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1993 Grain Sorghum Performance Trials

R. G. Hall
South Dakota State University, robert.hall@sdstate.edu

H. A. Geise
South Dakota State University

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1994 South Dakota GRAIN SORGHUM PERFORMANCE TRIALS

Robert G. Hall
Extension Agronomist, Crops
Leader, Crop Performance Testing
Plant Science Department
Agricultural Experiment Station
South Dakota State University
Brookings, SD 57007-1096

Grain sorghum hybrids grown under 1994 environmental conditions are evaluated in this report. Tables include 1994 grain yields in pounds per acre adjusted to 14% moisture content, 1993-94 2-year yield averages, test weight, plant height, and stalk lodging percentages.

Location of 1994 Trials

Trial locations and dates of seeding and harvesting are in Table 1. Soil classes and fertility are shown in Table 3. Trials were seeded at Armour and at the Dakota Lakes Research Farm near Pierre.

Climatic data (Table 2) for the 1994 grain sorghum growing season, May through September, are based upon U.S. Monthly Climatological Data (NOAA) recorded at a weather station reasonably near each trial site. The Pierre FAA (airport) data are used for the Dakota Lakes site. Weather stations are located at or near the other trial sites. Precipitation quantities could vary widely from the actual site to the recording station. However, temperatures are similar over a much wider area and are considered applicable to the trial area.

Growing season temperatures in 1994 were close to normal at both locations. Temperatures were near normal in April, 3 to 4 degrees above average in May, slightly above average in June, 5 degrees below average in July, and 2 to 3 degrees above average in August and September. The heat unit accumulation across most of the grain sorghum area was near normal for 1994. Statewide, 96% of the grain sorghum harvest was completed by November 13, according to the South Dakota Agricultural Statistics Service. Stalk lodging was not a factor in 1994.

Hybrid Entry Procedure

Only hybrids offered for sale in South Dakota or being produced for sale in 1994 were eligible for entry. Entries had to exhibit a laboratory germination of 80% or higher as required by state certification standards. A fee was charged for each entry in each trial. Entries were selected by the participating companies.

Experimental Procedure

Each trial consisted of four replications of two-row plots. Each plot was randomly located within each replication. Trials were seeded with cone seeders mounted above maxi-merge units. A herbicide recommended for grassy weed control was applied at seeding time. Thirty-inch row spacings were used at all trial sites. The plot length at seeding was 20 feet at both locations. All plots were later cut back to 17-foot lengths prior to harvest. Plots were seeded at a rate of 6 seeds per foot of row (104,544 seeds per acre) and later thinned to a final stand of 2.5 plants per foot of row (43,560 plants per acre). The trials at

The assistance of technicians Kevin Kirby and Darin Huber; Dwayne Beck of the Dakota Lakes Research Farm near Pierre; and farmer-cooperator Robert Clark is gratefully acknowledged.

Pierre and Armour were no-till seeded into wheat stubble and corn stubble, respectively.

Bushel weight of the grain was a realistic indicator of relative grain quality in 1994. Grain moisture determinations for adjusting final yields were obtained by collecting a yield sample, enclosing it within a paper bag, and later measuring the moisture content with an electronic moisture meter.

Harvesting was delayed until shortly after the first frost; however, stalk lodging was not significant in 1994. At both sites, three replications were harvested by small-plot combine when plots were mature enough to shell out readily. Harvest samples were returned to Brookings for drying and processing.

Results

Pierre: The average yield was 5,671 pounds per acre. There were no significant yield differences among the hybrids. The test coefficient of variation (CV) value (9.6%) indicated a low level of experimental error associated with the test. The bushel weight values averaged 56.7 pounds per bushel. Entries had to yield 57.7 pounds per bushel to be in the best bushel-weight group.

Armour: The average yield was 5,141 pounds per acre. Again, as at Pierre, there were no significant yield differences among hybrids tested. Test coefficient of variation (CV) value (12.7%) was relatively high but well within the acceptable limits to qualify as a test. However, even though the test was acceptable, the test was not significant at the 5% level of probability. The bushel-weight values at Armour averaged 56.1 pounds per bushel, which was similar to the values at Pierre. At Armour, entries that averaged 56.3 pounds or higher were in the best bushel-weight group.

Measurement of Performance

Variations in soil fertility, slope, or stand may cause hybrids of equal potential to yield differently. Statistical determinations were made to determine if yield differences were caused by variations in environment or were true hybrid differences. Hybrid performance results are in Tables 4 and 5. A listing of all entries is also given.

• Table 1. Test trial locations, seeding dates, and harvest dates.

LOCATION	COUNTY	POST OFFICE	DATE SEEDED	DATE HARVESTED
ROBERT CLARK FARM, 4W,1S	DOUGLAS	ARMOUR	MAY 16	OCT. 19
DAK. LAKES RES. FARM, 17E	HUGHES	PIERRE	MAY 23	OCT. 26

• Table 2. Temperature and precipitation data, 1994 grain sorghum performance trials.

LOCATION	TYPE OF DATA	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	TOTAL
ARMOUR	PRECIPITATION	2.97	1.84	2.98	3.56	1.12	1.53	14.00
(DOUGLAS CO.)	AVER. TEMP.	48.8	63.8	70.7	71.5	71.6	66.0	
	TEMP. DIFF.	-0.9	+2.9	+1.1	-5.1	-2.8	+2.4	
PIERRE	PRECIPITATION	1.29	2.21	3.00	4.53	2.30	1.22	14.55
AIRPORT	AVER. TEMP.	46.9	63.1	70.4	71.9	70.8	65.1	
(DLRF)	TEMP. DIFF.	-0.1	+3.9	+1.0	-4.8	-2.6	+2.5	

*PRECIPITATION = INCHES, TEMPERATURE = DEGREES FAHRENHIET.

• Table 3. Soil classification, fertilizer applied, and land preparation.

LOCATION	SOIL TYPE	STARTER, 2 X 2 FERTILIZER APPLIED (ACTUAL PER ACRE)	LAND PREPARATION
ARMOUR	*EAKIN-ETHAN COMPLEX	37 - 18 - 00	NO-TILL, CORN STUBBLE
PIERRE	LOWRY SILT LOAM	37 - 18 - 00	NO-TILL, WHEAT STUBBLE

*A MIXED SILT AND FINE LOAM

• Table 4. 1994 grain sorghum hybrid performance trial results: Armour, Robert Clark farm, seeded May 16, 1994.

---- BRAND & HYBRID ----		YIELDS AT 14.0% MOIST. 1994 (LB/AC)	YIELDS AT 14.0% MOIST. 2-YR (LB/AC)	BUSHEL WEIGHT (LB)	HT. (IN)	STALKS LODGED (%)
AGRIPRO	ST 3280	6120	4948	55.6	50	0
AGRIPRO	AP 9135	5955	.	56.4	48	0
DEKALB	DK-37	5792	4999	57.5	56	0
PIONEER	8925	5460	4727	56.4	47	0
DEKALB	DK-28E	5265	4549	56.4	49	0
PIONEER	8875	5206	4606	57.6	49	0
DEKALB	X-422	5169	.	56.5	49	0
PIONEER	8877	4962	4186	58.2	48	0
DEKALB	X-335	4933	4315	55.5	46	0
CARGILL	577	4903	4589	56.6	52	0
DEKALB	X-317	4894	4467	53.7	48	0
DEKALB	X-419	4702	.	55.3	49	0
PIONEER	8855	4638	4046	55.8	47	0
CARGILL	X11206	4629	4356	55.6	45	0
PIONEER	8950	4479	3789	53.9	46	0
TEST AVERAGE:		5141	4465	56.1	49	0
TEST LSD (5%) VALUE:		*NS	NS	2.0	4	
MINIMUM BEST VALUE:				56.3	53	
TEST C.V.:		#12.7	14.1			

*NS - INDICATES HYBRID DIFFERENCES WITHIN A COLUMN ARE NOT SIGNIFICANT.
#COEF. OF VARIATION - A MEASURE OF EXPERIMENTAL ERROR; IF VALUE EXCEEDS 16.0% DATA SHOULD NOT BE USED TO MAKE HYBRID COMPARISONS.

• Table 5. 1994 grain sorghum hybrid performance trial results: Pierre, Dakota Lakes Research Farm, seeded May 23, 1994.

---- BRAND & HYBRID ----		YIELDS AT 14.0% MOIST. 1994 (LB/AC)	YIELDS AT 14.0% MOIST. 2-YR (LB/AC)	BUSHEL WEIGHT (LB)	HT. (IN)	STALKS LODGED (%)
DEKALB	DK-28E	6163	5141	57.3	.	0
PIONEER	8925	6110	5268	57.1	.	0
CARGILL	577	6054	6106	58.0	.	0
DEKALB	X-422	5988	.	58.8	.	0
DEKALB	X-317	5968	5253	54.6	.	0
DEKALB	X-335	5829	4870	55.9	.	0
CARGILL	X11206	5820	4678	55.9	.	0
PIONEER	8855	5417	.	57.7	.	0
PIONEER	8875	5366	4519	57.1	.	0
DEKALB	DK-18	5299	4553	56.3	.	0
DEKALB	X-419	5163	.	56.9	.	0
PIONEER	8950	4874	5216	54.4	.	0
TEST AVERAGE:		5671	5067	56.7	.	0
TEST LSD (5%) VALUE:		*NS		1.2		
MINIMUM BEST VALUE:				57.7		
TEST C.V.:		#9.6	17.4			

*NS - INDICATES HYBRID DIFFERENCES WITHIN A COLUMN ARE NOT SIGNIFICANT.
#COEF. OF VARIATION - A MEASURE OF EXPERIMENTAL ERROR; IF VALUE EXCEEDS 16.0% DATA SHOULD NOT BE USED TO MAKE HYBRID COMPARISONS.

Entries in the 1994 South Dakota grain sorghum hybrid performance trials.

COMPANY (BRAND)	HYBRID	COMPANY (BRAND)	HYBRID	COMPANY (BRAND)	HYBRID
AGRIPRO	ST 3280	DEKALB	DK-18	PIONEER	8855
	AP 9135		DK-37		8875
			DK-28E		8877
CARGILL	577		X335		8925
	X11206		X317		8950
			X419		
			X422		

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