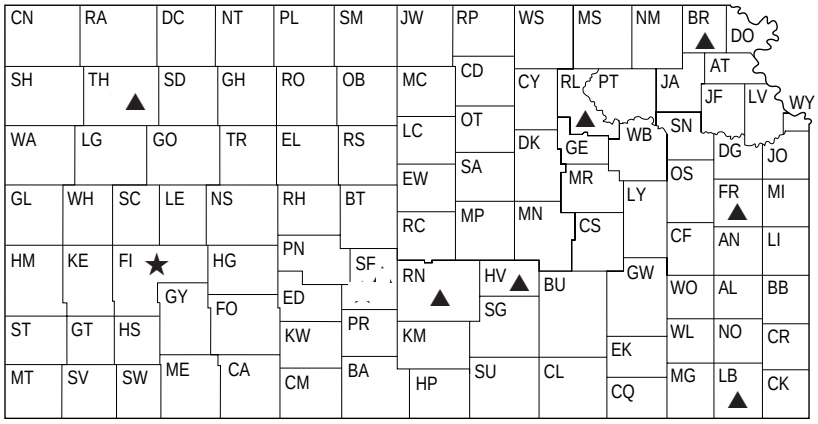
1994

KANSAS PERFORMANCE TESTS WITH

SPRING OAT VARIETIES



Report of Progress 714

Agricultural Experiment Station * Kansas State University, Manhattan * Marc A. Johnson, Director

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Contribution No. 95-74-S from the Kansas Agricultural Experiment Station

1994 KANSAS PERFORMANCE TESTS WITH SPRING OAT VARIETIES

INTRODUCTION

The number of acres utilized for spring oats production is small in comparison to the acreage used for the major crops in Kansas. However, this does not limit the potential importance of spring oats on individual producer's farms. Spring oats often are used in crop rotations or when winter wheat acreage is restricted or winter-damaged. Either grain or forage production from spring oats can make a significant contribution to a crop or livestock enterprise.

Spring oat production figures for 1994 and preceding years are given in Table 1. Oat production for 1994 was substantially higher than the very low 1993 production which was limited by adverse weather conditions. Only 43% of the planted acreage was harvested in 1993, and yields were 13 bushels below the long-term average. In 1994, many more acres were sown and harvested, and yields were slightly higher than the long-term average.

Table 1. Acreage, yield, and total production of spring oats in Kansas, 1975-1994 (Crops Report; Kansas Agricultural Statistics, August 11, 1994).

	Total Acres (1,000's)		Yield	Total Production
Year	Sown	Harvested	bu/acre	1,000 bu
1994	160	120	48	5,760
1993	70	30	34	1,020
1992	200	140	56	7,840
1991	160	110	53	5,830
1990	160	120	55	6,600
1975-89	213	153	46	7,040
1975-94	197	141	47	6,633

1994 PERFORMANCE TESTS

The Kansas Agricultural Experiment Station conducts trials of various crops at several locations throughout the state to provide agronomic information on new and established varieties and hybrids under current growing conditions. Table 2 lists the oat varieties included in 1994 Kansas tests. Because very few oat varieties are developed by private companies, most of the varieties in the tests have been developed and released by public universities or agricultural experiment stations.

Table 2. Spring oat varieties grown in 1994 Kansas performance tests.

Variety	State/ Company	Year Released	Variety	State	Year Released
Armor	OH	1991	Horicon	WI	1990
Bates*	MO	1977	Larry*	IL	1980
Brawn	IL	1993	Ogle*	IL	1980
Dane	WI	1990	Prairie	WI	1992
Don*	IL	1985	Premier*	MN	1990
Eli	Paramount		Settler*	SD	1989
Hazel	IL	1985	Starter*	MN	1986

* Certified seed produced in Kansas in 1994.

Spring oat tests have been conducted at various locations for several years. Locations of 1994 spring oat test sites are shown on the map on the front cover. The Greeley County test near Tribune had to be discarded because of freeze damage in late April. Site descriptions, management practices, and growing conditions for the remaining eight test sites are summarized in Table 3. The location codes listed in parentheses after each location name are used as column headers in the data tables.

Performance of specific varieties can best be determined by examining Tables 4 through 8. The information in these tables is derived from replicated varietal comparisons at the sites listed in Table 3. Yields are reported in Table 4 as bushels per acre (32 pounds per bushel) adjusted to a moisture content of 12.5 percent and as percentages of the test averages to speed recognition of highest yielding entries (more than 100%, the test average).

Table 6 provides yield performance of most entries over several years at the different testing locations. Measurements of characteristics often contributing to yield performance are shown in Table 5 (test weights and harvest moisture), Table 7 (maturity differences), and Table 8 (lodging and shattering for locations where varietal differences in these characters were noted).

Table 3. Oat Performance Test site descriptions, management, and conditions in 1994.

County and	Site, nearest town,	Dates of planting &	Soil type and	Fertilizers applied, lbs/a			
BROWN	Cornbelt Expt Field	3/17	Grundy silty clay loam	40	---	---	90 lb/a
Brian Marsh	Powhattan (BR)	7/12	Soybean, 1993				8" row spacing
Conditions:	good soil moisture at planting, hot and dry during grain fill						
RILEY	Agronomy North Farm	3/11	Smolan silt loam	50	25	---	64 lb/a
K. Roozeboom	Manhattan (RL)	7/1	Soybeans, 1993				10" row spacing
Conditions:	good seedbed with adequate moisture, little disease, hot just before harvest						
FRANKLIN	EC KS Expt Field	3/16	Woodson silt loam	60	---	---	60 lb/a
Keith Janssen	Ottawa (FR)	7/1	Soybean, 1993				7" row spacing
Conditions:	very wet early in the season, some barley yellow dwarf						
LABETTE	SE KS Ag. Res. Ctr.	3/17	Parsons silt loam	60	---	---	80 lb/a
Jim Long	Parsons (LB)	6/29	Soybeans, 1993				7" row spacing
Conditions:	first planted on February 17, replanted in March because of heavy rains						
HARVEY	Harvey Co Expt Fld	3/4	Ladysmith silty clay loam	90	32	---	60 lb/a (approx.)
Mark Claassen	Hesston (HV)	6/30	Oats, 1993				7" row spacing
Conditions:	dry in March, record low temperatures in April, good rains in April, hot and dry in late May and June						
RENO	SC KS Expt Field	2/17	Ost silt loam	100	40	---	64 lb/a
William Heer	Hutchinson (RN)	6/27	Wheat, 1993		---	---	8" row spacing
Conditions:	dry in early spring, cool in March and April, good rains in April						
THOMAS	NW KS Res-Ext Ctr	3/4	Keith silt loam	35	---	---	65 lb/a
Pat Evans	Colby (TH)	7/11	Barley, 1992				12" row spacing
Conditions:	adequate moisture resulted in good stands, but dry until just before harvest, which was delayed by rain						
FINNEY Irr	SW KS Res-Ext Ctr	3/4	Keith silt loam	45	---	---	70 lb/a
Merle Witt	Garden City Unit (FN)	6/29	Wheat, 1993				10" row spacing
Conditions:	dry during most of season, irrigated in mid-May, hot during June grain fill period, little or no damage from insects or diseases						

At the bottom of each column of replicated data in the various tables is the L.S.D. (Least Significant Difference). Unless two varieties differ by more than the L.S.D. given, little confidence can be placed in one being superior to the other. The use of the L.S.D. is intended to reduce the chance of overemphasizing small differences in yield or other characteristics. Small variations in soil structure, fertility, water-holding characteristics, and other test-site characteristics can cause considerable yield variation among plots of the same variety grown only a short distance apart.

Another statistical parameter is the coefficient of variation (C.V.) shown at the bottom of most columns. This figure, if properly interpreted, can be used to estimate the degree of confidence one may have in the data presented. In this testing program, C.V.'s below 10% generally indicate reliable, uniform data, whereas C.V.'s from 11 to 15% usually indicate less desirable but generally useful data for the rough performance comparisons desired from these tests.

Excerpts from the UNIVERSITY RESEARCH POLICY AGREEMENT WITH COOPERATING SEED COMPANIES*

Permission is hereby given to Kansas State University to test our varieties and/or hybrids designated on the attached entry forms in the manner indicated on the test announcement. I understand that all results from Kansas crop performance tests belong to the University and to the public and shall be controlled by the University so as to produce the greatest benefit to the public. It is further agreed that the name of the University shall not be used by the company in any commercial advertising either in regard to this agreement or any other related matter.

* This agreement must be signed by an authorized individual before results involving the company's entries can be published by the Experiment Station. Except for the limitation that the name "KANSAS STATE UNIVERSITY" cannot be used in advertising (you may use something like "official state tests" or "state yield trials"), this does not preclude the use of data for advertising, if done in a fair manner.

Table 4. Yield from 1994 Kansas Spring Oat Performance Tests.

Cultivar	Test Location									Test Location								
	BR	RL	FR	LB	HV	RN	TH	FN	Avg.	BR	RL	FR	LB	HV	RN	TH	FN	Avg.
	bushels per acre at 12% moisture									percent of test average								
Armor	53	65	41	49	58	53	57	75	57	92	103	86	106	94	96	107	88	97
Bates	53	62	45	49	73	64	56	91	62	92	99	95	106	119	115	104	107	105
Brawn	54	67	52	38	54	69	57	72	58	93	106	108	81	88	124	107	84	99
Dane	66	70	48	48	58	45	51	90	59	114	111	100	105	94	80	95	106	101
Don	74	77	62	45	71	69	55	100	69	127	123	129	96	115	124	103	118	117
Eli	--	--	32	--	--	--	32	--	32	--	--	67	--	--	--	60	--	63
Hazel	55	52	42	44	55	61	57	82	56	94	83	88	94	90	110	107	96	95
Horicon	55	55	43	38	56	50	50	82	54	96	87	90	82	90	89	94	97	91
Larry	52	65	50	59	74	48	60	89	62	89	103	104	128	121	86	112	105	106
Ogle	48	58	52	37	65	58	62	81	58	82	92	109	79	105	104	116	95	98
Prairie	59	62	53	47	58	67	65	78	61	102	98	111	101	94	121	122	92	105
Premier	60	63	51	52	62	53	53	94	61	103	100	106	113	101	95	100	110	103
Settler	59	57	44	49	63	55	46	75	56	103	90	92	106	102	99	85	88	96
Starter	65	66	55	48	55	33	48	96	58	113	105	114	103	89	58	89	113	98
Test Avg.	58	63	48	46	62	56	54	85	57	100	100	100	100	100	100	100	100	100
CV (%)	8	5	12	11	5	10	8	8	8	8	5	12	11	5	10	8	8	8
LSD (.05)**	5	4	8	7	4	7	5	8	3	9	6	16	15	6	12	9	10	5

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

Table 5. Test weight and moisture from 1994 Kansas Spring Oat Performance Tests.

Cultivar	Test Location									Test Location								
	BR	RL	FR	LB	HV	RN	TH	FN	Avg.	BR	RL	FR	LB	HV	RN	TH	FN	Avg.
	test weight, pounds per bushel									% moisture								
Armor	30	31	32	27	30	31	34	29	31	11	13	15	11	9	11	10	12	12
Bates	34	32	36	28	33	35	36	34	33	10	12	13	10	9	9	10	9	10
Brawn	29	29	33	26	28	31	32	28	29	10	14	13	9	9	10	10	10	11
Dane	28	29	33	25	28	31	32	30	30	10	13	12	10	9	10	9	9	10
Don	33	34	36	28	33	35	36	33	34	11	12	12	9	9	9	9	9	10
Eli	--	--	36	--	--	--	36	--	36	--	--	13	--	--	--	10	--	12
Hazel	30	32	34	28	31	33	34	32	32	10	14	12	10	9	10	9	10	11
Horicon	31	29	35	25	30	30	33	31	30	11	13	13	10	9	11	10	10	11
Larry	30	32	34	28	31	33	34	32	32	10	12	11	10	9	12	10	9	10
Ogle	29	30	34	26	30	31	34	30	31	10	13	12	10	9	11	10	10	10
Prairie	29	31	33	28	30	31	34	28	31	11	13	12	10	10	11	10	12	11
Premier	34	32	37	27	31	34	37	35	34	11	14	13	10	9	11	10	10	11
Settler	32	32	35	28	33	33	34	32	32	11	14	12	11	9	10	10	10	11
Starter	35	34	36	29	33	30	36	35	33	10	13	11	10	9	13	10	9	11
Test Avg.	31	31	35	27	31	32	34	32	32	10	13	12	10	9	11	10	10	11
CV (%)	2	3	2	8	5	3	3	2	4	1	3	5	6	3	15	2	6	7
LSD (.05)**	1	1	1	3	2	1	1	1	1	0	1	1	1	0	2	0	1	0

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

Table 6. Period-of-years yield averages (bushels per acre) from 1994 Kansas Spring Oat Performance Tests.

	Brown[1]			Riley[2]	Franklin[3]			Labette[4]		
	2yr.	3yr.	4yr.	2yr.	2yr.	3yr.	4yr.	2yr.	3yr.	4yr.
Cultivar	avg.	avg.	avg.	avg.	avg.	avg.	avg.	avg.	avg.	avg.
Armor	76	--	--	--	69	--	--	45	48	--
Bates	61	66	78	61	61	63	63	60	58	60
Dane	76	78	87	64	68	70	--	55	64	67
Don	78	83	90	75	71	71	65	44	47	46
Hazel	66	66	73	53	66	65	59	27	36	40
Horicon	70	68	75	49	67	65	--	40	53	50
Larry	63	66	70	65	63	67	63	45	53	53
Ogle	65	69	78	62	76	76	72	44	53	54
Premier	64	67	75	54	64	63	--	46	52	52
Starter	71	68	74	55	68	66	62	36	44	48
Test Avg.	69	70	78	60	67	68	64	44	51	52

Table 6. (continued).

	Harvey[1]			Reno[4]			Thomas[1]			Finney[4]		
	2yr.	3yr.	4yr.	2yr.	3yr.	4yr.	2yr.	3yr.	4yr.	2yr.	3yr.	4yr.
Cultivar	avg.	avg.	avg.	avg.	avg.	avg.	avg.	avg.	avg.	avg.	avg.	avg.
Armor	71	--	--	52	--	--	60	--	--	77	90	--
Bates	79	69	69	58	62	61	69	80	78	82	89	89
Dane	45	46	50	53	56	60	57	64	--	86	81	87
Don	65	59	60	62	61	60	58	73	74	91	98	96
Hazel	54	50	51	56	61	61	--	--	--	76	81	82
Horicon	59	54	53	50	57	58	57	72	72	77	82	82
Larry	66	59	56	50	53	53	66	74	76	80	84	82
Ogle	64	57	57	60	61	62	66	81	81	73	84	80
Premier	71	63	59	48	52	52	57	67	68	83	94	90
Starter	56	54	50	34	39	42	--	--	--	80	81	80
Test Avg.	63	57	56	52	56	56	61	73	75	80	86	85

[1] Includes data from 1990, 1991, 1992, and 1994.

[2] Includes data from 1991 and 1994.

[3] Includes data from 1989, 1991, 1992, and 1994.

[4] Includes data from 1991, 1992, 1993, 1994.

Table 7. Maturity and height from 1994 Kansas Spring Oat Performance Tests.

Cultivar	Test Location									Test Location							
	BR	RL	FR	LB	HV	RN	TH	FN	Avg.	BR	FR	LB	HV	RN	TH	FN	Avg.
	maturity, days earlier or later heading than Bates									height, inches							
Armor	4	7	4	4	5	7	5	7	5	34	31	33	29	34	29	34	32
Bates	5/30	5/23	5/29	5/28	5/23	5/22	5/29	5/26	5/26	33	30	32	31	38	24	32	31
Brawn	4	6	4	5	5	4	4	6	5	32	27	28	24	32	24	29	28
Dane	-1	0	0	0	0	2	0	2	0	33	29	34	30	35	25	33	31
Don	0	-1	0	1	1	1	-1	1	0	33	29	30	30	37	23	33	31
Eli	--	--	1	--	--	--	2	--	2	--	32	--	--	--	29	--	31
Hazel	2	4	2	3	3	3	1	3	3	33	28	28	27	32	23	30	29
Horicon	2	6	2	4	2	3	4	3	3	34	30	32	29	34	27	33	31
Larry	0	1	0	1	-1	1	0	1	0	31	28	30	29	33	25	30	29
Ogle	3	5	2	4	4	4	3	5	4	36	30	30	28	33	27	32	31
Prairie	4	7	3	5	7	5	5	7	5	33	31	32	28	33	27	34	31
Premier	3	5	3	3	3	5	1	2	3	34	31	32	31	35	26	34	32
Settler	3	7	3	4	2	5	4	3	4	34	33	34	31	39	29	34	33
Starter	-2	1	0	0	0	2	1	2	1	33	30	33	31	33	26	33	31
Test Avg.	2	4	2	2	2	3	2	3	3	33	30	31	29	34	26	32	31
CV (%)	2	2	2	3	2	5	2	3	3	6	4	6	3	3	4	5	5
LSD (.05)**	1	1	1	1	1	1	1	1	0	2	1	3	1	1	1	2	1

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

Table 8. Lodging and shattering from 1994 Kansas Spring Oat Performance Tests.

Cultivar	Test Location						Test Location		
	BR	LB	HV	RN	TH	Avg.	HV	TH	Avg.
	lodging, %						shattering, %		
Armor	2	2	2	6	3	3	0	2	1
Bates	8	7	16	30	8	14	1	2	2
Brawn	2	0	0	0	0	0	0	1	1
Dane	3	1	12	0	0	3	2	2	2
Don	11	3	3	8	10	7	1	2	2
Eli	--	--	--	--	5	5	0	3	2
Hazel	5	1	0	0	5	2	0	2	1
Horicon	3	1	6	5	0	3	1	1	1
Larry	18	1	3	1	0	5	3	1	2
Ogle	2	0	2	0	0	1	0	1	1
Prairie	2	2	0	0	0	1	0	2	1
Premier	4	4	14	4	13	8	1	4	3
Settler	55	3	5	3	13	16	1	2	2
Starter	25	2	4	0	8	8	1	2	2
Test Avg.	11	2	5	4	4	5	1	2	2
CV (%)	86	101	64	311	73	144	83	50	64
LSD (.05)**	11	3	4	16	4	5	1	1	1

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

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

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SRP714 September 1994