

# Comparison of cultivation techniques to affect sodium levels in turfgrass soils

---

Kai Umeda  
University of Arizona

Brian Whitlark  
USGA





**BLEC**  
**GROUND BREAKER**

**BLEC**  
**SANDMAST**



# Gypsum applications

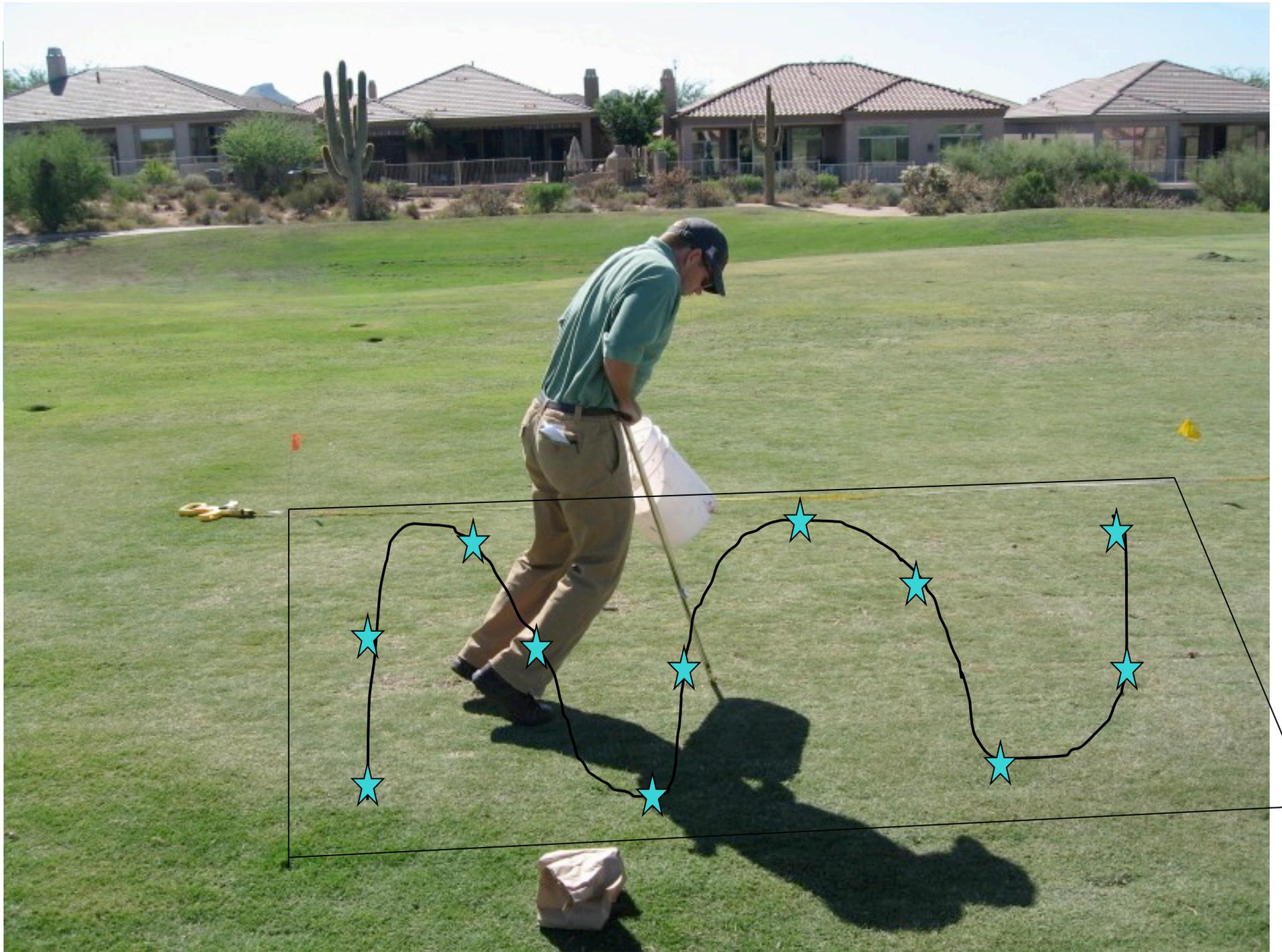
---



# Locations

---

- 4 golf course fairways
  - Legend Trail GC
  - Sun Lakes GC
  - Palm ValleyGC
  - Grayhawk GC
- Treatments replicated 3 times at each site



# Water infiltration

---





# Clegg

---



# TruFirm



# Irrigation audit



# EM-38 salinity measurements

---



# 2006 Results

---

- All aerification treatments exhibited beneficial effects
- $\text{Na}^+$  reduction observed by all aerification treatments
- Blec and Blec Sandmaster tended to enhance  $\text{Na}^+$  reduction in comparison to the Vertidrain
- Beneficial effects of aerification were observed for 2 WAT

# 2007 Results

---

- At Palm Valley, gypsum aided Na<sup>+</sup> and ESP reduction
  - Gypsum + Blec or Vertidrain was better than gypsum alone
  - Turf quality and density was visually worse for non-cultivated treatments
- At Legend Trail, with 'DG' soil, only Vertidrain showed improvement

# 2008 Results

---

- Variability among individual treated areas was striking!
  - Why? Most likely do to variability in water distribution and soil properties.

# 2008 Results – Palm Valley

---

- Na, EC and ESP- Rainfall levels of nearly 3 inches from July 10<sup>th</sup> to August 29 resulted in salt reduction. All treatments tended to produce greater salt reduction when compared to the control.
- Ca – Gypsum applied at 80lbs/1000 sq. ft. increased exchangeable Ca. Ca increased following rain in all treatments.

# 2008 Results – Legend Trail

3.9 inches of Rain in August, 2008 and 1.3 inches in July, 2008

- Na - Blec and Blec + gypsum tended to improve Na reduction. Vertidrain treatments were similar to the control, although 3x +gypsum was slightly better.
- EC - was generally unaffected by treatments.
- ESP – Vertidrain + gypsum did reduce ESP. 3x reduced ESP from 31.6% to 8% 6 weeks after the 3<sup>rd</sup> treatment.
- (Control – 26.2% to 9.3%)

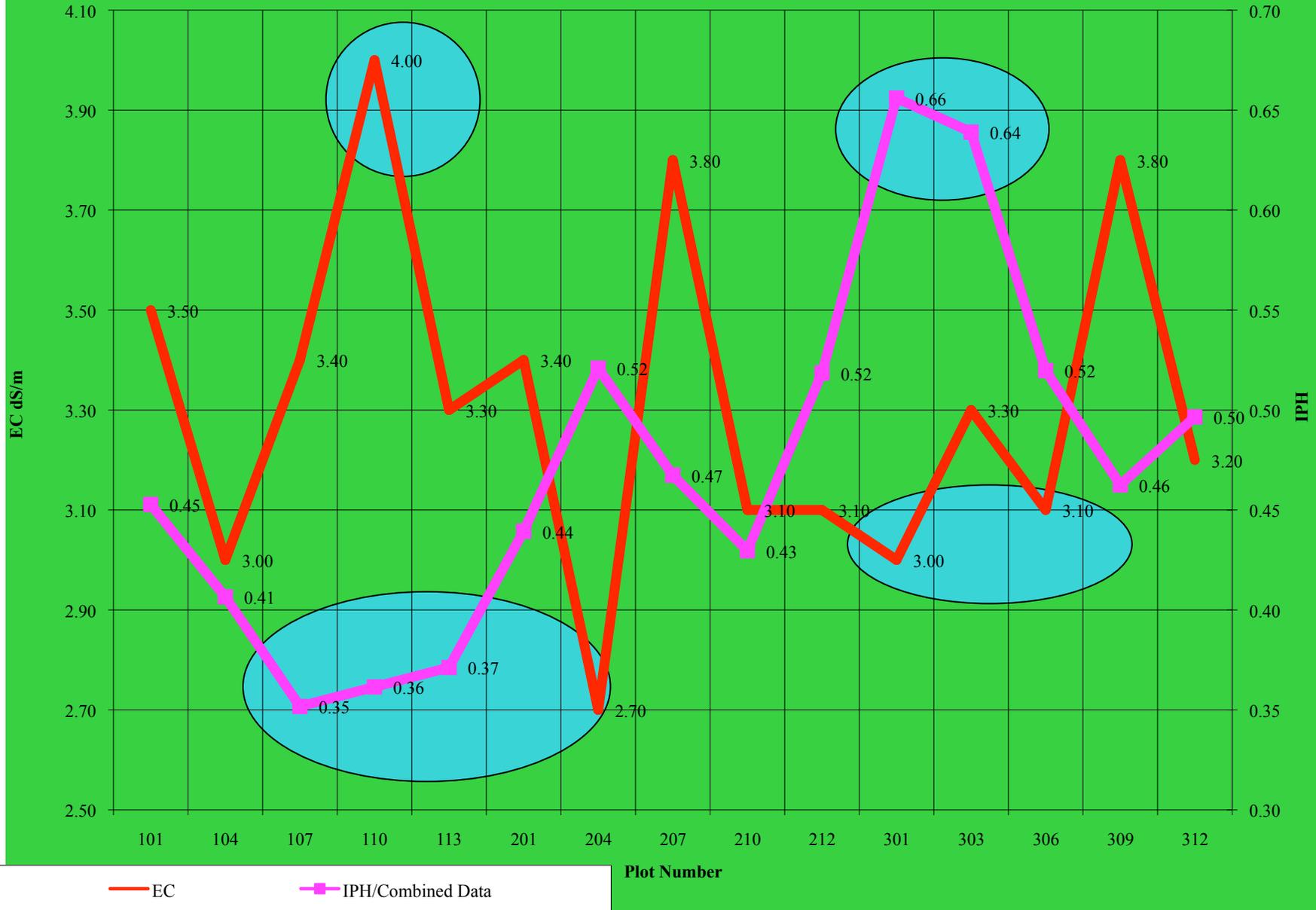


# Irrigation Uniformity

---

CU = 79.5%

June 18 Palm Valley  
First Row Data (3x Cultivation)



# Take Home Messages

---

- Diligence pays off!
  - Constant soil aeration will result in improved soil health and turfgrass density.
  - When Na is a problem, gypsum combined with aeration may improve conditions.
- Do your Rain Dance every July!
- In the absence of rain, overseeding offers a leaching opportunity.