

**Arkansas Corn and Grain Sorghum Promotion Board  
Project Update, 28 November 2007**

**Project Title:** Ultra-Short Season Corn Hybrid Evaluation

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**Status:** Year 3 of 3

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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.

Thirty seven hybrids ranging in maturity from 78 to 120 days were sown in replicated experiments at Fayetteville (April 20), 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 was applied in split applications, and at Fayetteville, 200 pounds of N per acre was applied in split applications. At all locations, the crop was irrigated when 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.

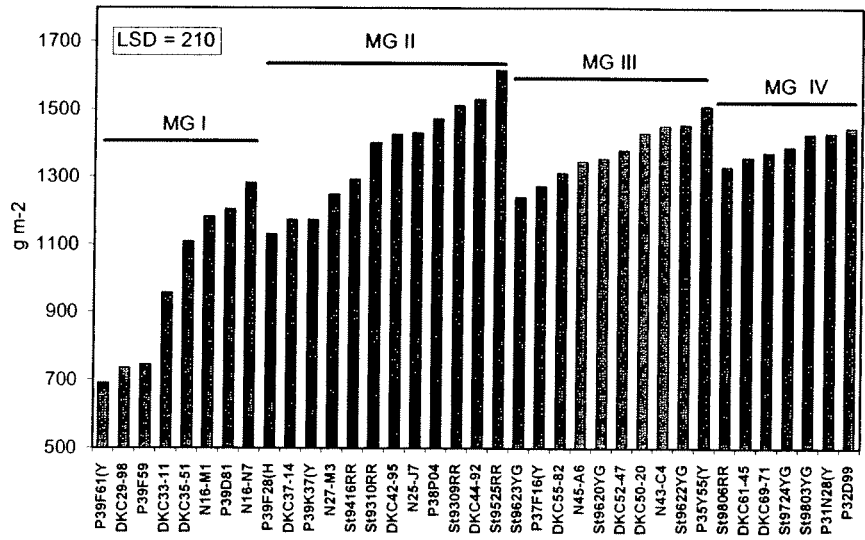
Data analysis for the year is not final, but on the following pages are preliminary yield reports for the hybrid evaluation at our three locations. Associated with earlier maturity are decreased irrigation amounts, but these data have not been compiled. Yield results are grouped by maturity. Maturity 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.

Dates for black layer relative to MG I hybrids were 11, 15, and 21 days later for MG II, III, and IV hybrids. Results from 2007 were similar to previous years in that yields of MG I hybrids were generally less than yields of MG II, III, and IV (see attached figure).

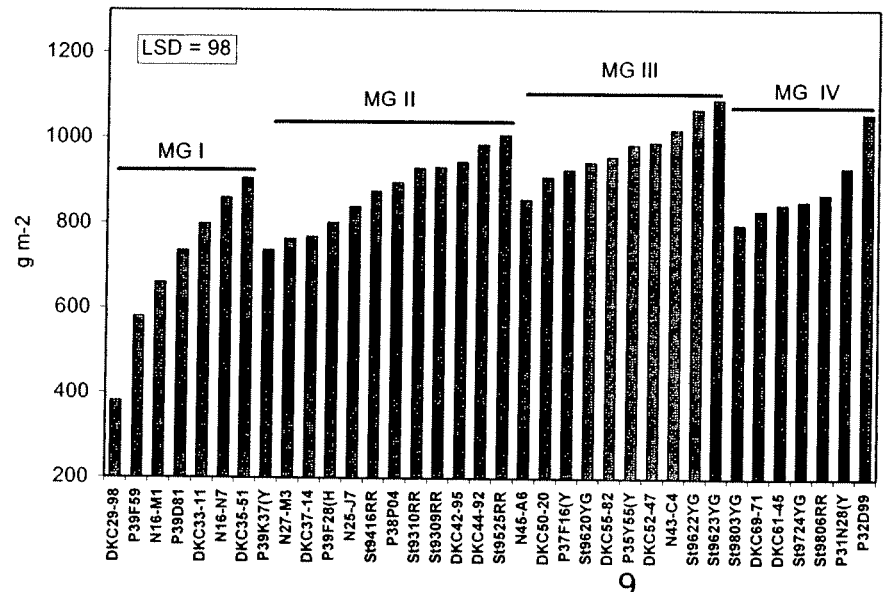
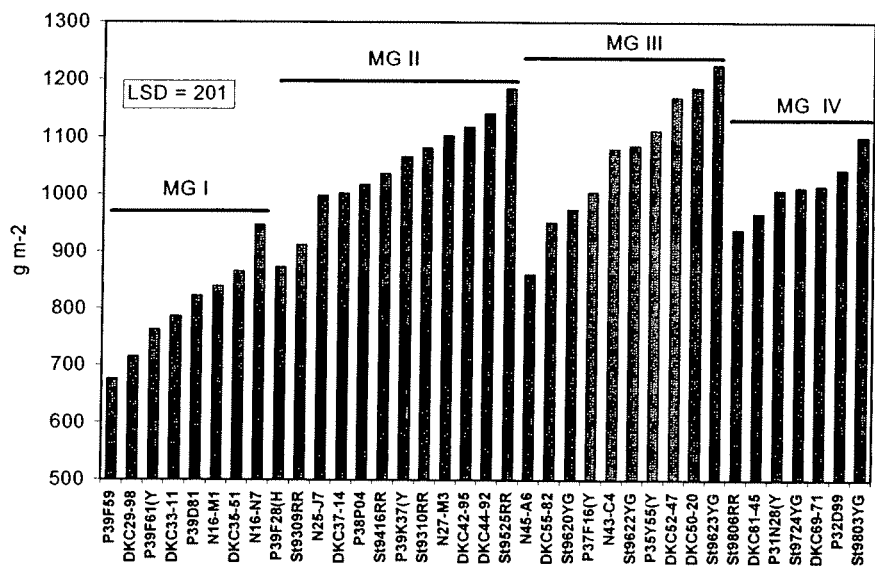
Within each of the MG II, III, and IV at all locations were hybrids that performed well. As in previous years, MG III hybrids generally had the highest yields.

When looking at all three years of this experiment, the highest yielding hybrids within MG II, III, and IV had yields that were generally very similar to one another (see Table 1). This indicates that hybrids with maturities from 85 to 105 days can have similar yields to full-season hybrids maturing in 106 to 120 days. Hybrids from MG II generally required about 2 inches less irrigation than MG IV hybrids.

To evaluate the consistency of yield response among locations, we have calculated correlation coefficients for each of the MGs and over all MGs for the 3 years of the project (see Table 2). 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. The asterisks indicate that the correlation is significant at the 5% (\*) or 1% (\*\*) levels of probability. Within a year, the correlations are often not significant for a given MG due to relatively few observations, but correlations of 0.7 or greater generally indicate a relatively strong relationship. When correlations are compared across all MGs (far right-hand column), correlations are significant and greater than 0.69. In general, this analysis indicates that hybrids that performed well at one location tended to perform well at other locations.



**Figure.** Grain yield of corn hybrids at Fayetteville (top), Keiser (middle), and Rohwer (bottom) in 2007. 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.



**Table 1.** Highest yielding hybrids (bu/ac) for each maturity group (MG) by year and location. Different letters following yield values within a year and location indicate significant differences as determined by an LSD ( $P=0.05$ ).

Location	MG	2005		2006		2007	
		yield	hybrid	yield	hybrid	yield	hybrid
Fay	I	143 bc	N1613	192 c	P39-D81	204 b	N16-N7
	II	164 b	G8899	204 bc	St9322	257 a	St9525
	III	202 a	DK52-47	233 a	St9622	240 a	P35Y55
	IV	181 ab	P31N28	220 ab	DK61-45	230 a	P32D99
Rohwer	I	162 c	G8986	154 c	DK35-51	144 b	DK35-51
	II	198 b	N25-J7	181 b	DK44-92	160 a	St9525
	III	261 a	NK43-34	220 a	DK55-82	173 a	St9623
	IV	234 b	P37-F16	186 b	DK61-45	168 a	P32D99
Keiser <sup>†</sup>	I	-----	-----	147 b	DK35-02	151 b	N16-N7
	II	-----	-----	166 a	DK44-92	189 a	St9525
	III	-----	-----	204 a	St9622	189 a	DK50-20
	IV	-----	-----	185 a	P31N28	175 ab	St9803

<sup>†</sup>Experiment was not conducted at Keiser in 2005.

**Table 2.** Correlation coefficients by year between locations for corn hybrids from MG I, II, III, IV, or over all MGs. Asterisks indicate significance at the 5% (\*\*) and 1% (\*\*\*) levels of probability.

Locations	Year	MG I	MG II	MG III	MG IV	All
Fay & Kei	2006	0.71	0.69*	0.52	0.68*	0.89**
	2007	0.88**	0.44	0.63	0.80*	0.76**
Fay & Roh	2005	0.58	0.39	0.19	0.36	0.76
	2006	0.65	0.53	0.27	0.61	0.73*
	2007	0.79*	0.90**	0.06	0.51	0.82**
Kei & Roh	2006	0.78	0.47	0.14	0.38	0.70**
	2007	0.61	0.41	0.63*	0.01	0.69**