Turf management in the future is about efficiency

Micah Woods

January 19, 2024

Asian Turfgrass Center
www.asianturfgrass.com

PACE Turf
www.paceturf.org

1. Pesticide restrictions
2. Electric & robotic machines
3. Predictive models
4. GPS sprayers
5. Grass species
6. Water
7. Data

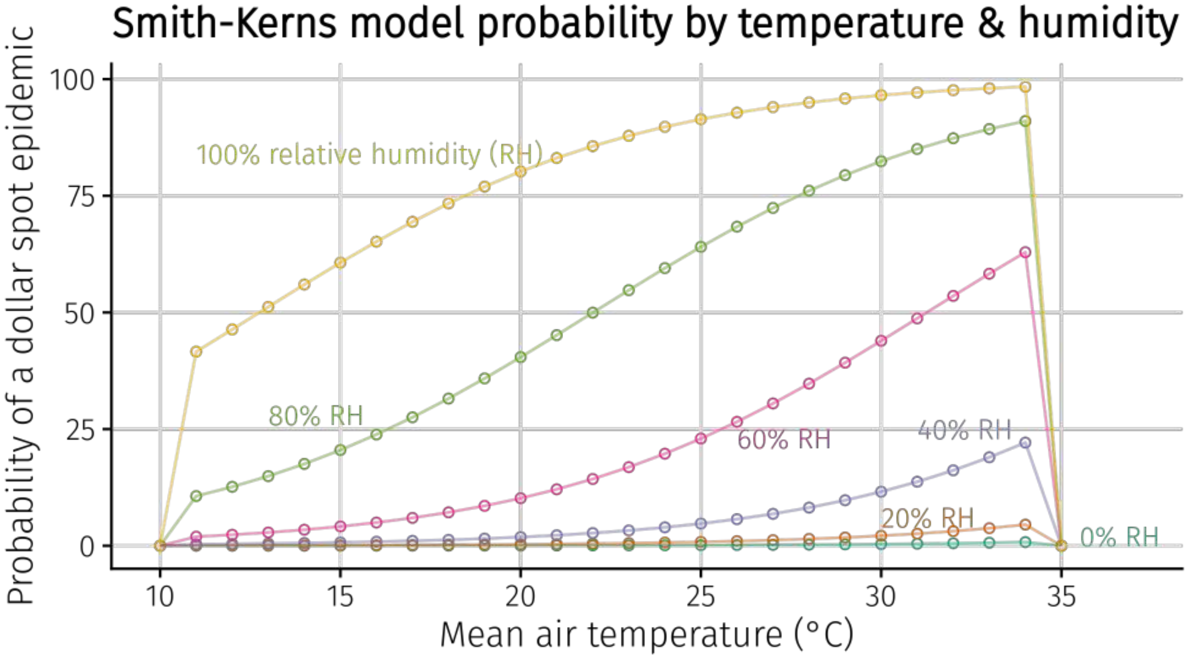
Pesticide restrictions

Electric & robotic machines


ZCS


Automowers on
golf courses with
Janne Lehto, MG
Cart Rides with Micah

Predictive models


Smith-Kerns model probability by temperature & humidity
Probability of a dollar spot epidemic
100
75
50
25
0
100% relative humidity (RH)
80% RH
60% RH
40% RH
20% RH
0% RH
10
15
20
25
30
35
Mean air temperature (°C)

Prepared for: Micah Woods
Mueang Trang, TH
Latitude: 7.5590
Longitude: 99.6140
January 19, 5:07 AM +07

Forecasted threat temperature: 83° F or 29° C

- Your maximum N this week for cool season turf: 0.05lb N/1000 sq ft
- Your maximum N this week for warm season turf: 0.15lb N/1000 sq ft

Turf Growth and Pest Models

Learn more about Growing Degree Days (GDD), Growth Potential (GP) Stress index and the Smith-Kerns dollar spot model (SK %).

Day	Avg Temp F/C	RH avg	GDD32	Sum GDD32	GDD50	Sum GDD50	Cool GP %	Warm GP %	Stress Index	SK %
12/20/2023	82°/28°	81	50	50	32	32	38	88	145	78
12/21/2023	82°/28°	82	50	100	32	64	38	88	151	79
12/22/2023	82°/28°	81	50	150	32	96	38	88	154	78
12/23/2023	81°/27°	79	49	199	31	127	43	84	149	71
12/24/2023	79°/26°	90	47	246	29	156	55	75	165	84
12/25/2023	77°/25°	93	45	291	27	183	67	66	163	85
12/26/2023	79°/26°	87	47	338	29	212	55	75	160	80
12/27/2023	81°/27°	83	49	387	31	243	43	84	152	77
12/28/2023	82°/28°	82	50	437	32	275	38	88	152	79
12/29/2023	82°/28°	82	50	487	32	307	38	88	156	79
12/30/2023	82°/28°	81	50	537	32	339	38	88	152	78
12/31/2023	82°/28°	81	50	587	32	371	38	88	147	78

Forecasted Disease Threats:
Rapid blight
Cyanobacteria (algae)
Rust
Bacterial wilt
Brown/large patch
Brown ring patch
Anthracnose
Fairy ring
Red thread
Spring dead spot
Summer patch
Take-all patch
Gray leaf spot
Bipolaris leaf spot
Curvularia blight
Southern blight
Pythium blight
Decline of C4 grasses

GPS sprayers

MAKING THE CASE FOR GPS SPRAYER TECHNOLOGY

by Bill Kreuser | Jan 17, 2024 | Blog | 0 comments

Grass species

Water

Published October 18, 2018

EUROPEAN TURFGRASS SOCIETY CONFERENCE

Combining Trinexapac-Ethyl with a Soil Surfactant Reduces Bermudagrass Irrigation Requirements

Matteo Serena, Mino Sportelli, Elena Sevostianova, Rossana Sallenave, and Bernhard Leinauer*

ABSTRACT

Soil surfactants and plant growth regulators (PGR) have shown potential to lower irrigation requirements and increase turfgrass quality under drought conditions. A study was conducted from 2014 to 2016 to investigate the soil surfactant Revolution, (modified methyl capped block copolymer [Aquatrols, Paulsboro, NJ]), or the plant growth regulator 'PrimoMaxx' (A.I. trinexapac-ethyl [4-(cyclopropylhydroxymethylene)-3,5-dioxocyclohexanecarboxylic acid]) (Syngenta, Basel, Switzerland), or a combination of both on percent green coverage, turfgrass color, quality, soil volumetric water content (VWC) and uniformity on Princess 77 bermudagrass (*Cynodon dactylon* L.) grown on a loamy sand (mixed, thermic Typic Torripsamments) and irrigated at either 80%, 65%, or 50%

Lawns and turfgrass areas represent the largest irrigated crop in the United States, accounting for approximately 163,800 km^2 (±35,850 km^2) (Milesi et al., 2005; Morris et al., 2005). These areas provide benefits such as the reduction of heat island effects, soil erosion control, carbon sequestration, cool and safe surfaces for exercise and athletic activities, to name a few (Beard and Green, 1994; Leinauer et al., 2010; Wang et al.; 2016). In addition to the aforementioned environmental benefits, the turfgrass industry contributes billions of dollars annually to the United States economy (Haydu et al., 2008). However, despite these advantages, as a non-food and fiber producing crop, turfgrass water usage is a major concern in many communities. For this reason, multi-pronged approaches to conserve irrigation water, such as the use of alternative water sources, the use of effi-

Received: 1 November 2019 | Accepted: 2 April 2020 | Published online: 7 May 2020

DOI: 10.1002/agj2.20246

Agronomy Journal

EUROPEAN TURFGRASS CONFERENCE

Irrigation scheduling technologies reduce water use and maintain turfgrass quality

Matteo Serena[1] | Ciro Velasco-Cruz[2] | Joshua Friell[3] | Marco Schiavon[4] | Elena Sevostianova[1] | Leslie Beck[1] | Rossana Sallenave[5] | Bernd Leinauer[1]

[1]Department of Extension Plant Sciences, New Mexico State University, Las Cruces, NM 88003, USA

[2]Programa de Estadistica, Colegio de Postgraduados, Texcoco, 56230, Mexico

[3]Center for Technology, Research, and Innovation, The Toro Co., Bloomington, MN 55420, USA

[4]Department of Environmental Horticulture,

Abstract

Smart irrigation controllers have demonstrated potential for turfgrass water conservation in humid and temperate environments but have not been comprehensively tested in arid environments. The objective of this study was to determine the accuracy of a wireless capacitance sensor over a wide soil moisture range and to ascertain if smart irrigation controllers resulted in water savings without reducing quality of tall fescue [*Schedonorus arundinaceus* (Schreb.) Dumort.] and bermudagrass

Data

A Year of Measuring Putting Green Performance

Taking the time to collect information about putting green performance pays off with more insight and improved management efficiency.

BY CHRIS HARTWIGER

As an agronomist, I am curious about what well-performing putting greens have in common. Are there things that good putting greens have in common, or are there many different paths to the same destination? How does performance fluctuate during a year, or among many years? When I ask these questions in the field, I find there are few golf courses that collect and consolidate information about putting green performance and management inputs that would allow them to provide definitive answers.

In 2018, USGA agronomist Addison Barden and I embarked on a project with six different golf courses to answer these questions by collecting daily putting green management information. Through this process of data collection and analysis, we hoped the participating golf course superintendents would use this newly accumulated information to make decisions that would smooth out the peaks and valleys in putting green performance and optimize the allocation of resources in managing their putting greens. This article will share a few details about the project, what we learned, and how you might use data collection to improve management at your golf course.

Collecting and visualizing data of key surface performance indicators and inputs enables superintendents to efficiently achieve specific surface performance goals with greater consistency.

in the USGA *Green Section Record*, November 2019

green surface management data

een and avoid their best or worst tting greens.

STEP 1: WHAT TO MEASURE

Next, we identified the variables we thought contributed most to those performance indicators. In other words, we had to decide which inputs

Recommend records of …

Key performance indicators

- Green speed
- Clipping volume

Cultural inputs & conditions

- Nitrogen applications
- Sand topdressing applications
- Growth regulator applications
- Daily high & low temperature
- Daily precipitation

Surface maintenance practices

- Mowing height
- Mowing frequency
- Vertical mowing
- Grooming
- Brushing
- Rolling

www.asianturfgrass.com

www.paceturf.org