

TITLE: Quantification and Validation of the Beneficial
Contributions of Golf Course Turfgrasses

INVESTIGATORS:

James Beard, Soil and Crop Sciences, Texas A&M Univ.
Samuel Sifers, Soil and Crop Sciences, Texas A&M Univ.

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CLIMATIC REGION: Warm Humid
USGA REGION: Mid-Continent

00113

EXECUTIVE SUMMARY

This progress report represents a summary of the ongoing research activities for the first nine months of a project entitled "Quantification and Validation of the Beneficial Contributions of Golf Course Turfgrasses." The objectives of this project were to 1) conduct a detailed assessment of the literature to obtain and validate scientifically based sources of information supporting the benefits of turfgrasses to our environment via golf courses and 2) conclude with a manuscript that will be submitted to a major, peer-reviewed, scientific journal as a seminal article on the environmental benefits of golf courses. Also, there would be the opportunity to publish a TAES bulletin or report which could be in press sooner than the scientific paper.

Considerable time and effort has been spent toward achieving our objectives since fall 1990. Over 282 papers have been collected, organized, and assessed (many are not useful for our needs) and over 84 personal inquiries have been made for specific information. These numbers will be increased substantially before our objectives are achieved. A tentative outline for a position paper to be submitted to Science was completed in June 1991. Currently we are writing a preliminary draft which should be completed in early 1992. A final draft of the manuscript will be sent to the USGA Green Section Research office on or before May 1, 1992.

This has been a rewarding and enlightening project because there is a need for it and because our perspective has evolved concerning the environmental issues challenging the golf course industries. This position paper and other USGA projects are needed first steps. However, we probably agree that the lasting solution will be achieved from the golf course industry and environmental groups working together to achieve common goals and objectives.

INTRODUCTION

The value of most industries is measured by income from the sale of products or services. However, this is not germane for a large portion of the turfgrass industry. Rather, the value of golf courses encompasses a range of beneficial contributions to our environment, people, and other biological organisms.

The current societal concerns of environmental protection, probably exaggerated by relatively small groups of environmentalists, are pressing hard against the golf course industry. Environmentalists basically perceive golf courses as more of an environmental liability than an environmental asset. Many of their claims and arguments against golf courses may or may not be founded on well-conducted scientific research. Their posture is almost a moral, spiritual one, i.e., "save mother earth". Their apparent antibusiness, antiestablishment agenda is a serious threat to the golf course industry.

However, we who are interested in the welfare of the golf course industry must proceed wisely and patiently. Yes, there are many positive attributes of golf courses, and there are probably more to be developed when there is more understanding and cooperation between the golf course industry and environmental groups. On the other hand, there have been situations where golf-course related activities have caused harm to the environment. However, future harm to the environment probably can be mitigated by the implementation of environmentally enhancing practices. Yes, there is a need to assemble and unbiasedly present all the currently available scientific data on the various impacts that golf courses have on the environment, people, and other biological organisms in a major peer-reviewed scientific journal. This is the major purpose of our project. This was an objective of the literature review prepared by Spectrum Research Inc.

However, the manner or posture in which we present "our facts" is just as important as the documentation itself. To state that golf courses are not causing environmental problems and that environmentalists are just over-emotional could be incredibly narrow-sighted. The golf course industry must establish a relationship with environmental groups that is based on mutual respect, cooperation, and truth. It need not be an adversarial relationship but a relationship with common goals. This current challenge to the golf course industry from environmentalists can be viewed as an opportunity for the golf course industry to join the environmental ranks in a win-win situation for all. The golf course industry must be willing to make a self-analysis, be honest with the facts, and be capable of holding their ground or taking corrective measures when appropriate.

OBJECTIVES

1. Conduct a detailed assessment of the literature to obtain and validate scientifically-based sources of information supporting the benefits of turfgrasses to our environment via golf courses.
2. Conclude the above objective with a manuscript that will be submitted to a major, peer-reviewed, scientific journal as a seminal article on the benefits of golf courses to the environment, people, and other biological organisms.

RESEARCH METHODOLOGY

The first phase of this project involved the assemblage, organization, and assessment of the available scientific literature documenting the environmental benefits of golf courses and turfgrass ecosystems; this phase is ongoing. The literature review by Spectrum Research Inc. was a great help. Over 282 papers have been obtained, organized, and assessed (many are not useful for our needs). The second phase of the project was to develop a tentative outline for a position paper to be submitted to Science (see last section of this report). The third phase was to begin to develop the outline beginning with the introduction. As contacts were made, new areas have been and will continue to be added to the outline; over 84 personal inquiries have been made for specific information. Considerable time has been spent tracking down leads and obtaining needed documentation. Sources of documentation for some areas have been scattered throughout various publications and almost require one contact for every one document. In some cases, the best publications to date, are hard-to-access reports, not necessarily published in peer-reviewed journals.

This would be an excellent time for the USGA Research Committee to give input concerning our outline if they desire. There is sufficient time for us to respond.

EXPECTED RESEARCH RESULTS

A final draft of a manuscript will be submitted to Science as a position paper. The paper will be submitted following a review by the USGA Green Section Research Committee and our revisions. Also, there would be the opportunity to publish a TAES Bulletin or Report which could be in press sooner than the scientific paper.

OUTLINE OF A POSITION PAPER TO BE SUBMITTED TO SCIENCE

BENEFITS OF GOLF COURSES AND TURFGRASSES ON THE ENVIRONMENT, PEOPLE, AND OTHER BIOLOGICAL ORGANISMS

J. B. Beard and R. L. Green

INTRODUCTION

1. Report alleged negative aspects of golf course construction and management. Major concerns are 1) contamination of surface water with sediment and nutrients during construction, 2) contamination of runoff and ground water with nutrients and pesticides, 3) development of pest populations with increased resistance to pesticides, 4) negative impact of turf chemicals on nontarget animals, especially wildlife, and 5) excessive use of water. Also, loss of natural habitat, ecosystem, wetlands, and open space.
Citations obtained: 4
Contacts made: 6
2. Yes, there have been and probably still are circumstances where golf courses have caused harm to the environment. However, is it fair to generalize about all golf courses, all golf people, all the time? Actually, the current scientific data needed to substantiate the generalization of these negative claims are incomplete or lacking. What happened to "innocent until proven guilty?" Actually, a good environment is good business for the golf industry. This industry is willing to make a self-analysis, and correct problems where they exist because it is an industry sincerely concerned about the welfare of the environment. The purpose of this paper is not to refute negative claims, those questions will be addressed with ongoing research. The purpose of this paper is to document the positive aspects of golf courses and turfgrasses on the environment, people, and other biological organisms.
Citations obtained: 20
Contacts made: 4
3. Could some of this concern about harm to the environment be chemophobia? Real vs. perceived harm? Current polls suggest chemophobia.
Citations obtained: 3
Contacts made: 0
4. Cite a few key research papers that basically show that under most situations, chemicals applied to turfgrass are not really harming ground and surface water (about 2% loss of chemical). Also what happens if an IPM approach is used? Lastly, how do chemical applications and environmental pollution on golf courses compare to other agricultural industries?
Citations obtained: 5; 67 total
Contacts made: 10

5. Cite a few key research papers that basically show that it does appear pesticide or fertilizer applications can sometimes aggravate thatch or pest problems by interfering with the activities of beneficial organisms. However, whether a problem exists under proper turfgrass management or if an IPM program is used is not known. Also, there are normal, seasonal fluctuations in beneficial organism populations that can not be attributed to human activities.
Citations obtained: 5
Contacts made: 3

6. Cite key research papers that basically show that pottable water used by golf courses is only a small fraction of the grand total and the total used for agricultural purposes. Cutting water supplies to golf courses is more of a political response than an action that gets to the root of the problem of water supplies and distribution. Is it really true that turfgrasses use more water than other landscape plants? Actually, golf courses are in a good position to recycle used water.
Citations obtained: 7
Contacts made: 3

7. Cite key research papers, environmental impact reports, surveys, etc. that show considerable planning is made prior to the construction of many golf courses on their impact on natural habitat, ecosystem, etc. One purpose of the planning is to minimize detrimental effects on the ecosystem which is obtainable. Actually, golf courses can create natural habitat, wetlands, and bird sanctuaries. Currently the trend in golf course design is naturalization vs. wall-to-wall maintained turf and landscape.
Citations obtained: 23
Contacts made: 15

GOLF COURSE/TURFGRASS BENEFITS AND THE ENVIRONMENT

WATER AND SOIL

1. Entrapping and retaining precipitation. Compare turfgrass surfaces to other types of surfaces. However, runoff does occur on turf. Maybe the issue is catching the runoff and filtering it through "infiltration" devices or storing it in ponds, not damaging other aquatic resources. Infiltration devices also could be used to filter runoff from impervious surfaces.
Citations obtained: 12
Contacts made: 6
2. Soil stabilization, dust prevention, reduction of sediment loss, filter strips on construction sites, slopes, roadsides, and mine sites. Compare turfgrass surfaces to other types of surfaces. Could golf courses be viewed as a means of restoring environmentally damaged areas, such as old dumps?
Citations obtained: 28
Contacts made: 2
3. A site for recycling treated effluent and used water. This benefit really needs to be pushed. The limitations may be more related to engineering.
Citations obtained: 18
Contacts made: 0
4. A site for recycling treated sewage sludge from municipal and industrial sites. The Milorganite story and other potential recycling stories.
Citations obtained: 0
Contacts made: 0
5. A site for filtering and recharging ground water. If there is any doubt concerning this benefit, infiltration devices could be built on golf courses.
Citations obtained: 10
Contacts made: 7
6. A relatively low water user compared to other urban landscape plants. Limited research available, yet enough to make preliminary statements.
Citations obtained: 2
Contacts made: 5

ATMOSPHERE

1. Carbon dioxide capture/oxygen evolution. Possibly difficult area to document because the literature is not in agreement. May drop the whole issue.
Citations obtained: 11
Contacts made: 2

2. Dust prevention.
Citations obtained: 7
Contacts made: 0
3. Heat dissipation. Compare turfgrasses to other types of surfaces.
Citations obtained: 4
Contacts made: 1
4. Glare reduction and noise abatement. Compare turfgrasses to other types of surfaces.
Citations obtained: 0
Contacts made: 0

GOLF COURSE/TURFGRASS BENEFITS AND PEOPLE

1. As a sport and national past time.
Citations obtained: 4
Contacts made: 0
2. As a form of physical health.
Citations obtained: 0
Contacts made: 0
3. As an industry (value, size, scope).
Citations obtained: 4
Contacts made: 1
4. As a form of social interaction.
Citations obtained: 0
Contacts made: 0
5. Enhances value of neighborhoods and communities.
Citations obtained: 1
Contacts made: 0
6. Psychological value of a natural open space.
Citations obtained: 5
Contacts made: 1

GOLF COURSE/TURFGRASS BENEFITS AND OTHER BIOLOGICAL ORGANISMS

1. Wildlife, especially being a bird sanctuary and creating aquatic habitat. Could certain endangered animal species be placed on golf courses and surrounding areas for sanctuary?
Citations obtained: 17
Contacts made: 10

2. Soil organisms, especially compared to soil underneath other types of surfaces. Actually, the soil underneath grasslands is improved.
Citations obtained: 2
Contacts made: 1

3. Plant life including the reestablishment of native species. Some new courses have become a native plant habitat. Existing courses can do the same.
Citations obtained: 7
Contacts made: 7

SUMMARY

1. Summary of our "facts".

2. A need for all to remain objective and flexible and create a cooperative atmosphere between the golf course industry and various environmental groups.

3. What are the obtainable, common goals and objectives that can be coordinated and achieved between the golf course industry and environmental groups? Certainly, a good place to start is education. The USGA-GCSAA has begun this phase, including sponsoring environmental research. What are the environmental groups doing?

4. This is not lip service; the golf course industry does and will continue to be environmentally sensitive and desires a win-win situation for all involved.