

Variations in Salinity for Soils in Zapata County

LeeRoy Rock, John Lloyd-Reilley and Shad D. Nelson

Zapata County, an arid environment located in the south-west region of southern Texas, has mild winters and hot dry summers. Summer temperatures can exceed over 100° F with highly variable rainfall year to year. Average annual rainfall is 19 inches for Zapata County. However, rains are seldom evenly spread throughout the year, leading to extended periods of drought. Less than 1% of the county is considered prime farmland as the majority of the soils contain highly soluble salts that prevent vegetation establishment. In order to develop successful revegetation strategies on these difficult sites, it is important to know how the varying temperature and rainfall of the different seasons will effect salt levels in the soil. Therefore, the objective of this study is to establish a monitoring station in Zapata County to daily record soil moisture, temperature conditions, and salinity levels.

A one-quarter acre field site in Zapata County has been selected for monitoring. Soils in this area vary in salinity with electrical conductivity values ranging from 1 to 45 dS/m. Due to the presence of highly soluble salts, the research site has limited vegetation and severe erosion. Four soil salinity sensors, a rain gauge, and data logging equipment (Decagon Devices Inc.TM) have been set-up at the study site to observe soil salinity level changes in response to seasonal rainfall distribution. This going study is expected to continue into 2008.

The results from this study should improve revegetation efforts by attempting to match changing soil conditions with saline adapted plant material.

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