Stop # 11: Kikuyugrass Irrigation Deficit Study

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Kikuyugrass (*Pennisetum clandestinum* Hochst. ex Chiov.) is considered either an invasive weed or the desired species on many golf courses and other turf areas along coastal and inland California. As part of a comprehensive project aimed at kikuyugrass improvement and management, a field study was initiated on 10 August 2014 to identify chemical practices in association with deficit irrigation that produce the best possible turf quality. The cultivar 'Whittet' was established from sod on a Hanford fine sandy loam. A two-level, four-factor factorial design was used to evaluate: deficit irrigation (50% ETo vs. 80% ETo), Primo Maxx (0 vs. 0.3 oz/1000 ft^2 biweekly), nitrogen (2 vs. 4 lbs/1000 ft^2/yr), and a wetting agent (0 vs. Revolution 6 oz/1000 ft^2/monthly). Turf quality was assessed visually and using Digital Image Analysis (DIA). Water content was measured using a Time-Domain Reflectometry (TDR) probe.

Location:	UCR Turf Facility
Soil:	Hanford fine sandy loam
Experimental Design:	2^4 Factorial with three replications
Plot Size:	Main plots (irrigation treatment) are 16 ft x 16 ft; Sub-plots (N, Revolution, Primo Maxx) are 4 ft x 8 ft
Sod Established:	25 July 2011
Species/Cultivars	Kikuyugrass 'Whittet'
Fertility:	0.5 lbs N /1000ft^2 $(NH4)_2SO_4$ was applied in January 2014 to entire field. Plots receiving higher N treatment were treated on 10 August 2014 and 7 September with 0.5 lbs N /1000ft^2 $(NH4)_2SO_4$. Total nitrogen was 1.5 lbs N/year and 0.5 lbs N/year on the high and low treatments, respectively by date of the 2014 field day.
Mowing and cultivation:	0.45 inches 3 days/wk using a Baroness walk-behind tee mower. Verticutting on 2 June 2014 using a Ryan Mataway walk behind machine
Irrigation Regime:	50% ETo vs 80% ETo replacement.
Data Collection:	Bi-monthly turfgrass quality, TDR, and DIA ratings.

Preliminary Results and Conclusions:

- ✓ Since the study was started in August 2014 there have been only two rating dates, the first of which showed no differences among any treatments, including ET.
- ✓ Turf quality and Digital Image Analysis results for ratings taken on 3 September 2014 showed significantly higher ratings for treatments 3, 6, and 7 (Figs. 1 and 2). All three treatments contain added nitrogen.
- ✓ Only nitrogen seems to be affecting higher turf quality for now but more significant results are expected over time as stress from the two deficit irrigation treatments begin to show.

Data:

LSD All-Pairwise Comparisons Test of TQ for Treatment

Table 1. Analysis of Variance (ANOVA) results for turf quality rating on 3 Sep 2014. Means followed by the same letter do not significantly differ from one another (p=0.5)

Treatment	Mean	Homogeneous Groups
6	6.1667	A
7	5.7500	AB
3	5.5833	AB
2	5.2500	BC
5	5.2500	BC
1	5.1667	BC
8	5.0000	BC
4	4.5833	C

LSD All-Pairwise Comparisons Test of DIA for Treatment

Table 2. Analysis of Variance (ANOVA) results for Digital Image Analysis rating on 3 Sep 2014. Means followed by the same letter do not significantly differ from one another (p=0.5).

Treatment	Mean	Homogeneous Groups
6	81.312	A
7	76.196	AB
3	71.516	ABC
5	71.414	BC
1	71.113	BC
8	70.076	BC
2	67.895	BC
4	65.054	C

Treatment List:

1. Primo 0.3 oz/M
2. Revolution 6 oz/M
3. Ammonium Sulfate 0.5 lb N/M
4. Primo + Revolution
5. Primo + Ammonium Sulfate
6. Revolution + Ammonium Sulfate
7. Primo + Revolution + Ammonium Sulfate
8. Control

Field Map