Salinity Assessment using Electro-Magnetic Induction Technique and soil salinity management in the Chamizal National Memorial Park

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Chamizal National Memorial Park is located in El Paso, TX. It is an important and popular national park serving the local as well as tourist communities. The vegetation conditions in the park are severely degraded and the bare spots are widespread. Congressman Beto O'Rourke (TX-16) has made restoration of vegetation in the park one his priorities. His office approached Texas A&M AgriLife Research for assessing the salinity distribution and developing management practices to restore the vegetation. Salinity distribution at the Chamizal Park was assessed using the Electro-Magnetic Induction (EMI) technique. Site specific calibration equations used to estimate salinity and sodicity from EMI data were derived using multiple linear regression (MLR) models included in the ECe Sampling Assessment and Prediction (ESAP) model developed by the United States Salinity Laboratory. Results showed that ECe and SAR values were strongly correlated with clay content of the soil. Salinity and sodicity were also strongly correlated indicating that salinity in the study site was caused by evapo-concentration. Root zone salinity in almost all turfed areas within the park exceeded the tolerance level of bermudagrass (ECe of 6.9 dS m-1). Similarly, SAR values in the turf root-zone exceed the threshold level of >13 mmol1/2 L-1/2 clearly indicating impaired soil physical conditions. Salinity Distribution data were used to develop salinity management practices to restore vegetation cover.