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DECISIONS

2005 Colorado Winter Wheat Variety Performance Trials

Acknowledgments:

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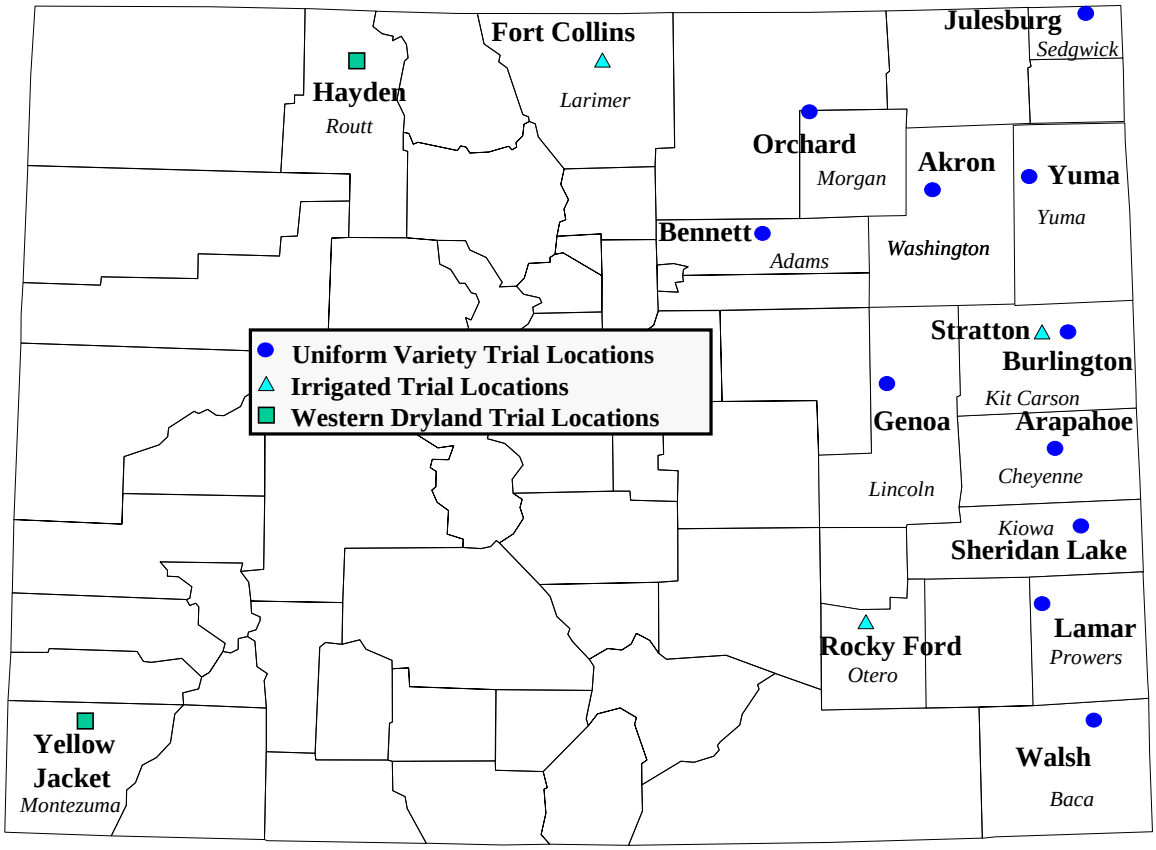
and Colorado State University

2005 Winter Wheat
Variety Performance Trials



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EASTERN COLORADO WINTER WHEAT VARIETY PERFORMANCE TRIALS

Introduction

Making Better Decisions is a publication of Colorado State University. Colorado State University conducts variety performance trials to obtain unbiased and reliable information for Colorado wheat producers to make better variety decisions. We are committed to providing the best information, in an appealing form, and in the timeliest manner to Colorado wheat producers.

Immediately after harvest, and prior to fall planting, CSU's Crops Testing program publishes current trial results in different media forms:

1) Results are published in CWAC's *Wheat Farmer.*
2) Variety trial results are available on the Crops Testing Internet page www.csucrops.com.
3) Results are published in *From the Ground Up*, a Soil and Crop Science Extension publication.
4) E-mail copies of results are sent to Cooperative Extension agents and producers who request them.
5) Results are incorporated into the Colorado wheat variety performance database http://wheat.colostate.edu/vpt.html.

Trial Conditions and Methods - 2004/05

Under the direction of CSU Extension Agronomist Dr. Jerry Johnson, the CSU Crops Testing Program evaluated check varieties and experimental lines at ten dryland trial locations (UVPT – Akron, Arapahoe, Bennett, Burlington, Genoa, Julesburg, Lamar, Sheridan Lake, Walsh, and Yuma) and three irrigated trial locations (IVPT – Fort Collins, Rocky Ford, and Stratton). In addition to these dryland locations, experimental lines and a reduced set of check entries were also tested at two dryland locations (Hudson, Granada) that were added in fall 2004 in response to the continued loss of so many variety trial sites.

Overall, the various UVPT trial locations experienced a variety of stresses, with spring drought stress, high temperatures at heading and during grain filling, and stripe rust being the most damaging. In spite of all of the problems, 10 out of 11 UVPT locations were successfully harvested with only Orchard being abandoned due to severe effects of the spring drought. In addition to the Fort Collins IVPT, both Rocky Ford and Stratton were both harvested though yields were reduced in these trials due to stripe rust and high temperatures.

The most significant disease or insect problem in the trials in 2005 was the severe stripe rust infection that was present at several of the locations. This infection was typically heavy at some of the irrigated locations (Fort Collins, Rocky Ford and Stratton) and higher yielding dryland locations (such as Genoa) but was uncharacteristically heavy in southeast Colorado (including Walsh, Lamar, and Sheridan Lake) where stripe rust has been a much lesser concern the last few years. In spite of the severity of the infection observed, and the high degree of apparent susceptibility of some entries, differences were noted among test entries in the capacity to fill the grain from stem reserves after stripe rust killed the leaves. While not a problem in most trials, except for perhaps the UVPT at Julesburg, wheat streak mosaic virus (WSMV) was a significant problem in some areas of the state due to the mild conditions experienced in late summer and fall 2004 that provided ideal conditions for the wheat curl mite that transmits WSMV. Aside from RWA, observed at several locations, no other

significant insect (Bird cherry-oat aphid, greenbug) problems were noted.

Ten dryland and three irrigated variety performance trials were harvested and the results are presented below. There were fifty-two entries in the dryland performance trial and thirty-four entries in the irrigated trial. Both trials include a combination of public and private varieties from Colorado and surrounding states. Each trial is planted in three replicates in a randomized complete block design. Yields are corrected to 13% moisture. The LSD is computed from the Analysis of Variance of all entries in the trial, including the Colorado experimental lines (performance not shown).

Note that the CSU variety CO00016, is being advanced toward variety release in fall 2006.

Table 1. Wheat Variety Trial Information by Location.

Locations	Date of Planting 2004	Date of Harvest 2005	Soil Texture	Fertilization (lb/ac) Nitrogen N	Fertilization (lb/ac) Phosphorus P_2O_5	Type of Irrigation
Dryland						
Akron	9/27/04	7/14/05	Clay Loam	76	20	None
Arapahoe	9/01/04	6/29/05	Silt Loam	56	18	None
Bennett	9/11/04	7/07/05	Sandy Clay	50	18	None
Burlington	9/13/04	6/30/05	Clay	56	60	None
Genoa	9/09/04	7/11/05	Sandy Loam	6	18	None
Julesburg	9/15/04	7/11/05	Clay	62	43	None
Lamar	9/15/04	6/28/05	Silt Loam	46	18	None
Sheridan Lake	9/07/04	6/28/05	Sandy Loam	40	18	None
Walsh	9/28/04	6/28/05	Sandy clay loam	56	20	None
Yuma	9/13/04	7/05/05	Silty Clay Loam	46	18	None
Irrigated						
Fort Collins	9/10/04	7/18/05	Sandy clay	96	30	Sprinkler
Stratton	9/17/04	7/11/05	Silt Loam	100	30	Sprinkler
Rocky Ford	10/28/04	7/08/05	Clay Loam	155	24	Furrow

Description of winter wheat varieties in eastern trials.

Name and Pedigree	Origin/Class	RWA	HD	HT	SS	ST	COL	WH	SR	LR	WSMV	TW	PC	MILL	BAKE	COMMENTS
Above TAM 110*4/FS2	CSU-TX 2001 Hard red winter	S	3	2	3	3	8	4	9	9	5	6	6	4	7	CSU/Texas A&M release (2001). Clearfield* winter wheat. White chaff, early maturing semidwarf. Excellent dryland and irrigated performance record in Colorado. Marginal baking quality characteristics.
Akron TAM 107/Hail	CSU 1994 Hard red winter	S	5	5	6	3	8	3	9	8	9	6	2	7	6	CSU release (1994). Semidwarf, medium-early maturity, vigorous growth pattern, closes canopy early in spring and competes well with weeds.
Alliance Arkan/Colt//Chisholm sib	NEB 1993 Hard red winter	S	5	5	5	4	4	2	7	8	9	4	9	6	7	Nebraska release (1993). Medium-early maturing semidwarf, short coleoptile, above average tolerance to root rot and crown rot.
Ankor Akron/Halt//4*Akron	CSU 2002 Hard red winter	R*	5	5	4	3	7	3	9	8	9	6	3	6	5	CSU release (2002). Russian wheat aphid resistant derivative of Akron, though with slightly higher grain yield and better straw strength. Semidwarf, medium-early maturity, vigorous growth pattern, closes canopy early in spring and competes well with weeds.
Antelope Pronghorn/Arlin	NEB 2002 Hard white winter	S	5	6	2	---	3	3	2	7	8	5	1	7	7	Hard white winter wheat (HWW) released by USDA-ARS breeding program in Nebraska. Medium height, medium-late maturity. Excellent straw strength, good stripe rust resistance, positioned only for irrigated production.
AP502 CL TXGH12588-26*4/FS2	Agripro 2001 Hard red winter	S	2	1	4	3	8	3	9	9	5	7	7	7	7	Clearfield* winter wheat marketed by Agripro. Red chaff, early maturing, semidwarf. Low test weight relative to TAM 110 and Above. Marginal milling and baking quality.
Avalanche KS87H325/Rio Blanco	CSU 2001 Hard white winter	S	5	5	4	3	5	4	9	6	5	1	4	2	5	CSU release (2001). Hard white winter wheat (HWW), sister selection to Trego. Slightly earlier, better straw strength than Trego. High test weight, good stand establishment. Good pre-harvest sprouting tolerance, similar to Trego. Good dryland yield record in CO and Western KS.
Bond CL Yumar//TXGH12588-120*4 /FS2	CSU 2004 Hard red winter	R*	5	5	3	2	6	4	8	7	8	8	7	7	3	CSU release (2004). Clearfield* winter wheat. Slightly later maturity and slightly taller than Above. Resistant to RWA biotype 1. Relatively low test weight and low protein content, excellent baking quality. High yields in CO and western KS in 2005.
Danby TREGO/JGR 8W	KSU 2005 Hard white winter	S	6	4	5	3	3	4	3	3	5	2	3	2	7	KSU-Hays release (2005). Hard white wheat (HWW), similar to Trego, except with better resistance to stripe rust and improved preharvest sprouting tolerance (similar to Jagger).
Dumas WI90-425//N84-0758 //WI81-297-3	Agripro 2000 Hard red winter	S	5	4	1	---	2	4	6	6	7	3	7	1	6	Developed and marketed by Agripro. Medium-height, medium-maturity. Targeted for irrigated production in the western Great Plains. Excellent straw strength and test weight.
Endurance HBY756A/Siouxland//2180	OK 2004 Hard red winter	S	5	5	4	5	8	4	6	3	---	4	7	5	5	Oklahoma State University release (2004). Dual-purpose wheat, excellent re-growth following grazing. First entered in Colorado Dryland Variety Trials (UVPT) in 2005.
Enhancer 1992 Nebraska Bulk Selection	Westbred 1998 Hard red winter	S	5	5	8	4	3	5	3	8	6	5	4	7	6	Developed and marketed by Westbred. Medium height and medium maturity. Good fall growth, good stripe rust resistance. Poor straw strength and test weight.
Goodstreak SD3055/KS88H164//NE89646 (=COLT*2/PATRIZANKA)	NEB 2002 Hard red winter	S	6	8	5	---	9	5	5	5	8	2	3	2	8	Nebraska release (2002). Tall, medium-late maturing. Good test weights, good performance in Nebraska-Panhandle trials. Marginal baking quality.

Russian Wheat Aphid resistance (RWA), heading date (HD), plant height (HT), straw strength (SS), shatter (ST), Coleoptile length (COL), winterhardiness (WH), stripe rust (SR), leaf rust resistance (LR), wheat streak mosaic virus tolerance (WSMV), test weight (TW), Protein Content (PC), milling quality (MILL), and baking quality (BAKE).

**Rating scale: 0 - very good, very early, or very short to 9 - very poor, very late, or very tall; WH-winterhardiness; WSMV - wheat streak mosaic virus tolerance.

***RWA rating denotes resistance to the original biotype (biotype 1) of RWA. All available cultivars are susceptible to the new biotypes of RWA.

Name and Pedigree	Origin/Class	RWA	HD	HT	SS	ST	COL	WH	SR	LR	WSMV	TW	PC	MILL	BAKE	COMMENTS
Guymon Intrada/WI89-163W F2:8	OK 2005 Hard white winter	S	6	5	6	2	---	5	9	3	---	1	3	4	4	New hard white wheat from OK State first tested in CSU trials in 2006.
Harry NE90614/NE87612	NEB 2002 Hard red winter	S	6	4	5	---	8	5	9	5	8	9	9	7	7	Nebraska release (2002). Very good performance in Nebraska-Panhandle trials. Very low test weight in Colorado trials.
Hatcher Yuma/PI 372129//TAM 200/3/4*Yuma/4/KS91H184/ Vista	CSU 2004 Hard red winter	R*	5	2	5	2	6	4	4	7	8	4	6	2	4	CSU release (2004). Medium maturity, semidwarf (similar to Halt height). Good test weight and milling and good baking quality. Good stripe rust resistance. High yields in Colorado and western KS trials. Average straw strength for irrigation.
Infinity CL Windstar/3/NE94481// TXGH125888-120*4/FS2	NEB 2004 Hard red winter	S	7	7	4	4	8	2	3	---	---	5	8	---	---	Nebraska release (2005). Clearfield* winter wheat. Medium-late, medium-tall, better baking quality than Above. Good performance in 2005 trials across the High Plains.
Jagalene Abilene/Jagger	Agripro 2001 Hard red winter	S	5	5	4	7	6	3	4	7	4	1	4	2	5	Agripro release (2001). Medium height, medium maturity. Excellent winterhardiness, stripe rust resistance, and test weight. Has been observed to shatter severely in Colorado dryland trials. Excellent yield record in CSU Irrigated trials.
Jagger KS82W418/Stephens	KSU 1994 Hard red winter	S	2	4	6	5	7	8	2	8	4	5	2	5	3	KSU release (1994). Bronze-chaffed, early maturing semidwarf. High grain protein content and good baking quality, good WSMV tolerance, good stripe rust resistance. Below average straw strength. Prone to spring freeze injury, breaks dormancy very early in the spring.
KS03HW158 TREGO/CO960293	KSU EXP Hard white winter	S	6	4	---	3	5	---	4	---	---	1	3	---	---	New hard white wheat from KS State-Hays, first tested in CSU trials in 2006. Potential release for fall 2006. Carries very high level of tolerance to wheat streak mosaic virus.
KS03HW6-6CL FIDEL/97HW150// 97HW349/3/TGO	KSU EXP Hard white winter	S	6	4	---	3	5	---	4	---	---	1	3	---	---	New hard white wheat from KS State-Hays, first tested in CSU trials in 2006. Potential release for fall 2006 Clearfield* wheat for winter annual grassy weed control.
Lakin Arlin/KS89H130	KSU 2000 Hard white winter	S	5	5	4	4	6	4	9	9	5	5	2	3	6	Hard white winter wheat (HWW) released by Kansas State. Medium height, medium maturity. Suitable for both domestic (bread) and export (Asian noodles) uses. Slightly lower yield than Prairie Red in Colorado Dryland Trials.
Millennium Arapahoe/Abilene//NE86488	NEB 1999 Hard red winter	S	6	5	3	4	4	5	3	2	8	5	5	2	6	Nebraska release (1999). Medium late, medium height wheat. Average performance in CSU trials.
NuDakota JAGGERxROMANIAN	Agripro 2005 Hard white winter	S	4	5	3	3	---	3	2	2	4	6	3	---	---	New Agripro hard white wheat release (2005), first tested in CSU trials in 2006.
NuFrontier Pioneer bulk selection (HBK0927)	Agripro 2000 Hard white winter	S	7	6	5	3	6	4	3	7	8	4	4	4	5	Agripro release (2000). Hard white winter wheat (HWW), medium-late maturing, tall. Good stripe rust resistance. Very susceptible to pre-harvest sprouting. Best adapted to dryland conditions.
NuGrain Platte/W92-456W	Agripro 2005 Hard white winter	S	6	7	4	3	---	4	8	3	5	3	2	---	---	New Agripro hard white wheat release (2005), first tested in CSU trials in 2005 as GM10006.
NuHills Abilene/Jagger	Agripro 2003 Hard white winter	S	5	5	2	3	4	5	2	8	4	5	1	2	5	Agripro release (2003). Hard white wheat, sister selection to Jagalene. Good straw strength, good stripe rust resistance, good dryland and irrigated yields.
NuHorizon WI89-282/Arlin	Agripro 2000 Hard white winter	S	6	1	3	3	7	4	3	9	4	1	2	5	7	Agripro hard white wheat. Medium maturing semidwarf, excellent test weight. Good stripe rust resistance. Best adapted to irrigated conditions.

*Russian Wheat Aphid resistance (RWA), heading date (HD), plant height (HT), straw strength (SS), shatter (ST), Coleoptile length (COL), winterhardiness (WH), stripe rust (SR), leaf rust resistance (LR), wheat streak mosaic virus tolerance (WSMV), test weight (TW), Protein Content (PC), milling quality (MILL), and baking quality (BAKE).

**Rating scale: 0 - very good, very early, or very short to 9 - very poor, very late, or very tall; WH-winterhardiness; WSMV - wheat streak mosaic virus tolerance.

***RWA rating denotes resistance to the original biotype (biotype 1) of RWA. All available cultivars are susceptible to the new biotypes of RWA.

Name and Pedigree	Origin/Class	RWA	HD	HT	SS	ST	COL	WH	SR	LR	WSMV	TW	PC	MILL	BAKE	COMMENTS
Ok102 2174/Cimarron	OK 2002 Hard red winter	S	5	1	2	4	4	4	8	3	---	3	3	2	3	Medium-maturity, semidwarf. Excellent milling and baking quality characteristics. Targeted toward irrigated production in the High Plains.
Overley U1275-1-4-2-2/ KS85W663-7-4-2//JGR	KSU 2003 Hard red winter	S	2	4	3	7	6	6	2	8	9	5	2	2	2	New release from Kansas State University (Manhattan). Excellent milling and baking quality characteristics. First entered in Colorado Dryland Trials (UVPT) in 2004. Has been observed to shatter severely across the High Plains.
Platte N84-1104/Abilene	Agripro 1995 Hard white winter	S	6	1	1	---	1	5	9	---	7	3	5	3	1	Agripro release (1995), marketed under identity-preserved contracts with ConAgra. Excellent test weight and milling and baking quality. Targeted specifically for irrigated production. Very susceptible to stripe rust.
Postrock Ogallala/KSU94U261//Jagger	Agripro 2005 Hard red winter	S	5	5	4	4	---	5	2	2	4	2	2	---	---	New Agripro hard red wheat release (2005), first tested in CSU trials in 2006.
Prairie Red CO850034/PI372129 //5*TAM 107	CSU 1998 Hard red winter	R*	1	2	4	2	8	4	9	9	5	7	3	4	7	CSU release (1998). Russian wheat aphid resistant version of TAM 107. Bronze-chaffed, early maturing semidwarf, medium long coleoptile, good heat and drought tolerance, poor end-use quality reputation.
Prowers 99 CO850060/PI372129 //5*Lamar	CSU 1999 Hard red winter	R*	8	8	7	4	9	2	5	6	7	1	1	5	1	CSU release (1999), developed from reselection within Prowers for improved RWA resistance. Tall, long coleoptile, medium-late maturity, high test weight, good milling and baking quality characteristics. Very similar to Lamar and Prowers.
Stanton PI220350/KS87H57//TAM- 200/KS87H66/3/KS87H325	KSU 2000 Hard red winter	R*	5	6	5	4	7	4	8	2	5	2	4	2	6	KSU release (2000). RWA biotype 1 resistant (different resistance gene from CSU varieties), medium-tall, medium maturity, high test weight, good quality.
TAM 111 TAM-107//TX78V3630/ CTK78/3/TX87V1233	TX 2002 Hard red winter	S	5	6	4	4	8	5	2	9	5	1	7	3	4	Texas A&M release (2002), marketed by Agripro. Medium height, medium maturity. Good milling and baking quality characteristics, good stripe rust resistance, good straw strength, high test weight.
Thunderbolt Abilene/KS90WGRC10	Agripro 1999 Hard red winter	S	7	5	3	7	7	4	7	8	5	1	1	1	4	Developed and marketed by Agripro. Bronze chaffed, medium height, medium maturity, high test weight, good milling and baking quality and leaf rust resistance. Has been observed to shatter severely in Colorado trials.
Trego KS87H325/Rio Blanco	KSU 1999 Hard white winter	S	6	4	6	3	5	4	9	4	5	1	3	2	6	KSU release (1999). Hard white winter wheat (HWW), medium-late maturity, semidwarf, high test weight. Good pre-harvest sprouting tolerance.
Wahoo Arapahoe/Abilene//Arapahoe	NEB 2000 Hard red winter	S	6	4	5	3	6	3	3	5	8	5	5	6	7	University of Nebraska release (2000). Very good performance in Nebraska-Panhandle trials. First entered in Colorado Dryland Trials (UVPT) in 2004.
Wesley KS831936-3//Colt/Cody	NEB 1998 Hard red winter	S	4	1	2	3	5	3	3	3	7	5	2	3	4	Nebraska-USDA release (1998). Later maturing, short, excellent straw strength. Good winterhardiness and milling and baking quality characteristics. Good stripe rust resistance.
Westbred Keota Custer/Jagger	Westbred 2005 Hard red winter	S	5	5	4	3	7	5	2	8	5	7	4	6	6	New Westbred hard red wheat release (2005), first tested in CSU trials in 2005. Good stripe rust resistance.
Yuma NS14/NS25/2/2*Vona	CSU 1991 Hard red winter	S	5	3	2	5	2	4	6	8	6	5	7	7	3	CSU release (1991). Medium maturity, semidwarf, very good straw strength, short coleoptile, good baking quality characteristics. Tough to beat under irrigation.
Yumar Yuma/PI372129// CO850034/3/4*Yuma	CSU 1997 Hard red winter	R*	5	4	3	5	2	4	6	8	6	5	5	5	3	CSU release (1997). Russian wheat aphid resistant version of Yuma. Medium-maturing semidwarf. Good straw strength, good baking quality characteristics.

*Russian Wheat Aphid resistance (RWA), heading date (HD), plant height (HT), straw strength (SS), shatter (ST), Coleoptile length (COL), winterhardiness (WH), stripe rust (SR), leaf rust resistance (LR), wheat streak mosaic virus tolerance (WSMV), test weight (TW), Protein Content (PC), milling quality (MILL), and baking quality (BAKE).

**Rating scale: 0 - very good, very early, or very short to 9 - very poor, very late, or very tall; WH-winterhardiness; WSMV - wheat streak mosaic virus tolerance.

***RWA rating denotes resistance to the original biotype (biotype 1) of RWA. All available cultivars are susceptible to the new biotypes of RWA.

Table 2. Colorado winter wheat Uniform Variety Performance Trial summary for 2005.

Variety[1]	Location										2005 Averages				
	Akron	Arapahoe	Bennett	Burlington	Genoa	Julesburg	Lamar	Sheridan Lake	Walsh	Yuma	2005	% of Trial Average	Grain Moist[2]	Test Wt	Plant Ht[3]
	----------Yield (bu/ac)----------											%	%	lb/bu	in
Bond CL	33.5	30.5	41.3	34.5	66.2	28.4	37.5	27.1	60.3	30.7	39.0	125	10.1	56.4	22
CO00016	31.3	34.6	37.3	35.0	53.1	31.9	44.9	38.4	57.4	25.0	38.9	125	10.4	56.9	23
Hatcher	26.7	24.3	35.3	14.8	66.2	33.4	43.5	30.4	65.0	18.0	35.8	115	10.6	57.6	20
Enhancer	28.6	25.7	37.6	27.1	59.4	26.0	44.0	24.9	57.4	24.5	35.5	114	10.3	55.3	25
Westbred Keota	26.6	20.9	36.9	17.6	72.5	28.1	37.4	20.3	51.7	25.1	33.7	108	10.9	56.2	24
AP502 CL	25.5	23.3	36.5	29.7	54.5	29.8	33.6	30.9	44.2	24.3	33.2	107	10.0	57.5	23
Prairie Red	26.6	25.0	40.7	25.4	57.8	32.3	35.1	25.1	46.0	17.4	33.1	106	10.3	57.6	21
Above	27.1	30.6	33.7	24.3	60.0	27.9	34.7	28.2	45.4	19.5	33.1	106	10.5	58.2	21
Jagalene	22.2	18.8	31.4	19.7	63.5	35.0	40.3	24.0	50.5	25.2	33.1	106	10.5	57.2	23
Avalanche	26.4	19.1	36.3	18.9	57.8	33.9	40.6	28.2	43.4	25.2	33.0	106	10.7	58.5	23
Jagger	31.2	25.8	26.6	19.8	66.8	28.9	32.8	16.8	53.5	25.1	32.7	105	10.2	56.4	23
NuGrain	28.6	15.3	35.4	22.1	63.8	31.9	38.3	21.6	45.9	21.7	32.5	104	10.7	58.2	23
Alliance	25.1	21.1	33.8	21.0	55.2	27.4	41.2	26.6	50.4	20.7	32.2	103	10.3	57.7	22
NuHills	25.0	24.8	38.2	15.6	59.4	21.7	35.2	29.2	47.0	26.2	32.2	103	10.3	55.3	23
NuFrontier	23.5	20.3	38.1	18.4	61.5	26.9	31.1	22.2	55.6	22.2	32.0	103	10.5	57.4	24
Overley	16.9	25.9	34.1	25.6	53.7	29.9	35.6	15.7	48.6	32.8	31.9	102	10.3	56.2	24
Harry	30.0	20.1	28.4	15.7	51.8	25.7	43.7	25.3	53.5	20.0	31.4	101	9.8	54.4	22
Prowers 99	23.9	15.9	39.0	18.8	54.4	32.8	36.0	21.0	50.4	20.6	31.3	100	11.0	57.7	24
Infinity CL	26.2	23.2	32.0	17.8	57.1	27.4	37.3	26.8	45.8	17.8	31.1	100	10.3	56.6	22
Danby	20.4	18.6	38.9	11.8	66.4	22.8	33.5	25.5	52.8	17.9	30.9	99	11.2	57.8	23
Yuma	18.9	19.6	35.4	19.3	56.0	28.8	28.8	23.2	54.1	24.2	30.8	99	10.2	56.5	20
Yumar	25.6	20.5	33.3	16.8	50.8	29.0	32.2	22.3	53.2	23.7	30.7	99	10.3	56.5	22
Endurance	17.2	22.9	29.4	23.0	61.4	25.4	30.4	28.6	48.2	20.4	30.7	98	11.1	58.0	24
Goodstreak	18.9	22.2	33.8	18.7	55.7	26.4	41.2	22.2	45.6	16.0	30.0	96	10.7	58.2	24
Ankor	22.0	21.1	38.4	9.8	55.8	27.3	33.3	24.5	51.1	14.4	29.7	95	10.5	57.1	21
TAM 111	23.0	17.0	28.3	7.1	62.4	27.4	32.4	23.4	56.7	16.6	29.4	94	11.4	57.5	25
Millennium	22.8	16.8	31.6	21.3	43.3	31.0	32.0	22.7	44.2	22.6	28.8	92	10.3	55.4	25
Thunderbolt	19.4	13.2	27.5	22.5	47.7	34.9	30.6	22.7	41.1	25.4	28.5	91	10.4	56.7	22
Akron	21.0	22.1	28.7	8.9	50.4	24.4	34.8	22.4	43.9	15.5	27.2	87	10.5	57.3	21
Wahoo	17.4	12.7	30.2	6.0	60.0	20.8	36.4	26.4	49.0	11.9	27.1	87	10.7	56.4	23
Stanton	22.3	22.5	23.7	10.5	53.8	23.0	25.9	22.2	41.9	18.6	26.4	85	9.8	58.2	22
Trego	20.0	17.3	31.7	7.8	50.2	20.4	31.7	30.1	39.3	13.1	26.2	84	10.9	58.2	22
NuHorizon	21.1	16.0	24.9	10.6	47.9	12.4	39.6	20.8	51.1	16.5	26.1	84	11.1	58.8	21
Lakin	12.2	22.3	16.5	3.8	44.1	20.3	37.5	19.2	41.7	9.6	22.7	73	10.7	58.1	22
Averages	**23.7**	**21.5**	**33.1**	**18.2**	**57.1**	**27.5**	**36.0**	**24.7**	**49.6**	**20.8**	**31.2**		**10.5**	**57.1**	**23**
$LSD_{(0.30)}$	2.7	2.8	3.9	2.0	5.8		5.3	3.1	3.2	2.6	1.2				

[1]Varieties in table ranked by the average yield over 10 locations in 2005.
[2]No moisture taken at Julesburg.
[3]No height notes at Burlington.

Table 3. Colorado winter wheat 3-Yr and 2-Yr Uniform Variety Performance Trial summary.

	Averages							
Variety[1]	3-Yr	2-Yr	2-Yr rank	2005	2004	2003	3-Yr	2-Yr
	----------Yield (bu/ac)----------						---TWT (lb/bu)---	
CO00016	46.3	43.3	1	38.9	52.1	53.6	57.4	56.9
Bond CL	45.9	42.1	2	39.0	48.4	55.2	56.7	56.0
Hatcher	44.5	39.9	4	35.8	48.3	56.0	58.2	57.4
Above	43.1	39.2	5	33.1	51.4	52.8	58.0	57.7
Avalanche	42.2	38.9		33.0	50.6	50.4	59.0	58.4
Jagalene	41.9	40.1	3	33.1	54.1	46.6	58.2	57.5
Prairie Red	41.5	38.1		33.1	48.0	50.2	57.8	57.4
AP502 CL	41.4	38.4		33.2	48.6	48.9	57.6	57.0
Yuma	41.3	36.7		30.8	48.4	53.0	57.3	56.5
TAM 111	41.0	36.4		29.4	50.2	52.6	58.4	57.5
Alliance	40.8	36.9		32.2	46.4	50.5	57.9	57.3
Yumar	40.6	36.7		30.7	48.7	50.3	57.6	56.8
Ankor	40.5	35.9		29.7	48.3	51.8	57.8	57.2
Jagger	40.0	37.6		32.7	47.3	46.0	57.3	56.5
Trego	38.9	33.3		26.2	47.7	52.9	59.3	58.6
Stanton	38.7	34.4		26.4	50.4	49.4	58.7	58.1
Akron	38.3	33.7		27.2	46.7	49.6	57.8	57.2
Prowers 99	37.9	34.9		31.3	42.2	45.4	58.6	57.8
Lakin	36.2	31.5		22.7	49.0	47.8	58.4	58.0
Thunderbolt	35.1	33.3		28.5	43.0	39.6	58.4	57.5
Harry	*	38.0		31.4	51.2	*	*	54.4
NuHills	*	37.5		32.2	48.1	*	*	55.6
NuFrontier	*	37.1		32.0	47.3	*	*	57.4
Goodstreak	*	37.0		30.0	51.0	*	*	58.2
Overley	*	36.3		31.9	45.1	*	*	56.5
Wahoo	*	34.4		27.1	49.1	*	*	56.4
Millennium	*	34.2		28.8	45.1	*	*	56.1
NuHorizon	*	32.0		26.1	43.7	*	*	58.5

[1]Varieties in table ranked based on 3-Yr average yields.

*Harry, NuHills, NuFrontier, Goodstreak, Overley, Wahoo, Millennium, and NuHorizon have been tested in the UVPT only two years.

Table 4. Winter wheat Uniform Variety Performance Trial at Akron[1].

Variety	Yield	Grain Moisture	Test Wt	Plant Ht	50% Heading[2]
	bu/ac	%	lb/bu	in	date
Bond CL	33.5	8.9	54.4	16	141
CO00016	31.3	8.6	55.0	17	141
Jagger	31.2	8.7	53.7	18	141
Harry	30.0	8.0	51.7	16	143
Enhancer	28.6	8.6	52.7	17	142
NuGrain	28.6	9.6	57.5	15	143
Above	27.1	9.4	56.4	16	141
Hatcher	26.7	9.2	54.1	14	143
Westbred Keota	26.6	8.6	54.1	17	142
Prairie Red	26.6	8.9	54.3	17	140
Avalanche	26.4	9.1	56.5	16	143
Infinity CL	26.2	8.5	53.2	17	142
Yumar	25.6	8.7	54.3	16	143
AP502 CL	25.5	8.6	55.7	16	140
Alliance	25.1	8.9	57.1	15	141
NuHills	25.0	8.4	49.8	17	141
Prowers 99	23.9	9.4	55.4	17	144
NuFrontier	23.5	8.9	55.4	17	142
TAM 111	23.0	9.1	58.7	16	142
Millennium	22.8	8.0	48.8	17	142
Stanton	22.3	9.1	55.9	16	142
Jagalene	22.2	8.2	53.7	15	143
Ankor	22.0	8.9	55.0	15	143
NuHorizon	21.1	9.4	56.8	15	142
Akron	21.0	9.0	54.8	15	142
Danby	20.4	9.2	54.2	16	143
Trego	20.0	9.2	56.5	16	143
Thunderbolt	19.4	6.0	38.9	14	142
Yuma	18.9	9.0	54.9	16	143
Goodstreak	18.9	8.8	55.8	18	144
Wahoo	17.4	*	*	15	142
Endurance	17.2	9.4	56.0	14	143
Overley	16.9	8.4	51.1	20	141
Lakin	12.2	9.1	55.8	17	142
Average	**23.7**	**8.8**	**54.2**	**16**	**142**
$LSD_{(0.30)}$	2.7				

[1]Trial conducted at the Central Great Plains Research Center; seeded 9/27/04 and harvested 7/14/05.
[2]Julian date from January 1.
*Sample insufficient to determine grain moisture and test weight.

Comments: Excellent fall emergence and plant stands, very lush growth in early spring, severe drought stress in early May followed by damaging high temperatures at heading. Early June rains relieved drought stress to some degree. Severe stripe rust infection in wetter parts of the field, low levels of leaf rust infection. Two rains at maturity delayed harvest and reduced test weights.

Table 5. Winter wheat Uniform Variety Performance Trial at Arapahoe[1].

Variety	Yield	Grain Moisture	Test Weight	Plant Height
	bu/ac	%	lb/bu	in
CO00016	34.6	10.5	59.6	22
Above	30.6	9.9	59.4	22
Bond CL	30.5	10.3	57.9	22
Overley	25.9	10.1	59.2	22
Jagger	25.8	10.4	59.2	22
Enhancer	25.7	9.5	56.0	20
Prairie Red	25.0	10.4	59.8	21
NuHills	24.8	10.6	59.5	20
Hatcher	24.3	10.7	59.7	22
AP502 CL	23.3	10.1	58.5	22
Infinity CL	23.2	10.5	58.8	23
Endurance	22.9	10.6	59.1	21
Stanton	22.5	11.0	60.1	23
Lakin	22.3	10.3	59.5	19
Goodstreak	22.2	10.1	59.4	22
Akron	22.1	9.9	58.0	21
Alliance	21.1	10.2	58.2	21
Ankor	21.1	10.3	57.9	22
Westbred Keota	20.9	10.9	59.4	22
Yumar	20.5	9.7	57.4	18
NuFrontier	20.3	10.2	57.0	21
Harry	20.1	9.7	55.5	20
Yuma	19.6	9.5	56.7	21
Avalanche	19.1	11.1	60.8	20
Jagalene	18.8	10.7	58.6	18
Danby	18.6	11.4	61.3	20
Trego	17.3	*	*	19
TAM 111	17.0	*	*	21
Millennium	16.8	*	*	18
NuHorizon	16.0	*	*	18
Prowers 99	15.9	10.9	57.3	22
NuGrain	15.3	*	*	20
Thunderbolt	13.2	*	*	19
Wahoo	12.7	*	*	19
Average	**21.5**	**10.3**	**58.7**	**21**
$LSD_{(0.30)}$	2.8			

[1]Trial conducted on the Dennis & Matt Campbell farm; seeded 9/1/04 and harvested 6/29/05.
*Sample insufficient to determine grain moisture and test weight.

Comments: Trial hailed on right after planting and crusting reduced emergence. Used rotary hoe to break crust and two dates of emergence were evident throughout the season. Plant stands were low even with second emergence and resulted in low yields. Freeze damage visible at heading. Some RWA pressure. High temperatures and strong winds may have caused damage as well as freezing.

Table 6. Winter wheat Uniform Variety Performance Trial at Bennett[1].

Variety	Yield	Grain Moisture	Test Weight	Plant Height
	bu/ac	%	lb/bu	in
Bond CL	41.3	10.1	61.3	22
Prairie Red	40.7	10.3	61.8	16
Prowers 99	39.0	10.8	62.8	21
Danby	38.9	10.8	61.6	18
Ankor	38.4	9.8	59.3	18
NuHills	38.2	10.1	59.4	18
NuFrontier	38.1	10.4	61.3	19
Enhancer	37.6	9.9	60.2	22
CO00016	37.3	10.5	60.0	19
Westbred Keota	36.9	10.6	60.4	21
AP502 CL	36.5	10.3	61.3	21
Avalanche	36.3	10.9	61.2	19
NuGrain	35.4	10.6	60.5	18
Yuma	35.4	10.8	60.8	15
Hatcher	35.3	10.7	62.6	14
Overley	34.1	10.5	59.1	19
Goodstreak	33.8	10.3	62.4	21
Alliance	33.8	10.6	61.8	17
Above	33.7	10.5	61.0	20
Yumar	33.3	10.3	59.7	19
Infinity CL	32.0	10.3	61.0	21
Trego	31.7	11.0	61.8	16
Millennium	31.6	10.3	60.7	19
Jagalene	31.4	10.8	60.1	19
Wahoo	30.2	10.3	60.2	18
Endurance	29.4	10.7	62.4	19
Akron	28.7	9.5	59.9	15
Harry	28.4	10.1	59.2	18
TAM 111	28.3	11.0	60.6	21
Thunderbolt	27.5	10.4	61.9	22
Jagger	26.6	10.3	58.2	20
NuHorizon	24.9	11.0	62.1	21
Stanton	23.7	10.1	59.7	16
Lakin	16.5	10.6	60.1	20
Average	**33.1**	**10.4**	**60.8**	**19**
$LSD_{(0.30)}$	3.9			

[1]Trial conducted on the John Sauter farm; seeded 9/11/04 and harvested 7/7/05.

Comments: Trial looked very uniform and lush into May but highly variable plant height across the trial resulting from high temperatures was due, most likely, to variable soil water-holding capacity. Stripe rust was evident and some freeze damage was visible. Drought affected parts of the field.

Table 7. Winter wheat Uniform Variety Performance Trial at Burlington[1].

Variety	Yield	Grain Moisture	Test Weight
	bu/ac	%	lb/bu
CO00016	35.0	9.4	56.0
Bond CL	34.5	9.3	55.0
AP502 CL	29.7	9.3	57.1
Enhancer	27.1	8.8	52.3
Overley	25.6	9.3	55.2
Prairie Red	25.4	9.6	56.8
Above	24.3	10.0	58.4
Endurance	23.0	9.6	57.5
Thunderbolt	22.5	9.8	58.8
NuGrain	22.1	9.4	57.4
Millennium	21.3	8.5	52.0
Alliance	21.0	9.2	55.9
Jagger	19.8	9.2	53.5
Jagalene	19.7	9.2	55.8
Yuma	19.3	9.2	55.2
Avalanche	18.9	8.9	54.8
Prowers 99	18.8	9.6	55.8
Goodstreak	18.7	9.8	59.5
NuFrontier	18.4	9.2	55.3
Infinity CL	17.8	9.3	55.3
Westbred Keota	17.6	9.4	55.5
Yumar	16.8	9.3	54.2
Harry	15.7	7.9	49.3
NuHills	15.6	8.9	53.9
Hatcher	14.8	9.6	54.0
Danby	11.8	11.1	57.2
NuHorizon	10.6	*	*
Stanton	10.5	*	*
Ankor	9.8	*	*
Akron	8.9	*	*
Trego	7.8	*	*
TAM 111	7.1	9.0	55.0
Wahoo	6.0	*	*
Lakin	3.8	*	*
Average	**18.2**	**9.3**	**55.4**
$LSD_{(0.30)}$	2.0		

[1]Trial conducted on the Randy Wilks farm; seeded 9/13/04 and harvested 6/30/05.
*Sample insufficient to determine grain moisture and test weight.

Comments: Excellent fall emergence and plant stand, very lush growth in early spring, severe drought stress in early May followed by damaging high temperatures at heading. Some hail damage prior to heading. Stripe rust present in early May prevented from developing by dry and hot conditions. Trials quite variable.

Table 8. Winter wheat Uniform Variety Performance Trial at Genoa[1].

Variety	Yield	Grain Moisture	Test Wt	Plant Ht	Stripe Rust[2]
	bu/ac	%	lb/bu	in	1-9
Westbred Keota	72.5	16.1	59.2	33	2
Jagger	66.8	12.0	61.2	21	2
Danby	66.4	14.9	61.5	32	2
Hatcher	66.2	12.6	60.6	21	3
Bond CL	66.2	12.0	61.5	21	7
NuGrain	63.8	13.6	61.7	31	4
Jagalene	63.5	13.0	60.6	30	2
TAM 111	62.4	18.0	59.6	29	2
NuFrontier	61.5	14.1	62.3	32	2
Endurance	61.4	16.3	60.7	33	6
Wahoo	60.0	12.3	60.4	28	2
Above	60.0	12.3	62.3	24	8
NuHills	59.4	12.1	58.9	29	2
Enhancer	59.4	15.1	59.0	30	2
Prairie Red	57.8	11.1	60.3	23	8
Avalanche	57.8	12.5	61.9	28	9
Infinity CL	57.1	12.4	60.9	18	2
Yuma	56.0	12.9	62.5	24	4
Ankor	55.8	12.9	60.8	22	7
Goodstreak	55.7	13.7	61.5	33	4
Alliance	55.2	12.2	60.4	23	9
AP502 CL	54.5	11.4	61.2	23	9
Prowers 99	54.4	14.6	63.8	29	2
Stanton	53.8	12.2	61.8	26	7
Overley	53.7	12.5	61.0	32	2
CO00016	53.1	11.8	59.8	28	9
Harry	51.8	12.4	58.2	28	5
Yumar	50.8	13.1	62.4	30	4
Akron	50.4	12.6	61.3	24	7
Trego	50.2	13.0	62.1	32	9
NuHorizon	47.9	12.7	61.1	24	2
Thunderbolt	47.7	13.5	62.7	24	4
Lakin	44.1	13.0	61.3	29	9
Millennium	43.3	13.6	60.6	34	2
Average	**57.1**	**13.2**	**61.0**	**27**	**5**
$LSD_{(0.30)}$	5.8				

[1]Trial conducted on the Ross Hansen farm; seeded 9/9/04 and harvested 7/11/05.
[2]Rating scale 1-9 with 1 = very resistant to 9 = very susceptible.

Comments: Plant stands were good and uniform for the whole trial. Drought relieved by snow on March 31. Leaf rust was visible on susceptible varieties in April. Yields higher in 2005 than in previous years.

Table 9. Winter wheat Uniform Variety Performance Trial at Julesburg[1].

Variety	Yield	Test Weight	Plant Height
	bu/ac	lb/bu	in
Jagalene	35.0	57.8	19
Thunderbolt	34.9	57.8	19
Avalanche	33.9	58.7	19
Hatcher	33.4	57.1	19
Prowers 99	32.8	56.5	22
Prairie Red	32.3	56.6	18
CO00016	31.9	55.2	20
NuGrain	31.9	58.8	18
Millennium	31.0	55.6	21
Overley	29.9	55.9	21
AP502 CL	29.8	57.3	19
Yumar	29.0	56.1	19
Jagger	28.9	56.0	21
Yuma	28.8	56.1	17
Bond CL	28.4	57.1	19
Westbred Keota	28.1	57.8	20
Above	27.9	57.9	18
Alliance	27.4	56.4	20
Infinity CL	27.4	56.3	21
TAM 111	27.4	56.1	20
Ankor	27.3	55.6	19
NuFrontier	26.9	57.6	20
Goodstreak	26.4	57.0	21
Enhancer	26.0	54.1	20
Harry	25.7	53.7	19
Endurance	25.4	57.7	20
Akron	24.4	55.8	19
Stanton	23.0	57.5	18
Danby	22.8	59.7	21
NuHills	21.7	55.1	17
Wahoo	20.8	55.6	21
Trego	20.4	59.0	19
Lakin	20.3	57.3	20
NuHorizon	12.4	59.0	18
Average	**27.5**	**56.8**	**19**

[1]Trial conducted on the David Deden farm; seeded 9/15/04 and harvested 7/11/05.

Comments: Excellent fall emergence, fall growth. Very lush in the spring, dry conditions as at other locations, though high temperatures at heading not as damaging as elsewhere. Stripe rust infection fairly heavy. High temperatures during grain filling.

Table 10. Winter wheat Uniform Variety Performance Trial at Lamar[1].

Variety	Yield	Grain Moisture	Test Weight	Plant Height
	bu/ac	%	lb/bu	in
CO00016	44.9	8.7	56.7	27
Enhancer	44.0	8.5	56.1	33
Harry	43.7	7.7	53.8	26
Hatcher	43.5	8.4	55.9	24
Alliance	41.2	8.7	57.7	25
Goodstreak	41.2	8.3	55.9	24
Avalanche	40.6	8.9	57.4	33
Jagalene	40.3	8.4	54.9	32
NuHorizon	39.6	9.0	57.4	26
NuGrain	38.3	8.0	54.5	30
Bond CL	37.5	7.9	53.5	26
Lakin	37.5	8.6	56.9	25
Westbred Keota	37.4	8.1	53.2	30
Infinity CL	37.3	8.4	55.1	27
Wahoo	36.4	7.8	53.1	27
Prowers 99	36.0	8.9	55.5	28
Overley	35.6	8.3	55.2	29
NuHills	35.2	7.6	50.9	31
Prairie Red	35.1	8.4	55.2	26
Akron	34.8	8.7	57.0	27
Above	34.7	8.2	54.7	25
AP502 CL	33.6	8.5	56.1	29
Danby	33.5	8.4	53.1	30
Ankor	33.3	9.0	56.9	25
Jagger	32.8	8.1	54.4	29
TAM 111	32.4	8.7	56.2	31
Yumar	32.2	8.3	53.1	26
Millennium	32.0	7.8	53.2	27
Trego	31.7	8.7	56.2	30
NuFrontier	31.1	7.8	53.4	29
Thunderbolt	30.6	8.7	56.9	28
Endurance	30.4	8.7	55.7	30
Yuma	28.8	8.0	53.9	23
Stanton	25.9	8.8	56.5	27
Average	**36.0**	**8.4**	**55.2**	**28**
$LSD_{(0.30)}$	5.3			

[1]Trial conducted on the John Stulp farm; seeded 9/15/04 and harvested 6/28/05.

Comments: Very average trial for Lamar. Good plant emergence in the fall followed by drought until a relatively moist March. Weeds, not controlled until late spring, may have reduced yields.

Table 11. Winter wheat Uniform Variety Performance Trial at Sheridan Lake[1].

Variety	Yield	Grain Moisture	Test Weight	Plant Height
	bu/ac	%	lb/bu	in
CO00016	38.4	8.9	54.5	25
AP502 CL	30.9	9.6	56.4	23
Hatcher	30.4	9.4	55.7	26
Trego	30.1	9.7	56.6	24
NuHills	29.2	9.3	55.2	25
Endurance	28.6	9.7	55.8	26
Above	28.2	9.4	56.8	23
Avalanche	28.2	9.5	56.6	26
Bond CL	27.1	8.7	53.5	24
Infinity CL	26.8	9.0	54.9	26
Alliance	26.6	9.2	55.5	24
Wahoo	26.4	9.1	54.6	27
Danby	25.5	10.2	57.7	24
Harry	25.3	8.4	52.7	25
Prairie Red	25.1	9.1	55.7	24
Enhancer	24.9	8.4	51.5	26
Ankor	24.5	8.6	53.5	27
Jagalene	24.0	9.4	55.4	26
TAM 111	23.4	9.3	56.0	30
Yuma	23.2	8.7	53.2	23
Thunderbolt	22.7	9.5	55.6	22
Millennium	22.7	9.2	53.5	27
Akron	22.4	9.0	53.4	25
Yumar	22.3	9.1	53.5	23
NuFrontier	22.2	9.4	55.5	25
Stanton	22.2	9.1	55.8	27
Goodstreak	22.2	9.3	54.2	26
NuGrain	21.6	9.3	56.0	24
Prowers 99	21.0	8.9	53.5	25
NuHorizon	20.8	9.4	56.5	21
Westbred Keota	20.3	9.4	53.6	22
Lakin	19.2	9.3	55.4	25
Jagger	16.8	8.7	52.8	23
Overley	15.7	8.8	53.4	21
Average	**24.7**	**9.2**	**54.8**	**25**
$LSD_{(0.30)}$	3.1			

[1]Trial conducted on the Burl Scherler farm; seeded 9/7/04 and harvested 6/28/05.

Comments: Excellent fall emergence, growth. Very lush in the spring. Some damage from spring freeze event in late April. Very wet May brought on significant stripe rust pressure with trace levels of leaf rust. Some RWA found at low levels.

Table 12. Winter wheat Uniform Variety Performance Trial at Walsh[1].

Variety	Yield	Grain Moisture	Test Wt	Plant Ht	Stripe Rust[2]
	bu/ac	%	lb/bu	in	1-9
Hatcher	65.0	9.0	59.0	26	5
Bond CL	60.3	8.5	53.8	28	8
Enhancer	57.4	8.4	57.2	31	4
CO00016	57.4	8.6	58.0	26	9
TAM 111	56.7	8.2	58.9	30	2
NuFrontier	55.6	8.8	58.5	31	4
Yuma	54.1	8.1	56.1	24	6
Harry	53.5	8.1	54.6	29	9
Jagger	53.5	8.5	58.3	30	2
Yumar	53.2	8.3	57.7	27	6
Danby	52.8	8.5	55.8	27	4
Westbred Keota	51.7	8.1	54.4	31	2
Ankor	51.1	8.8	58.6	27	7
NuHorizon	51.1	8.6	59.0	25	4
Jagalene	50.5	8.7	57.6	28	4
Prowers 99	50.4	8.8	58.8	33	5
Alliance	50.4	8.4	57.6	27	6
Wahoo	49.0	8.4	56.2	28	4
Overley	48.6	8.3	57.3	29	3
Endurance	48.2	8.6	57.8	27	8
NuHills	47.0	7.4	51.9	28	3
Prairie Red	46.0	8.4	56.8	25	9
NuGrain	45.9	8.8	59.1	25	9
Infinity CL	45.8	8.4	55.8	27	4
Goodstreak	45.6	8.5	59.7	30	5
Above	45.4	8.3	58.0	26	9
Millennium	44.2	8.6	58.1	30	4
AP502 CL	44.2	8.0	56.1	26	9
Akron	43.9	8.6	57.6	27	8
Avalanche	43.4	8.7	58.5	27	9
Stanton	41.9	8.6	58.6	27	8
Lakin	41.7	8.4	58.5	24	9
Thunderbolt	41.1	8.7	59.9	26	8
Trego	39.3	8.4	57.3	24	9
Average	**49.6**	**8.5**	**57.4**	**27**	**6**
$LSD_{(0.30)}$	3.2				

[1]Trial conducted at the Plainsman Research Center; seeded 9/28/04 and harvested 6/28/05.
[2]Rating scale 1-9 with 1=very resistant to 9=very susceptible.

Comments: Excellent fall emergence, growth. Very lush in the spring, nice dark green color indicated adequate available soil nitrogen. Good spring moisture resulted in moderate stripe rust infection by late April which became severe by early May. Some damage from spring freeze event in late April. Some RWA found, both biotype 1 and biotype 2 based on differential variety response. Trace levels of leaf rust found in mid-June. Very nice trials for this location.

Table 13. Winter wheat Uniform Variety Performance Trial at Yuma[1].

Variety	Yield	Grain Moisture	Test Wt	Plant Ht
	bu/ac	%	lb/bu	in
Overley	32.8	16.1	55.2	22
Bond CL	30.7	15.3	55.8	21
NuHills	26.2	15.8	54.7	22
Thunderbolt	25.4	16.5	58.2	24
Jagalene	25.2	16.1	57.7	21
Avalanche	25.2	16.7	58.8	21
Westbred Keota	25.1	16.9	54.6	21
Jagger	25.1	15.8	57.0	21
CO00016	25.0	16.9	54.2	22
Enhancer	24.5	15.9	54.0	23
AP502 CL	24.3	14.7	55.7	23
Yuma	24.2	15.7	55.8	20
Yumar	23.7	15.9	57.0	24
Millennium	22.6	16.7	56.4	27
NuFrontier	22.2	15.9	57.9	23
NuGrain	21.7	16.1	58.0	31
Alliance	20.7	15.7	56.9	22
Prowers 99	20.6	16.8	57.7	17
Endurance	20.4	16.7	57.1	23
Harry	20.0	15.7	55.6	22
Above	19.5	16.4	57.5	19
Stanton	18.6	*	*	18
Hatcher	18.0	15.7	57.5	17
Danby	17.9	16.0	56.4	20
Infinity CL	17.8	16.2	55.2	21
Prairie Red	17.4	16.3	59.0	16
TAM 111	16.6	18.1	56.1	24
NuHorizon	16.5	17.3	58.5	21
Goodstreak	16.0	17.4	57.1	23
Akron	15.5	17.0	57.8	18
Ankor	14.4	16.1	56.5	17
Trego	13.1	16.2	56.5	17
Wahoo	11.9	16.3	54.8	28
Lakin	9.6	16.5	58.2	22
Average	**20.8**	**16.3**	**56.6**	**22**
$LSD_{(0.30)}$	2.6			

[1]Trial conducted on the Andrew Brothers' farm; seeded 9/13/04 and harvested 1st rep 7/5/05 and 2nd & 3rd rep 7/6/05.
*Sample insufficient to determine grain moisture and test weight.

Comments: Plant stands were poor and erratic. RWA infestation was high by mid-June. Heat stress reduced yields at the end of the season.

Table 14. Protein Content of UVPT Entries at Four Trial Locations for 2005.

	Trial Locations				
Variety	Akron	Burlington	Julesburg	Walsh	Average
Jagger	18.1	18.4	18.7	13.4	17.2
Thunderbolt	18.2	18.1	16.5	15.0	16.9
Millennium	17.3	18.3	16.8	14.6	16.7
NuHills	17.5	17.8	17.0	14.6	16.7
TAM 111	17.2	18.2	17.9	13.5	16.7
Overley	18.1	18.0	17.6	13.0	16.7
NuHorizon	17.7	18.9	16.0	13.5	16.5
Wahoo	18.4	19.4	16.3	11.7	16.5
Westbred Keota	17.3	17.4	17.0	13.4	16.3
Goodstreak	17.8	17.7	17.5	11.7	16.2
Trego	16.9	17.8	16.8	12.5	16.0
Infinity CL	16.0	16.6	16.5	14.2	15.8
Avalanche	16.7	17.7	15.9	12.9	15.8
CO00739	16.7	18.1	16.1	12.3	15.8
Danby	16.6	17.7	16.4	12.4	15.8
CO01W173	16.8	17.9	15.7	12.5	15.7
Stanton	15.9	17.5	15.1	14.4	15.7
Lakin	17.6	19.1	15.3	10.8	15.7
Jagalene	17.3	17.1	16.3	11.9	15.7
Enhancer	17.2	17.0	17.0	11.4	15.7
Alliance	15.8	17.4	16.5	12.9	15.6
CO01W189-A1	17.6	17.4	16.7	10.6	15.6
CO01W191	17.0	16.7	16.1	12.5	15.6
CO01434-A1	17.0	18.5	16.1	10.4	15.5
CO01W171	16.9	18.0	16.4	10.8	15.5
Akron	15.9	18.0	15.7	12.4	15.5
CO01473	16.8	18.1	14.5	12.6	15.5
Harry	16.3	17.8	16.6	11.1	15.5
NuGrain	17.6	17.4	15.8	10.9	15.4
NuFrontier	16.6	17.8	16.0	11.4	15.4
CO01W173-A3	16.5	17.7	16.0	11.5	15.4
CO00554	16.2	17.0	16.0	11.8	15.2
CO01434	16.1	18.2	15.7	10.9	15.2
AP502 CL	16.3	16.0	15.3	13.2	15.2
CO01W189	17.1	16.9	16.8	10.1	15.2
CO01W172	17.0	16.6	15.7	11.5	15.2
CO991057-A4	17.1	15.6	16.1	12.0	15.2
Yumar	16.8	17.4	15.1	11.2	15.1
Endurance	16.4	16.9	15.3	11.8	15.1
Yuma	15.4	16.8	15.8	12.3	15.1
CO01385	15.6	17.8	15.1	11.5	15.0
Ankor	15.7	17.8	15.8	10.6	15.0
Prowers 99	16.1	17.3	14.2	12.2	14.9
CO01212	15.8	17.4	14.7	11.7	14.9
CO00016	16.3	16.7	16.0	10.2	14.8
Above	14.7	16.3	15.7	12.3	14.7
CO01385-A1	16.0	17.2	14.7	10.2	14.5
CO00796	15.9	16.9	15.7	9.6	14.5
Hatcher	15.7	17.3	14.4	10.6	14.5
Prairie Red	14.9	16.8	13.9	11.7	14.3
Bond CL	14.2	16.0	16.1	10.4	14.2
CO991407-A3	15.4	15.7	15.3	10.3	14.2
Average	**16.6**	**17.5**	**16.0**	**12.0**	**15.5**

*Protein values are adjusted to a 12% moisture basis.

Table 15. Colorado winter wheat Irrigated Variety Performance Trial summary for 2005.

	Location				2005 Averages			
Variety[1]	Fort Collins	Rocky Ford	Stratton	2005	% of Trial Average	Grain Moist	Test Wt	Plant Ht
	----------Yield (bu/ac)----------				%	%	lb/bu	in
Bond CL	94.8	92.0	82.7	89.8	115	10.2	59.6	36
Hatcher	80.3	97.2	91.6	89.7	115	10.7	60.7	34
NuGrain	93.7	88.9	81.3	88.0	113	10.7	61.3	35
TAM 111	68.8	97.5	95.4	87.2	112	10.4	60.7	36
Jagalene	75.4	92.5	86.8	84.9	109	10.6	61.6	33
NuHills	66.8	99.1	87.1	84.3	108	10.3	60.7	31
Ankor	77.3	81.6	86.6	81.8	105	9.9	58.8	36
NuFrontier	75.9	99.1	62.0	79.0	101	10.5	60.6	35
Yuma	74.3	82.1	79.2	78.5	100	10.4	59.6	32
Antelope	70.2	83.9	81.4	78.5	100	10.3	59.7	33
Overley	62.2	80.2	87.9	76.8	98	10.0	60.6	35
Ok102	74.1	78.4	75.8	76.1	97	10.2	60.2	32
CO00016	83.6	86.4	58.0	76.0	97	9.7	58.6	32
Dumas	62.2	87.3	70.5	73.4	94	10.4	59.6	32
Wesley	44.2	88.7	82.9	71.9	92	9.5	57.5	30
NuHorizon	54.0	84.6	76.2	71.6	92	10.6	60.5	30
Platte	65.5	77.7	62.8	68.7	88	10.5	60.5	29
W04-417	32.3	80.0	84.9	65.7	84	9.7	58.0	32
Prairie Red	46.9	81.0	65.3	64.4	82	9.6	57.3	32
Average	**68.6**	**87.3**	**78.9**	**78.2**		**10.2**	**59.8**	**33**
$LSD_{(0.30)}$	10.0	3.9	9.0	4.7				

[1]Varieties in table ranked by the average yield over three locations in 2005.

Table 16. Colorado winter wheat 3-Yr and 2-Yr Irrigated Variety Performance Trial summary.

	Averages							
Variety[1]	3-Yr	2-Yr	2-Yr rank	2005	2004	2003	3-Yr	2-Yr
	----------Yield (bu/ac)----------						----TWT (lb/bu)----	
Jagalene	100.2	91.2		84.9	100.7	115.1	59.8	60.1
Yuma	98.3	93.0	3	78.5	114.6	107.1	58.5	58.5
Hatcher	97.0	94.5	2	89.7	101.6	101.4	59.2	59.6
Ankor	93.3	92.7	4	81.8	108.9	94.3	57.7	58.0
Antelope	92.6	87.3		78.5	100.6	101.5	58.4	58.2
Wesley	91.8	82.6		71.9	98.6	107.1	57.7	57.1
Prairie Red	91.7	81.7		64.4	107.6	108.5	56.9	56.8
Ok102	91.1	88.1		76.1	106.1	96.2	58.9	59.5
Dumas	90.4	84.4		73.4	101.0	100.3	58.8	59.0
Platte	85.9	78.2		68.7	92.5	98.8	58.2	59.1
Bond CL	*	99.0	1	89.8	112.9	*	*	58.3
NuHills	*	91.8	5	84.3	102.9	*	*	59.2
CO00016	*	89.2		76.0	109.0	*	*	57.6
NuFrontier	*	88.2		79.0	101.9	*	*	59.1
Overley	*	87.1		76.8	102.7	*	*	59.4
NuHorizon	*	82.8		71.6	99.5	*	*	59.6

[1]Varieties in table ranked based on 3-Yr average yields.
[*]Bond CL, NuHills, CO00016, NuFrontier, Overley, and HuHorizon have been tested in the IVPT only two years.

Table 17. Winter wheat Irrigated Variety Performance Trial at Fort Collins[1].

Variety	Yield	Grain Moist.	Test Wt	Plant Ht	50% Heading[2]	Stripe Rust[3]
	bu/ac	%	lb/bu	in	date	1-9
Bond CL	94.8	9.5	59.4	33	141	9
NuGrain	93.7	9.5	59.6	35	143	2
CO00016	83.6	9.2	58.2	30	141	9
Hatcher	80.3	9.8	58.2	30	145	4
Ankor	77.3	8.9	56.9	33	144	9
NuFrontier	75.9	9.3	58.5	32	143	3
Jagalene	75.4	9.4	60.1	29	144	5
Yuma	74.3	9.3	56.8	27	144	8
Ok102	74.1	9.1	58.4	28	144	5
Antelope	70.2	8.9	55.8	30	142	2
TAM 111	68.8	8.8	56.8	36	145	2
NuHills	66.8	9.0	56.4	25	142	3
Platte	65.5	9.3	58.9	29	145	9
Dumas	62.2	9.3	57.8	29	144	8
Overley	62.2	8.7	57.4	32	142	2
NuHorizon	54.0	8.7	57.4	30	144	2
Prairie Red	46.9	8.3	53.0	29	140	9
Wesley	44.2	8.2	53.0	25	141	3
W04-417	32.3	7.7	51.2	29	143	2
Average	**68.6**	**9.0**	**57.0**	**30**	**143**	**5**
$LSD_{(0.30)}$	10.0					

[1]Trial conducted on at the Agricultural Development and Educational Research Center; seeded 9/10/04 and harvested 7/18/05.
[2]Julian date from January 1.
[3]Stripe rust rating scale 1-9 with 1 = very resistant to 9 = very susceptible.
[*]No fungicide was applied. Stripe rust infestation severity was extremely high.

Comments: Excellent stands and growth in the fall, significant fall stripe rust infection that did not overwinter into the spring. Excellent growth and tillering in the spring. Severe stripe rust infection by early June, significantly reduced yields. High temperatures throughout grain filling also was a significant factor reducing yields. Little significant lodging observed. Some severe but localized damage from RWA.

Table 18. Winter wheat Irrigated Variety Performance Trial at Rocky Ford[1].

Variety	Yield	Grain Moisture	Test Weight	Plant Height	50% Heading[2]
	bu/ac	%	lb/bu	in	date
NuFrontier	99.1	9.4	58.9	37	137
NuHills	99.1	10.0	62.7	35	136
TAM 111	97.5	10.1	61.8	36	137
Hatcher	97.2	10.0	61.6	36	137
Jagalene	92.5	10.2	61.7	35	139
Bond CL	92.0	9.2	58.6	37	135
NuGrain	88.9	10.0	61.8	37	137
Wesley	88.7	9.3	59.4	33	137
Dumas	87.3	9.6	58.7	33	136
CO00016	86.4	8.8	57.6	35	136
NuHorizon	84.6	10.2	61.8	31	138
Antelope	83.9	9.6	60.2	35	137
Yuma	82.1	9.7	60.8	35	137
Ankor	81.6	9.1	58.3	35	137
Prairie Red	81.0	9.2	59.0	35	136
Overley	80.2	10.0	61.6	37	136
W04-417	80.0	9.4	60.5	34	136
Ok102	78.4	9.6	60.3	33	137
Platte	77.7	9.6	60.3	31	138
Average	**87.3**	**9.6**	**60.3**	**35**	**137**
$LSD_{(0.30)}$	3.9				

[1]Trial conducted at the Arkansas Valley Research Center; seeded 10/28/04 and harvested 7/8/05.
[2]Julian date 50% to heading.

Comments: Very high yields considering the late date of planting. Very uniform. Trial sprayed to control RWA. Low levels of stripe rust were observed.

Table 19. Winter wheat Irrigated Variety Performance Trial at Stratton[1].

Variety	Yield	Grain Moisture	Test Weight	Plant Height	Stripe Rust[2]
	bu/ac	%	lb/bu	in	1-9
TAM 111	95.4	12.4	63.5	36	2
Hatcher	91.6	12.2	62.2	35	4
Overley	87.9	11.3	62.9	37	2
NuHills	87.1	12.1	63.0	34	2
Jagalene	86.8	12.3	62.9	34	2
Ankor	86.6	11.6	61.3	39	7
W04-417	84.9	12.2	62.4	33	2
Wesley	82.9	11.0	60.1	32	3
Bond CL	82.7	11.9	60.9	38	7
Antelope	81.4	12.5	63.0	34	2
NuGrain	81.3	12.6	62.6	32	2
Yuma	79.2	12.2	61.2	33	7
NuHorizon	76.2	13.0	62.4	28	3
Ok102	75.8	11.8	62.0	36	5
Dumas	70.5	12.3	62.4	34	4
Prairie Red	65.3	11.4	60.0	32	8
Platte	62.8	12.6	62.3	28	8
NuFrontier	62.0	12.9	64.3	37	2
CO00016	58.0	11.2	59.9	32	9
Average	**78.9**	**12.1**	**62.1**	**34**	**4**
$LSD_{(0.30)}$	9.0				

[1]Trial conducted on the Pautler Brothers' farm; seeded 9/17/04 and harvested 7/11/05.
[2]Rating scale 1-9 with 1 = very resistant to 9 = very susceptible.

Comments: Variable plant height and yield across this irrigated trial due to soil variability and uneven irrigation. Severe stripe rust infestation limited by late fungicide application but not before considerable damage was done.

Table 20. Protein Content of IVPT Entries at Fort Collins for 2005.

Variety	
Wesley	18.4
Overley	17.1
W04-417	16.7
Antelope	16.5
NuHills	16.3
Platte	15.9
NuHorizon	15.7
Ok102	14.6
Jagalene	14.6
NuFrontier	14.0
NuGrain	14.0
Prairie Red	13.8
Hatcher	13.8
CO01W189-A1	13.6
Dumas	13.5
CO01W171	13.5
Yuma	13.4
CO01473	13.1
CO01W173-A3	12.9
CO01W189	12.8
CO01W172	12.8
CO00016	12.8
CO01434-A1	12.7
CO01W191	12.6
Ankor	12.4
CO01212	12.3
CO991407-A3	12.1
TAM 111	12.0
CO991057-A4	11.9
CO01385	11.9
CO01W173	11.6
CO01385-A1	11.4
Bond CL	11.4
CO01434	11.2
Average	**13.6**

[*]Protein values are adjusted to a 12% moisture basis.

Winter Wheat Variety Selection in Colorado for Fall 2005

Jerry Johnson and Scott Haley (August 2005)

Colorado's unpredictable climate and the occurrence of various insect, disease, and weed pests of wheat make it difficult to predict the future performance of wheat varieties based upon their performance in previous trials. Nevertheless, in the tables below we provide the information wheat producers need to make the best possible decision under our variable circumstances.

Issues specific to variety selection in 2005:

Stripe rust- Stripe rust epidemics require a favorable environment, a susceptible variety, and presence of stripe rust spores - all three of which coincided in 2005. Many of the available varieties are susceptible, see following tables. The favorable environment last year was promoted by early planting, good moisture and good late-fall growing conditions followed by a mild winter, prolific tillering and rapid early spring growth. These environmental conditions are unlikely to reoccur in 2006. The presence of spores is becoming more common in Colorado but clearly irrigated wheat production is at much greater risk than dryland wheat.

White wheat- The white wheat varieties, Avalanche and Trego have performed well in the past few years but Trego must have been more affected by the heat and drought stress in May than Avalanche. We remain convinced that a white wheat variety should be high on the list for variety selection in 2005, as grain handlers are beginning to see premiums for white wheat over market prices for red wheat.

Russian wheat aphid- New forms (called "biotypes") of RWA have evolved and rendered ineffective the resistance found in all available RWA-resistant varieties. However, some of these varieties perform very well and should be considered for their yielding capability compared to other susceptible varieties. Hatcher, Bond CL, and Ankor are examples of RWA-resistant varieties that are high performance varieties for Colorado.

CLEARFIELD* wheat- The variety Above is still a top performing variety but the new variety from CSU, Bond CL, has performed even better under both irrigated and dryland conditions over the past three years. It is important to remember that you can't save seed of these varieties - even to plant on your own farm. The Plant Variety Protection Act and a U.S. Utility Patent protect them.

Selecting your variety

Dryland wheat producers: **Our first suggestion is to plant more than one variety in order to spread your risk**. The yield table below is based on 3-Yr average performance in our trials. Bond CL and Hatcher are the two newcomers to the highest potential performance column and are the newest CSU releases. Relative maturity, measured by heading date, might be one way to spread risk related to drought, hail, or freeze damage. Susceptibility to stripe rust might also be a criterion for variety selection in 2005 although be careful not to base variety selection on stripe rust resistance alone. Under our normal low rainfall conditions, wheat streak mosaic virus might be a more consistent threat than stripe rust and worthy of consideration when selecting a variety. Plant height and coleoptile length might be important criteria for southeastern Colorado producers.

Irrigated wheat producers: Most irrigated producers plant a single variety and the most important criteria are yield and straw strength from the tables below. The Platte program has returned profit to many irrigated wheat producers through the incentive package, although yield loss might be expected when stripe rust is a problem and is not effectively controlled with fungicides. The irrigated trials in Colorado have been very good the past

three years and Jagalene, Yuma, Hatcher, and Ankor have performed very well even though Yuma and Jagalene are the only ones with above average straw strength. The newly released varieties Hatcher and Bond CL are welcome additions to our high yielding irrigated wheat varieties.

High Performance Varieties for Dryland Eastern Colorado					
Higher Yielding		Intermediate		Lower Yielding	
Above Avalanche Bond CL Hatcher Jagalene		Alliance Ankor AP502 CL Jagger Prairie Red	TAM 111 Trego Yuma Yumar	Akron Lakin Prowers 99 Stanton Thunderbolt	
High Performance Varieties for Colorado Irrigated Conditions					
Higher Yielding		Intermediate		Excellent 2-Yr Performance	
Ankor Hatcher Jagalene Yuma		Antelope Dumas Ok102 Platte	Prairie Red Wesley	Bond CL NuHills	
Stripe Rust					
Moderately Resistant-Resistant		Intermediate		Moderately Susceptible-Susceptible	
Antelope Hatcher Jagalene Jagger TAM 111 Wesley		Alliance Dumas Prowers 99 Stanton Yuma Yumar		Above Akron Ankor AP502 CL Avalanche Bond CL	Lakin Platte Prairie Red Thunderbolt Trego
Wheat Streak Mosaic Virus					
Moderately Resistant-Resistant		Intermediate		Moderately Susceptible-Susceptible	
		Above AP502 CL Avalanche Jagalene Jagger Lakin Prairie Red	Stanton TAM 111 Thunderbolt Trego Yuma Yumar	Akron Alliance Ankor Antelope Bond CL Dumas Hatcher	Platte Prowers 99 Wesley
Test Weight					
Highest		Average		Lowest	
Avalanche Dumas Jagalene Platte Prowers 99 Stanton	TAM 111 Thunderbolt Trego	Above Akron Alliance Ankor Antelope Hatcher	Jagger Lakin Wesley Yuma Yumar	AP502 CL Bond CL Prairie Red	
Heading Date					
Earliest		Medium		Latest	
Above AP502 CL Jagger Prairie Red		Akron Alliance Ankor Antelope Avalanche Bond CL Dumas Hatcher Jagalene	Lakin Platte Stanton TAM 111 Trego Wesley Yuma Yumar	Prowers 99 Thunderbolt	

Height		
Shortest	Medium	Tallest
Above AP502 CL Hatcher Platte Prairie Red Wesley Yuma	Akron Alliance Ankor Antelope Avalanche Bond CL Dumas Jagalene Jagger Lakin Stanton TAM 111 Thunderbolt Trego Yumar	Prowers 99
Coleoptile Length		
Shortest	Medium	Longest
Antelope Dumas Platte Yuma Yumar	Alliance Avalanche Bond CL Hatcher Jagalene Lakin Trego Wesley	Above Akron Ankor AP502 CL Jagger Prairie Red Prowers 99 Stanton TAM 111 Thunderbolt
Winter Hardiness		
Good	Average	Fair
Akron Alliance Ankor Antelope AP502 CL Jagalene Prowers 99 Wesley	Above Avalanche Bond CL Dumas Hatcher Lakin Platte Prairie Red Stanton TAM 111 Thunderbolt Trego Yuma Yumar	Jagger
Protein Content		
Highest	Average	Lowest
Akron Ankor Antelope Jagger Lakin Prairie Red Prowers 99 Thunderbolt Trego Wesley	Above Avalanche Hatcher Jagalene Platte Stanton Yumar	Alliance AP502 CL Bond CL Dumas TAM 111 Yuma
Straw Strength (Irrigated Only)		
Best	Intermediate	Poorest
Antelope Bond CL Dumas Jagalene NuHills NuHorizon Ok 102 Overley Platte Wesley Yuma	Ankor Hatcher NuFrontier Prairie Red	

WESTERN WINTER WHEAT VARIETY PERFORMANCE TRIALS

Winter Wheat Variety Performance Test at Hayden

Calvin Pearson

Description of winter wheat varieties in western trials.

Variety Name	Class	Origin
Above	Hard Red	Colorado/Texas
Ankor	Hard Red	Colorado
Avalanche	Hard White	Colorado
CO00016	Hard Red	Colorado
CO00554	Hard Red	Colorado
CO00739	Hard Red	Colorado
CO00796	Hard Red	Colorado
Deloris	Hard White	Utah
Fairview	Hard Red	Colorado/Idaho
Gary	Hard White	Idaho
Golden Spike	Hard White	Utah
Hatcher	Hard Red	Colorado
Hayden	Hard Red	Colorado/Idaho
IDO571	Hard White	Idaho
IDO573	Hard White	Idaho
IDO575	Hard White	Idaho
IDO604	Hard White	Idaho
Lakin	Hard White	Kansas
NuFrontier	Hard White	Agripro

Summary

Each year small grain variety performance tests are conducted at Hayden, Colorado to identify varieties that are adapted for commercial production in northwest Colorado. Three small grain studies [winter wheat, spring wheat, and AGRO polyacrylamide (PAM)] were conducted at Hayden in 2005. Compared to other years, growing conditions during the 2005 cropping season were favorable for winter wheat production. Grain yield in the winter wheat variety performance test averaged 57.2 bu/acre. The highest yielding entry in the winter wheat test was CO00016 at 68.6 bu/acre with six entries outyielding other varieties.

An AGRO by N rate study was conducted in winter wheat at Hayden during 2005 in a two-factor experiment. The two factors were: 1) PAM applied at rates of 0, 2, and 6 lbs/acre of AGRO and 2) nitrogen rates applied at 0, 10, 20, 30, and 40 lbs N/acre using ammonium nitrate. Nitrogen application had a significant negative effect on grain yield of winter wheat. The application of AGRO PAM did not increase grain yields. Based on data obtained from this study and other similar studies we have conducted over several years in the Hayden area, grain yields have not been consistently increased when polyacrylamide has been applied. We conclude that the application of polyacrylamide is not likely to be a profitable production practice for wheat growers in northwest Colorado.

Introduction

Small grain variety performance testing has been ongoing in northwest Colorado for many years. Small grain variety performance tests are conducted in the Hayden, Colorado area to identify varieties that are adapted for commercial production in northwest Colorado.

Winter wheat variety performance test was conducted at Hayden, CO in 2005. We also conducted an experiment to evaluate the application of AGRO PAM (also referred to as hydrogel) and nitrogen fertilizer application on grain yield of winter wheat grown under the dryland conditions of northwest Colorado.

Materials and Methods

Winter Wheat Variety Performance Test

Nineteen winter wheat varieties and lines were evaluated during the 2005 growing season. The experiment design was a randomized complete block with four replications. Plot size was 4-ft. wide by 40-ft. long with six seed rows per plot. The seeding rate was 56 lbs/acre and planting occurred on 8 Oct. 2004 (Fig. 1). Harvest occurred on 18 Aug. 2005 using a Hege small plot combine (Fig. 2). Grain samples were cleaned in the laboratory using a small Clipper cleaner to remove plant tissue that remained in the grain

sample following combining. Grain moistures and test weights were determined using a Seedburo GMA-128 seed analyzer. Grain yields were calculated at 12% moisture content. Protein concentration was determined by whole grain near infrared reflectance spectroscopy with a Foss NIR Systems 6500.

Fig. 1. Planting winter wheat plots at Hayden, Colorado. Fred Judson is driving the tractor. A cone plant is attached to the tractor, 8 Oct. 2004. Photo by Calvin Pearson.

Fig. 2. Winter wheat plots at Hayden, Colorado just prior to harvest, 18 Aug. 2005. Fred Judson is standing in the field. Photo by Calvin Pearson.

AGRO PAM and Nitrogen Fertilizer Study

An AGRO PAM by N rate study was conducted on the Mike Williams Farm at Hayden, Colorado during 2005 in a two-factor experiment. The two factors were: 1) AGRO PAM applied at rates of 0, 2, and 6 lbs/acre of AGRO and 2) nitrogen fertilizer application rates at 0, 10, 20, 30, and 40 lbs N/acre applied using ammonium nitrate as the N source. A soil sample was obtained within the plot area prior to planting. Soil was sampled to a depth of 8 inches. Approximately 20 random soil cores were obtained across the plot area and bulked together. Once a subsample was air-dried it was sent to the Colorado State University Soil Testing Lab for analysis.

The winter wheat variety 'Hayden' was planted at 60 lbs of seed/acre. Treatments were applied by mixing the seed, AGRO, and nitrogen fertilizer in the same packet and the entire contents were applied through a cone planter during planting (Fig. 1). Agro (ALCOSORB AB3C) was provided by Ciba Specialty Chemicals Corp., Suffolk, VA. Planting occurred on 8 Oct 2004. Harvest occurred on 18 Aug 2005 with a Hege plot combine. Grain samples were cleaned in the laboratory using a small Clipper cleaner to remove plant tissue that remained in the grain sample following combining. Grain moistures and test weights were determined using a Seedburo GMA-128 seed analyzer. Grain yields were calculated at 12% moisture content.

Results and Discussion

Summer 2005 in the Craig/Hayden area was more favorable for winter wheat production than in many years. The average maximum temperature for July 2005 at Hayden, Colorado was 88.4 degrees F (Fig. 3). Precipitation at Hayden during the 2004-05 winter and spring growing season (September 2004 through August 2005, 12-month period) totaled 21.47 inches. The highest amount of precipitation occurred in June 2005 at 3.54 inches and the least amount of precipitation occurred in July 2005 at only 0.28 inches (Fig. 4).

Precipitation in the Craig/Hayden area varies considerably from month to month and year to year and is a critical factor affecting crop production. The monthly precipitation in 2005 illustrates the variability that occurs in the area (Fig. 4). If timely precipitation occurs, grain yields of small grains can be increased significantly. If precipitation does not occur in a timely fashion, grain yields of wheat can be low. Because precipitation is so variable during the

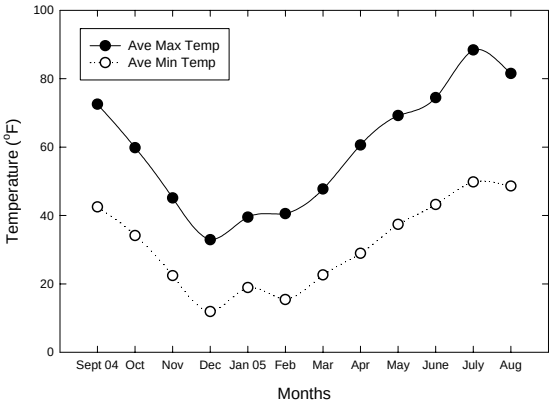


Fig. 3. Average maximum and minimum monthly temperatures for Sept 2004 through October 2005 at Hayden, Colorado.

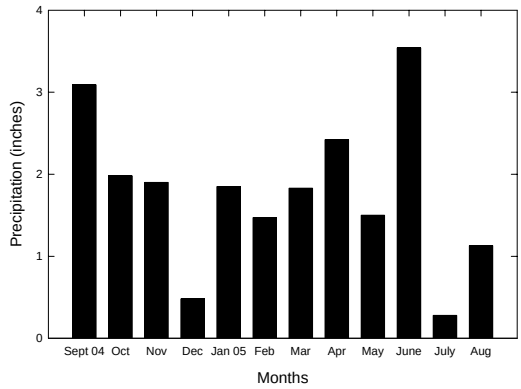


Fig. 4. Monthly precipitation for Sept. 2004 through October 2005 at Hayden, Colorado.

growing season in the Craig/Hayden area wheat yields often vary considerably from year to year.

AGRO PAM and Nitrogen Fertilizer Study

A soil test performed by the CSU Soil Testing Laboratory showed the soil in the plot area, sampled at planting, had a pH of 7.3, a salinity of 0.5 mmhos/cm, 2.2% organic matter, 8.0 ppm NO_3-N, 5.6 ppm P, 443 ppm K, 0.7 ppm Zn, 11.2 ppm Fe, 12.1 ppm Mn, and 2.7 ppm Cu. The recommended fertilizer applicator from the CSU Soil Testing Lab was to apply 25 lbs/acre of nitrogen and 20 lbs/acre of P_2O_5 for a yield goal of 50 bu/acre.

The application of nitrogen and AGRO did not significantly affect (P=0.05) grain moisture or test weight. Grain moisture averaged across all varieties was 11.2%. Test weight averaged across all varieties was 55.8 lbs/bu.

The application of nitrogen in winter wheat at Hayden, Colorado in 2005 had a significant negative effect on grain yield (Fig. 5). As nitrogen rate increased from 0 lbs N/acre up to 60 lbs N/acre grain yield decreased by 3.9 bu/acre. With each pound of nitrogen fertilizer applied grain yields decreased by 0.08 bu/acre. According to the soil test results, the soil was low in nitrate-nitrogen, yet winter wheat did not respond positively to the application of commercial fertilizer.

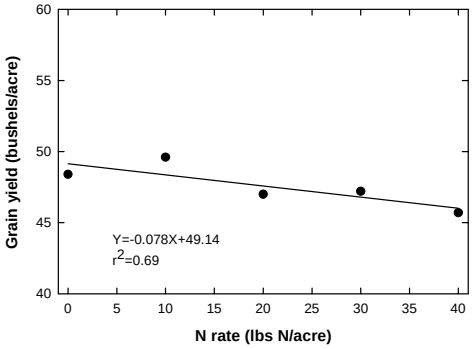


Fig. 5. The effect of nitrogen application on grain yield of winter wheat at Hayden, Colorado during 2005.

The application of AGRO PAM did not affect grain yield significantly (P=0.05; Fig. 6) and grain yields at the 2 and 6 lbs AGRO/acre remained flat compared to the check treatment of 0 lbs AGRO/acre.

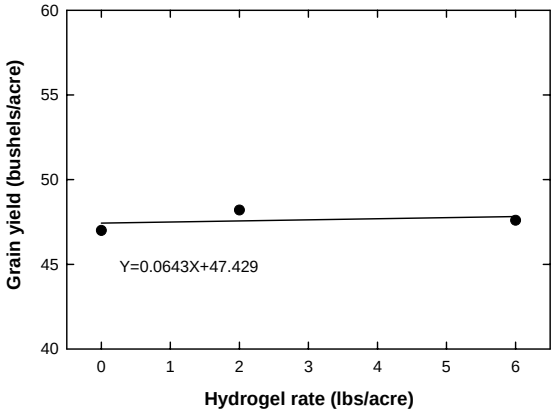


Fig. 6. The effect of applying AGRO PAM on grain yield of winter wheat at Hayden, Colorado during 2005.

Table 1. Winter wheat variety performance at Hayden[1].

Variety	Yield	Grain Moist.	Test Wt.	Plant Ht.	Protein
	bu/ac	%	lb/bu	in.	%
CO00016	68.6	11.2	56.7	29	14.0
Hatcher	66.6	11.1	56.6	31	12.3
CO00739	66.4	11.5	56.7	32	12.2
Lakin	63.2	12.0	57.1	31	12.3
CO00554	61.4	11.2	57.2	32	12.5
IDO573	60.8	11.0	58.7	40	14.6
Above	60.7	10.8	58.2	31	12.3
CO00796	58.4	11.5	56.8	35	11.9
Ankor	57.2	11.9	56.0	32	13.7
Deloris	56.4	11.3	56.4	39	13.5
NuFrontier	56.1	11.4	56.9	31	12.4
IDO575	56.1	10.6	57.2	45	14.2
IDO604	55.4	11.2	57.4	36	14.6
IDO571	54.1	11.5	53.2	33	13.9
Avalanche	53.6	10.9	58.5	30	12.2
Fairview	49.5	11.5	53.6	33	13.0
Golden Spike	49.3	11.3	54.3	34	12.3
Gary	49.1	12.3	50.7	32	13.3
Hayden	43.6	11.0	56.2	40	15.2
Average	**57.2**	**11.3**	**56.2**	**34**	**13.2**
$LSD_{(0.05)}$	4.6	0.4	1.4	1.4	

[1]Trial conducted on the Mike Williams farm; seeded 10/08/04 and harvested 8/18/05.
[*]No lodging.

Winter Wheat Variety Performance Test at Yellow Jacket

Mark Stack

Table 1. Winter wheat variety performance at Yellow Jacket[1].

Entry	Yield[2]	Grain Moist.	Test Wt.	Heading Date[3]	Plant Ht.	Grain Protein
	bu/ac	%	lb/bu	date	in	%
CO00016	50.2	11.0	56.6	6/3	27	14.0
IDO573	47.4	10.6	58.5	6/13	32	14.6
NuFrontier	47.1	10.8	58.3	6/8	29	12.4
CO00796	45.4	11.2	58.6	6/6	30	11.9
Fairview	44.8	10.6	57.9	6/13	31	13.0
CO00554	44.0	11.0	57.4	6/6	25	12.5
Lakin	43.7	11.4	57.1	6/6	26	12.3
CO00739	43.7	11.2	56.8	6/8	27	12.2
Hatcher	43.5	10.6	56.0	6/6	24	12.3
Above	43.2	10.9	56.6	6/3	25	12.3
IDO571	42.4	10.9	57.8	6/13	27	13.9
Ankor	42.2	11.6	56.0	6/6	26	13.7
Avalanche	41.1	10.8	59.8	6/6	26	12.2
Deloris	40.7	10.9	56.2	6/13	32	13.5
Juniper	40.5	10.5	58.2	6/13	35	14.2
IDO604	40.0	11.1	59.0	6/13	29	14.6
Gary	37.3	11.2	56.0	6/15	27	13.3
Golden Spike	37.1	10.9	56.3	6/13	28	12.3
Hayden	34.0	11.0	58.3	6/13	32	15.2
Average	**42.6**	**11.0**	**57.4**		**28**	**13.2**
$LSD_{(0.05)}$	4.5					

[1]Trial conducted at the Southwestern Colorado Research Center; seeded 10/11/04 and harvested 7/29/05.
[2]Bushel yield based on 60 lb/bu and 12% moisture.
[3]Date 50% of the plants headed.

Site Information:

Soil type:	Wetherill clay loam
Previous crop:	Fallow; one-year ago: dry beans
Seeding rate:	600,000 seeds/ac (50 lb/ac); 12-in. row spacing
Fertilizer:	50 lb N/ac broadcast pre-plant
Precipitation:	October 2004 thru June 2005: 14.2 inches (11.1 inches long-term average)

Comments: The 2004-2005 crop year had a very wet fall and above average winter precipitation. The average yield of 42.6 bu/ac can be attributed to the very good moisture throughout the year. Nitrogen fertilizer helped achieve an average 13.2% grain protein. Russian wheat aphid (RWA) feeding pressure was low both in the fall and spring. None of the entries lodged. Dwarf bunt was not found in the seed of any entry at harvest.

CONTRIBUTED WHEAT ARTICLES

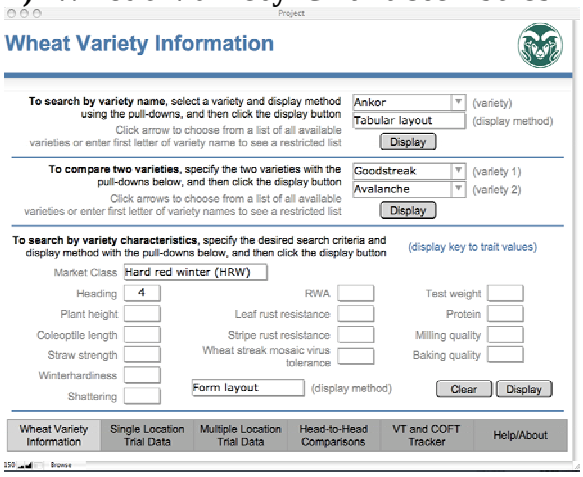
Colorado Wheat Variety Database

Scott Haley and Jerry Johnson

The Colorado Wheat Variety Database was launched in 2000 over the Internet/Web. The database provided access to up-to-date wheat variety information and variety trial data from the CSU Crops Testing Program. The database allowed users to search for wheat variety information, display variety trial results from all Colorado trial locations since 1990, create yield and test weight summaries averaged over years and trial locations specified by the user, and create head-to-head yield and test weight comparisons between two varieties of interest. The database system augmented traditional dissemination of trial data through the CSU Making Better Decisions Publication and other media.

Over the last couple of years, the database functions had become increasingly difficult to maintain over the Internet/Web. Security issues at Colorado State University have also become more important as hackers have become more sophisticated and devious. To alleviate these concerns, yet continue to allow access to the database, we have recently implemented a new approach to dissemination of the database. Rather than accessing the database over the Internet/Web, users will now download a stand-alone version of the database over the Internet and install this on their own computer. Once installed, all functions of the database system will be done from the user's computer without accessing the Internet/Web. The new Colorado Wheat Variety Database maintains the same functions as the previous version while providing several enhancements. These functions and enhancements include the following:

1) Wheat Variety Characteristics

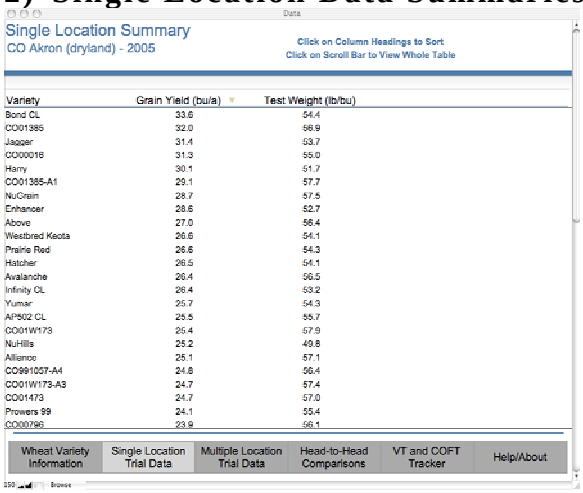


Searching for wheat variety information may now be done in one of three ways:

- Based on the name of the variety
- Based on a data comparison between two varieties of interest
- Based on characteristics of the varieties (e.g., pest resistance, lodging, test weight, etc.)

Comparisons may be displayed in either a tabular (columnar) format or a form-type format. In the form-type output, a photo of the variety from the variety trials is displayed.

2) Single Location Data Summaries

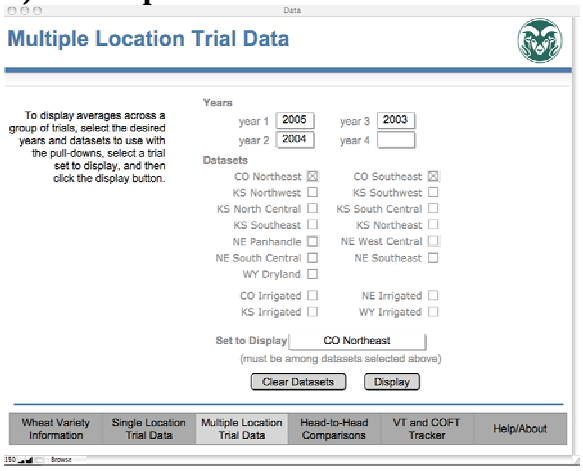


The database for single location trial data allows users to display variety trial data for all Colorado Variety Trial data going back to 1990.

Enhancements to the database include:

- Incorporation of data from state variety trial locations in adjacent states.
- A columnar output that allows sorting based on the name of the variety, grain yield, or test weight.

3) Multiple Location Data Summaries

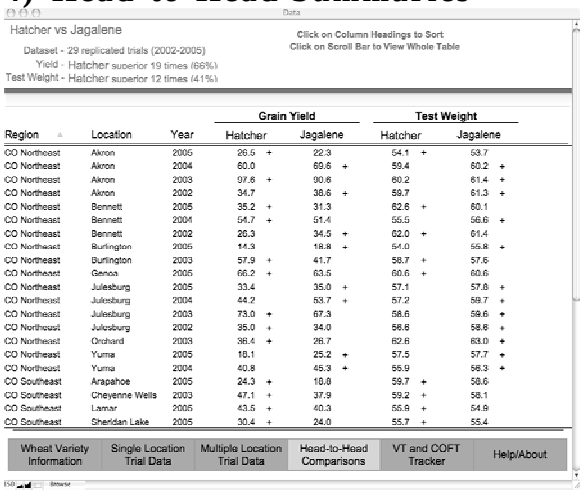


The database for multiple location data summaries allows users to generate yield and test weight averages across up to four years and as many locations as desired.

Enhancements to the database include:

- Incorporation of data from state variety trial locations in adjacent states.
- A columnar output that allows sorting based on the name of the variety, grain yield, or test weight.

4) Head-to-Head Summaries

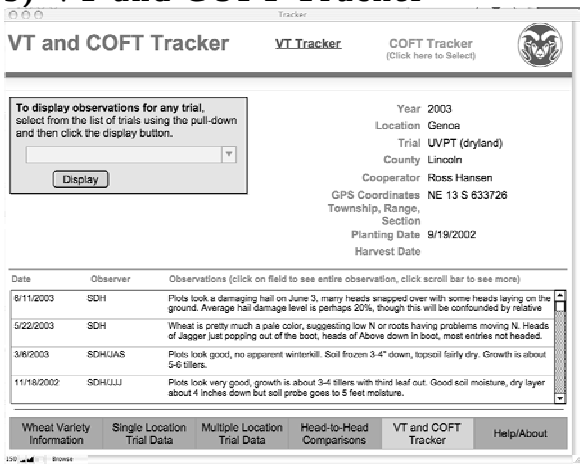


The database for head-to-head variety comparisons allows users to generate a statistical comparison of yield and test weight data between two varieties of interest.

Enhancements to the database include:

- Incorporation of data from state variety trial locations in adjacent states.
- A columnar output that allows sorting based on region, location, year, or yield/test weight of the varieties under comparison.

5) VT and COFT Tracker



The VT and COFT Tracker allows the user to search for information from all Variety Trial (VT) and Collaborative On-Farm Testing (COFT) trial locations since 2003.

- Information includes GPS coordinates of the trials and planting/harvest dates.
- Observations on each trial location are also provided, such as disease/insect infestations or critical climatic factors affecting the trial results. This information may be helpful in interpretation of trial results.

Users interested in obtaining the database may download the database from the following link: "http://wheat.colostate.edu/vpt.html". In order to gain insight about who is using the database, and determine if the effort is worth maintaining, users will be required to email the developer to obtain a username and password (scott.haley@colostate.edu). Users are highly encouraged to email the developer with comments, questions, and suggestions for improvement or enhancement, bug reports, help with problems, etc.

CWAC, CWRF and CAWG Invest in CSU Research

Darrell Hanavan

The Colorado Wheat Administrative Committee (CWAC) is maintaining its investment of approximately $100,000 in the wheat breeding program and wheat related research at Colorado State University (CSU) in the 2006-07 fiscal year (FY), despite five below average winter wheat crops in the past six years. Each dollar of this wheat producer funding provided by CWAC is currently leveraged with an additional $15 of state and federal funding or approximately $1.5 million.

The Colorado Wheat Research Foundation (CWRF) has provided additional funding totaling more than $550,000 (or an average of $78,571 per year) over the past seven years to support the wheat breeding program and wheat related research at CSU. CWRF acquires ownership of new varieties developed at CSU and collects royalties on the sale of certified seed.

The Colorado Association of Wheat Growers (CAWG) has been successful in obtaining substantial state and federal funding for the wheat breeding program and wheat related research at CSU. The best example of this is federal funding of more than $300,000 annually for new technologies that accelerate the identification of useful genes and the incorporation of these genes into new varieties of wheat with multiple resistance genes to the Russian wheat aphid, enhanced end-use quality to increase marketability in domestic and export markets, and improved heat and drought tolerance.

CWAC was instrumental in establishing the wheat breeding program at CSU in 1963 with funding from the Colorado General Assembly. The CSU wheat breeding and crop testing programs have been expanded over the past 40 years to develop hard red and hard white winter wheat varieties with improved milling and baking qualities.

The CSU wheat breeding and crop testing programs have a strong track record of responding to the needs and problems of Colorado wheat producers:

- In 1988, CWAC provided supplemental funding to introduce genetic resistance to the

Russian wheat aphid (RWA) into all new varieties. The CSU wheat breeding program responded by developing and releasing the first RWA-resistant wheat variety in the U.S. named "Halt" in 1994. The CSU wheat breeding program is now in a strong position to rapidly respond to the new biotypes of the RWA that were discovered in 2003.

- In 1994, CWAC provided supplemental funding to begin a hard white wheat breeding effort. The CSU wheat breeding program responded by developing and releasing its first hard white winter (HWW) wheat variety named "Avalanche" in 2001. Colorado was second only to Kansas in the production of hard white wheat in 2005, with production of approximately 4.2 million bushels from plantings on 8.0 percent of the state's winter wheat acreage (or approximately 204,000 acres for the 2005 crop).
- In 1997, CWAC provided supplemental funding to develop non-transgenic ("non-GM") wheat varieties that are herbicide tolerant for control of problematic winter annual grasses (jointed goatgrass, downy brome and volunteer rye). The CSU wheat breeding program responded by developing and releasing the first CLEARFIELD wheat variety in the U.S. named "Above" in 2001. Above was planted on 6.1 percent of the state's winter wheat acreage (or approximately 155,550 acres) for the 2005 crop.

It is a team effort by CWAC, CWRF and CAWG to invest in the wheat breeding program and wheat related research to enhance the demand and marketability of Colorado wheat, be the industry leader in the producing and marketing HWW wheat and to further improve the image of Colorado to one of a "high quality" producer.

Stripe Rust Management

Ned Tisserat

Stripe rust was severe throughout eastern Colorado in 2005 and resulted in significant yield reductions in susceptible wheat varieties. The epidemic was a result of a combination of favorable environmental conditions and genetic susceptibility of certain wheat cultivars. The general consensus among pathologists is that stripe rust is not likely to be a serious problem every year in the High Plains region because the disease requires extended periods of cool, wet weather. This type of weather is not common in eastern Colorado.

To my knowledge there have been no reports of stripe or leaf rust overwintering in Colorado in 2005/2006. Furthermore, drought conditions in Texas and Oklahoma this winter have not been conducive to stripe rust development. This is good news to Colorado growers because this is the primary source of rust spores in spring. Nevertheless, rust epidemics can develop rapidly during wet springs. Therefore, be prepared to implement management practices for stripe rust on susceptible varieties.

Several foliar fungicides including azoxystrobin (**Quadris**), propiconazole (**Tilt, PropiMax**), azoxystrobin + propiconazole (**Quilt**), trifloxystrobin + propiconazole (**Stratego**), and pyraclostrobin (**Headline**) are labeled for stripe rust. Details on these fungicides are available in the High Plains Pest Management Guide (http://www.highplainsipm.org/). All of the fungicides except Stratego can be applied up to flowering. Stratego can only be applied up to flag leaf emergence, but Bayer Corporation is petitioning for a special label to allow for applications up to flowering.

The decision to spray a fungicide for stripe rust is difficult. Although fungicides can provide good disease control, they may not always result in enough yield increase under non-irrigated conditions to justify the additional cost. Consider fungicide applications for stripe rust control only if you have a susceptible variety that has a high yield or quality potential (e.g. an irrigated winter wheat) and there is information that a stripe rust epidemic is eminent. Fungicide applications should be timed to prevent stripe rust development on the flag leaf. A healthy flag leaf is critical for grain fill and should be the primary target for protection by fungicide applications.

Managing new Russian wheat aphid biotypes

Frank Peairs, Terri Randolph, Scott Haley, Jerry Johnson, Jeff Rudolph, John Stromberger, Thia Walker, Mike Koch and Bob Hammon

Background

Starting with Halt, wheat varieties resistant to Russian wheat aphid have been available in Colorado for about 10 years. The resistance in available varieties is conferred by the gene Dn4 except for Stanton, a wheat variety from Kansas, which carries a different source of resistance. See the variety descriptions earlier in this publication for more detail on Russian wheat aphid resistant varieties.

New Biotypes

In 2003, we were able to confirm that damage to RWA resistant varieties in Colorado was caused by a new Russian wheat aphid biotype (designated as "RWA2"). In 2004, a USDA researcher identified at least three additional biotypes - two from Texas and one from Wyoming. Since then, we have identified additional biotypes, as summarized in Table 1.

Table 1. Known Russian wheat aphid biotypes as of March, 2006.

BIOTYPE	COMMENTS
RWA1	Original North American biotype
RWA2	Currently dominant in Colorado
RWA3	Texas-1 (USDA ARS collection)
RWA4	Texas-2 (USDA ARS collection)
RWA5	Wyoming-1 (USDA ARS collection)
Montezuma	Undesignated, SW Colorado
Pritchett	Undesignated, SE Colorado
Yellow Jacket	Undesignated, SW Colorado

We don't know if all of these biotypes pose a threat to Colorado wheat production. Greenbug is another aphid, which has multiple biotypes in both wheat and sorghum. There are many highly virulent greenbug biotypes found in noncrop hosts that never become problems in wheat or sorghum. Perhaps this is also the situation that is developing with Russian wheat aphid biotypes.

We conducted biotype surveys in 2004 and 2005 to determine distribution of the new biotype. We collected aphids in the field and then placed them on different resistant wheats in the greenhouse. Results are reported as RWA1 and RWA2, but there is some uncertainty about the RWA2 designation because of the limited types of wheat that we use. The aphids we call RWA2 are mostly likely this biotype, but there is a small chance that they could be some other non-RWA1 biotype. A significant amount of additional testing would be required to be certain.

Table 2. 2004 - 2005 Colorado Russian wheat aphid survey results.

	% of Samples Containing	
Year (number of samples)	RWA1	RWA2
2004 (91)	47	53
2005 (122)	19	81

It seems that RWA2 is displacing RWA1. Based on these results, Russian wheat aphid resistance is no longer an important criterion for selecting varieties unless the distribution of RWA1 increases. However, the resistant varieties have other traits that often make them good choices for eastern Colorado growing conditions.

Developing New Resistant Varieties

A common question is how soon will varieties resistant to both Biotype 1 and the new biotype(s) be available? Many resistant sources have been identified and have been used in crossing since fall 2003. Some resistance sources were identified in relatively well adapted materials, which will be easier to use in breeding than poorly adapted sources.

Resistance has been identified in wheat germplasm collections from the native range of the RWA (Iran, Afghanistan, Tajikistan, others). Thus far over 12,000 common wheat accessions and over 300 accessions of wheat relatives have been screened. Many excellent sources have been identified, and crosses have been made with many of these. Most of the sources known to be resistant to Biotype 1 have proven to be susceptible to the new biotypes. One exception is Dn7, which confers high resistance to both biotypes. Dn7 was transferred to wheat from rye

and is generally associated with poor baking quality, though studies are underway to break this association. It is possible that one or more of the newly discovered biotypes is virulent to Dn7. Several triticale-derived wheat lines in a Lamar wheat background have shown excellent resistance to RWA2, these are currently in field tests in eastern Colorado. It is hoped that a wheat cultivar with resistance to RWA2 can be released by 2008 or 2009, pending yield and quality evaluations.

Management of the New Biotypes

Management information for Russian wheat aphid and other wheat pests and diseases can be found in *The High Plains Integrated Pest Management Guide for Colorado, western Nebraska, Wyoming, and Montana* (http://www.highplainsipm.org/).

The Colorado State University fact sheet *Aphids in Small Grains* summarizes management information for Russian wheat aphid as well as other aphids that attack wheat and similar crops in Colorado (http://www.ext.colostate.edu/pubs/insect/05568.html).

A*reawide Pest Management for Wheat: Management of Greenbug and Russian Wheat Aphid* is a cooperative project between USDA ARS and several states, including Colorado. This project is designed to improve the management of these key wheat pests through diversified cropping, resistant varieties, remote sensing, and other pest management tools. New pest management information is being developed through economic surveys, field research, and grower focus groups. Colorado research sites are located at Walsh, Lamar, and Briggsdale. (http://www.ars.usda.gov/Business/docs.htm?docid=6556)

Irrigated Winter Wheat Planting Date Study at Rocky Ford in 2005

Abdel Berrada, Jerry Johnson and Scott Haley

Objective and Methods:

A field trial was conducted at the Arkansas Valley Research Center (AVRC) near Rocky Ford, Colorado in 2004-2005 to assess the effects of planting date on irrigated winter yield. This was part of a larger study to determine the latest insurable planting date of winter wheat for various environments in Colorado.

The trial at AVRC consisted of three planting dates (PD1: 9/2/04, PD2:9/27/04, and PD3: 10/18/04) and six winter wheat varieties ('Jagalene', 'NuHorizon', 'Platte', 'Prairie Red', 'Wesley', and 'Yuma') arranged in a randomized complete block, split-plot design. Planting dates were assigned to the main plots and varieties to the sub-plots in three blocks or replications. Individual plot size was 5 ft. (4 rows) by 24 ft.

The trial was furrow-irrigated twice in the fall of 2004 and five times in the spring of 2005 and was sprayed with Lorsban 4 E at 16 oz/acre on April 14 and May 5, 2005 to control Russian aphids. The soil had high residual NO_3-N concentration (60 ppm in 0-2 ft.) and an adequate level of available P. The two middle rows of each plot were harvested on 8 July 2005 to determine wheat yield and test weight. The incidence of lodging, stripe rust, and wheat stem maggot was assessed in May and June.

Results:

Grain yield and test weight:

The effects of planting date, variety, and their interaction on wheat yield was significant at $P \leq 0.10$ (Table 1). NuHorizon had the highest yield on average and at PD1. Jagalene produced the highest yield at PD3, while Platte and Prairie Red had the lowest yields on average.

Table 1. Wheat yield in 2005 adjusted to 13% moisture and 60 lb/bu.

Variety (VAR)	Planting Date (PD)			
	2-Sep	27-Sep	18-Oct	Mean
	bu/acre			
Jagalene	79.7	68.5	91.3	79.8
NuHorizon	96.9	95.0	78.1	90.0
Platte	65.6	58.3	51.3	58.4
Prairie Red	66.4	48.0	49.9	54.7
Wesley	75.6	70.5	79.3	75.1
Yuma	80.1	75.9	68.0	74.7
Mean	77.4	69.4	69.6	
$LSD_{0.1}$ (PD x VAR)* = 10.1 bu/acre				

*Based on difference of least square means (SAS PROC MIXED)

Average test weights ranged from 50.2 to 60.6 lb/bu, with NuHorizon and Jagalene outperforming Wesley and Yuma at PD1, PD2 (NuHorizon), and PD3 (Jagalene); and Platte and Prairie Red at all three planting dates (Table 2).

Table 2. Wheat test weight in 2005.

Variety (VAR)	Planting Date (PD)			
	2-Sep	27-Sep	18-Oct	Mean
	lb/bu			
Jagalene	59.6	55.6	57.6	57.6
NuHorizon	60.6	58.0	54.7	57.8
Platte	55.1	51.5	49.7	52.1
Prairie Red	57.1	51.2	50.2	52.8
Wesley	57.7	53.6	54.1	55.1
Yuma	57.3	55.6	54.4	55.8
Mean	57.9	54.2	53.4	
$LSD_{0.1}$ (PD x VAR)* = 1.7 lb/bu				

*Based on difference of least square means (SAS PROC MIXED)

Stripe rust and wheat stem maggot:

Platte and Prairie Red had a high infestation of stripe rust at all planting dates as did Yuma at PD2 and PD3 (Table 3). Jagalene and NuHorizon had the lowest incidence of stripe rust, particularly at PD1 and PD2.

Wheat stem maggots were noticeable (white heads) in Wesley at PD1 and to a lesser extent in Platte and Jagalene, also at PD1 (Table 4). Prairie Red did not have stem maggots at any planting date.

Table 3. Stripe rust infestation in 2005.

Variety (VAR)	Planting Date (PD)			
	2-Sep	27-Sep	18-Oct	Mean
	Rating (0-10)[§]			
Jagalene	0.8	0.9	2.4	1.4
NuHorizon	1.1	1.8	2.7	1.9
Platte	6.5	6.9	6.8	6.7
Prairie Red	7.2	7.2	7.5	7.3
Wesley	2.1	2.7	3.2	2.7
Yuma	4.5	6.3	7.5	6.1
Mean	3.7	4.3	5.0	
$LSD_{0.01}$* (PD x VAR) = 1.0				

*Based on difference of least square means (SAS PROC MIXED)

[§]O: No infestation, 10: 100% infestation

Table 4. Wheat stem maggot infestation in 2005.

Variety (VAR)	Planting Date (PD)			
	2-Sep	27-Sep	18-Oct	Mean
	Rating (0-10)[§]			
Wesley	3.0	0.3	0.5	1.3
Platte	1.4	0.2	0.0	0.5
Jagalene	0.8	0.2	0.3	0.4
NuHorizon	0.2	0.4	0.4	0.3
Yuma	0.4	0.1	0.0	0.2
Prairie Red	0.0	0.0	0.0	0.0
Mean	1.0	0.2	0.2	
$LSD_{0.01}$* (PD x VAR) = 0.6				

*Based on difference of least square means (SAS PROC MIXED)

[§]O: No infestation, 10: 100% infestation

Lodging and plant height:

Lodging was severe (80%) in Jagalene at PD2, substantial (32 to 48%) in Prairie Red (PD1 and PD2), Jagalene (PD1), Wesley (PD2), and Yuma (PD2); moderate (12%) in Wesley (PD1), and negligible or non existent at PD3 (all varieties) and at all planting dates for NuHorizon and Platte (Table 5).

Jagalene, Prairie Red, and Yuma had the tallest plants, particularly at PD1 and PD2 (Yuma), while NuHorizon, Platte, and Wesley had the shortest plants, particularly at PD3 (NuHorizon and Platte) and PD1 (Table 6).

Table 5. Incidence of lodging in 2005.

Variety (VAR)	Planting Date (PD)			
	2-Sep	27-Sep	18-Oct	Mean
	Rating (0-10)[§]			
Jagalene	3.5	8.0	0.0	3.8
Prairie Red	4.7	4.8	0.0	3.2
Yuma	2.3	3.2	0.0	1.8
Wesley	1.2	4.0	0.0	1.7
NuHorizon	0.0	0.3	0.0	0.1
Platte	0.0	0.0	0.0	0.0
Mean	1.9	3.4	0.0	
$LSD_{0.01}$* (PD x VAR) = 1.7				

*Based on difference of least square means (SAS PROC MIXED)

[§]O: No infestation, 10: 100% infestation

Table 6. Plant height in 2005.

Variety (VAR)	Planting Date (PD)			
	2-Sep	27-Sep	18-Oct	Mean
	inches			
Jagalene	40.7	40.5	38.8	40.0
Prairie Red	39.3	40.0	37.7	39.0
Yuma	38.0	40.7	38.3	39.0
Wesley	36.8	37.7	37.7	37.4
NuHorizon	35.2	37.7	35.3	36.1
Platte	36.0	37.5	34.0	35.8
Mean	37.7	39.0	37.0	
$LSD_{0.01}$* (PD x VAR) = 1.5 in.				

Discussion:

Except for Jagalene and Wesley, the other four varieties produced the highest grain yield when planted on or before 27 Sept. NuHorizon performed the best in this one-year trial relative to yield, test weight, and the incidence of lodging and stripe rust. It should not be planted past September. Jagalene did not grow as tall and had the least incidence of lodging and the highest yield when planted on 18 Oct. Wesley produced 70 to 80 bu/acre with no significant differences among planting dates. As expected, Platte and Prairie Red had the highest incidence of stripe rust, regardless of planting date. They also had the lowest grain yields and test weights. Being one of the tallest varieties, Prairie Red also had a lot of lodging when planted on or before 27 Sept. Stripe rust was prevalent in the Arkansas Valley in 2005. Such a high and widespread infestation was not seen in the valley for years. It was exacerbated by above-average precipitation in 2005 and by high soil N test (which caused too much vegetative growth) and frequent irrigations at the trial site. It was much less of a problem in the winter wheat variety trial, which was planted late (28 Oct.), had less residual soil N and was irrigated fewer times (five vs. seven applications) than the planting date trial. In a different irrigated winter wheat variety trial on the research station Jagalene averaged 92.5 bu/acre, Wesley 88.7, NuHorizon 84.6, Yuma 82.1, Prairie Red 81.0, and Platte 77.7 bu/acre.

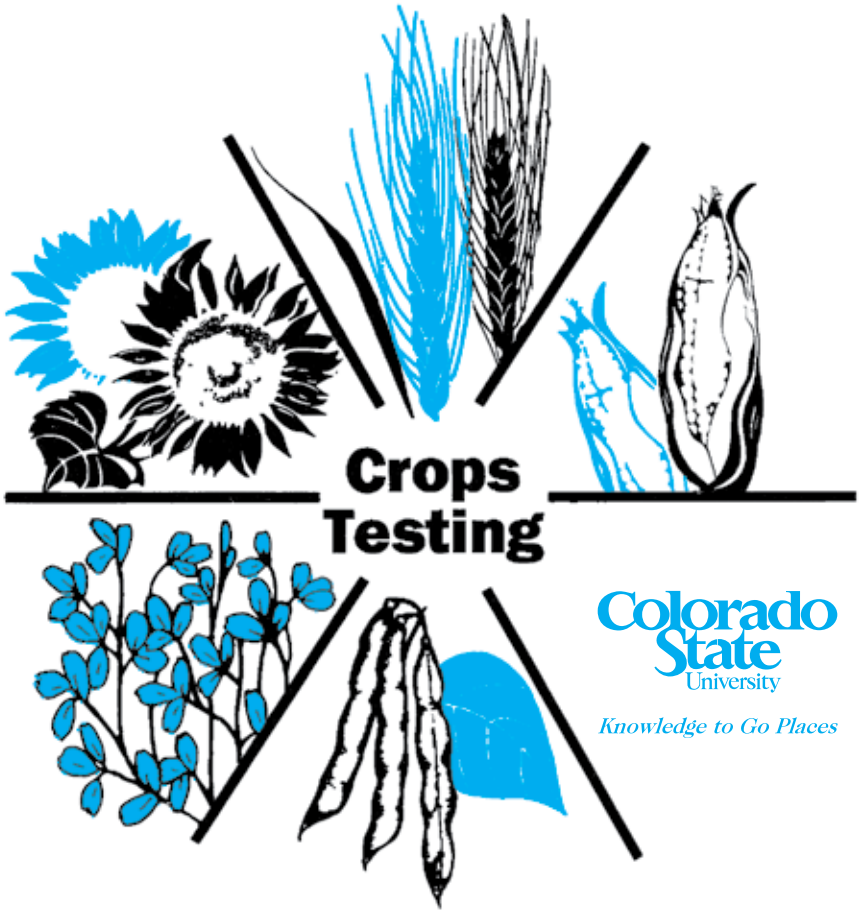
MAKE NOTES FOR VARIETIES YOU LIKE:

2005-2006 Colorado Winter Wheat UVPT

Variety Name	Plot #	Comments
Prowers 99	101	
CO03758	102	
Prairie Red	103	
Hatcher	104	
CO00016	105	
Ankor	106	
Akron	107	
Yuma	108	
Alliance	109	
Harry	110	
Goodstreak	111	
Jagger	112	
Above	113	
Bond CL	114	
Infinity CL	115	
KS03HW6-6	116	
Avalanche	117	
Trego	118	
Danby	119	
KS03HW158	120	
Guymon	121	
NuFrontier	122	
NuHills	123	
Jagalene	124	
TAM 111	125	
Westbred Keota	126	
Endurance	127	
AP03-20	128	
AP50W	129	
AP530W	130	
CO01212	131	
CO01385-A1	132	
CO01473	133	
CO01W171	134	
CO01W172	135	
CO02265	136	
CO02320-A1	137	
CO02322-A2	138	
CO02W040	139	
CO02W214	140	
CO02W237	141	
CO02W280	142	
CO03621	143	
CO03637	144	
CO03W238	145	
CO03W239	146	
CO03W253	147	
CO03W261	148	
CO03W262	149	
CO03W263	150	
CO03W267	151	
CO03W269	152	
CO03761	153	
CO03765	154	

2005-2006 Colorado Winter Wheat IVPT

Variety Name	Plot #	Comments
Yuma	101	
Jagalene	102	
Hatcher	103	
Bond CL	104	
Ankor	105	
TAM 111	106	
Wesley	107	
Westbred Keot	108	
NuHills	109	
Platte	110	
NuFrontier	111	
AP03-20	112	
AP50W	113	
AP530W	114	
Antelope	115	
Danby	116	
Guymon	117	
Prairie Red	118	
CO01385-A1	119	
CO02265	120	
CO01212	121	
CO02320-A1	122	
CO02322-A2	123	
CO02W040	124	
CO02W214	125	
CO02W237	126	
CO02W280	127	
CO03621	128	
CO03637	129	
CO03W238	130	
CO03W239	131	
CO03W253	132	
CO03W261	133	
CO03W262	134	
CO03W263	135	
CO03W267	136	
CO03W269	137	
NW98S097	138	
NI02425	139	
NI03427	140	



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Knowledge to Go Places

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Putting Knowledge to Work