

## 2002 Corn and Grain Sorghum Research Summary

**Project Title:** Improving Corn Irrigation Practices and Recommendations in Arkansas (Year 2)

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**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.

**2002 Results:** Field studies under this project were conducted at NEREC, Keiser, and on-farm at corn verification fields. Three Pioneer hybrids of different relative maturities (P33J57 – 113 day, P32P76 – 116 day, P31B13 – 119 day) were planted on April 11, 2002, on 38-inch rows at NEREC. The irrigation system was operated daily in the absence of rain from June 3 until August 4 at rates of 100% and 60% of the estimated evapotranspiration (ET), along with a nonirrigated check. Although the nonirrigated yields were significantly lower than irrigated, yields between the two irrigated treatments were not significantly different (Table 1). Additional measurements of soil moisture recorded daily may indicate whether the soil was drying in the 60% ET treatment, even though it wasn't sufficient to reduce yield.

Table 1. Results from 2002 drip irrigated corn at NEREC. No significant hybrid effects or interactions were observed.

	Irrigation Treatment*		
	Hi (100% ET)	Lo (60% ET)	NI
Irrigation Period	6/3-8/4	6/3-8/4	6/3-6/4**
ET during IP (in)	17.5	17.5	17.5
Rain during IP (in)	5.4	5.4	5.4
Rain during IP (% of ET)	31	31	31
Irrigation (in)	13.9	10.0	0.7**
Irrigation (% of ET)	80***	57	4
Avg. SWD during IP (in)	0.8	2.6	6.7
Yield (bu/acre@15%)	205 a	209 a	160 b

\* Irrigation treatments: Hi = 100% of daily ET replaced each day; Lo = 60% of daily ET replaced each day; NI = nonirrigated except for flushing system

\*\* flushing system

\*\*\* effective rainfall reason value < 100

The drip irrigation system worked well at allowing the application of precise amounts of water. Irrigation data from the 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 2002. With the departure of William Johnson, we will begin 2003 short a PI; however, we hope that a new agronomist will be hired soon and he will be interested in joining this project.

**Impact:** Since 2002 was the first full year of the study, the impact will be limited. However, the drip irrigation system was successfully used to precisely apply water to the plots. 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.