SWATs and Apps for Water Conservation on Turfgrass

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Landscape irrigation

- In SFHs, avg. 50% of total potable water is used for landscape irrigation (DeOreo et al., 2016)
- Waste of water and energy
- May create environmental problems

Irrigation Technologies and Apps (ITAs)

Questions

- Can ***ITAs*** help conserve irrigation water?
- How much water may they save?
- Would those savings have a negative impact on the turfgrass quality?

Objectives

- Compare 9 different ITAs:

  A) To a time-based irrigation schedule

  B) Between them

- Regarding:
  - Irrigation water applied
  - Resulting turf qualities

Materials and Methods

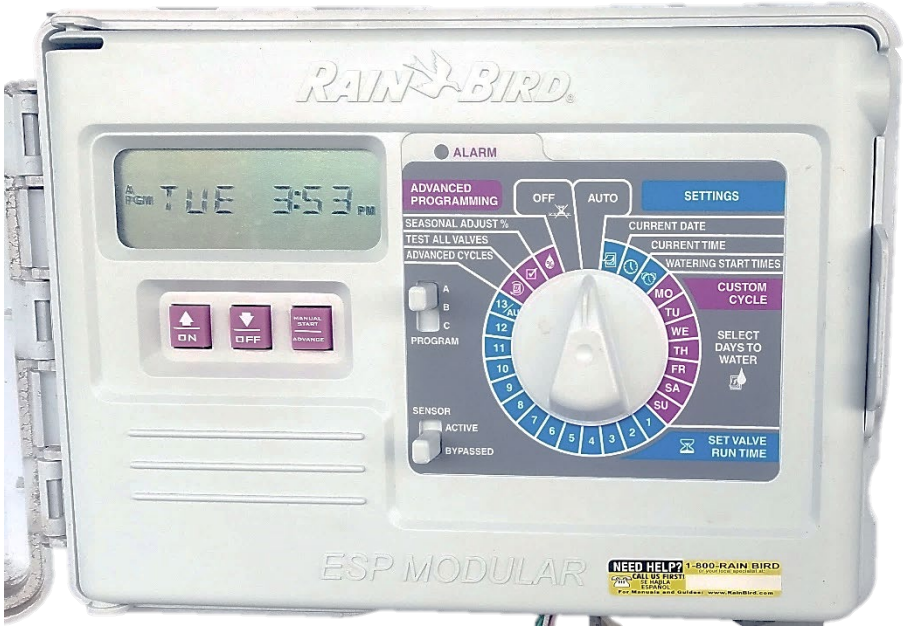
Site and Dates

- 72 Plots at UF campus
- Apr 28 – Oct 25, 2017

Materials and Methods

Treatments

Just timer



Without sensor feedback (WOS)

- Schedule recommended by UF-IFAS
- Based on historical ET
- Changes runtimes monthly

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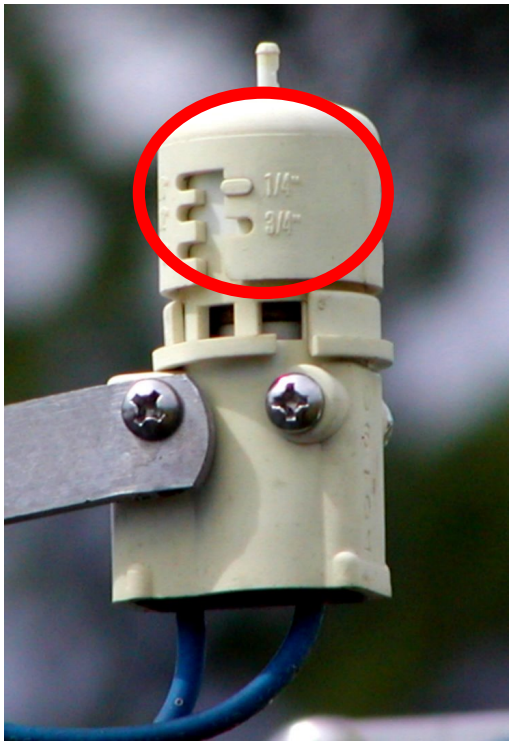
Materials and Methods

Treatments

Timer + rain sensor



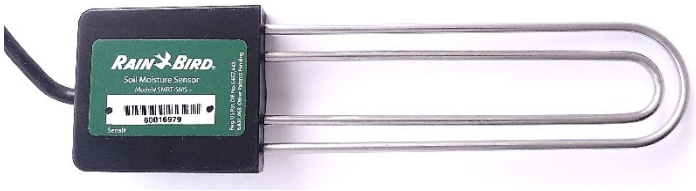
Hunter Mini-Clik
(RS)

- With rain sensor (WRS)
- WRS and 60% deficit irrigation (DWRS)

Materials and Methods

Treatments

Timer + soil moisture sensor



Rain Bird SMRT-Y
(RBD)

Baseline S100
(BAS)

Toro Precision SMS
(TOR)

Materials and Methods

Treatments

Evapotranspiration (ET) controllers

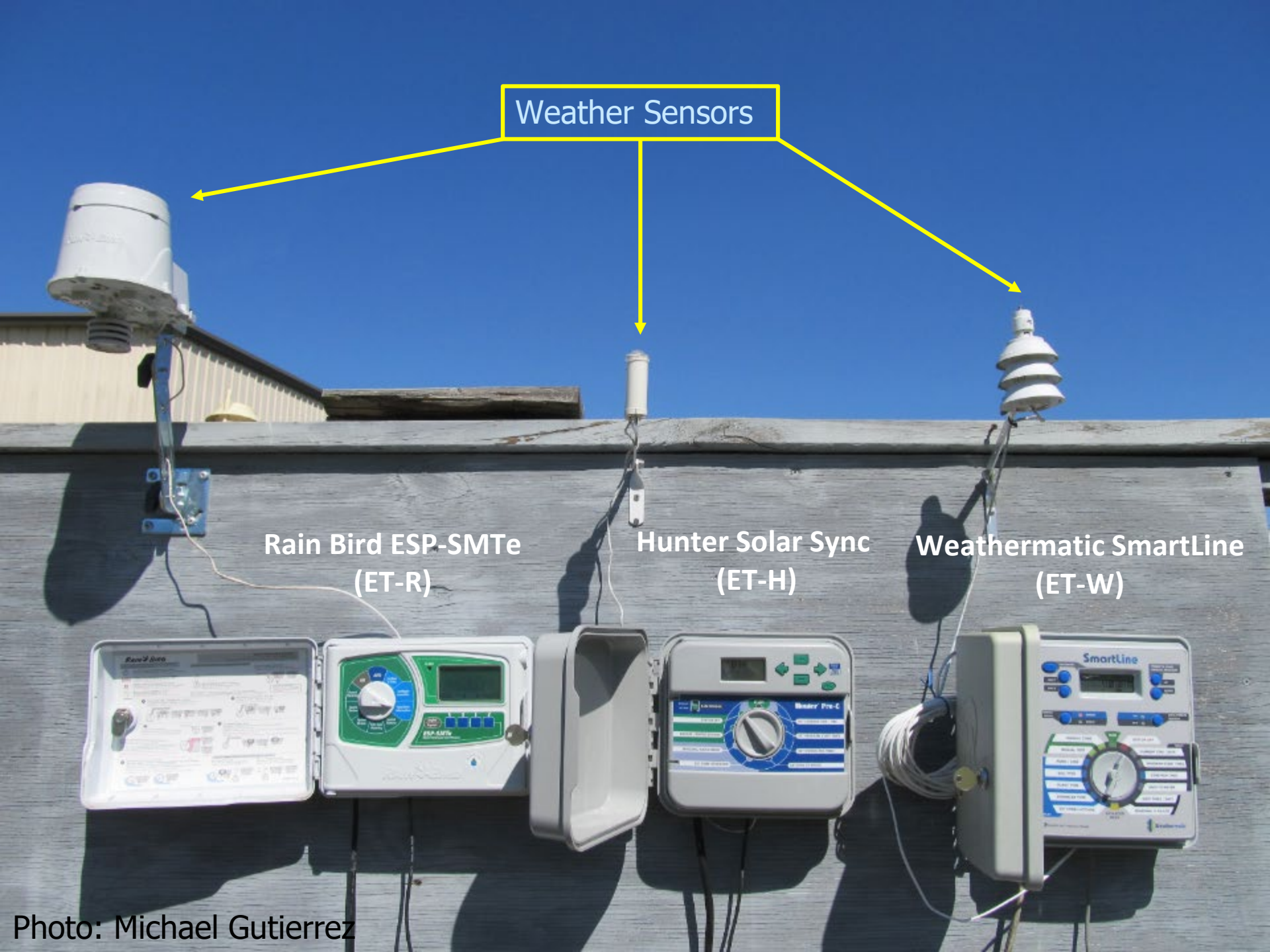


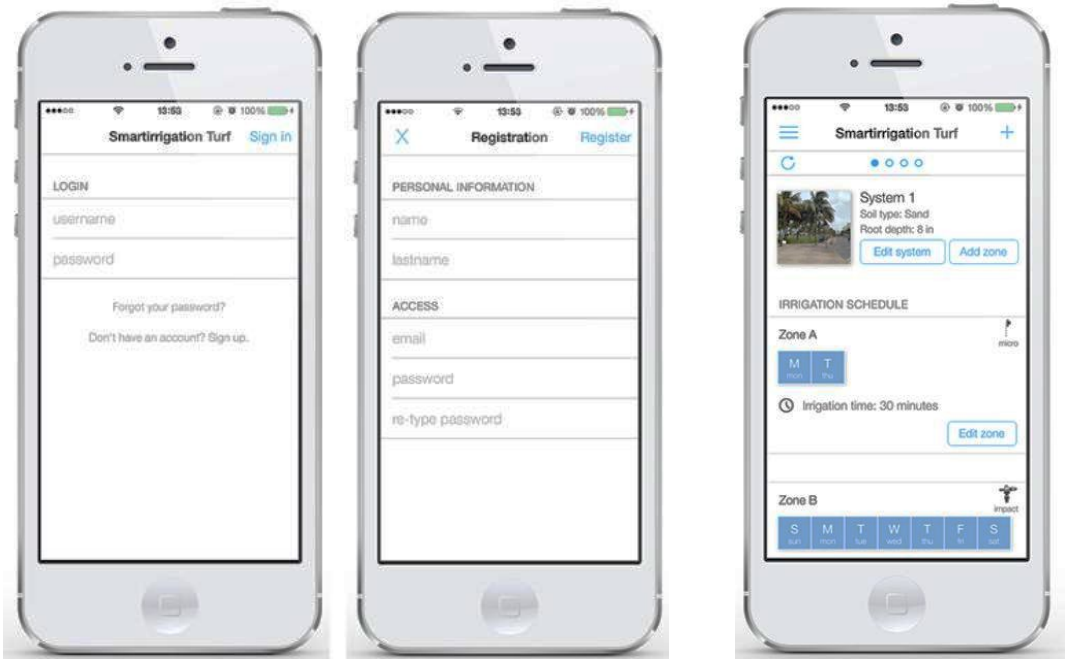
Photo: Michael Gutierrez

Materials and Methods

Treatments

Smartphone Apps

- Smartirrigation turf app (APP)
- APP with seasonal water conservation (APP-SWC)



Materials and Methods

Treatments

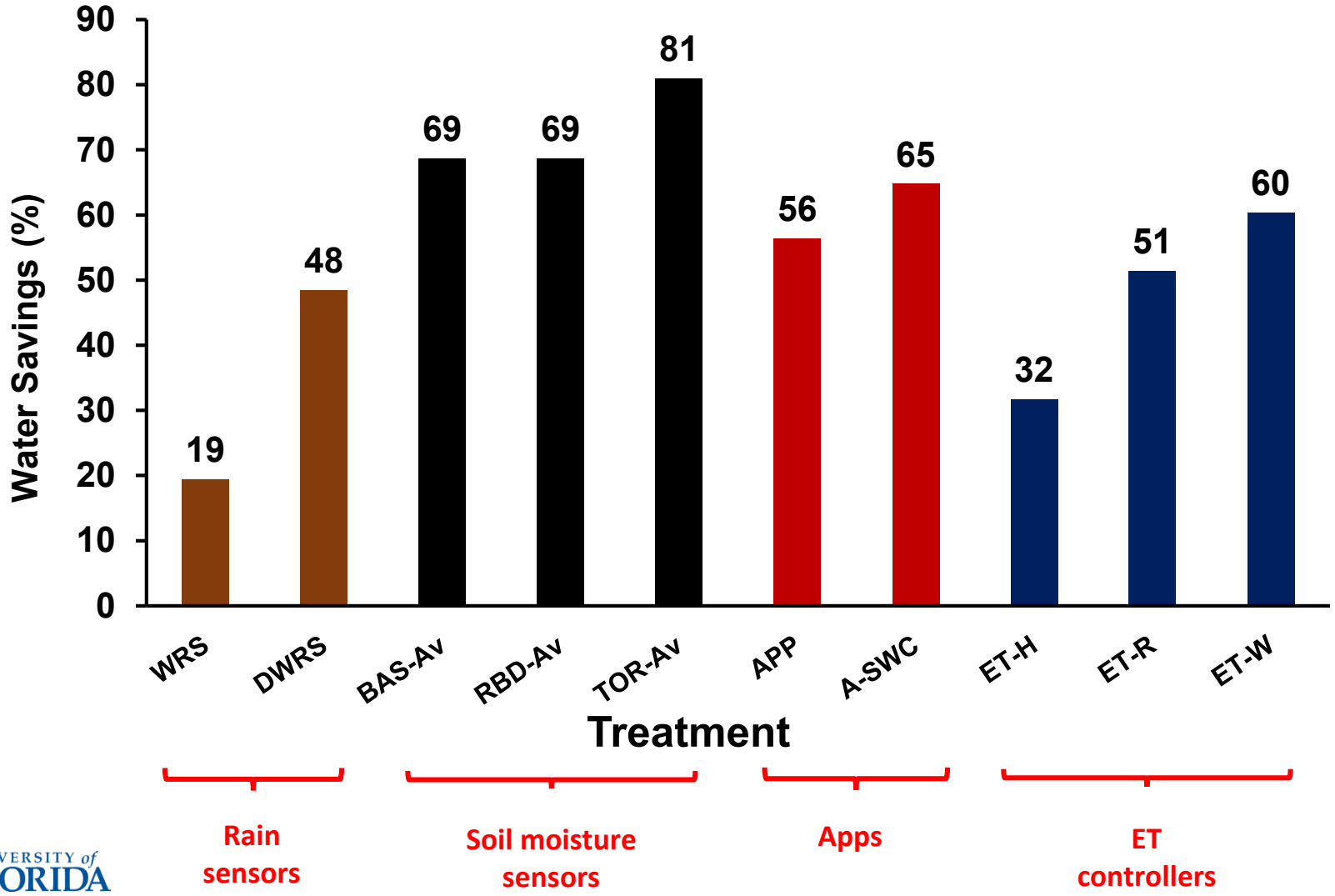
- Non-irrigated plots (NI)

Results
Turf quality

- Record breaking rainfall during June, July and (almost) August
- No turf quality differences between treatments
- Even the non irrigated plots

Results

Water savings compared to WOS



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Results
SMSs

Irrigation cycles that run as programed

Treatment	Morning AND Evening	Morning OR Evening	None
	---------- (%) ----------		
BAS	15	42	43
RBD	20	32	48
TOR	18	10	72

Conclusions

- All **ITAs** applied less water than the comparison WOS treatment
- Water savings SMSs > APPs > ET controllers > RSs
- SMSs bypassed numerous evening cycles as a result of afternoon rain events
- ET-based treatments → results are specific to input settings

Conclusions

- These results demonstrate the ability of **ITAs** to regulate irrigation based on real-time soil moisture/weather conditions, but with different outcomes.

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