



Source: CORNELL UNIVERSITY submitted to 

DEVELOPING ORGANIC GOLF TURF MANAGEMENT PROGRAMS FOR MUNICIPAL GOLF COURSES

Sponsoring Institution	National Institute of Food and Agriculture	Project Status	TERMINATED
Reporting Frequency	Annual	Funding Source	HATCH
Grant No.	(N/A)	Accession No.	0215832
Proposal No.	(N/A)	Project No.	NYC-145420
Program Code	(N/A)	Multistate No.	(N/A)
Project End Date	Sep 30, 2011	Project Start Date	Oct 1, 2008
		Grant Year	(N/A)

Project Director

ROSSI, F.

Recipient Organization

CORNELL UNIVERSITY
(N/A)
ITHACA, NY 14853

Performing Department

HORTICULTURE

Non Technical Summary

The public is deeply concerned about the effect of synthetic fertilizers and pesticides used for golf turf management on environmental quality and human health. We have been attempting to address this issue by conducting a project at the Bethpage State Park to reduce reliance on chemical pesticides and thereby enhance environmental compatibility. The project has been underway since 2000. Currently, Governor Patterson's administration is working on a ban of all pesticides on state managed land. However, the knowledge and tools to implement such policies, especially a more organic approach, are not currently available to golf turf managers. New York ranks as the fifth highest golf state nationally with 860 courses, more than 40 percent are municipal. The 2004 New York State Turfgrass Survey indicated that golf courses spend more than \$23 million dollars annually on pesticides with 74 percent spent directly on fungicides. When factored together with labor expenditures for pesticide application, pest management costs exceed \$40 million annually. When asked about significant problems they are facing today, 65 percent of golf course managers rated disease management as their highest concern. Furthermore, when asked about significant future problems, government regulations and loss of chemicals were the two most frequent answers. Therefore, additional research to assess emerging organic technologies for golf courses and a comprehensive operations manual for implementation are needed. This project will build on the existing success and visibility of our efforts at Bethpage to further assess organic technologies and download the knowledge we have developed by working on an operating golf course. This download and synthesis will allow us to develop an operations manual. The operations manual will include proven and emerging technology and practices necessary for implementing an organic approach. A portion of this project will assess the effectiveness of the operations manual in encouraging adopting of organic practices. In addition, this project will engage Community IPM and county based Extension faculty as well as faculty from SUNY schools for the research and extension. This highly integrated effort building on the established visibility and success of the Bethpage project insures this project has an excellent chance of having a widespread impact.

Animal Health Component (N/A)

Research Effort Categories

Basic 5%

Applied 85%

Developmental 10%

Classification

Knowledge Area (KA)	Subject of Investigation (SOI)	Field of Science (FOS)	Percent
216	2130	1060	50%
215	2130	1060	50%

Knowledge Area

215 - Biological Control of Pests Affecting Plants; 216 - Integrated Pest Management Systems;

Subject Of Investigation

2130 - Turf;

Field Of Science

1060 - Biology (whole systems);

Keywords

organic

turfgrass

golf courses

ipm

Goals / Objectives

The goals of this project are to identify and evaluate emerging organic technologies for use in golf turf management that reduce the need for synthetic fertilizers and pesticides and to develop an operations manual for organic golf turf management for use on New York State operated Golf Courses. The primary outcome and impact of this project will be the integration of organic golf turf management technologies that are rigorously evaluated into existing management programs working to reduce chemical pesticide use. Additionally, the development of a manual will serve as a resource that will allow us to assess the manager's willingness to embrace new management strategies. Finally, with legislation pending to limit chemical use the project will work to inform legislators of the potential effect of the legislation.

Project Methods

The proposed work would extend a large scale research and demonstration project that began in 2001 on the 18 putting greens of the Green Course at Bethpage State Park, Long Island, NY. When the project was first conceived, we wanted to test how well greens would fare when managed without chemical pesticides (mimicking a law in an adjacent county), and with reduced reliance on chemical pesticides (IPM). Therefore, we established three pest management treatments: conventional (unrestricted), IPM and nonchemical. However, we felt that the best chance for the low chemical strategies to succeed would be if cultural practices were modified to reduce stress on the turfgrass plants. To test this hypothesis, while providing fair comparisons with how golf courses are currently managed, we maintained half of the greens under current cultural practices, and half with stress reducing alternative practices. The 3 x 2 factorial design resulted in six unique management systems, with three greens (replicates) in each treatment regime. The two cultural and three pest management treatments for example Cultural Management Current Standard: Cultural practices normally employed on the Green Course, such as mowing height and frequency, topdressing, and irrigation practices Alternative: Modified Bethpage cultural practices, selected to reduce turfgrass stress, and minimize pest problems, while striving to maintain acceptable performance standards (e.g. quality ratings above 6 on the NTEP rating scale and ball roll distance > 2.5 meters). We will continue to compare reduced risk (low pesticide use), IPM and conventional management strategies on the putting greens of the Green Course at Bethpage State Park, and we will begin introducing reduced risk approaches to the tees and fairways which have not previously been a part of the project. We will assist the Bethpage staff in adopting reduced risk and IPM strategies on the Blue and Yellow courses. In addition, we will begin development of an operations manual for reduced chemical management for public golf courses in northern climates, especially Municipal Golf.

Progress 10/01/08 to 09/30/11

Outputs

OUTPUTS: Twelve training sessions were held in total in 2011. Five sessions were held in NY state for the 27 state golf courses and 105 employees. The remaining seven sessions were conducted in 5 states and Canada. In total more than 350 golf turf professionals were trained in developing organic golf turf management programs. Two field days were held on Long Island for 69 golf turf professionals, one at Bethpage and one at Seabonack Golf Club in East Hampton, NY. These field days allowed for hands on learning. **PARTICIPANTS:**

Dave Catallano; Park Superintendent Bethpage State Park Kevin Cassidy; Director of Golf; NYS Dept. of Parks Recreation and Historic Preservation. Jennifer Grant Assistant Director NYS IPM Program Robert Portmess Extension Associate Dept of Horticulture TARGET AUDIENCES: Golf Turf Managers Turfgrass suppliers and manufacturers PROJECT MODIFICATIONS: Not relevant to this project.

Impacts

This project has resulted in a redefining of integrated pest management programs for golf turf that includes the use of effective organic technology. We have seen widespread increase in use of programs and products developed in this project such as Civitas (an OMRI certified fungicide) and Converted Organics (food waste compost based fertilizer). The use of these products and programs has resulted in more than a 30% decrease in fertilizer use at the facilities that have fully embraced this program.

Publications

- Rossi, F.S. and M.C. Thurn. 2011 Civitas reduces N-fertilizer use. Cornell Turfgrass Research Report. vol 16:1-7.
- Rossi, F.S. and M.C. Thurn. 2011 Synergistic interaction among Civitas, fungicides and PGR's. Cornell Turfgrass Research Report. vol 16:8-17.
- Rossi, F.S. and M.C. Thurn. 2011 Civitas influence on clipping yield and ball roll distance. Cornell Turfgrass Research Report. vol 16:18-29.
- Portmess, R.E., J.A. Grant and F.S. Rossi. 2011. Reduciendo el Uso de Agroquimicos en Campos de Golf: Redefiniendo MIP. IPM Publication 617.

Progress 10/01/09 to 09/30/10

Outputs

OUTPUTS: This project has been very successful in developing outputs from field research experiments with food waste compost fertilizer, isoparifin-based organic fungicides, soybean-based lyseine fertilizer as well as strategies for integrating biological fungicides into traditional disease management programs. We have conducted more than a dozen educational events with municipal golf course managers using the newly published "Reducing Chemical Use on Golf Course Turf: Redefining IPM" manual and training materials. Additionally we conducted several field tours of our research projects including the Bethpage Project for practitioners, international scientific visitors, and local policy makers. Finally, we have developed webinars and podcasts focused on organic golf turf management that we expect to deliver in 2011. PARTICIPANTS: Robert Portmess, Extension Associate, lead author on Chemical Reduction Manual. Dave Catalano, Park Superintendent, Bethpage State Park, facilitated training programs. Kevin Cassidy, New York State Parks, Recreation and Historical Preservation, Director of Golf facilitated training programs. Jennifer Grant, New York State IPM Program co-PI on Bethpage Project. TARGET AUDIENCES: Municipal golf course superintendents and local golf communities were primary audience. Efforts included training sessions, field tours, webinars, podcasts, and site visits to courses. PROJECT MODIFICATIONS: Not relevant to this project.

Impacts

The most significant outcome to date from this project has the overwhelming increase in the use of food waste compost fertilizer and organic fungicides that were explored and evaluated in our program. The sale of these products in the NY metropolitan area golf courses as well as the entire NY State Park Golf Course System has shown a 500% increase in the use of these organic technologies. This shift was simply a result of our published field studies, we expect significantly more implementation of organic technologies as we increase our educational efforts and distribution of the training manual.

Publications

- Portmess, R., J.A. Grant and F.S. Rossi. 2010. Reducing Chemical Use on Golf Course Turf: Redefining IPM. New York State IPM Publication No. 617.
- Emmons, R.A. and F.S. Rossi. 2010. Turfgrass Science and Management. Fifth Edition. Delmar Publishing, Delmar, NY.
- Rossi, F.S. 2010. CUTT: Quarterly Research Digest. editor and contributor.
- Moody, D.S. and F.S. Rossi. 2010. Effect of Potassium Fertilization on Psychrophillic Fungi. ASA Abstracts of Annual Meeting.
- Rossi, F.S. and M.C. Thurn. 2010. Effect of Civitas Organic Fungicide on Dollar Spot Incidence and Severity. Cornell Turfgrass Field Research Report.
- Rossi, F.S. and M.C. Thurn. 2010. Civitas Organic Fungicide Reduces Nitrogen Fertility Requirements of Golf Course Fairway Turf. Cornell Turfgrass Field Research Report.
- Rossi, F.S. and M.C. Thurn. 2010. Effectiveness of Food Waste Compost and Lyseine-based Fertilizer for Golf Course Fairway Turf. Cornell Turfgrass Field Research Report.

Progress 10/01/08 to 09/30/09

Outputs

OUTPUTS: This year marked two significant milestones for the organic golf turf management efforts. First, we have begun evaluating an entire organic golf management system as part of the long term effort at the Bethpage State Park. This effort has been highlighted around the world as a model research and outreach effort, almost as a proving ground for products and systems designed organically. The results of the first seven years of the project were published in the International Turfgrass Society Journal in 2009. The second significant milestone this season has been the development of strictly organic turfgrass fertility and turfgrass disease management programs in cooperation with the industry. The reductionist approach in concert with the systems-based effort outlined at Bethpage serves as an ideal research and educational environment for policy-makers, industry professionals, as well as our scientific colleagues. Our extensive and progressive outreach network of traditional (field days, conferences, written publications), electronic media (e-newsletters and webinars) and multi-media (audio and video podcasts) utilizing University and public venues (TurfNet.com, iTunes) has allowed us to lead the discussion of developing organic golf management standards and draft an organic golf management manual currently in process with the New York State Department of Parks, recreation and Historical Preservation. **PARTICIPANTS:** Nothing significant to report during this reporting period. **TARGET AUDIENCES:** The increased interest in organic turf management attracted many turfgrass professionals beyond the golf industry. A much wider audience than was originally expected has been reached with the project that speaks to the growing interest in this area. **PROJECT MODIFICATIONS:** Nothing significant to report during this reporting period.

Impacts

The 2009 field day at the Bethpage State Park was held over a two day period and included every sector of the turfgrass industry, i.e., golf, lawn, sports, sod, municipal garden, etc. all interested in organic turf management. This event is held every other year and this year had over 250 attendees. When surveyed the attendees indicated that as a result of the education and demonstration at the 2009 field day they would be making changes to their existing management programs to add two to three of the organic products being evaluated and discussed at Bethpage. The interesting aspect of this effort was that while it was focused on organic golf turf management, we were able to impact all sectors of the industry as a result of our established credibility and relevancy of the information.

Publications

- Senesac, A. F., F. S. Rossi, A. DiTommaso, L. A. Weston, and C. Bertin. 2009. Evaluation of selected fine-leaf fescue cultivars for their turfgrass quality and weed suppressive ability in field settings. HortTechnology. 19(3):p. 660-668.
- Rossi, F.S. and J.A. Grant. 2009. Long term evaluation of reduced chemical pesticide management of golf course turf. Intl. Turf Society 11:77-90.
- Rossi, F.S. 2009. Turfgrass ShortCUTT. Volume 10; Issues 1-33.
- Rossi, F.S. 2009. Gazing in the Grass Blog. <http://blogs.cornell.edu/turf/>
- Rossi, F.S. 2009. ShortCUTT Podcast. Volume 1; Issues 1-33. <http://blogs.cornell.edu/turf/category/shortcutt-podcast/>

Progress 10/01/07 to 09/30/08

Outputs

OUTPUTS: This project is designed to continue our long term project designed to reduce chemical pesticide use on golf courses, specifically municipal golf courses. This project directly supports NY State's initiative to eliminate pesticides on state owned land. The project began by assessing the overall carbon footprint of various golf turf management programs and resulted in the first publication of carbon emissions in golf turf. The next step with this effort is to take the recently produced golf turf manual and conduct workshops in NY to golf turf managers. **PARTICIPANTS:** Not relevant to this project. **TARGET AUDIENCES:** Not relevant to this project. **PROJECT MODIFICATIONS:** Not relevant to this project.

Impacts

A landmark publication on carbon assessment of golf turf management programs was published in 2008. This publication served as a launching pad for additional funding from industry associations and the International Sustainability Council for further reducing the carbon footprint of golf courses. A MS project was recently completed that included the development of manual designed to manage golf courses with less pesticides and improve their environmental compatibility.

Publications

- Portmess, R., N. Pettinati, C. Miller, B. Hochstein, T. Condzella, and F. S. Rossi. 2008. Can a golf course be carbon neutral A preliminary assessment. CUTT. 19(2):p. 1, 7-10.