



CASE STUDY

Industry: Golf

Application: High Bicarbonate Irrigation Water

BACKGROUND

The Boca Grove Plantation in Boca Raton, FL uses a combination of well water and surface runoff to irrigate the grounds and golf course. The irrigation water is "hard" (high mineral content) and contains bicarbonates at levels of 200-400 ppm. The pH of the water ranges from 7.5-7.9. Calcium and Magnesium are bound by the bicarbonate and thus not plant available. Nutrient availability in the soil is poor given the above conditions.

Boca Grove had used sulfur burner technology to reduce the high pH of the irrigation water and bicarbonate levels. The unit was aging and in need of replacement. They inquired about the water conditioner technology as an alternative.

TECHNICAL APPROACH

Irrigation water is pumped from a chain of lakes that are located on the property. An 8 inch water conditioner was connected to the discharge of the irrigation pump station. The unit was fitted with a 20mA power regulator. Flow rate through the unit is approximately 1650 gpm. The unit was installed in February 2007.

RESULTS

Below are listed various values for water, soil and tissue testing at the site.

Parameter	March 2006	May 2007
Water: pH	7.5	7.9
Soil: pH	7.3	7.1
HCO ₃ ⁻	148 ppm	84 ppm
Na	70 ppm	45 ppm
Ca	153 ppm	56 ppm
Tissue: Ca	0.2%	0.64%

The pH of the water source has risen slightly over the previous year but the soil pH has dropped. Bicarbonate levels in the soil have been reduced by over 40%. Likewise, sodium levels have dropped by 35%. Calcium levels in the soil solution have dropped while the levels in the tissue have tripled.

Visual results of the turf confirmed the improvement in the soil. It was a dry spring and water restrictions were imposed. In fact, county water authorities conducted an unannounced visit to the golf course to find out how Boca Grove was able to stay so "green" compared to neighboring courses.

RETURN ON INVESTMENT

In addition to managing the high bicarbonate water, the water conditioner proved to be a cost savings over the traditional treatment. A cost analysis of the two technologies is shown below.

	Sulfur Burner	Water Conditioner
Fixed Cost – unit	\$22,000	\$40,000
Variable Cost		
- Annual Sulfur usage	\$16,000	None
Lifespan	5 years	10 years
Annual Cost (\$/yr)	\$20,400	\$4,000
Realized Savings	80.4% or \$16,400/yr	

CONCLUSION

Given the data above, the water conditioner has provided an alternative means to control high pH, high bicarbonate water at a lower cost than traditional treatment.