

WHEAT VARIETAL DIFFERENCES IN FORAGE AND STRAW YIELD POTENTIAL

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Introduction:

Wheat is primarily grown as a grain crop in Kentucky, but is also used for straw production, winter grazing and forage production, all while serving as an important winter cover crop.

Straw is a valuable commodity for Kentucky's equine industry. Growers who sell straw want varieties with high grain yield and high straw yield potential. Growers who do not sell straw want varieties with high grain yield potential, but low straw yield potential to minimize residue.

Forage crops are an important commodity for Kentucky's cow/calf production industry. 25% of the wheat acreage planted in Kentucky is not harvested for grain, but used for other purposes such as forage production. Wheat has excellent winter grazing potential and hay/ silage production potential. Wheat forage provides a high quality feed source during late winter and early spring when the previous summer/fall forage reserves are low in quantity and have deteriorated in quality. Wheat forage crops can also be double-cropped with full season corn or soybeans. An annual evaluation for varietal differences in forage potential is beneficial for this segment of wheat growers.

Objective:

To evaluate straw and forage production potential among wheat varieties.

Methods:

In 2006, 72 wheat entries were evaluated for grain production potential in UK's small grain variety tests and were additionally evaluated for post-grain harvest straw yields, winter grazing potential and forage biomass production at heading. The tests were conducted in Lexington, KY in a randomized complete block design with 4 replications (planting date 10/5/05).

The straw yield test was part of an annual variety test for grain production and was managed using intensive management practices for grain production. Plots were harvested (6/22/06) for grain using a small plot combine, a small plot forage combine collected and weighed all residual straw from each plot. Data expressed as dry matter (DM) in Tons/Acre.

A separate forage variety test was planted next to the grain/straw test. Winter grazing potential was determined (3/8/06) using a pasture plate meter prior to spring green-up and was expressed as a grazing productivity index (100=average). Forage biomass yields were determined by harvesting plots (4/28/06) with a small plot forage combine at heading and expressed as dry matter in Tons/Acre. Forage quality (% Crude Protein) at heading was also determined.

Results and Discussion:

Results from the forage test (Table 1) indicate that forage dry matter yields at heading vary among varieties. Yields

ranged from 2.96 to 4.33 T/A with an average of 3.66 T/A dry matter produced. Crude protein (%) at heading ranged from 12.4 to 17.1 with an average of 14.9%. Although varietal differences in crude protein existed, it may be more important to note that wheat in general has good nutritional quality at heading. Differences in winter grazing potential also exist among varieties. There were also varietal differences in post-grain harvest straw yields. Straw yields ranged from 1.39 to 2.28 T/A with an average of 1.8 T/A. Differences in straw yield were moderately correlated ($R^2=0.45$) with plant height. Bolded values indicate no significant difference ($p=0.05$) from the top performer within each column.

There are varieties with both good grain and straw yield potential for growers interested in both crops. Likewise there are varieties with high grain yield and low straw yield potential for grain producers interested in minimizing post-harvest field residue. Tall varieties tend to produce more straw, however this is not always the case. Growers involved with forage and grain production can find varieties with good forage and grain yield potential. Although a crop can only be harvested for either forage or grain, market factors may dictate the amount of acreage planted a grower may devote to either enterprise.

TABLE 1. 2006 KENTUCKY WHEAT VARIETY FORAGE & STRAW TRIAL

VARIETY	DM YIELD* at heading Tons/Acre	PROTEIN at heading (%)	WINTER GRAZING Productivity Index** (%)	VARIETY	STRAW DM YIELD* Tons/Acre	MATURE HEIGHT (IN)	GRAIN YIELD Bu/A
Pioneer variety 25R37	4.33	14.6	120	EXCEL 399	2.28	40	88.8
Vigoro WX8501	4.27	15.5	141	Adler 625	2.21	39	92
Clark	4.18	14.1	109	Beck 122	2.19	40	97.9
EXCEL 399	4.15	13.8	113	KY93C-0378-5-2	2.15	37	93.2
Exsegen Lydia	4.11	14.7	111	Delta King 7710	2.12	40	91.7
SS 520	4.09	15.6	141	Exsegen Judith	2.11	40	93.6
SS MPV-57	4.08	15.3	147	KY93C-1238-17-1	2.07	39	98.1
KY97C-0232-2-2	4.07	14	123	SS 8302	2.04	38	95.9
Adler 575	4.04	14.4	115	KY93C-1238-17-2	2.03	41	100.1
USG 3665	4.04	14.7	101	Delta Grow 4100	2.02	41	87.7
EXCEL 212	4.02	15.3	84	Delta King 7830	2.02	40	77.6
USG 3244	4.00	14.6	117	EXCEL 361	2.00	41	84.4
Pioneer variety 26R22	3.99	14.1	83	IMI 95047-6-3-18	2.00	40	98.2
KY93C-1238-17-2	3.97	15.1	114	EXCEL 307	1.96	40	89.8
Delta Grow 1600	3.96	15.1	103	USG 3665	1.95	37	94.9
Exsegen Rachel	3.95	16.5	115	EXCEL 212	1.93	41	87.3
IMI 95053-1A-11-6	3.95	14.1	136	Pioneer variety 25R54	1.92	38	95.7
KY93C-0378-5-2	3.94	14.9	76	Delta King 9577	1.91	37	95.4
KY93C-1238-17-1	3.94	16	106	EXCEL 410tw	1.91	39	88.6
Pioneer variety 25R54	3.93	14	103	KY93C-0004-22-1	1.90	37	94.6
SS 8302	3.91	14.2	115	KY93C-1238-17-5	1.90	38	92.4
KY96C-0770-3	3.90	16.3	117	Pioneer variety 26R22	1.90	39	99.1
IMI 95047-6-3-18	3.88	15.4	116	Clark	1.89	39	82
KY96C-0772-6-2	3.87	16.8	111	AgriPro COKER Cooper	1.88	36	97.9
Adler 625	3.86	13.9	80	USG 3350	1.88	41	93.7
KY93C-0004-22-1	3.81	15.3	89	Pioneer variety 26R15	1.86	37	99
Steyer Merrell	3.81	16.2	96	EXCEL 392	1.85	40	90.1
Pioneer variety 26R15	3.80	14.7	95	IMI 95053-1A-11-6	1.85	39	85.3
Adler 545	3.78	13.3	98	USG 3244	1.85	40	92.8
Steyer Alma	3.78	14.9	76	AgriPro COKER 9511	1.83	38	102.7
Delta Grow 4100	3.76	13.6	87	Beck 117	1.83	37	90.7
SS 8309	3.76	15	70	Delta King 9410	1.82	40	88
Steyer McLane	3.74	15.6	83	EXCEL 173	1.82	37	83.9
USG 3209	3.73	16	126	Delta Grow 1600	1.81	38	94.6
EXCEL 173	3.72	15.7	120	Exsegen Leah	1.81	34	88.4

TABLE 1. 2006 KENTUCKY WHEAT VARIETY FORAGE & STRAW TRIAL (continued)

Steyer Morral	3.72	16.2	71	KY96C-0772-6-2	1.80	37	91.4
Cumberland	3.71	12.4	119	AgriPro COKER Branson	1.79	36	88.8
Delta King 9410	3.70	15.1	102	Bravo	1.79	39	88.1
Delta King 9577	3.70	15.6	90	KY97C-0232-2-2	1.77	38	97.9
Exsegen Leah	3.69	17.1	133	SS MPV-57	1.77	37	100.8
JGL EXP 604	3.66	15.8	70	Adler 575	1.75	36	96.3
KY96C-0786-3-2	3.66	14.4	84	JGL EXP 604	1.73	39	90.3
Bravo	3.61	14.1	103	KY96C-0786-3-2	1.73	37	99.1
AgriPro COKER Cooper	3.59	14.7	89	Steyer McLane	1.73	39	88
AgriPro COKER 9553	3.58	15.4	137	AgriPro COKER 9553	1.72	38	91.4
EXCEL 307	3.55	15.7	96	Exsegen Rachel	1.72	35	87.9
KY93C-1238-17-5	3.55	15.2	67	Adler 545	1.70	39	83.3
USG 3910	3.54	14.1	73	Steyer Merrell	1.70	37	96.5
Ebberts 501	3.53	13.4	63	Cumberland	1.69	36	88.7
Exsegen Judith	3.53	16	106	Pioneer variety 25R37	1.68	37	101.5
EXCEL 410tw	3.52	15.2	84	SS 560	1.68	36	99.4
USG 3350	3.41	16.1	86	SS 8309	1.68	38	95.2
AgriPro COKER Branson	3.37	15.2	115	USG 3910	1.68	36	93.7
JGL EXP 603	3.35	14.8	86	Vigoro V9410	1.68	40	84.4
Croplan Genetics 8301	3.34	14.4	100	EXCEL 211	1.67	38	80.6
Delta King 7710	3.34	15.2	83	JGL EXP 603	1.67	39	84.6
Ebberts 518	3.34	13.3	64	Vigoro WX8501	1.67	37	95.5
EXCEL 392	3.33	13.9	70	UMD MV5-46	1.66	34	91.5
AgriPro COKER 9511	3.32	15.8	111	Steyer Alma	1.63	35	100.8
Beck 117	3.31	14.1	57	SS 520	1.62	38	94.6
UMD MV5-46	3.31	15.3	93	Ebberts 501	1.61	38	96.5
Vigoro V9412	3.29	15.3	74	Exsegen Lydia	1.61	36	91.4
Beck 122	3.25	14	72	KY96C-0770-3	1.59	35	90.4
SS 560	3.23	16.7	127	KY94C-0094-11-2	1.56	38	84.3
SS 8404	3.21	15.5	116	Vigoro V9412	1.56	37	93.8
Vigoro V9410	3.19	14.2	112	Ebberts 518	1.55	38	97.1
EXCEL 361	3.15	14.1	84	SS 8404	1.53	33	85.9
KY94C-0094-11-2	3.13	15.1	80	Croplan Genetics 8301	1.50	36	94.3
Delta King 7830	3.10	13.3	104	Steyer Morral	1.44	34	97.9
UMD Choptank	3.06	16.8	94	USG 3209	1.44	33	84.1
EXCEL 211	3.05	14.8	94	Pioneer variety XW04C	1.39	32	91.6
Pioneer variety XW04C	2.96	14.2	123	UMD Choptank	1.39	31	88.5
AVERAGE	3.66	14.9	100	AVERAGE	1.8	38	92.1
C.V.	12.23	7.4	18	C.V.	18.3		9.1
LSD (0.05)	0.62	1.5	26	LSD (0.05)	0.46		4.1