Using Science and Technology in Turf

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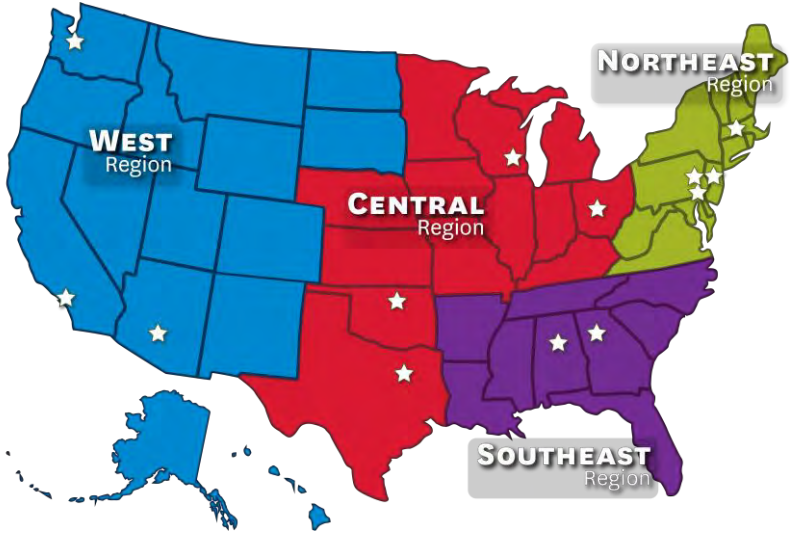

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- Course Consulting
- Educational articles and videos
- Championship agronomy
- Research

Green Section Record

- Link to be sent in email – or Google “Green Section Record”
- Research updates
- Technical articles
- Videos
- FREE!!

Agenda – Science and Technology in Turf and Landscapes

The Basics

- Environments
- Drainage
- OM Management

Surface Management

- Mowing
- GPS Spraying
- PGRs
- Measuring playability

Emerging Trends

- MLSN vs. SLAN
- Clipping yield
- Water management
- Drones

The Basics

1. Growing environment
2. Drainage
3. Organic matter management
4. Good decision making

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Ideal growing environments

1. Maximize light penetration
2. Air movement

Not-so-ideal growing environments

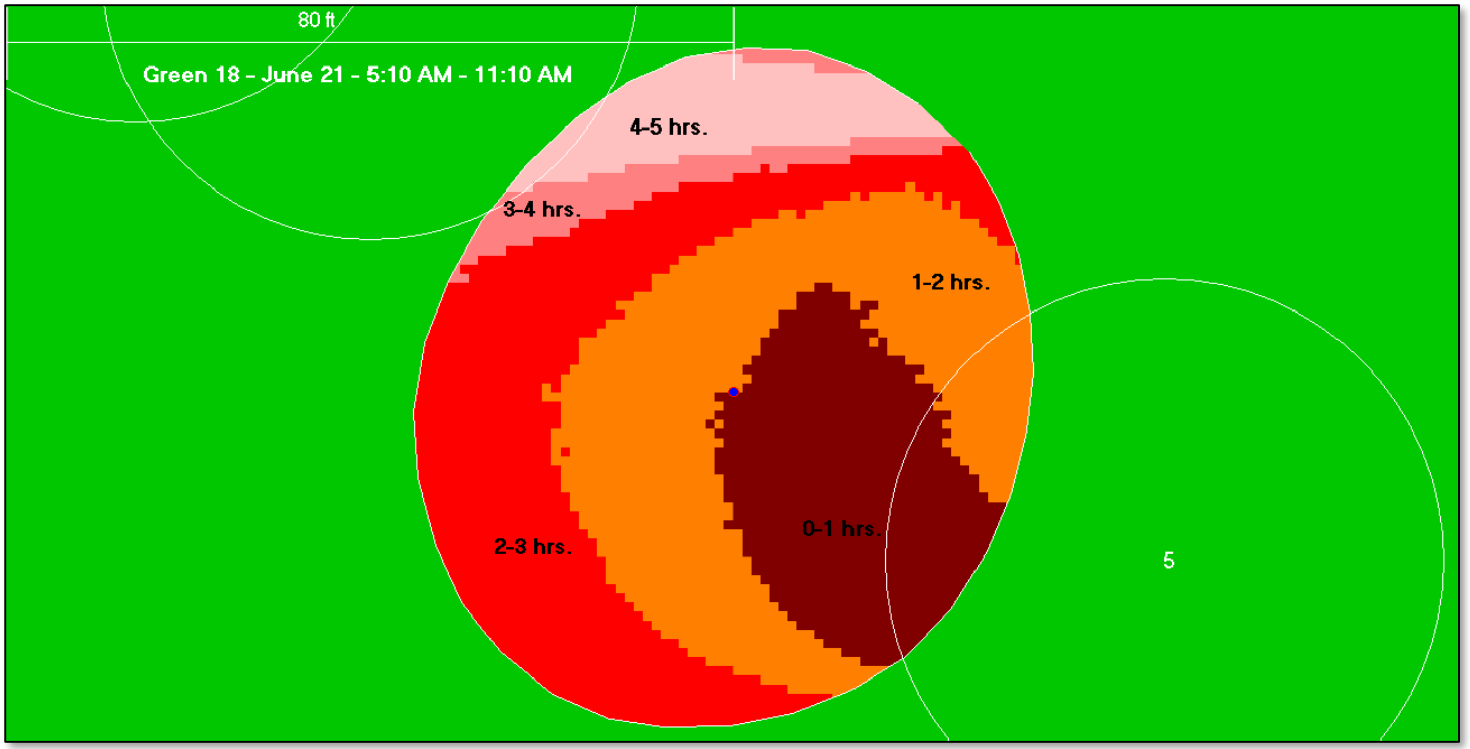
Ideal growing environments

1. Maximize light penetration
    a) Summer months – AM light critical for cool season turf

Morning Shade

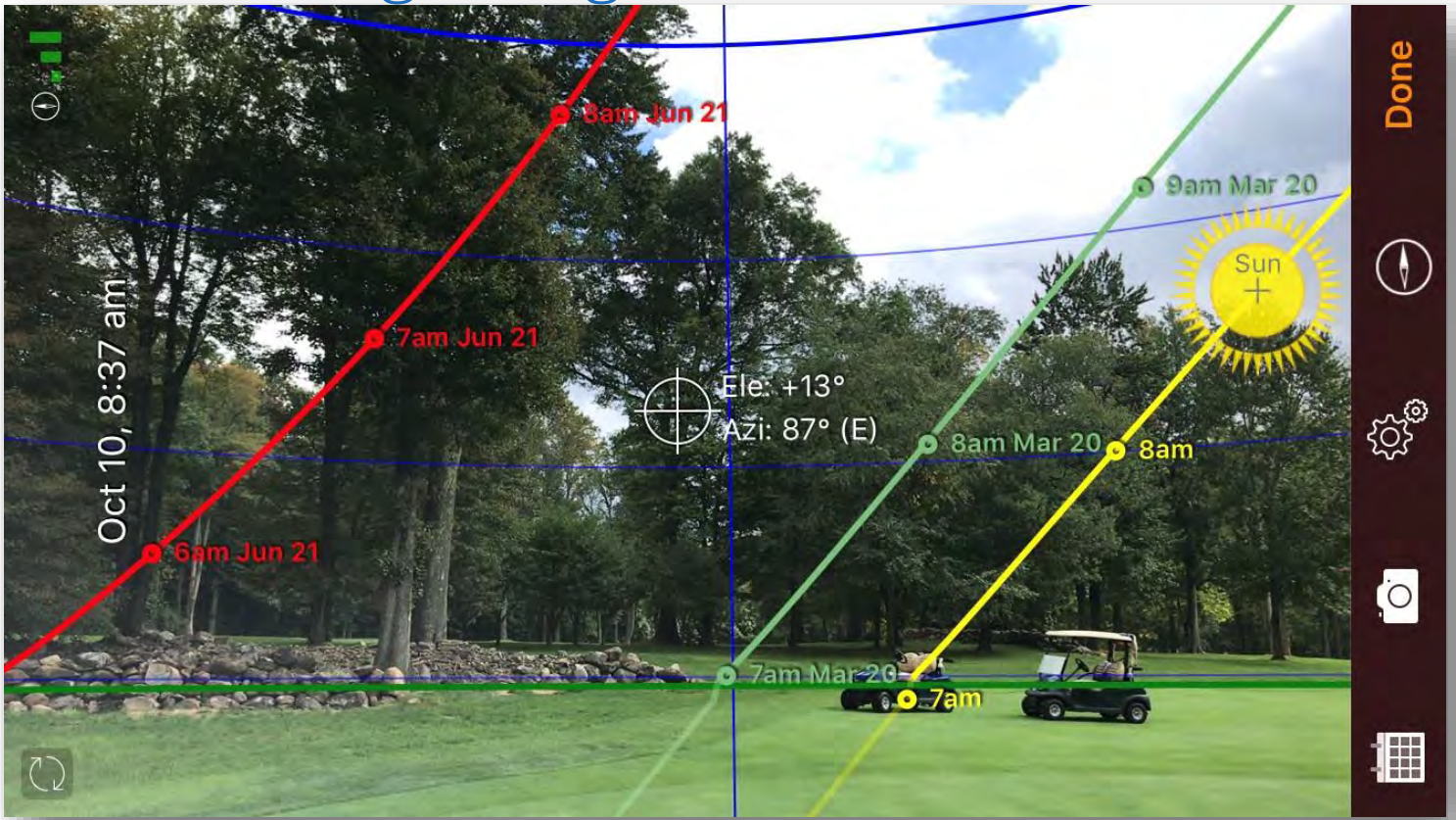
Technology to evaluate growing environments

ArborCom



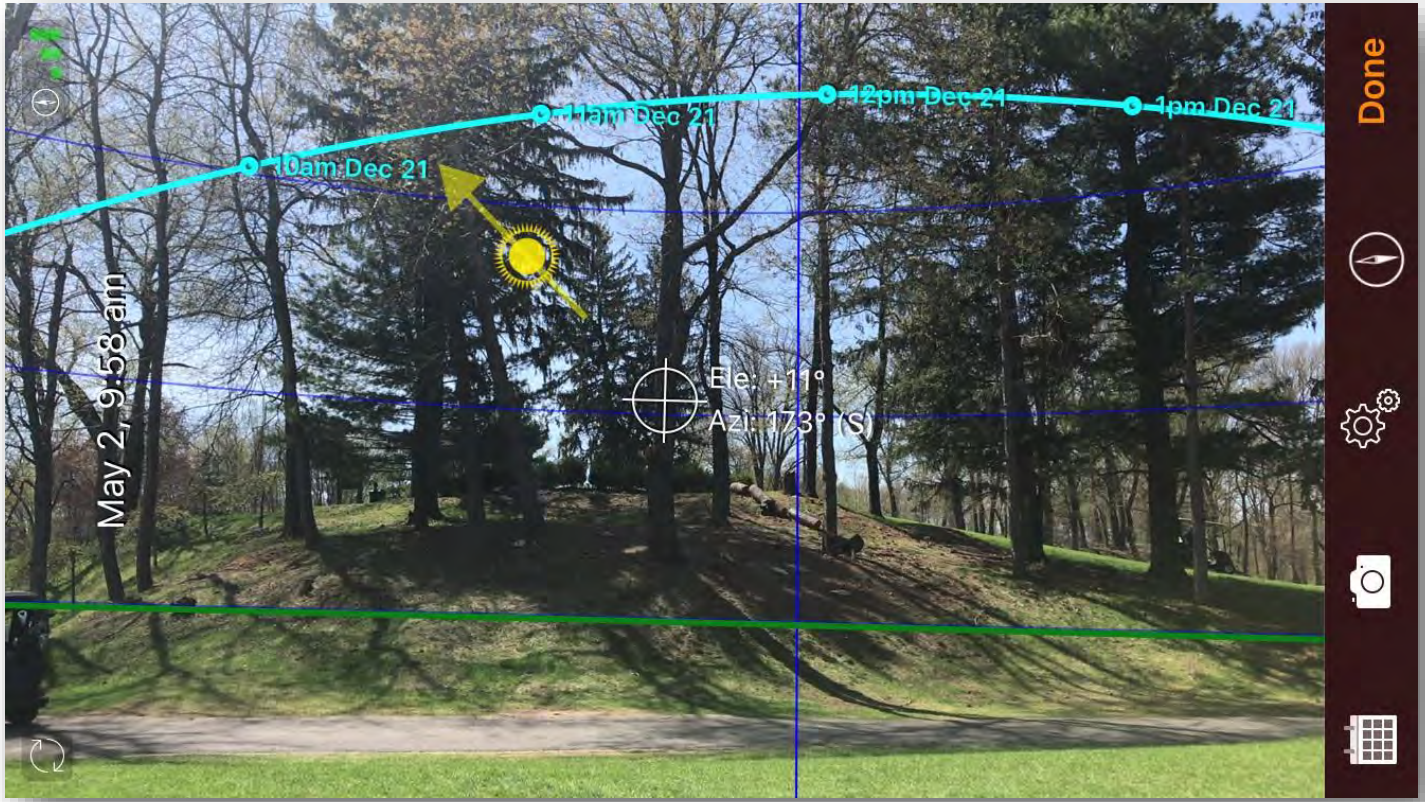
Technology to evaluate growing environments

Sunseeker

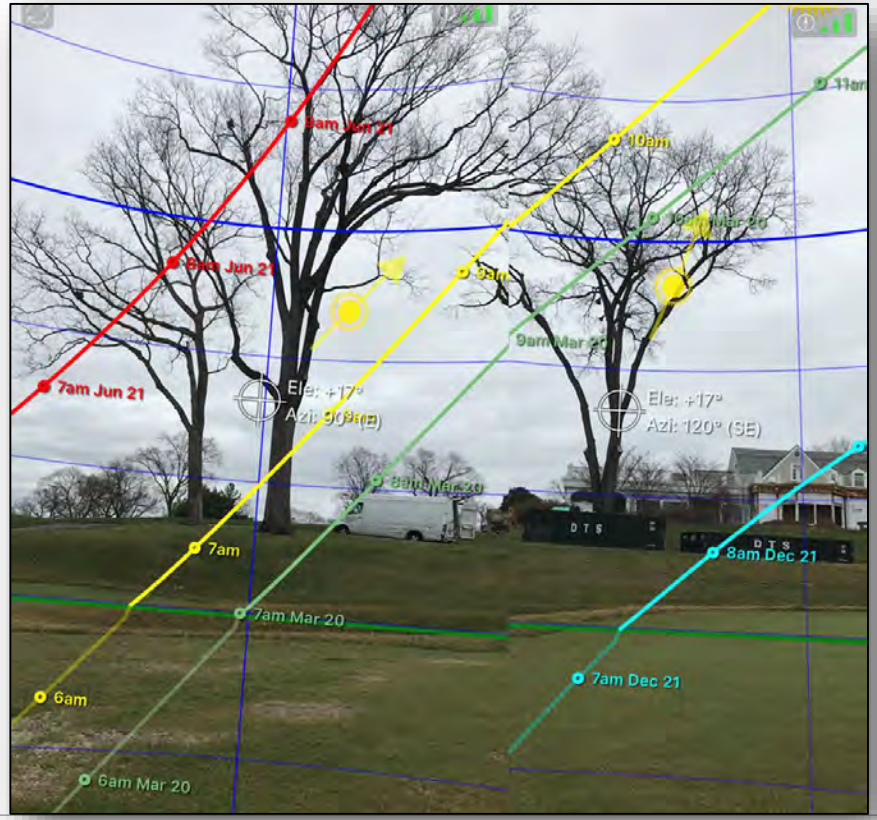


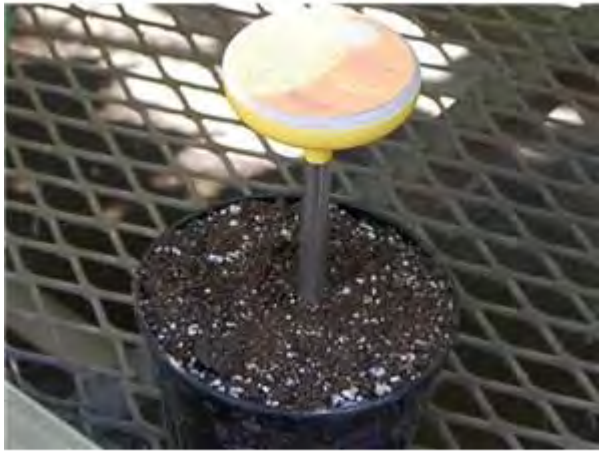
Technology to evaluate growing environments

Sunseeker



Quantifying light requirements





Drainage…not much as changed

Sand channel drainage best option for soil based greens

Drainage – Drill and Fill

- Improves internal drainage by “increasing depth of bathtub”

Organic Matter Management

Organic Matter Management

- Hollow core aeration
- Aggressive verticutting
- DryJect
- Sand Topdressing

DILUTION IS THE SOLUTION

Organic Matter Management

- Hollow core aeration

Organic Matter Management

- Aggressive verticutting

Organic Matter Management

- DryJect

Organic Matter Management

- DryJect “Top changer”

Organic Matter Management

- Sand Topdressing
- ✓ Thatch dilution
- ✓ Firmness
- ✓ Smoothness/speed
- ✓ Crown protection

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Rutgers Sand Topdressing Research

- Sand Topdressing can be difficult to incorporate into the dense turf canopy.
- Using finer sands makes it easier to incorporate, but could result in excess moisture retention near surface

Rutgers Sand Topdressing Research

1. Does TD with fine sands produce the negative affects we would expect to see?
    a) i.e., Excess moisture retention in upper potion of profile?
2. Does backfilling aeration channels with coarse sand offset potential negative effects of using fine sand?

Rutgers Sand Topdressing Research

Sand	1,000 µm Very Coarse	500 µm Coarse	250 µm Medium	150 µm Fine	53 µm Very Fine
			lbs. / 1,000 sq. ft.		
Medium-coarse	0	33.8	57.7	8.4	0.1
Medium-fine	0	0.1	76.7	22.7	0.5
Fine-medium	0	5.7	25.8	66.8	1.7

	Gravel 4.0 (5)	Gravel 2.0 (10)	V. Coarse 1.0 (18)	Coarse 0.5 (35)	Medium 0.25 (60)	Fine 0.15 (100)	V. Fine 0.05 (270)
	≤ 3% Gravel ≤ 10% Combined			≥ 60% Combined		≤ 20%	≤ 5%***

Rutgers Sand Topdressing Research

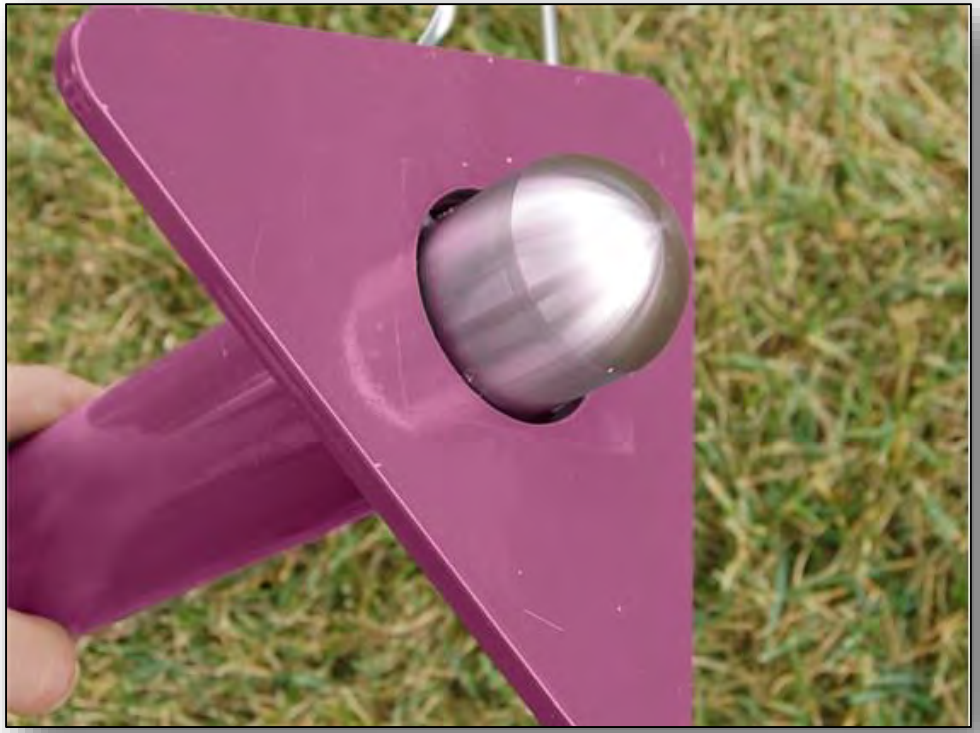
RESULTS

1. Any sand better than no sand.
2. Don’t want all fines, but a Medium/Fine for TD is not producing negative effects.
    1. No Very Coarse and <5% Coarse particles
3. Particles >0.5 mm are more likely to get picked up by mowers anyway.

Surface Management

1. Measuring surface quality
2. Robotic mowing
3. GPS sprayers
4. PGRs

Measuring Speed and Firmness



Measuring Speed and Firmness

1. Quantitative measures help define conditions
2. Use to encourage consistency, not maximize speed
3. Slow greens are better than dead greens

Robotic Mowing

- Improved efficiency
  a) Mow, roll, change hole locations, rake bunkers and fix ball marks with one person

GPS Sprayers

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Other industries investing in technology