

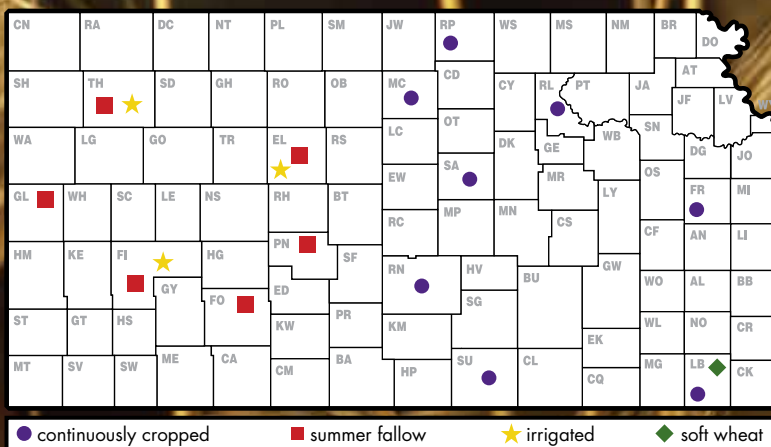
# 2010

## Kansas Performance Tests with Winter Wheat Varieties

Report of Progress 1036



Kansas State University  
Agricultural Experiment Station  
and Cooperative Extension Service



## CONTENTS

<b>2010 WHEAT CROP REVIEW</b> .....	1
Weather and Crop Development, Diseases, Insects, Harvest Statistics, Acreage Distribution	
<b>2010 PERFORMANCE TESTS</b> .....	2
Varieties, Environmental Factors, Results and Variety Characterization, Entrants Table	
Comparisons of Leading Winter Wheat Varieties Table 2.....	4
Site Descriptions and Management Table 3.....	5
Southeast Dryland Tests Table 4.....	6
Southeast Soft Tests Table 5.....	7
North Central Dryland Tests Table 6.....	8
South Central Dryland Tests Table 7.....	9
Northwest Dryland Tests Table 8.....	10
Southwest Dryland Tests Table 9.....	11
Irrigated Tests Table 10.....	12
Planted Seed Characteristics and Hessian Fly Ratings Table 11.....	13
<b>National Winter Canola Variety Trial*</b> .....	14
Objectives, Procedures, Growing Conditions	
Seed Sources for Entries Table 1.....	15
Weather Data and Summaries	
Clearwater, Kansas Table 2.....	16
Marquette, Kansas Table 3.....	16
Garden City, Kansas Table 4.....	17
Hutchinson, Kansas Table 5.....	18
Manhattan, Kansas Table 6.....	19

\*Excerpts from the 2010 National Winter Canola Variety Trial, Report of Progress 1044, Kansas State University Agricultural Experiment Station and Cooperative Extension Service (to be published in winter 2010-2011).

## 2010 WHEAT CROP REVIEW

### Weather and Crop Development

Seeding of wheat acres for the 2009-2010 growing season progressed slowly during the fall because of widespread rains and later snow. It was not until the week of December 6 that planting was reported to be 99% complete. Many fields, particularly in southeast Kansas, were never able to be planted to wheat because of wet soils. The increased precipitation continued into late December but came in the form of snow; however, drifting caused by low temperatures and high winds meant that some wheat fields were left bare. A few weeks of unseasonably warm weather in March broke dormancy in many areas. The wheat crop progressed quickly until the season was delayed again by extensive rains in April and May. Disease pressure from powdery mildew, leaf and stripe rust, and barley yellow dwarf became a concern as rains and moderate temperatures continued into June. The wheat crop also declined in quality during this time from a high of 73% rated as good or excellent at the end of April to only 56% with the same rating as harvest neared completion. (*Crop Progress and Conditions* report, Kansas Agricultural Statistics)

### Diseases

Wheat diseases were an important factor influencing wheat production in Kansas this year. Moderate temperatures and frequent precipitation in May favored the development of several diseases. The most important diseases in 2010 included stripe rust, *Septoria tritici* blotch, barley yellow dwarf, and *Fusarium* head blight.

Stripe rust caused significant yield losses throughout the state. The population of the fungus that causes stripe rust changed this year, rendering the genetic resistance of many varieties ineffective. Many popular varieties were vulnerable to the new population of stripe rust including Fuller, PostRock, Art, Santa Fe, and Jagalene. All of these varieties derived their stripe rust resistance from the variety Jagger, which has been widely used as a parent in the Great Plains region.

Barley yellow dwarf was also very common in central Kansas this year. Symptoms of barley yellow dwarf did not become readily apparent until later than normal this year, suggesting that moderate temperatures may have slowed progress of this disease.

*Septoria tritici* blotch (speckled leaf blotch) was a persistent problem in northwestern Kansas, and *Fusarium* head blight caused moderate damage in the northeastern region of the state. (Erick De Wolf and Bill Bockus, Kansas State University Plant Pathologists)

### Insects

The 2009-2010 wheat crop had relatively few insect problems. There were some issues with grasshoppers in the fall, especially in the early planted fields. Insecticide seed treatments provide some protection against grasshopper feeding, but as for most wheat pests, planting after the "best pest management planting date" (formerly the Hessian fly-free date) usually avoids this feeding damage.

Hessian fly infestations continue to cause some losses around the state, but there were no large outbreaks last season; that was also the case of bird cherry oat aphids. Aphid populations were relatively common and scattered throughout the state but were of little concern, except for the fact that they can transmit the viruses that cause barley yellow dwarf, and we did see some instances of infection by this disease. (Jeff Whitworth, Kansas State University Extension Entomologist)

### Harvest Statistics

The Kansas Agricultural Statistics June 10 estimate of the 2010 crop was 352.6 million bushels from 8.2 million acres with a 43 bushel/acre yield average, up 1 bushel from last year's final yield. (June 10, 2010, *Crops* report, Kansas Agricultural Statistics)

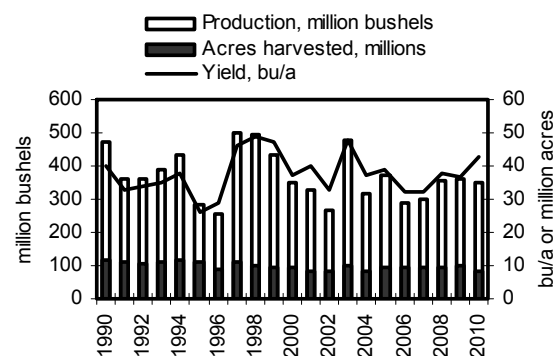


Figure 1. Historical Kansas wheat production

Fuller became the leading variety of wheat seeded in Kansas. It accounted for 12% of the state's wheat and was the most popular variety in three of the nine districts. TAM 111 was the second most seeded variety, accounting for 10% of the acres in the western third of the state. Postrock and Overely occupied the third and fourth spots, respectively.

Santa Fe came in fifth, with 7% of the acreage. Jagger fell to the seventh spot of the most common wheat varieties in Kansas; this is the first time in 13 years that it has not been in the top five. (February 10, 2010, *Wheat Variety*, Kansas Agricultural Statistics)

## Acreage Distribution

TAM 111 18 (13) Postrock 11 Fuller 10 Jagalene 10 (14) Jagger 8 (12)	Postrock 16 (15) Fuller 11 (7) Santa Fe 8 (10) Art 6 Jagger 4 (7)	Santa Fe 38 (46) Art 11 Fuller 11 (7) Karl/Karl 92 8 Postrock 5 (6)
TAM 111 25 (18) TAM 112 11 (8) Jagalene 10 (22) T81 8 (9) Hatcher 6 (5)	Fuller 17 Santa Fe 14 (15) Postrock 12 Art 11 Overley 8 (19)	Santa Fe 18 (13) 2137 13 (7) Fuller 12 (9) Overley 6 Postrock 5 (33)
TAM 111 23 (25) Jagalene 14 (21) TAM 112 9 (5) Danby 8 Jagger 8 (10)	Fuller 19 Overley 17 (26) Santa Fe 11 (14) Art 7 (10) Postrock 6 (5)	Fuller 17 (12) Overley 17 (23) Santa Fe 16 (17) Pioneer 25R47 11 2174 9

**Figure 2. Leading wheat varieties in Kansas  
Percentage of seeded acreage for 2010 and (2009) crops**

## 2010 PERFORMANCE TESTS

The Kansas Agricultural Experiment Station annually compares both new and currently grown varieties in the state's major crop-producing areas. These performance tests generate unbiased performance information designed to help Kansas growers select wheat varieties suited for their area and conditions.

Site descriptions and management practices for each site are summarized in Table 3. One-year or one-location results can be misleading because of the possibility of unusual weather or pest conditions.

### Varieties

Public varieties are selected for inclusion in the tests on the basis of several criteria. Most represent new or established varieties with potential for successful use in Kansas. Some are included as long-term checks. Others are entered at the request of the originating institution.

Originators or marketers enter privately developed varieties on a voluntary basis. Entrants choose both the entries and test sites. The 2010 private entrants are listed in Table 1. Eleven entrants provided a total of 36 varieties for testing.

Table 11 describes the characteristics of seed submitted for testing. Seed quality-including factors such as size, purity, and germination-can be important in determining the performance of a variety. Wheat seed used for entries in the Kansas Crop Performance Tests is prepared professionally and usually meets or exceeds Kansas Crop Improvement Certification standards.

Performance of a given variety similar to that obtained in these tests is best assured under similar environmental and cultural conditions and with the use of certified or professionally prepared seed.

### Environmental Factors

Leaf and stripe rust were determining factors in many of the tests this year. The Larned dryland and Colby irrigated tests were both sprayed with a fungicide at heading, which consequently affected the performance of the varieties susceptible to leaf and stripe rust. **Be sure to keep extenuating environmental conditions in mind when examining test results.**

### Results and Variety Characterization

Results from Kansas tests are presented in Tables 4 through 10. Yields are reported as bushels per acre (60 lb/bu) adjusted to a moisture content of 13%, where moistures were reported at harvest. Yields also are converted to percentages of the test average to speed recognition of highest-yielding entries. Multiyear averages are presented for those varieties entered more than 1 year.

Additional information such as test weight, heading date, and plant height is helpful for fine-tuning variety comparisons. Planting varieties with a range of maturities helps minimize weather risks.

At the bottom of each table is the (0.05) LSD (least significant difference) for each column of replicated data. One can think of the LSD as a "margin of error" that shows how big the difference between two varieties must be for one to be 95% confident that the difference is real. The use of the LSD is intended to reduce the chance of overemphasizing small differences. Small variations in soil structure, fertility, water-holding characteristics, and other test-site characteristics can cause considerable yield variation among plots of one variety.

**Table 1. Private entrants in the 2010 Kansas wheat performance tests**

---

<b>AgriPro Wheat, Inc.</b> AgriPro Wheat, Inc. 11783 Ascher Rd. Junction City, KS 66441 785-210-0218	<b>Ehmke Seed</b> 74 W. Road 130 Healy, KS 67850 620-397-2766	<b>MFA</b> MFA Incorporated 201 Ray Young Dr. Columbia, MO 65201 573-876-5363	<b>Syngenta</b> 778 CR 680 Bay, AR 72411 870-483-7691
<b>AGSECO, Inc.</b> AGSECO, Inc. PO Box 7 Girard, KS 66743-0007 620-724-6223	<b>Horinek Brothers</b> HC 2 Box 36 Trenton, NE 69044 785-626-3608	<b>Pioneer Brand</b> Pioneer Hi-Bred Intl., Inc. 8100 South 15th Lincoln, NE 68512 800-258-5604	<b>Watley</b> Watley Seed PO Box 51 Spearman, TX 79081 806-659-3838
<b>Drussel</b> Drussel Seed and Supply 2197 W. Parallel Road Garden City, KS 67846 620-275-2359	<b>Kansas Wheat Alliance</b> 2005 Research Park Circle, Manhattan, KS 66502 785-477-3400	<b>Scott Seed Company</b> Box 1732 Hereford, TX 79045 806-364-3484	<b>WestBred</b> WestBred LLC 14604 S. Haven Rd. Haven, KS 67543 620-465-2675

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**Table 2. Comparisons of leading winter wheat varieties - agronomy and quality**

Variety <sup>1</sup>	% of Kansas seeded acreage 2010 <sup>1</sup>	Relative <sup>2</sup>											Resistance or tolerance to: <sup>5</sup>																
		Test weight	Straw strength	Maturity	Height <sup>3</sup>	Coleoptile		Shattering	Winter hardiness	Acid tolerance	Sprout tolerance	Protein content <sup>3</sup>	Relative milling and baking quality <sup>4</sup>	Soil-borne mosaic	Spindle streak mosaic	Wheat streak mosaic	Barley yellow dwarf	Leaf rust	Stem rust	Septoria						Powdery mildew	Head scab	Hessian fly	Russ. wheat aphid
						length	length													Leaf blotch	Glume blotch	Tan spot	Septoria tritici						
Fuller	11.8	5	4	2	5	5	2	3	I	3	3	AC	1	1	5	6	5	7	7	6	6	6	6	7	9	9			
TAM 111	9.9	3	2	4	6	2	2	7	MS	2	7	AC	8	8	7	7	8	1	3	5	--	6	6	7	5	9			
PostRock	8.0	2	2	3	5	--	3	3	MT	3	6	AC	2	5	7	7	5	7	7	8	7	5	8	7	--	9			
Overley	7.2	3	3	1	6	5	7	6	MT	2	3	EX	1	4	5	5	8	3	4	5	9	5	7	9	--	9			
Santa Fe	7.0	3	3	2	6	2	3	3	MT	--	5	AC	1	--	7	6	3	4	7	3	6	5	6	7	9	9			
Jagalene	5.3	3	3	2	4	6	4	5	MT	2	4	EX	2	3	5	7	9	2	9	4	--	7	9	8	--	9			
Jagger	5.1	4	4	1	5	6	5	6	T	3	3	EX*	2	4	5	7	9	5	7	3	6	4	7	7	9	9			
Art	4.6	--	2	2	5	--	--	--	--	--	--	AC	1	1	6	8	3	2	6	5	7	6	3	6	--	9			
TAM 112	3.4	2	5	2	5	2	2	5	T	--	3	AC	8	8	5	6	7	3	8	5	--	6	1	8	--	9			
T81	2.4	4	2	2	4	7	3	3	I	2	6	AC	8	4	8	6	8	3	3	7	7	6	3	5	--	9			
2137	1.8	4	1	3	5	7	5	3	T	2	7	AC	1	5	6	5	7	7	8	5	7	5	4	8	8	9			
Hatcher	1.7	5	6	3	5	2	3	2	MS	--	4	AC	7	8	8	8	7	4	4	5	--	5	5	6	--	9			
Danby+	1.5	3	4	3	6	5	2	2	MS	4	5	AC	7	--	5	8	8	2	8	6	--	8	7	7	9	9			
Endurance	1.4	--	--	--	--	--	--	--	--	--	--	--	2	8	7	5	5	7	5	5	--	7	5	6	--	9			
TAM 110	1.1	3	2	1	5	5	2	--	S	3	7	LD	9	9	5	8	9	4	8	6	6	7	1	8	9	9			
Shocker	0.8	3	2	1	5	5	5	6	MT	--	4	AC	1	2	8	7	4	4	7	4	--	6	5	8	--	9			
Duster	0.8	--	--	--	--	--	--	--	--	--	--	AC	1	1	7	4	3	7	3	7	--	7	3	9	--	9			
T136	0.6	4	3	1	3	7	2	6	I	3	--	AC	1	--	--	--	8	3	--	--	--	7	--	--	--	9			
TAM107	0.5	--	--	--	--	--	--	--	--	--	--	LD	8	7	5	8	9	3	8	5	6	6	1	7	9	9			
Smoky Hill	0.5	--	6	3	6	--	--	--	--	--	--	EX	1	--	8	8	5	6	9	4	--	4	6	8	9	9			
Winter Hawk	0.5	--	3	2	5	--	--	--	--	--	--	AC	1	1	7	5	7	8	2	7	--	7	6	7	9	9			
Karl/Karl 92	0.4	3	4	1	3	7	3	3	S	3	3	EX*	1	3	9	8	8	6	5	5	3	3	4	6	--	9			
Larned	0.4	4	5	4	9	3	3	3	S	3	4	AC	9	8	9	9	8	2	2	8	8	9	5	5	3	9			
Protection	0.4	4	3	2	7	--	--	6	I	--	5	AC	4	3	7	8	9	4	7	6	--	7	7	8	9	9			
Armour	0.3	4	2	2	2	--	--	--	--	--	--	--	1	1	6	6	5	4	3	6	7	5	2	7	--	9			
Ike	0.3	3	4	4	6	7	2	3	S	2	3	AC	1	5	9	6	9	3	6	7	6	8	6	6	4	9			
2174	0.3	3	1	3	4	5	3	4	I	1	3	AC	1	5	8	5	7	8	7	5	7	5	2	6	--	9			
OK Bullet	0.3	--	--	--	--	--	--	--	--	--	--	EX	4	4	6	6	8	7	6	6	--	5	7	7	--	9			
Aspen+	0.3	3	2	2	2	--	2	--	--	--	--	AC	1	1	6	8	6	4	3	5	--	6	2	6	--	9			
Centerfield	0.2	--	--	--	--	--	--	--	--	--	--	--	2	--	--	5	7	--	--	7	--	7	--	8	--	9			
Thunderbolt	0.2	2	--	3	7	6	6	--	MS	2	3	AC	8	8	6	7	7	8	5	6	--	7	7	7	--	9			
Cutter	0.2	4	4	3	5	5	5	3	T	3	4	AC	3	4	6	7	8	2	--	6	--	6	7	8	--	9			
Dominator	0.2	4	3	4	2	8	7	3	I	5	3	LD	1	4	7	6	9	4	6	5	4	5	4	7	--	9			
Dumas	0.2	--	--	--	--	--	--	--	--	--	--	AC	8	7	7	7	6	3	7	6	--	7	6	5	--	9			
Scout/S.66	0.2	--	--	--	--	--	--	--	--	--	--	LD	9	7	7	9	8	3	1	7	9	9	5	--	9	9			
Blends	11.6																												
Other White	0.1																												
Other Red	8.4																												
Other Soft	0.1																												

<sup>1</sup> Hard white variety Scale: 1=Best 9=Poor 1=Best 9=Poor 1=Early 9=Late 1=Short 9=Tall 1=Long 9=Short 1=Best 9=Poor 1=Best 9=Poor T=Toler S=Susc 1=Best 9=Poor 1=Best 9=Poor Scale: 1=Most resistant/tolerant 9=Least resistant/tolerant

<sup>2</sup> Varieties and percentage seeded acreage from the Feb. 13, 2009, wheat variety survey, Kansas Agricultural Statistics, Topeka, KS.

<sup>3</sup> Most ratings are estimates based on information and observations from many sources over several years. Agronomic information by Joe Martin - Hays and Allan Fritz, Jim Shroyer, and Steve Watson - K-State Agronomy.

<sup>4</sup> Summary of crop performance test results from recent years.

<sup>5</sup> Ratings from Rebecca Miller - K-State Wheat Quality Laboratory, using inputs from the U.S. Grain Marketing and Production Research Center and industry.

EX = Exceptional; large kernels; high protein content; very good milling, mixing, and commercial bread-baking.

LD = Less Desirable; one or more serious quality defects.

-- = Inadequate information or conflicting data.

AC = Acceptable; milling and baking attributes acceptable, but not outstanding, for all properties; may have minor defects.

\*Strong blending wheat; needed for blending with weaker wheats; may not be suitable alone for bread flour.

<sup>6</sup> Ratings by Allan Fritz - Manhattan, Joe Martin - Hays, Erick DeWolf and Bill Bockus - K-State Plant Pathology, Jeff Whitworth - K-State Entomology.

Final ratings and descriptions of disease and insect pests are available in "Wheat Variety Disease and Insect Ratings 2010," Publication MF-991 from Kansas State University.

<sup>7</sup> New Russian wheat aphid biotype is thought to be virulent on all currently available commercial varieties.

**Table 3. Wheat performance test site descriptions and management in 2010**

<b>Region and location</b>	<b>Soil type previous crop</b>	<b>N</b>	<b>P<sub>2</sub>O<sub>5</sub></b>	<b>K<sub>2</sub>O</b>	<b>Plant-harvest seed rate</b>	<b>Conditions</b>
<b><u>Northeast Dryland</u></b>						
Ashland Agronomy Farm Manhattan (MA)	Reading silt loam Soybean	--	--	--	Fall Abandoned 75 lb/a	Test was never planted because of wet fields.
<b><u>Southeast Dryland</u></b>						
East Central KS Experiment Field Ottawa (OT)	Woodson silt loam Soybean	--	--	--	Fall Abandoned 60 lb/a	Test was never planted because of wet fields.
Southeast Agricultural Research Center Parsons (PA)	Parsons silt loam Corn	60	30	30	Fall 11/6/2009-6/22/2010 75 lb/a	Planting was delayed by wet soils but test had excellent stand establishment.
<b><u>Soft Wheat</u></b>						
Southeast Agricultural Research Center Parsons (PA)	Parsons silt loam Corn	60	30	30	Fall 11/6/2009-6/22/2010 75 lb/a	Planting was delayed by wet soils but test had excellent stand establishment.
<b><u>North Central Dryland</u></b>						
North Central KS Experiment Field Belleville (BE)	Crete silt loam Soybean	100	30	--	Fall 9/30/2009-6/30/2010 90 lb/a	Growing season had increased precipitation; some wind damage in the spring.
North Central KS Farmer's Field Beloit (BL)	Harney silt loam Soybean	120	30	--	Fall 9/30/2009-6/24/2010 80 lb/a	Growing season had increased precipitation; some wind damage in the spring.
<b><u>South Central Dryland</u></b>						
South Central KS Experiment Field Hutchinson (HU)	Ost silt loam Soybean	75	40	--	Fall 10/5/2009-6/21/2010 60 lb/a	Growing season had plenty of moisture.
South Central KS Farmer's Field Caldwell (CS)	Sandy loam Soybean	30	--	--	Fall 10/6/2009-6/24/2010 60 lb/a	Good stand establishment; increased rainfall over the season.
<b><u>Northwest Fallow</u></b>						
Agricultural Research Center Hays (HA)	Harney silt loam Fallow	30	--	--	Fall 10/1/2009-6/24/2010 50 lb/a	Good stand establishment; cold and wet winter was followed by a cool and dry spring.
Northwest Research-Extension Center Colby (CO)	Keith silt loam Fallow	60	30	--	Fall 9/28/2009-7/2/2010 60 lb/a	Leaf and stripe rust affected susceptible varieties.
Southwest Research-Extension Center Tribune (TR)	Richfield silt loam Fallow	60	30	--	Fall 9/24/2009-7/1/2010 55 lb/a	Good stand establishment; stripe rust was present.
<b><u>Southwest Dryland/Fallow</u></b>						
Southwest KS Farmer's Field Larned (LA)	Harney clay loam Fallow	30	--	--	Fall 10/3/2009-6/26/2010 50 lb/a	Wind and hail damage 1 week before harvest; sprayed with Quilt during heading.
Southwest KS Farmer's Field Dodge City (DC)	Harney clay loam Fallow	60	--	--	Fall 10/7/2009-6/18/2010 45 lb/a	Leaf and stripe rust were severe on susceptible varieties.
Southwest Research-Extension Center Garden City (GC)	Keith silt loam Wheat	30	--	--	Fall 9/25/2009-7/1/2010 65 lb/a	Uniform emergence across study; above normal precipitation in the fall and winter.
<b><u>Irrigated</u></b>						
Northwest Research-Extension Center Colby (CO)	Keith silt loam Fallow	110	30	--	Fall 9/22/2009-6/28/2010 90 lb/a	Sprayed with Quilt during heading; 1 inch of irrigation during June.
Agricultural Research Center Hays (HA)	Harney clay loam Fallow	60	--	--	Fall 10/9/2009-6/24/2010 80 lb/a	1.5 inch of irrigation in May and June.
Southwest Research-Extension Center Garden City (GC)	Keith silt loam Soybean	100	--	--	Fall 9/30/2009-6/29/2010 75 lb/a	Double-cropped after soybeans; stands and emergence were uneven.

**Table 4. 2010 SOUTHEAST Kansas dryland winter wheat performance tests**

Brand / Name	OT <sup>1</sup> PA <sup>2</sup> Av.			OT PA Av.			-OT- 2yr 3yr		-PA- 2yr 3yr		OT PA Av.			OT PA Av.					
	yield (bu/a)			% of test average			multiyear av. (bu/a)				tw (lb/bu)		head (+/- Jagger)		height (in.)				
<b>AgriPro</b>																			
Art	--	47	47	--	102	102	67	49	46	46	--	55	55	--	1	1	--	33	33
CJ	--	53	53	--	115	115	--	--	--	--	--	55	55	--	-1	-1	--	34	34
JackPot	--	56	56	--	121	121	70	--	53	--	--	56	56	--	0	0	--	34	34
Postrock	--	38	38	--	81	81	--	--	--	--	--	55	55	--	4	4	--	32	32
<b>AGSECO</b>																			
Armour	--	54	54	--	116	116	69	51	50	50	--	54	54	--	0	0	--	31	31
Hitch	--	44	44	--	96	96	70	58	50	55	--	54	54	--	3	3	--	32	32
Santa Fe	--	42	42	--	92	92	70	46	42	46	--	54	54	--	1	1	--	33	33
Shocker	--	41	41	--	90	90	60	39	45	47	--	54	54	--	1	1	--	32	32
<b>Kansas</b>																			
2137	--	40	40	--	87	87	67	50	45	48	--	53	53	--	2	2	--	33	33
Everest	--	57	57	--	124	124	72	--	58	--	--	58	58	--	0	0	--	32	32
Fuller	--	39	39	--	85	85	66	47	46	47	--	53	53	--	0	0	--	33	33
Jagger	--	39	39	--	85	85	67	46	41	42	--	53	53	--	0	0	--	32	32
Overley	--	35	35	--	77	77	59	43	41	41	--	53	53	--	-1	-1	--	33	33
<b>Oklahoma</b>																			
Billings	--	50	50	--	109	109	--	--	--	--	--	57	57	--	0	0	--	32	32
Endurance	--	48	48	--	104	104	70	--	47	--	--	55	55	--	1	1	--	34	34
<b>WestBred</b>																			
HV9W03-1596R	--	51	51	--	110	110	--	--	--	--	--	55	55	--	-1	-1	--	33	33
HV9W03-696R-2	--	51	51	--	110	110	69	--	51	--	--	57	57	--	1	1	--	31	31
HV9W04-1594R	--	31	31	--	66	66	--	--	--	--	--	51	51	--	6	6	--	36	36
HV9W96-1383R	--	60	60	--	130	130	76	--	54	--	--	56	56	--	-2	-2	--	32	32
Stout	--	46	46	--	99	99	67	--	49	--	--	51	51	--	2	2	--	33	33
Averages	--	46	46	--	46	46	--	--	--	--	--	54	54	--	1	1	--	33	33
CV (%)	--	7	7	--	7	7	--	--	--	--	--	2	2	--	--	--	--	5	5
LSD (0.05)*	--	5	5	--	10	10	--	--	--	--	--	1	1	--	--	--	--	2	2

<sup>1</sup> OT = Ottawa, KS, East Central Kansas Experiment Field, Franklin County. Not planted in 2009 because of adverse field conditions.

<sup>2</sup> PA = Parsons, KS, Southeast Agricultural Research Center, Labette County.

(W) = Hard white wheat.

\* Least significant difference, similar to margin of error, indicates difference needed to overcome test error.



**Table 5. 2010 SOUTHEAST Kansas SOFT winter wheat performance tests**

Brand / Name	PA <sup>1</sup>	PA	-PA-		PA	PA	PA
	yield (bu/a)		% of test average	2yr			
<b>AgriPro</b>							
Art	40	87	43	--	54	1	31
JackPot	52	114	51	--	56	0	34
<b>Georgia</b>							
(S) 991209-6E33	49	107	60	--	55	1	32
(S) 991336-6E9	46	100	52	--	53	2	32
031238-7E34	49	108	--	--	53	4	27
<b>Kansas</b>							
2137	34	74	42	--	53	2	32
Fuller	37	82	--	--	54	0	33
Jagger	36	79	38	--	53	0	33
<b>MFA</b>							
(S) 2525	48	106	54	--	54	4	35
(S) 2631	49	107	--	--	55	0	34
<b>Pioneer</b>							
(S) 25R56	51	112	--	--	54	3	30
(S) 25R62	54	117	63	--	52	2	31
(S) 25R78	45	98	61	--	54	1	32
<b>Syngenta</b>							
(S) Coker 9553	42	93	53	--	53	1	32
(S) OAKES	53	117	--	--	56	3	32
Averages	46	46	--	--	54	2	32
CV (%)	8	8	--	--	1	--	5
LSD (0.05)*	6	12	--	--	1	--	2

1 PA = Parsons, KS, Southeast Agricultural Research Center, Labette County.

(S) = Soft red wheat.

\* Least significant difference, similar to margin of error, indicates difference needed to overcome test error.

**Table 6. 2010 NORTH CENTRAL Kansas dryland winter wheat performance tests**

Brand / Name	BE <sup>1</sup> BL <sup>2</sup> Av.			BE BL Av.			-BE- 2yr 3yr		-BL- 2yr 3yr		BE BL Av.			BE BL		BE BL Av.		
	yield (bu/a)			% of test average			multiyear av. (bu/a)				tw (lb/bu)			(+/- Jagger)		height (in.)		
<b>AgriPro</b>																		
00x0100-51	76	61	69	115	87	101	--	--	--	--	59	58	58	--	--	32	38	35
Art	69	77	73	104	109	107	93	90	84	79	59	57	58	--	--	33	38	36
CJ	71	77	74	107	109	108	--	--	--	--	58	58	58	--	--	34	41	38
Hawken	62	52	57	93	74	83	83	79	61	65	59	57	58	--	--	34	36	35
Jagalene	54	61	58	82	87	84	78	74	70	68	59	58	59	--	--	34	37	36
Postrock	73	71	72	109	100	105	90	87	79	78	60	59	60	--	--	30	38	34
<b>AGSECO</b>																		
Armour	87	87	87	130	123	127	96	92	81	77	58	56	57	--	--	31	34	32
Hitch	59	57	58	88	81	85	84	83	70	71	58	57	57	--	--	33	34	33
Santa Fe	70	66	68	104	93	99	89	85	69	70	58	58	58	--	--	31	36	34
Smoky Hill	45	44	45	68	62	65	78	78	63	66	57	57	57	--	--	34	39	36
Winterhawk	74	71	73	112	101	107	90	82	78	74	60	58	59	--	--	33	37	35
<b>Kansas</b>																		
2137	65	74	69	98	105	101	86	82	82	80	59	58	58	--	--	34	38	36
Everest	81	96	88	121	136	128	96	--	86	--	61	59	60	--	--	31	37	34
Fuller	74	77	76	112	110	111	92	89	76	76	60	56	58	--	--	31	38	35
Jagger	66	71	69	100	101	100	81	77	71	69	58	56	57	--	--	33	39	36
Overley	63	74	69	95	106	100	85	77	79	79	58	57	57	--	--	35	40	37
<b>Nebraska</b>																		
Infinity CL	61	72	66	91	102	97	78	--	74	--	59	56	58	--	--	36	41	38
Millennium	62	68	65	94	97	95	--	--	--	--	60	53	56	--	--	37	45	41
<b>WestBred</b>																		
HV9W03-1596R	62	75	68	93	107	100	--	--	--	--	57	57	57	--	--	32	38	35
HV9W03-696R-2	65	76	70	98	107	102	85	--	75	--	59	57	58	--	--	33	38	36
HV9W04-1594R	46	41	44	70	59	64	--	--	--	--	56	55	55	--	--	33	33	33
HV9W96-1383R	83	104	93	125	147	136	95	--	93	--	59	58	58	--	--	31	37	34
Stout	61	68	64	92	96	94	83	--	72	--	56	56	56	--	--	33	37	35
Averages	67	70	68	67	70	68	--	--	--	--	59	57	58	--	--	33	38	35
CV (%)	8	8	8	8	8	8	--	--	--	--	--	--	0	--	--	5	5	5
LSD (0.05)*	9	9	9	13	13	13	--	--	--	--	--	--	0	--	--	2	3	3

<sup>1</sup> BE = Belleville, KS, North Central Kansas Experiment Field, Republic County.

<sup>2</sup> BL = Beloit, KS, Mitchell County.

(W) = Hard white wheat.

\* Least significant difference, similar to margin of error, indicates difference needed to overcome test error.

**Table 7. 2010 SOUTH CENTRAL Kansas dryland winter wheat performance tests**

Brand / Name	<sup>1</sup> GY <sup>2</sup> HU <sup>3</sup> CW Av.				GY HU CW Av.				-GY- -HU- -CW- 2yr3yr2yr3yr 2yr 3yr				GY HU CW Av.				GY HU CW Av.							
	yield (bu/a) (lb/a)				% of average				multiyear av. (bu/a)				tw (lb/bu)				head (+/- Jagger)				height (in.)			
<b>AgriPro</b>																								
Art	50	45	49	48	99	99	96	98	--	--	49	--	57	--	53	56	55	54	--	--	--	--	--	--
CJ	50	45	51	49	100	99	99	99	--	--	--	--	--	--	54	58	56	56	--	--	--	--	--	--
Postrock	50	40	53	48	98	88	103	97	--	--	41	--	56	--	53	57	54	55	--	--	--	--	--	--
RustBuster-S	55	47	56	53	108	104	109	107	--	--	51	--	60	--	54	55	55	55	--	--	--	--	--	--
<b>AGSECO</b>																								
Armour	52	51	56	53	102	114	108	108	--	--	52	--	56	--	52	57	55	55	--	--	--	--	--	--
Hitch	55	45	50	50	109	100	96	102	--	--	49	--	56	--	53	55	53	54	--	--	--	--	--	--
Santa Fe	47	41	49	46	93	91	96	94	--	--	47	--	57	--	51	57	53	54	--	--	--	--	--	--
Shocker	50	45	49	48	98	99	95	97	--	--	49	--	53	--	53	56	54	54	--	--	--	--	--	--
<b>Kansas</b>																								
2137	49	45	51	48	98	99	99	99	--	--	47	--	57	--	52	56	54	54	--	--	--	--	--	--
Everest	53	51	62	55	104	114	121	113	--	--	60	--	60	--	57	59	57	58	--	--	--	--	--	--
Fuller	50	37	48	45	99	82	93	92	--	--	44	--	51	--	52	57	55	55	--	--	--	--	--	--
Jagger	46	40	51	46	90	88	100	93	--	--	39	--	54	--	55	56	55	55	--	--	--	--	--	--
Overley	45	42	49	45	90	93	95	92	--	--	42	--	52	--	51	57	55	54	--	--	--	--	--	--
<b>Oklahoma</b>																								
Billings	55	49	56	53	109	110	109	109	--	--	--	--	--	--	54	59	56	56	--	--	--	--	--	--
Endurance	51	50	51	51	101	110	100	104	--	--	55	--	58	--	52	56	54	54	--	--	--	--	--	--
<b>WestBred</b>																								
HV9W03-1596R	49	46	55	50	97	102	107	102	--	--	--	--	--	--	54	57	56	56	--	--	--	--	--	--
HV9W03-696R-2	50	50	37	46	99	111	72	94	--	--	56	--	47	--	52	57	55	55	--	--	--	--	--	--
HV9W04-1594R	46	38	51	45	91	85	99	92	--	--	--	--	--	--	51	54	55	54	--	--	--	--	--	--
HV9W96-1383R	53	50	57	53	105	110	111	109	--	--	59	--	56	--	54	58	56	56	--	--	--	--	--	--
Stout	55	47	47	50	109	103	92	102	--	--	49	--	52	--	53	55	51	53	--	--	--	--	--	--
Averages	51	45	51	49	51	45	51	49	--	--	--	--	--	--	53	57	55	55	--	--	--	--	--	--
CV (%)	10	7	10	9	10	7	10	9	--	--	--	--	--	--	2	1	2	2	--	--	--	--	--	--
LSD (0.05)*	7	5	7	6	14	10	14	13	--	--	--	--	--	--	1	1	2	1	--	--	--	--	--	--

<sup>1</sup> GY = Gypsum, KS, Saline County.

<sup>2</sup> HU = Hutchinson, KS, South Central Kansas Experiment Field, Reno County.

<sup>3</sup> CW = Caldwell, KS, Sumner County.

(W) = Hard white wheat.

\* Least significant difference, similar to margin of error, indicates difference needed to overcome test error.

**Table 8. 2010 NORTHWEST Kansas dryland winter wheat performance tests**

Brand / Name	<sup>1</sup> HA <sup>2</sup> CO <sup>3</sup> TR Av.				-HA- -CO- -TR-				HA CO TR Av.				HA CO TR Av.											
	yield (bu/a)				% of test average				multiyear av. (bu/a)				tw (lb/bu)				head (+/- Jagger)				height (in.)			
<b>AgriPro</b>																								
00x0100-51	48	65	58	57	98	89	92	93	--	--	--	--	62	55	60	59	2	0	0	1	36	35	33	35
Hawken	45	59	51	52	93	81	82	85	53	57	68	65	61	51	60	57	3	1	0	1	35	34	32	34
Jagalene	49	58	52	53	101	79	83	88	55	57	66	65	62	58	58	59	4	2	3	3	38	36	34	36
Postrock	50	69	60	60	103	95	97	98	56	57	74	72	63	59	60	61	3	1	1	2	36	35	33	35
TAM 111	51	84	76	70	104	115	122	114	61	61	85	78	63	61	58	60	3	1	4	3	39	38	36	38
<b>AGSECO</b>																								
Armour	55	88	79	74	114	120	127	120	61	65	86	78	61	62	60	61	3	-1	0	1	33	32	32	32
Aspen	50	85	67	67	104	116	107	109	57	59	83	76	61	60	60	61	2	0	0	1	31	33	30	31
Hitch	49	55	54	53	101	75	87	88	55	57	69	66	62	59	59	60	4	3	2	3	34	33	32	33
Keota	44	70	57	57	91	95	91	93	54	52	75	69	62	59	58	60	3	1	3	2	38	37	34	37
Protection CL	44	68	59	57	90	93	94	92	54	54	75	70	60	61	61	61	1	0	1	1	37	37	36	37
Santa Fe	44	68	62	58	89	93	99	94	--	--	--	--	61	60	61	60	1	0	-2	0	35	36	33	34
Smoky Hill	44	53	48	48	91	73	76	80	58	59	75	71	61	53	60	58	5	4	6	5	36	36	35	36
Winterhawk	51	84	66	67	104	115	106	108	59	59	84	78	63	61	59	61	2	1	3	2	39	38	36	38
<b>Colorado</b>																								
(W) Snowmass	48	81	65	65	99	111	105	105	--	--	--	--	63	61	55	60	6	3	5	5	39	38	37	38
(W) Thunder CL	53	69	63	61	109	94	100	101	--	--	--	--	60	60	60	60	4	1	2	2	37	36	34	36
Above	45	72	55	57	93	98	88	93	--	--	--	--	61	59	60	60	0	0	1	0	35	35	34	35
Bill Brown	56	74	62	64	115	102	99	105	57	59	72	71	62	54	58	58	3	0	6	3	37	36	35	36
Hatcher	52	82	75	70	106	112	121	113	58	60	77	74	62	59	59	60	2	1	4	3	35	37	35	35
Ripper	48	62	53	54	99	85	85	90	58	59	71	69	59	55	59	58	4	1	2	2	34	34	33	34
<b>Drussel</b>																								
T158	52	88	67	69	107	121	108	112	--	--	--	--	62	61	60	61	0	0	1	0	35	35	32	34
T81	49	78	63	63	100	106	101	102	56	57	80	73	62	61	59	61	2	1	0	1	37	37	35	37
<b>Ehmke Seed</b>																								
Ike	50	72	62	61	104	98	99	100	54	--	75	--	61	61	60	61	4	1	-1	1	39	38	35	37
<b>Kansas</b>																								
(W) Danby	49	74	61	61	101	101	97	100	57	60	80	76	63	58	56	59	5	3	7	5	37	36	36	36
(W) Tiger	52	80	70	67	106	109	112	109	59	--	84	--	63	61	58	61	4	3	5	4	34	34	32	33
2137	45	69	59	58	93	95	95	94	54	56	72	67	61	61	60	60	3	1	6	3	37	36	36	36
Everest	47	80	72	66	96	109	116	107	--	--	--	--	62	63	59	61	1	0	0	0	35	36	33	35
Fuller	47	68	53	56	97	93	85	92	54	56	74	71	61	58	58	59	4	1	1	2	36	35	32	34
Jagger	45	74	55	58	92	101	88	94	52	51	76	71	60	55	61	59	0	0	0	0	36	36	33	35
Overlay	37	72	56	55	76	99	90	88	48	50	74	70	61	62	60	61	-1	0	1	0	36	37	34	36
<b>Nebraska</b>																								
Infinity CL	51	80	73	68	105	109	118	111	--	--	--	--	62	60	58	60	6	3	4	4	38	38	37	38
Millennium	53	76	69	66	109	104	111	108	--	--	--	--	62	61	57	60	7	5	5	6	39	39	37	39
<b>Scott Seed</b>																								
TAM 304	53	83	73	70	110	114	118	114	--	--	--	--	62	61	57	60	4	1	4	3	40	38	37	38
<b>Watley</b>																								
TAM 112	50	77	60	62	103	105	96	101	58	61	82	79	62	58	60	60	3	0	2	1	36	37	33	35
<b>WestBred</b>																								
HV9W03-1596R	48	72	62	61	99	98	99	99	--	--	--	--	61	61	59	60	0	0	4	1	34	36	34	34
HV9W96-1383R	47	82	70	66	96	112	112	106	53	--	86	--	61	63	60	61	-1	-1	0	-1	31	34	31	32
Stout	49	63	58	56	100	86	93	93	57	--	71	--	60	53	60	58	4	1	3	3	33	34	33	33
Averages	49	73	62	61	49	73	62	61	--	--	--	--	61	59	59	60	3	1	2	2	36	36	34	35
CV (%)	5	4	5	5	5	4	5	5	--	--	--	--	1	2	1	1	--	--	--	--	3	3	3	3
LSD (0.05)*	4	4	4	4	7	5	7	7	--	--	--	--	1	1	1	1	--	--	--	--	1	1	2	1

<sup>1</sup> HA = Hays, KS, Agricultural Research Center, Ellis County.

<sup>2</sup> CO = Colby, KS, Northwest Research-Extension Center, Thomas County.

<sup>3</sup> TR = Tribune, KS, Southwest Research-Extension Center, Greeley County.

(W) = Hard white wheat.

\* Least significant difference, similar to margin of error, difference needed to overcome test error.



**Table 10. 2010 IRRIGATED Kansas winter wheat performance tests**

Brand / Name	<sup>1</sup> CO <sup>2</sup> HA <sup>3</sup> GC Av.				CO HA GC Av.				-CO- -HA- -GC- 2yr 3yr 2yr 3yr 2yr 3yr				CO HA GC Av.				CO HA GC Av.									
	yield (bu/a)				% of test average				multiyear av. (bu/a)				tw (lb/bu)				head (+/- Jagger)				height (in.)					
<b>AgriPro</b>																										
Jagalene	81	50	50	60	88	83	75	82	77	85	--	--	54	--	58	61	48	56	2	7	5	5	39	40	35	38
Postrock	81	58	66	68	88	96	99	95	--	--	--	--	72	--	55	63	57	58	2	5	-1	2	39	39	36	38
TAM 111	101	64	68	78	111	107	103	107	91	--	--	--	74	--	59	63	55	59	2	7	4	4	41	41	38	40
<b>AGSECO</b>																										
Armour	91	72	73	79	100	120	109	110	90	94	--	--	--	--	58	61	55	58	-1	4	-1	1	36	35	33	34
Aspen	122	65	70	86	134	109	106	116	110	10	--	--	79	--	60	61	51	57	-1	1	-1	0	38	36	32	35
Hitch	92	59	60	70	101	98	90	96	94	96	--	--	--	--	56	60	53	56	3	7	4	4	38	39	34	37
Winterhawk	96	63	68	76	106	106	102	104	86	89	--	--	75	--	59	62	52	58	2	3	-1	1	40	43	37	40
<b>Colorado</b>																										
(W) Thunder CL	90	57	71	73	99	95	107	100	--	--	--	--	--	--	60	59	53	57	1	7	2	3	39	40	37	39
Above	92	58	66	72	101	96	99	99	--	--	--	--	65	--	59	60	51	57	0	0	-2	-1	39	39	35	38
Bill Brown	80	68	72	73	88	113	108	103	71	78	--	--	--	--	54	62	51	56	1	6	1	3	38	40	36	38
Hatcher	81	61	67	70	88	102	101	97	71	76	--	--	73	--	59	62	52	58	2	6	1	3	38	40	37	38
Ripper	79	55	59	65	87	92	89	89	--	--	--	--	57	--	56	58	50	55	2	6	0	3	40	39	36	38
<b>Drussel</b>																										
T158	100	59	79	79	110	98	119	109	--	--	--	--	--	--	60	62	54	59	1	-1	-3	-1	39	37	34	36
T81	94	59	65	73	103	99	98	100	86	89	--	--	67	--	58	61	52	57	1	2	-1	1	42	40	37	40
<b>Kansas</b>																										
(W) Danby	82	64	63	69	90	106	94	97	77	87	--	--	64	--	56	62	51	57	2	8	4	5	39	41	37	39
2137	90	61	61	70	99	101	91	97	80	86	--	--	66	--	58	61	55	58	2	6	1	3	40	39	36	38
Everest	104	58	78	80	114	97	117	109	--	--	--	--	--	--	62	63	59	61	-2	-1	-3	-2	39	39	34	37
Fuller	75	57	66	66	83	96	99	93	74	81	--	--	72	--	57	62	54	58	1	1	1	1	38	39	36	37
Jagger	82	55	56	64	90	92	84	89	73	79	--	--	57	--	55	60	54	56	0	0	0	0	39	42	35	38
Overley	86	49	59	65	95	81	89	88	80	87	--	--	67	--	60	61	56	59	0	0	0	0	40	40	35	38
<b>Scott Seed</b>																										
TAM 304	98	62	73	78	107	104	110	107	95	98	--	--	--	--	59	63	54	59	2	7	1	4	41	41	39	40
<b>Watley</b>																										
TAM 112	85	62	64	70	93	103	96	97	76	84	--	--	66	--	58	62	55	58	0	2	-2	0	37	41	36	38
<b>WestBred</b>																										
HV9W03-1596R	92	60	68	73	101	99	102	101	--	--	--	--	--	--	59	60	54	58	1	0	-1	0	40	39	34	37
HV9W96-1383R	116	66	77	86	127	109	116	118	106	--	--	--	--	--	61	61	55	59	-3	-1	-3	-2	37	36	32	35
Stout	87	59	64	70	96	98	97	97	81	--	--	--	--	--	54	59	51	55	1	2	-1	1	37	41	35	38
Averages	91	60	67	73	91	60	67	73	--	--	--	--	--	--	58	61	53	57	1	3	0	1	39	39	35	38
CV (%)	6	8	6	7	6	8	6	7	--	--	--	--	--	--	1	1	2	1	--	--	--	--	3	5	3	4
LSD (0.05)*	8	7	6	7	9	12	8	10	--	--	--	--	--	--	1	1	1	1	--	--	--	--	2	3	1	2

<sup>1</sup> CO = Colby, KS, Northwest Research-Extension Center, Thomas County.

<sup>2</sup> HA = Hays, KS, Agricultural Research Center, Ellis County.

<sup>3</sup> GC = Garden City, KS, Southwest Research-Extension Center, Finney County.

(W) = Hard white wheat.

\* Least significant difference, similar to margin of error, difference needed to overcome test error.

**Table 11. 2010 Planted seed characteristics and Hessian fly ratings**

Brand / Name	1000	Test weight	Seeds per lb	Hess. fly <sup>1</sup>	Brand / Name	1000	Test weight	Seeds per lb	Hess. fly <sup>1</sup>
	Seed weight					Seed weight			
	(grams)	(lb/bu)	(1000)	(rating)		(grams)	(lb/bu)	(1000)	(rating)
<b>AgriPro</b>					<b>Nebraska</b>				
00x0100-51	42.8	62.1	10.6	--	Infinity CL	44.5	61.5	10.2	--
Art	37.5	60.6	12.1	--	Millennium	39.0	60.0	11.6	2
CJ	42.8	58.4	10.6	--	<b>Oklahoma</b>				
Hawken	38.8	60.5	11.7	--	Billings	40.3	62.1	11.3	--
JackPot	42.0	54.0	10.8	--	Endurance	38.8	61.2	11.7	--
Jagalene	38.8	61.1	11.7	--	<b>Pioneer</b>				
Postrock	42.3	62.2	10.7	--	(S) 25R56	41.5	54.0	10.9	--
RustBuster-S	40.8	58.2	11.1	--	(S) 25R62	42.8	53.7	10.6	--
TAM 111	40.5	61.3	11.2	5	(S) 25R78	42.3	56.9	10.7	--
<b>AGSECO</b>					<b>Scott Seed</b>				
Armour	39.8	62.6	11.4	--	TAM 304	34.5	56.0	13.2	9
Aspen	45.5	60.9	10.0	--	<b>Syngenta</b>				
Hitch	39.5	60.3	11.5	9	(S) Coker 9553	43.8	56.5	10.4	--
Keota	39.3	61.3	11.6	9	(S) OAKES	39.0	55.9	11.6	--
Protection CL	44.8	60.4	10.1	9	<b>Watley</b>				
Santa Fe	39.8	57.4	11.4	9	TAM 112	41.3	62.4	11.0	8
Shocker	46.0	57.7	9.9	--	<b>WestBred</b>				
Smoky Hill	39.3	59.2	11.6	9	HV9W03-1596R	47.5	61.7	9.6	--
Winterhawk	44.3	61.3	10.3	9	HV9W03-696R-2	35.5	59.1	12.8	--
<b>Colorado</b>					HV9W04-1594R	40.0	56.0	11.3	--
(W) Snowmass	52.0	62.5	8.7	9	HV9W96-1383R	48.8	61.0	9.3	--
(W) Thunder CL	42.0	61.0	10.8	--	Stout	38.3	61.4	11.9	1
Above	39.5	61.2	11.5	--	Maximum	52.0	62.6	13.2	
Bill Brown	48.0	61.9	9.5	9	Minimum	34.5	53.0	8.7	
Hatcher	45.0	61.6	10.1	--	Average	42.4	59.4	10.8	
Ripper	48.0	59.3	9.5	--	<b>Drussel</b>				
<b>Drussel</b>					T158	47.0	62.0	9.7	--
T158	47.0	62.0	9.7	--	T81	45.0	61.6	10.1	--
T81	45.0	61.6	10.1	--	<b>Ehmke Seed</b>				
<b>Ehmke Seed</b>					Ike	43.0	60.4	10.6	4
Ike	43.0	60.4	10.6	4	<b>Georgia</b>				
<b>Georgia</b>					(S) 991209-6E33	51.0	56.7	8.9	--
(S) 991209-6E33	51.0	56.7	8.9	--	(S) 991336-6E9	49.8	55.7	9.1	--
(S) 991336-6E9	49.8	55.7	9.1	--	031238-7E34	36.8	53.0	12.3	--
031238-7E34	36.8	53.0	12.3	--	<b>Kansas</b>				
<b>Kansas</b>					(W) Danby	39.8	62.3	11.4	9
(W) Danby	39.8	62.3	11.4	9	(W) RonL	42.8	62.2	10.6	9
(W) RonL	42.8	62.2	10.6	9	(W) Tiger	41.0	59.0	11.1	2
(W) Tiger	41.0	59.0	11.1	2	2137	40.3	57.8	11.3	8
2137	40.3	57.8	11.3	8	Everest	43.0	60.4	10.6	5
Everest	43.0	60.4	10.6	5	Fuller	43.0	58.7	10.6	9
Fuller	43.0	58.7	10.6	9	Jagger	43.0	56.5	10.6	9
Jagger	43.0	56.5	10.6	9	Overley	48.3	61.4	9.4	--
Overley	48.3	61.4	9.4	--	<b>MFA</b>				
<b>MFA</b>					(S) 2525	47.3	57.4	9.6	--
(S) 2525	47.3	57.4	9.6	--	(S) 2631	36.8	55.5	12.3	--
(S) 2631	36.8	55.5	12.3	--					

<sup>1</sup> Hessian fly ratings by Ming Chen, USDA, with inputs from Jeff Whitworth, K-State Entomology; 1=Highly resistant, 5=Intermediate, 7=Moderately susceptible, 9=Highly susceptible. Ratings are based on greenhouse results with the Kansas (Great Plains) biotype of Hessian fly.

(W) = Hard white wheat (S) = Soft red wheat

# 2010 Winter Canola Variety Trial

## Senior Authors

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and Oklahoma State University, Stillwater  
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## Other Contributors

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William Heer, Kansas State University, Hutchinson  
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Dale Ladd, Kansas State University, McPherson  
Victor Martin, Kansas State University, Hutchinson

## Cooperating Producer

Dean Elvin, Marquette, KS

## Objectives

The objectives of the National Winter Canola Variety Trial (NWCVT) are to evaluate germplasm over a wide range of environments, determine where released and experimental varieties are best adapted, increase visibility of winter canola across the nation, and aid producers with variety selection decisions. The trials are planted at locations in the Great Plains, Midwest, Northern Plains, and Southeast. The wide diversity of environments has improved our knowledge and understanding of winter canola variety performance.

## Procedures

The 2009-2010 NWCVT was distributed to 56 locations in 24 states. The trial included 20 released and 21 experimental varieties from nine participating seed suppliers (Table 1). All entries were treated with either Helix XTra or Prosper FX seed treatment to control insects and diseases during winter months.

Management guidelines were supplied to cooperators, but previous experience at the location influenced final management decisions. Agronomic information, site descriptions, and growing conditions are described for each location. All trials were planted in small research plots (approximately

100 ft<sup>2</sup>) and replicated three times. Yield results are grouped by brand.

The three NWCVT sites planted in Kansas were harvested. The NWCVT trials included in this report are Garden City, Hutchinson, and Manhattan, KS. Also, two subsets of NWCVT entries were planted at Clearwater and Marquette, KS, and the results are reported.

## 2009-2010 Growing Conditions

Temperature and precipitation data are plotted at the top of the page for most locations. Smooth black lines on the temperature graphs represent long-term average high and low temperatures (°F) for the location. The upper thin line represents actual daily high temperatures, and the lower thin line represents actual daily low temperatures. On the precipitation graph, the line labeled “normal” represents long-term average precipitation, and the line labeled “09-10” represents actual precipitation.

Overall, the 2009-2010 growing season produced outstanding yields. Fall stands were adequate, and plants compensated extremely well where stands were thin. Winter canola showed a tremendous capacity to survive a harsh winter, even where snow cover was not present. All locations had favorable spring and fall growing conditions.



**TABLE 1. SEED SOURCES FOR ENTRIES IN THE 2009-2010 NATIONAL WINTER CANOLA VARIETY TRIAL**

Brand/Name	Type <sup>1</sup>	Trait <sup>2</sup>	Release Date	Sd Trt <sup>3</sup>	Brand/Name	Type <sup>1</sup>	Trait <sup>2</sup>	Release Date	Sd Trt <sup>3</sup>				
Kansas State University/Oklahoma State University Canola Breeding Program 2004 Throckmorton, Manhattan KS 66506 Michael J. Stamm (mjstamm@ksu.edu)					University of Arkansas Dr. Jim Kelly (jkelly@uark.edu)								
KS3132	OP	---	---	H	ARC2189-2	OP	---	---	H				
KS4158	OP	---	---	H	ARC00005-2	OP	---	---	H				
KS4426	OP	---	---	H	ARC00024-2	OP	---	---	H				
KS4475	OP	---	---	H	ARC99009-1	OP	---	---	H				
Kiowa	OP	---	2008	H	Winfield Solutions/Croplan Genetics Jay Bjerke (jemberke@landolakes.com)								
Sumner	OP	SU	2003	H	HyClass 110W	OP	RR	2008	P				
Wichita	OP	---	1999	H	HyClass 115W	OP	RR/SURT	2008	P				
DL Seeds Inc. Kevin McCallum (kevin.mccallum@dseeds.ca)					HyClass 154W					Hyb	RR	2008	H
Baldur	Hyb	---	2004	H	Monsanto Company Robert Ihrig (robert.a.ihrig@monsanto.com)								
Dimension	Hyb	---	2008	H	DKW41-10	OP	RR	2008	P				
Dynastie	Hyb	---	2007	H	DKW46-15	OP	RR/SURT	2008	P				
Flash	Hyb	---	2007	H	DKW47-15	OP	RR/SURT	2008	P				
Safran	Hyb	---	2008	H	Virginia State University Agricultural Experiment Station Dr. Harbans Bhardwaj (hbhardwj@vsu.edu)								
Sitro	Hyb	---	2007	H	Virginia	OP	---	2003	H				
Visby	Hyb	---	2008	H	<sup>1</sup> OP = open pollinated, Hyb = hybrid								
Dr. Charlie Rife (rifewy@gmail.com)					<sup>2</sup> RR = Roundup Ready, IMI = imidazolinone resistant, SU/SURT = sulfonyleurea carryover tolerant								
HPX-501	OP	IMI	---	H	<sup>3</sup> Sd Trt = Seed treatment (H = Helix XTra, P = Prosper FX)								
HPX-6271	OP	---	---	H	MOMONT, France Dr. Thierry Momont (tmomont@momont.com)								
HPX-7019	OP	---	---	H	CHHE96	Hyb	---	---	H				
HPX-7127	OP	---	---	H	Hybristar	Hyb	---	2006	H				
HPX-7228	OP	---	---	H	Hybrisurf	Hyb	---	2008	H				
HPX-7341	OP	---	---	H	Kadore	OP	---	2007	H				
Alabama A&M University Dr. Ernst Cebert (ernst.cebert@aamu.edu)					MH06E4	Hyb	---	---	H				
AAMU-18-07	OP	---	---	H	MH06E10	Hyb	---	---	H				
AAMU-33-07	OP	---	---	H	MH06E11	Hyb	---	---	H				
					MH905492	Hyb	---	---	H				

**TABLE 2. CLEARWATER, KS**

Cooperators:  
 Gary Cramer, Sedgwick County Agriculture and Natural Resources Agent  
 Victor Martin, Kansas State University

Planted: 9/24/2009 at 5 lb/a in 8-in. rows  
 Harvested: 6/24/2010  
 Fertility: 50-0-0 lb N-P-K fertilizer in the fall  
 75-0-0 lb N-P-K fertilizer in the spring

Name	Winter Survival (%)	Moisture (%)	Test Weight (lb/bu)	Yield (lb/a)	Yield (bu/a)	Yield (% of mean)
Hybristar	100	6.9	48.4	<b>1848.5</b>	37.0	101.7
Hybrisurf	100	6.7	48.6	<b>2005.2</b>	40.1	110.3
Kadore	100	7.4	49.5	<b>2168.8</b>	43.4	119.3
Kiowa	100	6.9	48.8	1613.7	32.3	88.8
KS4158	100	6.9	48.9	<b>2020.4</b>	40.4	111.1
Sumner	100	6.9	49.0	1529.7	30.6	84.1
Wichita	100	7.0	49.5	<b>1835.7</b>	36.7	101.0
Flash	100	6.8	50.2	1804.9	36.1	99.3
Safran	100	6.9	49.6	<b>2065.8</b>	41.3	113.6
Sitro	100	6.8	49.5	<b>2220.4</b>	44.4	122.1
DKW41-10	100	7.0	50.3	1429.4	28.6	78.6
DKW46-15	100	6.7	49.6	<b>2025.5</b>	40.5	111.4
DKW47-15	100	7.1	49.2	1584.2	31.7	87.1
HyClass110W	100	6.9	49.0	1691.7	33.8	93.0
HyClass115W	100	6.9	48.7	1584.9	31.7	87.2
HyClass154W	100	7.1	47.8	1660.4	33.2	91.3
<b>Mean</b>		6.9	49.2	1818.1	36.4	
<b>CV</b>		4.5	1.4	15.3	15.3	
<b>LSD (0.05)</b>		NS	1.0	397.0	7.9	

**Bold** - Superior LSD Group - Unless two entries differ by more than the LSD, little confidence can be placed in one being superior to the other.

**TABLE 3. MARQUETTE, KS**

Cooperators:  
 Dean Elvin, Cooperating Producer  
 Dale Ladd, McPherson County Agriculture and Natural Resources Agent  
 Victor Martin, Kansas State University

Planted: 9/23/2009 at 5 lb/a in 8-in. rows  
 Harvested: 6/24/2010  
 Fertility: 50-0-0 lb N-P-K fertilizer in the fall  
 50-0-0 lb N-P-K fertilizer in the spring

Name	Winter Survival (%)	Moisture (%)	Test Weight (lb/bu)	Yield (lb/a)	Yield (bu/a)	Yield (% of mean)
Hybristar	93.3	7.6	49.1	2053.9	41.1	99.6
Hybrisurf	90.8	8.2	48.9	2333.7	46.7	113.1
Kadore	<b>100.0</b>	7.7	50.3	2376.0	47.5	115.2
Kiowa	<b>99.5</b>	7.4	49.4	1733.4	34.7	84.0
KS4158	<b>99.5</b>	7.9	49.6	1937.9	38.8	93.9
Sumner	<b>98.8</b>	8.0	49.9	2005.9	40.1	97.2
Wichita	<b>99.0</b>	7.5	50.1	1879.4	37.6	91.1
Flash	<b>97.0</b>	8.2	49.2	<b>2557.2</b>	51.1	124.0
Safran	<b>97.5</b>	7.6	49.7	2285.0	45.7	110.8
Sitro	<b>96.5</b>	7.7	50.0	<b>2857.8</b>	57.2	138.5
DKW41-10	<b>98.3</b>	8.2	50.1	1569.6	31.4	76.1
DKW46-15	<b>97.0</b>	7.1	49.6	1895.2	37.9	91.9
DKW47-15	<b>99.0</b>	7.6	49.6	1831.5	36.6	88.8
HyClass110W	<b>98.3</b>	7.8	49.0	1902.9	38.1	92.2
HyClass115W	<b>98.5</b>	7.6	48.4	1812.3	36.2	87.9
HyClass154W	<b>97.8</b>	8.0	49.3	1975.3	39.5	95.8
<b>Mean</b>	97.5	7.7	49.5	2062.9	41.3	
<b>CV</b>	3.4	7.1	1.3	14.0	14.0	
<b>LSD (0.05)</b>	4.8	NS	0.9	411.1	8.2	

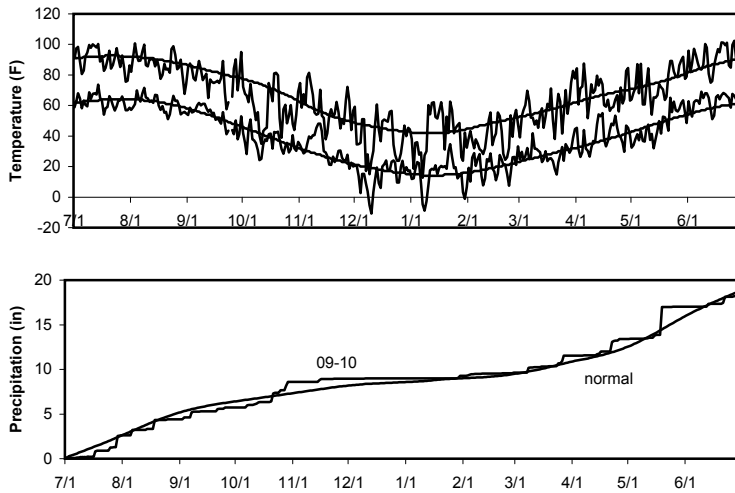
**Bold** - Superior LSD Group - Unless two entries differ by more than the LSD, little confidence can be placed in one being superior to the other.

TABLE 4. GARDEN CITY, KS

Cooperator:  
 Johnathon Holman  
 Southwest Research-Extension Center  
 Kansas State University

Planted: 9/14/2009 at 5 lb/a  
 Harvested: 6/25/2010  
 Irrigation: None  
 Herbicide: Prowl H<sub>2</sub>O  
 Fertility: 6-29-0-11 lb N-P-K-S fertilizer in the fall  
 160-0-0-0 lb N-P-K-S fertilizer in the spring  
 Soil Type: Ulysses-Richfield silt loam  
 Elevation: 2888 ft  
 Latitude: 37°99'N

**Comments:** This trial was not irrigated and was treated as a dryland experiment. Yields and overall performance were excellent.



Name	Fall		Winter	Spring	Plant Height (inches)	Moisture (%)	Test Weight (lb/bu)	Yield (lb/a)	Yield (bu/a)	Yield (% of mean)	Yield (rank)
	Stand (0-10)	Vigor <sup>1</sup> (1-5)	Survival (0-10)	Vigor <sup>1</sup> (1-5)							
AAMU-18-07	9.0	4.0	5.0	3.0	43.2	7.0	50.7	1719	34	79	35
AAMU-33-07	9.0	4.0	6.7	3.7	43.6	6.9	51.9	2177	44	100	25
HPX-501	9.0	4.0	7.3	3.3	48.8	6.7	51.8	2192	44	101	24
HPX-6271	9.3	4.3	7.7	4.0	47.2	6.8	53.0	<b>2423</b>	48	111	12
HPX-7019	9.3	4.0	8.3	4.0	46.8	6.7	53.2	<b>2389</b>	48	110	15
HPX-7127	9.0	4.0	7.0	3.7	46.8	7.4	52.5	2296	46	105	20
HPX-7228	9.3	4.7	9.0	4.7	49.2	6.9	53.5	<b>2533</b>	51	116	7
HPX-7341	9.7	4.3	9.0	4.0	47.2	6.6	53.9	<b>2391</b>	48	110	14
HyClass110W	9.0	4.0	3.7	2.0	44.0	8.0	51.6	1502	30	69	39
HyClass115W	9.3	4.7	8.3	4.0	46.8	6.8	52.5	<b>2357</b>	47	108	18
HyClass154W	9.0	4.0	6.0	3.0	50.4	7.0	52.7	2142	43	98	27
DKW41-10	9.0	4.0	7.3	3.7	39.6	6.7	53.8	1994	40	91	31
DKW46-15	9.3	4.0	8.0	3.7	48.4	6.5	51.7	2212	44	101	21
DKW47-15	9.0	4.0	7.0	3.3	46.0	6.9	52.5	2044	41	94	29
Baldur	9.0	4.3	7.3	4.3	49.2	6.8	54.6	<b>2507</b>	50	115	8
Dimension	9.0	4.0	4.0	2.7	44.0	8.2	52.8	1693	34	78	36
Dynastie	9.0	4.0	6.0	3.7	46.0	7.7	52.7	<b>2384</b>	48	109	16
Flash	9.0	4.0	4.7	2.7	49.6	8.6	52.5	1895	38	87	33
Safran	9.0	4.0	6.7	3.3	48.0	7.7	51.9	<b>2493</b>	50	114	9
Sitro	9.0	4.0	5.3	2.3	46.0	6.9	52.6	2004	40	92	30
Visby	9.0	4.0	7.3	4.0	44.0	6.8	52.7	<b>2628</b>	53	121	4
Kiowa	9.7	4.3	8.7	3.7	50.8	7.3	51.9	2303	46	106	19
KS3132	9.3	4.3	8.7	4.3	48.4	7.1	52.6	<b>2412</b>	48	111	13
KS4158	9.0	4.3	8.3	4.3	51.6	6.6	53.5	<b>2712</b>	54	124	2
KS4426	9.0	4.0	8.7	4.0	50.8	7.7	53.5	<b>2460</b>	49	113	11
KS4475	9.3	4.7	8.3	4.3	49.6	7.6	52.9	<b>2474</b>	49	113	10
KSIU331	9.3	4.0	8.3	3.7	51.6	6.8	53.0	2211	44	101	22
Sumner	9.7	4.7	8.7	4.3	47.6	6.6	52.7	<b>2636</b>	53	121	3
Wichita	9.3	4.3	9.0	4.3	50.0	7.1	53.2	<b>2553</b>	51	117	6
CHHE96	9.3	4.0	7.0	3.3	49.6	7.3	53.2	<b>2601</b>	52	119	5
Hybristar	9.0	4.0	2.7	2.0	44.4	9.3	50.6	1264	25	58	40
Hybrsurf	9.0	4.0	2.7	2.3	44.4	7.7	52.3	1518	30	70	38
Kadore	9.7	4.0	8.7	4.0	46.8	6.9	53.2	<b>2762</b>	55	127	1
MH06E10	9.0	4.0	2.7	2.3	45.6	9.5	51.4	1240	25	57	41
MH06E11	9.0	4.0	4.3	3.0	44.8	8.6	51.7	1583	32	73	37
MH06E4	9.0	4.0	3.0	2.3	50.4	9.4	51.7	2155	43	99	26
MH905492	9.0	4.0	1.0	1.7	40.0	.	.	380	8	18	42
ARC00005-2	9.0	4.0	6.3	3.3	50.0	7.7	52.5	2103	42	96	28
ARC00024-2	9.0	4.0	5.7	3.3	52.8	9.8	50.9	1875	37	86	34
ARC2189-2	9.0	4.0	7.0	3.3	50.8	7.3	52.6	2194	44	101	23
ARC99009-1	9.0	4.0	5.7	3.0	48.0	6.8	53.7	1985	40	91	32
Virginia	9.0	4.0	7.0	4.0	43.2	7.3	51.7	<b>2380</b>	48	109	17
<b>Mean</b>	9.1	4.1	6.5	3.4	47.3	7.4	52.5	2138	43		
<b>CV</b>	3.6	7.0	14.9	14.9	6.4	8.1	2.0	12	12		
<b>LSD (0.05)</b>	NS	0.5	1.6	0.8	4.9	1.0	1.7	405	8		

**Bold** - Superior LSD Group - Unless two entries differ by more than the LSD, little confidence can be placed in one being superior to the other. <sup>1</sup> Vigor is rated on a scale of 1=poor and 5=excellent.

TABLE 5. HUTCHINSON, KS

Cooperator:

William Heer, Kansas State University  
 South Central Kansas Experiment Field  
 Redd Foundation Field

Planted: 9/25/2009 at 5 lb/a in 9-in. rows

Swathed: 6/8/2010

Harvested: 6/18/2010

Herbicides: Treflan 1.0 qt/a

Fertility: 50-0-0 lb N-P-K fertilizer in the fall

75-0-0 lb N-P-K fertilizer in the spring

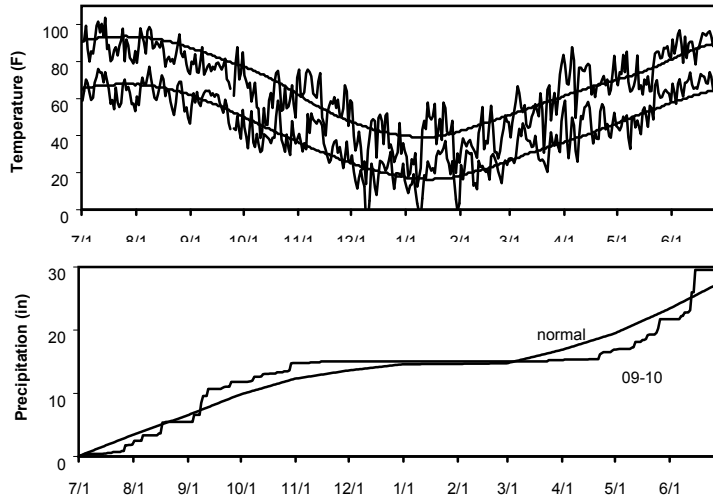
Previous Crop: Wheat

Soil Type: Loam

Elevation: 1611

Latitude: 37°58'N

**Comments:** Rainfall immediately after planting aided establishment. A cold winter with minimal snow cover provided a good test for winter hardiness, and no winterkill was observed.



Name	Fall Stand (0-10)	50% Bloom <sup>1</sup> (d)	Moisture (%)	Test Weight (lb/bu)	Yield (lb/a)	Yield (bu/a)	Yield (% of mean)	Yield (rank)
AAMU-18-07	6.7	105.3	7.9	50.9	1963	39	95	29
AAMU-33-07	6.7	107.3	8.7	52.9	<b>2203</b>	44	106	13
HPX-501	6.0	109.0	8.0	52.1	1875	37	90	36
HPX-6271	7.0	107.0	7.9	51.9	2080	42	100	22
HPX-7019	7.3	107.7	7.4	52.1	2092	42	101	21
HPX-7127	6.3	109.3	8.3	52.2	<b>2213</b>	44	107	11
HPX-7228	6.0	107.0	7.8	51.6	2093	42	101	20
HPX-7341	7.7	108.3	8.0	52.6	<b>2389</b>	48	115	5
HyClass110W	6.0	109.0	8.4	51.6	1647	33	79	41
HyClass115W	7.3	107.0	8.1	51.1	<b>2150</b>	43	104	15
HyClass154W	5.7	111.0	8.6	52.7	1806	36	87	37
DKW41-10	5.7	106.3	8.3	52.1	1674	33	81	40
DKW46-15	4.7	108.0	8.4	51.2	1753	35	85	39
DKW47-15	6.3	109.3	8.7	51.5	2031	41	98	25
Baldur	6.3	107.3	7.7	52.2	<b>2145</b>	43	103	16
Dimension	6.0	107.3	8.5	52.5	1911	38	92	33
Dynastie	7.0	107.7	8.7	52.4	<b>2498</b>	50	120	1
Flash	6.3	108.7	8.8	51.7	2030	41	98	26
Safran	7.7	108.7	8.0	52.8	<b>2361</b>	47	114	6
Sitro	6.7	106.7	8.1	52.5	<b>2390</b>	48	115	4
Visby	6.0	107.7	8.1	52.4	<b>2432</b>	49	117	2
Kiowa	5.7	109.0	8.4	50.9	1989	40	96	27
KS3132	5.7	109.3	7.9	52.1	<b>2338</b>	47	113	7
KS4158	6.7	109.0	8.0	51.7	<b>2242</b>	45	108	10
KS4426	5.3	109.0	7.6	52.8	1957	39	94	31
KS4475	7.0	111.0	7.9	52.4	1906	38	92	35
KSJU331	5.3	109.7	8.5	52.5	<b>2113</b>	42	102	18
Sumner	6.3	106.7	8.5	51.9	1786	36	86	38
Wichita	5.3	108.7	8.4	51.8	2047	41	99	24
CHHE96	6.7	109.7	8.0	52.7	<b>2400</b>	48	116	3
Hybristar	5.0	108.0	8.4	52.3	<b>2173</b>	43	105	14
Hybrisurf	6.0	108.3	7.7	51.9	<b>2268</b>	45	109	9
Kadore	5.0	111.0	8.7	53.4	<b>2206</b>	44	106	12
MH06E10	6.3	109.3	8.3	52.6	1950	39	94	32
MH06E11	6.7	109.0	8.0	52.5	<b>2274</b>	45	110	8
MH06E4	5.3	110.0	8.3	51.6	1909	38	92	34
MH905492	5.7	108.0	8.0	51.3	1604	32	77	42
ARC00005-2	7.0	110.3	8.1	52.0	2069	41	100	23
ARC00024-2	7.7	110.3	8.5	52.6	<b>2127</b>	43	103	17
ARC2189-2	6.3	110.3	8.4	51.4	<b>2102</b>	42	101	19
ARC99009-1	6.7	108.3	8.6	51.3	1957	39	94	30
Virginia	6.7	107.7	7.6	51.1	1967	39	95	28
<b>Mean</b>	6.3	108.5	8.2	52.0	2074	41		
<b>CV</b>	15.3	0.6	9.0	1.3	12	12		
<b>LSD (0.05)</b>	1.6	1.1	1.2	1.1	398	8		

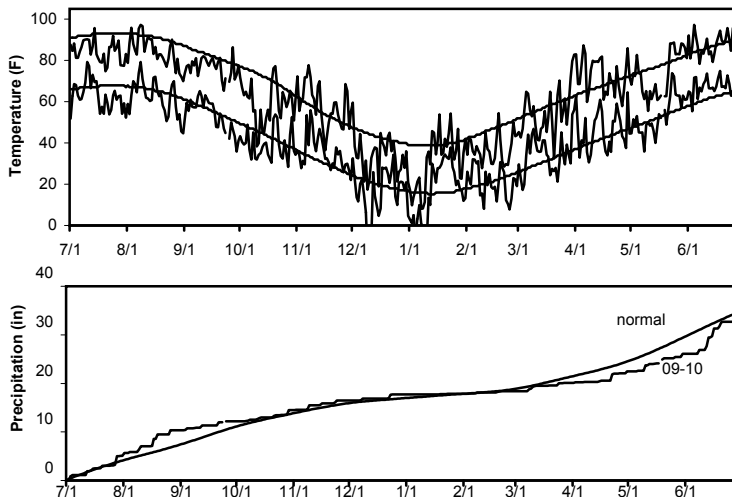
**Bold** - Superior LSD Group - Unless two entries differ by more than the LSD, little confidence can be placed in one being superior to the other. <sup>1</sup>Bloom is rated as the date after 1-1-2010 when 50% of plants have one or more open flowers.

TABLE 6. MANHATTAN, KS

Cooperator:  
Mike Stamm  
Kansas State University  
Oklahoma State University

Planted: 9/12/2009 at 5 lb/a in 9-in. rows  
Harvested: 6/23/2010  
Herbicides: Treflan 1.5 pt/a  
Fertility: 20-10-0 lb N-P-K fertilizer in the fall  
70-0-0 lb N-P-K fertilizer in the spring  
Previous Crop: Soybean  
Soil Type: Sandy loam  
Elevation: 1064 ft  
Latitude: 39°12'N

**Comments:** Plot yields were reduced by severe sulfur deficiency. Only two replications provided usable data. Adequate snow cover during a very cold winter aided survival.



Name	Fall Stand (0-10)	Winter Survival (%)	50% Bloom <sup>1</sup> (d)	Plant Height (in)	Moist (%)	Test Weight (lb/bu)	Yield (lb/a)	Yield (bu/a)	Yield (% of mean)	Yield (rank)
AAMU-18-07	9.0	87.0	100.0	43.0	7.8	45.7	1876	38	115	30
AAMU-33-07	7.5	<b>100.0</b>	103.0	49.0	8.7	49.7	2385	48	146	8
HPX-501	7.5	<b>100.0</b>	105.5	51.0	7.7	49.0	2271	45	139	14
HPX-6271	9.0	<b>100.0</b>	103.0	48.0	8.6	49.1	1987	40	122	25
HPX-7019	8.5	<b>100.0</b>	105.5	53.0	8.5	47.7	1601	32	98	36
HPX-7127	8.0	<b>100.0</b>	106.0	49.0	9.2	46.6	1337	27	82	41
HPX-7228	8.0	<b>100.0</b>	103.5	48.0	8.5	47.6	2342	47	144	11
HPX-7341	9.0	<b>100.0</b>	105.0	53.0	8.4	49.1	2492	50	153	4
HyClass110W	7.5	85.0	103.5	47.0	8.5	49.5	2210	44	136	17
HyClass115W	7.5	<b>100.0</b>	102.5	49.0	7.5	46.7	1231	25	76	42
HyClass154W	8.5	<b>100.0</b>	105.0	48.0	8.7	46.9	1584	32	97	38
DKW41-10	7.0	<b>100.0</b>	102.0	41.0	8.4	47.9	1553	31	95	39
DKW46-15	7.0	<b>100.0</b>	105.5	49.0	8.1	48.1	1590	32	98	37
DKW47-15	7.5	<b>100.0</b>	105.0	51.0	8.0	48.5	1870	37	115	32
Baldur	8.0	<b>97.5</b>	103.5	51.0	8.3	48.5	1874	37	115	31
Dimension	7.5	<b>89.5</b>	102.0	52.0	9.8	48.4	2444	49	150	5
Dynastie	9.0	<b>97.5</b>	106.0	50.0	8.1	50.5	2717	54	167	1
Flash	8.0	<b>90.0</b>	105.0	53.0	7.6	49.2	1981	40	122	27
Safran	8.5	<b>100.0</b>	105.0	48.0	8.6	46.3	1823	36	112	34
Sitro	8.0	<b>100.0</b>	104.0	49.0	8.3	50.9	2671	53	164	2
Visby	8.0	<b>100.0</b>	103.0	49.0	8.0	49.2	2176	44	134	18
Kiowa	7.5	<b>100.0</b>	106.0	53.0	8.9	47.5	1407	28	86	40
KS3132	7.5	<b>99.5</b>	105.0	53.0	8.1	50.1	1946	39	119	28
KS4158	7.5	<b>97.5</b>	104.0	49.0	8.1	49.4	1985	40	122	26
KS4426	5.5	<b>100.0</b>	106.0	52.0	8.6	50.4	2175	44	134	19
KS4475	8.0	<b>90.0</b>	109.0	51.0	8.6	49.4	1828	37	112	33
KSIU331	7.5	<b>100.0</b>	105.0	54.0	8.5	49.6	2601	52	160	3
Sumner	8.5	<b>100.0</b>	103.0	51.0	6.9	50.6	2385	48	146	7
Wichita	8.0	<b>100.0</b>	105.0	51.0	8.2	50.4	2102	42	129	21
CHHE96	8.0	<b>99.5</b>	104.5	52.0	8.3	49.4	2289	46	141	13
Hybristar	6.5	<b>90.0</b>	103.0	50.0	8.3	49.8	2246	45	138	15
Hybrisurf	8.0	<b>100.0</b>	104.5	52.0	9.0	49.3	2377	48	146	9
Kadore	6.5	<b>100.0</b>	105.5	46.0	8.7	47.7	2040	41	125	24
MH06E10	9.0	82.5	105.0	55.0	8.4	50.4	2365	47	145	10
MH06E11	9.0	<b>99.5</b>	103.0	52.0	8.1	49.6	2230	45	137	16
MH06E4	7.0	<b>95.0</b>	104.0	53.0	8.4	49.6	2154	43	132	20
MH905492	7.5	<b>90.0</b>	102.5	51.0	6.9	49.8	2296	46	141	12
ARC00005-2	8.0	<b>95.0</b>	106.0	53.0	9.4	47.9	2074	41	127	23
ARC00024-2	8.0	<b>89.5</b>	109.0	52.0	9.0	49.5	2075	42	127	22
ARC2189-2	8.0	<b>97.5</b>	105.5	51.0	8.8	48.6	1896	38	116	29
ARC99009-1	8.0	<b>99.5</b>	104.5	52.0	8.7	48.8	1727	35	106	35
Virginia	8.0	<b>97.5</b>	102.0	45.0	9.2	50.1	2421	48	149	6
<b>Mean</b>	7.9	96.9	104.4	50.2	8.4	48.9	2063	41		
<b>CV</b>	7.5	5.4	0.5	3.5	11.5	2.9	21	21		
<b>LSD (0.05)</b>	1.2	10.5	1.1	3.6	NS	NS	NS	NS		

**Bold** - Superior LSD Group - Unless two entries differ by more than the LSD, little confidence can be placed in one being superior to the other. <sup>1</sup> Bloom is rated as the date after 1/1/2010 when 50% of plants have one or more open flowers.

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