

Sustainable Data-Driven Golf Course Best Management Practices Study



Challenge

The Robert Trent Jones (RTJ) Golf Course at Cornell University wanted to employ site-specific practices to significantly reduce pesticides, nutrient, and water use on expansive playing surfaces.

Solution

Site specific recommendations for nutrient use were developed through the collection of soil, light, and traffic data across 27.5 acres of fairway turf.

Results

Site-specific recommendations were implemented, allowing the RTJ Golf Course to significantly reduce nutrient use while simultaneously producing more uniform playing conditions.

Robert Trent Jones (RTJ) Golf Course

The Robert Trent Jones Golf Course is Cornell University's golf course located in Ithaca, NY. This golf course was designed by Cornell alumnus Robert Trent Jones and proves to be a challenge for golfers of all levels. It is a private golf course open for use by the Cornell Community and their guests only.

Challenge

Golf course management has traditionally required the uniform application of water, nutrients, and pesticides across the entirety of a given playing surface. When considering actual site-specific needs, this can be quite wasteful. Research at the Cornell University Turfgrass Program (Cornell) has focused on the potential of site-specific Best Management Practices (BMPs) to significantly reduce pesticides, nutrient, and water use on expansive playing surfaces like fairways and roughs. Playing surfaces have considerable heterogeneity in site conditions across the golf course landscape, necessitating the collection of data to characterize these conditions and provide a framework for resource use guidelines that optimize application rates and reduce environmental impacts.

Solutions

Cornell requested assistance from the New York State Pollution Prevention Institute (NYSP2I) to analyze the current resource use and management practices at various sites on the golf course. After the collection of soil, light, and traffic data, the results were used to characterize the variance in site conditions across the 27.5 acre golf course landscape. This data informed site-specific recommendations for nutrient and water use for fairway areas that accounted for variable site conditions.

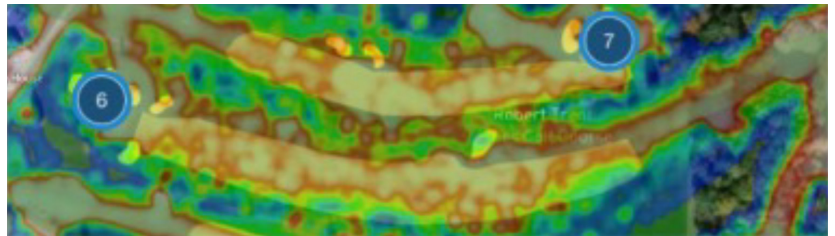


Figure 1. Generated heat map of golfer traffic taken from USGA DEACON software

Results

RTJ at Cornell University implemented site-specific nutrient recommendations, resulting in a 56% decrease in nitrogen fertilizer use compared to 2022. This is equivalent to a reduction of 2,802 pounds of fertilizer. A site-specific management plan to achieve these results can be developed using low-cost data collection methods including basic soil tests and general classifications of traffic and growing conditions. Less fertilizer should be used in areas where traffic is low, growing conditions are desirable (no shade), and/or adequate organic matter levels currently exist.

Partners



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