

2001 Corn and Grain Sorghum Research Summary

Project Title: Improving Corn Irrigation Practices and Recommendations in Arkansas (Year 1)

Investigators: Earl Vories, Agricultural Engineer, NEREC
Phil Tacker, Agricultural Engineer, CES
William Johnson, Agronomist, CES
Jeremy Ross, Agronomist, CES

Crop: Corn

Objectives:

1. Develop a new crop coefficient curve for irrigation scheduling of corn.
2. Determine whether the corn crop coefficient curve needs to be adjusted for maturity of the particular hybrid being grown.
3. Field test the resulting Irrigation Scheduler program for corn.

2001 Results: Field studies under this project were conducted at NEREC, Keiser, and nine corn verification fields. Much of the season at Keiser was spent in installation and testing of the new drip irrigation research field. The site was moved twice, first when deep soil cores indicated another site would be better suited to corn production and second when a water pipe belonging to the city of Keiser (but not showing up on their maps) was discovered while installing the buried drip irrigation tubing. Additional delays in getting municipal water to the field allowed some drought stress to develop before the system was operational. While a furrow irrigation was applied to the field before the soil water deficits reached 2.5 inches, the peak deficits came at a critical time and probably affected the yields that were observed (Table 1).

Table 1. Yields from corn irrigation study at NEREC in 2001. No significant differences in yield were observed.

Irrigation Level*	Yield (bushels/acre @15% moisture)			Average
	DK C69-70 Bt	T2160 Bt	P 34B24 Bt	
Hi	164	138	171	158
Lo	165	157	193	172
NI	132	139	134	135
Average	154	145	166	

* Hi = 125% of daily ET replaced each day beginning June 23; Lo = 75% of daily ET replaced each day beginning June 23; NI = nonirrigated except for furrow irrigation applied to all treatments on June 18.

No significant yield differences were observed, although the "nonirrigated" treatment would have likely been considerably lower yielding if not for the furrow irrigation applied

to all plots on June 18 (it was not possible to irrigate only certain plots and avoid others). However, the drip irrigation system worked well at allowing the application of precise amounts of water. The treatments were modified because of the advanced stage of the crop when the system went on line and there was a trend (not significant) toward depressed yield from overwatering (i.e., the "Hi" irrigation treatment received more water each day than the crop used).

Irrigation data from the nine corn Research Verification fields will be studied over the winter along with observations from the fields. The first impression was that the computerized projections fit the crop well in 2001.

Impact: Since 2001 was the first year of a three-year study, the impact will be limited. However, the drip irrigation system was successfully installed and tested and is ready for the subsequent seasons. Results from the entire study, along with observations and data from the Research Verification fields will aid Arkansas corn producers for many years to come. Irrigation is an essential component of the corn production system in Arkansas and the findings from this project will tailor irrigation recommendations to Arkansas conditions, rather than trying to adapt them from very different climates.