

COMPARING WATER USE EFFICIENCY FOR SOUTH TEXAS FURROW AND DRIP IRRIGATED WATERMELON

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ABSTRACT

Crop production in the Lower Rio Grande Valley of South Texas is at continual risk of failure due to periodic and extreme drought conditions. Irrigation sources stem from the Rio Grande River, and when water resources are limiting, growers need to change to more water conserving methods to raise crops. The purpose of this project was to evaluate drip irrigation with plastic mulch as a water conservation method to drip without plastic and furrow irrigated watermelon. Crop water requirements were estimated using a weather station, Penman-Monteith evapotranspiration (ET) equation, and FAO crop coefficients. Plots were replicated using a completely randomized design with sub-sampling. Drip irrigation was determined by employing a water balance approach, replacing ET water loss within the drip irrigated plots versus irrigating to soil saturation point in furrow irrigated plots. The furrow system was irrigated without producing runoff by blocking furrows at the lower end of the field. Harvested watermelon was measured for size and weight to determine produce yield and quality. The lowest amount of irrigation water used was in the Drip with Plastic treated plots, which resulted in the highest average yield and best overall irrigation use efficiency compared to other systems.

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