



November 2004 (pr)

AG/Crop Trials/2004-02

Grain Corn Performance, 2001; Box Elder and Millard Counties, Utah

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Corn grain is grown on approximately 15,000 ac in Utah, with 57% of total production from Box Elder, Utah, and Millard counties. This report summarizes performance of irrigated grain corn hybrids on farms in Box Elder and Millard counties in 2001. Sites were at 4290-4900 ft elevation and had long-term averages of 3050-3450 corn growing degree days (GDD, 50/86° F) per year (Tables 1-2). Hybrids from breeding programs and seed marketers were seeded with farm planters on May 2-16 at a target rate of 34,000 seeds/ac. Plots were six rows wide at 30-in row spacing by 850-2480 ft long in two pivot-irrigated (Millard) or three furrow-irrigated (Box Elder) randomized complete blocks. Nutrient and pesticide applications and previous crops are indicated in Tables 1-2. Soil fertility levels were within recommended ranges.



Hybrids had relative maturity (RM) ratings of 95-111 days. Plots were harvested with combines on October 17-November 8 and weights were obtained with a grain cart with scales. Sample dry matter (DM) concentration was determined at 103° C (217° F). Test weights were determined on field-dry or oven-dried samples. Plot weights were expressed as bu/ac of 15.5%-moisture grain with an assumed test weight of 56 lb/bu.

Hybrids ranked in decreasing order of grain production (Tables 1-2) may be compared in terms of the least significant difference (LSD). This is the minimum difference required between entries in a column for significance at a given level of confidence. Values of LSD are shown for 5 and 30% probabilities that observed differences among entries are merely due to chance, rather than to variety effects. For example, in Table 1, grain yields of the top two hybrids are not different at the 5% probability level, because they vary by less than the LSD of 12 bu/ac. Yields of the fifth- and lower-ranked hybrids are different from the top entry at the 5% level because they vary by at least the LSD. At 30% probability that yield variations are due to chance, smaller differences become significant. The coefficient of variation (CV) describes variability among replications of the same hybrid; values below 10% suggest good precision for detecting entry differences.

Grain yield differed by 31-45 bu/ac among hybrids, depending on location. Differences were not strongly associated with varying population densities and RM ratings. Planter calibration difficulties at McCornick led to wide variations in population density and excessive populations. Moisture concentration at harvest exceeded 15.5% in a few cases and was generally higher for hybrids with longer RM ratings. Similarly,

grain test weight was generally higher for hybrids with shorter RM ratings. Excessive moisture at harvest can be avoided by selecting hybrids that perform well at shorter RM ratings and permit adequate grain filling and field drying prior to harvest.

Table 1. 2001 corn grain production at Elwood (Box Elder Co.), UT (Paul & Roger Munns).

Planted May 2, harvested Oct. 17. Elevation 4290 ft, 3050 corn GDD, Honeyville silty clay loam. Applications: 200 lb N, 80 lb P₂O₅, 20 lb S, and 5 lb Zn/ac; Lasso[®], Banvel[®], and 2,4-D herbicides; and Counter[®] insecticide at planting. Previous crop: corn.

Brand	Hybrid	Relative maturity	Population density	Grain moisture	Test weight lab (96%) DM	Grain yield 15.5% moist.
		days	plants/ac	% fresh wt	lb/bu	bu/ac
HYTEST	HT4602	103	35198	16.1	56.2	186
NK	N67-T4	111	33787	17.6	56.0	182
Asgrow	RX508	103	33787	12.6	57.5	180
DEKALB	DKC53-33	103	34717	11.6	57.8	177
DEKALB	DKC46-28	96	32360	10.5	58.6	174
Asgrow	RX452	99	35281	11.1	59.9	174
DEKALB	DK477	97	30651	10.9	57.3	155
Mean		102	33198	12.6	57.6	174
Significance of F test (P)			0.01	<0.01	<0.01	<0.01
LSD (0.05)			2851	<0.7	1.0	12
LSD (0.30)			1430	<0.4	0.5	6
CV (%)			4.9	3.3	1.0	3.9

Table 2. 2001 corn grain production at McCornick (Millard Co.), UT (Paul Bishop).

Planted May 16, harvested Nov. 8. Elevation 4900 ft, 3450 corn GDD, Woodrow silty clay loam and Oasis loam. Applications: 190 lb N and 80 lb P₂O₅/ac. Previous crop: wheat.

Brand	Hybrid	Relative maturity	Population density	Grain moisture	Test weight field dry	Grain yield 15.5% moist.
		days	plants/ac	% fresh wt.	lb/bu	bu/ac
Asgrow	RX452	99	44110	15.1	59.4	196
NK	N3030Bt	95	44309	14.8	59.4	189
Asgrow	RX508	103	43114	16.5	57.4	189
DEKALB	DKC48-83	98	48590	15.5	57.4	181
HYTEST	HT7415	98	40326	16.8	59.0	175
HYTEST	HT4602	103	45802	19.4	51.4	172
DEKALB	DKC46-28	96	32410	14.2	60.8	160
DEKALB	DK477	97	35098	13.9	58.2	160
HYTEST	HT7550	102	57950	17.1	54.5	151
Mean		99	43152	15.7	57.9	170
Significance of F test (P)			<0.01	<0.01	0.03	0.20 ^a
LSD (0.05)			4264	<0.6	3.5	NS ^a
LSD (0.30)			1675	<0.2	1.4	NS
CV (%)			2.6	1.1	1.6	5.7

^aNo significant differences among hybrids.

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This publication is issued in furtherance of Cooperative Extension work. Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Noelle Cockett, Vice President for Extension and Agriculture, Utah State University.