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WHEAT AND OAT GRAIN VARIETY TESTS FOR 1989 AND 3 YEAR AVERAGES

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SUMMARY

Wheat and oat grain variety tests were conducted at the Texas A&M University Agricultural Research and Extension Center at Overton. Since climatic conditions often favor one variety more than another in certain years, variety recommendations should not be made from one year's data, however these results are useful for making at least partial judgement of varieties. A three year average for grain yields is presented which provides a more reliable estimate of yield potential of varieties. It is important to study not only the grain yields, but other variety characteristics such as disease resistance and maturity dates (heading date), especially if doublecropping with soybeans is being considered.

INTRODUCTION

These trials were conducted to determine which varieties are best adapted to East Texas for disease resistance and grain yield production. A second objective was to test newly released or experimental lines to determine their potential under East Texas environmental conditions.

PROCEDURES

Wheat and oat variety tests were sown in a well drained, deep, loamy sand on a well prepared seedbed in mid-October. Fertility rates and application dates and planting and harvest dates are reported on tables. Both wheat and oats were planted with a drill in plots of seven rows spaced 6 inches apart and 12 feet in length. Seeding rates were 82 lbs and 78 lbs/ac for wheat and oats, respectively. Good stands were obtained and a high amount of tillering was apparent on both crops. The herbicide, Glean®, was applied preemergence at 1/3 oz active ingredient (ai)/ac to the oat experiment. A combination of Glean (0.1 oz ai/ac) and Hoelon (1/2 lb ai/ac) was applied to all wheat tests in 1989 and also the preceding two years.

During the growing season, plots were trimmed to 10 feet in length with the aid of Roundup. The entire plot was harvested with a Hege plot combine to determine grain yield. At Overton, three separate variety tests are presented. The Elite Soft Red Wheat Test was recommended varieties, experimentals and newly released soft red winter wheats. Uniform Hard Red Winter Elite Test included experimental and newly released hard red winter wheat varieties. The oat variety

test included recommended, newly released, and experimental oat lines. All tests had four replications and were arranged in a randomized complete block design. A least significant difference (LSD) value is presented and yield differences between varieties, greater than the LSD value are judged to be significantly different 95 times out of 100. Averages are presented for those varieties which had remained in the tests for three years.

RESULTS

The growing season in 1988-89 was unusual in several ways. Fall and early winter temperatures were above normal which promoted excessive plant growth and early heading of varieties which have least vernalization requirements. A hard freeze in mid-February caused heavy winter freeze damage and winterkill on many varieties. Several heavy rains in April and May resulted in late season disease buildup of leaf spotting diseases such as *Septoria nodorum*. Delayed harvest and sprouting of seed prior to harvest was also quite common. These growing conditions favored late maturing varieties with high vernalization requirements.

Soft red winter wheat varieties produced quite low yields (Table 1). The highest yielding variety was Caldwell, followed by the experimental line TX-82-118 and Bradford. Note the inverse relationship between yield and percent freeze damage. Although there are exceptions, most of the higher yielding lines had less freeze damage. The heading dates for 1989 are not useful because many lines were frozen to the ground and had to retiller to produce new foliage. Therefore, the second crop was delayed in date of heading. The heavy rainfall in May caused excessive lodging. Both powdery mildew and leaf rust were severe on some cultivars in 1989. These data are useful in identifying lines susceptible to either of these diseases. Three year data indicate higher yields particularly for Fla 302, Bradford and other lines.

Hard red winter wheat yields (Table 2) were also quite low in 1988-89. Freeze damage significantly reduced yields of many of the varieties in this test. Lodging, powdery mildew and leaf rust were severe in East Texas on most hard red winter wheat lines in 1989. Three year mean yields for hard wheat averaged about ten bu/ac less than soft wheat at the Overton location.

Oat yields (Table 3) were about normal for 1988-89, however freeze damage was severe. Lodging was very high and crown rust levels were sufficient to indicate which lines were susceptible to the disease. Three-year mean yields are useful in demonstrating which lines have consistently produced good yields at Overton. The

two highest yielding varieties were H-833 and Blizzard, which both produced a 3-year mean yield of 121 bu/ac.

TABLE 1. ELITE SOFT RED WINTER WHEAT TEST AT OVERTON, TEXAS 1988-89

Variety	Yield bu/ac	Average bu/ac	Test Wt. lbs/bu	Heading Date	% Freeze Damage	Plant Ht. Inches	% Lodging	Powdery Mildew	Leaf Rust	Septoria Glume Blotch
Caldwell	56.3¶	--§	54	4-8	3	41	50	60†	20†	4#
TX-82-118	48.3	--	55	4-9	3	39	5	0	30	5
Bradford	37.1	44	54	4-14	60	43	50	0	3	4
Siouxland	33.0	37	51	4-13	5	41	60	90	60	5
TAM 200	29.0	--	54	4-15	15	30	80	0	20	5
TX-85-242	28.6	--	42	4-23	30	40	50	0	30	4
TX-73025	26.5	--	45	4-14	15	32	0	0	3	2
TX-80-32	25.7	31	44	4-10	5	30	20	0	0	3
TX-76-40-2	22.6	--	40	4-18	80	32	10	0	0	3
TX-80-31-3	21.3	--	46	4-10	4	39	20	0	10	3
Waco	21.3	--	46	4-8	35	33	10	40	3	4
Fla. 302	18.6	51	46	4-19	95	32	0	0	2	4
TX-76-40-1	17.4	--	44	4-19	95	32	0	0	8	3
TX-85-264	17.3	--	42	4-18	85	35	5	0	0	4
Hunter	17.3	--	50	4-17	20	32	0	0	5	4
Traveler	16.9	--	49	4-17	85	31	0	0	1	4
Keiser	16.1	--	51	4-13	5	41	60	0	60	5
Collin	14.6	40	50	4-14	85	31	0	80	10	5
TAM 201	13.6	--	45	4-8	25	27	0	15	30	6
TX-82-185	11.3	--	42	4-18	95	29	0	0	25	4

TABLE 1. ELITE SOFT RED WINTER WHEAT TEST AT OVERTON, TEXAS 1988-89 (CONTINUED)

Variety	Yield bu/ac	Average bu/ac	Test Wt. lbs/bu	Heading Date	% Freeze Damage	Plant Ht. Inches	% Lodging	Powdery Mildew	Leaf Rust	Septoria Glume Blotch
TX-75-213	11.1	37	34	4-28	10	39	0	3	1	5
TX-75-213-1	9.8	--	29	5-2	35	36	0	1	3	2
TX-85-237	7.3	--	34	--	--	--	--	--	--	--
Fla. 7927-G29	5.5	30	39	--	--	--	--	--	--	--
Fla. 301 H	1.7	--	12	--	--	--	--	--	--	--
Fla. 303	0.5	--	--	--	--	--	--	--	--	--
Fla. 301	0.4	--	--	--	--	--	--	--	--	--
Mean	19.6									
CV	43.8									
LSD (0.05)	12.1									

Planted on October 3, 1988. Harvested May 30, 1989.

Fertilizer application rates: Preplant 78 lbs/ac of N, P₂O₅ and K₂O plus 72 lbs/ac of sulfur.
Topdressed with 60 lbs/ac actual N as ammonium nitrate on February 24, 1989.

†Powdery mildew and leaf rust are a % of leaf area covered by the disease.

#Septoria ratings were on a scale of 0-9, where 0 = no disease and 9 = dead plants.

§Variety not tested over the last 3 years.

¶Mean yield differences greater than the LSD are considered significantly different 95 times out of 100.

TABLE 2. UNIFORM HARD RED WINTER WHEAT TEST AT OVERTON, TEXAS 1988-89 (CONTINUED)

Variety	Yield bu/ac	3 Yr. Average bu/ac	Test Wt. lbs/bu	Heading Date	% Freeze Damage	Plant Ht. Inches	% Lodging	% Powdery Mildew	% Leaf Rust	Septoria Glume Blotch
TX-87V1316	36.0¶	--§	48	4-14	50	40	100	0†	10†	3#
TX-86V1110	35.0	--	52	4-9	3	38	95	80	0	4
Siouxland	34.6	41	51	4-13	2	44	95	0	80	4
TX-86A8072	32.8	--	48	4-9	2	35	90	1	40	5
TAM 107	31.2	44	49	4-9	60	33	97	0	60	5
TX-86V1109	30.4	--	51	4-9	2	36	95	80	0	4
TX-GH12588	30.4	--	46	4-10	30	38	95	50	50	4
TX-86A7041	29.0	--	46	4-9	25	34	80	50	5	5
Siouxland 89	27.1	--	51	4-11	2	43	80	0	50	4
TAM 108	26.2	37	44	4-18	0	43	99	50	40	4
Pioneer 2172	25.0	--	48	4-11	10	32	60	95	0	5
Hawk	24.7	32	46	4-15	20	36	95	50	60	5
TAM-W-101	24.0	32	44	4-21	30	38	85	70	15	4
Century	23.2	35	43	4-14	95	36	100	80	60	5
Mustang	23.2	31	51	4-11	30	33	98	90	60	5
TX-86V1405	21.3	--	43	4-18	95	35	95	20	3	4
Mesa	20.2	--	50	4-10	20	30	90	90	35	4
Waco	19.9	--	48	4-11	95	32	95	40	0	4
TAM 105	19.8	34	45	4-24	15	34	95	70	40	5
TX-84V1307	19.7	--	46	4/8	40	32	90	85	40	5
Pioneer 2157	16.5	33	51	4-11	5	34	50	90	60	5
Chisholm	16.4	33	50	4-9	15	30	90	80	60	6
TAM 201	16.4	28	44	4-9	90	25	70	5	20	6
TAM 200	15.1	38	40	4-17	90	29	100	0	20	4
TX-85V1326	15.1	--	46	4-17	97	23	15	80	0	4

TABLE 2. UNIFORM HARD RED WINTER WHEAT TEST AT OVERTON, TEXAS 1988-89 (CONTINUED)

Variety	Yield bu/ac	3 Yr. Average bu/ac	Test Wt. lbs/bu	Heading Date	% Freeze Damage	Plant Ht. Inches	% Lodging	% Powdery Mildew	% Leaf Rust	Septoria Glume Blotch
Scout 66	15.1	--	45	4-28	60	42	95	90	60	5
Collin	12.4	32	48	4-12	85	29	60	70	30	6
TX-87V1233	12.3	--	49	4-9	30	30	40	95	0	4
TX-84V2036	11.8	--	20	4-14	96	33	10	80	0	4
NK Pro 812	6.7	28	27	4-13	96	25	2	80	0	5
Mean	22.4									
CV	23.7									
LSD (0.05)	7.5									

Planted on October 16, 1988. Harvested on June 13, 1989.

Fertilizer application rate:

Preplant 78 lbs/ac of N, P₂O₅, K₂O plus 72 lbs/ac of sulfur.

Topdressed with 60 lbs/ac actual N as ammonium nitrate on February 24, 1989.

†Powdery mildew and leaf rust are a % of leaf area covered by the disease.

#Septoria ratings were on a scale of 0-9, where 0 = no disease and 9 = dead plants.

§Variety not tested over the last 3 years.

¶Mean yield differences greater than the LSD value are considered significantly different 95 times out of 100.

TABLE 3. OVERTON OAT ELITE GRAIN TEST

Variety	Yield bu/ac	3 Yr. Mean bu/ac	Test Wt. lbs/bu	Heading date	% Freeze damage	Plant Ht. inches	% Lodging	% Crown Rust
H-833	98.5§	121	24	4-26	90	38	90	1†
Nora	96.0	118	25	4-17	5	42	100	5
Blizzard	80.6	121	27	4-25	90	32	98	20
NF 63	71.8	104	25	4-20	50	42	95	15
NF 20	70.6	103	24	4-16	80	42	95	10
Mesquite II	67.3	103	27	4-25	85	34	95	5
NF 170	64.1	93	26	4-20	40	45	95	25
Bob	63.3	87	27	4-16	75	37	95	50
TAM-0 386	62.7	87#	26	4-21	90	41	95	0
82M 4350	61.4	94	25	4-23	85	38	98	1
87M 1654	61.2	--	27	4-24	90	33	95	0
Coker 86-13	59.7	106	26	4-26	90	32	95	5
86B 1117	49.9	--	26	4-24	85	34	100	0
83AB 2930	49.4	98	24	4-24	85	38	100	1
87M 1531	46.5	--	25	4-23	75	31	100	0
Big Mac	36.8	86	23	4-24	90	35	90	5
Citation	34.9	106	24	4-23	96	33	100	10
87M 1079	33.7	--	23	4-25	95	34	100	0
87M 2097	32.0	--	25	4-24	90	34	100	0
82M 4964	26.1	77	23	4-23	80	35	100	0
86B 1207	24.9	--	22	4-25	96	28	100	0
86B 1151	23.7	--	23	4-23	40	34	100	0
87M 1031	22.7	--	21	4-24	99	--	--	--
87B 3087	16.4	--	22	4-25	96	36	100	0
86B 1240	15.0	--	20	4-25	98	30	100	3

TABLE 3. OVERTON OAT ELITE GRAIN TEST (CONTINUED)

Variety	Yield bu/ac	3 Yr. Mean bu/ac	Test Wt. lbs/bu	Heading date	% Freeze damage	Plant Ht. inches	% Lodging	% Crown Rust
87B 3120	13.3	--	21	4-24	100	--	--	--
87M 2037	11.0	--	22	4-25	95	34	95	0
83AB 2923	9.2	86	30	4-23	80	40	100	0
Mean	46.5							
CV	39.2							
LSD (0.05)	25.7							

Planted on October 11, 1988. Harvested June 13, 1989.

Fertilizer application rate: Preplant 78 lbs/ac of N, P₂O₅ and K₂O plus 72 lbs/ac of sulfur.

Topdressed with 60 lbs/ac actual N as ammonium nitrate on February 24, 1989.

Herbicide applied postemergence at 2 leaf stage was Glean at 1/3 oz ai/ac.

†Crown rust is a % of leaf area covered by the disease.

#Variety tested for two years rather than three.

§Mean yield differences greater than the LSD value are considered significantly different 95 times out of 100.