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Is Golf Really Green?

When most people think of a golf course, they immediately think of green grass, rolling hills, and a natural setting. Since the 16th century people have been attracted to golf because the challenge of the game and the connection created with the surrounding environment. However, with the transformation of golf courses over the last 100 years, golf has moved away from this harmonious relationship with nature. Golf courses have emerged as a leader in making our planet less eco-friendly and less "green." Environmentally damaging design and maintenance practices have disrupted wildlife habitats and continue to deplete our natural resources. In a time of increasing environmental instability, golf in its present form is yet another roadblock in the path towards a sustainable world. As a self-proclaimed "environmentalist" and a golfer myself, I want to see the sport I love have a positive environmental impact. Golf can be a sustainable sport that peacefully coexists with the environment; however, it takes smart ecological planning and management. In my analysis of golf course maintenance I will examine both the environmental problems and solutions for the golf industry. Ultimately, the sustainability and future of golf lies directly in the hands of golfers themselves. The golfer's perception of the "perfect" golf course has to change in order for golf to continue to grow and even exist in our world.

With technological advancements and more effective maintenance practices, golfers have come to expect a certain quality in the golf course they are paying to play. They expect to find vibrant grass, interesting design, and impeccable playing conditions.

This expectation fuels competition between golf courses and has allowed golf to become the 65 billion dollar industry that it is today[1]. But this competition has also started a maintenance arms race that increasingly sacrifices the environment for the cause of having the most "perfect" golf course. Water, pesticide, fertilizer, and land use have all exponentially increased in the 20th century solely because this new perception of what a golf course should look like.

Environmental Problems

Globally the most pressing environmental issue today is our diminishing freshwater supplies. In 2007 the United Nations reported that by 2025, 1.8 billion people worldwide will be living in dire water scarcity.[2] In the United States, a country that covers a variety of climate zones, the average golf course uses 300,000 gallons of water per day[3]. With over 35,000 golf courses internationally, some argue that the golf industry is committing an environmental and moral injustice with its current consumption.[4] While some use recycled or effluent water, around 80% of the 18,000 American golf courses are diverting water directly from freshwater rivers, lakes, or aquifers.[5] Additionally, the

[1] "How Green is Golf?"
[2] UN
[3] "America's 18,000 Golf Courses Are Devastating the Environment"
[4] "Missing the Green"
[5] "Missing the Green"

growing popularity of golf in warmer, dryer climates is only intensifying this issue. With complex irrigation systems and imported water, golf courses can now exist in any climate zone. Currently there are one hundred and twenty-six golf courses in the Coachella Valley[6] (better known as Palm Springs, Ca), an area that receives less than 5 inches of rain each year[7]. To maintain the desired green playing surface, golf courses in the Coachella Valley use between 1 million and 1.5 million gallons of water per day[8]. In a time of growing scarcity, golf is consuming more than its fair share of water.

A common site at a golf course is a maintenance crewmember spraying chemicals in order to enhance the condition of the grass. Complimented by a mask, gloves, and a full body suit, few people question what exactly this person is spraying onto the grass. While the EPA has regulated certain pesticides and fertilizers, the constant adaptability of funguses and grass diseases are making chemical use more attractive to golf course superintendents. Maintenance crews apply these chemicals to create a perfectly unnatural ecological zone- a place where grass can grow perfectly, but no animals or habitats can survive. Native species are seen as a disruption to the goal of creating a perfectly groomed golf course. In 1991, the New York Attorney General's Office reported that golf courses in Long Island, New York use 7 times more pesticides than comparable land used for agricultural purposes. The 52 golf courses in Long Island used over 50,000 pounds of insecticide and pesticide in one year.[9] Further, when combined with extensive irrigation, the runoff of all these chemicals have very detrimental effects on ecosystems surrounding maintained golfing areas. One study showed mercury concentrations from pesticide and

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[6] "Missing the Green"
[7] Weather.com
[8] "America's 18,000 Golf Courses Are Devastating the Environment"
[9] "Toxic Fairways"

fertilizer in bodies of water up to five miles away from a golf course. In this same study, fish also showed to have higher mercury concentrations that were similarly traced back to chemicals from the golf course.[10] The use of pesticides and fertilizers not only sterilizes golf courses themselves, but also has many unintended affects on nearby ecosystems.

The overuse of water and chemicals allow golf courses to dominate their environment. The inherent size of golf courses combined with these harmful maintenance practices are simply crowding out natural habitats. The average golf course is estimated to use 150 acres of land,[11] and worldwide, golf courses consume a combined 5.25 million acres (roughly the size of Puerto Rico[12]). Lands that were formerly healthy ecosystems are now unnatural and inhospitable golf courses. Moreover, constant demand for aesthetically appealing golf courses further motivates developers to build in or around some of our most vulnerable ecosystems. Forests, coastlines, and wetlands are increasingly put at risk for the sake of a breathtaking setting to a golf course. Manicured green carpets of grass are disruptive within any ecological zone and are putting too many habitats at risk. Habitat destruction is one of the leading causes in biodiversity loss[13]. These large amounts of maintained and unnatural environments created by golf courses ruin ecosystems and pose a huge threat to even the most adaptive of species.

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[10] “Effects of golf courses on local biodiversity”
[11] "America's 18,000 Golf Courses Are Devastating the Environment"
[12] Wikipedia
[13] [13] "America's 18,000 Golf Courses Are Devastating the Environment."

Solutions

The point has come when golfers need embrace the only feasible way for golf to exist: with a much smaller environmental footprint. Mike Hurdzan, a renowned golf course architect, commented, "Nowhere in the rules of golf does it say we have to play on green grass." If we can change the perception of the "perfect" golf course, ultimately we open the door for innovation and alternative maintenance techniques. In recent times, the golf industry has become obsessed with turning golf into a superficial, marketable entity. It seems golfers often forget the point of the game; it is the challenge of getting the ball into hole. To allow golf course maintenance to change and golf to become sustainable, the golf community needs focus more on the game, and less on the aesthetics.

Geographically golf has seen huge changes since coming to the United States. Initially the game was only played in the wet, cool climate zones of the Northeast. But in recent times, golf has moved from North to South and East to West. Southern California, Arizona, and Nevada are now hotspots for development and are golfing destinations. The fastest way to solve water usage problems is to reverse this development. While many argue such a complete reversal is unrealistic, it is possible to discourage further development. By continuing to raise the awareness of golf courses' water problems, consumer demand for golf courses in these dry areas will change. In 2007, a *Golf Digest* study showed that 91% of golfers believed golf to be an "environmental friendly" sport.[14] Through education, golfers will begin to realize just how damaging golf courses are, especially in such barren, desert climate zones. Consumer demand will slowly change and golf development will move away from these warm, dry environments.

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[14] "How Green Is Golf?"

Another avenue towards sustainability is the use of better-adapted and newer breeds of grass. The compatibility of grass to a given climate or ecological zone determines the amount of water and chemical usage needed on a golf course.[15] The best-fitting grasses require minimal inputs and can survive almost independent of additional maintenance. The United States Golf Association's "Green Section" focuses on this relationship between turf grass and surrounding environments. James T. Snow, the national director of the "Green Section" claims better grass, "saves 50 percent of water, and you hardly have to use any pesticides." More ecologically adapted grasses can survive with natural rainfall and can fight the diseases and funguses that chemicals are routinely used for.[16] With this goal in mind, the "Green Section" creates strains of grass that can better associate with specific environments. Also, they have created fungal, temperature, and drought tolerant grasses. Grasses produced through this "Green Section" have the ability to revolutionize the current relationship with water and chemical use. One groundbreaking discovery is the *Seashore paspalum* grass. Naturally this grass exists in coastal tropical regions but only recently was developed for application for golf courses.[17] *Seashore paspalum* is most notable for not requiring any freshwater in growth. The grass has a high salt tolerance level, allowing it to survive with irrigation solely from salt water. Due to its high durability and adaptability to most warm weather climates, golf courses employing this grass have eliminated their freshwater use, but also their chemical consumption. Golf courses in Hawaii, Florida, and Central America have started using

[15] "How Green is Golf?"
[16] "How Green is Golf?"

Seashore paspalum and all experience lower maintenance costs from this grass innovation.

Golf courses ultimately have goals that align with sustainability; they want to cut maintenance costs and save money with less water and chemical use. Today new and more efficient grasses exist, but many golf courses have been reluctant to make changes. In warmer, dryer climates, strains of Bermuda grass require the least amount of inputs for maintenance. While this seems like the most logical grass for many regions of the United States, we see golf courses continually choosing other grasses instead of Bermuda. Bent grass is a common alternative, even though it requires intensive water and chemical use in these warmer climates. Historically golfers want a specific type of grass to play on, and this explains the inefficiencies in grass application. When given the option between Bermuda and Bent grass, all 10 golfers on Stanford Men's Golf Team chose Bent grass to play on. This overwhelming preference for bent grass explains golf courses' reluctance to change. They want the most efficiency in their maintenance, but most important is happy consumers. With these developed preferences of the golfing community, often a change in grasses means sacrificing profits. The solutions to applying the most environmentally friendly grasses lie in reconciling this conflict between golfers' preference and better fitting grass types. Golfers need to settle for less, and remove themselves from these petty preferences in order to reach the broader goal of sustainability.

The combination of environmentally friendly grass application and more organic maintenance will greatly reduce fertilizer and pesticide use. Adapted originally from agriculture, Integrated Pest Management is a growing organic practice in golf course

maintenance.[18] Integrated Pest Management combines both natural and unnatural controls in dealing with damaging pests.[19] Biological controls (using natural enemies), cultural controls (changing irrigation patterns), physical controls (manually killing pests), and in last resort chemical controls are all employed. Rather than just arbitrarily spraying a pesticide, this alternative strategy looks to use "common sense and organic practices" in dealing with pest problems.[20] With widespread use of Integrated Pest Management, golf courses can become less reliant on synthetic, toxic pesticides and ease the negative impacts on nearby ecosystems.

Sustainable golf course maintenance can allow a golf course to move away from its current segregated relationship with nature. With less water and chemical use through practices like Integrated Pest Management, a golf course will not be such an ecological abnormity. Also, wildlife crossings and conservation areas can help to decrease the overall footprint of a golf course. In leaving more areas of a golf course untouched by maintenance, effects on nearby ecosystems can be minimized. By allowing maintained areas to return to their natural composition, an ecosystem can thrive alongside a golf course. Rather than filling in grass from fence to fence, golf courses can reserve such areas for native plants and animals. By solely maintaining grass on the vital parts of the

[18] "Integrated pest management (IPM) principles"
[19] "Integrated pest management (IPM) principles"
[20] "Integrated pest management (IPM) principles"

golf course- the fairways, rough, tee boxes, and putting greens- golf courses can largely reduce their average size. A decrease in total acreage of maintained grass from 150 acres to 120 acres, would allow more habitats and species to once again live in their native ecosystems.

Examples

One golf course gaining notoriety for its innovative management is the Vineyard Country Club in Martha's Vineyard, Massachusetts. Vineyard Golf Club is the only fully organic golf course in the United States. In order to prevent aquifer pollution, the Martha's Vineyard County Commission only permitted the 2002 construction of the golf course under the condition that no synthetically produced fertilizers or pesticides would be used. Golf course superintendent, Jeff Carlson, has since proven that a great golf course can exist without environmentally harming chemical usage. While labor costs are higher, the club saves money with the absence of expensive pesticides, herbicides, and fertilizers.[21] By using alternative methods like Integrated Pest Management, Carlson is able to keep both golfers and environmentalists satisfied. Mr. Snow of the "Green Section" notes, " Most golf courses wouldn't make it with an approach so organic. But over time, we're going to be using less synthetics, and [Vineyard GC is starting] a good thing." The members of this private golf course accept the occasional weed or brown spot. And most importantly, they promote the mantra "playability rather than visual perfection".[22] This golf community understands the bigger picture- that golf needs to mix in cohesively with its environment. While today the Vineyard Golf Club may be a unique

[21] "How Green Is Golf?"
[22] "Green Greens"

outlier with its maintenance approach, with this example of organic innovation we see opportunity to change destructive patterns elsewhere.

Many environmentally conscience golfers have suggested a “back to the future” mentality. This would mean returning to pre 20th century maintenance techniques that are more environmentally friendly and use less energy inputs. This kind of low input, low energy maintenance is very common in the British Isles, home to some of most famous golf courses in the world. The main idea to this maintenance style is finding grasses that

will live entirely on their own. Instead of using foreign or more preferred grasses, native and adapted grasses are employed. With the use of these natural grasses, chemical and water usage is kept at a minimum. The goal is in preserving the natural characteristics of the land by focusing less on grass condition and more on general ecology.[23] Better soil composition, and a healthier ecosystem helps the native grasses grow, while artificial additions would only be destructive. Low input, low energy maintenance uses a complete environmental perspective while trying to create the best golf course playing conditions.

Conclusion

Together the models of the Vineyard Country Club and low energy, low input maintenance represent the future for golf course management. These two maintenance

[23] "GCM - February 2008 - Feature"

structures offer solutions to many of our current environmental problems through better grass types and a more organic focus. For golf courses to be sustainable there needs to be a change in the amount of chemicals, land, and imported water used in daily operations. In my opinion there are strong indications that this change is in motion. Both the United States Golf Association and the Royal and Ancient (Europe's governing body for golf) recognize our current environmental problems and are set to change golf's relationship with nature. But with this leadership, two more things need to happen before golf can be sustainable. First, golfers need to recognize the negative impacts that golf courses have on the environment. And with this awareness, the golf community's perception of the "perfect" golf course needs to change. In golf, "green" should no longer describe only the color of the grass; "green" should also describe its sustainable future.

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