

DEVELOPMENT OF A WATER CONSERVATION EDUCATIONAL PROGRAM FOR TURFGRASS PROFESSIONALS

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Abstract. In collaboration with the Golf Course Superintendents Association of America (GCSAA), a “Blended Learning Program for Golf Course Water Conservation” was developed. This program is a new and unique concept in training golf course superintendents, in that, it was designed as a learning experience which assists the practitioner in development of a water conservation plan site-specific to their golf course. The University of Georgia turfgrass faculty was responsible for development of sound scientific-based educational resources and the responsibilities of GCSAA were to market the program to its clientele. The first phase of the program was the development and launch of an online course, to provide introductory level information on Water and how it is impacted by atmospheric factors, uptake and use by the turfgrass plant, impact of edaphic or soil factors, and the relationship of the soil / plant / atmosphere continuum, the title of the course was the acronym W.A.T.E.R. The second phase of this program was development of an extensive document (template) on components of a water conservation plan, including a proposed planning process and a workshop with hands-on development of a water conservation plan. The superintendents received instruction and access to templates they could modify and implement to accommodate the nuances of their locale. The program concludes with a 90-day access to instructors through a GCSAA maintained list-serve for final refinement of individual plans. The deliverables of this program are written plans to be followed for water conservation on individual golf courses. Within the first two weeks of launching the online phase, registrants included superintendents from 20 states and 7 counties. The program was initiated in winter 2004 and has been requested for winter 2005.

INTRODUCTION

A mission of many university systems is to disseminate useful, practical, and scientific-based

information to its clientele. As society struggles with issues related to water management and conservation, it is these stakeholders who will look to the Cooperative Extension Service and Experiment Station personnel for guidance, recommendations, and solutions. Informational packages must be developed for an increasingly educated and web adept audience with demands for high levels of educational programs. To meet these expectations, novel modes of information delivery and packaging must be employed.

Tenets for the implementation of water conservation practices are to present in-depth informational packages of scientific principles with specific, practical applications to all individuals involved with water management (i.e., elected officials, municipal authorities, regulatory agents, on-site water managers, and the general public). While educating all involved is critical, improving the practitioner’s awareness of water conservation practices coupled with implementation on their site are where the most immediate and long-lasting effects can be realized. Site specific practices are developed using a template of Best Management Practices (BMPs) that is holistic, comprehensive, and science based.

In an effort to improve water use efficiency and the industry’s image, a partnership between UGA Extension and Research faculty, and the GCSAA was initiated in 2003. The objectives of this collaboration were to generate and disseminate educational packages focused on turfgrass water conservation practices. These packages were marketed to golf course superintendents, who are often well-educated managers placed in charge of a golf facility’s water resources.

THE PROGRAM

Upon completion of this program, it is expected that the participating golf course superintendents and the golf facility’s officials complete the process of developing and implementing a set of BMPs for water conservation

which is site-specific. These BMPs will guide daily water management practices, future planned renovations or new constructions to improve infrastructure, and general turfgrass management. Furthermore, the development, implementation, and adherence to these BMPs will provide documentation of a course's previous and ongoing stewardship efforts that may be used as proof of existing water conservation measures when resources become limited. This water management approach may allow golf courses to continue to operate without any additional irrigation restrictions when other industries are adjusting to meet water conservation demands.

The "Blended Learning Program for Golf Course Water Conservation" is divided into three modules. The first module of the program was the development of an online course. The specific goal of Module 1 is to provide introductory level information on water and how it is impacted by atmospheric factors, uptake and use by the turfgrass plant, impact of edaphic or soil factors, and the relationship of the soil / plant / atmosphere continuum. Module 2 is a 6-hour interactive workshop which covered various water conservation strategies and options, a workbook (template) detailing the course content was also provided. The seminar was conducted by UGA turfgrass scientist during the GCSAA's annual conference and show. Lastly, Module 3 provides access to a "list serve" hosted by GCSAA where course participants could post questions and interact with colleagues and scientist during the development process of their site-specific water conservation plans. This program "blended" three learning styles, self-study through the online course, a class-room lecture style as part of the seminar, and active participation style through the development of a deliverable product, the site-specific water conservation plan, and access to a "list serve" for discussion of ideas and feedback.

The development of this course was a joint project between The UGA faculty and GCSAA and is hosted on the GCSAA server, www.gcsaa.org/learn/online/water.asp. It was the responsibility of the turfgrass scientists to write and ensure scientific accuracy of the content while keeping the course focused on turfgrass water use and conservation. Furthermore, submission of content updates and revisions will be the responsibility of the UGA authors. The GCSAA was responsible for preparation of the course format, advertisement to its membership, collection and distribution of fees, the administration of membership continuing education credits, and maintaining the website for the course. In addition, graphic artists on staff assisted the authors with design and development of graphical content and interactive activities within the course.

Module 1: W.A.T.E.R. for Efficient Water Management (online course)

This is a stand-alone, for fee, online course to provide a sound, scientific understanding of turfgrass water relationships. The target audience is golf course superintendents, assistants, technicians, agronomy and horticulture students, grounds managers, or other turfgrass industry professionals who desire a better understanding of turfgrass water management. While this was written as a stand-alone course which is available to anyone, GCSAA member or non-member, Module 1 integrates into the "Blended Learning" concept by being a prerequisite to continue into Modules 2 and 3.

W.A.T.E.R contains five chapters, each featuring a chapter outline, learning objectives, in-depth reading material, interactive reviews, and photos and illustrations. Each chapter is broken down into a number of sections, such that, the participant does not have to complete the entire course, or even one chapter, in one sitting. The flexibility of online learning allows the participant the ability to repeat chapters or advance to the next section when they feel they have mastered the chapter's concepts.

The course was launched in December 2004 and has been well received. W.A.T.E.R. had the best first month registration and use of any GCSAA's online courses, 43 participants (Table 1). For the first 14 months this course was "live", 118 students representing 33 US states and 10 counties had completed the training. California has had the greatest number of individuals to complete the course (13), followed by Florida (11) and, New York (8). Four superintendents from Georgia have taken the course. The remaining 30 states with participants, ranging from Maine to Hawaii, had five or fewer students. Internationally, Canada had seven participants, while Australia, Barbados, France, Germany, Portugal, and Spain have had three or fewer. The diversity of participants in this course certainly demonstrates a universal interest among golf course superintendents in water conservation.

Not surprisingly, initial registration was greatest in December and January. This is likely due to several factors, 1) GCSAA's aggressive promotion, 2) appropriate timing for golf course superintendents, many have time for self study during winter months when there is little activity on the golf course, and 3) need to complete the course as a prerequisite for Modules 2 and 3. Although there are times of the year where increased activity is expected, because this is an online course it is offered year-round.

Module 2: BMPs for Turfgrass Water Conservation (workshop)

The second phase of this program is a full-day (six-hour) workshop during the national GCSAA meeting in

February of each year. The focus of this workshop is to assist golf course superintendents in the development of site-specific BMPs for water conservation in a manner that would be acceptable for submission to their facility's decision makers, elected officials, municipal authorities, regulatory agents, on-site water managers, and the general public.

During the initial four hours of the workshop, a science-based and holistic, systems approach for developing BMPs for water conservation was presented through a lecture format. Also, the major categories of water conservation strategies were presented along with options within each strategy so that a superintendent could select appropriate options for their site-specific situations.

During the next two hours, instructors facilitated discussion among the participants and initiated the development of individual plans. In the development of their water conservation plan, participants were instructed to include various options and the practical implications of specific practices on water use and turfgrass management. Furthermore, the participants were encouraged to include the scientific reasons and justifications for these options, which were presented in the workbook (template) along with scientific references.

To aid in the writing of site-specific plans, the superintendents were provided with a workbook in a hard- and electronic-copy format. The workbook detailed specific water conservation practices with scientific documentation of the practices. By use of the electronic copy, participants were allowed to integrate the workbooks contents into their plans.

Module 3: List-serve and Conference Call (follow-up)

For 90-days following the workshop, the instructors were available via a voluntary list-serve to assist the participants in development of their water conservation

BMPs document. The instructors offered technical and scientific assistance through the list-serve, while GCSAA maintained and hosted the service.

At the conclusion of the 90-day period there was a voluntary conference call between participants, instructors, and GCSAA Education Department personnel. The purpose of the conference call was to obtain industry input for improvement of future offerings; participants provided specific feedback for improvement of all the learning modules.

CONCLUSION

The purpose of this blended learning program was to use various learning styles to increase the level of understanding of water conservation, educate participants on methods of improving and implementing water conservation practices, and, ultimately, the development of a site-specific plan to be employed on individual golf courses. This program was initiated in 2004 and thus far, participant reviews have been positive. The instructors integrated suggestions for improvement and offered the entire course again at the 2005 GCSAA conference and show.

Georgia's golf industry is beginning to understand the importance and relevance of water conservation. This is evidenced by a recent Memorandum of Agreement with the Georgia Department of Natural Resources – Environment Protection Division to have 75% of member golf courses develop BMPs for water conservation (see article by Waltz et al., 2005 in this issue). Also, water conservation is the sole focus of upcoming Georgia Golf Course Superintendents meetings. The materials developed for the GCSAA course will be utilized in these trainings.

Table 1. Distribution of participants of W.A.T.E.R. online course.

Year	Number of Participants		
	United States	International	Total
2003	33	10	43
2004	57	7	64
2005*	8	3	11
Total	98	20	118

*Through 7 Jan. 2005.