

CUTT

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NYSTA Funded Research Issue

Does Mower Type Effect Turf Performance

Introduction

This study was designed to investigate the effect of various walk-behind putting green mowers on putting green performance. This report represents results from the second year of the study.

Methodology

This study was conducted from June 6, 2006 to September 27, 2006. The 2006 growing season (Figure 1) was among the top ten wettest in recorded weather history, therefore, supplemental irrigation was rarely required.

Due to the excessive precipitation, there were some days when the experimental area was too saturated to mow. On such occasions, data collection was postponed until normal mowing conditions could be resumed without collateral damage to research area.

Experimental plots were established at the Cornell University Turfgrass and Landscape Research and Education Center in Ithaca, NY on a mixed stand of creeping bentgrass (60%)/annual bluegrass (40%) (*Agrostis palustris/Poa annua*) soil-based putting green (pH = 6.7). The research area has been heavily modified with

coring and straight sand topdressing for the last four years resulting in a significant sand layer above the native soil green.

The research area was maintained to championship conditions with light frequent liquid fertilization applied weekly during the season. Total nutrient rates for the season was 3.15 lbs. N, 1.1 lbs. P and 1.5 lbs. K, all per 1000 square feet, with supplemental liquid iron for color.

In addition, light frequent sand topdressing was applied every two to three weeks depending on growth and performance. Due to the high disease pressure present throughout the season, pest management was conducted on a preventative basis. Therefore, no disease data were collected this year.

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CUTT

Clippings

Mr. Hornung was chosen to receive the Citation of Merit, NYSTA's most prestigious award, because of his dedication to turfgrass research and education; involvement in and support of association activities; interest in promoting careers in the turfgrass industry; community involvement; and admiration and respect of peers and colleagues.

Maffei Receives GCSAA Excellence in Government Relations Award

Michael Maffei, CGCS, Past President of the Metropolitan Golf Course Superintendents Association and New York State Turfgrass Association, has received the 2008 Excellence in Government Relations Award in the Advocacy Category from the Golf Course Superintendents Association.

He was honored at the 2008 Golf Industry Show in Orlando, Florida. The award ceremony was held during the opening session of the GCSAA Education Conference on January 31, 2008.

Michael received the advocacy award for his outstanding individual and chapter efforts in government relations. Criteria for award selection include the creation of programs to encourage member compliance with laws and regulations, effective communication, and building alliances and coalitions with green industry associations.



NYSTA Past President, Jim Hornung Sr. (left), is honored with the Citation of Merit award at the 2007 Empire State Green Industry Show. Michael Maffei, CGCS (right) presents the award.



Larry Wilson, pictured here giving a presentation at NYSTA's 2006 Turfgrass Advocacy Day, received the Friend of the Green Industry Award at the 2007 Empire State Green Industry Show.

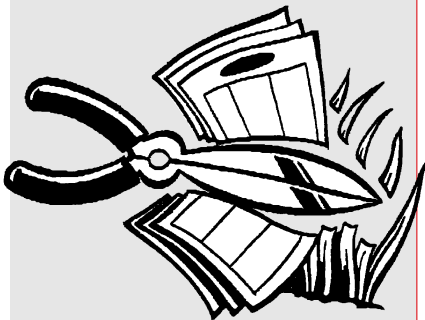
NYSTA Presents Citation of Merit and Friend of the Green Industry Awards

The New York State Turfgrass Association, (NYSTA), presented the Citation of Merit Award to Mr.

James Hornung Sr., Past President of NYSTA and owner of Elbers Landscape Service, Inc. and Great Lakes Athletic Fields located in Buffalo, New York. The award was presented on November 13, 2007, at the Empire State Green Industry Show in Rochester, New York. Mr. Hornung was chosen to receive the Citation of Merit, NYSTA's most prestigious award, because of his dedication to turfgrass research and education; involvement in and support of association activities; interest in promoting careers in the turfgrass industry; community involvement; and admiration and respect of peers and colleagues.

Jim Hornung served on the NYSTA Board of Directors since 1992 and became President of the Association in 2004. He was recently appointed as Commissioner of Parks & Recreation by Erie County Executive Chris Collins. Hornung is also Chairman of the Foundation Board for Cornell Cooperative Extension of Erie County and a Past President of the Western New York State Nursery and Landscape Association. He served on the Board of Directors of the New York State Nursery and Landscape Association and Buffalo Pest Management Board, and is a member of the Sports Turf Managers Association.

On Wednesday, November 14, Mr. Larry Wilson, Chairman of the New York Alliance for Environmental Concerns (NYAFEC), received NYSTA's Friend of the Green Industry Award, which is given to individuals who have excelled in support of the industry. As Chair of NYAFEC, Mr. Wilson has joined separate industry groups together to educate lawmakers and the public on the many benefits derived from environmental horticulture in New York. Larry Wilson is the owner of Lawrence Landscape Design in Yonkers, New York and is a member of the Westchester County Parks Board. He has been a Past President and Chairman of Government Affairs for the New York State Turf and Landscape Association.



NYSTA Funded Research

Improving Soil Test Recommendations for Turfgrass

Purpose of Project:

Soil testing is thought to be a useful way to determine the chemical nature of soil. Soil testing may also be a best management practice used to reduce the risk of phosphorus runoff. Fertilizer recommendations based on soil testing are developed from years of turf performance-soil test calibration research. There is lack of current soil test calibration studies with newer varieties and contemporary fertilization practices. The purpose of the project is to improve the Cornell University fertilizer recommendations by conducting soil test-turf response studies with newer varieties under various management practices.

2006 Update

This project is being conducted at three locations. Across all three sites phosphorus only and potassium only plots were split and nitrogen was applied to half of the plot. All other plots received the same treatments as in previous years. Quality ratings were taken monthly during the growing for each site. Quality is based on per cent of weeds, bare, and turfgrass, along with overall appearance. At all sites grass clippings and soil samples were collected in July and October 2006. Samples were at the Analytical lab for analysis of N, P and K (and 15 other element for the foliar analysis).

Summary of Results to Date

Results from 2002-2003 were published in the International Turf Research Conference Journal in 2005. What follows is a summary of the paper:

Results for 2002 and 2003, found that application of P and K at all sites did not affect turfgrass quality while the application of N improved turfgrass quality. Soil P levels (4.2 lbs/acre) were identified below which a tissue P content or quality response is likely. These levels were in line with current soil test recommendations (though twice as high). Similar levels for soil K were not identified indicating that soil K was adequate (although deemed low by current soil test interpretation). The application of N increased tissue K content, but application of K alone did not. Tissue levels of N, P, and K content were not well correlated with quality. The results of this study suggest current soil test K and P interpretations are too high and should be re-evaluated, and P and K application recommendations may need to be based on N application amount.

The three years of additional data involving 2006-2008 will give 7 years of solid data that allows us to make substantial improvements to the fertilizer recommendation for turf in New York.

A. Martin Petrovic, Ph.D.

New York State Turfgrass Association

Calendar of Events

2008

- | | |
|--------------|---|
| July 14 | METGCSA Poa Annual
Split Rock Golf Club, Bronx, NY |
| August 19 | CNYGCSA Poa Annual
Tuscarora Golf Course, Marcellus, NY |
| August 20 | Sullivan County Challenge
Grossinger Golf and Country Club, Liberty, NY |
| September 15 | FLAGCS Poa Annual
Country Club of Rochester, Rochester, NY |

2009

- | | |
|-------------|---|
| January 7-9 | Empire State Green Industry Show |
|-------------|---|



Scanning the Journals

The results of this study suggest current soil test K and P interpretations are too high and should be re-evaluated, and P and K application recommendations may need to be based on N application amount.

*A fact sheet on the European crane fly has been fully completed. This document was written to include both *Tipula paludosa* and *Tipula oleracea*.*

The fact sheet is now published on-line at the NYS IPM Website (<http://www.nysipm.cornell.edu/factsheets/turfgrass/default.asp>) where it can be downloaded as a pdf file.

NYSTA Funded Research Promoting IPM with New Information Resources

Project Description from Original Proposal:

We will develop, publish and promote eight fact sheets representing the most damaging and widespread pests of turfgrass maintenance and sod production. Our goal is to increase the quality and availability of information relevant to IPM under the geographic, meteorological and regulatory conditions of NY. Three fact sheets will be converted to Spanish versions so we can assess the value of bilingual materials to the green industry workforce. To accompany these pest profiles, we will gather information to construct range maps for each species across counties of the state. Overall impact of the project will be measured in numbers of individuals that come in contact with hard copy or on-line versions of this information.

Objectives from Original Proposal:

- 1 Obtain and assess information materials that are currently disseminated by CCE agents in reference to turfgrass insect pests
- 2 Write fact sheets that summarize and coalesce our current understanding of the bioecology and management of eight major turfgrass pests in NY State
- 3 Gather and coalesce distribution information to develop range maps for the same eight turfgrass pests in NY State
- 4 Produce Spanish-language versions of three fact sheets
- 5 Publish and promote fact sheets
- 6 Evaluate project impact

Results:

A fact sheet on the European crane fly has been fully completed. This document was written to include both *Tipula paludosa* and *Tipula oleracea*. Modifications were made based on the comments of three outside reviewers that included Art Agnello (Dept. Entomology, NYSAES, Cornell University), Pamela Charbonneau (Guelph Turfgrass Institute of the Ontario Ministry of Agriculture and Food) and Brian Eshenaur (Cornell Cooperative Extension of Monroe County). It is now published on-line at the NYS IPM Website (<http://www.nysipm.cornell.edu/factsheets/turfgrass/default.asp>) where it can be downloaded as a pdf file. Over the three months that the European crane fly fact sheet has been posted, it averaged ~80 hits per week, or 270 hits in September, 597 in October and

110 in November.

The Spanish language version of the European crane fly document has also been fully completed and was recently posted on-line.

A fact sheet on the annual bluegrass weevil has also been written and modified based on the comments received from three outside reviewers: Art Agnello (Dept. Entomology, NYSAES, Cornell University), Dave Oatis (Northeast Region, USGA Green Section) and Paula Shrewsbury (Dept. Entomology, University of Maryland). The illustrations are still under preparation. An unformatted version is available. The Spanish language version of the annual bluegrass weevil document is currently under review by two native Spanish speakers.

We will next write a fact sheet on the white grub complex, together with a Spanish language version. The final fact sheet will be on the hairy chinch bug. Once the entire series is published on-line, all CCE cooperators will be invited to review them and submit comments that will be integrated into updated versions.

After speaking with CCE extension agents in more detail, Objective 1 does not fit into the structure of this project. As long as cooperators are made aware of where they can access this material on-line, they will be able to make use of it. And as long as they are given the opportunity to review and comment on the material summarized in the fact sheets, they will be able to transmit any regionally-specific information to us that could be amended or worked into the document.

A database has been assembled for all available distribution information on both species of European crane flies. Data is still being gathered for the other pest species.

The fact sheets were not ready for promotion at the 2006 Empire State Green Industry Show, as anticipated. We do, however, plan to promote the series through educational displays at the 2007 NYSTA Southeast, Western and Adirondack Regional Conferences. Complimentary copies will be made available to anyone visiting the booths. Hard copies will also be sent to executive officers of local Golf Course Superintendent Association chapters for promotion among their constituents. Hard copies will be included among the materials given to participants in the Cornell Golf Pest Management Short Course.

Daniel C. Peck, Ph.D.

Message From the NYSTA President

On behalf of the New York State Turfgrass Association Board of Directors, I am pleased to offer the Annual Research Issue highlighting the projects made possible through funding by our Association. NYSTA has been actively supporting research at Cornell University for more than 50 years and has appropriated more than one million dollars to turfgrass research. As a matter of fact, the research reported in this issue represents more than \$50,000 of member-generated support for 2006-2007.

In 1991, the New York State Turfgrass Association formed the New York Turfgrass Foundation, established in the College of Agriculture and Life Sciences at Cornell University, to ensure the future of the turfgrass industry. The goal of the fund is one million dollars. Since its inception, individual members, businesses and friends, as well as a generous dollar for dollar matching program by Cornell University, have allowed us to raise nearly \$890,000. As a result, the New York Turfgrass Foundation is now generating \$50,000 in interest income per year to be used annually in support of turfgrass research. The matching program was discontinued when the Foundation generated annual revenue of \$50,000 without imposing on the principle, thereby ensuring permanent support for turfgrass research in New York State.

Each year, key members join with NYSTA Board members to review research proposals that address a variety of issues facing the turfgrass industry in New York. This vetting process ensures high quality, well-directed research is conducted that will have direct benefits for NYSTA members. Once a project is funded, a Board member is assigned to oversee progress and serve as a liaison between the Board and the researcher.

This Annual Research Issue highlights key projects in the area of culture, fertility, pest management and environmental issues. We are confident that we are funding a broad array of projects that serve the various sectors of our industry. We hope you agree and, as always, welcome your input.

In addition to the New York Turfgrass Foundation, NYSTA has expanded activities to include research funding in the New York State Budget for our economically important industry. The New York Turfgrass Survey documented that our industry employed 43,000 people and contributed five billion dollars in turf maintenance expenses to the economy in 2003 by creating jobs, paying taxes and generating opportunities for hundreds of thousands of New Yorkers. This survey has helped us leverage two new important research funding programs. First, \$175,000 has been appropriated for the Turfgrass Environmental Stewardship Fund, in 2006-2007 and 2007-2008, which targets research that improves best management practices. A second effort has brought support

through the New York Farm Viability Institute, an independent, non-profit organization that is dedicated to strengthening agricultural and horticultural industries. In fact, more than \$300,000 has been awarded to turfgrass research



focusing on sod production.

All totaled, NYSTA is involved in providing more than \$250,000 in 2008-2009 for turfgrass research at Cornell University, SUNY Cobleskill and SUNY Delhi. We are very proud of this accomplishment but do not intend to rest on our laurels. Rather, we are actively involved in filling the Cornell University Turfgrass Weed Management position and advocating for a new Turfgrass Pathology position. These positions are vital for sustaining a full complement of researchers, at Cornell University, who are able to serve the turfgrass industry.

We hope you enjoy this issue and look forward to receiving your input and opinion on challenges and opportunities for additional research or how we might serve you better.

Sincerely,

Owen Regan
NYSTA President

New York State Turfgrass Association elects 2008 Board of Directors at the Empire State Green Industry Show in Rochester, New York

(left to right) James Baird, Ph.D., Michael McNamara, Timothy Hahn, Thomas Wright, Peter Muller, Owen Regan, Craig Yunker, Greg Chorvas, Michael Maffei, CGCS, Roger Lind

(Missing) Rick Holfoth, CGCS, Robert Sanderson, Craig Currier

NYSTA would like to thank the members of the Adirondack Golf Course Superintendents Association for their generous donation to the production and printing of Cornell University Turfgrass Times.

continued from page 1

In general turf quality ratings were higher in 2006 compared to 2005 (data not shown). This is most likely related to preventative fungicide use to address increased disease pressure associated with warm and wet conditions.

When averaged across all three dates, the Toro 1000 had significantly fewer uncut blades than all except the Jacobsen e-Walk mower.

Golf traffic is simulated daily during the season using a modified traffic device with two 0.5 meter diameter rollers that spin at different speeds to create slipping. The rollers are fitted with SoftSpikes. The amount of spikes and passes used are designed to simulate 30,000 rounds of golf.

Six walk-behind putting green mowers from the three major equipment manufacturers in the US were evaluated for their effect on putting green performance (Table 1). Mowing heights were established to ensure a consistent field height of 0.100" (2.5 mm). This was accomplished by setting mowers to baseline heights from previous observations and then operating the mowers on a level test area at 90° angles so that the cut path of the mowers interact. The TurfChek Prism was used to determine consistency between mowers and then mowers were adjusted accordingly. All mowers were fitted with full (smooth) rollers to avoid differences in roller types.

Each mower was evaluated using three mowing frequency regimes. The regimes were one mow per day seven days per week; one mow per day five days per week and two mows per day two days per week; and one mow per day four days per week and two mows per day three days per week.

Mowers were only used for the study and not for other mowing at the Research Center. To ensure accurate mower set up and performance, mowers were evaluated for height and cut quality adjustments seven days per week (except on days when excessive rainfall prevented mowing). The mowers were maintained by Research Center staff under the supervision of the Equipment Technician (30 years experience) at the Robert Trent Jones Golf Course at Cornell University.

Data were collected for cut quality, turf quality, chlorophyll, ball roll, surface hardness (Gmax), and clipping production. Data analysis was conducted using linear mixed models with compound symmetric covariance structure to assess overall treatment effects when repeated measurements were made on the same experimental unit over time. Treatment differences at individual measurement events were evaluated using analysis of variance and Fisher's protected least significant difference (LSD). The MIXED and GLM procedures in SAS/STAT software version 9.1 (SAS, Cary, NC) were used to perform the analyses.

Results Cleanliness of Cut

Mower cut quality was assessed at three dates during the study. While there was a significant main effect of mower type at each rating, frequency had no significant effect, nor was there an interactive effect. This continues to confirm previous reports that indicate increased frequency of cuts (double cutting) does not benefit cleanliness of cut.

Among the mower types, the fixed head mowers, specifically, the Toro 1000 and Jacobsen e-Walk had the fewest number of uncut blades for all three dates. The Toro 1000 provided the cleanest cut of the gas-powered mowers, while the Jacobsen 518A had the most uncut blades on two dates and the John Deere 180B had the most uncut blades on one date.

When averaged across all three dates, the Toro 1000 had significantly fewer uncut blades than all except the Jacobsen e-Walk mower.

Turf Quality

In general turf quality ratings were higher in 2006 compared to 2005 (data not shown). This is most likely related to preventative fungicide use to address increased disease pressure associated with warm and wet conditions.

Table 2. Effect of mower type on cleanliness of cut (# of uncut blades).

Mower	11-Jul	20-Jul	8-Sept
Toro 1000	2.0	2.1	2.1
Toro Flex 21	4.2	3.9	3.9
Jacobsen 22	3.3	3.5	3.5
Jacobsen 518A	5.2	5.6	5.1
Jacobsen E-Walk	2.6	2.7	2.6
John Deere 180B	5.9	4.5	3.7
LSD (p = 0.05)	1.2	0.9	1.0

Table 3. Effect of frequency of mowing on cut quality (# of uncut blades).

Frequency	11-Jul	20-Jul	8-Sept
7 day single	4.1	4.2	3.5
5 day single + 2 day double	3.9	3.4	3.4
4 day single + 3 day double	3.6	3.6	3.5
LSD (p = 0.05)	NS	NS	NS

Table 1. Technical specifications for the mowers used in the study are presented below.

Mower	Width Of Cut	Weight	Wt. Dist. (lbs)	Reel	ReelRPM	Ground Speed	FOC	Bedknife Position	Bench Ht.
Toro 1000	21"	208 lbs. (94.3 kg)	168.5 (rear) 34.5 (front)	11 blades, 5" dia.	2010	3.24	0.141	20 mm	0.125
Toro Flex 21	21"	238 lbs. (108 kg)	190.5 (rear) 52.5 (front) 87.0 (head)	11 blades, 5" dia.	2340	3.52	0.121	16 mm	0.121
Jacobsen T-22	22"	206 lbs. (93.5 kg)	188.0 (rear) 42.0 (front) 76.0 (floathead)	9 blades, 4" dia.	2310	4.10	0.166	20 mm	0.115
Jacobsen 518A	18"	215 lbs. (97 kg)	185.0 (rear) 24.0 (front)	11 blades, 5" dia.	1730	3.19	0.173	15 mm	0.139
Jacobsen E-Walk	22"	223 lbs. (101 kg)	192.0 (rear) 36.5 (front)	11 blades, 5" dia.	2107	3.84	0.152	15 mm	0.125
John Deere 180B	18"	203 lbs. (92.3 kg)	181.5 (rear) 24.0 (front)	11 blades, 5" dia.	2118	4.03	0.131	17 mm	0.137



In general there was very little effect of mowing frequency on turfgrass quality (Table 7). However, when averaged across all dates, plots receiving the 7 day single cut treatment had higher turf quality (average of 0.2 higher) ratings than plots receiving the 4 day single cut + 3 day double cut treatment.

This suggests a significant increase in stress when double cutting more than two days per week.

Table 4. Effect of mower type on turf quality.

Turf Quality							
Mower	13-Jun	20-Jun	5-Jul	11-Jul	17-Jul	24-Jul	8-Aug
Toro 1000	7.5	7.2	6.4	6.8	7.1	6.8	6.9
Toro Flex 21	7.5	7.4	6.5	6.5	7.1	6.9	6.8
Jacobsen 22	7.3	7.3	6.4	6.6	6.9	7.0	6.7
Jacobsen 518A	7.4	6.9	6.3	6.6	6.9	6.8	6.4
Jacobsen E-Walk	7.4	7.3	6.3	6.7	7.1	6.7	6.7
John Deere 180B	7.6	7.0	6.2	6.5	7.2	6.9	6.6
John Deere 220B	7.4	7.2	6.2	6.8	7.0	7.0	6.6
LSD (p=0.05)	NS	0.2	NS	NS	NS	NS	NS

Turf quality is assessed on a scale of 1 to 9; where 1 = poor quality, 9 = excellent quality, and 6 = acceptable quality.

Turf Quality							
Mower	16-Aug	22-Aug	31-Aug	6-Sept	12-Sept	18-Sept	27-Sept
Toro 1000	6.6	7.2	7.0	7.1	7.1	7.2	6.9
Toro Flex 21	6.4	6.6	6.5	7.1	6.9	7.1	6.8
Jacobsen 22	6.3	6.6	6.6	7.0	6.8	7.1	6.7
Jacobsen 518A	6.3	6.5	6.4	7.0	6.7	6.9	6.6
Jacobsen E-Walk	6.3	6.5	6.6	6.9	6.7	6.8	6.7
John Deere 180B	6.5	6.8	6.7	7.0	6.9	7.0	6.7
John Deere 220B	6.7	6.8	6.7	6.9	6.9	7.0	6.8
LSD (p=0.05)	NS	0.4	0.3	NS	NS	NS	0.1

There were significant main effects for mower type on four of the fourteen rating dates (Table 6). The Jacobsen 518A consistently had among the lowest turfgrass quality ratings on dates when significance was noted and the Toro 1000 among the highest ratings. However, when averaged across all rating dates, there was no significant difference in turf quality regardless of mower type.

In general there was very little effect of mowing frequency on turfgrass quality (Table 7). However, when averaged across all dates, plots receiving the 7 day single cut treatment had higher turf quality (average of 0.2 higher) ratings than plots receiving the 4 day single cut + 3 day double cut treatment. This suggests a significant increase in stress when double cutting more than two days per week.

Ball Roll

Ball roll was determined on 19 occasions with a modified USGA-Stimpmeter using standard ball roll measurement techniques. Ball roll measures were taken on double cut

days within two hours after mowing. On three occasions, a second ball roll measurement was taken approximately six to eight hours after mowing.

There were significant differences among mowers on four of the 19 measurement dates/times, and a significant mower*frequency interaction on two occasions (20 and 26-July). In general, when significant differences were noted the greatest ball roll distances were achieved with the Jacobsen e-Walk and the John Deere 180B among the least. However, when averaged over the season, there were no differences in ball roll distance among mowers or frequencies.

Contrary to popular belief there continues to be no significant effect of time of day when ball roll measurement was taken nor related to mowing frequency.

Clippings

Clippings were collected on three occasions during the study using the mower assigned

Table 5. Effect of mowing frequency on turf quality.

Turf Quality							
Frequency	13-Jun	20-Jun	5-Jul	11-Jul	17-Jul	24-Jul	8-Aug
7d single	7.6	7.2	6.4	6.7	7.1	6.8	6.8
5d single+2d double	7.5	7.2	6.3	6.7	7.0	6.9	6.6
4d single+3d double	7.4	7.1	6.3	6.5	7.0	6.8	6.7
LSD (p=0.05)	NS	NS	NS	NS	NS	NS	NS

Turf quality is assessed on a scale of 1 to 9; where 1 = poor quality, 9 = excellent quality, and 6 = acceptable quality.

Turf Quality							
Frequency	16-Aug	22-Aug	31-Aug	6-Sept	12-Sept	18-Sept	27-Sept
7d single	6.5	6.9	6.8	7.0	7.0	7.0	6.8
5d single+2d double	6.4	6.6	6.6	7.0	6.8	6.9	6.7
4d single+3d double	6.3	6.6	6.5	7.0	6.8	7.0	6.7
LSD (p=0.05)	NS	NS	NS	NS	NS	NS	0.08

CUTT

Contrary to popular belief there continues to be no significant effect of time of day when ball roll measurement was taken nor related to mowing frequency.

In addition, since conducting the preliminary work, alterations in mower set up and field height adjustments have significantly altered results. There appears to be more parity among mowers for quality and performance.

to each plot. A strip was mowed down the center of the plot, clippings collected, dried and weighed.

There was a main effect for mower type at each collection date, and also for frequency on the August 24 collection date (Table 14 & 15). In general the Toro 1000 consistently recorded among the highest clipping amounts among the gas-powered mowers with the Jacobsen T-22 and John Deere 180B. In fact, when averaged across all collection dates, the Toro 1000 had the greatest clipping yield.

When averaged across all collection dates, there was no main effect for frequency. There was no mower frequency interaction.

Mower Adjustments

Prior to daily mowing of the experimental plots, all mowers were checked for bedknife and height adjustment.

Summary to Date

The 2006 growing season presented significantly more challenges than 2005, with increased rainfall and high temperatures. This season was more consistent with the preliminary research season of 2004 that demonstrated severe anthracnose infestations. In addition, since conducting the preliminary work, alterations in mower set up and field height adjustments have significantly altered results. There appears to be more parity among mowers for quality and performance.

That said there are differences among mower types such as fixed head versus flex or

floating head relative to turf quality and ball roll, however these differences do not appear to be substantial.

We made a concerted effort in 2006 to more fully characterize mower set up as evidenced by our calculations of FOC and assessment of bedknife position relative to the center-line of the reel. When taken together, the effects or interaction of bedknife position, mower weight, and frequency of clip will require further assessment.

Frank S. Rossi, Ph.D.

Table 8. The effect of mower type on clipping dry weight.

Mower	Dry Wt. (g)		
	15-Jun	25-Jul	24-Aug
Toro 1000	2.8	2.5	2.0
Toro Flex 21	1.0	1.6	1.5
Jacobsen 22	1.3	1.4	2.1
Jacobsen 518A	0.9	0.9	1.3
Jacobsen E-Walk	2.3	1.1	1.9
John Deere 180B	1.1	1.5	1.9
LSD (p = 0.05)	0.6	0.5	0.6

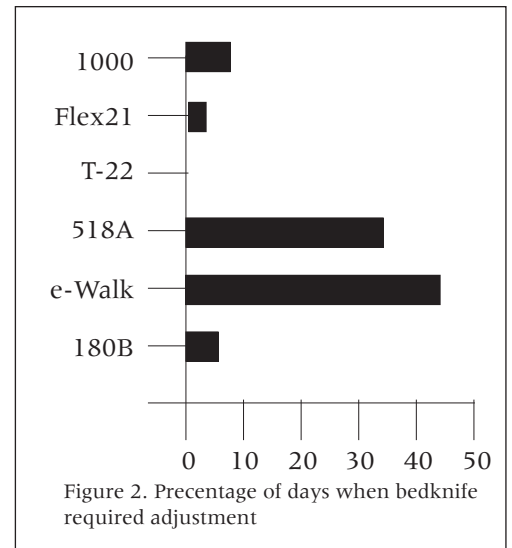


Table 9. The effect of frequency on clipping dry weight (g).

Frequency	Dry Wt. (g)		
	15-June	25-Jul	24-Aug
7d s	1.8	1.7	2.2
5d s + 2d d	1.6	1.3	1.6
4d s + 3d d	1.3	1.5	1.6
LSD (p = 0.05)	NS	NS	0.4

Table 6. Effect of mower type on ball roll (continued)

Mower	Ball Roll Distance (in feet)						
	13-Aug	1-Sept(am)	1-Sept(pm)	7-Sept	17-Sept	20-Sept	27-Sept
Toro 1000	12.9	11.3	11.2	12.2	11.7	12.4	13.0
Toro Flex 21	13.1	10.9	10.8	11.7	11.3	12.2	12.2
Jacobsen 22	12.9	11.2	10.8	11.7	11.5	11.9	12.4
Jacobsen 518A	13.3	11.0	11.1	12.4	11.9	12.1	12.8
Jac. E-Walk	13.2	11.7	12.1	12.8	11.9	12.2	13.1
JD180B	12.6	10.9	11.1	12.0	11.4	11.9	12.4
LSD (p=0.05)	NS	NS	0.8	NS	NS	NS	NS

Table 7. Effect of mower type on ball roll.

Mower	Ball Roll Distance (feet)												
	11-Jun	18-Jun	25-Jun	5-Jul	6-Jul(am)	6-Jul(pm)	16-Jul	20-Jul	24-Jul(am)	24-Jul(pm)	26-Jul	7-Aug	
Toro 1000	9.3	14.1	13.0	12.6	12.9	12.7	11.4	11.8	11.3	10.7	11.7	11.3	
Toro Flex 21	9.6	13.4	12.4	12.2	12.6	12.0	10.9	11.4	11.1	10.5	11.2	10.8	
Jacobsen 22	9.5	13.8	12.8	12.3	12.9	12.4	11.0	11.3	10.8	11.3	11.4	11.1	
Jacobsen 518A	9.8	13.8	13.4	12.8	12.8	12.7	11.3	11.0	11.2	11.1	11.7	11.1	
Jac. E-Walk	10.0	13.8	12.8	12.8	13.6	12.8	12.0	11.7	11.5	11.3	12.0	11.4	
JD180B	9.4	12.6	12.1	11.7	11.9	12.0	10.7	11.0	10.5	10.5	11.1	10.9	
LSD (p=0.05)	NS	0.9	NS	NS	0.9	NS	0.8	NS*	NS	NS	NS**	NS	

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New NYSTA Membership Benefits for 2008 Include:

TracTurf Software - pest management and pesticide application tracking software for green industry professionals

Branching Out - electronic newsletter on IPM for trees and shrubs published by Cornell University

Submit your membership dues before April 1, 2008 so you will be eligible to receive these helpful industry resources.

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Everything you need to know about NYSTA membership and links to turfgrass industry resources are available.

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Healthy Ecosystem

The agricultural crop industry in the U.S. and around the world has had an increasing focus on the traceability of the practices and products used to grow food—often resulting in additional documentation requirements from processors, distributors, retail stores and other marketers and end-users.



Healthy Ecosystem

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Trac© Software. Trac is an Excel-based record-keeping program for recording plant protection applications and generating specific forms to meet the requirements of government agencies, processors and growers. Since 2003, TracApple, TracGrape, TracBerry, TracPear, TracCherry and TracStoneFruit have been created to serve New York's fruit industry. Trac effectively streamlines the burdensome task of record keeping and reporting. The current Trac programs keep records up-to-date, generate reports, analyze pest management strategies and can therefore improve IPM practice. Instead of filling out several forms for different processors, buyers and government agencies, growers enter information once in Trac© software, and the forms required by each buyer and agency are created. The turfgrass industry will also benefit from Trac software.

Procedures

We are creating TracTurf by tailoring the Trac software to meet the needs and requirements of schools, golf courses, parks, and lawn care companies in NY. Funding from NYS IPM is also enabling us to simultaneously create TracTurf for sod farms. The turf maintenance and sod farm components will be combined into one comprehensive TracTurf package for all NY turf managers. Like the Trac programs for fruit, TracTurf will consolidate and streamline record keeping for turf managers and will automatically generate business and site specific forms that meet DEC and EPA requirements, as well as the pest management needs of individual turf managers. We believe that by making thorough documentation of pest management practices easier, TracTurf will advance changes in plant protection methods that will further encourage and enable the turfgrass industry to manage pests in a cost effective, environmentally sound manner.

Trac works by the user filling in the blanks on data entry worksheets in Excel. Drop-down lists for pesticides, fertilizers, and pests are provided—saving time and preventing typographical errors. The software also generates drop-down lists specific to the user's business. When a pesticide trade name is selected from the list, the program automatically fills in the EPA registration number, restricted entry interval, pre-harvest interval, and calculates the earliest harvest date. Some of the special features of

Trac include: comprehensive drop-down lists of pests, pesticides and fertilizers; automatic EPA registration numbers linked to pesticides; harvest data sheets; and farm data sheets—all designed to facilitate managers' record-keeping and reporting of crop protection inputs. The pesticide specific information and the output forms will be customized for turfgrass in New York State. The ability to calculate spray rates, track weather, and record unit-costs of pesticides and fertilizers that enable cost calculations will also be incorporated into TracTurf.

For further information on Trac software, visit: <http://nysipm.cornell.edu/trac/>.

Objectives and Progress

Objective 1) Develop "TracTurf"

We are currently developing the software program, which includes:

- Creating a master template in which field records are entered and from which required data are automatically sent to reporting forms.
- Customizing the template for turfgrass by creating comprehensive lists and drop-down menus for: schools areas, golf courses, parks, and lawns; fertilizers and pesticides that are legal in New York State; non-pesticidal methods of pest management; and target pests.
- Developing record-keeping and reporting sheets for the DEC, EPA and for personal use by turfgrass managers. In the spring we will:

Objective 2) Debug and field-test TracTurf

- Debug software by running it through several mock trials in-house, and correcting any problems found.
- Field-test the software with multiple turfgrass managers. Correct any problems found.

Objective 3) Develop an instructional manual for TracTurf

- A manual will be developed to instruct turfgrass managers on how to use TracTurf. The manual will be made available with the software, and on the NYS IPM website.

Objective 4) Copyright TracTurf

- Follow procedures previously used to copyright TracTurf with Cornell University.

In 2007/2008 we will:

Objective 5) Release and distribute the software

to turfgrass managers

- The software will be sent to all NYSTA members on CD, and a system will be developed to allow non-NYSTA members to obtain the software.

Objective 6) Project Evaluation

- Each recipient will be surveyed to determine utility and benefits of TracTurf.

Expected Outcomes/Impacts

Progress to date is noted in the previous section. Future expected impacts follow.

An easy and simple software system that stores pest management records and generates the appropriate forms needed for reporting to the DEC and EPA, as well as in-house records, will have great utility. TracTurf will consolidate and streamline record-keeping for turf managers

and will automatically generate business and site specific forms that meet DEC and EPA requirements, as well as the pest management needs of individual turf managers. We also believe that TracTurf will advance changes in plant protection methods that will encourage and enable the turfgrass industry to manage pests in a cost effective, environmentally sound manner. Turfgrass managers can better manage their businesses and make more informed IPM decisions if they are able to easily access computer records of pesticide applications and compare pest management practices from year to year, and track costs and efficacy.

Jennifer A. Grant, Ph.D.

CUTT

Healthy Ecosystem

An easy and simple software system that stores pest management records and generates the appropriate forms needed for reporting to the DEC and EPA, as well as in-house records, will have great utility.

NYSTA 2008 Southeast Regional Conference



Rick Grant, Director of Business Development for Phoenix Environmental Care, LLC, presents NYSTA a \$10,000 donation from the Friends of Phoenix Program to Southeast Regional Conference Co-chair, Michael Maffei, CGCS. Phoenix Environmental Care, a company dedicated to product innovation, industry support, stewardship and industry involvement, re-invests a portion of their sales to support golf course superintendents.

Michael Maffei, CGCS, Co-chair of the Southeast Regional Conference Committee, presents a plaque to Dr. Jim Baird, Turfgrass Extension Specialist at the University of California, Riverside. He was honored for his years of service on the New York State Turfgrass Association Board of Directors.



Congratulations Jim!



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Healthy Ecosystem

We are developing TracTurf—user-friendly software, specifically designed for professional turfgrass managers of lawns, golf courses and parks in New York State to record pest management and fertilization practices.



NYSTA Funded Research

TracTurf: Software for Documentation of Pest Management Practices for New York State Turfgrass

Abstract

We are developing TracTurf—user-friendly software, specifically designed for professional turfgrass managers of lawns, golf courses and parks in New York State to record pest management and fertilization practices. This Excel-based software program, will make record-keeping and reporting for government agencies easier, improve the accuracy and consistency of pest management records, and promote the practice of IPM. A companion user’s manual is also being developed. Both will be available for distribution on CD. This work is funded by the New York State Turfgrass Association. Funding from the NYS IPM Program is allowing for simultaneous development of TracTurf for sod farms.

Background and Justification

Documenting pest management and fertility practices is a fundamental component of good integrated pest management (IPM), and pesticide records are specifically required by law. Records help turf managers determine trends in pest occurrence and severity, track susceptible areas, observe influences of cultural practices, and assess the efficacy of pesticides and other pest management practices. However, turfgrass managers often lack a practical, organized and efficient system for tracking their pest management practices. User-friendly software,

specifically designed for lawns, golf courses and parks in New York State, would lessen the burden on managers, improve the records they keep, and result in improved IPM.

Commercial pesticide applicators are required by the New York State Department of Environmental Conservation (DEC) to maintain pesticide application records, and submit them to the department annually. Both commercial and private applicators are required by state and federal regulations to keep records of their pesticide use. Although they are not required to submit these records, they must be maintained and available for audit. A customized software program would allow turfgrass managers to keep all pesticide records in one file, and generate specific records as needed—including the “Certified Private Applicator Record of Restricted Pesticide Purchase and Use” form that is required by the DEC.

The agricultural crop industry in the U.S. and around the world has had an increasing focus on the traceability of the practices and products used to grow food—often resulting in additional documentation requirements from processors, distributors, retail stores and other marketers and end-users. To help growers face the myriad of reporting requirements from these sources as well as government agencies, the NYS IPM Program developed

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