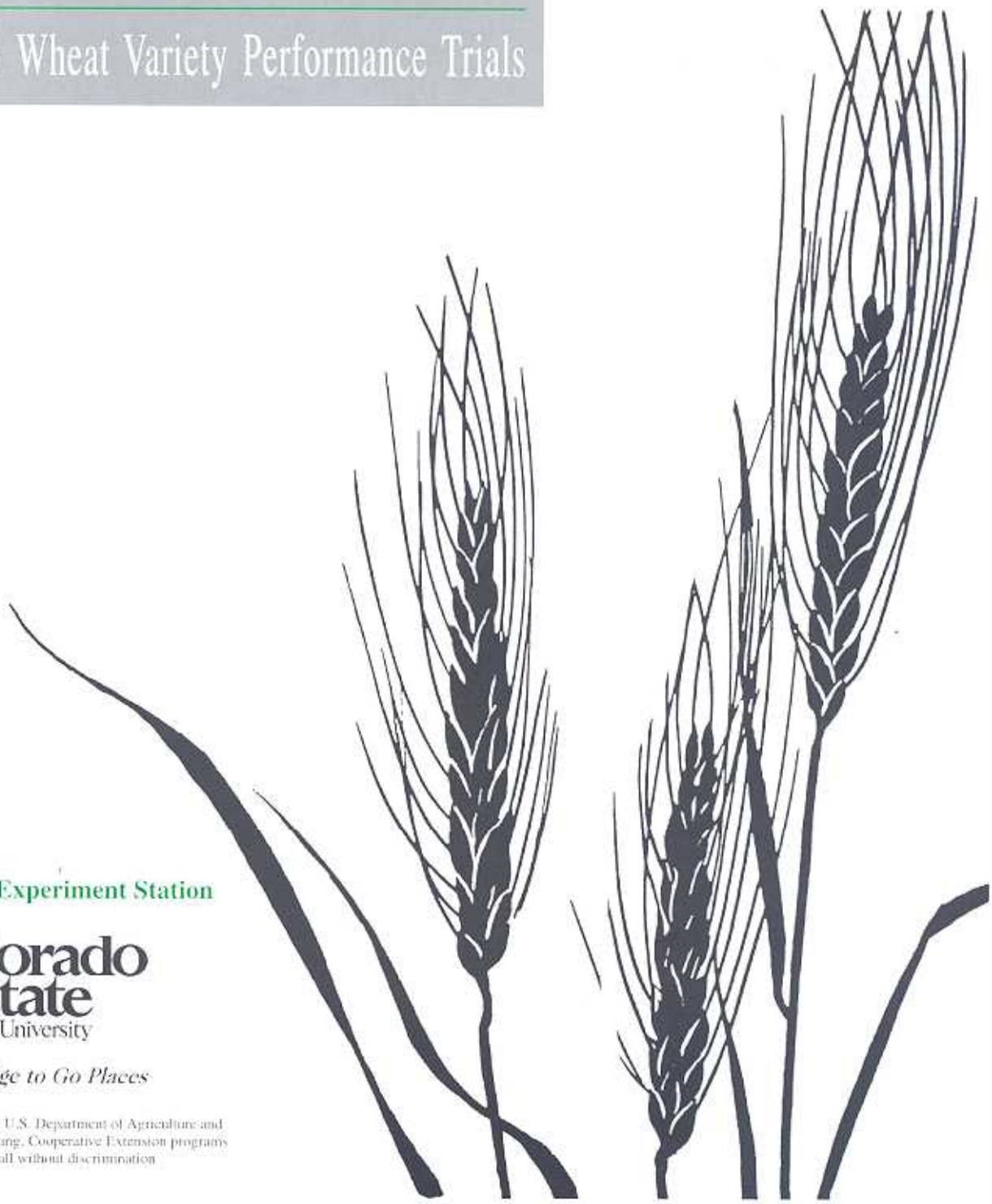
Cooperative Extension
Colorado State University

MAKING BETTER DECISIONS

2002 Colorado Wheat Variety Performance Trials



Agricultural Experiment Station

Colorado State University

Knowledge to Go Places

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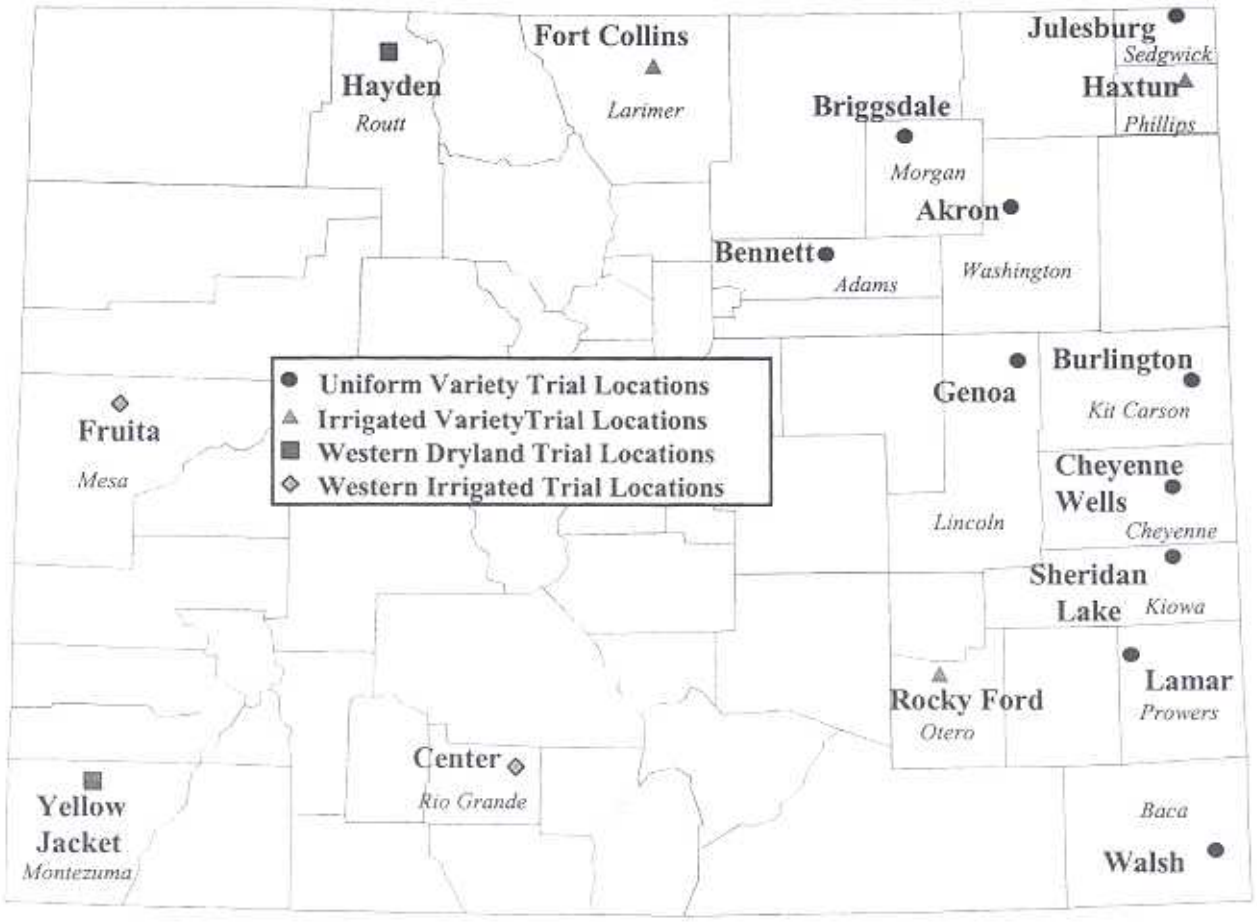
2002 Wheat
Variety Performance Trials



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Technical Report TR 03-4

Agricultural Experiment Station	Department of Soil and Crop Sciences	Cooperative Extension	April 2003

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2002 COLORADO WINTER WHEAT VARIETY PERFORMANCE TRIALS

Introduction

Making Better Decisions is a publication of Colorado State University. We are committed to providing the best information, in an appealing form, and in the most timely manner to Colorado wheat producers. Colorado State University conducts variety performance trials to obtain unbiased and reliable information for Colorado wheat producers to make better variety decisions. Good variety decisions can save Colorado wheat producers millions of dollars each year.

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 published on DTN (Data Transmission Network)
3) Variety trial results are available on the Crops Testing Internet page: ***www.colostate.edu/Depts/SoilCrop/extension/CropVar/wheat1.html***
4) Results are published in *From the Ground Up*, a Soil and Crop Science Extension publication
5) Results are published in *The Colorado Farmer Stockman*
6) E-mail copies of results are sent to Cooperative Extension agents and producers who request them
7) Results are incorporated into the Colorado wheat variety performance database *http://wheat.colostate.edu/vpt.html*

Trial Conditions and Methods - 2001/02

Although precipitation in late summer and early fall 2001 was not abundant, trials were seeded timely and wheat stand establishment was excellent at all trial locations. The 2001/2002 winter temperatures were moderate but most trial locations suffered from lack of winter precipitation and snow cover. At each dryland trial location south of I-70, dry winter conditions combined with moderately cold temperatures caused significant winter injury and in some cases, total trial abandonment (e.g., Sheridan Lake, Cheyenne Wells). The winter drought carried through spring and early summer. Cold night temperatures in mid- and late- May led to widespread late spring freeze damage, especially in Northeast Colorado along Highway 14. As if conditions were not bad enough already, some areas were severely affected by hail, including the Genoa variety trial location. Continued widespread and severe drought conditions, combined with several periods of damaging high temperatures, led to earlier-than-normal harvest and extremely low yields. Though widespread throughout eastern Colorado, drought conditions were more prolonged and severe in southeastern Colorado.

In drought years like this, common dryland root rot often adversely affects yields-visible by sporadic 'white heads' in the field as was observed in many production fields and several trial locations. Insect pressure was low, but Russian wheat aphids could be found in some fields and may have caused slight yield reductions, especially along the Front Range. There was minimal yield loss due to wheat steak mosaic, high plains disease, or barley yellow dwarf virus. Stripe rust, which had been so severe in 2001, and leaf rust were present in relatively low levels in some irrigated fields after grain filling had commenced and probably had only small effects on yield.

Our dryland winter wheat variety trial (UVPT) is a single uniform variety performance trial comprised of 60 entries grown at 10 locations. Of the 60 entries in this trial, approximately half are named varieties and the other half are experimental lines. In addition to CSU varieties and experimental lines, the trial included public varieties from Nebraska, Oklahoma, Kansas, and Texas, and private varieties from Cargill-Goertzen and AgriPro. Due to winter injury, drought, spring freeze, and hail, only five of the ten trial locations were successfully harvested. Two of the five trials, Walsh and Lamar, were extremely low-yielding and highly variable preventing reliable differentiation among entries. Plot yields at Bennett, Akron, and Julesburg were low but reasonably high enough to be used for wheat variety selection purposes. Akron, the best dryland trial location all spring, experienced a damaging hail storm the night before harvest that reduced yields 15-25% in some entries. A randomized complete block field design with three replicates is used in all trials. Dryland trials were seeded at 600,000 seeds per acre and planted in 12 inch-spaced rows, except Julesburg which was seeded in 9 inch-spaced rows.

Irrigated variety trials were conducted at Rocky Ford, Haxtun, Fort Collins and Center. The

irrigated trials are seeded at 1.2 million seeds per acre. The Haxtun and Fort Collins trials were grown under sprinkler irrigation and the Rocky Ford trial was furrow-irrigated. Rocky Ford and Haxtun trials provided excellent results, but the Fort Collins trial suffered significantly from the spring freeze of May 9 and a damaging hail storm two weeks before harvest that reduced yields 30-70% in some entries. The Center trial was abandoned due to winter drought and low winter survival.

CLEARFIELD* Wheat varieties

CLEARFIELD* is a unique production system comprised of herbicide-tolerant wheat varieties, Beyond™ herbicide to manage problematic weed species, and a stewardship agreement with growers to ensure the use of best management practices for system sustainability. The first publicly-developed CLEARFIELD* winter wheat varieties to be released in the U.S., 'Above' (from Colorado State University and marketed by the Colorado Wheat Research Foundation) and 'AP502 CL' (marketed by AgriPro Seeds, Berthoud, CO) are tolerant to Beyond™ herbicide for use in the CLEARFIELD* wheat production system.

Above is an awned, white-chaffed, early maturing, semidwarf hard red winter wheat. In 2000 and 2001 Colorado variety trials, Above yielded more than Akron, TAM 107, and TAM 110. Average test weight for Above in these trials was less than TAM 107, but more than TAM 110. Above matures 3.5 days earlier than Akron and about 1.5 days later than TAM 107. Above is short, similar to TAM 107, and has similarly good straw strength. Above is resistant to stem rust, susceptible to leaf rust, and moderately susceptible to both wheat streak mosaic virus and barley yellow dwarf virus. Above is resistant to greenbug biotypes C, E, I and all previous field biotypes, and susceptible to the Great Plains biotype of Hessian fly and Russian wheat aphid.

AP502 CL is an awned, red-chaffed, early maturing, semidwarf hard red winter wheat. AP502 CL is very similar to Above in many respects, yet has shown lower average grain yield and test weight in Colorado variety trials. AP502 CL is resistant to greenbug biotypes C, E, I and all previous field biotypes. AgriPro Wheat intends to market AP502 CL in areas of the Great Plains where their distribution and marketing system is strongest.

More information on the CLEARFIELD* wheat production system can be obtained at the following websites:
http://wheat.colostate.edu/03116.html
(CLEARFIELD* Wheat Fact Sheet as html)
http://wheat.colostate.edu/03116.pdf
(CLEARFIELD* Wheat Fact Sheet as PDF)
http://www.clearfieldsystem.com/html/default.asp
(BASF's CLEARFIELD* website with their technical bulletin and the stewardship guide).

White Wheat varieties

Development of hard white winter wheat (HWW) varieties has been a top breeding priority in the Great Plains for over 10 years. Enhanced preference for HWW over hard red winter wheat (HRW) in most export markets is the predominant factor driving the strong interest in increasing HWW acreage in the Great Plains.

In the 2002 US Farm Bill, a three-year market incentive program was established to foster development of US HWW production and markets. With the recent development of HWW varieties well adapted for production in Colorado, wheat producers now have an excellent opportunity to participate in a concerted, market-expansion effort. The most promising of these HWW varieties for production in Colorado include the following:

Trego is medium height, medium-late semidwarf released by the Kansas State University program at Hays, KS, in 1999. Trego has shown both very high yield and test weight in CSU dryland trials and throughout the High Plains region. Trego has inadequate straw strength for irrigated production conditions. Trego is susceptible to Russian wheat aphid.

Avalanche is a medium height, medium maturing semidwarf released by Colorado State University in 2001. Yields of Avalanche in CSU dryland variety trials have been slightly less than Trego (though equivalent to Akron) with similarly high test weight. Avalanche has performed better than average in experimental bread baking tests but, like Trego, is not suitable for Asian noodle production. Avalanche is susceptible to Russian wheat aphid.

Lakin is an awned, white-chaffed, medium maturing, semidwarf released by the KSU-Hays program in 2000. Grain yields of Lakin in CSU dryland variety trials have been slightly less than

Trego and Avalanche, but its straw strength may allow successful irrigated production at moderately-high yield levels. Lakin possesses both good bread baking and good Asian noodle quality characteristics. Lakin is susceptible to Russian wheat aphid.

Platte is an awned, white-chaffed, medium maturing, semidwarf released by AgriPro in 1995 and marketed under an exclusive contract arrangement with ConAgra Flour Milling. Platte has shown excellent straw strength as required for high-input, irrigated production conditions. Platte is very susceptible to stripe rust, a rare problem in Colorado except under very high moisture or irrigated conditions. Platte is susceptible to Russian wheat aphid.

More information concerning hard white wheat may be obtained at the following website: ***http://www.awwpa.com*** (website for the American White Wheat Producers Association).

The authors encourage wheat producers to make use of the "Decision Tree for Winter Wheat Variety Selection in Colorado" because it reflects our synthesis of data and field observations over years and locations. Because this year provided so little information to aid variety selection, we think growers should rely on variety performance data acquired in more normal years. Unfortunately, some varieties were being tested for the first time in 2002 and there is just too little information to make sound recommendations. Producers are also encouraged to spread the variety decision risk by planting two or more varieties. The average performance over two or three years is a proven tool for yield performance evaluation but producers should be mindful of other variety characteristics, like maturity, height, disease and insect resistance, quality characteristics, and winter hardiness, that influence variety adaptation, performance, and marketing options.

Complete variety descriptions and the full complement of trial results can be viewed on the web at: ***http://www.colostate.edu/Depts/SoilCrop/extension/CropVar/wheat1.html***. The Colorado wheat variety performance database at ***http://wheat.colostate.edu/vpt.html*** provides characteristics for all varieties and allows producers to generate yield variety summaries and head-to-head comparisons over multiple years and locations.

Table 1. 2002 Trial Information.

Locations	Date of Planting 2001	Date of Harvest 2002	Soil Texture	Fertilization (lb/ac) Nitrogen N	Phosphorus P_2O_5	Type of Irrigation
Uniform						
Akron	9/20/01	7/01/02	Sandy clay loam	70	0	None
Bennett	9/12/01	7/03/02	Sandy clay	56	38	None
Julesburg	10/01/01	7/08/02	Sandy clay loam	45	0	None
Lamar	9/11/01	6/25/02	Silt loam	40	20	None
Walsh	9/25/01	6/25/02	Sandy clay loam	45	0	None
Irrigated						
Fort Collins	9/28/01	7/18/02	Clay	40	180	Sprinkler
Haxtun	9/20/01	7/10/02	Sandy loam	151	60	Sprinkler
Rocky Ford	9/24/01	6/26/02	Silty clay loam	71.9	50	Furrow

Description of winter wheat varieties.

NAME AND PEDIGREE	ORIGIN/CLASS	RWA	HD	HT	SS	COL	WH	LR	WSMV	TW	PC	MILL	BAKE	COMMENTS
2137 W2440/W9488A//2163	KSU 1995 Hard red winter	S	6	5	2	4	3	7	4	5	4	4	6	Semidwarf, medium-early maturity. Good winterhardiness, good straw strength, good barley yellow dwarf virus tolerance, very susceptible to stem rust and stripe rust. Good performance record in irrigated CSU Variety Trials.
Above TAM 110*4/FS2	CSU-TX 2001 Hard red winter	S	3	2	4	7	4	9	5	5	6	4	7	CLEARFIELD* winter wheat developed cooperatively by CSU and Texas A&M-Amarillo. 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	5	5	3	8	9	5	6	7	6	Semidwarf, medium-early maturity, vigorous growth pattern, closes canopy early in spring and competes well with weeds. Slightly better straw strength and baking quality than Akron. Excellent dryland performance record in Colorado.
Alliance Arkan/Colt//Chisholm sib	NEB 1993 Hard red winter	S	5	5	5	3	2	8	9	6	4	6	7	Medium-early maturing semidwarf, short coleoptile, above average tolerance to root rot and crown rot. Excellent dryland performance record in Colorado.
Ankor Akron/Halt//4*Akron	CSU 2002 Hard red winter	R	5	5	4	5	3	8	9	5	8	6	5	Russian wheat aphid resistant version of Akron. Semidwarf, medium-early maturity, vigorous growth pattern, closes canopy early in spring and competes well with weeds. Slightly better straw strength and baking quality than Akron.
Antelope Pronghorn/Arlin	NEB 2002 Hard white winter	S	5	6	2	NA	NA	NA	NA	5	4	7	7	Hard white winter wheat (HWW) released by USDA-ARS breeding program in Nebraska. Medium height, medium-late maturity. Excellent straw strength and excellent irrigated performance record in Colorado.
AP502 CL TXGH12588-26*4/FS2	Agripro 2001 Hard red winter	S	2	1	4	6	3	9	5	8	7	7	7	CLEARFIELD* winter wheat marketed by Agripro. Red chaff, early maturing, semidwarf. Very low test weight relative to TAM 110 and Above. Marginal milling and baking quality.
Arrowsmith KS87809-10/Arapahoe	NEB 2002 Hard white winter	S	7	8	NA	NA	NA	NA	NA	2	2	4	5	Hard white winter wheat (HWW) released by USDA-ARS breeding program in Nebraska. Tall, medium-late maturity. First entered in Colorado trials in 2003.
Avalanche KS87H325/Rio Blanco	CSU 2001 Hard white winter	S	5	5	4	5	4	7	5	2	5	2	5	Hard white winter wheat (HWW), sister selection to Trego HWW. Two days earlier than Trego in Colorado. High test weight, good stand establishment and fall growth. Excellent dryland performance record in Colorado.
CDC Falcon Norstar*2/Vona//Abilene	CAN-Saskatoon 2000 Hard red winter	S	9	5	2	NA	1	NA	NA	8	8	NA	NA	Developed by University of Saskatchewan winter wheat breeding program, marketed in the US by Western Plant Breeders. Very late maturity, excellent straw strength.
Cisco CG9119021/CG60725//Karl 92	Goertzen 2002 Hard red winter	S	6	2	NA	4	NA	NA	NA	6	NA	NA	NA	Developed and marketed by Cargill-Goertzen. Medium-maturing semidwarf. First entered in Colorado Trials in 2002.
Cutter Jagger/WI89-189-14	Agripro 2001 Hard red winter	S	4	5	NA	5	3	2	4	3	2	4	6	Developed and marketed by Agripro. Medium-height, medium-maturity. Good test weight, fall growth characteristics, leaf rust resistance, and test weight.
Dumas WI90-425//N84-0758// WI81-297-3	Agripro 2000 Hard red winter	S	5	4	3	5	4	4	7	3	6	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.

*Russian Wheat Aphid resistance (RWA), heading date (HD), plant height (HT), straw strength (SS), Coleoptile length (COL), winterhardiness (WH), 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.

NAME AND PEDIGREE	ORIGIN/CLASS	RWA	HD	HT	SS	COL	WH	LR	WSMV	TW	PC	MILL	BAKE	COMMENTS
Enhancer 1992 Nebraska Bulk Selection	Goertzen 1998 Hard red winter	S	5	5	8	5	5	7	6	7	1	7	6	Developed and marketed by Cargill-Goertzen. Medium height and medium maturity. Good fall growth, good stripe rust resistance. Poor straw strength and test weight. Excellent dryland performance record in Colorado.
Halt Sumner/CO820026,F1// PI372129, F1/3/TAM 107	CSU 1994 Hard red winter	R	3	1	3	4	4	9	7	7	5	3	2	RWA resistant, semidwarf, early maturity, below average test weight, very good milling and baking quality characteristics. Dryland yield record in Colorado identical to TAM 107 with advantages over TAM 107 seen at higher yield levels.
Intrada Rio Blanco/TAM 200	OK 2000 Hard white winter	S	5	2	5	4	NA	5	7	4	3	2	4	Hard white winter wheat (HWW) released by Oklahoma State. Medium maturity, semidwarf, good fall growth characteristics, very good millling and baking quality.
Jagalene Abilene/Jagger	Agripro 2001 Hard red winter	S	6	5	4	5	NA	2	4	1	2	NA	NA	Developed and marketed by Agripro. Medium height, medium maturity. Excellent winterhardiness, leaf rust resistance, and test weight. Shattering reputation of parents warrants close observation at harvest.
Jagger KS82W418/Stephens	KSU 1994 Hard red winter	S	2	4	6	5	8	8	4	5	2	5	5	Bronze-chaffed, early maturing semidwarf. High grain protein content and good baking quality, good WSMV tolerance. Below average straw strength. Prone to spring freeze injury, breaks dormancy very early in the spring.
Kalvesta Oelson/Hamra//Australia 215/3/Karl 92	Goertzen 1999 Hard red winter	S	4	2	3	4	2	9	8	4	1	2	5	Developed and marketed by Cargill-Goertzen. Medium-early, semidwarf. Good milling and baking quality characteristics.
Lakin Arlin/KS89H130	KSU 2000 Hard white winter	S	5	5	4	5	4	9	5	5	4	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. Good dryland and irrigated performance record in Colorado.
Nuplains Abilene/KS831862	NEB 1999 Hard white winter	S	8	3	4	3	2	6	8	4	1	2	5	Hard white winter wheat (HWW) released by USDA-ARS program in Nebraska. Medium-late maturity, semidwarf, excellent straw strength, good test weight. High protein, very good milling and baking quality characteristics.
Ok101 OK87W663/Mesa//2180	OK 2001 Hard red winter	S	3	5	4	3	6	5	7	5	8	2	5	Medium-early, medium height. Good fall forage production and excellent recovery after grazing. Large kernel size, good milling and baking quality. Targeted for production in north central Oklahoma and irrigated production in the High Plains.
Ok102 2174/Cimarron	OK 2002 Hard red winter	S	5	1	NA	4	NA	NA	NA	4	NA	NA	NA	New release from Oklahoma State. Medium-maturity, semidwarf. First entered in Colorado trials in 2003.
Platte N84-1104/Abilene	Agirpro 1995 Hard white winter	S	6	1	2	3	5	NA	7	3	5	3	1	Developed by Agripro and marketed under identity-preserved contracts with ConAgra. Medium-maturing, semidwarf, excellent test weight and milling and baking quality. Targeted specifically for irrigated production.
Prairie Red CO850034/PI372129//5* TAM 107	CSU 1998 Hard red winter	R	1	2	4	6	4	9	5	5	6	4	6	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. Very susceptible to leaf rust.
Prowers 99 CO850060/PI372129//5* Lamar	CSU 1999 Hard red winter	R	8	8	7	8	2	6	7	2	2	5	1	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	5	4	2	5	4	4	2	6	RWA-resistant (different resistance gene from CSU varieties), medium-tall, medium maturity. Good leaf rust resistance. Very good dryland performance record in Colorado.

*Russian Wheat Aphid resistance (RWA), heading date (HD), plant height (HT), straw strength (SS), Coleoptile length (COL), winterhardiness (WH), 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.

NAME AND PEDIGREE	ORIGIN/CLASS	RWA	HD	HT	SS	COL	WH	LR	WSMV	TW	PC	MILL	BAKE	COMMENTS
TAM 107 TAM 105*4/Amigo	TX 1984 Hard red winter	S	1	2	4	6	4	9	5	5	5	3	6	Greenbug resistant version of TAM 105. Bronze-chaffed, early maturing semidwarf, medium long coleoptile, good heat and drought tolerance, poor end-use quality reputation. Very susceptible to leaf rust.
TAM 110 (TAM 105*4/Amigo)*5//Largo	TX 1995 Hard red winter	S	3	2	4	5	4	9	5	6	8	5	5	Developed transfer of an additional Greenbug resistance gene directly into TAM 107. Bronze-chaffed, early maturing semidwarf, low test weight, slightly improved end-use quality reputation relative to TAM 107.
TAM 111 TAM-107//TX78V3630/CTK 78/3/TX87V1233	TX 2002 Hard red winter	S	5	6	4	7	5	6	5	4	8	3	4	New release from Texas A&M-Amarillo, marketed by Agripro outside of Texas. Medium height, medium maturity. Excellent stress tolerance, excellent milling and baking quality characteristics. Very good dryland performance record in Colorado.
Thunderbolt Abilene/KS90WGRC10	Agripro 1999 Hard red winter	S	6	5	3	6	4	4	5	1	3	1	4	Developed and marketed by Agripro. Bronze chaffed, medium height, medium maturity, good straw strength. High test weight, good milling and baking quality and leaf rust resistance. Targeted for High Plains dryland production.
Trego KS87H325/Rio Blanco	KSU 1999 Hard white winter	S	6	4	4	5	4	2	5	1	7	2	6	Hard white winter wheat (HWW) released by Kansas State. Medium-late maturity, semidwarf, high test weight. Excellent dryland performance record in Colorado.
Venango Random Mating Population	Goertzen 2000 Hard red winter	S	7	3	3	4	4	5	5	3	4	6	4	Developed and marketed by Cargill-Goertzen. Medium-late maturing, semidwarf, very good straw strength, good test weights. Excellent irrigated performance record in Colorado. Observed to shatter severely in 1999 Colorado trials.
Wesley KS831936-3//Colt/Cody	NEB 1998 Hard red winter	S	4	0	2	4	3	7	7	8	1	3	4	Medium-early, short, excellent straw strength. Good winterhardiness and milling and baking quality characteristics. Good irrigated performance record in Colorado.
Yuma NS14/NS25/2/2*Vona	CSU 1991 Hard red winter	S	5	3	3	3	4	8	6	5	7	7	3	Medium maturity, semidwarf, very good straw strength, short coleoptile, good baking quality characteristics. Good dryland and irrigated performance record in Colorado.
Yumar Yuma/PI372129//CO850034 /3/4*Yuma	CSU 1997 Hard red winter	R	5	4	3	3	4	8	6	5	5	5	3	Russian wheat aphid resistant version of Yuma. Medium-maturing semidwarf. Good straw strength, good baking quality characteristics. Good irrigated performance record in Colorado.

*Russian Wheat Aphid resistance (RWA), heading date (HD), plant height (HT), straw strength (SS), Coleoptile length (COL), winterhardiness (WH), 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.

Table 2. Colorado winter wheat dryland Uniform Variety Performance Trial summary for 2002.

	Location								2002			
	Akron				Bennett		Julesburg		Average			
Variety[1]	Yield	Test Weight	Days to Heading[2]	Shatter[3]	Yield	Test Weight	Yield	Test Weight	Yield	% of Trial Average	Test Weight	Plant Height
	bu/ac	lb/bu	days	0-9	bu/ac	lb/bu	bu/ac	lb/bu	bu/ac	%	lb/bu	inches
Jagalene	38.6	61.3	146	7	34.5	61.4	34.0	58.6	35.7	111	60.4	23
TAM 111	37.8	59.1	147	4	32.6	62.1	34.5	56.4	35.0	109	59.2	24
Halt	38.3	58.4	142	6	30.9	60.9	34.9	56.3	34.7	108	58.5	22
Prairie Red	41.2	59.2	141	4	30.8	59.7	31.7	56.9	34.6	108	58.6	22
Above	44.1	59.7	142	3	23.9	61.2	35.6	56.9	34.5	108	59.3	22
Trego	40.2	61.2	148	5	31.1	62.1	31.6	58.1	34.3	107	60.5	21
Lakin	37.2	59.4	147	6	29.6	62.1	34.8	56.8	33.9	105	59.4	24
Ankor	36.1	57.9	146	3	31.4	61.2	33.5	54.8	33.7	105	58.0	23
G970246	40.0	59.1	141	5	26.0	62.1	33.6	57.3	33.2	103	59.5	22
Akron	36.6	58.0	144	5	30.9	60.9	32.1	56.1	33.2	103	58.3	21
AP502 CL	36.4	57.1	141	3	28.4	60.2	33.4	56.6	32.7	102	58.0	22
Stanton	39.3	59.9	144	3	28.2	61.3	30.3	57.9	32.6	102	59.7	23
Alliance	35.5	58.5	145	5	29.8	62.3	32.3	55.7	32.5	101	58.8	21
Cutter	34.9	59.7	145	6	27.4	61.9	35.3	58.8	32.5	101	60.1	25
TAM 110	39.4	59.1	142	3	24.6	60.7	32.8	57.4	32.2	100	59.1	23
2137	34.0	58.3	146	4	30.4	61.9	32.1	54.7	32.2	100	58.3	22
Prowers 99	36.8	58.9	150	3	27.5	62.9	31.1	57.0	31.8	99	59.6	24
Cisco	34.5	58.5	146	6	27.1	62.4	33.6	55.9	31.8	99	58.9	22
Jagger	38.1	60.0	141	5	25.3	60.4	31.7	56.7	31.7	99	59.0	25
Avalanche	38.7	60.2	146	5	24.0	64.0	32.0	57.4	31.6	98	60.5	23
Ok101	36.7	58.9	142	5	23.3	61.5	32.7	55.8	30.9	96	58.7	23
Yumar	34.7	57.8	146	4	25.1	61.1	32.6	56.9	30.8	96	58.6	21
Thunderbolt	35.0	60.0	147	7	23.8	62.3	33.5	57.2	30.8	96	59.8	22
G970447	31.3	57.7	144	5	28.7	61.3	31.8	54.9	30.6	95	58.0	20
Enhancer	32.5	57.7	145	6	26.2	62.0	32.3	55.1	30.3	94	58.3	24
Yuma	32.7	57.7	148	5	23.8	62.6	33.4	56.4	30.0	93	58.9	22
Venango	32.6	59.9	148	7	24.7	62.0	32.3	55.8	29.9	93	59.2	22
Dumas	33.4	59.6	146	4	22.4	62.3	33.6	56.9	29.8	93	59.6	22
G970209W	33.7	60.0	147	7	20.4	60.1	31.1	56.7	28.4	89	58.9	21
G970380A	27.5	57.9	141	5	25.9	60.7	30.5	56.2	28.0	87	58.3	22
Average	**36.3**	**59.0**	**145**	**5**	**27.3**	**61.6**	**32.8**	**56.7**	**32.1**		**59.1**	**22**
$LSD_{(0.10)}$	3.3				3.0		2.5					

[1]Varieties in table ranked by the average yield over three locations in 2002.

[2]Days from January 1.

[3]Rating scale 0-9, with 0 = no shatter and 9 = severely shattered.

Table 3. Colorado winter wheat Uniform Variety Performance Trial summary for 2000-02.

	Averages							
	2000		2001		2002		3-Yr	
Variety[1]	Yield	Twt	Yield	Twt	Yield	Twt	Yield	Twt
	bu/ac	lb/bu	bu/ac	lb/bu	bu/ac	lb/bu	bu/ac	lb/bu
Trego	41.3	59.7	47.8	58.9	34.3	60.5	42.9	59.4
Stanton	38.6	58.0	46.3	56.8	32.6	59.7	40.9	57.8
Alliance	40.2	56.5	44.0	56.1	32.5	58.8	40.6	56.7
Enhancer	39.2	55.0	45.5	56.7	30.3	58.3	40.5	56.2
Akron	39.4	57.0	43.2	56.4	33.2	58.3	40.0	57.0
Jagger	36.3	55.8	46.7	57.0	31.7	59.0	39.9	56.8
Above	39.7	57.0	41.9	55.5	34.5	59.3	39.8	56.7
Avalanche	41.0	59.3	41.3	57.7	31.6	60.5	39.6	58.8
Yuma	39.0	56.8	43.1	56.0	30.0	58.9	39.3	56.8
Prairie Red	38.9	56.9	40.7	56.3	34.6	58.6	39.0	56.8
Halt	35.4	56.1	42.9	56.2	34.7	58.5	38.5	56.5
AP502 CL	38.8	56.3	39.5	55.2	32.7	58.0	38.2	56.0
Lakin	39.5	57.2	38.2	57.1	33.9	59.4	38.1	57.6
2137	40.3	56.1	37.8	55.7	32.2	58.3	38.0	56.3
TAM 110	39.6	56.7	37.9	55.1	32.2	59.1	37.7	56.4
Yumar	36.1	57.2	40.7	57.1	30.8	58.6	37.2	57.4
Venango	39.6	58.2	37.2	58.1	29.9	59.2	37.1	58.3
Prowers 99	32.9	58.1	41.4	58.8	31.8	59.6	36.3	58.6

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

Table 4. Colorado winter wheat Uniform Variety Performance Trial summary for 2001-02.

	Averages					
	2001		2002		2-Yr	
Variety[1]	Yield	Twt	Yield	Twt	Yield	Twt
	bu/ac	lb/bu	bu/ac	lb/bu	bu/ac	lb/bu
Trego	47.8	58.9	34.3	60.5	44.1	59.3
Stanton	46.3	56.8	32.6	59.7	42.6	57.6
Jagger	46.7	57.0	31.7	59.0	42.6	57.5
Enhancer	45.5	56.7	30.3	58.3	41.4	57.0
Alliance	44.0	56.1	32.5	58.8	40.8	56.8
Halt	42.9	56.2	34.7	58.5	40.6	56.8
Akron	43.2	56.4	33.2	58.3	40.4	57.0
Above	41.9	55.5	34.5	59.3	39.9	56.5
Yuma	43.1	56.0	30.0	58.9	39.5	56.8
Prairie Red	40.7	56.3	34.6	58.6	39.0	56.8
Prowers 99	41.4	58.8	31.8	59.6	38.8	58.9
Avalanche	41.3	57.7	31.6	60.5	38.6	58.4
Yumar	40.7	57.1	30.8	58.6	38.0	57.5
AP502 CL	39.5	55.2	32.7	58.0	37.7	55.8
Lakin	38.2	57.1	33.9	59.4	37.0	57.8
TAM 110	37.9	55.1	32.2	59.1	36.4	56.1
2137	37.8	55.7	32.2	58.3	36.3	56.4
Venango	37.2	58.1	29.9	59.2	35.2	58.4

[1]Varieties in table ranked based on 2-Yr average yields.

Table 5. Winter wheat Uniform Variety Performance Trial at Lamar in 2002[1].

Variety	Yield	% of Trial Average	Plant Height
	bu/ac	%	inches
Above	15.2	223	16
Jagalene	13.1	192	18
AP502 CL	11.2	165	16
Thunderbolt	11.0	162	19
Ankor	9.0	132	17
Alliance	8.8	130	13
TAM 110	8.6	127	16
Avalanche	8.5	126	14
Prairie Red	8.4	124	13
Lakin	8.0	117	13
G970246	7.7	113	19
Trego	7.6	112	13
Dumas	7.3	107	17
G970209W	6.4	93	13
Cisco	6.2	91	15
Stanton	6.2	91	11
Jagger	5.9	86	14
Halt	5.3	78	12
Ok101	5.2	77	16
2137	5.0	74	16
Enhancer	4.6	68	14
Yuma	4.6	67	12
G970447	4.4	64	15
TAM 111	4.3	63	20
Venango	4.3	63	13
Cutter	4.2	61	16
G970380A	4.2	61	16
Akron	3.8	56	11
Yumar	3.2	47	14
Prowers 99	2.6	38	10
Average	**6.8**		**14.7**

[1]Trial conducted on the John Stulp farm; seeded 9/11/01and harvested 6/25/02.

*Large yield variation makes these results of little value in making variety decisions.

Table 6. Winter wheat Uniform Variety Performance Trial at Walsh in 2002[1].

Variety	Yield	% of Trial Average	Test Weight
	bu/ac	%	lb/bu
Jagalene	17.0	227	60.5
Avalanche	12.9	172	60.3
TAM 110	12.3	164	59.6
Prairie Red	11.5	153	58.7
Thunderbolt	10.6	142	61.2
Above	10.5	140	58.9
Cutter	10.1	135	59.7
G970246	10.0	133	60.7
Trego	10.0	133	59.5
AP502 CL	9.7	129	56.7
Ankor	9.5	127	58.5
Lakin	8.3	111	60.2
Alliance	8.1	107	58.7
Dumas	8.0	107	60.5
Akron	7.7	102	59.9
Halt	6.8	91	59.3
Cisco	6.5	87	60.0
Jagger	6.1	81	58.8
TAM 111	5.6	75	59.4
Yuma	5.5	73	59.2
Stanton	5.0	67	59.8
G970447	4.9	66	58.2
2137	4.6	61	58.0
Yumar	4.5	60	----*
Prowers 99	4.2	56	----*
G970209W	4.1	54	60.1
Ok101	3.6	48	----*
Enhancer	2.8	37	----*
Venango	2.6	35	61.8
G970380A	2.2	30	----*
Average	**7.5**		**49.6**

[1]Trial conducted on the Plainsman Research Center; seeded 9/25/01and harvested 6/25/02.

*Inadequate grain for test weight determination.

**Large yield variation makes these results of little value in making variety decisions.

Table 7. Colorado winter wheat Irrigated Variety Performance Trial summary for 2002.

	Location								2002			
	Haxtun				Rocky Ford				Average			
Variety[1]	Yield	Grain Moisture	Test Weight	Lodging[2]	Yield	Grain Moisture	Test Weight	Lodging	Yield	% of Trial Average	Test Weight	Plant Height
	bu/ac	%	lb/bu	1-9	bu/ac	%	lb/bu	1-9	bu/ac	%	lb/bu	inches
Platte	98.7	11.7	60.9	1	92.9	10.1	59.5	1	95.8	111	60.2	33
Prairie Red	90.1	11.0	58.7	1	99.7	9.3	57.9	3	94.9	110	58.3	34
Above	83.9	11.6	60.0	1	101.3	9.9	59.1	2	92.6	107	59.6	36
Yuma	93.1	11.1	58.3	1	92.1	10.0	57.2	2	92.6	107	57.8	35
Jagalene	89.8	11.7	60.0	1	95.1	10.9	59.7	2	92.4	107	59.8	36
Ok101	91.4	10.8	57.1	1	92.9	7.1	57.8	2	92.2	107	57.4	35
Avalanche	87.6	11.6	59.5	2	96.2	10.7	61.3	3	91.9	107	60.4	36
Lakin	92.9	11.9	60.4	1	90.4	12.3	59.2	3	91.6	106	59.8	37
Wesley	85.3	11.0	59.0	1	96.6	10.0	59.7	1	90.9	106	59.3	33
Nuplains	85.7	12.0	60.8	1	93.2	10.6	59.7	2	89.5	104	60.3	36
TAM 111	86.7	11.8	59.5	1	91.4	11.0	58.9	2	89.0	103	59.2	37
Ankor	85.4	10.9	56.1	1	92.1	10.1	55.4	4	88.8	103	55.8	36
Antelope	88.7	11.3	59.3	1	85.0	11.0	58.5	2	86.8	101	58.9	36
Trego	75.2	11.3	58.2	7	94.8	11.0	59.7	6	85.0	99	59.0	35
Yumar	85.7	12.1	59.6	1	83.3	10.2	56.6	2	84.5	98	58.1	36
Dumas	84.9	12.0	61.4	1	83.6	10.8	61.2	1	84.3	98	61.3	35
Jagger	85.2	11.0	58.2	1	79.1	9.7	58.5	3	82.2	95	58.3	35
2137	74.5	11.1	58.7	1	85.0	10.5	57.8	1	79.7	92	58.2	36
CDC Falcon	85.5	10.8	57.6	1	73.5	9.9	57.2	1	79.5	92	57.4	35
TAM 107	75.3	11.0	57.5	1	80.7	10.2	59.1	3	78.0	90	58.3	35
Akron	73.3	11.1	57.4	4	80.6	9.7	57.1	6	77.0	89	57.3	36
Venango	90.2	12.0	61.2	1	61.4	14.7	59.3	2	75.8	88	60.3	36
Enhancer	69.4	11.4	59.4	6	68.2	11.5	58.2	7	68.8	80	58.8	36
Average	**85.1**	**11.4**	**59.1**	**2**	**87.3**	**10.5**	**58.6**	**3**	**86.2**		**58.9**	**35**
$LSD_{(0.10)}$	9.1				7.6				5.9			

[1]Varieties in table ranked by the average yield over two locations in 2002.

[2]Rating scale 1-9, with 1 = no lodging and 9 = completely lodged.

Table 8. Colorado winter wheat Irrigated Variety Performance Trial summary for 2000-02.

	Averages							
	2000		2001		2002		3-Yr	
Variety[1]	Yield	Twt	Yield	Twt	Yield	Twt	Yield	Twt
	bu/ac	lb/bu	bu/ac	lb/bu	bu/ac	lb/bu	bu/ac	lb/bu
Wesley	96.2	54.4	108.2	61.9	90.9	59.3	98.5	58.6
Yuma	108.7	54.5	92.9	62.2	92.6	57.8	98.0	58.1
Jagger	105.3	54.6	101.2	62.9	82.2	58.3	96.2	58.6
Avalanche	102.9	56.8	90.3	62.2	91.9	60.4	95.0	59.8
Prairie Red	96.5	55.3	87.0	61.0	94.9	58.3	92.8	58.2
Venango	111.8	56.9	90.4	62.7	75.8	60.3	92.7	59.9
Enhancer	100.2	53.7	107.9	62.6	68.8	58.8	92.3	58.4
Trego	98.5	57.3	89.2	63.0	85.0	59.0	90.9	59.8
Yumar	97.2	52.2	89.0	61.0	84.5	58.1	90.3	57.1
TAM 107	110.6	55.0	80.5	60.6	78.0	58.3	89.7	58.0
Nuplains	98.1	56.1	80.3	62.0	89.5	60.3	89.3	59.4
2137	102.6	54.0	82.9	61.1	79.7	58.2	88.4	57.8
Akron	90.5	55.2	88.2	61.1	77.0	57.3	85.2	57.9

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

Table 9. Colorado winter wheat Irrigated Variety Performance Trial summary for 2001-02.

	Averages					
	2001		2002		2-Yr	
Variety[1]	Yield	Twt	Yield	Twt	Yield	Twt
	bu/ac	lb/bu	bu/ac	lb/bu	bu/ac	lb/bu
Wesley	108.2	61.9	90.9	59.3	99.6	60.6
Antelope	109.8	63.5	86.8	58.9	98.3	61.2
Yuma	92.9	62.2	92.6	57.8	92.7	60.0
Above	91.2	60.4	92.6	59.6	91.9	60.0
Jagger	101.2	62.9	82.2	58.3	91.7	60.6
Avalanche	90.3	62.2	91.9	60.4	91.1	61.3
Prairie Red	87.0	61.0	94.9	58.3	91.0	59.7
Enhancer	107.9	62.6	68.8	58.8	88.4	60.7
Trego	89.2	63.0	85.0	59.0	87.1	61.0
Yumar	89.0	61.0	84.5	58.1	86.8	59.5
Lakin	80.4	60.3	91.6	59.8	86.0	60.0
Nuplains	80.3	62.0	89.5	60.3	84.9	61.1
Venango	90.4	62.7	75.8	60.3	83.1	61.5
Akron	88.2	61.1	77.0	57.3	82.6	59.2
2137	82.9	61.1	79.7	58.2	81.3	59.7
TAM 107	80.5	60.6	78.0	58.3	79.3	59.5

[1]Varieties in table ranked based on 2-Yr average yields.

Table 10. Winter wheat Irrigated Variety Performance Trial at Fort Collins in 2002[1].

Variety	Yield[2]	% of Trial Average	Test Weight	Days to Heading[3]	Plant Height	Shatter[4]
	bu/ac	%	lb/bu	days	inches	0-9
Ankor	59.2	135	60.6	148	29	2
Yumar	54.8	126	60.9	148	25	4
Akron	54.7	125	60.9	148	29	2
Antelope	54.2	124	61.0	149	28	5
CDC Falcon	51.9	119	59.1	152	28	4
Avalanche	51.7	118	61.5	148	27	3
TAM 111	51.1	117	61.3	149	29	4
Ok101	51.1	117	59.9	146	27	5
Trego	50.8	116	61.1	149	26	4
Enhancer	50.6	116	60.0	147	27	3
Yuma	50.6	116	60.0	149	25	4
Platte	45.6	104	61.5	149	24	4
Nuplains	45.4	104	61.6	150	26	5
Jagalene	45.0	103	61.5	149	27	6
2137	44.9	103	60.2	148	26	2
Dumas	42.4	97	61.8	149	26	4
Lakin	41.3	95	61.3	148	26	5
Jagger	31.7	72	59.2	145	26	7
Prairie Red	29.7	68	58.9	144	24	5
Venango	28.1	64	61.0	149	27	7
Above	24.7	57	60.0	145	25	6
Wesley	24.5	56	59.4	147	25	6
TAM 107	21.9	50	59.1	144	25	7
Average	**43.7**		**60.5**	**148**	**26**	**5**

[1]Trial conducted on the Agricultural Research Development and Educational Center; seeded 9/28/01and harvested 7/18/02.
[2]Yields significantly reduced due to hail and spring freeze injury.
[3]Days from January 1.
[4]Rating scale 0-9, with 0 = no shatter and 9 = severely shattered.

Table 11. Grain protein content from two UVPT testing locations.

Variety	Akron	Julesburg
Thunderbolt	15.1	16.3
Jagger	14.5	16.5
Jagalene	14.9	15.4
Akron	14.6	15.4
2137	14.1	15.5
Avalanche	14.2	15.2
Lakin	14.4	14.9
Ankor	13.8	15.4
Venango	14.6	--
Prowers 99	15.0	13.6
Trego	13.2	15.1
Stanton	14.1	--
Halt	14.1	--
AP502 CL	13.5	14.5
TAM 110	13.4	14.3
Prairie Red	13.8	--
Above	13.3	14.1
Yumar	13.2	--

*Adjusted to 14% moisture basis.

Table 12. Grain protein content from one IVPT testing location.

Variety	Fort Collins
Venango	13.4
Ankor	13.2
Jagger	13.1
Avalanche	12.9
2137	12.9
Dumas	12.8
Trego	12.8
Akron	12.7
Enhancer	12.7
Lakin	12.6
TAM 111	12.6
Yumar	12.6
Prairie Red	12.6
Platte	12.6
Yuma	12.4
Wesley	12.4
Ok101	12.3
Nuplains	12.2
Above	12.2
Jagalene	12.1
Antelope	12.1
TAM 107	12.0
CDC Falcon	12.0

*Adjusted to 14% moisture basis.

Table 13. Dryland Wheat Strips, Forage and Grain Yield at Walsh[1] in 2002.

Variety	Jointing		Boot		Grain	Test	Plant	
	Fresh Wt.	Dry Wt.	Fresh Wt.	Dry Wt.	Yield	Weight	Height	Residue
	----------lb/ac----------				bu/ac	lb/bu	in	lb/ac
TAM 107	4120	1480	6953	2924	17	58	14	1172
Ike	4308	1435	7011	2702	16	60	16	1470
TAM 110	4499	1531	7241	2622	16	59	17	1268
Akron	4115	1695	7721	3021	16	59	16	1489
Thunderbolt	2387	899	6852	2498	15	61	16	869
Trego	4259	1525	8125	2966	15	61	15	1383
Halt	3203	1203	7438	2774	15	60	13	1062
Stanton	2968	1198	7769	2844	14	60	15	927
Prairie Red	3505	1316	7932	2995	14	58	15	1364
2137	3837	1351	7668	2718	13	59	16	1076
Jagger	3914	1584	7582	3087	13	59	15	1340
Alliance	1753	672	6315	2339	12	58	15	1542
Above	4970	1616	8091	3091	12	59	14	884
Avalanche	3361	1328	8124	3113	11	61	15	1071
T81	3386	1125	6305	2215	11	60	18	1162
Lamar	2320	819	5287	1882	8	60	15	1206
Average	**3557**	**1299**	**7276**	**2737**	**13**	**60**	**15**	**1205**
$LSD_{(0.05)}$	1558	454	2194	795	3			350

[1]Trial conducted at the Plainsman Research Center; seeded 9/28/02 and harvested 6/24/02.

Site Information:

Seeding rate: 45 lb seed/ac 5 gal/ac 10-34-0.
Jointing sample taken April 16, 2002.
Boot sample taken May 6, 2002.
Wet Weight is reported at field moisture.
Dry Weight is corrected to 15% moisture content.
Grain Yield is corrected to 12% seed moisture content.

2002 Collaborative On-Farm Testing Results

Jerry Johnson

In the fall of 2001, twenty-eight eastern Colorado wheat producers planted collaborative on-farm tests (COFT) in Baca, Prowers, Kiowa, Lincoln, Kit Carson, Washington, Phillips, Arapahoe, Adams, Morgan, and Weld counties. The objective was to compare performance of the newly-released varieties, Avalanche (HWW) and Above (HRW CLEARFIELD®), with the performance of the popular HRW variety, Akron, and the high-yielding HWW variety Trego. With the help of Federico Pardina, a graduate student in the wheat breeding program, we also hoped to use the COFT results to map eastern Colorado for yield and wheat quality characteristics. From two HRW wheat varieties and two HWW wheat varieties we hoped to deduce the optimum areas for adoption of hard white wheat in Colorado from the COFT results. We had originally planned to spray Beyond herbicide on the CLEARFIELD® wheat variety, Above, in each test in order to demonstrate the efficacy of the CLEARFIELD® package but that objective became operationally impossible and Above was grown under the same conditions as the other varieties.

Working alongside local Extension agents, each producer/collaborator received 100 pounds seed of each variety and planted the four varieties in side-by-side strips. The 2001-02 season was the fifth year of winter wheat variety on-farm testing and many collaborating producers have conducted tests each of the five years.

Thanks to on-farm testing, wheat producers get to evaluate new varieties on their own farms before seed of the new varieties is available on the market to all farmers. On-farm testing directly involves agents and producers in the variety development process, thereby speeding adoption of superior, new varieties. Agents get experience with new varieties before the varieties are commonly available and share this experience with growers who are not COFT participants. The whole wheat community benefits from reliable and unbiased COFT results. Multiple COFT farm environments offer insights into variety performance to the wheat breeding program that might not be obtained from the small-plot trials. Farmers acquainted with COFT results tend to rely more on COFT results than on the traditional replicated small-plot results.

The 2002 COFT results are divided into three geographic groups- primarily for ease of understanding the results. Twenty-one test results are reported. The overall average performance of all four varieties was remarkable similar and there were no statistical differences among varieties. Conclusions should not be drawn from a single on-farm test. All tests suffered from winter, spring, and early summer drought. Some locations were severely affected by winter freezes and some tests barely survived the late May freeze. None of the varieties performed less well than any other variety under drought conditions so severe that they are reportedly only expected to occur once in 100 years. For example, some people feared that the variety Akron with its long head would not survive as well as other varieties in extreme drought conditions- which proved to be unfounded. The white wheat varieties, Avalanche and Trego, were not any more susceptible to loss by severe drought and freezing than their hard red cousins. No unexpected agronomic flaws were found in the new CLEARFIELD® wheat variety, Above.

Colorado State University Cooperative Extension agents have a large responsibility for the success of this program -recruiting volunteer growers, delivering seed, planning test layout and operations, helping with planting, keeping records, coordinating visits, communicating with growers and campus coordinators, coordination of weighing plot and measuring yields and collecting grain samples for quality analyses. I am very thankful for the cooperation of so many dedicated and conscientious wheat producers throughout eastern Colorado. Even under the most stressful conditions, there was never an unkind or harsh word heard. This year, more than in the past, the successful harvest and conclusion of the COFT program was due to the long hours of hard work by our Cooperative Extension agents listed below. This is truly a collaborative on-farm testing program.

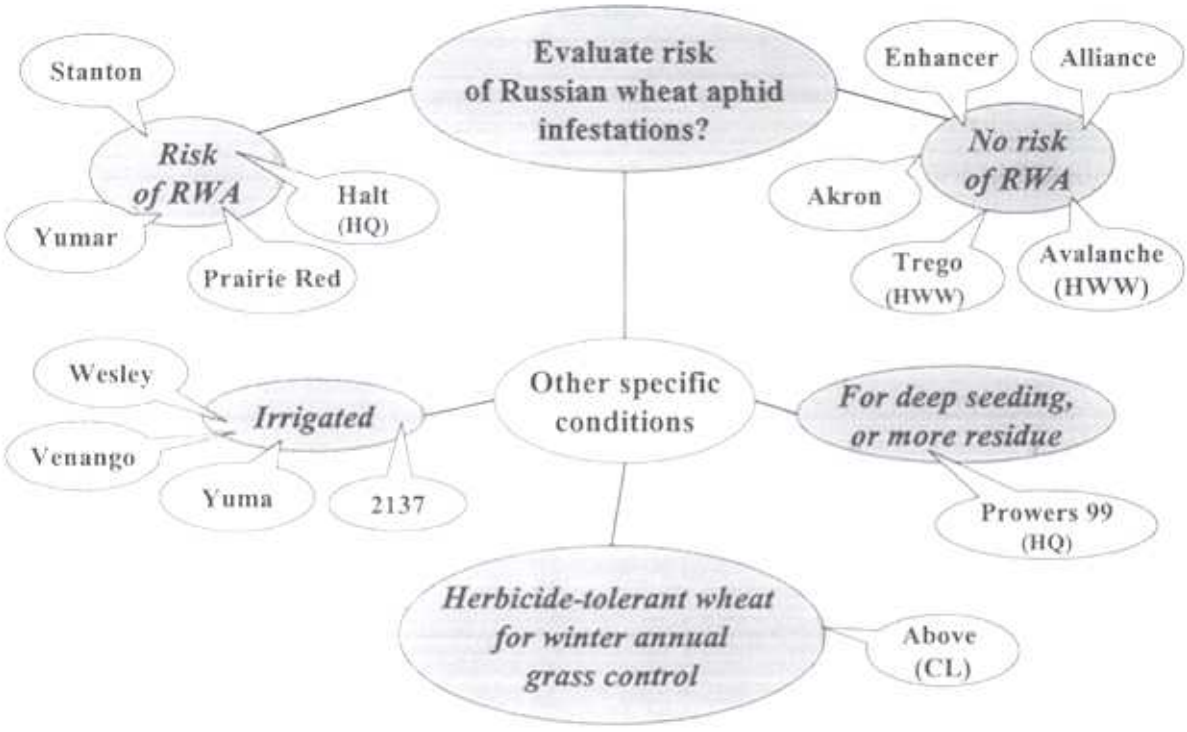
Eastern Colorado Cooperative Extension Wheat Educators and On-Farm Test Coordinators		
Name	**Title**	**Office Location**
Bruce Bosley	Platte River agronomist	Sterling
Tim Macklin	SE Area agronomist	Lamar
Ron Meyer	Golden Plains agronomist	Burlington
Bruce Frickenger	Kiowa County agent	Eads
Thaddeus Gourd	Adams County agent	Brighton
Jerry Alldredge	Weld County agent	Greeley
Leonard Pruett	SE Area leader	Lamar
Dwight Rus	Lincoln County agent	Hugo
Assefa Gebre-Amlak	Golden Plains entomologist	Akron

Table 14. Colorado Collaborative On-Farm Test (COFT) results in 2002.

	Variety (Yields in bu/ac @ 13% moisture)			
	Above	**Akron**	**Avalanche**	**Trego**
Test Location	Yield	Yield	Yield	Yield
NE Phillips	29.3	28.3	29.0	30.9
SE Phillips	29.2	22.7	24.4	23.6
SE Washington	36.1	37.4	36.9	37.4
NE Kit Carson	12.4	8.0	10.5	9.3
Central Kit Carson	20.3	19.6	14.2	14.6
SE Kit Carson	25.4	22.5	24.3	23.0
NE Lincoln	43.7	43.5	39.6	40.3
Golden Plains Avg	**28.0**	**26.0**	**25.5**	**25.6**
	Above	**Akron**	**Avalanche**	**Trego**
NW Weld	25.3	23.3	24.2	24.4
NW Morgan	28.2	32.4	27.9	32.5
SE Weld	35.2	32.6	32.8	33.9
South Weld	24.6	27.4	26.9	27.1
SW Morgan	28.3	28.9	28.5	26.6
SW Adams	24.1	24.8	18.2	25.0
South Adams	15.6	16.3	15.0	14.8
NE Arapahoe	27.1	27.6	27.4	28.4
Front Range Avg	**26.1**	**26.7**	**25.1**	**26.6**
	Above	**Akron**	**Avalanche**	**Trego**
NE Kiowa	8.5	11.6	8.7	9.0
East Kiowa	3.5	4.8	3.0	3.1
NE Prowers	6.2	3.4	11.4	11.2
North Central Prowers	24.2	22.4	23.8	23.2
SW Baca	8.7	10.3	5.6	13.3
East Baca	11.8	15.8	10.9	15.2
SE Colorado Avg	**10.5**	**11.4**	**10.6**	**12.5**
	Above	**Akron**	**Avalanche**	**Trego**
Overall Average	**22.3**	**22.1**	**21.1**	**22.2**

Decision Tree for Winter Wheat Variety Selection in Colorado

Jerry Johnson and Scott Haley (July 2002)



(HQ) signifies high end-use (milling and baking) quality.

(HWW) signifies Hard White Winter wheat variety.

(CL) signifies herbicide-tolerant CLEARFIELD* wheat variety.

The best combination of winter wheat varieties in Colorado depends upon variable production conditions. Production risks may be reduced by planting two or more varieties. The decision tree suggests varieties for planting that have performed well in CSU variety trials over a period of two or more years. The 2002 dryland variety trial results failed to add valuable performance information, thus forcing us to base most decisions on previous years' results. It should be remembered that avoiding poor variety decisions may be as important as choosing the winner among winners.

The authors wish to make special note of two wheat improvement programs that will affect variety selection for the coming year: CLEARFIELD* wheat and Hard White Wheat (HWW) varieties. Refer to the introduction for more information concerning these programs.

VT and COFT Tracker Database

Scott Haley and Jerry Johnson

Colorado State University personnel conduct dryland and irrigated wheat variety trials at multiple locations throughout Colorado every year. The Collaborative On-Farm Testing (COFT) system has been used since the release of 'Halt' (in 1994) to test a few varieties in side-by-side strips in many farmer fields throughout eastern Colorado. These trials provide reliable and unbiased information to wheat producers to make winter wheat variety selection decisions. Data from these trials are published in the popular press, extension publications, DTN, and on the Internet.

We have recently developed a "tracking system" to monitor information on both the Variety Trials and COFT. Individual trial data and observations can be entered on the web by CSU personnel, extension agents, or producers. Anyone with access to the web can monitor the evolution of wheat trials. This tracking system organizes and stores data and observations made by different observers and make them available to the entire Colorado wheat community. At harvest, yields can be interpreted with respect to the environmental conditions experienced at any given location. This tracking system is unique to Colorado and still in an experimental phase. We are continually looking for suggestions on how to improve the system to make it more useful.

The VT and COFT Tracker databases may be found from the CSU Wheat Breeding Program home page (http://wheat.colostate.edu) or directly at http://wheat.colostate.edu/tracker.html.

- For the VT Tracker, counties with dryland or irrigated trials are color coded (*above left*).
- For the COFT Tracker, individual locations within each color-coded county are selected with a simple pull-down menu system.
- Selection of a trial location within either database produces a report (*above right*) for that particular location.
- The top part of the tracker report displays information on the location of the trial, date of planting, and GPS coordinates.
- The bottom part of the report displays a list of trial observations entered for that site.
- For security reasons, users interested in entering or updating information in either database are required to obtain a password (by emailing scott.haley@colostate.edu).

New CSU Wheat Variety – 'Ankor'

Scott Haley, Jerry Johnson, and Frank Peairs

'**Ankor**' winter wheat was developed by the Colorado Agricultural Experiment Station and released to seed producers in August 2002. Ankor was developed by "backcrossing" Russian wheat aphid (RWA) resistance into the CSU variety 'Akron'. Akron is popular (22% of 2003 acreage) with Colorado wheat producers for its excellent dryland yield, vigorous growth pattern and excellent weed competition, and head structure that mitigates damage from hailstorms near harvest. The backcross breeding procedure used to develop Ankor had previously been used at CSU to develop other RWA-resistant varieties (e.g., Yumar, Prowers, Prairie Red).

The development of Ankor began in 1994, under the direction of Dr. Jim Quick, with the cross between Akron and the RWA-resistant donor 'Halt'. Four additional crossing/selection cycles with Akron were completed in 1998. In between each crossing cycle, selection for RWA resistance was done in screening tests in the CSU Insectary. Beginning in 1999, the development of Ankor was accelerated by the use of "off-season field environments". These field environments included the CSU San Luis Valley Research Center, to allow increase of two breeding generations in 1999, and Yuma Arizona, for rapid seed stocks increase in 2000 and 2001. The seed stocks increases in Arizona, enabled through royalty funds provided to CSU by the Colorado Wheat Research Foundation, are directly responsible for reducing the time required for Ankor's release and providing an adequate seed supply for rapid increase and dissemination.

Ankor closely resembles Akron, an awned (bearded), white-chaffed, medium height and medium maturity wheat. The coleoptile length of Ankor is slightly less than Prairie Red and similar to Akron. The straw strength of Ankor is good, slightly better than Akron based on limited evaluation in irrigated trials in 2002. Aside from its RWA resistance, Ankor has shown a similar response as Akron to diseases and insects of concern in Colorado. Ankor is moderately resistant to stem rust, susceptible to leaf rust, and susceptible to both wheat streak mosaic and barley yellow dwarf viruses. Ankor is susceptible to the Great Plains biotype of Hessian fly and the greenbug. In two years of statewide yield testing in Colorado Dryland Variety Performance Trials (UVPT), Ankor has also shown very similar dryland yield performance as Akron. In USDA and various industry breadmaking trials, however, Ankor has shown improved milling and breadmaking performance relative to Akron.

Ankor is the most recent addition to the group of wheat varieties developed at CSU and marketed by the Colorado Wheat Research Foundation (CWRF). The partnership between CSU, CWRF, and the Colorado Seed Growers Association (CSGA) was initiated in 1994 with the release of 'Halt' and has expanded in recent years with release of 'Yumar' and 'Prowers' (1997), 'Prairie Red' (1998), 'Prowers 99' (1999), 'Avalanche' (hard white wheat, 2001), and 'Above' (*Clearfield*™ wheat, 2001). Under the CSU/CWRF/CSGA agreement renewed in 2001, seed of these varieties may be grown and sold only as certified seed by CSGA members licensed by CWRF. The CWRF has applied for a Certificate of Plant Variety Protection (PVP) for Ankor under the federal Plant Variety Protection Act. Royalties paid to CWRF by certified seed growers from the sale of these varieties are returned to CSU to strengthen the CSU Wheat Breeding Program and to foster new areas of wheat-related research.

Deciphering Wheat Pedigrees

Scott Haley

A pedigree is the most common way of documenting the parentage of any wheat variety. The composition of a pedigree usually shows what parents were used in crossing and the specific sequence of the crossing scheme. While pedigrees are usually (but not always!) straightforward for most wheat breeders to decipher, the notation used can be confusing and not particularly clear. The principle of "*variety complementation*" (e.g., selection of more distantly related varieties to minimize production risks) suggests that knowledge of pedigree notation is a useful component of a sound variety selection strategy.

The following types of pedigrees are the most common among the majority of today's wheat varieties.

Parent A/Parent B

This type of cross is known as a *single cross*. As with all pedigree notation, the parent on the left of the slash (Parent A in this case) is the female while the one on the right of the slash (Parent B in this case) is the male parent. A variety from this type of cross would, on average, carry 50% of its genes from each parent. This is the most common type of cross that wheat breeders make; examples of this include Avalanche (KS87H325/Rio Blanco) and Akron (TAM 107/Hail).

Parent A/Parent B//Parent C

This type of cross is known as a *three-way cross* or *topcross*. The double-slash notation represents the point of separation of the parents used in the final cross. Thus, in this example, a plant derived from crossing Parent A and Parent B is used (as female) in a second cross with Parent C (as male). A variety from this type of cross would, on average, carry 50% of its genes from Parent C and 25% of its genes from both Parents A and B. Common examples of this type of cross include 2137 (W2440/W9488A//2163) and Wesley (KS831936-3//Colt/Cody).

Parent A/4*Parent B

This type of cross is known as a *backcross*. The 4* notation in this example indicates that Parent B was used four times (as the *recurrent parent*) in a crossing sequence involving an initial cross with Parent A (as the *donor parent*). This type of cross is usually used to transfer a single trait from the donor parent to the recurrent parent while preserving the desirable attributes of the recurrent parent. The number of backcrosses may vary and thus the percentage of the genes contributed by the donor and recurrent parents vary. Common examples of a backcross include Above (TAM 110*4/FS2) and Ankor (Akron/Halt//4*Akron).

Parent A/Parent B//Parent C/Parent D

This type of cross is known as a *double cross*. The double-slash in this example indicates that a plant derived from crossing Parents A and B was crossed (as female) with a plant derived from crossing Parents C and D (as male). A variety from this type of cross would, on average, carry 25% of its genes from each of the four parents used. Few wheat breeders make a lot of double crosses and, in fact, no varieties in the CSU variety trials in the last five years originated from a double cross.

Caterpillar Pests of Wheat in Colorado

Frank Peairs

Several species of caterpillars attack wheat in Colorado, including army cutworm and pale western cutworm, which attack in early spring. These can be easily distinguished from each other by the lack of markings on the body of pale western cutworm. Wheat head armyworm and the armyworm are later season pests.

Army cutworm - Army cutworm has one generation per year. Eggs hatch in the fall following a rainfall, and the small caterpillars feed on warmer days throughout the winter. In the spring they feed more and grow more rapidly. Army cutworms are found under soil clods and other debris during the day, and climb plants at night and on cloudy days to feed. They attack many different plants, including wheat, alfalfa and sugar beet. They often prefer broadleaf weeds over wheat plants. They pupate in the soil and adult moths (a.k.a. "millers," a household nuisance) emerge in May and June and migrate to higher elevations in the Rocky Mountains to escape high summertime temperatures. In late summer and early fall, the moths return to the plains to lay their eggs in wheat fields and other cultivated areas.

Monitor wheat fields periodically during late winter and early spring. Army cutworm is a foliage feeder but usually hides during the day. Larvae can be found under soil clods and surface debris, usually near the base of the plant. Occasionally they are found feeding on cloudy days and during the evening. Consider treatment with a pyrethroid insecticide based on following guidelines:

Table 1. Guidelines for treatment for army cutworm.

Condition of crop	Treat if larvae exceed
Thin or moisture stressed	2 or more per square foot
Healthy	4 or more per square foot

Pale western cutworm - Pale western cutworm moths emerge from the soil in late summer and fall. They deposit eggs in loose soil in late August and September. Eggs usually hatch in late winter, although hatch may be delayed if moisture and temperature conditions are unfavorable. Larvae prefer loose, sandy or dusty soil and are found most

easily in the driest parts of the field, such as hilltops. Pale western cutworm is a subterranean cutworm, feeding on stems at the crown. It will attack many crops, although it is mostly a pest of winter grains and corn. Feeding results in severed stems, and entire fields may be lost in a matter of days. After feeding is complete, larvae move to pupal chambers constructed several inches below the soil surface.

Outbreaks are associated with dry conditions in the previous spring. If the preceding May and June had fewer than 10 days on which rainfall exceeded 1/4 inch, expect pale western cutworm populations to increase. If the preceding May and June had more than 15 days on which rainfall exceeded 1/4 inch, pale western cutworm will almost totally disappear. Rainfall of more than 1/4 inch drives pale western cutworms to the soil surface and exposes them to natural enemies such as birds.

Scouting is particularly important if high adult activity is detected during the previous summer and fall and weather conditions are dry. Pale western cutworms tend to concentrate in favorable parts of the field, so it is important to sample the entire field before making any decisions. Larvae can occur at least three inches below the soil surface. Leaf feeding, wilted leaves and dead tillers are good signs of cutworm feeding. Studies in Wyoming found losses of 5 to 15 percent per larva per foot of row. Consider treatment with a pyrethroid insecticide as shown in Table 2. Spot-treating heavily infested areas can save chemical application costs and prevent the spread of damage.

Table 2. Guidelines for treatment for pale western cutworm.

Condition of crop	Treat if larvae exceed
Good yield potential	1 per square foot
Low yield potential	2 per square foot

Armyworm - Armyworm moths migrate into Colorado in early summer. It is mostly a pest of corn and spring grains, with only occasional infestations occurring in winter wheat. They lay their eggs in rows or clusters on the lower leaves of various grass crops, mostly in denser vegetation. Larvae feed at night and on cloudy days, and hide under crop debris during sunny periods. One or more generations may occur per year. Mature larvae are about 1.5 inches in length, smooth-bodied, and dark grey to greenish-black. They have five stripes, three on the back and two on the sides, running the length of the body. While the stripes on the back are variable in color, the stripes on the sides are pale orange with a white outline. The head capsule is remarkable for its "honeycomb" of black markings.

Scout for armyworm in field margins, low areas with rank growth or areas of lodged plants. Look for feeding damage, frass (droppings) around base of plant, or plant material that has been severed by armyworm feeding and fallen to the ground. Check for larvae in and under debris around damaged plants and in heads of barley or wheat.

Consider treating armyworm infestations with a pyrethroid or other contact insecticide if worms are 0.75 to 1.25 inches long; most larvae are not parasitized (look for white eggs behind the head or small brown cocoons attached to the body); leaf feeding or head clipping is evident; and the guidelines below are exceeded:

Table 3. Guidelines for treatment for armyworm.

Condition of crop	Treat if larvae exceed
Preheading - defoliation in lower leaves	5 per square foot
Headed - head clipping	2 per square foot

Wheat head armyworm - Moths emerge from the soil to lay eggs in the spring, and larvae can be found in wheat in June. First generation larvae feed on the heads of wheat at night and hide near the base of the plant during the day. Damage to grain is similar in appearance to that caused by weevils in stored grain. Pupation occurs again in the soil, and a second moth flight occurs in late August. Wheat head armyworm feeds on the heads of a variety of grasses and cereal crops and seems to prefer the heads.

Wheat head armyworm is generally considered to be a minor pest, but it has the potential to be a serious problem because it directly damages grain. No treatment guidelines are available. A sweep net can be used for sampling for this pest. Infestations often are limited to field margins. If an outbreak occurs, any registered contact insecticide should be effective.

Weed Science Update

Phil Westra

New Herbicide Use in Wheat

Aim - (FMC Chemical Co.), is labeled for broadleaf weed control in wheat and barley. This product is a contact, or burn-down type herbicide with no residual activity. Coverage is critical and weed size should be four inches or less for effective results. Aim may be applied as a tank mix partner with other herbicides registered for use in wheat.

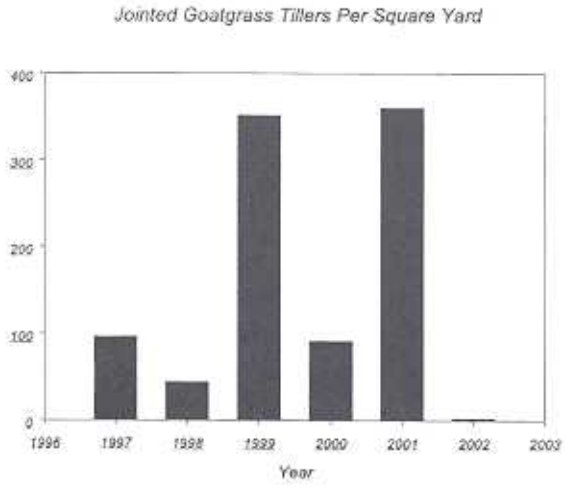
Maverick - (Monsanto Chemical Co.), is labeled for use in wheat in wheat/fallow rotations. Maverick is a selective herbicide for control of annual brome species (in the Great Plains region - downy brome, cheatgrass, Japanese brome), as well as control of flixweed and pennycress, and suppression of blue mustard. Maverick provides post and soil residual activity, and is most effective when applied in the fall.

Paramount - (BASF Chemical Co.), is labeled for use in fallow with rotation to wheat or milo, pre-emergence to wheat or milo, and in-crop milo. Paramount has excellent residual activity and is effective for management of field bindweed, as well as providing control of barnyard grass and foxtail species. The Paramount label is expected to be expanded to in-crop wheat, and rotations that include millet and corn.

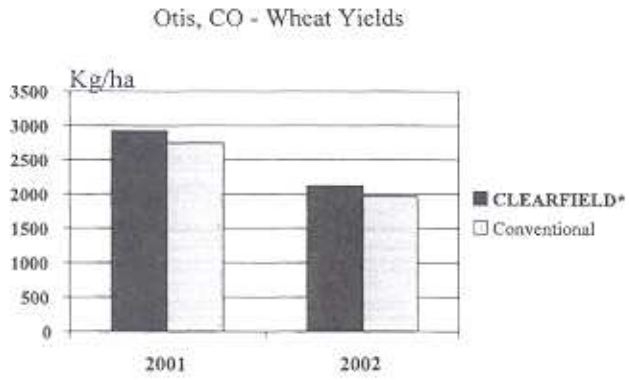
Starane - (United Agri Products), is a post emergence herbicide registered for use in small grains. Starane has excellent crop safety in wheat, barley, and oats and applied in a tank mix with 2,4-D or MCPA will provide control of a wide spectrum of susceptible broadleaf weeds. Predictions are that 2003 will be a year with severe kochia pressure in all crops and waste areas. Starane will be an excellent product for the control of kochia under these circumstances.

CLEARFIELD* Wheat - BASF and regional universities are developing "IMI Wheat" or wheat lines resistant to imidazolinone herbicides. CLEARFIELD* wheat is developed for resistance by way of induced mutation, not gene insertion, and is not classified as a GMO (genetically modified organism). Locally adapted CLEARFIELD* wheat seed was available in the Central Great Plains Region by planting time in 2002. The herbicide labeled for use in CLEARFIELD* wheat goes by the trade name **Beyond** and provides selective control of winter annual grasses such as downy brome, Jointed Goatgrass, and feral rye. Weed control in large demonstration plots in 2002 were good to excellent and emphasized the importance of treating feral rye when it is in the 1-3 leaf stage for optimum control. Over 70,000 acres of CLEARFIELD* (primarily **Above**) wheat was planted in the fall of 2002, so we should have a good assessment of how this technology functions for Colorado wheat producers.

Integrated Management Systems - A large-scale experiment near Platner, CO, is evaluating the effects of cultural practices (variety, tillage, plant density, date of planting, and nitrogen application) on severity of Jointed Goatgrass infestation. No-till increased Jointed Goatgrass reproductive tillers over that of conventional-tillage or reduced-tillage. Increasing planting rate from 40 to 60 lb/ac decreased Jointed Goatgrass growth characteristics. Delayed planting resulted in lower wheat yields and more Jointed Goatgrass. The variety "Akron" yielded the highest, however "TAM 107" seemed to suppress Jointed Goatgrass infestations. Jointed Goatgrass densities have varied widely during the 6 years of this study as seen in the graph below. Fall moisture and spring growing conditions have a huge impact on Jointed Goatgrass density in winter wheat.



Implementation of Best Management Practices for Management of Jointed Goatgrass - The National Jointed Goatgrass Research Program has funded the establishment of four large scale, on-farm trials in the Great Plains for economic analysis and demonstration of current practices compared to new integrated approaches. Crop rotations and cropping systems have been adapted to environmental conditions and surrounding cultural practices of each cooperator. Results are not yet available but field days will be held at several of these sites this summer. We have now integrated Above wheat and Beyond herbicide into these cropping systems to evaluate if the use of CLEARFIELD* wheat and crop rotations can rapidly deplete Jointed Goatgrass from wheat fields.



Wheat yield for the cropping systems research project near Otis, CO

Detection and Management of Jointed Goatgrass and Broadleaf Weeds Using Remote Sensing and Site-Specific Variable Rate Technology

Raj Khosla, Chris Woodward, and Phil Westra

Jointed Goatgrass is a nationwide problem estimated to cost producers over $145 million annually. In Colorado alone over 200,000 acres are infested with Jointed Goatgrass annually causing severe losses to farmers. Effective control and management of Jointed Goatgrass is a growing need.

The objectives of this study were two fold. First, this study was conducted to determine if Jointed Goatgrass could be detected remotely in wheat fields at wheat maturity using digital color infrared aerial imagery. The second objective was to control Jointed Goatgrass via site-specific application of Imazamox (Beyond herbicide) and to test herbicide efficacy in controlling weed infestation and to measure the impact on grain yield.

The study was conducted on five winter wheat fields located in Northeastern Colorado that had infestations of Jointed Goatgrass during 2000 - 2001 wheat growing season; and on four fields during 2001 – 2002 wheat growing season. Because of droughty conditions of 2002, 2 out 4 fields in 2002 were abandoned. These fields were planted with both standard wheat and CLEARFIELD* wheat. In 2002 we collected data on Jointed Goatgrass and broadleaf weeds. Perimeters of Jointed Goatgrass and broadleaf weed patches were mapped using a backpack mounted differentially corrected global positioning system. Each study field was traversed in a serpentine manner while collecting the specific coordinates of Jointed Goatgrass and broadleaf weed patches. Likewise, Jointed Goatgrass patch density tissue measurements were collected with a stratified random sample frequency of twelve points per acre. Data collected during the growing season included: digital color infrared imagery, weed locations using a global positioning (GPS) system, and field samples including above ground biomass, wheat and Jointed Goatgrass density, and Jointed Goatgrass weed seed banks.

Results of this study improve the assessment of the amount and locations of all weed infestations within a given field. Typical Jointed Goatgrass detection accuracy was in the range of 8% to 56%. Broadleaf weeds were identified with an accuracy range of 69% to 97%. High accuracy of broadleaf weeds detection was determined to be a function of its unique spectral response when compared to other field cover-types. Jointed Goatgrass detection accuracy was positively influenced by the degree of weed infestations. Spatial statistical procedures used in an innovative approach were able to detect wheat density with up to 68% accuracy, Jointed Goatgrass seed banks with up to 100% accuracy, and biomass with 62% predictive accuracy. Our site-specific control and management of Joint Goatgrass study indicated that the efficacy of the

herbicide when applied site-specifically versus uniform conventional application was similar. Such a finding indicates that site-specific control of Jointed Goatgrass would save farmers money on expensive herbicide and also be beneficial to the environment.

Figure 1 below shows the visible distinction between standard wheat (left) and CLEARFIELD* wheat (right) at a study field. Figure 2, shows the color infrared imagery for the same field with Jointed Goatgrass and kochia patches indicated.

Figure 1. Visible distinction between standard wheat (left) and CLEARFIELD* wheat (right) at Study Field 3.

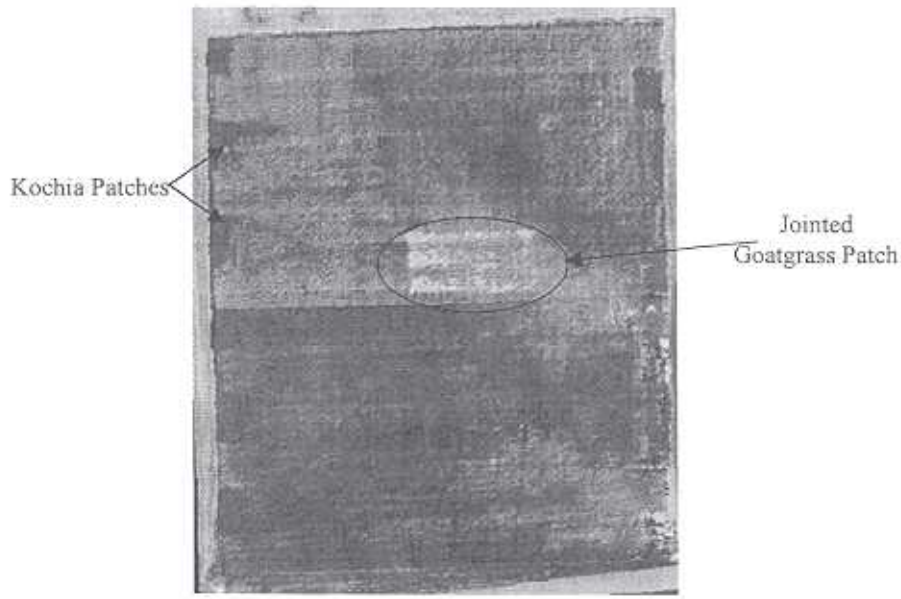


Figure 2. Color infrared imagery obtained overhead Study Field 3 with a Jointed Goatgrass and kochia patches indicated.

Making Better Marketing Decisions in 2003

Darrell Hanavan

Seven years ago, U.S. and worldwide wheat stocks were the lowest in history which resulted in record-high wheat prices. U.S. wheat ending stocks are now projected to fall below the 10-year average by 31 percent on May 31, 2003 and should continue to decline during the 2003-04 marketing year. Wheat prices should rise above the 10-year average price of $3.21 per bushel, until ending stocks climb to the 10-year average of 670 million bushels.

Projected planting of all U.S. wheat for harvest in 2003 is expected to be up approximately 2 percent, but still down 8 percent from the 10-year average and the second lowest planted acreage since 1973. Actual acres harvested and yield will be the keys to the price of wheat in the 2003-2004 marketing year. World wheat stocks are also below the 10-year average and should provide further support to U.S. wheat prices.

Understanding historical market trends can help Colorado wheat producers make better marketing decisions. Only 32 percent of the state's winter wheat production is marketed during the months of December to February when the highest price is typically received for the lowest carrying cost (storage plus interest). Fifty-six percent (56%) of Colorado's wheat production is sold prior to December when market prices have been the lowest. On average, there has been a 47-cent price advantage by selling after November instead of July. The estimated monthly carrying cost for storage and interest is five to six cents per bushel. Producers who are unable to take advantage of this historic rise in prices after November might consider options or futures contracts to manage financial risk.

Current wheat market fundamentals suggest that prices may increase by more than the 10-year average of 47 cents per bushel after November in the 2003-2004 marketing year. The price of wheat during the 2002-2003 marketing year has been erratic and uncharacteristic of long-term trends. Colorado wheat producers should strongly consider long-term price trends when making decisions to sell wheat early in the market season as they may miss out on upward price movement that historically occurs after November.

Irrigated Winter Wheat - The Platte Value Program

Rollin Sears and Rob Bruns

AgriPro's "Platte" variety is exclusively licensed to the Grain Processing Group of ConAgra Food Ingredients Company, and ConAgra contracts directly with High Plains producers to produce Platte and deliver it to assigned local country elevators or the ConAgra flour mill. This identity-preserved (IP) program, entering its seventh year in Colorado, links seed suppliers, producers, country elevators, a processor and bakers together to add value to each other's businesses. The producer benefit is based upon a grain pricing schedule, available at planting time and backed by a ConAgra Foods contract, that offers a basic premium over local hard red wheat markets, plus protein premiums which are commonly attainable under proper management. So the producer knows his premium potential prior to planting the wheat, and he also understands the crop's overall return potential if targets are achieved.

The Platte Value Program process starts when producers sign up with a local AgriPro Seed Associate to buy certified Platte seed in the fall. Producers agree to deliver all their Platte production the following year to specified local delivery points spread out across NE Colorado and SW Nebraska. ConAgra markets the flour milled from Platte to a variety of customers to whom Platte delivers increased value over flour milled from "commodity" wheats such as Hard Red Winter or Hard Red Spring.

Platte was the highest yielding variety in CSU's 2002 Irrigated Winter Wheat Variety Performance Trials at 95.8 bu/ac, 11% above trial average, and average test weight of 60.2 lbs/bu. Platte's parentage includes Abilene and an experimental white wheat from Spain. It has shown the following characteristics in past years:

Height	- short semidwarf
Stem & Leaf Rust	- good
Straw strength	- excellent
Wheat Streak Virus	- above average
Test Weight	- excellent
Stripe rust	- susceptible
Protein potential	- excellent
Mildew	- susceptible
Maturity	- medium
RWA	- susceptible
Winter hardiness	- similar to Akron
Shatter	- average

In 2001, the rare, severe infestation of stripe rust reduced yields of all susceptible varieties, including Platte. Because of this and powdery mildew, AgriPro is recommending a standard fungicide application on all high yield potential irrigated wheat and scouted high yield dryland acres. A rebate on Tilt fungicide application on Platte is being offered in 2003 through a joint program by ConAgra and Syngenta. The grain produced from fungicide protection should improve the end use quality and ConAgra is willing to contribute to this cost.

Participation in the Platte Value Program also allows a producer to be eligible to participate in the USDA's White Wheat Incentive Program, the details of which are available at local FSA offices. If you're interested in more information about participating in the Platte Value Program, contact Pete Anthan with ConAgra's Grain Processing Group at 303-289-6141, or Chuck Johnson, AgriPro Wheat at 785-667-2335, or any of the following AgriPro Associates that are growing the certified seed:

Andrew Bros	Yuma	970.848.0709
Perry Bros	Otis	970.246.3401
Kenny Pottorf Seed	Stratton	719.348.5213
Kneivel Seed	Wiggins	970.483.6166
Terry Ring Seed	Crook	970.253.5009
Dave Wagers Seed	Woodrow	970.842.2022
Dry Creek Seed	Genoa	719.763.2367
Tom Luhrs	Enders	308.882.5917
Prairie Farms	Albin	307.246.3458
Mattson Seed Farms	Pine Bluffs	307.245.3336

Description of winter wheat varieties in western trials.

Variety Name	Class	Origin
Above	Hard Red	Colorado/Texas
Ankor	Hard Red	Colorado
Ankor (CO99508)	Hard Red	Colorado
Avalanche	Hard White	Colorado
CO970547	Hard Red	Colorado
CO99534	Hard Red	Colorado
Deloris (UT203032)	Hard Red	Utah
Fairview	Hard Red	Colorado/Idaho
Gary (ID 550)	Hard White	Idaho
Golden Spike	Hard White	Utah
Hayden	Hard Red	Colorado/Idaho
ID 571	Hard Red	Idaho
ID 573	Hard Red	Idaho
ID 574	Hard Red	Idaho
ID 575	Hard Red	Idaho
Jeff	Hard Red	Idaho
Lakin	Hard White	Kansas
Manning	Hard Red	Utah
Moreland (ID 517)	Hard Red	Idaho
Presto	Triticale	Colorado
Trego	Hard White	Kansas
UT910320	Hard White	Utah
UT910422	Hard Red	Utah

Small Grain Variety Performance Tests at Hayden, Colorado 2002

Calvin Pearson and Scott Haley

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 variety performance tests (winter wheat, spring wheat, and spring barley) were conducted at Hayden in 2002. The 2002 growing season was very dry and overall yields in the trials were low. The 2002 results provide information about the performance of wheat and barley varieties under high stress conditions. Grain yield in the winter wheat variety performance test averaged 31.4 bu/ac. The highest yielding variety in the winter wheat test was UT910422 at 36.4 bu/acre with twelve varieties out-yielding the other eight.

Growers in northwest Colorado are limited to only a few crops they can grow because of constraints created by dryland production conditions, a short growing season, limited precipitation, and isolation from markets. Growers in this region of Colorado are supportive of agronomic research that provides them with science-based information that when adapted to their farms can lead to increased crop yields and profits. They are also interested in alternative crops for production in northwest Colorado. The principal cash crop grown in northwest Colorado is wheat. Alternative small grains, such as malting barley, triticale, and specialty wheats (i.e., hard white wheats) are of interest to growers because these crops often create specialty markets that demand a premium selling price. Alternative crops, such as these specialty small grains, are also of interest because they can be grown with production practices and equipment already owned by farmers. During 2002, we conducted winter and spring small grain variety tests that included not only traditional small grains but also some of these specialty small grains.

Precipitation during the 2002 growing season was 1.57 inches for April, 0.23 inches for May, 0.35 inches for June, 0.74 inches for July, 1.90 inches for August, 1.26 inches for September, and 1.61 inches for October. Precipitation in the Craig/Hayden area varies considerably from month to month and year to year and is the most limiting factor for dryland grain yields.

Grain moisture in the winter wheat variety performance test at Hayden averaged 8.8% (Table 15). Grain moisture content ranged from a high of 9.2% for ID 571 to a low of 8.5% for ID 574. Grain yields of the winter wheat varieties averaged 31.4 bu/ac. Grain yield ranged from a high of 36.4 bu/ac for UT910422 to a low of 24.8 bu/ac for ID 517. Twelve of the twenty winter varieties out-yielded the other eight varieties. Test weights averaged 55.1 lb/bu. Test weights ranged from a high of 57.6 lb/bu for Trego to a low of 52.1 lb/bu for Presto. Planted height averaged 22.6 inches. Plant heights ranged from a high of 30.8 inches for Presto to a low of 18.7 inches for Trego. There was no lodging in the winter wheat variety performance test in 2002. Protein concentration averaged 15.7%. Protein concentration ranged from a high of 17.7% for ID 517 to a low of 12.9% for Presto triticale.

Table 15. Dryland winter wheat variety performance trial at Hayden[1] in 2002.

Variety	Grain Yield	Grain Moisture	Test Weight	Plant Height	Protein
	bu/ac	%	lb/bu	in	%
UT910422	36.4	8.7	55.3	24.8	16.5
Lakin	35.9	8.7	56.8	22.1	14.6
Above	35.6	8.7	55.6	20.5	14.7
Golden Spike	35.3	8.8	54.6	24.1	15.1
CO99534	34.5	8.9	55.9	20.4	16.4
Deloris	33.2	8.6	54.9	23.1	16.1
ID 574	32.8	8.5	57.1	26.5	15.1
Gary	32.4	9.1	54.1	22.4	17.1
UT910320	32.1	8.6	53.6	22.7	16.1
Ankor	31.6	8.9	54.6	21.7	16.3
Avalanche	30.9	8.6	56.8	20.9	15.7
ID 575	30.9	8.9	54.8	22.8	14.1
ID 573	30.8	8.6	56.3	22.9	16.9
Trego	30.5	8.8	57.6	18.7	15.3
Fairview	29.5	8.8	54.0	22.7	16.9
Presto	28.8	9.1	52.1	30.8	12.9
ID 571	28.7	9.2	53.1	21.5	17.0
CO970547	27.6	8.9	55.2	20.5	14.7
Hayden	26.5	8.5	57.5	24.3	15.6
Moreland	24.7	8.9	52.2	19.2	17.7
Average	**31.4**	**8.8**	**55.1**	**22.6**	**15.7**
$LSD_{(0.05)}$	5.6	0.3	1.4	1.8	

[1]Trial conducted on Mike and Dutch Williams farm; seeded 10/3/01and harvested 7/31/02.

Site Information:

Seeding rate: 56 lb/ac

An application of 2,4-D at 0.50 lb/acre was made on May 15, 2002. No insecticides or fertilizer were applied.

Tour of winter wheat variety test plots at Hayden, Colorado. July 30, 2001. Photo by Calvin Pearson.

Table 16. Dryland winter wheat performance trial at Yellow Jacket[1] in 2002.

Variety	Yield[2]	Test Weight	Plant Height	Heading Date[3]	Grain Protein
	bu/ac	lb/bu	in	date	%
CO970547	24.2	59.6	22	5/24	16.8
Above	22.1	59.5	22	5/24	16.2
Lakin	21.8	59.9	21	5/24	15.6
Presto	21.5	54.6	31	5/22	15.3
CO99534	21.3	59.2	21	5/24	16.5
ID 575	20.7	58.0	24	5/28	17.6
Avalanche	19.5	60.8	21	5/24	16.5
ID 574	19.5	59.8	26	5/31	17.6
Ankor	18.8	58.9	21	5/28	16.3
Fairview	18.7	58.3	23	5/31	18.6
Golden Spike	18.6	58.9	23	5/31	17.2
ID 571	18.4	60.9	22	5/31	16.6
UT910422	18.4	59.5	23	5/31	17.0
Deloris	18.0	57.4	23	5/28	17.6
Manning	17.6	60.2	23	5/31	16.6
Jeff	17.6	60.4	24	5/31	17.4
Moreland	17.6	55.4	19	5/28	17.7
Hayden	17.0	59.7	25	5/31	18.1
Gary	16.4	59.5	23	5/31	15.8
UT910320	16.2	55.1	19	6/5	19.4
Trego	15.5	61.9	19	5/28	17.1
ID 573	15.5	58.6	23	6/3	17.4
Average	**18.9**				
$LSD_{(0.05)}$	1.8				

[1]Trial conducted at the Southwestern Colorado Research Center; seeded 10/11/01 and harvested 7/17/02.
[2]Bushel yield based on 60 lb/bu and 12% moisture.
[3]Date 50% of plants headed.

Site Information:
Soil type: Wetherill silty clay loam
Previous crop: Fallow
Seeding rate: 50 lb/ac; 12-in. row spacing
Fertilizer: 50 lb N/ac broadcast preplant
Herbicide: None
Insecticide: None
Precipitation: October 2001 thru June 2002: 2.6 inches (11.1 inches long-term average)
Total for 2001: 10.0 inches (16.0 inches long-term average)

Comments:

The dryland winter wheat variety trial yielded better than expected in spite of the drought conditions. Fairview is the predominant winter wheat grown in southwestern Colorado. Deloris is a recent hard red release from Utah and Gary is a new hard white wheat from Idaho.

For comparison, the average yields (1996-2000) for Dolores and Montezuma counties are 16.6 and 23.7 bu/ac, respectively. In the fall of 2001, there was sufficient moisture at planting to germinate the seed and to allow some growth before winter. Evidently, the fallow period (12 months) allowed the soil moisture to be recharged enough to achieve average yield potential.

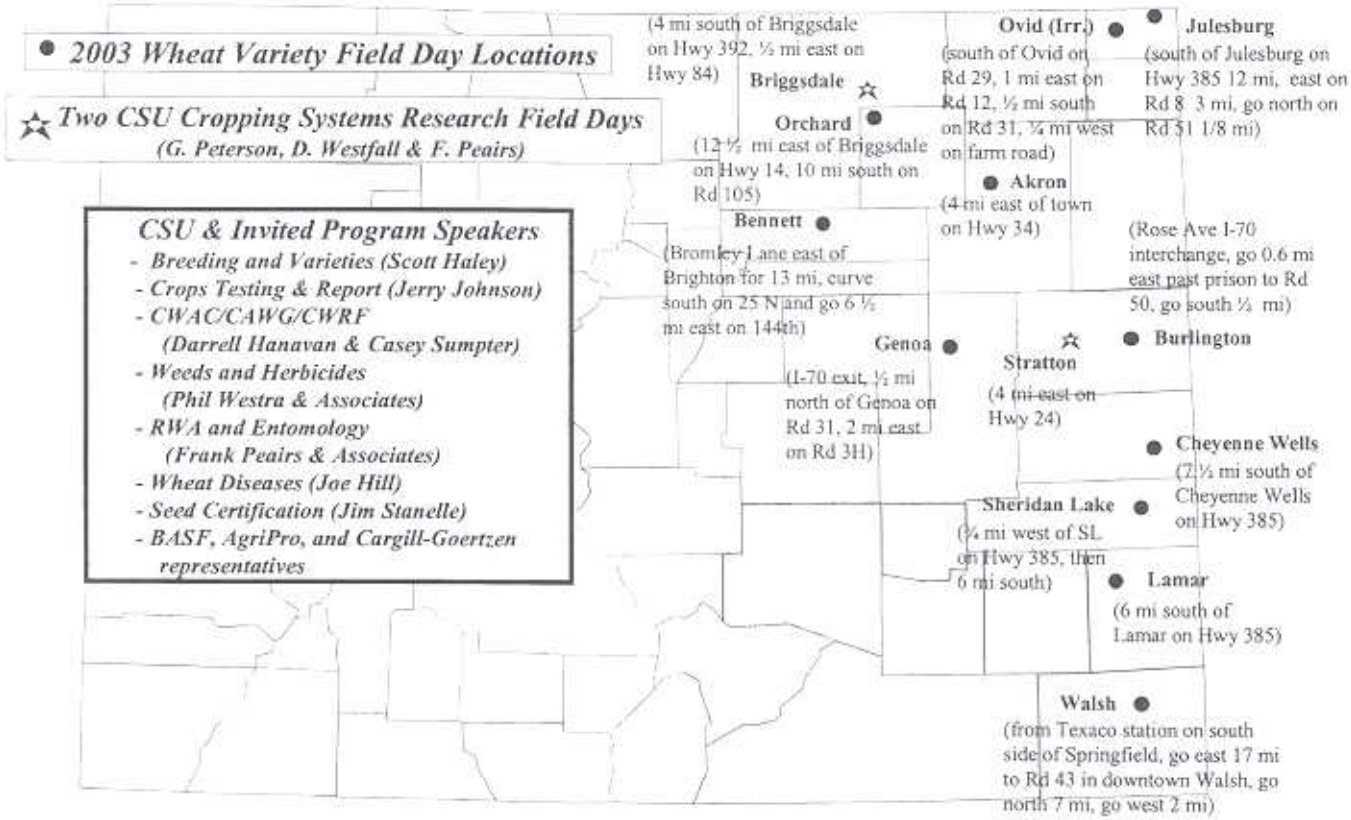
In 2002, Russian wheat aphid damage was not observed in any of the entries nor was dwarf bunt noted at harvest.

Seed of 'Hayden' hard red winter wheat.

Colorado State University
Knowledge to Go Places

Colorado Wheat Field Days 2003

Stratton ☆	*June 3 (Tues)*	*5 p.m. at Miltenberger Bros. Farm, Kit Carson County*
Walsh	*June 9 (Mon)*	*9 a.m. at Plainsman Research Center, Baca County*
Lamar	*June 9 (Mon)*	*5 p.m. at John Stulp's house, Prowers County*
Sheridan Lake	*June 10 (Tues)*	*9 a.m. at Eugene Splitter Farm, Kiowa County*
Cheyenne Wells	*June 10 (Tues)*	*1 p.m. at Tom Heinz Farm, Cheyenne County*
Burlington	*June 10 (Tues)*	*5 p.m. at Barry Hinkhouse Farm, Kit Carson County*
Genoa	*June 11 (Wed)*	*9 a.m. at Ross Hansen Farm, Lincoln County*
Julesburg	*June 11 (Wed)*	*3 p.m. at Walt Strasser Farm, Sedgwick County*
Ovid (Irr)	*June 11 (Wed)*	*5 p.m. at Jim Carlson Farm, Sedgwick County*
Orchard	*June 12 (Thurs)*	*9 a.m. at Cary Wickstrom Farm, NW Morgan County*
Briggsdale ☆	*June 12 (Thurs)*	*11:30 a.m. at Stan Cass Farm, N Weld County*
Bennett	*June 17 (Tues)*	*5 p.m. at John Sauter Farm, Adams County*
Akron	*June 18 (Wed)*	*8 a.m. at Central Great Plains Res. Station, Washington County*



2002-2003 Colorado Winter Wheat UVPT

Variety	Plot #	Comments
Prowers 99	101	
Stanton	102	
Yumar	103	
Prairie Red	104	
Ankor	105	
Akron	106	
Alliance	107	
Jagger	108	
Trego	109	
Avalanche	110	
Lakin	111	
TAM 111	112	
Ok101	113	
Ok102	114	
Above	115	
AP502 CL	116	
Jagalene	117	
Thunderbolt	118	
Enhancer	119	
Kalvesta	120	
Venango	121	
Cisco	122	
G980091-1	123	
Yuma	124	
Halt	125	
2137	126	
TAM 110	127	
CO970547	128	
CO970547-2	129	
CO970547-7	130	
CO980376	131	
CO980607	132	
CO980630	133	
CO99141	134	
CO99177	135	
CO99314	136	
CO99W183	137	
CO99W188	138	
CO99W192	139	
CO99W254	140	
CO99W277	141	
CO99W329	142	
CO00D007	143	
CO00D011	144	
CO991057	145	
CO991132	146	
CO991350	147	
CO991407	148	
CO980684-1	149	
CO00W015	150	
CO00016	151	
CO00335	152	
CO00345	153	
CO00347	154	
CO00480	155	
CO00484	156	
CO00501	157	
CO00523	158	
CO00554	159	
CO00579	160	
CO00580	161	
CO00582	162	
CO00583	163	
CO00698	164	
CO00739	165	
CO00796	166	

2002-2003 Colorado Winter Wheat IVPT

Variety	Plot #	Comments
Yuma	101	
2137	102	
Wesley	103	
Nuplains	104	
Venango	105	
Cisco	106	
Kalvesta	107	
Platte	108	
Dumas	109	
Jagalene	110	
NW97S278	111	
NW97S182	112	
G980091-1	113	
G980122	114	
Prairie Red	115	
Ankor	116	
Ok101	117	
Ok102	118	
CO970547-2	119	
CO970547-7	120	
CO980607	121	
CO980630	122	
CO99141	123	
CO99314	124	
CO99W183	125	
CO99W188	126	
CO99W192	127	
CO99W254	128	
CO99W277	129	
CO99W329	130	

Tribute to William M. Brown

William Malcolm Brown, Jr., age 67, Professor of Plant Pathology in the Department of Bioagricultural Sciences & Pest Management at Colorado State University for 25 years, passed away unexpectedly on January 27, 2003 after suffering a heart attack at home. Bill is survived by Betty Muller Brown, and sons William Malcolm Brown III and Karl William Brown. He was born June 20, 1935 in Hastings, NE. Bill is described by all that knew him as one of the most upbeat and positive individuals that they ever met. His contributions to humanity and to plant pathology have been many and profound to the hundreds of students and colleagues worldwide who had the privilege of knowing Bill, his zest for life and jazz, and his witty sense of humor.

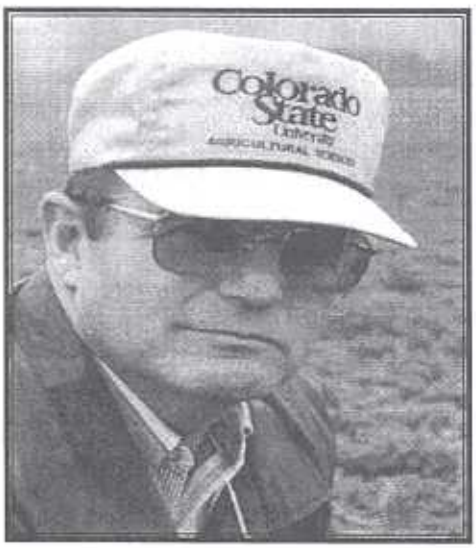
Bill received his A. A. in Agriculture from Modesto Junior College in 1955. Bill's professional passion took hold with his B. S. degree in Plant Pathology from U.C.-Davis (1957) and PhD in Plant Pathology from Oregon State University (1965). He worked in Nigeria, Thailand, South Korea, and Bolivia before "settling down a bit" in 1980 at CSU as Professor of Plant Pathology and Cooperative Extension IPM Coordinator. Since then he also served as International Extension Coordinator and faculty advisor for the Peace Corps, and taught courses and guest lectured at CSU, nationally and internationally (in Mexico, North Yemen, Albania, Guinea Bissau, Palestine, Iran, Hungary and Romania). He had a passion for teaching plant pathology and the philosophy of Integrated Pest Management, and addressed audiences as diverse as farmers, golf course superintendents, and schoolchildren.

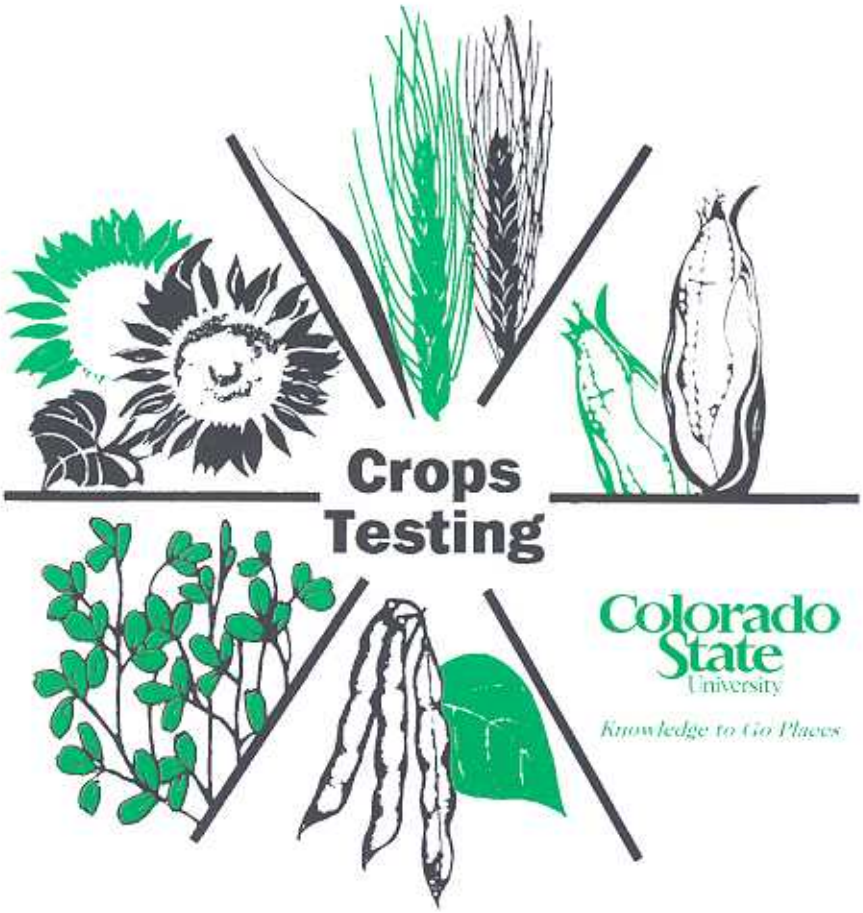
Bill Brown was an internationally recognized and highly respected researcher, particularly for his work on small grain diseases. This was recently acknowledged by his invitation to speak at the First Central and West Asia and North African Yellow Rust Conference held in Iran in 2001. His work on Barley Stripe Rust received the Presidential Award for Outstanding Paper at the Master Brewers Association of the Americas in 1996, and in 2000 Bill was presented the Life Time Achievement Award by the APS Pacific Division.

Bill was recognized as a Distinguished Educator by the Rocky Mountain Plant Food and Agrochemical Association and as a Mortar Board Outstanding Professor by Colorado State University, as well as for Service to Agriculture by the Colorado Department of Agriculture. Throughout the course of his long career, Bill also received the Epsilon Sigma Phi International Extension Award for both the Western Region and Colorado State University, an International University Teaching Abroad Grant from Rotary International, and a Citation for Outstanding Service from the South Korean Ministry of Agriculture. He was instrumental in the creation of and served as co-director of the Center for Crop Biosecurity.

Bill mentored, counseled, befriended, pushed and helped many to become respected plant pathologists. His colleagues at CSU view these productive people as the greatest accomplishment and long-lasting legacy of Bill's successful career as a plant pathologist and extension specialist. Bill thrived on family and friends, international travel, classical music and jazz. His idea of a perfect evening included great food, good wine, live music, and dining surrounded by friends old and new from all cultures, preferably in a garden afflicted with an unusual disease!

A William M. Brown Jr. Memorial Scholarship has been established; please make checks payable to the "CSU Foundation," P. O. Box 1870, Colorado State University, Fort Collins, CO 80522.





Colorado State University

Knowledge to Go Places

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