

## Evaluation of Salt Tolerance of Chile Peppers

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### BACKGROUND

Use of saline water resources, primarily municipal effluent and brackish groundwater, for irrigating agricultural crops and urban landscapes is important to conserve freshwater throughout the Rio Grande Basin. In addition to water scarcity, soil salinity has long been recognized as a major problem throughout the Rio Grande Basin, which has resulted in reduction in yield, crop selection and irrigated acreage and loss in farm profitability. Specialty chile peppers are important crops in Texas and New Mexico but salinity currently limits the production. The goal of this project is to identify salt and drought tolerant cultivars of chile peppers and develop salinity management guidelines for irrigation management of chile peppers in the Rio Grande Project area.

### OBJECTIVES

- Evaluate the salt tolerance of selected commercial varieties of chile peppers through laboratory, greenhouse and field studies.
- Understand salt tolerance mechanisms of chile peppers in order to aid breeding and biotechnological programs.

### RESULTS AND BENEFITS

- Genotype variations in salt tolerance in over 20 varieties were found. Early Jalapeno was found to be one of the salt tolerant genotypes while Habanero was salt sensitive.
- Soil type and salinity of irrigation water affected seedling emergence. Emergence percent was generally high in loamy sand than silt loam.
- Salts accumulate at the top soil layer when irrigation water contains salts and the salinity of the top soil layer increases over time.
- Salt tolerance mechanisms in chile peppers include osmotic adjustment and partial exclusion of  $\text{Na}^+$  and/or  $\text{Cl}^-$  ions from shoots.
- These results will help growers to select salt tolerant cultivars. Salt tolerant cultivars generally have higher yield in this region and thus bring more profitability to chile pepper growers and benefit the economy of the region.
- The research project on salt tolerance of chile peppers continues to evaluate more genotypes and at various growth stages through laboratory, greenhouse and field studies.



*Salt tolerance of chile pepper study in the greenhouse*