

**Arkansas Corn and Grain Sorghum Promotion Board
Project Update, 2 January 2007**

Project Title: Ultra-Short Season Corn Hybrid Evaluation

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Status: Year 2 of 3

The objectives of this research are to evaluate a wide range of corn-hybrid maturities (78 to 120 days) at several locations in Arkansas for agronomic and economic potentials and to promote interest among seed companies for developing earlier-maturing hybrids specifically for the Midsouth.

Twenty four hybrids ranging in maturity from 78 to 120 days were sown in replicated experiments at Keiser (April 13) and Rohwer (April 4). Plots consisted of four rows, 20 feet in length with a row spacing of 20 inches. Seeding rate was 30,000 kernels per acre for hybrids with a maturity of greater than 105 days, and seeding rate was 45,000 kernels per acre for hybrids with a maturity of less than 105 days. Hybrids with similar maturity were blocked together within each replication to allow their timely harvest. At both Keiser and Rohwer, 250 pounds of N per acre have been applied in split applications. At all locations, the crop was irrigated as required according to the Arkansas Irrigation Scheduling Program.

At Fayetteville, an experiment similar to that described at Rohwer and Stuttgart was planted (May 12) except that there were a total of 40 hybrids. In addition, at Fayetteville we evaluated the response of early-season hybrids to population. In this experiment hybrids with maturities of 80, 85, 98, 106, and 119 days were sown at five different seeding rates (8.1, 12.1, 16.2, 32.4, and 81.0 thousand kernels per acre) in 20 inch rows. For both the hybrid evaluation and population experiments, N was applied at 200 pounds per acre in split applications. At Fayetteville we also made weekly measurements of light interception, which in previous experiments we found to be a key for determining the yield and response to population of early-season hybrids.

Data analysis for the year is not final, but on the following pages are preliminary yield reports for the hybrid evaluation at our three locations. Associated with earlier maturity are decreased irrigation amounts, but these data have not been compiled. Yield results are grouped by maturity. Maturity group I (MG I) hybrids have relative maturities between 78 and 85 days, MG II hybrids have maturities between 86 and 95 days, MG III hybrids have relative maturities between 96 and 105 days, and MG IV hybrids have relative maturities between 106 and 120 days.

The figure on the attached page shows that over all locations, yields from MG I and II hybrids were lower than those from MG III and IV. At Keiser and Rohwer one factor contributing to lower yields for MG I and II hybrids was racoon damage. Estimated yield

decrease due to racoons ranged from 5 to 95%. Plots with estimated losses greater than 25% were excluded from analysis.

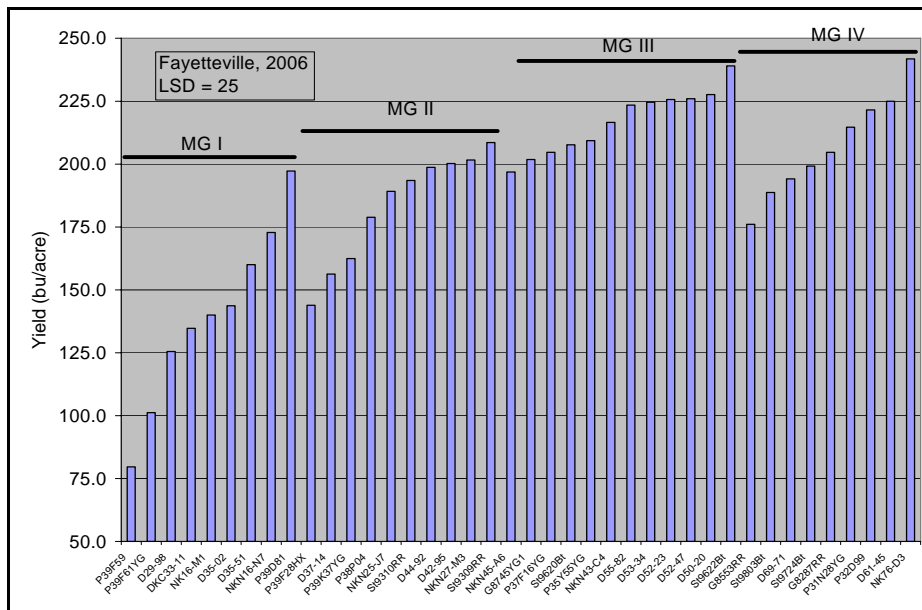
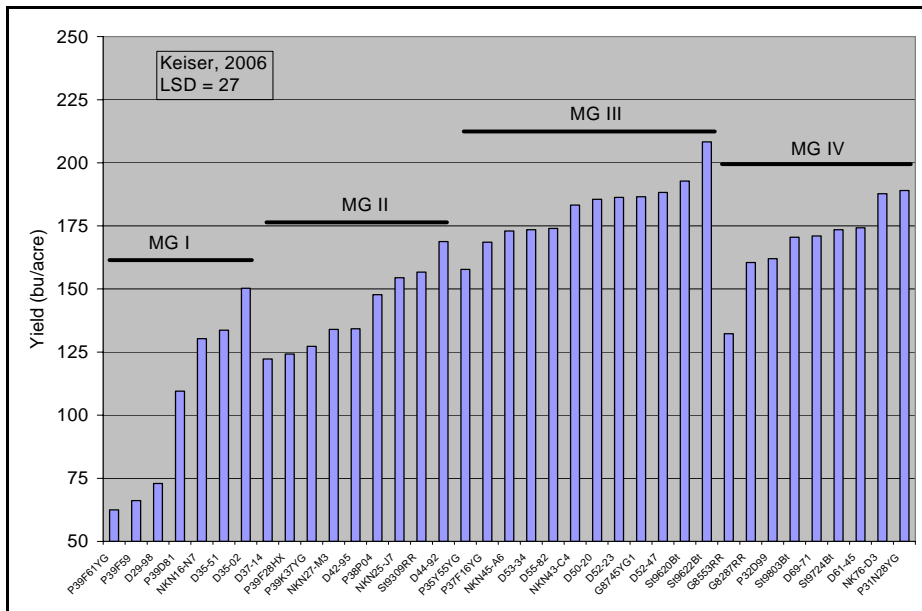
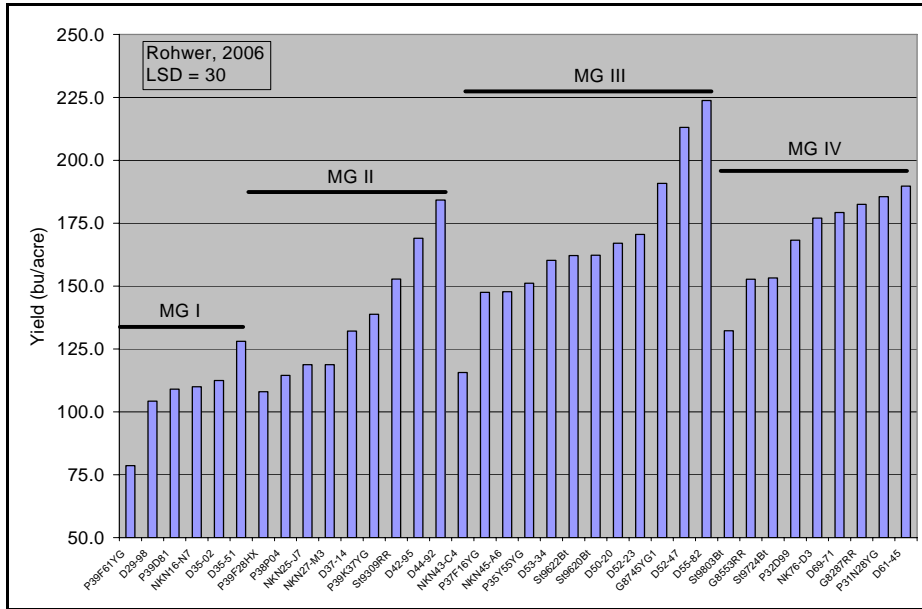
For all MG, the highest yields were at Fayetteville where at least one hybrid from each MG had yields >195 bu/ac. In general, MG III (relative maturities 96 to 105 days) had the highest yields. Within each MG, there was considerable variation in yield. The average yield of hybrids in MG II were lower than the average yield of MG IV hybrids, but, surprisingly, the highest yielding hybrid from MG II (86 to 95 day) was similar to the highest yielding hybrid from MG IV (106 to 120 day) for each location. The population experiment at Fayetteville indicated that yields were highest at a seeding rate of 32 thousand kernels per acre for all hybrids (Figure 2).

To evaluate the consistency of yield response among locations, we have calculated correlation coefficients for each of the maturity groups and over all maturity groups (see Table below). The correlation coefficient indicates how well hybrids in one location performed relative to another location. For example, if the correlation of MG I hybrids between Rohwer and Keiser was 1.00, it would mean that there was perfect agreement and that those hybrids that yielded well at Rohwer also yielded well at Keiser. With the exception of correlations between Fayetteville and Rohwer for MG III hybrids, Keiser and Rohwer for MG III and MG IV, correlations were close to or greater than 0.5. This indicates that hybrids that performed well in one location generally performed well in other locations.

Table 1. Correlation of yield by hybrid maturity group (MG) and over hybrid maturity among locations in 2006.

MG		Fayetteville	Rohwer	Keiser
I	Fayetteville	1.00		
	Rohwer	0.65	1.00	
	Keiser	0.60	0.78	1.00
II	Fayetteville	1.00		
	Rohwer	0.53	1.00	
	Keiser	0.69	0.47	1.00
III	Fayetteville	1.00		
	Rohwer	0.27	1.00	
	Keiser	0.52	0.14	1.00
IV	Fayetteville	1.00		
	Rohwer	0.61	1.00	
	Keiser	0.68	0.38	1.00
ALL	Fayetteville	1.00		
	Rohwer	0.73	1.00	
	Keiser	0.85	0.71	1.00

Figure 1. Grain yield of corn hybrids at Rohwer, Keiser, and Fayetteville in 2006. Hybrids were grouped by maturity group (MG) where MG I hybrids had relative maturities from 78 to 85 days, MG II hybrids had relative maturities of 86 to 95 days, MG III hybrids had relative maturities of 96 to 105 days, and MG IV hybrids had relative maturities from 106 to 120 days.



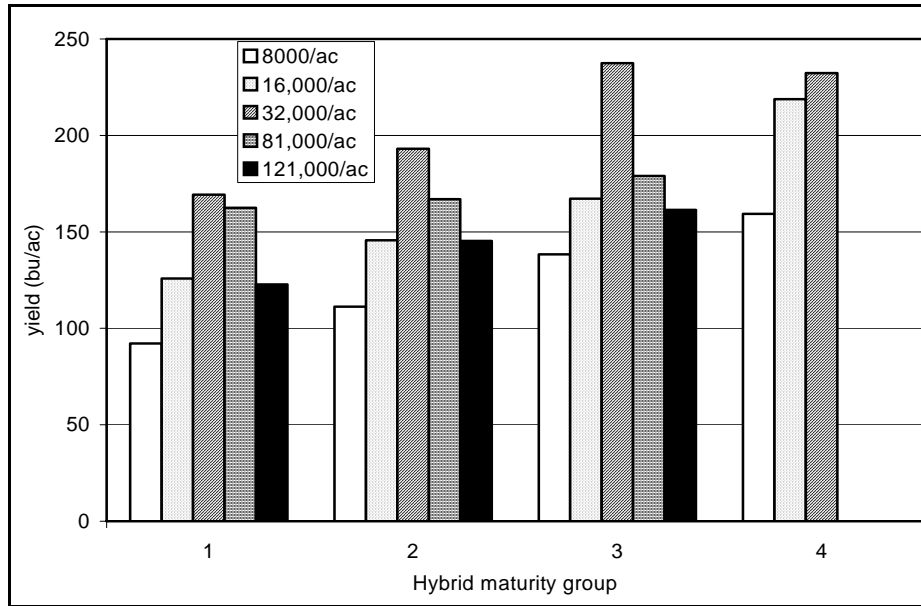


Figure 2. Response of hybrid maturity to seeding rate, Fayetteville 2006. Hybrids were grouped by maturity group (MG) where MG I hybrids had relative maturities from 78 to 85 days, MG II hybrids had relative maturities of 86 to 95 days, MG III hybrids had relative maturities of 96 to 105 days, and MG IV hybrids had relative maturities from 106 to 120 days. Hybrids in MG IV lodged severely at the two highest populations and were not harvested.