

**2004 RESEARCH PROGRESS REPORT  
ARKANSAS CORN AND GRAIN SORGHUM PROMOTION BOARD  
DECEMBER 2004**

**Project Title:** Management Practices to Increase Grain Sorghum Productivity.

**Principle Investigators:** Jason Kelley and Leo Espinoza

**STATUS:** Completed year 1 of 3

**OBJECTIVES:**

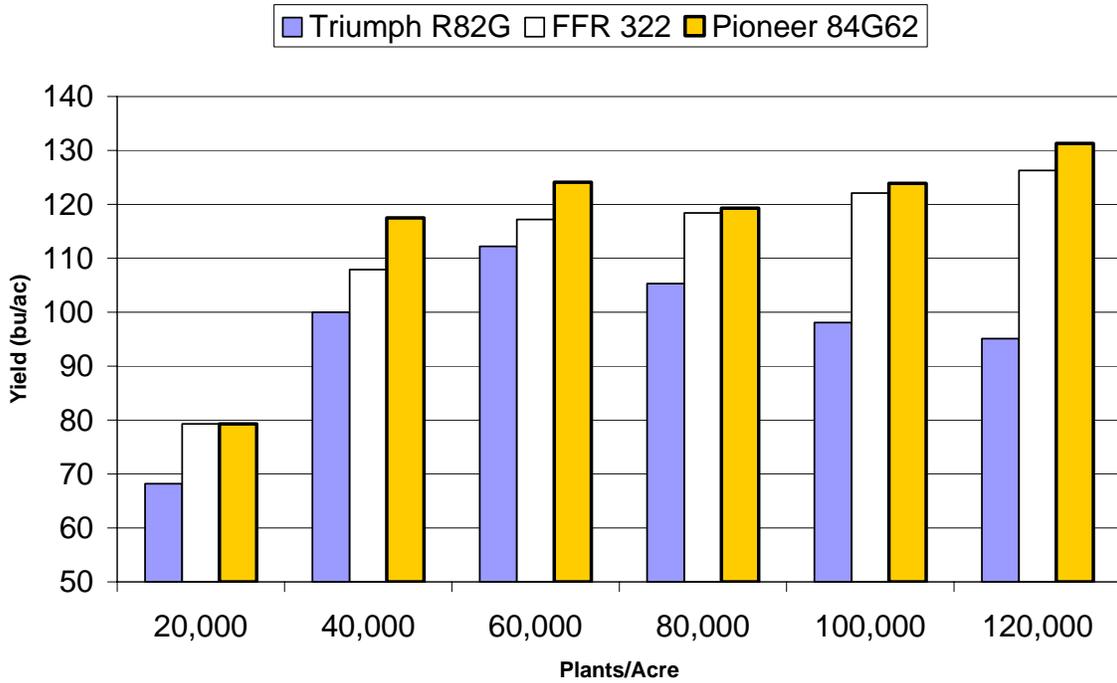
**1. Determine Optimum Plant Populations for Maximum Yield Under Irrigated and Dryland Grain Sorghum Production Systems.**

Research trials were conducted at the Northeast Research and Extension Center (NEREC), Pine Tree Station (PTS), and the Southeast Research and Extension Center (SEREC) evaluating three grain hybrids at plant populations of 20,000, 40,000, 60,000, 80,000, 100,000, and 120,000 plants/acre. Grain sorghum hybrids evaluated included Triumph 82G, FFR 322, and Pioneer 84G62. Plots were planted in late April to early May and row spacing was 38 inches at NEREC and SEREC on beds and 30 inches at PTS planted on flat ground. Irrigated plots were furrow irrigated twice at both NEREC and SEREC at boot and early grain fill. Irrigated plots were flood irrigated once at PTS.

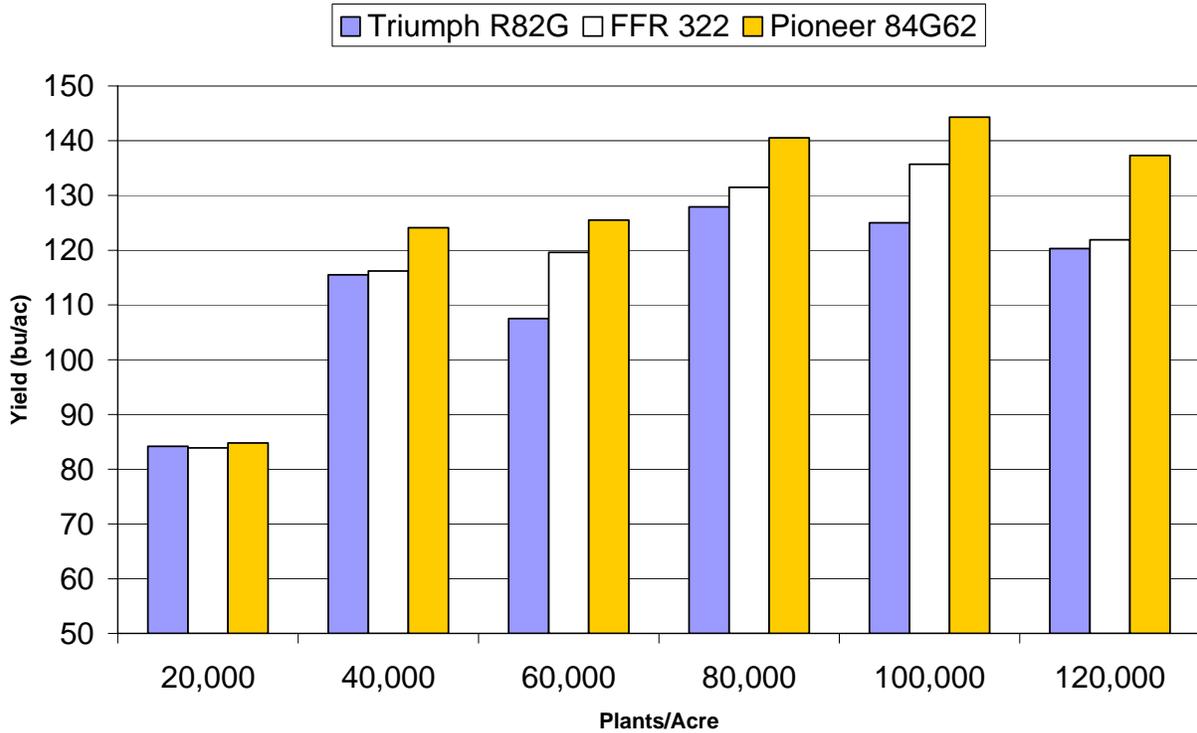
Experimental design was a randomized complete block with a factorial arrangement of treatments. Treatments were replicated four times. Plots were 20 or 25 ft long and 2 or 4 rows wide, depending on location. Standard weed control consisting of Dual II Magnum + Atrazine was used in all trials. Nitrogen fertility was consistent between irrigated and dryland at each location and ranged from 125 to 150 lbs of nitrogen per acre applied preplant or preplant + sidedress. Phosphorus and Potassium were applied according to soil test recommendations.

Results from NEREC are shown below. Plant populations of 20,000 plants/acre were too low to maximize grain yield. Under both irrigated and dryland cropping systems yields were maximized at plant populations of 60,000 to 80,000 plants/acre. Increasing populations beyond 60,000 to 80,000 tended to decrease yield for Triumph 82G, while yields from the FFR and Pioneer hybrids tended to gradually increase. Results from PTS and SEREC are similar to those of NEREC where populations of 20,000 plants/acre were too low for maximum yield, while populations of 40,000 to 60,000 plants maximized grain yields.

### Effect of Grain Sorghum Population on Yield (Irrigated) at NEREC



### Effect of Grain Sorghum Population on Yield (Non Irrigated) at NEREC



## Objective 2:

### Determine effect of starter fertilizer on grain sorghum yield.

Trials were conducted at NEREC and SEREC evaluating the effects of starter fertilizer on grain yields of irrigated grain sorghum. Eleven grain sorghum hybrids were evaluated with or without 18-46-0 placed in the furrow at planting at a rate of 30 lbs/acre. Hybrids evaluated included: Dyna Gro 751B, Golden Acres 3694, Triumph 82G, Southern States 650, FFR 322, Golden Harvest H-502, Terral TV9421, Croplan Genetics 514, Pioneer 84G62, Pioneer 83G15, and Pioneer 83G66. Cultural practices were identical as previously described.

Effects of starter fertilizer were not visually pronounced during the growing season. Temperatures at planting and during the early season were warm and plant growth was not retarded by cool wet conditions in which starter fertilizer effects might have been seen. Statistical analysis showed differences between yields of hybrids, but no differences between having starter fertilizer placed in-furrow or no starter fertilizer.

Effect of starter fertilizer on grain sorghum yield (bu/a) averaged over 11 hybrids at two locations.		
	Location	
Treatment	NEREC	SEREC
No Starter Fertilizer	112	96.5
30 lb/a 18-46-0 In-furrow	114	94.6
LSD (0.05)	NS	NS

## Objective 3:

### Effect of narrow row spacing on grain yield

Two trials were initiated at the Cotton Branch Station at Marianna to evaluate the effect of hybrid and plant population in a narrow row (7.5 inch) and a wide row (38 inch) production system under dryland conditions. Heavy rains immediately after planting resulted in poor stands and variability from plot to plot was high and the trials were not harvested.

**Information Dissemination:** Information gathered from this research will be directly presented to county extension agents and grain sorghum producers across the state through county extension production meetings, field tours, agent trainings, and newsletters.