CORNELL UNIVERSITY TURFGRASS TIMES

CUTT

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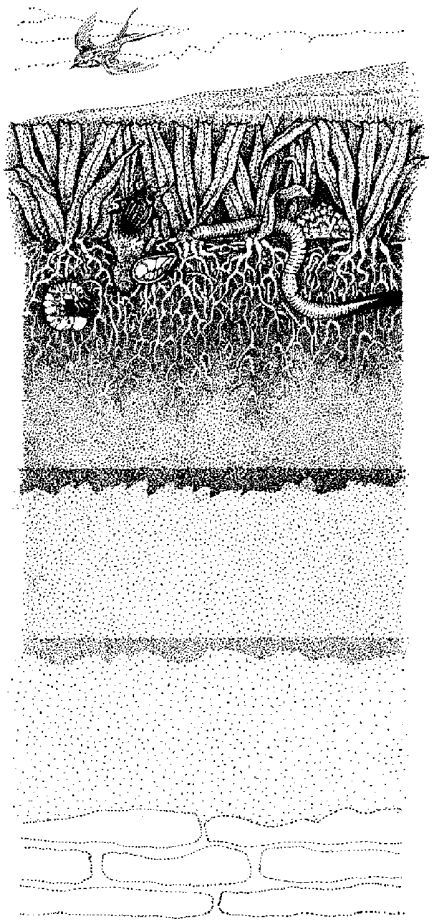

NTEP Evaluation of Bentgrass Cultivars for Greens

In 1923, U.S. Department of Agriculture Agristologist, Dr. Charles Piper, and Agronomist, Dr. Russell Oakley, wrote *Turf for Golf Courses.* In the chapter, "The Important Turf Plants", they wrote: "Unquestionably the finest commercial grass for putting greens in the North is Creeping Bent." Back then, Creeping Bent was *Agrostis stolonifera* and the seed came from south Germany (hence the name South German Bent). Several other bentgrasses, such as Rhode Island Bent *(Agrostis vulgaris)*, Velvet Bent *(Agrostis canina)* and Redtop *(Agrostis alba)* also were mentioned as grasses used on golf courses. Interestingly, creeping bentgrass became *Agrostis palustris* in the United States and remained *Agrostis stolonifera* in Europe. It is widely thought now that the South German bents were mostly Browntop or Colonial bentgrasses *(Agrostis tenuis)* with small amounts of creeping and velvet. ■

Until the mid 1950s, bentgrasses were established vegetatively from the C-series with varieties such as Cohansey, Washington, Congressional, and the now infamous Toronto. Establishment by seed meant that you planted either South German or Seaside. Then in 1955, Penncross, a seeded bentgrass (the standard by which all future varieties would be measured) was released by Dr. H. Burton Musser of Penn State University. Penncross is quick to establish and recover from injury due in part to its aggressive nature and extensive lateral growth. Penncross seed is produced from the random crossing of three vegetatively propagated strains in the field. The next 20 years would see the release of very few bentgrass cultivars, and not until 1978 did Dr. Joe Duich, also from Penn State, release the first serious competitor in Penneagle. Penneagle is considered less aggressive and more upright than Penncross. Many of the management standards and equipment in use today were developed to maintain Penncross.

After relying on Penncross for over 40 years there now are approximately 25 commercially available bentgrasses for golf courses. The last several years have brought an explosion of cultivars to meet the increased demand from golf

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This Times

Short Cutts

Get help identifying and managing more than 65 turfgrass diseases and disease agents from a new interactive CD-ROM.

A new book on human resource management gives golf course superintendents insight into human relations and communications issues.

Turfgrass Disease Compendium Goes Interactive

Get help identifying and managing more than 65 turfgrass diseases and disease agents from a new interactive CD-ROM. The disc, *Turfgrass Diseases: Diagnosis and Management*, by Gail Schumann and James MacDonald, provides an easy way to find solutions to turfgrass problems.

Designed for anyone who works with turfgrass — from experienced turf professionals to students to plant scientists — the guide combines an extensive collection of high-quality images with the most current approaches to environmentally-sound integrated programs. It includes material from the *Compendium of Turfgrass Diseases, 2nd Edition* by R.W. Smiley, P.H. Demoeden, and B.B. Clarke.

The disc offers a flexible system for diagnosing diseases that allows users to choose an approach that works best for them. The system is based on interactive guides that can take users through the entire diagnostic process or allow them to focus on specific procedures. Users can conduct a step-by-step investigation using variables such as symptoms, temperature, microscopic signs, and environmental conditions.

An interactive image browser allows users to click on color images to match symptoms observed in the field with possible turfgrass diseases. Once a match is made, the guide displays information about the disease causing the symptoms and advice on control strategies.

The CD-ROM contains a vast storehouse of information — from answers to practical, applied questions, to technical, scientific details. More than 65 turfgrass diseases and disease agents are covered, with over 350 images available. The disc runs on either a Windows-equipped PC or Macintosh. The single user version costs $295; local network licenses are available.

For further information and to order, contact The American Phytopathological Society, 3340 Pilot Knob Road, St. Paul, MN 55121; (800) 328-7560 or (612) 454-7250; or via email, aps@scisoc.org.

Human Resource Management for Golf Course Superintendents

A new book for golf course superintendents was recently published for the Golf Course Superintendents Association of America by Ann Arbor Press. The book, *Human Resources Management for Golf Course Superintendents*, was written by Cornell Turfgrass Team members Robert A. Milligan and Thomas R. Maloney.

As the title implies, the book gives golf course superintendents insight into human relations and communications issues. Written in an informal style that appeals to nonacademics, the book incorporates the real-life experience from many golf course superintendents.

The book is divided into three sections dealing with management frameworks, staffing and directing. Chapters explore the superintendent as planner, choosing the right person, employee motivation, and total quality management, among other subjects. Staff discipline is treated positively with the authors outlining a four-step procedure when staff reprimands are necessary.

A chapter on communication skills gives the superintendent good tips for honing listening skills, evaluating nonverbal communication, questioning for problem solving, and resolving conflicts.

Total quality management is presented as a normal business management philosophy in the context of the competitive environment golf course superintendents must appreciate and work within.

Despite its focus on golf course superintendents, the book is more broadly useful to any sports turf manager needing information on human resource management.

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Short Cutts

continued from page 2

New Construction Educator at USGA

On-Site Bentgrass Evaluations

James Francis Moore, former director of the Mid-Continent region of the United States Golf Association has been named to the newly created position of Director of Construction Education Programs. The intent of the program is to provide education and deliver information to persons interested or associated with the construction of golf courses. For example, Jim has developed a spectacular web site found through the USGA site or directly at www.usga.org/green/coned/index.html. In this site you will see and read about the latest in constructing greens, tees, fairways, and bunkers from a seasoned professional with experiences that could fill an encyclopedia.

In addition to the web site and the coming educational seminar program, Jim is coordinating a program in cooperation with the National Turfgrass Evaluation Program to evaluate bentgrass cultivars for greens at existing golf course throughout the country. The USGA is providing funding for the construction of approximately 10 bentgrass greens and 5 Bermuda grass greens. These greens will be exposed to regular play, most likely as practice greens, which as many of us know receive an exceptional amount of traffic during the season. The goal of the program is to generate data under more realistic conditions and expose the golfing community to the variety of choices that are available to their golf superintendent when selecting a bentgrass. One hope is to promote regional field days at the sites that include golf pros, architects, and club officials.

Turfgrass Information Directory

Did you ever wonder if there was any good educational resources available for soil testing or irrigation? Possibly you heard a professor from Minnesota speak at a conference and you'd like contact them. Or you just might want to know if there is a good video on turfgrass IPM training. Well, the search has been made easier. Ann Arbor Press has published the Turfgrass Management Information Directory edited by Dr. Keith Karnok.

This information directory includes a substantial list of educational resources available in the turfgrass management area. Inside you will find a list of teaching programs in the United States and Canada, a variety of instructional resources, a list of diagnostic and soil testing services, as well as, green industry organizations, University and key industry personnel.

This publications is by no means complete and there is already a planned revision in the near future with an expanded section on web sites and other computer resources. For ordering information you can write to: Ann Arbor Press, Inc., PO Box 310, Chelsea, MI 48118.

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Viable Alternative Weed Control

Preemergence annual grass control, typically crabgrass *(Digitaria spp.)*, can be accomplished fairly successfully with many synthetic herbicides such as Halts, Barricade, Dimension, and Team. The growing concern over the use of synthetic pesticides has prompted many turfgrass managers to consider alternative control strategies. Unfortunately, biological, or for lack of a better term organic, controls have not been developed for use in turf.

Over the last several years researchers at Iowa State University under the direction of Dr. Nick Christians have identified a viable alternative to traditional herbicide control using corn gluten meal. This material is available via mail-order from the Gardens Alive Company in Indiana as A-Maizing Lawn. As a result of its corn meal base it does serve as a nitrogen source and must be used carefully as all pesticides.

While corn gluten meal can be successful in providing commercially acceptable weed control, it has been plagued with poor performance in the first year of use. In general, studies conducted on plots over a two year period have provided excellent control in the second year. To facilitate the use of the material and integrate it into an existing turf weed program, Iowa State researchers investigated mixing low rate applications of Halts Pre-M (60DG) with the corn gluten meal. Results suggest that the low rate combinations can provide excellent control and allow for corn gluten meal use alone in the second year. This could provide an adequate transition to managers interested in moving to an alternative approach. Keep in mind, corn gluten meal may be more expensive and does serve as a nitrogen source.

(From: D.S. Gardner, N.E. Christians, and B.R. Bingaman. 1996. Use of Corn Gluten Meal to Reduce Application Rate of Pendimethalin. Agronomy Abstracts 88:144.)

Scanning the Journals

A review of current journal articles

Researchers at Iowa State University have identified a viable alternative to traditional herbicide control using corn gluten meal. While plagued with poor performance in the first year of use, studies conducted on plots over a two year period have shown excellent control in the second year.

NTEP Bentgrass Evaluation

continued from front cover

Twenty-eight experimental and commercially available bentgrass cultivars were tested on USGA sand based and native silty loam greens.

As the number of available cultivars increases, research will be needed to understand the potential of bentgrass blends to provide a consistent playing surface.

course construction and renovation. The objective of these studies is to evaluate the visual quality of bentgrass cultivars maintained on USGA sand based or native soil rootzones.

Experimental Methods

Twenty-eight experimental and commercially available bentgrass cultivars were seeded at 0.75#/M on May 22, 1994 on 10,000 ft^2 of green area, divided in half, with 5,000 ft^2 constructed on a native Batavia silt loam soil with pH 6.8, and 5,000 ft^2 constructed to meet the 1993 USGA specifications with a calcareous sand pH 7.7. To avoid confusion, the USGA green will be referenced as the sand-based green.

Fertilizer applications are made to supply 2 to 3 lbs. of N/M/year with Greens Grade Lebanon Country Club 18-4-10. Plots are mowed daily with walking greens mowers during the summer and a triplex mower in the spring and fall set at 0.156 in. in April, then raised to 0.187 in. in May, 0.156 in. for June through August, and back to 0.187 in. in September. Irrigation is supplied to maintain adequate moisture in the profile. However, an outbreak of algae on the sand-based green indicated that the greens were overwatered. Significant reductions in irrigation were made starting in July.

An aggressive grooming and topdressing program was initiated in 1995 to adjust surface integrity with an 80% sand-20% peat mix twice per month in spring and fall, and once per month in summer. Core cultivation with 5/8 in. hollow tines was performed in September and plugs harvested. Fungicides are applied on a curative basis only. A slip-wear traffic device fitted with golf spikes imposed golfer traffic that simulated 150 rounds six times per week (900 rounds per week).

Visual quality ratings were recorded monthly during the growing season on a scale of 1 to 9 (1=poor quality, 6=minimum acceptable quality, 9=ideal turf). Disease and other pest incidence ratings are also taken on a scale of 0 to 9 (0=no pest damage evident, 9=severe pest damage).

Results

Turfgrass quality in 1995 was significantly below the quality for 1994. Many plots suffered under intense heat stress, regular topdressing and traffic imposed with the slip-wear traffic simulator. The regular surface disruption resulted in thinning of several cultivars that lead to algae development on the sand-based greens. Regardless of the rootzone, only 50% of the cultivar had acceptable quality ratings in July and less than 20% were acceptable in August. Most cultivars recovered by September.

The introduction of the Penn series (A-1, A-4, G-2, G-6) seems to have set a new standard for bentgrass green cultivars. Specifically, A-1 and A-4 produce an upright, high shoot density turf that will provide championship conditions. A-1 and A-4 appeared to develop a puffy nature from observations at the various mowing heights during the season.

Several synthetic materials from the Texas A&M program, with exceptional heat tolerance, performed in the top 20% of all cultivars on the sand-based green. Interestingly, most of them did not perform as well as the native soil, possibly because of adequate soil moisture that kept the rootzone cooler than the sand. The experimental cultivar ISI-Ap-89150 performed at the top of the sand-based trial and almost at the bottom on the native soil.

Summary and Conclusions

Bentgrass selection has become more complex with the increased availability of many new cultivars with different growth habits and stress tolerance. Additionally, as evidenced in the 1995 data, many cultivars perform differently depending on the rootzone.

Several cultivars seem to provide consistent quality regardless of environmental conditions, rootzone and pest infestations. Still, experimental materials such as the synthetic cultivars (syn) and the new Penn series could be attractive options, however, time will tell. As the number of available cultivars increases, research will be needed to understand the potential of bentgrass blends to provide a consistent playing surface.

FRANK ROSSI, EXTENSION TURFGRASS SPECIALIST
CORNELL UNIVERSITY TURFGRASS TEAM

Table 1. Data from the 1993 National Turfgrass Evaluation Program Bentgrass Green Trial on Native Soil Greens.

	Visual Quality								Pest Damage*	
Cutlivar	Spring Color	May	June	July	August	Sept.	Fall Color	1995 Quality Mean	Yellow Tuft	Brown Patch
A-1	6.1	6.6	7.1	6.9	6.3	7.0	7.7	6.8	1.0	0.3
Syn 92-1-93	6.1	6.9	7.4	6.3	5.8	6.5	7.1	6.6	1.7	0.3
Penncross	6.8	6.0	6.5	6.5	6.2	6.9	7.6	6.4	1.0	0.3
18th Green	5.5	6.6	7.2	5.9	5.5	6.2	6.8	6.3	2.2	1.0
Providence	6.8	5.9	6.4	6.5	6.2	6.0	6.7	6.2	2.5	0.7
Cato	6.5	5.9	6.4	6.4	5.8	6.4	7.1	6.2	2.3	1.0
PRO/Cup	6.5	5.9	6.3	6.1	6.0	6.6	7.3	6.2	2.0	0.7
SR 1020	6.1	5.9	6.4	5.9	5.9	6.6	7.2	6.1	1.3	0.3
Syn 92-2-93	6.1	6.1	6.6	6.0	5.6	6.2	6.8	6.1	2.3	0.3
BAR As 493	6.1	6.0	6.5	6.1	5.6	6.2	6.9	6.1	2.3	0.0
Syn 92-5-93	6.5	6.4	6.9	5.8	5.2	5.8	6.4	6.0	2.3	0.0
G-6	6.5	6.3	6.8	5.9	5.3	5.9	6.5	6.0	2.7	1.3
Trueline	6.5	5.4	5.8	6.8	5.7	6.3	6.9	6.0	2.0	0.0
A-4	6.8	5.8	6.3	6.0	5.6	6.2	6.9	6.0	1.7	0.7
G-2	6.5	5.8	6.3	6.3	5.4	6.0	6.7	6.0	2.8	0.7
Southshore	6.8	5.8	6.3	6.1	5.5	6.2	6.8	6.0	2.2	1.5
Regent	6.8	5.8	6.3	5.7	5.6	6.3	6.9	5.9	1.8	0.0
L-93	6.8	5.8	6.3	5.8	5.5	6.2	6.8	5.9	2.7	1.0
Pennlinks	6.8	5.9	6.4	5.6	5.5	6.2	6.8	5.9	1.3	0.0
Syn-1-88	6.5	5.6	6.1	5.8	5.7	6.3	6.9	5.9	2.3	0.7
Seaside	6.8	5.4	5.8	6.1	5.7	6.3	7.0	5.9	1.8	0.5
BAR Ws 42102	5.8	5.8	6.2	5.6	5.5	6.1	6.7	5.8	2.3	0.3
Tendeq	6.1	5.8	6.3	5.7	5.3	5.9	6.5	5.8	3.0	1.0
MSUEB	6.8	5.4	5.8	5.4	5.6	6.2	6.8	5.7	2.2	0.0
Crenshaw	5.8	5.2	5.6	5.7	5.4	6.0	6.6	5.6	3.8	0.7
ISI-Ap-89150	6.8	5.2	5.6	5.5	5.2	5.8	6.4	5.5	2.7	1.0
Lopez	6.8	4.9	5.3	5.8	5.0	5.6	6.1	5.3	2.8	0.3
DG-P	6.1	5.2	5.7	5.0	4.9	5.5	6.0	5.3	3.0	0.0
LSD (0.05)	0.3	0.5	0.4	0.5	0.2	0.5	0.6	0.3	0.4	0.2

* Disease incidence rated on scale of 0 to 9 where: 0=no disease, 3=objectionable amount of injury, 9=severe injury

Table 2. Data from the 1993 National Turfgrass Evaluation Program Bentgrass Green Trial on Sand-based Greens.

	Visual Quality								
Cutlivar	Spring Color	May	June	July	August	Sept.	Fall Color	1995 Quality Mean	Algae*
ISI-Ap-89150	6.5	6.7	7.2	6.3	6.6	7.4	7.3	6.8	1.5
Syn 92-1-93	5.9	7.2	7.7	6.0	5.9	6.7	7.2	6.7	2.7
A-1	5.9	6.7	7.2	6.2	6.3	7.1	7.4	6.7	1.2
Providence	6.5	7.5	6.9	6.4	5.7	6.7	7.4	6.6	4.0
Syn 92-5-93	6.2	7.1	7.6	6.0	5.9	6.6	7.0	6.6	1.3
Syn 92-2-93	5.9	6.9	7.4	5.9	5.9	6.7	6.8	6.6	2.2
Pennlinks	6.5	6.5	7.0	6.1	6.2	7.0	6.2	6.6	0.7
SR 1020	5.9	6.9	7.4	5.8	6.0	6.8	7.3	6.6	0.8
G-6	6.2	6.6	7.1	6.1	6.1	6.9	7.4	6.6	1.5
Penncross	6.5	7.0	7.5	6.0	5.7	6.4	5.9	6.5	2.8
18th Green	5.3	6.4	6.8	6.2	6.1	6.9	6.7	6.5	2.7
Trueline	6.2	6.9	7.4	6.2	5.6	6.3	6.8	6.5	3.2
G-2	6.2	6.6	7.1	6.1	5.9	6.7	7.5	6.5	3.2
BAR As 493	5.9	6.8	7.3	5.8	5.7	6.5	6.5	6.4	3.3
Syn-1-88	6.2	6.6	7.1	6.0	5.9	6.6	6.4	6.4	2.2
Crenshaw	5.6	6.7	7.2	6.0	5.6	6.3	7.0	6.4	2.3
A-4	6.5	6.5	7.0	6.1	5.7	6.4	7.2	6.3	1.8
L-93	6.5	6.7	7.2	5.9	5.6	6.4	7.2	6.3	3.7
Pro/Cup	6.2	6.4	6.9	5.9	5.6	6.4	6.7	6.2	2.0
Southshore	6.5	6.5	7.0	5.9	5.4	6.1	7.2	6.2	2.7
Tendez	5.9	6.6	7.1	5.2	5.5	6.3	5.7	6.1	1.5
Cato	6.2	6.5	7.0	5.5	5.4	6.1	7.1	6.1	3.3
Regent	6.5	6.7	7.2	5.3	5.3	6.0	6.8	6.1	4.5
DG-P	5.9	6.2	6.7	5.3	5.4	6.1	7.0	5.9	4.2
Seaside	6.5	5.9	6.3	5.8	5.4	6.1	5.0	5.9	3.3
MSUEB	6.5	5.9	6.4	5.7	5.4	6.1	6.6	5.9	2.7
BAR Ws 42102	5.6	5.8	6.2	5.5	5.5	6.2	6.9	5.8	3.5
Lopez	6.5	5.7	6.1	5.2	5.2	5.9	6.8	5.6	3.0
LSD (0.05)	0.3	0.5	0.4	0.5	0.2	0.2	0.4	0.3	0.7

* algae rated on scale of 0 to 9 where: 0=no algae, 3=objectionable amount of algae, 9=severe algae

Turfing The Net

There is a wealth of turfgrass information on the Internet. For example, you can retrieve a fact sheet on moss and algae control, get all the latest information on turf equipment, see color photographs of turf diseases, and find a discussion of common pesticides.

Turfgrass Information on the Information Superhighway

There is a wealth of knowledge on the Internet. I'd guess there's more turf and landscape information on it than you could read in a lifetime. This article is a brief introduction to the Internet. Perhaps it will stimulate nonusers to give the Net a try.

What Is the Internet?

In 1969 the U.S. Department of Defense began to develop a communication system that could survive a nuclear war. What has evolved from this is the Internet — a gigantic computer network that connects computers all over the world. They are linked together by satellites, telephone lines and modems. The Internet is often referred to as the "Information Superhighway" or "cyberspace." Anyone who has access to this communication system has access to millions of pieces of information.

On the Internet you can visit the White House, get the most recent weather forecast, watch a video clip on how to use a sand wedge, discover what the ten worst performing stocks are (I own five of them), buy a computer, find the value of a used car, and check whether the striped bass are running off Montauk.

There's a lot of turf and landscape information too. For example, you can retrieve a fact sheet on moss and algae control, get all the latest information on turf equipment from the manufacturer's Web sites, see color photographs of turf diseases, find a discussion of common pesticides and their effects on earthworms, read the National Park Service's IPM program for gypsy moth control, look at a list of Kentucky bluegrass cultivars recommended for athletic fields or fairways, or get a listing of turf and landscape jobs that are available. This is just the tip of the iceberg.

The World Wide Web

The World Wide Web (WWW) organizes and links together thousands of Internet sites. The Web allows you to visit and retrieve information from these sites. A Web browser program, such as Netscape Navigator or Microsoft Internet Explorer, enables you to move easily from one Web site to another simply by clicking on a highlighted word with your computer's mouse.

Getting Started

To get started you need a computer, monitor, modem, and an Internet Service Provider, such as America Online, to hook you up to the Web. You will probably want a sound card for your computer (Macs have sound built in) and speakers so you can listen to Web sites that have audio and also play CDs. A printer is a good idea also.

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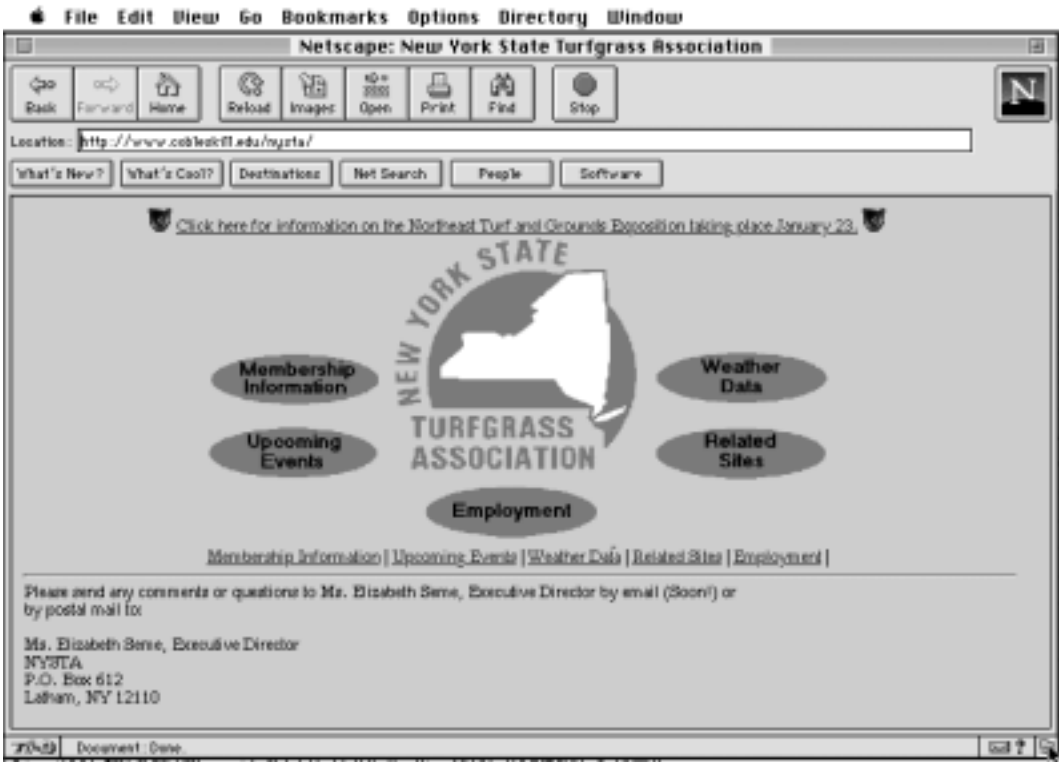

The New York State Turfgrass Association's home page on the World Wide Web.

A Generic Football Field Maintenance Program

Football field management programs are uniquely different and are directly affected by field management practices such as mowing, watering, fertilizing, coring, topdressing, renovation, drainage, and many others. There are many nonagronomic factors that also ultimately influence the success of playing fields. The annual budget; field manager's expertise; equipment and resources available; and the relationship with coaches, parents and administrators, all have a profound effect on the safety and playing quality of the facility. Listed below are some of the basic agronomic and human resources that are needed to manage a safe and attractive playing surface.

- indicates general football field maintenance;
◊ indicates intense management on high sand rootzone fields.

Mowing

- Rule of thumb: mow frequently enough so that no more than one third of the grass height is removed at each mowing. If your mower is set at two inches, clippings should only be one inch after mowing. Clippings should easily filter into the turf canopy and should not need to be removed from the field by sweeping or bagging.
- Reel-type mowers produce the best cut and make an attractive stripe on the field.
- For the best traffic tolerance, mow cool season grasses at two to three inches.

◊ Cutting heights of 3/4 to 1 1/2 inches are used sometimes under intense management. These lower mowing heights will require mowing every one to two days and wear tolerance will be reduced.

Watering

- Water only when the plant tells you. Look for the first signs of visible wilt and then water deep and infrequently. Mature turf can withstand moderate drying and this will increase root growth and prevent overwatering of the field.
- Overwatering can increase turf disease and create anaerobic soil conditions.
- When forcing growth with nitrogen fertilizer and when establishing grass from seed or sod, it may be necessary to water with lighter amounts more frequently.
- A permanent, and preferably automatic, irrigation system that evenly supplies a minimum of 1/4 inch water daily is desired.
- Commercial traveling gun sprinklers also have been successful when an automated system is not possible.
- Small homeowner-type sprinklers are not suitable for football field irrigation.

◊ Sand based systems will require an automated irrigation system that is capable of supplying light and frequent irrigation cycles for syringe cooling and seed establishment.

Fertilizing

- Have the soil tested once a year and make adjustments for pH, phosphorus and potassium.
- In addition, apply potassium during the growing season at the same time and same rate as nitrogen.
- At least once per year apply a complete fertilizer containing nitrogen, phosphorus and potassium.
- Apply phosphorus in combination with coring to facilitate incorporation into the soil profile.
- Nitrogen fertilization schedule:
  Cool season grasses (bluegrass, ryegrass, fescue)
  Mar. to Apr.: 1.0 lb N/1,000 ft^2 from a soluble N source;
  May: 1.5 lbs N/1,000 ft^2 from a slow release source;
  Sept. to Nov.: 1.0 lb N/1,000 ft^2 per month from a soluble N source.

◊ High sand content rootzones have low nutrient retention and require more frequent fertilization. A combination of tissue and rootzone nutrient testing is often used to fine tune frequent application of fertilizers. Anticipate applying nitrogen and potassium at 1/2 to 3/4 lbs/1,000 ft^2/growing month. Three to five lbs. of phosphorus per 1,000 ft^2 per year is usually sufficient on established sand based fields. Biostimulants, growth enhancers and micronutrients often are used to supplement the lack of nutrient retention and microbial activity in sand rootzones.

Pest Control

- Contact your state turfgrass extension specialist for local pest control recommendations. Pesticides are an effective way to control weeds, diseases and insects when pest populations are high enough to cause turfgrass decline. Your goal should be to properly identify the pest problem in the early stages; determine if the pest population would significantly alter turf function; and develop a plan to reduce the pest population. Routine pesticide

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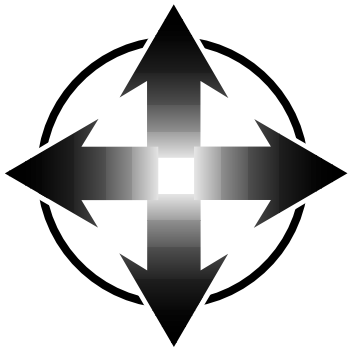

Cutt Out

Expertise from outside the Cornell community

Football field management programs are uniquely different and are directly affected by field management practices such as mowing, watering, fertilizing, coring, topdressing, renovation, drainage, and many others.

Nonagronomic factors also influence the success of playing fields, including the annual budget; field manager's expertise; equipment and resources available; and the relationship with coaches, parents and administrators.

Football Fields

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Have the soil tested once a year and make adjustments for pH, phosphorus and potassium.

You are not exercising sound policy when pesticides are used as insurance against turf loss and as a substitute for proper employee training in turfgrass management.

Cultivation equipment physically penetrates the surface to improve air, water and nutrient movement into the soil.

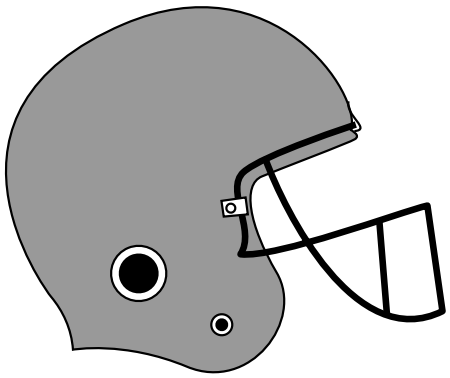
If you are experiencing routine loss of turf from disease, it is time to change your management practices or select more disease-resistant grasses.

In high traffic areas it is not uncommon to use some form of coring, slicing or spiking six to eight times per year.

application as a preventative measure of pest control is not recommended on high school athletic facilities. Treat the pest curatively once it has been observed; and preventively only when you have had prior outbreaks and have good reason to suspect a recurrence.
Remember, you are *not* exercising sound policy when pesticides are used as insurance against turf loss and as a substitute for proper employee training in turfgrass management.

Weeds

- Herbicide applications must be carefully scheduled to account for newly emerging turfgrass that may be part of your annual



renovation program for high-traffic areas. Most herbicides are not labeled for use on newly planted or seedling turf.
- Broadleaf weeds can be controlled effectively with selective postemergent herbicides, such as 2,4-D, dicamba, MCPP, and triclopyr.
- When annual grassy weeds are anticipated in established turf, control with preemergent annual grass herbicides, such as benefin, pendimethalin, prodiamine, oxadiazon, and dithiopyr. Annual grassy weeds, such as crabgrass, begin to germinate when the soil temperature in the vicinity of the seed has been 55°F for five consecutive days. High traffic areas with exposed dark soil will warm faster than densely covered turf areas. Once these herbicides have been applied reseeding must be delayed from 12 to 16 weeks. Siduron is the only preemergent crabgrass herbicide labeled for use at the time of seeding. Perennial ryegrass establishes root depth quickly and is more tolerant of surface barrier preemergent herbicides. Once an early spring seeding of perennial ryegrass has developed, dimension can be used postemergent to control pretillered crabgrass. Subsequent germination of crabgrass also will be controlled with dimension. It is critical that perennial ryegrass is not stressed and has sufficiently established. Roots should be at least two inches deep and treatment should not be applied until three to four weeks after perennial ryegrass germination.
- Knotweed is especially competitive in high traffic areas. Where knotweed is a problem and overseeding is not required, a late fall application of pendimethalin will give preemergence control of knotweed that normally germinates in early March.
- When renovating and reseeding high traffic areas, seed at 1 1/2 to 2 times the normal seeding rate to give the young turfgrass a competitive edge. High seeding rates will often make young turf outcompete weeds and make herbicides more effective.

Diseases

- Specific turf diseases can be managed with fungicides and cultural practices such as mowing, watering and fertilizing. If you are experiencing routine loss of turf from disease, it is time to change your management practices or select more disease-resistant grasses. Fungicide application should not be a routine practice on high school athletic fields. To prevent summer patch in sod harvested and laid in the summer, treat with propiconazol (banner) one week prior to sod harvest. Repeat treatment 21 days after laying sod.

◊ Kentucky bluegrass grown on high sand content rootzones is susceptible to summer patch, especially when combined with close mowing and forced growth from soluble nitrogen. Preventative DMI fungicides should be applied three weeks before the first symptoms of wilt associated with summer patch appear.

Insects

- Subsurface feeding insects are of major concern because they feed on roots, cause turf to be dislodged easily, and result in poor footing. Know the life cycle of underground feeders such as grubs, and anticipate when they may become a problem. Insecticides can give a quick kill once you know where and when a pest is present. Insecticide application should not be a routine practice on high school athletic fields. Lights from nighttime sporting

events can attract the adult beetles of white grubs. Watch for May beetles and Masked Chafer beetles near July 4th. Inspect sod in late July and August for small grubs.

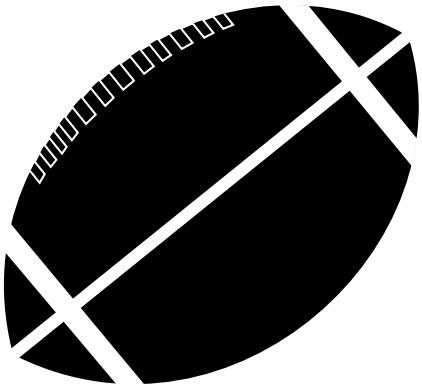
Cultivation

- Hollow- and solid-tine coring, drill coring, shatter coring, water jet coring, slicing, and spiking are methods of cultivation that are used routinely on football fields to reduce soil compaction. Vertidrain and Floyd McKay drill can provide deep coring from 6 to 18 inches.
- Cultivation equipment physically penetrates the surface to improve air, water and nutrient movement into the soil.
- Hollow-tine coring equipment absolutely is necessary in the management of athletic turf. Football fields should be aerated at least twice per year.
- Select cultivation based on your specific needs, i.e.:
  - General — for thatch control and water penetration, hollow core the entire field twice per year with at least ten holes per ft^2 (one hole every four inches).
  - High Traffic — supplement high traffic areas that become compacted with various types of cultivation. In high traffic areas it is not uncommon to use some form of coring, slicing or spiking six to eight times per year.
  - Renovation with reseeding — when combining coring with overseeding of high traffic areas, use intense coring. It is not uncommon to core until there are 64 holes per ft^2 (one hole every 1 1/2 inches).

Renovation

- High school football fields usually require renovation every one to three years. The extent and cost of renovation will depend on how long the field has been neglected. Typical components of a renovation are:
  - Repair crown by adding soil and regrading.
  - Core aerify and add complete fertilizer and other soil amendments.
  - Topdress with sand or sand/soil mix.
  - Drill or slit seed in two to four different directions with commercial turf-type equipment. Drill seeding is preferred, but broadcast seeding in combination with power slicing and coring also has been successful.
  - Water lightly and frequently until turf is established.

Traffic Control



- Managing a football field requires coordination among the administrator, coach, band director, and grounds manager. Administrators should keep in mind that proper traffic control costs nothing in terms of dollars and at the same time offers the most effective means of reducing dangerously worn areas on game and practice fields. Understanding your role as a user of the field is a first step in communication.
- The coach must take an active interest in scheduling practice activities and preventing excessive turf wear. The coach and the grounds manager can work together to develop improved grass areas specifically for drills that are conducted off the game and practice fields.
- The band director should have a practice field painted on another grass area or in a parking lot. The area should be situated so that the practice can be viewed from above, as if you were in the bleachers. Band practice on the game field should be limited to once per week and only when the soil is dry enough to resist compaction in marching paths. No activity (band, football or field maintenance) should be conducted on the field while there is frost on the grass.
- The grounds manager should realize that he is caring for a multiuse facility rather than just a football field. Extra use requires additional labor, equipment and resources.
- The administrator should define clearly the conditions for using the field. As much as possible, reserve the field for games only. Be prepared to allocate resources on an annual basis for field maintenance and on a less frequent basis for field renovation. Spread larger capital improvements out over multiple years, i.e. automated irrigation system:
  - Year 1: install pipe, valves and wire
  - Year 2: install heads and operate system manually
  - Year 3: install automatic controller.

David Minner, Extension Turfgrass Specialist
Iowa State University

When combining coring with overseeding of high traffic areas, use intense coring. It is not uncommon to have 64 holes per ft^2 (one hole every 1 1/2 in.)

Proper traffic control costs nothing in dollars and offers the most effective means of reducing dangerously worn areas on game and practice fields.

The coach must take an active interest in scheduling practice activities and preventing excessive turf wear.

The grounds manager should realize that he is caring for a multiuse facility rather than just a football field.

Turfing the Net

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The Cornell Turfgrass Team is planning to go online with their own Web site in 1997. It will contain research reports, plant pest profiles, pest control recommendations, and regional growing degree day information.

Most computers sold today are Pentiums, have 16 MB of Random Access Memory, a Super VGA card for graphics, and at least a gigabyte of hard disk storage space. The standard speed for a modem is 28.8 baud. Now, if this doesn't mean much to you, either talk to your twelve-year old, or visit a computer store. Most computer store employees can give you good advice on your specific requirements.

The December 1996 issue of *Golf Course Management* has an excellent article on computers and the Internet (pp. 79-99). You should be able to purchase all the stuff you need for around $2,000.

To hook up with the Web you need an Internet Service Provider. America Online, CompuServe and Prodigy are three commercial services that provide Web access for a fee. There also are county and regional access providers. Subscriber charges usually start at about $20 per month.

Places To Go

When you want to visit a Web site, you type in its address (referred to by computer nerds as the URL — Uniform Resource Locator). For example, a good place to try first is the New York State Turfgrass Association's Web site. Type in: <http://cobleskill.edu/nysta> (do not include the brackets) and you will arrive at NYSTA's home page (see graphic on page 6). If you click on the "related sites" icon, you will find a list of other turfgrass Web sites. By clicking on one of them you will go immediately to that site, which, in turn, has links to other turf Web sites.

Sites you visit regularly can be bookmarked. Rather than typing in the address each time you can go directly to the Web site by clicking on its name in your list of bookmarks. Net searches can be very productive and a lot of fun. If you want to look for information on a certain pest, for example, you can enter its name and do a search. You may locate hundreds of documents that discuss the pest.

The Cornell Turfgrass Team is planning to go online with their own Web site in 1997. It will contain research reports, plant pest profiles, pest control recommendations, and regional growing degree day information.

Don't despair if you have problems loving your computer. Things can get very confusing at times. I take solace from a story I read about the mother of one of the world's greatest computer experts. A reporter said that she must be very impressed by her son's intelligence. She replied, "I was until he tried to make up the gas and oil mixture for my snowblower last winter."

Professor Robert E. Emmons, Turfgrass Program Leader
SUNY Cobleskill

The educational video Low Input Lawn Care (LILAC) developed under the direction of Dr. Frank Rossi has been awarded the 1996 Certificate of Excellence by the American Society of Agronomy.

Short Cutts

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Low Input Lawn Care (LILAC) Wins!

The educational video entitled Low Input Lawn Care (LILAC) developed at the University of Wisconsin-Madison under the direction of Dr. Frank Rossi and produced by Dave Luciani has been awarded the 1996 Certificate of Excellence by the American Society of Agronomy. The video is available in three 30 minute modules and has been featured on satellite broadcast and public television programs throughout the country.

The modules are 1) Starting out Right; Selection and establishment of Turfgrass; 2) Primary Culture; Mowing Fertilizing, and Watering; and 3) Solving common problems; shade, thatch, and weeds. This video is geared for the homeowner or lawn care professional who desires to provide a more resource efficient lawn care program. It is based on turfgrass biology and ecology with an emphasis on the link among quality expected, use desired and maintenance performed.

If you would like copies of the video series you can contact the University of Wisconsin-Extension at (608) 265-2527.

Pest Watch

continued from back cover

therefore, this treatment was invalid after the spring 1995 treatments. It was applied at the correct rate for the fall application and will be evaluated in the spring of 1996.

Alternatives to traditional herbicides, such as Borax and Sharpshooter (now known as Scythe) have not provided acceptable control over the two years of this study. Results with the Borax treatment are inconsistent with the results reported from Iowa State University in 1991-1993. Several factors might be involved in the lack of efficacy involving ecotype differences and boron availability. Soil tests for boron are being conducted to determine plant availability.

Summary

Effective ground ivy control appears to be more timing dependent and less product dependent. The typical 3-way herbicide mixture with 2,4-D, or 2,4-D applied alone provides excellent control. In addition, Confront and the Turflon + 2,4-D combination are effective, however, the Confront could be cost prohibitive and is not labeled for use in New York. Still, regardless of control level, if adjacent areas are not kept in check, ground ivy will reinfest, as indicated by the population increases in this study.

FRANK ROSSI, EXTENSION TURFGRASS SPECIALIST
CORNELL UNIVERSITY TURFGRASS TEAM

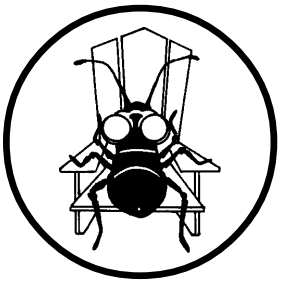
Regardless of control level, if adjacent areas are not kept in check, ground ivy will reinfest.

Table 1. Data from the 1994-5 Postemergence Ground Ivy Control Evaluation.

			Number of Ground Ivy Plants/Plot and % Control*					
			28-Apr		9-Jun		11-Sep	
Treatment	Rate (lb. ai/A)	Timing**	Mean	% control	Mean	% control	Mean	% control
Untreated			42	0	28	0	19	0
Confront 3 SL	0.5	Spring						100
Confront 3 SL (4 wk Follow)	0.5	Spring	33	22	4	87	5	74
Confront 3 SL	0.5	Fall						100
Confront 3 SL (4 wk Follow)	0.5	Fall	2	95	7	76	9	54
Confront 3 SL	1	Spring	33	21	3	88	8	56
Confront 3 SL	1	Fall	0	100	4	85	8	58
Turflon ester (4EC) + 2,4-D ester (3.8EC)^	0.5 +0.5	Spring	23	44	3	90	1	95
Turflon ester (4EC) + 2,4-D ester (3.8EC)^	0.5 +0.5	Fall	1	98	3	90	3	82
Weedone amine 3.7SL	1.85	Spring	25	41	0	99	2	89
Weedone amine 3.7SL	1.85	Fall	9	78	4	87	6	70
2,4-D ester (3.8EC)	1	Spring	37	11	1	98	4	77
2,4-D ester (3.8EC)	1	Fall	0	100	1	95	4	79
Triplet 3.96 EC	1	Spring	28	33	0	100	8	60
Triplet 3.96 EC	1	Fall	1	98	3	88	7	65
Sharpshooter	100ml/2L	Spring	56	0	49	0	24	0
Sharpshooter	100ml/2L	Fall	19	55	20	27	12	35
20-Muleteam Borax	35oz/gal	Spring	39	8	21	24	13	30
20-Muleteam Borax	35oz/gal	Fall	23	44	17	38	15	21
Confront 3 SL + 2,4-D ester (3.8EC) ^	0.5 + 0.5	Spring	44	0	0	99	7	65
Confront 3 SL + 2,4-D ester (3.8EC)^	0.5 + 0.5	Fall	32	24	11	61	8	58
Round-up 4L	2	discont (1995)	0	100	2	93	1	96
Finale 1SL	1	Spring	59	0	36	0	11	40
Finale 1SL	1	Fall	0	100	3	90	6	67
Ortho's Weed-B-Gone^	0.25	Spring	40	5	27	5	13	30
Ortho's Weed-B-Gone^	0.25	Fall	11	73	22	21	16	16
LSD (0.05)			8	15	7	12	5	7

* 28-April ground ivy counts are a measure of Fall 1994 applications and covariates used for Spring 1995 applications
** Spring treatments applied to ground ivy plants in full bloom (125-150 base 50 GDD); fall treatments applied following the first frost
^ treatments initiated in Spring 1995

Effective Timing for Postemergence Ground Ivy Control



Pest Watch

Effective ground ivy control appears to be more timing dependent and less product dependent.

Ground Ivy *(Glechoma hederacea)*, sometimes referred to as Creeping Charlie or gill-over-the-ground, has been a difficult to control weed. It is an aggressive perennial producing a network of above-ground lateral stems that invade turf stands. Historically, ground ivy was associated with shady conditions, yet, it also persists anywhere turf is thin and not competitive. As a result, control has been available via hand-pulling or multiple herbicide applications.

Research reports throughout the United States have indicated inconsistent control with herbicide formulations and rates. Therefore, ground ivy was classified as a hard-to-control weed. Our approach was to select herbicides known to have activity on ground ivy and apply them at full bloom (125-150 base 50 growing degree days) in the spring or following the first frost in late summer/early fall.

The objective of this study is to determine effective timing and herbicide strategies that provide consistent ground ivy control over a three year period.

Experimental Methods

Herbicide applications were made to a uniform stand of ground ivy growing in a mixed cool-season turf stand. Liquid applications were made with a CO_2 backpack sprayer equipped with 11005 VS flat fan nozzles calibrated to deliver 40 GPA at 45 psi and 3 mph. Applications were made at either full bloom in spring (1994: 127 base 50 GDD; 1995: 140) or immediately following the first frost. Control is evaluated using the point quadrat method with a 4x8 foot grid.

Results

The 1995 trial was the first evaluation for "after-frost" treatments from 1994. Split applications of Confront performed equally as well as the single full-rate application, however, in both cases the plots were reinfected from adjacent plots. This is typical of ground ivy infestations. The 2,4-D-ester applications and the 3-way premix Triplet (2,4-D, Dicamba and MCPP) provided excellent control applied after frost.

Finalé, a nonselective herbicide with contact-like activity provided excellent control of ground ivy from the fall applications. This was surprising in light of the fact that the spring treatment, at bloom, the previous season was completely ineffective. It is possible that frost predisposes the ground ivy to the contact activity of Finale. This provides important information on Finale that has been touted as ineffective on aggressive perennials such as quackgrass.

The 1995 spring treatments introduced two materials not applied the previous spring. The Turflon-ester + 2,4-D ester was highly effective, to no one's surprise. However, the Ortho Weed-B-Gone (2,4-D + 2-4DP) did not provide any control. It was determined that the Weed-B-Gone was applied at 1/16 the recommended rate,

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Cornell Cooperative Extension

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