

Evaluation of Sulfur Burner for Salinity Management in Irrigated Cotton Fields

Dr. Girisha Ganjegunte and John Clark, Texas A&M AgriLife Research

Support provided by: Cotton Incorporated and Texas State Support Committee; in collaboration with cotton grower Mr. Stubbs

BACKGROUND

Cotton occupies more than half of the irrigated acreage in the far west Texas region that includes El Paso and Hudspeth counties. The productivity of irrigated cotton in El Paso and Hudspeth counties has been declining due to increased salinity. Cotton is considered as a salt tolerant crop with a salinity threshold of 7.7 dS/m. However, recent research has indicated that in many cotton fields, the root-zone salinity far exceeds the threshold level of cotton crop. This elevated salinity is reducing the productivity of the cotton and therefore, it is important to develop effective salinity management practices to ensure the long-term viability of irrigated cotton production in the far west Texas region. This study is evaluating feasibility of sulfur burner to utilize native Ca sources in soil to counter sodicity and improve permeability to manage rootzone salinity. Sulfur (S) burner is a relatively new and safe approach. The process involves controlled burning of perlated sulfur to produce sulfurous acid and eventually sulfuric acid. The resultant acid is mixed with irrigation water and upon irrigation, native calcium present as calcite and gypsum will become soluble and can counter the sodium on exchange complex. This improves soil permeability and excess water can be used to drain the accumulated salts below the effective root zone.

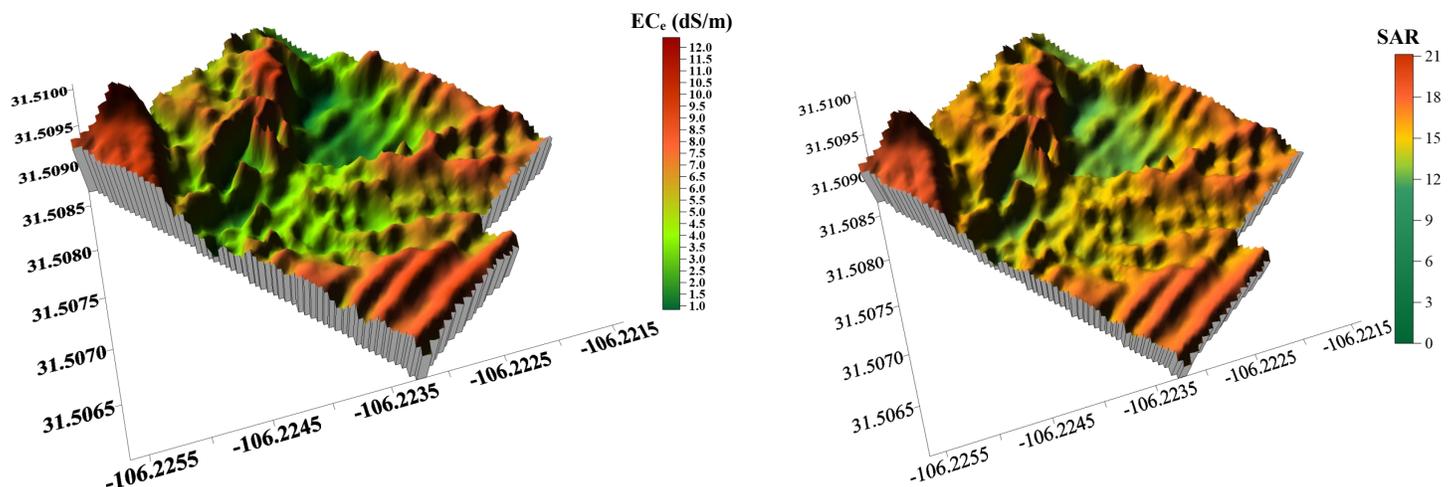


Sulfur burner is treating irrigation water in the field

OBJECTIVES

- To assess baseline distribution of the salinity in the root zone of the affected cotton field (s).
- Evaluate the effects of sulfur burner treated irrigation water on salinity and sodicity in the effective root-zone.
- Develop recommendations for use of sulfur burner for root-zone salinity and sodicity management.

FINDINGS AND BENEFITS



The results of pre-study root zone soil samples analyses indicated that the field had both elevated salinity and sodicity. Salinity of the rootzone exceeded the threshold value for cotton and sodicity levels exceeded the acceptable level of 13. Field is being irrigated with S burner treated water and the study will continue for 2 years. Results will provide the necessary data to evaluate the effectiveness of sulfur burner treatment of irrigation water in soil salinity & sodicity management. This will aid the interested growers in proper decision making before investing a large amount on a relatively new and unproven method of salinity management in the region.

Texas A&M AgriLife Research Center at El Paso

1380 A&M Circle, El Paso, Texas 79927

Phone: (915) 859-9111, Fax: (915) 859-1078

<http://elpaso.tamu.edu/Research>