgrass growth regulators.

at 0.25 oz per 1,000 sq ft for a total of 3 applications. TNC content of creeping bentgrass treated with Primo showed trends similar to those observed in the first experiment. Primo increased the TNC during the first two weeks after application, but TNC contents began to decrease four weeks after treatment as compared to untreated turf. Primo applied at 0.75 oz per 1,000 sq ft each time with different application intervals showed greater impact on TNC contents of bentgrass than Primo applications with lower rates. Accordingly, the time for recovery of TNC levels after suppression was shorter with the lower application rates. However, the retardation effect will also diminish when the application concentration is lowered.

These results indicate that high application rates may limit their use in turf. On the other hand, repeated low rate applications of Primo may have minimal effect on TNC, reducing the potential for negative effects on stress tolerance or recuperative potential. To verify these greenhouse findings, a field experiment was initiated in the summer of 1995. In this field experiment, Primo effects on TNC and general growth regulation will be determined for the various application intervals and different application rates used in the greenhouse studies.

Although investigating carbohydrate flux in creeping bentgrass has become my major focus, many other projects are also being initiated. Two graduate students under my supervision are investigating new methods of managing fine turfs. Hye-Yun Jeong, a doctoral candidate, will build on Tom Voigt's research, working to learn the optimum use of perennial ryegrass cultivars for site-specific situations. This study will explore the National Turfgrass Evaluation Program (NTEP) databases for new information. In Voigt's research, we developed new methods of rapidly searching the results of cultivar evaluation experiments to discover new relationships between the variables.

Claudio Golombek, a master's degree candidate, is developing a computer-based tool to assist in record keeping and decision making for fairway management. His project is one of several that will be required to develop a functional system for site-specific management.

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Turfgrass Extension and Outreach Activities at the University of Illinois

Tom Voigt

Extension Specialist in Turfgrass

Disseminating current, accurate, research-based information is the major outreach and extension goal of the University of Illinois Turfgrass Program. Members of the program strive to be responsive to Illinois turf clientele and are proud of their involvement in a variety of outreach and extension programs and activities. During 1995, members of the program were involved in the production of extension and educational publications, problem solving in the field, and conducting a wide variety of educational programs and sessions.

Extension and Educational Publications

Members of the turf team feel strongly that communicating with the turf public is one of its primary responsibilities. This year marked the beginning of a new vehicle for communications, Turfgrass Tips, as well as the continued evolution of several other communication vehicles.

Turfgrass Tips was developed in 1995 to quickly and easily address a single topic of current interest. Topics such as turf responses to climatic conditions or increased presence of particularly troublesome weeds, insects, or diseases have been examined. Distributed four times in 1995, Turfgrass Tips complements the existing Illinois Turfgrass Update, the newsletter of the Illinois Turfgrass Foundation (ITF). Although it is not a formal production of the ITF, members of the UI Turf Program routinely contribute articles to the Home, Yard, and Garden Pest newsletter.

Along with these newsletter activities, members of the turf team contributed information and chapters to the 1995 Turfgrass, Nursery, Landscape, and Trial Garden Field Day program and the 1996 Urban Pest Control Handbook. These publications are revised annually to provide up-to-date information about a variety of turf management and pest control topics.

Finally, the Pesticide Training Manual for Turf is being revised in 1995 for early 1996 distribution. This training manual is used extensively by turf managers not only to train for pesticide licensing but also as a basic turf reference. This is the first revision of this publication, originally printed in 1982.

Problem Solving in the Field

Weather during 1995 made the production of fine turf exceedingly difficult. Cool, wet conditions in the spring gave way to hot and humid conditions in August and hot and dry conditions in September. Damage resulting from heat, as well as from diseases during mid- to late-summer, injured or killed many acres of turf in Illinois.

To assist managers during these periods of uncooperative weather, members of the UI Turf Program made many visits to golf courses, athletic fields, home and corporate lawns, and other high-quality turf areas to provide recommendations and information.

In addition to on-site visits, members of the Turf Program also assisted turf managers through one-on-one telephone consultations and by working with personnel at the University of Illinois Plant Clinic. In these situations, turf problems were diagnosed and corrective recommendations meted out. Due to the weather difficulties experienced, these avenues of assisting turf managers were heavily used in 1995.

Educational Programs and Sessions

Reaching turf managers and growers through educational programs and sessions also kept members of the UI Turf Program busy during 1995. During winter and spring members of the program participated in pesticide applicator training programs for more than 500 Illinois turf managers. Also during this time, more than 250 Master Gardeners received turf training.

Tom Voigt describes ornamental grasses at a Master Gardener's convention.

The Indiana-Illinois Turfgrass Short Course met for the second time in 1995. Forty-two students received concentrated turf training from members of the Turf Program in this well-received educational program.

Members of the Turf Program were in great demand to participate in many

additional educational programs ranging from the Southern Illinois Grounds Maintenance School in Collinsville to the Northern Illinois Grounds Maintenance School in Rockford. In between were talks to golf-course superintendent organizations, lawn care and landscape professionals, sod growers, athletic turf managers, and homeowners.

All members of the UI Turf Program participated in the 1995 Turfgrass, Nursery, Landscape, and Trial Garden Field Day. This day-long event featured tours of research plots in the morning and educational sessions in the afternoon. More than 275 turf managers attended the event.

The final activity of the year is the 1995 North Central Turfgrass Exposition (NCTE). The UI Turf Program is responsible for planning NCTE educational sessions and assisting in trade show activities. In addition, all members of the program made presentations during this three-day event.

Obviously, members of the UI Turf Program are serious about assisting the turf public through education, training, and problem solving. The group is involved in a wide variety of programs and activities designed to effectively disseminate the most current and accurate turf-related information to the widest audience possible.

Future Activities

The past goal of disseminating current, accurate, research-based information will continue to be the major outreach and extension goal of the University of Illinois Turfgrass Program. Participation in production of extension and educational publications, problem solving in the field, and conducting a wide variety of educational programs and sessions will be continued to the limits of the group's resources.

In the future, however, more effective methods of communicating information to a varied public will be examined. Electronic media, such as the Internet, facsimile communications, and bulletin boards, will possibly be used to provide timely information in an efficient, effective fashion. Increased use of the electronic media will allow the Turfgrass Program at the University of Illinois to continue to be a leader in outreach and extension programming.

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Supporting Turfgrass Pathology Research

Hank Wilkinson

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It is with great admiration that I thank the members of the ITF for their support of turfgrass pathology research and other service activities. The turfgrass pathology program at the University of Illinois operates with a staff of visiting scientists, two research associates, graduate students, field staff and undergraduate assistants. Your continued support has allowed the program to grow sizably during the past 13 years, and we are always ready to assist you with answers to questions, solutions to problems, and interest in your ideas.

The central focus of my ITF supported research addresses patch diseases (take-all, summer and zoysia). The goal of this research is to develop lasting protocols for managing patch diseases to a level at which they are considered only minor problems. My research can be divided up into three categories: i) ETIOLOGY; ii) EPIDEMIOLOGY; and iii) MANAGMENT.

Etiology is the study of what causes turfgrass disease. This sounds simple: a fungus, turf and the correct environment. While this is the simple truth, it does not allow effective management of patch diseases to be achieved. My research has focused on learning which fungi can cause patch diseases, how to identify them on grass roots, and determining how many of these fungi actually exist. I have discovered more and different fungi in Illinois soils that can cause patch diseases than was predicted 10 years ago. My research has found that among the fungi that cause summer patch differences can be seen in how aggressively they attack bluegrass, bentgrass and zoysiagrass. Only recently have we found that bentgrass is also a host for these fungi. Fortunately, it appears that the fungi don't attack bentgrass as voraciously as they do bluegrass. Sorting the fungi out is not a simple procedure. It is impossible to do with the naked eye or even microscopes. We are well on the way, however, to using DNA as a means of identifying these fungi. More research should lead to rapid, patch disease identification. Knowing which fungus is attacking your grass is an important first step in managing a patch disease, but more knowledge is required to reach this goal.

Epidemiology is the study of how and why disease spreads in a population of turf or a lawn. Simply having a pathogen in turf is not enough to bring on a severe disease. Research has demonstrated that two classes of factors are required to bring on severe patch disease: the health of individual grass plants; and conditions that allow the pathogen to move from one plant to the next. My research has demonstrated that soil temperatures are critical in determining when a grass plant is to be attacked. Next, the plant must not be stressed, i.e., it must be growing new roots for the fungus to attack it aggressively. For the pathogen to move between plants, the roots must be extensive and the soil must be moist. Further, the effects of stress are being studied, but these effects on patch epidemics are complicated. For example, we have learned that as turf is stressed in ways that reduce new root formation, signals are sent to the fungus to grow into the center of the root and the crown. This usually is the terminal phase of disease development: the grass plant dies. By combining our knowledge of what causes patch disease and under what conditions epidemics develop, logical and effective methods to manage these diseases will be achieved. This is the main focus of my research now and for the foreseeable future.

I am aggressively pursuing research that will improve your ability to ***manage patch diseases***. I am using three different approaches to achieve this goal: cultural; chemical; and genetic. Cultural practices are directed at the turf, not the disease or pathogen that causes it. To achieve patch disease management you must have consistent turf growth. Fungicides, fertilizers, plant growth regulators, and nematicides all can influence the severity of patch diseases, but these are mitigating factors. The future for effective patch management will be determined by how effectively we can manage the DNA of the grass plant and other microbes that live around grass roots. This aspect, more than any other, is where my research is focused. If we can learn how to control the physiology of turf and microbes that live with turf, diseases, like take-all and summer patch, will be manageable. More on that next time.

Creeping bentgrass infected with take-all patch on a modified sand green located in the Chicago area.

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The Cantigny Green: Bentgrass Research and Demonstration Plot in the Chicagoland Environment

Randy Kane

Turfgrass Advisor

Major construction and initial seeding of an 8,000 square-foot bentgrass golf green was completed in September 1994. The green was built to provide a research area for root-zone experimentation and evaluating creeping bentgrass varieties under weather, disease, and management conditions in the Chicagoland area.

The west half of the green (4,000 sq ft) is dedicated to root-zone studies. There are four 1,000 square-foot blocks with separate irrigation and leachate collection capabilities. The four root zones are: (1) straight sand, (2) 85:15 v:v sand:peat, (3) 70:30 sand:calcined clay, and (4) 60:30:10 sand:calcined clay:peat. The green has been constructed to 1993 USGA recommendations with a 1/4-inch Birdseye pea gravel base, no intermediate choker layer, and a primarily medium-textured sand as the major root-zone component. Aside from examining turf quality issues associated with each type of root zone, we also plan to examine the effects of the various root zones on water retention, nutrient leaching, and soluble salt accumulation. (Cantigny's irrigation source is tertiary effluent from the Wheaton sanitary district.)

The east half of the green consists of bentgrass variety trial and research areas for disease, plant growth regulators, or other studies. The variety trial consists of 20 entries replicated three times in 4- x 6.5-foot plots. Many of the newer cultivars and experimental bents are included. Several new varieties were added to the trial in June 1995 using Roundup and Finale treatments followed by overseeding. Most of the seedlings survived the mid-July heat. The root-zone mix on this half of the green is 85:15, built to USGA recommendations.

We have performed two ratings of the variety trial with some interesting results so far. After this summer's heat, varieties developed for southern climates showed good vigor and density—especially Crenshaw, Cato, and SR1020. Pennlinks, Providence, and Putter also performed well. Of the experimental or unnamed varieties, L-93, M-65-4-A2, M-65-4-G2, and M-65-4-A4 look exciting. Several of the newest varieties have a very fine texture and upright growth habit. A variety from Canada called 18th Green also looks very interesting.

The summer of 1995 was a difficult time for growing in a new bentgrass research area. The height of cut on the green was gradually reduced from 5/16 inch to 3/16 inch (0.190). Most weak or damaged areas have been repaired (damn geese!), and the green has been verticut and topdressed twice. One goal for 1996 is to get the height of cut to approximately 5/32 inch (0.150) with a walking greens mower and to aerify and topdress out uneven surface areas.

Bob Duntemann and Hank Wilkinson examine finished green in October 1994.

Cantigny Green construction in June 1994 prior to addition of the root-zone mixes.

Cantigny Golf has donated the site, manpower, and equipment for maintenance. Special thanks to Mike Nass, General Manager of Cantigny Golf, and Tony Rzadzki, who was golf course superintendent at Cantigny through April 1995. He also supervised construction of the green. New superintendent Scott Witte has been a big help through the tough 1995 season. Also, major financial support has been provided by the CDGA Foundation, the Midwest Association of Golf Course Superintendents, and the Illinois Turfgrass Foundation.

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The Next Step Toward Growth Regulation of Turfgrass

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Since the mid-1940s, chemicals have been researched for control of turfgrass growth in order to reduce mowing. Early materials mildly injured the turf, stopping growth temporarily. The turf was unsightly for a while, but energy was saved in the elimination of one or more mowings. More recent fast-acting materials, Limit and Primo, stop growth for two to four weeks with far less injury, even to the point of not reducing turf quality. Two slow-acting products, TGR and Cutless, cause more gradual and extended reduction in growth. This effect not only eliminates a mowing or two but also reduces the amount of clippings in previous and subsequent mowings.

The question now arises: Can we extend the period of growth reduction beyond 2 to 4 weeks without reducing turf quality? Research at Southern Illinois University indicates that we can. While research at other universities is being done to repeat applications of the same material, we tested the advantage of combining a fast-acting material with a slow-acting material. We hope to regulate a different aspect of growth as we switch from one material to the other, thereby preventing reduction in turf quality. The materials were applied to Kentucky bluegrass, tall fescue, and perennial ryegrass. Primo was chosen as the fast-acting material and applied at the recommended rates. Florel was chosen as the slow-acting material; it was applied at the proven optimal rate for Kentucky bluegrass. Florel has been known to be effective in Kentucky bluegrass, but it has never been marketed. It was once labeled as Ethrel. Percent reductions in clipping weights are shown in Table 1.

With tall fescue, Florel + Primo reduced clipping weights twice as much as either material alone during the first four weeks. In a practical sense, a 75 percent reduction in clippings would eliminate the need to mow for that week. Applying Florel three weeks after Primo extended the effective period by one week. Applying Primo five weeks after Florel, however, took advantage of the effects of both materials; clipping reductions were extended to beyond ten weeks. Turf quality was reduced to objectional levels from week 2 to week 3 by Primo alone and Florel + Primo. Florel alone did not reduce turf quality.

Perennial ryegrass and Kentucky bluegrass were more responsive to treatments than tall fescue. Florel alone was more effective than Florel + Primo throughout the ten weeks. The most effective treatments were applications of the two products in tandem. With perennial ryegrass, Primo applied five weeks after Florel resulted in the most consistent reduction in growth over ten weeks. Three mowings could have been avoided with that treatment. With Kentucky bluegrass, Florel applied three weeks after Primo gave more consistent reduction. Five mowings could have been avoided with that treatment. Turf quality in perennial ryegrass was reduced to objectional levels from weeks 2 to 4 by Primo alone and Florel + Primo. Florel alone did not reduce turf quality. Turf quality in Kentucky bluegrass was slightly reduced by all treatments from weeks 2 to 3. Only Florel + Primo reduced it to an objectional level.

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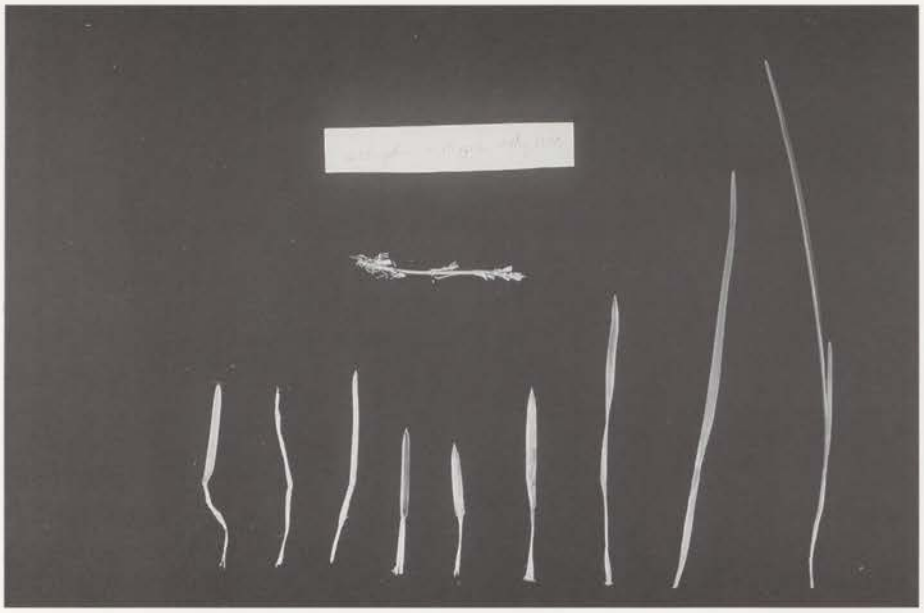
Ken Diesburg speaking at a field day in Carbondale, IL.



This is the series of leaves of a shoot, from oldest to youngest (L to R). It shows the effect of Florel upon leaf length through its period of efficacy. Each leaf represents one week of growth.

Table 1.
Percent reduction in clipping weights in response to growth regulators, Southern Illinois University, 1995

	Wk1	Wk2	Wk4	Wk5	Wk6	Wk7	Wk8	Wk9	Wk10
Tall fescue									
Florel + Primo	50	75	79	25	0	0	0	0	0
Florel	0	36	40	29	0	0	0	22	44
Primo	10	38	42	18	0	0	0	0	0
Primo after Florel[1]	0	18	30	12	0	27	63	58	35
Florel after Primo[2]	40	39	56	22	50	0	0	0	0
Perennial ryegrass									
Florel + Primo	43	50	91	72	75	23	17	0	31
Florel	26	75	71	26	57	23	31	17	60
Primo	18	59	80	30	0	0	0	0	0
Primo after Florel	9	41	65	46	40	81	71	49	25
Florel after Primo	38	50	82	72	44	17	8	18	54
Kentucky bluegrass									
Florel + Primo	78	80	94	60	36	49	4	3	15
Florel	57	84	89	45	46	65	11	18	18
Primo	48	58	64	26	0	0	0	0	0
Primo after Florel	42	63	83	60	59	82	98	45	30
Florel after Primo	75	76	84	73	72	84	62	33	20

[1]Primo applied five weeks after Florel.
[2]Florel applied three weeks after Primo.

Illinois Turfgrass Research/Extension Personnel

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Dr. Mal Shurtleff — Professor, Emeritus

Dr. Hank Wilkinson — Associate Professor, Turfgrass Science

Dr. Tom Voigt — Extension Specialist in Turfgrass

Dr. Hanafy Fouly — Visiting Scientist

Jean Haley — Senior Research Specialist in Turfgrass

Loretta Ortiz — Research Associate

Dianne Peterson — Research Associate

Daryl Huffstutler — Foreman, Field Research Lab

Jim Wilsey — Agricultural Gardener, Field Research Lab

Frank Stynchula — Field Research Lab

Claudio Golombek — Graduate Student

Sang-Wook Han — Graduate Student

Hye-Yun Jeong — Graduate Student

Erwin McKone — Graduate Student

Eugnia McMeans — Graduate Student

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Dr. Ken Diesburg — Associate Professor, Turfgrass Science

Bao Guiping — Graduate Student

Chicago District Golf Association

Dr. Randy Kane — Turfgrass Advisor

We wish to thank the following companies, and organizations for their support of our turfgrass research programs during 1995. Much of our success depends on the generous support of industry through contributions of time, materials, or funding. If your organization provided support in 1995 and was not listed please, contact Jean Haley.

A-G Turf Farms
Abbot Labs
AgrEvo, USA
American Cyanamid, Inc.
Arkansas Valley Seed Co.
Authur Clesen, Inc.
BASF Corp.
Baker Seed Co.
Belleville Seed House
Benck's Turf Nursery
Beverly Country Club
BioPlus Mfg., Inc.
Cannon Turf Supply, Inc.
Cantigny Golf Course
Cardinal Creek Country Club
Central Illinois Golf Course Superintendents Association
Central Illinois Power Service
Central Sod Farms, Inc.
Champaign Country Club
Chicago Botanic Gardens
Chicago District Golf Foundation
Chicagoland Golf Course Superintendents Association
Ciba Corp.
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Floratine Products, Inc.
Forbes Seed Co.
Grace-Sierra
Greenview Nursery Co.
Growmark
H & E Sod Nursery, Inc.
Huber Ranch Sod Nursery, Inc.
ICI America
IMC Agrico
ISK Biosciences, Corp.
Illini F.S. Inc.
Illinois Landscape Contractors Association
Illinois Lawn Equipment, Inc.
Illinois Turfgrass Foundation
International Seeds, Inc.
Jacklin Seed Co.
Jackson Country Club
Jacobsen Div. Textron Co.
Kellog, Inc. Seed & Supplies
LESCO Inc.
Lebanon Chemical Corp.
Lincolnshire Fields Country Club
Lofts Seed, Inc.
Medalist America
Mid American Sod Producers Association
Midlothian Country Club
Midwest Association of Golf Course Superintendents
Miles Incorporated
Modern Distributing, Inc.
Monsanto Agricultural Co.
Mueller Farms, Inc.
National Turfgrass Evaluation Program
National Turfgrass Federation
Nature Safe
Neogen, Inc.
Northwest Illinois Golf Course Superintendents Association
O.M. Scott & Sons Co.
Olsen-Fennel Seed Co.
Olympia Fields Country Club
Outdoor Equipment, Inc.
PBI-Gordon
Pickseed West, Inc.
Possibility Place Nursery
Professional Turf Specialties
Pure Seed Testing
Quality Turf Nurseries
Red Hen Turf Farm, Inc.
Rend Lake Golf Course
Rhone-Poulenc Ag. Co.
Riverside Golf Club
Rohm & Haas Company
Rolawn Turf Nursery of England
Ruth Lake Country Club
Sandoz Crop Protection
Schaafsma Sod Farm
Seed Research of Oregon, Inc.
Silver Lake Country Club
Southern Illinois Golf Course Superintendents Association
Southern Illinois Grounds Maintenance Association
Southern Illinois University, College of Agriculture
Southern Illinois University, Physical Plant
Spraying Systems Co.
Summit Seed Company
Tee-2-Green Corp.
Terra/Androc, Inc.
Terra International
Toro Co.
Tri-State Turf and Irrigation
Turf Merchant, Inc
Turf Producers International
Turf-Seed Inc.
Tyler Enterprises, Inc.
University of Illinois, College of Agriculture Experiment Station
University of Illinois Extension Service
University of Illinois, Grounds Department
University of Missouri
University of Nebraska
Warren's Turf Nursery
Zeneca Incorporated

Calendar of Events

February 19-23, 1996
Indiana-Illinois Turfgrass Short Course

August 21, 1996
University of Illinois Turfgrass Field Day

December 2-4, 1996
North Central Turfgrass Exposition

For More Information on these, and other turf-related events, telephone (217) 333-7847.

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