

Stop #7b: Products That Can Make Bermudagrass Look Better With Less Water

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Objective:

Evaluate if correct management practices such as the use of plant growth regulators (PGRs), wetting agents, proper fertilization, or the combined application of the three can help maintain acceptable turf quality under deficit irrigation.

Methods:

The study was conducted on mature bermudagrass 'Princess 77' turf. The 60' x 90' field was divided into six 30' x 30' plots. Beginning May 18, the plots received either 40% or 70% of previous week ET_0 , as determined by an on-site CIMIS station. Treatments are arranged in a split-plot design with 3 different factors randomized within ET_0 replacement plots and 3 replicates. Plant Growth Regulator (Primo Maxx) serves as split plot; wetting agent (Revolution) as split-split-plot; finally, fertilizer products (see table below) were randomized inside the wetting agent plots (plot size 24 ft²) and applied monthly beginning May 18, 2016. Each treatment received an equivalent of 1 lb N/M/month. Every two weeks, plots were evaluated for turf quality, volumetric soil water content, Normalized Difference Vegetation Index (NDVI), and Digital Image Analysis (DIA).

Results:

All ratings collected at the beginning of the study showed that bermudagrass was significantly affected by lack of N fertilization (Figures 1 and 2). However, grass recovered quickly after the first application of N, and no differences between ET_0 replacements were found until the beginning of July. Moreover, plots treated with Revolution achieved a sufficient rating of 6 or higher for two months even when irrigated at only 40% ET (Figure 2). After 8 July 2016, no plots irrigated at 40% ET_0 achieved acceptable quality, although plots treated with Revolution, alone or in combination with Primo Maxx, showed consistently better quality of plots than those that did not receive Revolution (Figure 2). At 70% ET_0 replacement plots that received both Primo Maxx and Revolution had higher visual quality in comparison to all the other treatments on 4 ratings dates, including during the entire month of August (Figure 1). No differences were observed in fertilizer treatments. Preliminary results suggest that maintaining sufficient fertilization (5 lb N/M/year on bermudagrass) and regular use of Primo Maxx and Revolution are the most powerful tools to manage bermudagrass with less water.

Acknowledgments:

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PGR, wetting agent, and fertilization study treatment list

Plot	Treatment	Company	Rate	Frequency (wks)
Whole Plot	ET ₀ replacement	---	40%-70%	Mon-Wed-Fri
Split	Primo Maxx	Syngenta	0.25 oz/M	2
Split-split-plot	Revolution	Aquatrols	6 oz/M	4
Split-split-split-plot	Gro-Power (5-3-1)	Gro-Power	1 lb N/M	4
Split-split-split-plot	SeaBlend (12 4 5) + StressRX + XP Micro	Ocean Organics	1 lb N/M +	4
			6 oz/M +	2
			6 oz/M	2
Split-split-split-plot	Turf Royale (21-7-14)	Yara	1 lb N/M	4
Split-split-split-plot	Yara Liva (15.5-0-0)	Yara	1 lb N/M	4
Split-split-split-plot	Turf Royale (21-7-14) + ACA 1935	Yara	1 lb N/M +	4
		Aquatrols	4 oz/M	4
Split-split-split-plot	Turf Royale (21-7-14) + ACA 5000	Yara	1 lb N/M +	4
		Aquatrols	4 oz/M	2

PGR Wetting Agent and Fertilization Study Treatment List and Plot Plan

Rep 1	70% ET ₀	19	20	12	9		13	18	4	3	40% ET ₀
		21	22	11	7		15	16	1	2	
		23	24	8	10		17	14	6	5	
		14	18	5	2		9	8	19	21	
		13	17	1	6		11	7	22	24	
		16	15	3	4		10	12	23	20	

Rep 2	70% ET ₀	5	6	15	16		5	3	13	17	40% ET ₀
		2	3	17	14		6	2	14	16	
		1	4	18	13		1	4	18	15	
		23	19	10	12		9	11	22	19	
		21	22	8	9		10	12	20	21	
		24	20	7	11		8	7	23	24	

Rep 3	40% ET ₀	13	16	2	5		23	19	7	11	70% ET ₀
		15	17	1	3		22	21	10	12	
		14	18	6	4		20	24	9	8	
		11	8	20	19		2	3	18	14	
		10	7	24	23		1	6	13	17	
		9	12	22	21		4	5	16	15	

Trt #	Fertilizer	Primo Maxx	Revolution	Trt #	Fertilizer	Primo Maxx	Revolution
1	Gro-Power			13	Gro-Power		x
2	SeaBlend + StressRX + XP Micro			14	SeaBlend + StressRX + XP Micro		x
3	Yara Turf Royale			15	Yara Turf Royale		x
4	Yara Liva			16	Yara Liva		x
5	Yara Turf Royale + ACA 1935			17	Yara Turf Royale + ACA 1935		x
6	Yara Turf Royale + ACA 5000			18	Yara Turf Royale + ACA 5000		x
7	Gro-Power	x		19	Gro-Power	x	x
8	SeaBlend + StressRX + XP Micro			20	SeaBlend + StressRX + XP Micro		x
9	Yara Turf Royale	x		21	Yara Turf Royale	x	x
10	Yara Liva	x		22	Yara Liva	x	x
11	Yara Turf Royale + ACA 1935		x	23	Yara Turf Royale + ACA 1935		x
12	Yara Turf Royale + ACA 5000		x	24	Yara Turf Royale + ACA 5000		x

Figure 1. Quality of plots irrigated at 70%ET₀ treated with either Primo Maxx, Revolution, a combination of the two or untreated. 2016. Riverside, CA.

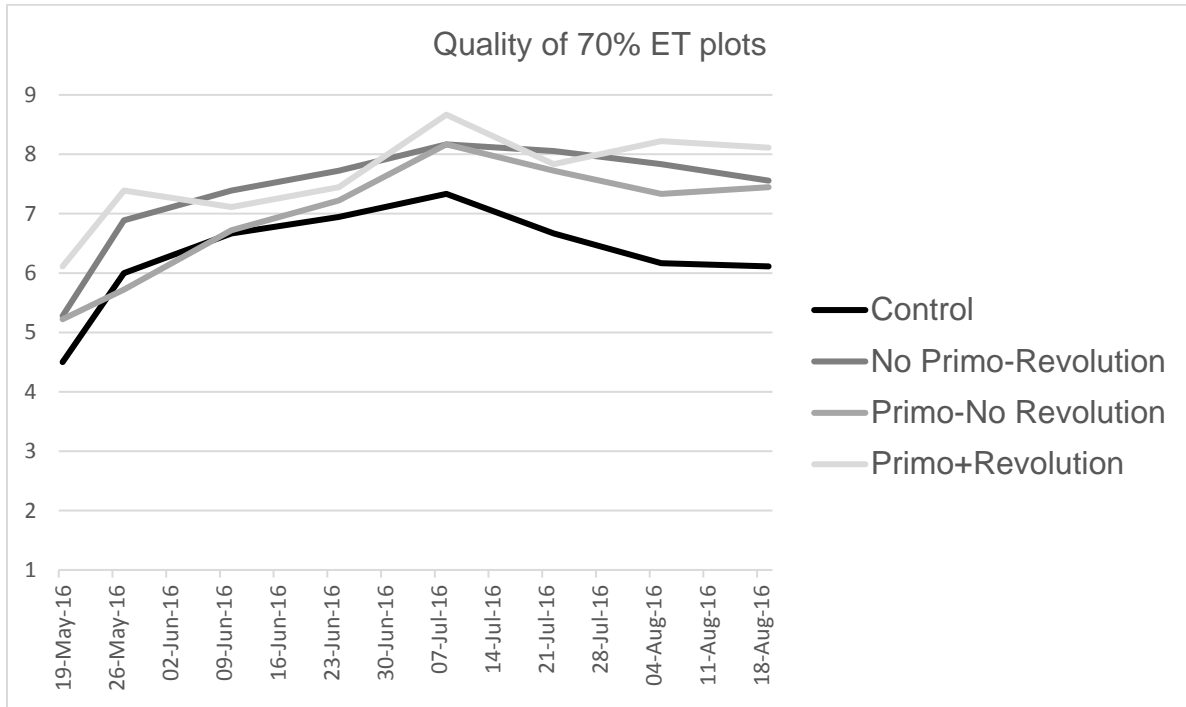


Figure 2. Quality of plots irrigated at 40%ET₀ treated with either Primo Maxx, Revolution, a combination of the two or untreated. 2016. Riverside, CA.

