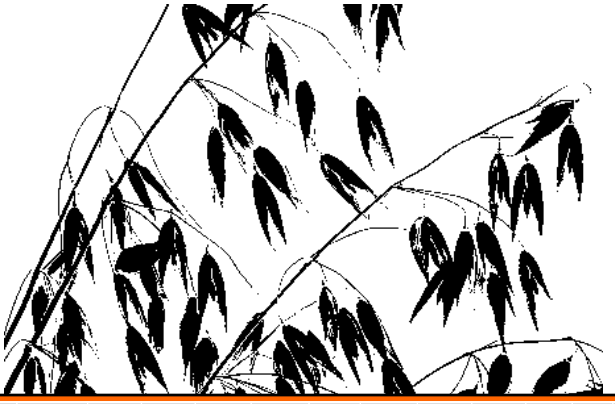
2002

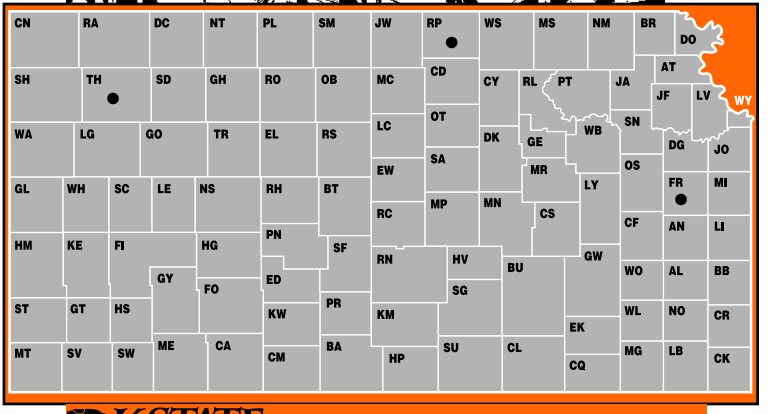
KANSAS PERFORMANCE TESTS WITH

SPRING SMALL GRAINS

REPORT OF PROGRESS 907

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service





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Spring small grains in Kansas

Although not major cash crops in Kansas, spring small grains can be important in specific situations. Oats are used as a feed grain for balancing animal rations, as a source of highly nutritious forage, as an intermediate crop when changing crop rotations, or occasionally as a food crop when and where such a market is available. Spring wheat and spring-planted winter wheat often are viewed as possible alternatives for dealing with abandoned winter wheat acreage. Since 1990, an average of over 1 million acres of winter wheat is abandoned each year. Unfortunately, spring wheat typically matures and fills grain during hot, dry summer weather, limiting its productivity. Spring-planted winter wheat may not vernalize, preventing grain production. However, both spring wheat and spring-planted winter wheat can produce grain if suitable varieties are planted early enough to avoid summer heat and to allow for vernalization in the case of winter wheat. In either case, appropriate spring moisture and temperatures are crucial for success.

Of the spring small grains, oats occupy the largest acreage. Oat acreage peaked at over 1.6 million acres during the early 1900s. Acreage declined steadily during the 1950s and 1960s, leveling off at around 200,000 acres in the 1970s. In 2002, spring oat acreage was 140,000 acres, ranking 6th behind wheat, sorghum, corn, soybean, and sunflower. This acreage represented less than 1% of the total crop acres. Roughly 63% of the oat acres were harvested for grain; the remainder were abandoned, grazed, or harvested for forage. Statewide grain yield averaged around 25 bushels per acre until the 1950s. Since then, average yield has increased gradually to over 50 bushels per acre in recent years. Records of spring wheat plantings in Kansas are not available because winter wheat dominates the wheat acreage so completely. (Kansas Agricultural Statistics)

Choosing the right variety

Achieving adequate grain yields requires selecting varieties adapted to the Kansas environment. Yield-limiting factors include potentially high temperatures and low moisture availability during the grain-filling period; diseases such as barley yellow dwarf virus, leaf rust, crown rust, and stem rust; and summer storms and fertility situations that might result in lodging. Selecting varieties that are equipped to perform reliably under these conditions requires the type of information provided by K-State Research and Extension performance tests.

With no commercial or university spring oat or spring wheat variety development programs in Kansas to provide specifically adapted varieties, most varieties grown in the state originate elsewhere. Early-maturing varieties with good test weights and adequate disease resistance are included in performance tests to evaluate their suitability for Kansas growing conditions.

Performance tests

The Kansas performance tests are designed to evaluate varieties in several environments using recommended production practices. Varieties are evaluated for yield, test weight, maturity, height, and other characteristics that may arise in a given season.

Yield integrates a number of factors that affect the potential performance of a variety. However, yield data from one test does not tell the entire story. A variety may yield well in a year with a cool, wet summer but be unsuited for Kansas in most years. Using information from a number of tests minimizes the possibility of choosing an unsuitable variety.

Examining other information about a variety in addition to yield provides a more complete picture of its potential performance. Bloom date is a consistent trait that indicates the relative maturity of a variety and its potential for maturing early enough to fill grain before the hot, dry weather of summer. Test weight evaluates the ability of a variety to fill seed under harsh summer conditions and often is related to maturity. Height is another consistent trait that may be related to maturity. Shorter varieties tend to be early maturing and able to produce and fill grain before temperature and moisture stresses become extreme. Taller varieties tend to mature later and are usually better adapted to the northern states.

Performance test summaries

The tables included on this publication present test results for 2001 and 2002. Only Colby could be planted in 2001 because wet soils prevented planting at the other locations. In 2002, the tests at Hutchinson and Colby had to be abandoned because of hail and drought, respectively. Spring wheat and spring-planted winter wheat tests were planted in conjunction with the oat test at Colby in 2001.

Kraig Roozeboom, Manhattan (Senior Author)
Patrick Evans, Colby
W. Barney Gordon, Belleville
Keith Janssen, Ottawa

Note: Trade names are used to identify products. No endorsement is intended nor is any criticism implied of similar products not named

Contribution number 03-263-S of the Kansas Agricultural Experiment Station.

2001 and 2002 Kansas Spring Oat Performance Tests.*

	Yield (bu/a)				Yield (% average)					Grain moisture (%)				Test weight (lb/bu)			
Variety	**Ott.**	**Bell.**	**Colby**	**Avg**	**Ott.**	**Bell.**	**Colby**	**Avg**	**Variety**	**Ott.**	**Bell.**	**Colby**	**Avg**	**Ott.**	**Bell.**	**Colby**	**Avg**
INO9201	89	71	59	73	150	127	110	129	INO9201	11	13	8	10	28	34	30	31
Blaze	83	71	57	70	139	127	105	124	Blaze	11	13	9	11	28	34	30	31
Jim	77	70	60	69	130	126	110	122	Jim	11	12	9	11	27	35	31	31
Jay	84	58	59	67	141	104	109	118	Jay	11	13	9	11	29	35	30	31
Dane	62	71	61	65	105	128	113	115	Dane	10	13	8	10	25	32	28	28
Don	59	74	57	64	99	134	105	113	Don	11	13	8	10	28	35	31	31
Chaps	75	51	58	61	125	92	107	108	Chaps	11	13	8	11	28	33	28	30
Rio Grande	66	62	55	61	110	112	101	108	Rio Grande	9	12	8	10	22	32	25	26
Armor	52	69	53	58	88	125	99	104	Armor	10	13	9	11	22	34	28	28
Riser	50	67	57	58	84	120	105	103	Riser	11	12	8	10	30	34	32	32
Jerry	61	61	50	57	102	109	93	101	Jerry	11	13	9	11	30	35	30	31
Moraine	53	63	50	56	89	113	93	99	Moraine	11	13	9	11	26	35	28	30
Classic	70	43	53	55	118	77	97	97	Classic	10	15	8	11	25	32	29	28
Rodeo	54	51	54	53	90	93	100	94	Rodeo	11	14	8	11	24	32	28	28
Bates	46	54	57	53	77	98	106	94	Bates	10	13	8	10	28	35	31	31
Gem	60	47	47	51	100	84	86	90	Gem	11	15	8	11	26	32	28	29
Ogle	56	23	60	46	94	41	111	82	Ogle	10	15	7	11	24	30	28	27
Powell	41	49	47	45	68	88	86	81	Powell	10	14	8	11	20	30	23	24
Monida	30	36	42	36	50	65	78	64	Monida	8	19	9	12	20	23	26	23
Russell	24	21	46	30	39	37	84	54	Russell	11	15	8	11	25	29	28	27
Average	60	56	54	56	60	56	54	56	Average	10	14	8	11	26	33	28	29
CV (%)	11	8	8	9	11	8	8	9	CV (%)	4	6	12	7	4	4	4	4
LSD (0.05)**	9	6	6	4	15	11	11	7	LSD (0.05)**	1	1	NS	1	2	2	2	1

2001 Colby Spring Wheat.

Variety	Yield (bu/a)	Yield (%avg)	Moist (%)	TW (lb/bu)	Head date	Ht (in)
Oxen	29	106	8	51	153	29
GM40019	28	105	8	50	153	26
2375	28	105	9	52	151	31
Ingot	27	100	8	51	152	36
GM40020	27	99	8	50	152	27
Forge	26	98	8	47	152	34
GM40002 Exp	26	97	9	54	151	28
Russ	26	95	8	48	154	34
Pristine	26	95	7	47	152	30
Average	27	27	8	50	152	30
CV (%)	6	6	7	7	0	4
LSD (0.05)**	2	9	1	5	1	2

2001 Colby Spring Planted Winter Wheat.

Variety	Yield (bu/a)	Yield (%avg)	Moist (%)	TW (lb/bu)	Head date	Ht (in)
Jagger	42	207	8	45	161	27
(W) Heyne	30	147	17	41	166	24
TAM 202	30	145	14	45	162	25
Custer	0	0	0	0	0	0
Karl 92	0	0	0	0	0	0
Average	20	20	13	44	163	25
CV (%)	14	14	31	8	1	5
LSD (0.05)**	4	22	7	6	2	2

2001 and 2002 Kansas Spring Oat Performance Tests.*

	Head date			Height (in)				Lodging (%)		
Variety	Ott.	Colby	Avg	Ott.	Bell.	Colby	Avg	Ott.	Colby	Avg
INO9201	148	154	151	40	30	31	34	0	0	0
Blaze	151	157	154	42	32	31	35	6	0	3
Jim	149	154	151	43	29	31	35	1	0	1
Jay	154	157	156	41	28	28	32	0	0	0
Dane	148	152	150	40	29	32	34	5	0	3
Don	146	152	149	40	28	29	32	38	3	20
Chaps	150	156	153	42	30	33	35	6	8	7
Rio Grande	152	158	155	42	29	27	33	31	3	17
Armor	153	159	156	42	31	30	34	13	0	6
Riser	141	152	146	42	27	31	33	40	3	21
Jerry	153	157	155	45	33	33	37	6	6	6
Moraine	151	157	154	44	32	33	36	38	13	25
Classic	152	156	154	43	32	32	35	0	0	0
Rodeo	152	158	155	42	31	31	34	1	0	1
Bates	144	152	148	40	27	30	32	26	0	13
Gem	155	160	158	43	33	33	36	2	3	2
Ogle	153	157	155	42	30	32	34	1	5	3
Powell	157	162	160	41	28	25	31	73	0	36
Monida	156	163	159	44	30	29	34	85	14	49
Russell	156	159	158	43	30	31	35	2	8	5
Average	151	157	154	42	30	30	34	19	3	11
CV (%)	0	0	0	4	5	4	4	65	154	84
LSD (0.05)**	1	1	1	2	2	2	1	17	7	9

*Test Locations

Ott. = Ottawa, East Central Experiment Field, 2002. Planted 2/14. Good moisture and seedbed, good stands; relatively cool until June 15, then hot; barley yellow dwarf virus evident. Harvested 7/8

Bell. = Belleville, North Central Experiment Field, 2002. Planted 3/4. Cool soils delayed emergence until late March; only Russell and Ogle had poor final stands; dry with the exception of rains in mid-May and early June. Harvested 7/5

Colby = Northwest Research-Extension Center, 2001. Planted 3/21. Wet conditions at planting, but good stands were established. Winter wheat did not appear to vernalize very well. Harvested 7/12.

**Unless two varieties differ by more than the LSD, little confidence can be placed in one being superior to the other.