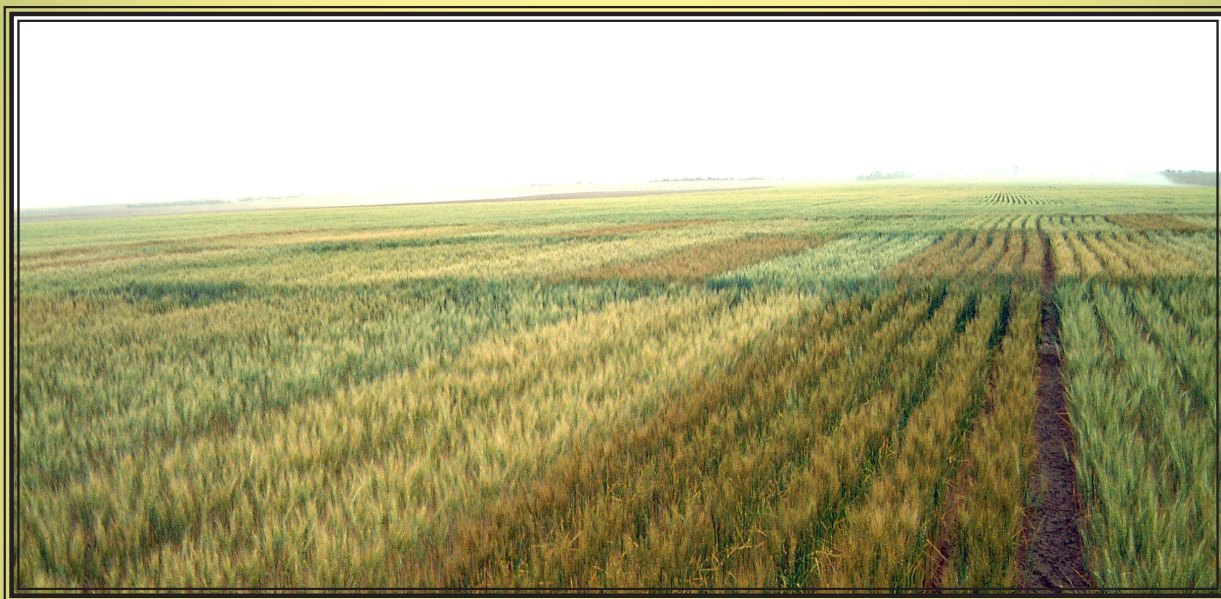


From the Ground Up



Agronomy News

Volume 29
Issue 4



QuickTopics

2010 Wheat Results

Brave New Seed World

Newsletter of Soil & Crop Extension at Colorado State University

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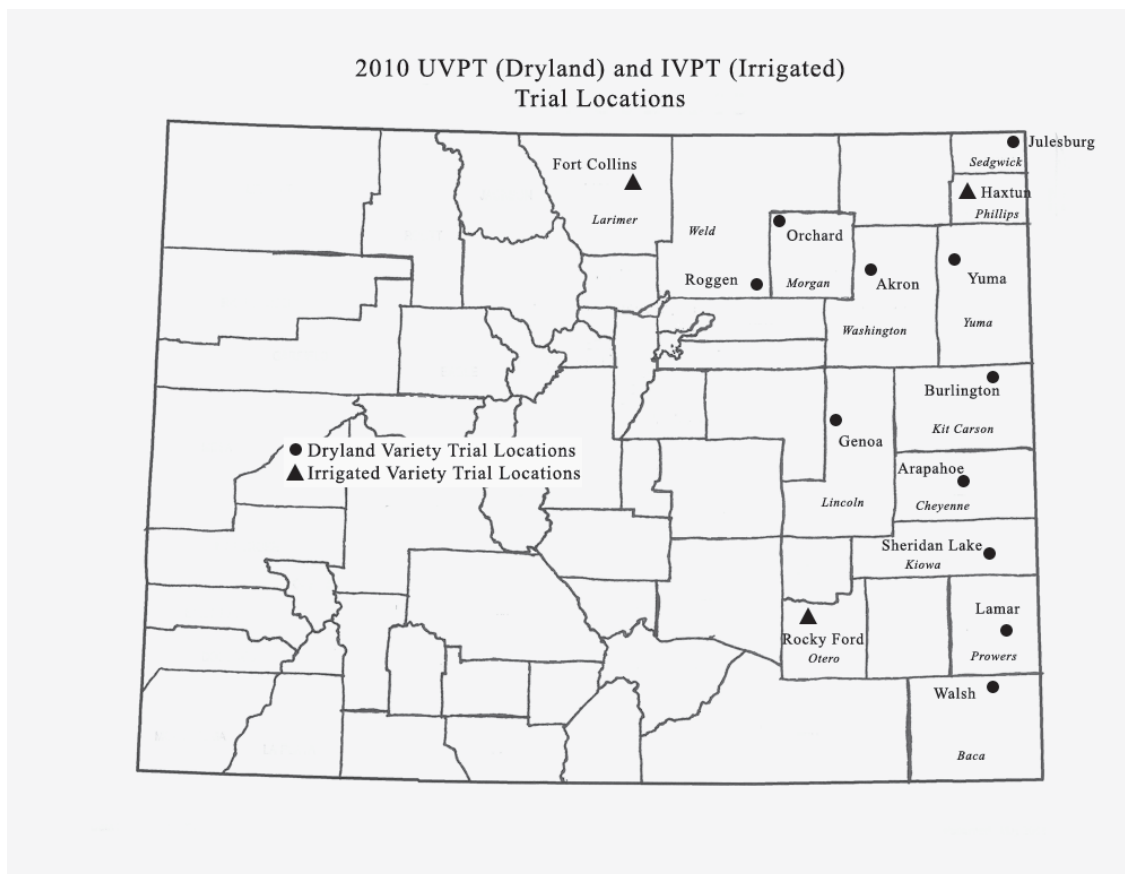
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2010 Eastern Colorado Winter Wheat Variety Performance Trials

Jerry Johnson and Scott Haley

Colorado State University provides unbiased and reliable information to Colorado wheat producers to help them make better wheat variety decisions. It provides excellent research faculty and staff, a focused breeding program, graduate and undergraduate students, and dedicated agricultural extension specialists. However, wheat improvement in Colorado would not be possible without the support and cooperation of the entire Colorado wheat industry. On-going and strong support for a public breeding program is critical because variety development and testing is a long process, especially under the highly variable climatic conditions in Colorado.

There is an increasing investment in wheat breeding by private seed companies in the Great Plains. WestBred has become a unit of Monsanto and AgriPro COKER has become part of Syngenta. Limagrain is poised to begin winter wheat breeding in Fort Collins this fall. More traits and adapted varieties or hybrids should be available to Colorado producers in the future.

Our wheat variety performance trials, and collaborative on-farm testing, represent the final stages of a wheat breeding program where promising experimental lines are tested under an increasingly broad range of environmental conditions. Variation in precipitation, as well as variable fall, winter, and spring temperature regimes, hail and spring freeze events, interact with disease and insect pests and variety maturity to affect wheat yields. As a consequence of large environmental variation, Colorado State University annually conducts a large number of performance trials, which serve to guide producer variety decisions and to assist our breeding program to more reliably select and advance the most promising lines toward release as new varieties.

2010 Trials

Dryland trials were planted in Lamar, Sheridan Lake, and Arapahoe in early September; in Burlington and Orchard in mid-September; and in Julesburg, Yuma, Akron, and Walsh in late September (due to unseasonably wet conditions in mid-September at the NE Colorado

locations). Variety trial emergence was good across locations although cool, dry conditions in the fall led to slow growth and small plants going into winter. Moist spring conditions in most locations ensured good plant growth as well as creating good conditions for the spread of stripe rust. Rust, high temperatures and strong winds stripped the leaves from wheat plants prematurely at Walsh, Lamar, and Sheridan Lake. Even so, yields were above average at these locations. Two trials, at Genoa and Roggen, were lost to hail in June. A new race of stripe rust developed in the southern states and spread to Colorado in 2010. Many varieties previously resistant to stripe rust are now fully susceptible to the new race. Stripe rust infected all trials to different degrees and at different times. Seemingly, the late-planted locations at Julesburg, Yuma, and Akron were most affected by a late-season stripe rust infection following an especially wet period. Russian wheat aphid was not a problem in 2010.

The Irrigated Variety Performance Trials (IVPT) at Fort Collins and Rocky Ford were planted in mid-September while wet mid-September conditions made it impossible to plant at Haxtun until late September. The trial at Rocky Ford suffered from a severe infection of powdery mildew and lodging resulting from lush fall and spring growth which led to low irrigated wheat yields. In spite of late planting, yields of some varieties at Haxtun still surpassed 100 bu/ac. The yields at Fort Collins were very good even though the trial may have benefitted from more spring and summer irrigation. Stripe rust was most serious at Fort Collins but less so at Haxtun (due to fungicide application).

There were 40 different entries in the dryland performance trials (UVPT) and 32 entries in the irrigated performance trials (IVPT). All trials included a combination of public and private varieties and experimental lines from Colorado and surrounding states. All dryland and irrigated trials were planted in a randomized complete block design with three replicates. Plot size was approximately 180 ft² and all varieties were planted at 700,000 viable seeds per acre for dryland trials and 1.3 million viable seeds per acre for irrigated trials. Yields are corrected to 12% moisture. Test weight information was obtained from a combine equipped with a Harvest Master measuring system.

Summary of 2010 Dryland Variety Performance Results

Origin ^a and Release Year	Variety ^b	Market Class ^c	Yield ^d bu/ac	Test Weight lb/bu	Height in
CSU exp	CO06424	HRW	65.9	60.2	30
CSU exp	CO050322	HRW	63.8	60.5	29
CSU exp	CO050303-2	HRW	63.6	62.0	32
CSU exp	CO050173	HRW	63.5	62.4	30
CSU exp	CO050337-2	HRW	62.7	60.8	31
CSU exp	CO050233-2	HRW	62.5	60.5	30
CSU exp	CO050270	HRW	61.7	59.9	29
CSU exp	CO05W111	HWW	61.5	61.6	31
NE 2008	Settler CL	HRW	61.1	60.6	29
WB 2007	Winterhawk	HRW	60.5	61.8	30
CSU exp	CO05W194	HWW	60.1	60.2	29
TX/A 2002	TAM 111	HRW	59.2	61.3	31
CSU 2007	Bill Brown	HRW	59.2	60.7	30
CSU 2006	Ripper	HRW	59.0	59.2	29
CSU exp	CO050175-1	HRW	59.0	62.0	31
CSU exp	CSU Blend09	HRW	59.0	60.1	29
CSU 2009	Snowmass	HWW	59.0	61.1	31
CSU 2004	Hatcher	HRW	58.8	60.9	30
NE 2004	Infinity CL	HRW	58.4	61.0	32
CSU exp	CO04393	HRW	58.3	60.3	30
CSU 2004	Bond CL	HRW	58.3	58.7	31
WB 2008	Armour	HRW	58.3	59.7	27
CSU 2008	Thunder CL	HWW	58.0	59.8	29
CSU exp	CO06052	HRW	58.0	61.3	30
NE 2008	Camelot	HRW	57.7	60.8	32
CSU-TX 2001	Above	HRW	57.6	60.1	30
AP 2009	SY Gold	HRW	57.4	61.4	30
TX/W 2005	TAM 112	HRW	57.4	60.7	30
KSU 2005	Danby	HWW	57.2	62.5	30
KSU 2009	Everest	HRW	57.1	61.5	29
CSU/AG 2004	Protection	HRW	56.7	58.7	32
CSU exp	CO04499	HRW	56.6	60.8	32
WB 2005	Keota	HRW	56.4	61.5	31
AP 2006	Hawken	HRW	56.1	60.6	28
OK 2006	Duster	HRW	55.5	60.8	30
CSU 1998	Prairie Red	HRW	55.4	59.2	29
WB 2006	Smoky Hill	HRW	55.3	60.4	29
WB 2010	Stout	HRW	55.1	58.7	30
KSU 2006	Fuller	HRW	54.9	60.5	30
KSU 1994	Jagger	HRW	53.8	60.5	30
Average			58.7	60.6	30

^aVariety origin code: CSU=Colorado State University; CSU-TX=Colorado State University/Texas A&M University; CSU/AG=CSU release, marketed by AGSECO; WB=WestBred, LLC; AP=AgriPro COKER; TX/A=Texas A&M release, marketed by AgriPro COKER; TX/W=Texas A&M release, marketed by Watley Seed Co.; KSU=Kansas State University; NE=University of Nebraska; OK=Oklahoma State University

^bVarieties ranked according to average yield in 2010

^cMarket class: HRW=Hard Red Winter Wheat; HWW=Hard White Winter Wheat

^d2010 average yield and test weight are based on nine 2010 trials

Summary of 2-Yr Dryland Variety Performance Results

Origin ^a and Release Year	Variety ^b	Market Class ^c	2-Yr Average ^d	
			Yield bu/ac	Test Weight lb/bu
NE 2008	Settler CL	HRW	58.9	60.2
CSU exp	CO04393	HRW	58.8	60.5
CSU exp	CSU Blend09	HRW	58.7	59.8
CSU 2009	Snowmass	HWW	58.3	60.9
TX/A 2002	TAM 111	HRW	58.2	61.3
CSU 2006	Ripper	HRW	58.1	59.4
CSU 2004	Bond CL	HRW	58.1	58.8
WB 2007	Winterhawk	HRW	58.0	61.4
CSU 2007	Bill Brown	HRW	57.6	60.7
CSU exp	CO04499	HRW	57.6	60.8
CSU 2004	Hatcher	HRW	57.4	60.4
CSU-TX 2001	Above	HRW	57.3	60.0
TX/W 2005	TAM 112	HRW	57.2	61.2
NE 2004	Infinity CL	HRW	56.8	60.3
KSU 2005	Danby	HWW	56.0	61.6
NE 2008	Camelot	HRW	55.9	60.3
CSU 1998	Prairie Red	HRW	55.8	59.4
AP 2009	SY Gold	HRW	55.8	60.8
WB 2008	Armour	HRW	55.8	59.3
CSU 2008	Thunder CL	HWW	55.8	59.7
OK 2006	Duster	HRW	55.8	60.3
WB 2006	Smoky Hill	HRW	55.2	60.2
AP 2006	Hawken	HRW	54.7	60.3
WB 2005	Keota	HRW	54.3	60.1
KSU 2006	Fuller	HRW	53.5	59.7
KSU 1994	Jagger	HRW	52.4	60.1
Average			56.6	60.3

^aVariety origin code: CSU=Colorado State University; CSU-TX=Colorado State University/Texas A&M University; WB=WestBred, LLC; AP=AgriPro COKER; TX/A=Texas A&M release, marketed by AgriPro COKER; TX/W=Texas A&M release, marketed by Watley Seed Co.; KSU=Kansas State University; NE=University of Nebraska; OK=Oklahoma State University

^bVarieties ranked according to average 2-yr yield

^cMarket class: HRW=Hard Red Winter Wheat; HWW=Hard White Winter Wheat

^d2-yr average yield and test weight are based on nine 2010 trials and ten 2009 trials

Summary of 3-Yr Dryland Variety Performance Results

Origin ^a and Release Year	Variety ^b	Market Class ^c	3-Yr Average ^d	
			Yield bu/ac	Test Weight lb/bu
NE 2008	Settler CL	HRW	56.5	60.3
CSU 2006	Ripper	HRW	55.9	59.5
CSU 2009	Snowmass	HWW	55.8	60.8
WB 2007	Winterhawk	HRW	55.1	61.5
CSU 2007	Bill Brown	HRW	54.8	60.8
TX/A 2002	TAM 111	HRW	54.6	61.2
CSU-TX 2001	Above	HRW	54.5	60.0
CSU 2004	Hatcher	HRW	54.4	60.7
CSU 2004	Bond CL	HRW	54.4	59.3
TX/W 2005	TAM 112	HRW	54.2	61.0
NE 2004	Infinity CL	HRW	53.8	60.4
NE 2008	Camelot	HRW	53.0	60.5
OK 2006	Duster	HRW	52.8	60.4
CSU 1998	Prairie Red	HRW	52.7	59.7
WB 2006	Smoky Hill	HRW	52.7	60.6
KSU 2005	Danby	HWW	52.4	61.8
AP 2006	Hawken	HRW	52.3	60.6
CSU 2008	Thunder CL	HWW	51.8	60.0
WB 2005	Keota	HRW	51.5	60.0
KSU 2006	Fuller	HRW	51.1	60.1
KSU 1994	Jagger	HRW	50.0	60.0
		Average	53.5	60.4

^aVariety origin code: CSU=Colorado State University; CSU-TX=Colorado State University/Texas A&M University; WB=WestBred, LLC; AP=AgriPro COKER; TX/A=Texas A&M release, marketed by AgriPro COKER; TX/W=Texas A&M release, marketed by Watley Seed Co.; KSU=Kansas State University; NE=University of Nebraska; OK=Oklahoma State University

^bVarieties ranked according to average 3-yr yield

^cMarket class: HRW=Hard Red Winter Wheat; HWW=Hard White Winter Wheat

^d3-yr average yield and test weight are based on nine 2010 trials, ten 2009 trials, and six 2008 trials

2010 Collaborative On-Farm Test (COFT)

Results

Much of Colorado's 2010 wheat acreage was planted to winter wheat varieties that have been tested in the COFT program which is in its 12th year of operation. In the fall of 2009, twenty-one eastern Colorado wheat producers planted COFT trials in Baca, Prowers, Kiowa, Cheyenne, Kit Carson, Washington, Yuma, Phillips, Logan, Adams, and Weld counties. Each collaborator planted five varieties in side-by-side strips (approximately 1.25 acres per variety) at the same time and at the same seeding rate as they seeded their own wheat. Viable harvest results were obtained from 19 of the 21 tests; failed tests were lost to severe hail damage.

The objective of the 2010 COFT was to compare performance and adaptability of popular and newly-released CSU varieties (Snowmass, Ripper, and Bill Brown), and promising commercial varieties from WestBred (Winterhawk) and Watley Seed (TAM 112) under unbiased testing conditions. The COFT trial results are intended to be interpreted based on the average across all tests within a year and not on the basis of a single variety comparison on a single farm in one year. Interpreted as an average of 19 test results, the 2010 COFT results can be a powerful complement to our other trial results for helping farmers make better variety decisions.

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2010 Collaborative On-Farm Tests (COFT) Variety Performance Results

County/Town	2010 Varieties ¹																	
	Bill Brown			TAM 112			Snowmass			Winterhawk			Ripper					
	Yield	Test Wt	Protein	Yield	Test Wt	Protein	Yield	Test Wt	Protein	Yield	Test Wt	Protein	Yield	Test Wt	Protein			
bu/ac ²	lb/bu	%	bu/ac ²	lb/bu	%	bu/ac ²	lb/bu	%	bu/ac ²	lb/bu	%	bu/ac ²	lb/bu	%	bu/ac ²	lb/bu	%	
Adams/Bennett	47.2	61.0	11.2	46.0	60.0	11.8	40.6	60.0	12.7	47.6	62.5	12.1	48.3	60.0	11.4	45.9	60.7	11.8
Baca/Two Buttes	49.9	63.0	9.5	49.3	63.5	9.8	52.3	63.0	9.5	43.0	63.0	10.2	49.7	61.5	9.3	48.8	62.8	9.7
Baca/Vilas	52.7	63.0	9.0	50.5	63.6	9.8	48.0	64.0	9.9	45.6	63.5	10.1	53.1	61.5	10.0	50.0	63.1	9.7
Baca/Walsh	45.5	61.0	-	46.1	61.0	-	44.3	60.0	-	45.5	62.0	-	44.5	58.0	-	45.2	60.4	-
Bent/Lamar	44.1	63.0	13.2	39.0	62.0	14.3	38.5	61.0	13.5	36.0	63.0	14.2	41.6	60.0	15.0	39.8	61.8	14.0
Cheyenne/Arapahoe	55.1	58.0	12.5	56.1	58.5	13.0	54.8	60.0	12.6	50.8	60.5	11.5	48.4	57.0	12.7	53.0	58.8	12.4
Kiowa/Haswell	51.9	56.3	13.2	52.6	58.8	12.7	45.5	56.5	13.4	46.9	56.7	12.3	48.0	55.6	13.7	49.0	56.8	13.1
Kit Carson/Bethune	61.0	60.5	-	51.9	60.3	-	49.6	61.3	-	51.1	58.8	-	45.1	58.2	-	51.7	59.8	-
Logan/Leroy	64.8	62.0	10.3	67.7	61.5	10.6	63.2	61.0	11.3	70.0	60.5	10.9	60.6	57.0	11.9	65.3	60.4	11.0
Logan/Peetz	50.1	60.0	9.7	51.5	60.5	9.6	47.7	61.0	9.3	48.8	60.0	9.5	42.8	58.0	10.2	48.2	59.9	9.7
Logan/Sterling	61.2	58.5	11.3	59.2	57.0	11.6	61.5	58.5	11.7	58.9	60.0	11.5	50.5	55.0	12.3	58.3	57.8	11.7
Phillips/Haxtun	73.6	61.5	10.7	82.8	61.3	9.6	81.8	60.3	11.0	68.9	58.1	10.7	78.9	60.2	10.2	77.2	60.3	10.5
Phillips/Haxtun E	54.4	57.5	11.1	54.8	56.5	11.5	62.7	58.2	11.4	58.3	57.4	9.4	50.0	53.6	11.4	56.0	56.6	11.0
Prowers/Lamar	70.3	60.0	14.3	66.8	63.0	14.5	72.0	61.0	13.6	49.9	62.0	13.8	65.0	60.0	14.8	64.8	61.2	14.2
Washington/Akron	59.6	59.0	11.4	59.0	58.0	11.5	57.6	58.5	11.8	58.3	60.0	11.3	53.9	57.0	11.7	57.7	58.5	11.5
Washington/Woodlin	45.1	55.0	11.7	39.0	60.0	10.8	44.5	60.0	10.7	44.0	62.5	10.7	44.6	56.5	11.3	43.4	58.8	11.0
Washington/Woodrow	65.5	63.0	11.5	58.2	62.0	11.2	64.0	60.0	11.3	65.2	62.5	11.6	59.1	57.5	10.9	62.4	61.0	11.3
Weid/New Raymer	53.7	63.0	10.6	52.0	62.0	11.3	54.5	61.5	11.3	47.9	62.0	11.9	52.9	61.0	10.9	52.2	61.9	11.2
Yuma/Yuma	57.5	57.2	11.5	61.3	57.2	11.9	56.8	56.4	11.8	60.5	59.4	11.7	53.0	55.0	12.3	57.8	57.0	11.8
Average	56.0	60.1	11.3	54.9	60.4	11.5	54.7	60.1	11.6	52.5	60.8	11.4	52.1	58.0	11.8	54.0	59.9	11.5
Significance ³ Yield	a			a			a			b			b					
Significance ³ Test Wt		b			b			b			a			c				
Significance ³ Protein			c			bc			b			c			a			

LSD_(0.30) for yield = 1.3 bu/ac LSD_(0.30) for test weight = 0.4 lb/bu LSD_(0.30) for protein = 0.2%

¹Varieties are ranked left to right according to average yield in 2010

²Yield corrected to 12% moisture

³Significance: Varieties with different letters are significantly different from one another based on the LSD values (1.3 bu/ac for yield, 0.4 lb/bu for test weight, and 0.2% for protein)

Summary of 2010 Irrigated Variety Performance Results

Origin ^a and Release Year	Variety ^b	Market Class ^c	Yield ^d bu/ac	Test Weight lb/bu	Height in	Heading Date at Ft.	Stripe Rust at	Lodging at
						Collins Days from trial avg.	Ft. Collins Scale 1-9 ^e	Rocky Ford Scale 1-9 ^f
CSU exp	CO06424	HRW	92.4	61.8	37	0	4	7
AP 2001	Jagalene	HRW	91.3	61.0	38	1	9	7
NE 2008	Settler CL	HRW	89.3	60.7	36	1	3	3
CSU exp	CO050175-1	HRW	89.0	62.1	38	1	4	7
WB 2006	Aspen	HWW	89.0	60.2	32	-1	1	1
CSU exp	CO06052	HRW	88.5	62.4	35	-3	4	1
CSU exp	CO050303-2	HRW	88.2	61.7	37	2	1	2
CSU exp	CO04393	HRW	88.0	61.8	37	0	2	2
CSU exp	CO050233-2	HRW	88.0	60.3	36	1	1	1
WB 2007	Winterhawk	HRW	87.9	61.0	36	0	1	4
WB 2008	Armour	HRW	86.9	60.7	32	-3	1	6
CSU exp	CO050322	HRW	86.8	59.9	36	2	1	7
CSU 2004	Bond CL	HRW	86.4	60.4	37	-1	7	1
CSU exp	CO050337-2	HRW	86.4	61.2	37	3	1	8
WB 2010	Stout	HRW	85.7	59.4	36	-1	8	2
CSU exp	CO05W194	HWW	85.5	61.0	33	0	5	1
WB 2005	Keota	HRW	85.5	61.4	36	0	6	3
TX/A 2002	TAM 111	HRW	85.3	60.4	38	1	1	7
CSU 2008	Thunder CL	HWW	85.1	60.1	35	-1	2	2
OK 2006	Duster	HRW	84.5	60.9	36	0	4	5
OK 2009	Billings	HRW	84.2	61.8	36	1	3	5
CSU 2006	Ripper	HRW	83.5	59.2	34	-1	8	6
AP 2009	SY Gold	HRW	82.7	60.3	35	-1	5	3
WB 2008	Hitch	HRW	82.4	59.4	32	1	8	1
KSU 2006	Fuller	HRW	82.2	60.6	35	-2	7	7
CSU 1991	Yuma	HRW	81.8	60.1	33	0	5	3
CSU exp	CO05W111	HWW	81.8	61.1	37	3	2	3
CSU exp	CO050270	HRW	81.7	60.3	35	-3	2	7
WB 2006	Smoky Hill	HRW	81.2	60.2	36	1	8	6
CSU 2004	Hatcher	HRW	80.1	60.6	35	0	2	4
TX/W 2005	TAM 112	HRW	78.8	62.4	35	-1	7	7
CSU 2007	Bill Brown	HRW	75.4	60.0	34	0	4	7
Average			85.2	60.8	36	6/2/2010	4	4

^aVariety origin code: CSU=Colorado State University; WB=WestBred, LLC; AP=AgriPro COKER; TX/A=Texas A&M release, marketed by AgriPro COKER; TX/W=Texas A&M release, marketed by Watley Seed Co.; KSU=Kansas State University; NE=University of Nebraska; OK=Oklahoma State University

^bVarieties ranked according to average yield in 2010

^cMarket class: HRW=Hard Red Winter Wheat; HWW=Hard White Winter Wheat

^d2010 average yield and test weight based on three 2010 trials

^eStripe rust rating: 1-no rust, 9-severe rust

^fLodging rating: 1-no lodging, 9-fully lodged

Summary of 2-Yr Irrigated Variety Performance Results

Origin ^a and Release Year	Variety ^b	Market Class ^c	2-Yr Average ^d				
			Yield	Test Weight	Height	Heading Date at Ft. Collins	Lodging
			bu/ac	lb/bu	in	Days from trial avg.	Scale 1-9 ^e
NE 2008	Settler CL	HRW	91.9	60.4	36	1	2
WB 2006	Aspen	HWW	90.5	58.5	33	-1	1
CSU exp	CO04393	HRW	90.0	60.6	37	0	3
AP 2001	Jagalene	HRW	89.3	60.1	37	0	4
TX/A 2002	TAM 111	HRW	88.9	60.0	37	1	4
WB 2008	Armour	HRW	87.4	59.3	32	-2	4
CSU 2004	Bond CL	HRW	86.6	59.3	37	0	3
CSU 2008	Thunder CL	HWW	86.5	58.9	35	0	2
CSU 2006	Ripper	HRW	85.8	57.9	35	-1	5
WB 2008	Hitch	HRW	84.1	58.8	33	1	1
WB 2005	Keota	HRW	83.9	59.7	37	0	3
AP 2009	SY Gold	HRW	81.1	59.1	35	0	2
TX/W 2005	TAM 112	HRW	80.9	61.3	36	-1	6
KSU 2006	Fuller	HRW	80.1	58.9	35	-1	4
CSU 1991	Yuma	HRW	78.8	58.6	34	1	3
CSU 2007	Bill Brown	HRW	78.2	59.3	34	0	5
CSU 2004	Hatcher	HRW	78.1	59.2	35	0	5
		Average	84.8	59.4	35	0	3

^aVariety origin code: CSU=Colorado State University; WB=WestBred, LLC; AP=AgriPro COKER; TX/A=Texas A&M release, marketed by AgriPro COKER; TX/W=Texas A&M release, marketed by Watley Seed Co.; KSU=Kansas State University; NE=University of Nebraska; OK=Oklahoma State University

^bVarieties ranked according to average 2-yr yield

^cMarket class: HRW=Hard Red Winter Wheat; HWW=Hard White Winter Wheat

^d2-yr average yield and test weight are based on three 2010 trials and three 2009 trials

^eLodging rating: 1-no lodging, 9-fully lodged

Summary of 3-Yr Irrigated Variety Performance Results

3-Yr Average^d

Origin ^a and Release Year	Variety ^b	Market Class ^c	3-Yr Average ^d				
			Yield	Test Weight	Height	Heading Date at Ft.	
			bu/ac	lb/bu	in	Collins	Lodging
						Days from trial avg.	Scale 1-9 ^e
CSU exp	CO04393	HRW	91.8	60.8	36	0	4
AP 2001	Jagalene	HRW	91.2	60.5	35	1	5
TX/A 2002	TAM 111	HRW	89.6	60.4	35	1	5
CSU 2004	Bond CL	HRW	88.7	59.0	35	-1	4
WB 2006	Aspen	HWW	87.8	58.4	31	-1	3
CSU 2008	Thunder CL	HWW	86.5	58.9	35	-1	2
WB 2005	Keota	HRW	86.4	59.9	35	1	4
CSU 1991	Yuma	HRW	83.1	59.2	33	1	4
CSU 2004	Hatcher	HRW	82.5	59.7	33	1	6
TX/W 2005	TAM 112	HRW	81.4	61.6	34	-2	7
CSU 2007	Bill Brown	HRW	81.1	59.6	32	0	6
Average			86.4	59.8	34	0	4

^aVariety origin code: CSU=Colorado State University; WB=WestBred, LLC; AP=AgriPro COKER; TX/A=Texas A&M release, marketed by AgriPro COKER; TX/W=Texas A&M release, marketed by Watley Seed Co.

^bVarieties ranked according to average 3-yr yield

^cMarket class: HRW=Hard Red Winter Wheat; HWW=Hard White Winter Wheat

^d3-yr average yield and test weight are based on three trials in 2008, 2009, and 2010

^eLodging rating: 1-no lodging, 9-fully lodged

Winter Wheat Variety Selection in Colorado for Fall 2010

Variety performance summary tables from CSU are intended to provide reliable and unbiased information to farmers, seed producers, and wheat industry representatives in Colorado and surrounding states. Although we have yet to find the perfect variety, this section of the report is designed to provide guidance to farmers so they can weigh the advantages and disadvantages of different varieties and choose the variety that best fits their farm conditions.

- Producers should focus on multiple-year summary yield results when selecting a new variety. Over time the best buffer against making poor variety decisions has been to select varieties based on three year average performance and not on performance in a single year, especially not to select a variety based upon performance at a single location in one year.
- Producers should consider planting more than one variety based on different maturity, disease or insect resistance, test weight, lodging, herbicide tolerance, coleoptile length, height, or end-use quality characteristics. These non-yield traits are useful to spread your risk due to the unpredictability of climatic conditions and pest problems.
- Producers should be aware that a new race of stripe rust emerged in 2010 and varieties that were resistant before are now susceptible. (See variety descriptions for new stripe rust ratings).
- Producers should control volunteer wheat and weeds to avoid the negative effects of a green bridge that could lead to serious virus disease infections vectored by the wheat curl mite or aphids.
- Producers should soil sample to determine optimum fertilizer application rates. In the absence of soil sampling, grain protein levels should be monitored closely. If protein levels in a field fall below 12%, nitrogen fertilizer was likely insufficient to meet demands for yield and yield was lost (consult <http://wheat.colostate.edu/00555.pdf>).

Although many new varieties possessing valuable traits and with high potential are in the breeding and selection process, emphasis here is placed on variety yield performance over the past three years and the specific traits they possess.

Ten dryland wheat varieties to consider based on the order

of relative performance for three years

Settler CL – This 2008 Nebraska release is a HRW Clearfield* winter wheat that has performed well in 3 years of testing and has good test weight. It is later maturing, medium height, and is moderately susceptible to leaf and stripe rust.

Ripper – An early maturing HRW 2006 CSU release that is high yielding, taller than Hatcher, excellent baking quality, and a medium-long coleoptile. It has relatively lower test weight, and is susceptible to both leaf and stripe rust. Ripper has shown extremely stable yields, being in the top three of the three year yield averages every year since 2005.

Snowmass – HWW CSU released in 2009 is a medium-maturing, taller semidwarf with excellent milling and baking quality. It has good resistance to wheat streak mosaic virus and stripe rust and moderate sprouting tolerance. Snowmass has relatively poor straw strength and will not be recommended for high-yield irrigated conditions. It is being handled in the CWRP ConAgra Mills Ultragrain® Premium Program for hard white wheat (HWW).

Winterhawk – This WestBred release in 2007 is medium maturing, medium tall, longer coleoptile with good stripe rust resistance.

It has good test weight and good baking quality but is susceptible to both leaf and stem rust. It has been high yielding in our variety and COFT trials.

Bill Brown – CSU HRW release (2007) can be compared to Hatcher and Ripper: It is similar in maturity to Hatcher and later maturing than Ripper. Like Ripper it is slightly taller than Hatcher. It has good resistance to stripe rust like Hatcher, which is much better than Ripper, and also very good resistance to leaf rust (unlike Hatcher and Ripper). It has superior test weight to Hatcher and other varieties, especially Ripper (low) and better baking quality than Hatcher but not quite as good as Ripper. Bill Brown is susceptible to stem rust, which is a much greater concern under irrigated conditions.

TAM 111 – A HRW 2002 release from Texas A&M and marketed by AgriPro has good test weight, good straw strength and excellent stripe rust resistance making it well adapted to irrigated conditions. TAM 111 also has good milling and baking characteristics, but is susceptible to leaf rust. TAM 111 performed below average in 2008 under drought conditions years ago but above average under higher dryland yield levels in 2009 and 2010.

Above – This CSU Clearfield* HRW (2001) release and Ripper are the earliest maturing varieties in the 2010 trials. On a 3-yr average, Above is the second highest yielding Clearfield* variety. It has average test weight and is susceptible to leaf and stripe rust and has relatively poor baking quality.

Hatcher – This medium maturing, high yielding 2004 CSU HRW variety was planted on more Colorado wheat acres in fall 2009 than any other variety. It has good stress tolerance, good test weight and adult plant resistance to stripe rust. Hatcher is also relatively short and develops a “speckling” condition on the leaves in the spring in the absence of any apparent disease. Hatcher is stable and was in the top three of three year yield averages every year from 2003-2009. Hatcher remains a highly recommended HRW wheat variety based on yield record, stress tolerance, and resistance to stripe rust.

Bond CL – A medium maturing taller 2004 HRW CSU release with high yields and good baking quality in addition to the Clearfield* trait. It has lower test weight and is susceptible to stripe rust.

TAM 112 – A HRW 2005 release from Texas A&M and marketed by Watley Seed Company has good dryland adaptation and is distinguished by excellent wheat streak mosaic virus resistance (or resistance to its vector, the wheat curl mite), a medium-long coleoptile, early maturity, and good test weight and baking quality. It is susceptible to leaf and stripe rust and has poor straw strength.

Four irrigated wheat varieties to consider based on the order of relative performance for three years

The most important variety selection criteria for irrigated varieties are yield, straw strength, and stripe rust resistance.

Jagalene - Agripro release (2001). Good test weight. Good wheat streak mosaic virus tolerance. Observed to shatter in CO and KS trials. Leaf and stripe rust susceptible.

TAM 111 – A HRW 2002 release from Texas A&M and marketed by AgriPro that is a high yielding irrigated variety with good straw strength, excellent resistance to stripe rust, and good test weight.

Bond CL – A medium maturing taller HRW CSU release (2004) with high yields, average straw strength, but susceptible to stripe rust. It has lodged significantly in some high yielding irrigated trials. It has low test weight that is more manageable and less of a concern in irrigated conditions.

Thunder CL - is a CSU 2008 hard white Clearfield* wheat release with excellent irrigated yield, good straw strength, and excellent baking quality. It has moderate resistance to stripe rust and wheat streak mosaic virus but is moderately susceptible to pre-harvest sprouting (intermediate to Platte and Trego). Thunder CL is being handled in the CWRP ConAgra Mills Ultragrain® Premium Program for hard white wheat (HWW).

2010 Wheat Crop Climatic Conditions and Specific Trial Comments

After a high-yielding 2009 crop, there were sufficient rains throughout the state for planting into good soil moisture although heavy and prolonged rain in the northeast prevented farmers from planting until late September and early October. The fall of 2009 was windy and cool such that fall growth and tillering were retarded compared to other years with warm falls. The winter of 2010 was windy with variable amounts of rain and snow. The crop came out of winter in decent shape in most places with adequate soil moisture. Wheat streak mosaic virus (WSMV) and Triticum mosaic virus were found alone or together in many places in eastern Colorado. Stripe rust infections were observed throughout the state - earlier in southeast Colorado and later in northeast Colorado. Deleterious effects of stripe rust were more obvious in northeast Colorado due to late plant development brought on by later dates of planting and cool fall conditions. In addition, the emergence of a new race of stripe rust rendered previously resistant varieties susceptible which increased general vulnerability to yield loss due to stripe rust infection. Russian wheat aphid was not a factor in the 2010 cropping season. 2010 was not free from hail incidence, especially affecting significant acreages along the central Front Range and Limon areas. Overcast, cool, wet, and cloudy weather dominated the early harvest season in NE Colorado.

Specific comments on individual 2010 dryland and irrigated trials

Dryland Locations

Walsh - Planted 9/21/2009 into clean-tilled summer fallow. GPS Coordinates: N 37 25.642 W 102 18.794. Satisfactory plant stands due to rain immediately following planting. Rain and snow from January through March. Wheat streak mosaic virus (WSMV) and Triticum mosaic virus were found on together on isolated plants in the trial. Freeze damage evident but may not have caused as much damage as first thought. Stripe rust was present by late May but not as heavy as other locations. Harvested 6/29/2010. Trial average yield = 53.1 bu/ac; test weight = 56.6.4 lb/bu.

Lamar - Planted 9/10/2009 into no-till wheat stubble ~ 500 feet west of the 2009 trial. GPS Coordinates: N 37 45.305 W 102 29.035. Satisfactory plant stands, some grasshopper damage. Dry winter and early spring conditions prevailed followed by late season drought and high temperatures. Plants defoliated by early June due to a combination of the effects of drought, high temperatures and a late-season stripe rust infection. Harvested 6/29/2010. Trial average yield = 46.3 bu/ac; test weight = 59.6 lb/bu.

Sheridan Lake - Planted 9/10/2010 into no-till sunflower stalks into satisfactory soil moisture for good stands with timely fall rains. GPS Coordinates: N 38 31.724 W 102 28.356. Good sub-soil moisture in early spring albeit dry surface conditions. Timely spring and early summer rains. Stripe rust infection was present but not severe. Harvested 6/30/2010. Trial average yield = 51.3 bu/ac; test weight = 63.5 lb/bu.

Arapahoe - Planted 9/11/2009 into good soil moisture conditions and good emergence. GPS Coordinates: N 38 52.353 W 7.705. WSMV present in the trial at very low levels. Good spring and early summer moisture but excessive rains delayed harvest until received 7/11/2010. Stripe rust was heavier in the trial than the locations further to the south. Trial average yield = 61.5 bu/ac; test weight = 62.8 lb/bu.

Burlington - Planted 9/17/2009 into tilled ground with good soil moisture. GPS Coordinates: N 39 11.096 W 102 16.805. Excellent emergence and good growing conditions, including timely moisture, throughout the year although early July rain prevented harvest until 7/17/2010. Stripe rust detected late May and sprayed with a fungicide soon afterwards. Trial average yield = 79.9 bu/ac; test weight = 61.6 lb/bu.

Genoa – Trial lost to hail in June 2010.

Roggen – Trial lost to hail in June 2010.

Orchard - Planted 9/16/2009 into short millet stubble with good soil moisture conditions. GPS Coordinates: N 40 30.641 W 104 04.241. Good to very good growing conditions throughout the year with relatively heavy stripe rust by early June. Harvested 7/12/2010. Trial average yield = 67.4 bu/ac; test weight = 63.0 lb/bu.

Akron – Relatively late planting on 9/29/2009 into marginal soil moisture led to mediocre fall stands that tillered well in the spring and filled in the rows. GPS Coordinates: N 40 08.970 W 102 09.715. Some spots in the trial showed stress in late spring but trial uniformity was better than most previous years. Late planting led to late plant development and significant stripe rust infection during grain formation and filling. Harvested on 7/12/2010 after wet early July conditions. Trial average yield = 57.5 bu/ac; test weight = 59.5 lb/bu.

Yuma - Planted later than normal due to wet mid-September conditions on 9/30/2009 into clean till summer fallow with good soil moisture. GPS Coordinates: N 40 16.400 W 102 39.684. Average stand establishment but late date of planting slowed down spring growth and plant development. Stripe rust visible by end of May but remained at relatively

low levels. The average plant height in the trial was 28 inches, nearly 10 inches shorter than the 2009 trial when the trial yielded almost 80 bu/ac. Harvested 7/13/2010. Trial average yield = 50.7 bu/ac; test weight = 59.7 lb/bu.

Julesburg - Planted 9/29/2009 into no-till corn stubble and good moisture leading to good fall stands but small plants going into winter. Spring growth retarded due to small plant size resulting from late planting and cool fall and spring conditions. Stripe rust was relatively heavy by early June; both leaf rust and tan spot/Septoria were also present. Average plant height was approximately 7 in shorter in 2010 than in 2009 when it average yield was over 80 bu/ac. Harvested 7/16/2010. Trial average yield = 60.9 bu/ac; test weight = 61.3 lb/bu.

Irrigated Locations

Haxtun - Planted 9/29/2009 into tilled sandy soil following dry beans with good soil moisture. GPS Coordinates: N 40 40.287 W 102 39.806. Good uniform stands but not over planted. Cool fall temperatures reduced plant development leading to few early spring tillers and small plants. Severe wind damage during winter. Excellent management resulted in better than expected average yields. Stripe rust evident at the end of May and field was sprayed with a fungicide. Harvested 7/16/2010. Trial average yield = 93.0 bu/ac; test weight = 61.9 lb/bu.

Rocky Ford - Planted 9/17/2009. Emergence was uneven with some plants not emerging until spring 2010. Stands and plant height were highly variable with early and severe infection of powdery mildew and potential soil problems. Harvested 7/15/2010. Trial average yield = 57.0 bu/ac; test weight = 57.8 lb/bu.

Fort Collins – Planted 9/18/2009 into good moisture, excellent emergence and fall growth. Some blowing during the winter, good condition though coming into spring. Excellent early spring wet snows. Drought stress in early May and again in early June may have reduced yields slightly. Stripe rust became heavy shortly after heading (by June 10) and continued to develop, completely taking out flag leaf of susceptible entries by mid grain filling. Some leaf rust present on stripe rust resistant varieties. Harvested 7/23/2010. Trial average yield = 105.5 bu/ac; test weight = 62.7 lb/bu.

Description of winter wheat varieties in eastern Colorado trials.

Name, Class, and Pedigree	Origin	RWA*	HD	HT	SS	COL	YR	LR	WSMV	TW	MILL	BAKE	Comments
Above	CSU-TX 2001	S	5	5	3	7	9	9	5	5	4	7	CSU/Texas A&M release (2001). Clearfield* winter wheat. Early maturing semidwarf, excellent dryland yield in CO. Leaf and stripe rust susceptible. Marginal baking quality.
Hard red winter TAM 110*/4/FS2													
Armour	Westbred 2008	S	1	1	3	7	1	3	6	7	5	5	Westbred release (2008). First entered in CSU trials in 2009. Early maturing short semidwarf, heavy tillering, good leaf and stripe rust resistance.
Hard red winter B1551-WH/KS94U326													
Aspen	Westbred 2006	S	3	2	1	6	1	3	5	7	6	6	Westbred release (2006). Hard white winter wheat (HWW), good sprouting tolerance. Short semidwarf, good leaf and stripe rust resistance.
Hard white winter TAM 302/B1551W													
Bill Brown	CSU 2007	R*	5	3	4	2	4	2	6	2	5	3	CSU release (2007). Good dryland and irrigated yield record in CSU trials. High test weight, good leaf rust resistance, moderate resistance to stripe rust. Stem rust susceptible. Good baking quality, short coleoptile.
Hard red winter Yumar/Arlin													
Billings	OK 2009	S	7	4	--	5	2	2	7	8	4	5	Oklahoma State release (2009). First entered into CSU Irrigated Variety Trials in 2010. Good leaf and stripe rust resistance.
Hard red winter N566/OK94P597													
Bond Cl	CSU 2004	R*	6	6	5	5	7	6	8	8	7	3	CSU release (2004). Clearfield* winter wheat. Slightly later, slightly taller than Above. Excellent dryland yield in CO, very high irrigated yields, excellent baking quality, lower test weight. Leaf and stripe rust susceptible.
Hard red winter Yumar//TXGH12588-120*/4/FS2													
Camelot	NE 2008	S	3	7	7	6	4	2	7	6	6	6	Nebraska release (2008). Medium-early, taller wheat, relatively poor straw strength. Good leaf rust resistance, moderately resistant to stripe rust.
Hard red winter KS91H184/Arlin SIB//KS91HW29/3/NE82761/Redland/4/VBF0168													
CSU Blend09	CSU 2004/2006	R*	3	4	4	--	--	--	--	6	--	--	50:50 blend of Hatcher and Ripper. First entered into CSU Dryland Variety Trial (UVPT) in 2009.
Hard red winter Hatcher-Ripper Blend													
Danby	KSU 2005	S	4	5	4	4	9	6	5	2	2	7	KSU-Hays release (2005). Hard white wheat (HWW), very high test weight. Similar to Trego with improved preharvest sprouting tolerance. Lower baking quality, stripe rust susceptible.
Hard white winter TREGO/JGR 8W													
Duster	OK 2006	S	8	8	3	2	4	2	7	4	7	5	Oklahoma State release (2006). Medium tall, medium late, short coleoptile, leaf rust resistant, moderately resistant to stripe rust.
Hard red winter WO405D/HGF112//W7469C/HCF012													

Russian wheat aphid resistance (RWA), heading date (HD), plant height (HT), straw strength (SS), coleoptile length (COL), stripe rust resistance (YR), leaf rust resistance (LR), wheat streak mosaic virus tolerance (WSMV), test weight (TW), milling quality (MILL), and baking quality (BAKE). Rating scale: 1 - very good, very resistant, very early, or very short to 9 - very poor, very susceptible, very late, or very tall.

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

Description of winter wheat varieties in eastern Colorado trials.

Name, Class, and Pedigree	Origin	RWA*	HD	HT	SS	COL	YR	LR	WSMV	TW	MILL	BAKE	Comments
Everest	KS-Manhattan 2009	S	5	3	--	6	1	2	7	4	2	7	KSU-Manhattan release (2009). First entered into CSU Variety Trials in 2010. Good leaf and stripe rust resistance. Targeted for production in more eastern portions of the Plains.
Hard red winter HBK1064-3/KS84063-9-39-3-4W//VBF0589-1//L89-6483													
Fuller	KSU 2006	S	2	3	7	4	7	2	5	5	6	5	KSU-Manhattan release (2006). Early maturing semidwarf. Average test weight, good leaf rust resistance, stripe rust susceptible. Lower straw strength.
Hard red winter Bulk selection													
Hatcher	CSU 2004	R*	6	2	6	5	3	8	8	4	2	4	CSU release (2004). Medium maturing semidwarf. Good test weight, moderate resistance to stripe rust. Excellent dryland yield across the High Plains, good milling and baking quality. Develops "leaf speckling" condition.
Hard red winter Yuma/PI 372129//TAM-200/3/4*Yuma/4/KS91H184/Vista													
Hawken	Agripro 2006	S	2	2	2	5	8	2	8	4	5	6	Agripro release (2006). Medium maturing, short semidwarf. Good leaf rust resistance, stripe rust susceptible, good straw strength.
Hard red winter Rowdy/W96-427													
Hitch	Westbred 2008	S	6	2	2	2	7	2	7	4	6	8	Westbred release (2008). First entered in CSU trials in 2009, positioned for High Plains irrigated production. Good straw strength, good leaf rust resistance, stripe rust susceptible, lower baking quality.
Hard red winter 53/3/ABL/1113//K92/4/JAG/5/KS89180B													
Infinity CL	NE 2004	S	5	7	6	6	3	3	6	4	4	4	Nebraska release (2005). Clearfield* winter wheat. Medium maturing, taller wheat, moderate resistance to stripe rust. Improved baking quality relative to Above. Develops "leaf speckling" similar to Hatcher.
Hard red winter Windstar/3/NE94481//TXGH125888-120*4/FS2													
Jagalene	Agripro 2001	S	5	5	5	4	9	9	4	3	2	5	Agripro release (2001). Good test weight, good wheat streak mosaic virus tolerance. Observed to shatter in CO and KS trials. Leaf and stripe rust susceptible.
Hard red winter Abilene/Jagger													
Jagger	KSU 1994	S	3	5	5	5	8	9	4	5	5	3	KSU-Manhattan release (1994). Early maturing semidwarf, good baking quality, good WSMV tolerance, very leaf and stripe rust susceptible. Breaks dormancy very early in the spring.
Hard red winter KS82W418/Stephens													
Keota	Westbred 2005	S	5	6	5	5	7	8	8	6	6	6	Westbred release (2005). Leaf and stripe rust susceptible. Taller plant stature, maintains height under stress.
Hard red winter Custer/Jagger													
Prairie Red	CSU 1998	R*	4	3	3	6	8	9	5	6	4	7	CSU release (1998). Backcross derivative of TAM 107, resistant to RWA biotype 1. Good stress tolerance, poor end-use quality reputation, lower yields relative to more recent wheat releases. Leaf and stripe rust susceptible.
Hard red winter CO850034/PI372129//5*TAM 107													

Russian wheat aphid resistance (RWA), heading date (HD), plant height (HT), straw strength (SS), coleoptile length (COL), stripe rust resistance (LR), leaf rust resistance (LR), wheat streak mosaic virus tolerance (WSMV), test weight (TW), milling quality (MILL), and baking quality (BAKE). Rating scale: 1 - very good, very resistant, very early, or very short to 9 - very poor, very susceptible, very late, or very tall.

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

Description of winter wheat varieties in eastern Colorado trials.

Name, Class, and Pedigree	Origin	RWA*	HD	HT	SS	COL	YR	LR	WSMV	TW	MILL	BAKE	Comments
Protection Hard red winter Jagger//TXGH12588-120*4/FS2	AGSECO/CSU 2004	S	3	7	3	5	7	9	4	8	4	7	CSU release (2004), marketed by AGSECO. Clearfield* winter wheat. Lower yield relative to Bond CL in CSU Variety Trials in 2003 and 2004. Taller plant stature, moderate susceptibility to stripe rust.
Ripper Hard red winter CO940606/TAM107R-2	CSU 2006	R*	2	4	4	7	9	9	7	7	2	2	CSU release (2006). Excellent stress tolerance, high dryland yields in Colorado, excellent milling and baking quality. Very good recovery from stand reduction. Leaf and stripe rust susceptible, lower test weights.
Settler CL Hard red winter N95L164/3/MILLENNIUM SIB//TXGH125888-120*4/FS2	NE 2008	S	8	5	3	6	4	8	7	4	4	6	Nebraska release (2008). Clearfield* winter wheat. Excellent dryland and irrigated yield in CSU Variety Trials. Later maturing, medium height. Moderately susceptible to leaf rust, moderately resistance to stripe rust.
Smoky Hill Hard red winter 97 8/64 MASA	Westbred 2006	S	6	3	4	4	8	2	8	5	5	2	Westbred release (2006). Medium late, shorter semidwarf. Good leaf rust resistance, stripe rust susceptible, good baking quality.
Snowmass Hard white winter KS96HW94//Trego/CO960293	CSU 2009	S	7	6	8	5	2	5	2	4	3	2	CSU release (2009). Hard white winter wheat (HWW). Medium-maturing, taller semidwarf. Good resistance to wheat streak mosaic virus and stem and stripe rust, moderate sprouting tolerance. Grown under contract with ConAgra.
SY Gold Hard red winter W95-301/W98-151	Agripro 2009	S	4	5	5	4	7	3	--	3	3	7	Agripro release (2009). First tested in CSU trials in 2009. Good leaf rust resistance, susceptible to stripe rust. Good milling quality, lower baking quality.
TAM 111 Hard red winter TAM-107//TX78V3630/CTK78/3/TX87V1233	TX 2002	S	6	7	3	6	1	8	5	2	3	4	Texas A&M release (2002), marketed by Agripro. Medium maturing, taller wheat. Good test weight, good straw strength, good irrigated yield. Leaf rust susceptible, very good stripe rust resistance.
TAM 112 Hard red winter U1254-7-9-2-1/TXGH10440	TX 2005	S	2	4	7	7	9	2	2	6	6	6	Texas A&M release (2005), marketed by Watley Seed. Good test weight, good quality, excellent wheat streak mosaic virus tolerance. Susceptible to leaf and stripe rust, poor straw strength.
Thunder CL Hard white winter KS01-5539/CO99W165	CSU 2008	R*	4	4	3	5	3	5	4	4	5	2	CSU release (2008). Hard white Clearfield* wheat. Good straw strength, top yields under irrigation. Excellent quality, moderate resistance to stripe rust and wheat streak mosaic virus, moderate sprout susceptibility. Grown under contract with ConAgra.
WB Stout Hard red winter KS94U275/1878//Jagger	Westbred 2009	S	1	3	5	5	8	2	4	8	7	5	Westbred release (2009). First tested in CSU trials in 2010. Good leaf rust resistance, stripe rust susceptible, lower test weight.

Russian wheat aphid resistance (RWA), heading date (HD), plant height (HT), straw strength (SS), coleoptile length (COL), stripe rust resistance (LR), leaf rust resistance (Lr), wheat streak mosaic virus tolerance (WSMV), test weight (TW), milling quality (MILL), and baking quality (BAKE). Rating scale: 1 - very good, very resistant, very early, or very short to 9 - very poor, very susceptible, very late, or very tall.

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

Description of winter wheat varieties in eastern Colorado trials.

Name, Class, and Pedigree	Origin	RWA*	HD	HT	SS	COL	YR	LR	WSMV	TW	MILL	BAKE	Comments
Winterhawk Hard red winter 474S10-1/X87807-26//HBK0736-3	Westbred 2007	S	5	5	5	7	2	8	5	2	2	4	Westbred release (2007). Medium maturing, medium tall, longer coleoptile. Good stripe rust resistance, susceptible to both leaf and stem rust. Good test weight, good quality.
Yuma Hard red winter NS14/NS25//2*Vona	CSU 1991	S	6	3	3	2	5	5	6	6	7	3	CSU release (1991). Medium maturity, semidwarf, short coleoptile, good baking quality characteristics. Moderate resistance to stripe rust. Good yields especially under irrigation.

Russian wheat aphid resistance (RWA), heading date (HD), plant height (HT), straw strength (SS), coleoptile length (COL), stripe rust resistance (YR), leaf rust resistance (LR), wheat streak mosaic virus tolerance (WSMV), test weight (TW), milling quality (MILL), and baking quality (BAKE). Rating scale: 1 - very good, very resistant, or very short to 9 - very poor, very susceptible, very late, or very tall.
* RWA rating denotes resistance to the original biotype (biotype 1) of RWA. All available cultivars are susceptible to the new biotypes of RWA.

Wheat Information Resources

Dr. Jerry Johnson - Associate Professor/Extension Specialist - Crop Production, Colorado State University, Department of Soil and Crop Sciences, C12 Plant Science Building, Fort Collins, CO 80523-1170, phone: 970-491-1454, fax: 970-491-2758, e-mail: jerry.johnson@colostate.edu.

Dr. Scott Haley - Professor/Wheat Breeder, Colorado State University, Department of Soil and Crop Sciences, C136 Plant Science Building, Fort Collins, CO 80523-1170, phone: 970-491-6483, fax: 970-491-0564, e-mail: scott.haley@colostate.edu.

Dr. Jessica Davis - Professor/Extension Specialist/Soils, Colorado State University, Department of Soil and Crop Sciences, C09 Plant Science Building, Fort Collins, CO 80523-1170, phone: 970-491-1913, fax: 970-491-2758, e-mail: jessica.davis@colostate.edu.

Brad Erker - Director of Colorado Seed Programs, Colorado State University, Department of Soil and Crop Sciences, C143 Plant Science Building, Fort Collins, CO 80523, phone: 970-491-6202, e-mail: brad.erker@colostate.edu.

Darrell Hanavan - Executive Director of the Colorado Wheat Administrative Committee/Colorado Association of Wheat Growers/Colorado Wheat Research Foundation, 7100 South Clinton Street, Suite 120, Centennial, CO 80112, phone: 303-721-3300, fax: 303-721-7555, e-mail: dhanavan@coloradowheat.org.

Dr. Frank Peairs - Professor/Extension Specialist/Entomologist, Colorado State University, Department of Bioagricultural Sciences & Pest Management, 102 Insectary, Fort Collins, CO 80523-1177, phone: 970-491-5945, fax: 970-491-6990, e-mail: frank.peairs@colostate.edu.

Dr. Ned Tisserat - Professor/Plant Disease Specialist, Colorado State University, Department of Bioagricultural Sciences & Pest Management, C137 Plant Science Building, Fort Collins, CO 80523-1177, phone: 970-491-6527, fax: 970-491-3862, e-mail: ned.tisserat@colostate.edu.

Thia Walker - Extension Specialist - Pesticide Education Colorado State University, 1177 Campus Delivery, Fort Collins, CO 80523-1177, phone: (970) 491-6027, fax: (970) 491-3888, e-mail: thia.walker@colostate.edu.

Dr. Phil Westra - Professor/Extension Specialist/Weed Science, Colorado State University, Department of Bioagricultural Sciences & Pest Management, 112 Weed Research Lab, Fort Collins, CO 80523-1177, phone: 970-491-5219, fax: 970-491-3862, e-mail: philip.westra@colostate.edu.

Additional Wheat Information Resources on the Web:

<http://www.csucrops.com>- Colorado State University Crop Variety Testing Program

<http://wheat.colostate.edu> - Colorado State University Wheat Breeding Program

<http://wheat.colostate.edu/vpt.html> - Colorado Wheat Variety Performance Database (CSU Wheat Breeding Program).

<http://www.coloradowheat.org> - Colorado Wheat Administrative Committee (CWAC), Colorado Association of Wheat Growers (CAWG), and Colorado Wheat Research Foundation (CWRF) website.

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It's a Brave New Seed World

Brad Erker

In days gone by, seeds were a product of nature, saved by farmers from one year's crop to plant the next. The best kernels were winnowed from the chaff, saved and replanted. That was then, this is now. Today, seed companies and university breeding programs spend millions of dollars annually to devise new and better crop varieties. These new varieties respond to the modern farmer's need to meet consumer and industry demands of higher quality, better yields, and specific end use traits. These new varieties are also living in the world of Plant Variety Protection and patents. The developers are able, and have a need, to protect their investment in order to continue developing new varieties today and into the future.

Colorado farmers have benefitted from the development of many new varieties in the last 40-50 years, and the trend is only increasing. But farmers need to know how to properly use this great tool in their toolbox, the seed. Improper use of seed can lead to enforcement actions from variety owners. On August 4, 2010, the Kansas Wheat Alliance issued a press release on the settlement of three more PVP infringement cases involving illegal wheat seed sales occurring in 2009. The dollar amounts involved in these cases were \$16,250, \$18,000, and \$100,000. The farmers involved admitted to selling the federally protected wheat varieties Fuller and Jagger as non-certified seed without the permission of KWA.

In addition, BASF Corporation issued a press release on April 12, 2010 regarding a Nebraska wheat grower who admitted to a violation of the CLEARFIELD Wheat Grower Stewardship Agreement by saving seed across multiple growing seasons. BASF worked with the grower to identify a mutually agreeable solution that allows the farmer to grow CLEARFIELD wheat in the future, along with the payment of a monetary settlement. The entire amount of the settlement was donated to the University of Nebraska-Lincoln (UNL) Ag Research Division to help fund wheat research and promote localized advancement of wheat traits and varieties.

The Colorado Seed Growers Association is available to all farmers in Colorado as an educational resource for proper use of seed. Contact our office at (970) 491-6202 for detailed information on specific varieties. The following table is a quick reference for most of the commonly grown wheat varieties.

Classification of varieties by seed use options				
	PVP - Variety is protected by Plant Variety Protection and can only be sold as certified seed - seed can be saved for use on your own farm	Patent - Variety is protected by a patent that disallows saving any production for seed and requires all production be marketed as grain	Identity Preserved - a contract requires purchase of grain produced only from fields planted with Certified seed	No Protection - the variety's PVP has expired, or it was not PVP'd
VARIETY				
Most commonly planted				
(year of PVP)				
Hatcher (2006)	x			
Ripper (2007)	x			
TAM 111 (2004)	x			
Jagalene (2002)	x			
Prairie Red (2000)	x			
Bond CL (2006)	x	x		
Jagger (1996)	x			
Above (2002)	x	x		
Akron (1996)	x			
Ankor (2004)	x			
Bill Brown (2008)	x			
Prowers 99 (2001)	x			
TAM 107 (1988)				x
TAM 112 (2007)	x			
Yuma (1994)	x			
Yumar (2000)	x			
Weston				x
Platte (1999)	x		x	
Scout 66				x
Newer				
AP503 CL2 (2008)	x	x		
Armour (2009)	x			
Fuller (2008)	x			
Hawken (2007)	x			
Keota (2007)	x			
NuDakota (2006)	x			
NuGrain (2006)	x		x	
Protection (2006)	x	x		
Smoky Hill (2007)	x			
Thunder CL 2009)	x	x	x	
Snowmass (2010)	x		x	
Winterhawk (2008)	x			

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