

2003 - 2004

Grain Yields
and
Estimated Returns
from

**Rye,
Wheat,
Triticale,
Oat
and
Barley**
Varieties and Strains

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DISCUSSION

Small-grain varieties and strains were evaluated for forage and grain yield at Ardmore, Okla., and Burneyville, Okla., during the 2003-2004 season. Forage yields are reported in NF-FO-04-03. The tests included 27 ryes, 27 wheats, 15 triticales, 13 oats and two barleys. Plantings were made on Sept. 19 at Burneyville and Sept. 26 at Ardmore. Planting moisture was adequate to get excellent stands immediately at both locations. Early fall growth was fair to good in spite of dry weather in October. Below-normal moisture persisted throughout much of the growing season at both locations. Very little rainfall came from October until January, minimizing growth in the late fall and early winter months. Timely moisture and mild temperatures from late February through April aided good spring growth and development. In contrast, moisture conditions were well below normal in May at both locations. The rainfall for the growing season finished approximately 10 inches below the long-term average. Despite a moisture shortage, grain yields and test weights were excellent for all the crops at Ardmore. Drought conditions were more severe on the sandy loam soils at Burneyville, resulting in numerically lower but still average to above average yields for all of the crops but oats. Though vegetative growth was slowed during the late fall and early winter months by dry weather, many entries in the tests (particularly the ryes) reached jointing or first hollow-stem (FHS) stage by mid-February.

Again this year, diseases were not a major factor in grain production in the trials. There was some incidence of leaf rust on ryes, wheats and triticales, but severity was light and infection occurred too late to cause significant yield loss. Stripe rust (SR) also appeared on wheats and triticales but was of short duration. Some infection occurred, but the weather conditions were such that the SR fungus was inactivated, resulting in very little damage. Powdery mildew (PM) infection on the wheats was probably the most limiting grain yield factor this year. We observed PM on the flag leaves, heads and awns of many of the susceptible varieties and strains (primarily the

hard wheats). In all probability, some yield reduction occurred on those entries with severe infections. Slight stunting caused by barley yellow dwarf virus (BYDV) infection, occurred in some oat and wheat plots, but yield reduction was most likely insignificant. Overall grain production averaged 69.4 bushels per acre at Ardmore (Table 1). We were able to simulate an abbreviated dual-purpose forage and grain system. We were unable to include February forage clipping of the grain plots because of inclement weather. Several entries had initiated jointing before the second clipping could be made. Therefore, only fall forage production can be considered in this year's dual-purpose system. Overall, average crop yields in bushels per acre were as follows: rye, 61.9; wheat, 60.9; triticale, 77.1; oat, 94.5; and barley, 67.4. Yields among varieties were variable within each crop. The triticale yields were the most uniform, ranging from 58.9 to 91.5 bushels per acre. Wheat and oat yields were the most variable. The higher-yielding wheat entries appeared to be least affected by PM, whereas several lower-yielding wheat entries were those most infected by the disease. The April rains and wind caused some oat entries to lodge and shatter worse than others, resulting in yield reductions.

At Burneyville (Table 2), the overall grain yield average was 48.8 bushels per acre. Again this year at this location we were able to simulate only a fall forage plus grain system. Many of the entries in the test (particularly the ryes and triticales) reached FHS by mid-February, so there was no forage harvest of the grain plots on the Feb. 20 harvest date. All forage clipping of the grain plots was terminated after the Dec. 4 harvest date. Overall crop yields in bushels per acre were as follows: rye, 52.9; wheat, 44.9; triticale, 58.4; oat, 39.4; and barley, 35.8. Grain yield reductions from the persistent dry weather at this location were more apparent with the oat and barley entries. Overall oat yields were approximately 60 percent less than the same entries at Ardmore. The variability range for yield was similar for the wheats, triticales and oats. The variability for oat

yields was lower because of the overall low yields for the crop at this site. Rye yields were the most variable, with a 49.2-bushel range from the highest-yielding entry to the lowest. The lowest-yielding rye entries had poor stands and were late maturing. Several of the lower-yielding wheat entries in the test were heavily infected by PM.

The estimated gross economic returns in tables 1 and 2 were calculated on the basis of values at the bottom of the tables; substitute your own values as necessary. Overall test weights ranged from good to excellent for all crops this year and were not a factor in determining grain prices. The gross income estimates are shown to encourage you to calculate possible returns and profits from various varieties, crops and management systems and strategies.

Table 3 shows the grain yields of commercially available varieties that have been tested at both locations over the last two-to-three growing seasons. Historically, grain yields have been taken after forage clipping, which is generally terminated at the initial sign of FHS. The occurrence of FHS varies yearly due to planting dates, varietal maturity, fall-winter temperatures and moisture availability. The early-maturing varieties generally incur the most grain yield loss when clipping (i.e., grazing) continues beyond FHS in the late winter or early spring. This type of loss should not be a factor in this year's data from either location because forage was not harvested from the grain plots in the late winter or early spring. The later-maturing rye varieties, "Elbon" and "Maton," continue to be more consistent and dependable for grain yield than the early-maturing varieties such as "Wrens 96" and "Oklon." Wheat grain yields continue to be highly variable at both locations. "Coker 9663" soft wheat has shown a trend to be a little more consistent than the hard wheat varieties at both locations. "Custer" and "Tam 202" have the highest three-year averages of any hard wheats at both locations, however, yields have tended to fluctuate dramatically from year to year. "Jagger" and "OK 101" hard wheat yields have been consistently low at both locations.

"Horizon 314" oat variety has been very stable in grain performance at both locations.

"ThunderCale," a late-maturity triticale, has produced excellent grain yields over the last three seasons at both locations. "TAMcale 6331" and "Trical 2700" have also been very productive the last two seasons.

Information in this report is inconclusive but can be of great value when compared with similar information from other sources. Use all available information pertaining to grain and forage production when making conclusions and decisions. This publication is intended to furnish supplemental information to aid in decision-making and idea formulation.

I would like to acknowledge the following personnel for their valuable assistance in collecting and analyzing data and preparing this report: Julie Barrick, Dan Childs, Bret Flatt, Marci Grover, Roger Hartwell, Steve Howe, Shawn Norton and Frank Motal.

Table 1. Grain yields and estimated gross returns from small-grain varieties, 2003-2004; Ardmore, Okla.

Variety or Strain ¹	Yield (Bu./Ac.)	Test Weight (Lb./Bu.)	Estimated Gross Returns per Acre (Dollars)			
			Grain ²	Forage Produced by Dec. 8 ³	Total Grain and Forage	Total Forage, No Grain Harvest ⁴
Rye						
96309	70.5	57.1	394.80	46.45	441.25	218.25
96304	69.9	57.0	391.44	47.76	439.20	226.96
XR-032	68.8	56.9	385.28	25.58	410.86	233.55
Wintermore	67.3	57.6	376.88	25.00	401.88	205.58
NF95306	66.9	57.2	374.64	51.97	426.61	217.22
95322B	66.8	57.9	374.08	48.57	422.65	213.45
Elbon	66.7	58.3	373.52	29.61	403.13	197.68
Boss	66.6	58.0	372.96	12.37	385.33	201.63
NF95304	66.2	57.0	370.72	60.24	430.96	230.40
96323	66.0	57.5	369.60	40.48	410.08	217.18
NF95322	65.1	57.4	364.56	43.63	408.19	223.11
Winterking	64.4	58.0	360.64	44.18	404.82	225.49
Maton	63.8	58.1	357.28	34.51	391.79	200.71
Oklon (Foundation)	63.7	57.8	356.72	41.32	398.04	218.76
Oklon (Breeders)	63.4	56.7	355.04	53.29	408.33	235.78
Bates	63.0	57.6	352.80	42.75	395.55	216.12
Bates RS4	63.0	57.5	352.80	57.32	410.12	231.20
95301B	63.0	57.5	352.80	50.87	403.67	232.48
XR-031	62.6	56.8	350.56	18.12	368.68	209.21
NF65	62.5	57.7	350.00	54.24	404.24	238.71
95318	62.0	57.7	347.20	50.07	397.27	235.19
NF19	61.8	57.5	346.08	52.45	398.53	212.68
XR-033	60.3	56.4	337.68	18.08	355.76	222.24
AGS 104	58.7	56.7	328.72	33.20	361.92	210.93
Wrens 96	58.2	57.2	325.92	53.29	379.21	235.05
XR-034	33.2	50.8	185.92	3.22	189.14	137.84
XR-035	26.7	50.1	149.52	7.25	156.77	163.57
Wheat						
AGS-2000 (soft)	86.5	61.8	268.15	26.94	295.09	192.85
Ranger Brand (soft)	76.5	62.1	237.15	23.46	260.61	202.62
Coker 9663 (soft)	75.1	61.7	232.81	12.04	244.85	161.74
Fannin	70.6	63.8	232.98	40.32	273.30	207.74
Tam 202	68.7	62.9	226.71	24.82	251.53	195.85
Coker 9152 (soft)	67.8	60.7	210.18	21.23	231.41	211.77
Endurance	67.0	63.1	221.10	12.04	233.14	180.44
NF94120	65.7	63.5	216.81	21.63	238.44	190.65
96125A	65.2	59.1	215.16	17.35	232.51	180.62
NF94109 (soft)	65.1	63.0	201.81	29.98	231.79	177.99
Coronado	64.7	62.7	213.51	36.82	250.33	199.21
Overley	64.6	62.1	213.18	38.83	252.01	208.40
2174	64.1	63.4	211.53	40.88	252.41	199.62
96104	63.6	63.0	209.88	23.02	232.90	192.92
Lockett	61.0	60.8	201.30	26.50	227.80	208.22
Custer	58.8	62.1	194.04	27.34	221.38	187.21
Cutter	57.6	63.3	190.08	24.30	214.38	165.65
JEI 110	54.1	61.7	178.53	42.49	221.02	191.93
Sturdy 2K	53.9	62.4	177.87	22.03	199.90	172.50
Jagalene	53.6	63.7	176.88	33.86	210.74	157.42
NF4	53.0	62.5	174.90	37.37	212.27	187.94
OK 102	52.9	62.5	174.57	25.14	199.71	161.74
96104A	50.5	62.9	166.65	28.99	195.64	187.25
95123	49.5	61.8	163.35	43.35	206.70	189.63
Bradley (soft)	47.6	62.5	147.56	41.58	189.14	196.80
OK 101	43.5	63.0	143.55	36.97	180.52	186.73
Jagger	42.6	60.9	140.58	34.00	174.58	192.33

Triticale						
Trical 2700	91.5	54.5	224.18	35.50	259.68	189.88
RSI 1029E	88.3	57.3	216.34	13.47	229.81	210.63
NF95203	85.0	52.1	208.25	34.08	242.33	197.13
96202	84.3	52.9	206.54	28.00	234.54	184.98
TAMcale 6331	84.0	53.9	205.80	22.77	228.57	211.22
RSI 1029E/Trical 2700 blend	82.0	56.0	200.90	23.13	224.03	193.94
ThunderCale	81.9	54.5	200.66	13.07	213.73	228.90
ThunderCale V	81.2	53.2	198.94	14.42	213.36	207.41
Trical 342	78.5	54.1	192.33	39.49	231.82	171.91
TAMcale 5019	76.6	56.7	187.67	20.50	208.17	211.37
96210	67.5	52.6	165.38	38.83	204.21	219.56
NF91	66.3	52.4	162.44	37.95	200.39	180.88
96213	65.5	53.2	160.48	40.19	200.67	218.43
NF9	64.8	52.9	158.76	40.44	199.20	181.87
95215	58.9	53.6	144.31	27.34	171.65	190.61
Oat						
Horizon 314	123.9	36.2	204.44	32.06	236.50	190.03
Harrison	109.5	37.9	180.68	35.50	216.18	193.43
Dallas	108.7	35.8	179.36	26.50	205.86	197.31
Horizon 321	104.8	39.1	172.92	31.51	204.43	166.24
Plot Spike LA9339	102.4	37.3	168.96	46.63	215.59	208.51
LA9766B122-B-12	95.2	36.3	157.08	19.47	176.55	198.67
96412	92.7	36.6	152.96	27.23	180.19	215.10
Horizon 474	90.0	40.0	148.50	47.80	196.30	172.24
NF27	84.0	36.3	138.60	45.06	183.66	234.09
TX96D093	83.1	36.0	137.12	45.93	183.05	215.76
95418	81.7	39.2	134.81	37.30	172.11	217.26
NF95407	75.8	33.3	125.07	22.47	147.54	232.92
95412	66.2	34.1	109.23	32.98	142.21	245.70
Barley						
Tambar 501	80.3	50.1	204.77	15.85	220.62	184.21
TX00D639 (awnless)	54.5	55.6	138.98	46.30	185.28	228.38

¹NF designations and numbered lines only are Noble Foundation experimental strains. XR numbers are experimental blends developed by Seed Resource. TX and LA numbers are Texas A&M University and Louisiana State University experimental strains, respectively. RSI 1029E is an experimental triticale strain developed by Resource Seeds, Inc. Seed of these experimental materials are not commercially available.

²Grain values per bushel: rye, \$5.60; hard wheat, \$3.30; soft wheat, \$3.10; triticale, \$2.45; oat, \$1.65; and barley, \$2.55.

³Forage value: approximately \$3.66/cwt for oven-dry forage.

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|---------------|---|
| assumptions: | 1. stocker calves: average daily gain (ADG) = 2 lb. |
| | 2. consumption: 3% (0.03) of body weight. |
| | 3. average weight: 600 lb./calf. |
| calculations: | 1. 600 lb. x 0.03 = 18 lb./head/day. |
| | 2. 2,000 lb./ton divided by 18 lb. = 111 animal days. |
| | 3. 2 lb. ADG x 111 animal days = 222 lb. of gain. |
| | 4. \$0.33 = custom rate for 1 lb. of gain; 222 lb. x 0.33 = \$73.26/ton = \$3.66/cwt. |

⁴Forage yields and influencing factors are reported in publication number NF-FO-04-03.

Table 2. Grain yields and estimated gross returns from small-grain varieties, 2003-2004; Burneyville, Okla.

Variety or Strain ¹	Yield (Bu./Ac.)	Test Weight (Lb./Bu.)	Estimated Gross Returns per Acre (Dollars)			
			Grain ²	Forage Produced by Dec. 4 ³	Total Grain and Forage	Total Forage, No Grain Harvest ⁴
Rye						
96309	61.4	56.1	343.84	65.95	409.79	215.32
NF95304	60.0	57.0	336.00	70.13	406.13	194.60
95301B	58.4	57.0	327.04	64.42	391.46	185.60
Winterking	58.3	57.5	326.48	46.92	373.40	200.97
Maton	57.8	57.3	323.68	53.73	377.41	208.03
96304	57.8	56.0	323.68	59.22	382.90	187.76
XR-031	57.3	56.6	320.88	37.22	358.10	190.58
Bates	57.1	57.5	319.76	53.99	373.75	192.74
NF65	57.1	56.9	319.76	64.45	384.21	226.23
Bates RS4	57.1	56.8	319.76	60.06	379.82	203.75
NF19	56.8	56.8	318.08	69.91	387.99	197.94
Oklon (Foundation)	56.5	57.4	316.40	60.50	376.90	218.39
Oklon (Breeders)	56.4	57.0	315.84	58.38	374.22	222.13
96323	56.4	57.1	315.84	66.39	382.23	217.37
NF95322	55.2	57.0	309.12	72.51	381.63	217.22
Boss	55.1	57.6	308.56	32.39	340.95	183.33
XR-032	54.3	56.9	304.08	41.36	345.44	186.44
Wintermore	54.2	57.2	303.52	45.75	351.27	178.65
Elbon	54.0	57.3	302.40	49.01	351.41	185.71
NF95306	53.1	56.9	297.36	55.08	352.44	182.63
XR-033	53.1	57.2	297.36	35.98	333.34	182.20
95322B	52.5	57.2	294.00	61.38	355.38	195.30
95318	51.1	57.1	286.16	69.36	355.52	204.12
AGS 104	50.8	56.5	284.48	66.17	350.65	182.60
Wrens 96	48.9	57.2	273.84	59.15	332.99	194.16
XR-034	24.7	49.9	138.32	8.46	146.78	120.89
XR-035	12.2	49.0	68.32	16.03	84.35	116.06
Wheat						
AGS-2000 (soft)	61.0	58.7	189.10	16.47	205.57	128.28
Overley	54.2	60.6	178.86	14.46	193.32	114.45
Coker 9663 (soft)	52.9	58.8	163.99	12.41	176.40	118.22
Tam 202	51.5	59.7	169.95	6.55	176.50	119.61
Coronado	50.6	60.4	166.98	17.09	184.07	139.59
Ranger Brand (soft)	50.1	58.3	155.31	6.19	161.50	122.13
Endurance	49.9	61.0	164.67	12.52	177.19	131.25
Custer	49.2	60.6	162.36	7.72	170.08	138.24
Fannin	47.8	62.4	157.74	21.08	178.82	130.52
Coker 9152 (soft)	47.0	57.5	145.70	5.01	150.71	118.22
OK102	46.0	61.6	151.80	6.22	158.02	118.26
2174	44.9	61.4	148.17	17.82	165.99	151.78
Cutter	44.5	60.5	146.85	8.53	155.38	120.96
NF4	44.2	60.2	145.86	10.91	156.77	126.23
Sturdy 2K	44.1	60.0	145.53	7.83	153.36	130.77
Jagger	42.8	59.2	141.24	17.68	158.92	120.52
Bradley (soft)	41.9	60.4	129.89	15.67	145.56	122.06
96104A	41.7	60.0	137.61	11.13	148.74	128.47
NF94120	40.6	60.2	133.98	10.54	144.52	130.77
JEI 110	40.5	57.8	133.65	21.05	154.70	145.12
95123	40.4	58.9	133.32	14.60	147.92	118.27
Jagalene	40.2	61.9	132.66	17.02	149.68	112.66
96125A	40.1	56.9	132.33	7.14	139.47	134.51
96104	39.4	59.0	130.02	6.59	136.61	124.77
NF94109 (soft)	38.2	58.7	118.42	12.99	131.41	106.69
Lockett	35.7	57.6	117.81	6.15	123.96	120.27
OK 101	32.5	60.0	107.25	8.53	115.78	119.46

Triticale						
Thundercale V	72.8	53.3	178.36	16.80	195.16	188.34
TAMcale 6331	67.4	53.1	165.13	12.52	177.65	138.57
NF95203	66.5	50.1	162.93	27.16	190.09	153.24
RSI 1029E	66.1	55.4	161.95	16.18	178.13	168.43
RSI 1029E/Trical 2700 blend	64.7	54.0	158.52	37.22	195.74	162.03
ThunderCale	61.2	53.2	149.94	9.37	159.31	193.39
Trical 2700	59.4	51.5	145.53	44.58	190.11	153.17
96202	59.1	51.9	144.80	19.62	164.42	140.51
TAMcale 5019	57.7	54.6	141.37	18.30	159.67	147.24
96210	54.8	53.0	134.26	24.45	158.71	161.37
96213	53.2	53.5	130.34	26.10	156.44	161.04
NF91	52.8	51.8	129.36	29.98	159.34	138.49
Trical 342	49.8	54.5	122.01	42.60	164.61	96.11
NF9	46.0	51.5	112.70	42.16	154.86	132.71
95215	44.4	52.1	108.78	17.20	125.98	127.30
Oat						
Dallas	51.7	36.9	85.31	40.96	126.27	217.70
Horizon 321	48.4	38.4	79.86	49.85	129.71	156.72
96412	47.4	36.1	78.21	50.44	128.65	172.02
Horizon 314	43.1	36.2	71.12	49.74	120.86	166.02
95412	40.2	35.5	66.33	40.74	107.07	163.71
95418	39.9	38.7	65.84	51.39	117.23	173.01
Horizon 474	39.5	38.8	65.18	56.91	122.09	137.21
Harrison	39.4	37.5	65.01	40.04	105.05	164.74
Plot Spike LA9339	39.4	37.2	65.01	50.33	115.34	152.73
NF95407	37.7	35.3	62.21	26.35	88.56	178.46
NF27	29.7	36.5	49.01	56.47	105.48	189.92
TX96D093	29.5	36.6	48.68	45.64	94.32	176.23
LA9766B122-B-12	26.9	36.1	44.39	45.75	90.14	147.79
Barley						
Tambar 501	45.3	46.4	115.52	32.06	147.58	178.21
TX00D639 (awnless)	26.2	56.8	66.81	30.27	97.08	138.13

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²Grain values per bushel: rye, \$5.60; hard wheat, \$3.30; soft wheat, \$3.10; triticale, \$2.45; oat, \$1.65; and barley, \$2.55.

³Forage value: approximately \$3.66/cwt for oven-dry forage.

- assumptions:
 1. stocker calves: average daily gain (ADG) = 2 lb.
 2. consumption: 3% (0.03) of body weight.
 3. average weight: 600 lb./calf.
- calculations:
 1. 600 lb. x 0.03 = 18 lb./head/day.
 2. 2,000 lb./ton divided by 18 lb. = 111 animal days.
 3. 2 lb. ADG x 111 animal days = 222 lb. of gain.
 4. \$0.33 = custom rate for 1 lb. of gain; 222 lb. x 0.33 = \$73.26/ton = \$3.66/cwt.

⁴Forage yields and influencing factors are reported in publication number NF-FO-04-03.

Table 3. Bilocation grain performance comparison of commercial small-grain varieties, 2001-2004.

Variety	Bushels per acre					
	Ardmore			Burneyville		
	2001–2002	2002–2003	2003–2004	2001–2002	2002–2003	2003–2004
Rye						
Bates	33.0	46.5	63.0	28.3	37.1	57.1
Elbon	42.3	44.9	66.7	39.3	42.8	54.0
Maton	41.8	47.2	63.8	38.2	47.5	57.8
Oklon	35.6	44.7	63.7	29.6	36.1	56.5
Winterking	29.4	49.8	64.4	28.4	46.6	58.3
Wrens 96	39.7	36.2	58.2	28.2	30.5	48.9
Wintermore	38.0	46.1	67.3	32.8	45.3	54.2
Average						
	37.1	45.1	63.9	32.1	40.8	55.3
Wheat						
2174	61.8	61.5	64.1	38.9	38.3	44.9
Coker 9663 (soft)	69.8	61.0	75.1	40.8	33.9	52.9
Coronado	49.4	57.5	64.7	38.9	29.9	50.6
Custer	56.4	73.8	58.8	38.7	43.7	49.2
Jagger	37.6	54.9	42.6	29.5	23.8	42.8
Lockett	51.1	50.4	61.0	48.2	33.3	35.7
OK 101	49.8	54.6	43.5	41.9	26.5	32.5
Tam 202	38.4	67.7	68.7	45.2	36.2	51.5
Bradley (soft)	38.9	64.7	47.6	42.6	41.6	41.9
Cutter	41.9	56.4	57.6	40.6	38.2	44.5
Jagalene	47.2	47.5	53.6	46.9	36.3	40.2
AGS-2000 (soft)	•	55.0	86.5	•	33.8	61.0
Coker 9152 (soft)	•	47.7	67.8	•	27.3	47.0
OK 102	•	59.7	52.9	•	40.0	46.0
JEI 110 (Nova) ¹	•	53.4	54.1	•	42.9	40.5
Average						
	49.3	57.7	59.9	41.1	35.1	45.4
Oats						
Dallas	69.4	87.3	108.7	70.7	•	51.7
Harrison	78.3	72.9	109.5	52.7	•	39.4
Horizon 314	104.6	91.9	123.9	92.9	•	43.1
Horizon 321 (FL9708-P37)	•	75.3	104.8	•	•	48.4
Horizon 474	•	73.1	90.0	•	•	39.5
Average						
	84.1	80.1	107.4	72.1	0	44.4
Triticale						
Thunder Cale (Danko Presto)	42.0	60.0	81.9	53.8	44.2	61.2
TAMcale5019 (TX96VT5019)	•	45.7	76.6	•	32.3	57.7
TAMcale6331 (TX96VT6331)	•	54.4	84.0	•	35.6	67.4
Trical 342 (FL91142-A19)	•	54.8	78.5	•	32.9	49.8
Trical 2700	•	53.1	91.5	•	40.0	59.4
Average						
	42.0	53.6	82.5	53.8	37.0	59.1
Overall Average						
	49.8	57.8	71.7	43.1	37.2	49.6

¹Former identification.