

Irrigation Research Update

Activities at the Western Peanut Growers Association Research Farm

Irrigation studies were initiated in the 2000 cropping season to answer questions related to management of irrigation in peanut production. Irrigation application rates (based on Evapotranspiration demand) and irrigation application methods were investigated.

Irrigation application rates: Weather-based evapotranspiration (ET) models are being used increasingly for irrigation scheduling. In the Texas Panhandle and the Southern High Plains, available reference evapotranspiration data are used to estimate crop water demand, provided that appropriate crop coefficients can be used. (Crop coefficient X reference ET = crop ET.) Target irrigation rates of 50%, 75%, 100%, and 125% were applied through LEPA irrigation to begin verification of reasonable peanut ET rates, as determined at the AG-CARES research facility in Dawson County, Texas. In this first season at the Western Peanut Growers Association site, spatial differences in yield within the field overshadowed differences between irrigation rate treatments. We will continue these treatments over a few seasons to help us refine this tool, and provide additional information to answer the question, “How much irrigation (capacity) is necessary for peanut production in the Texas Southern High Plains?”

Irrigation application methods: Low Elevation Spray Application (LESA) and Low Energy Precision Application (LEPA) irrigation treatments were conducted on the same field and on the same pivot to compare the effects of these methods. LEPA (drag hoses and bubbler-mode Quad-Spray® nozzles) significantly out-yielded the LESA (I-Wob® and LDN® spray nozzles) treatments. Small differences between the LEPA methods were not significant; small differences between the LESA methods were not significant. We are considering whether the apparent LEPA advantage was due to increased irrigation application efficiency or whether it was due to water quality (foliar injury by dissolved constituents in the irrigation water applied to leaves through the LESA systems, for instance) or to other factors (i.e. harvest losses, etc.) However, the yield advantage of the LEPA methods over LESA methods is consistent with observations by Dr. Mike Schubert and others at the AG-CARES facility (on Amarillo fine sandy loam soil) over the period of 1995-1999.

These results are from only one year of work, and we do not advocate major changes in irrigation practices based solely upon this information. We are still trying to identify and quantify other factors that influence the results. These include location-specific factors and influences caused by interactions of the conditions and management on site during this season.

Collaborators from Texas Agricultural Experiment Station, Texas Agricultural Extension Service, and Texas Tech University included: Mike Schubert, Terry Wheeler, Ben Carreon, Jim Bordovsky, Dan Krieg, Calvin Trostle, and Dana Porter. Dana Porter appreciates the contributions of all these participants, as well as those of the technicians and student workers.

We appreciate and acknowledge the funding and in-kind support we received from Western Peanut Growers, Texas Peanut Producers Board, The Peanut Foundation, and the Texas High Plains Precision Agriculture Initiative.

®Quad-Spray®, I-Wob®, and LDN® nozzles used in this study are available from Senninger Irrigation, Inc. Names of the products are provided for information purposes only; this is not intended as an endorsement of Senninger, Inc. or of the specific products identified.