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U.S. Department
of Transportation



Title: *Use of Alternative Water Sources for Bioenergy Crops*

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Project Goal

The main goal project is to develop alternative irrigation water sources and suitable salinity management practices to ensure long-term sustainability of bioenergy crop production and improve farm profitability in the arid southwest region.

This project used greenhouse and bench top experiments to evaluate the feasibility of using marginal quality water for producing selected bioenergy crops on salt affected land and its effects on soil salinity.

Project Outcomes

- Jatropha and camelina were not tolerant to salinity, whereas the cultivars castor-Memphis; switchgrass-Alamo, NSL2009-1 & 2; sorghum-ES-5200, Shallow, Desert Maize and 1790E; and canola-DKW 47-15 were relatively salt tolerant.
- Average biomass yields for switchgrass and sorghum were 7.4 and 21.6 Mg ha⁻¹, respectively. Canola seed yield was 917 kg ha⁻¹. There were no significant differences for biomass/oil seed yield between wastewater (EC~ 2.6 dS m⁻¹) and freshwater (EC ~ 1.4 dS m⁻¹) irrigated columns.
- Soil salinity increased compared to pre-study levels, but, most of the increases in salinity came from the solubilization of Ca salts, which is not expected to affect soil productivity and soil sodicity.
- Economic feasibility study results indicated that fertilizer is a major production cost and that energy sorghum production under marginal quality water irrigation was highly profitable when no amendments were added. Irrigation with reclaimed municipal wastewater improved soil nutrient levels that may have important implications for the cost of production and farm profitability.

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