

High Plains  
Journal  
August 2023

# Colorado State University

## Making Better Decisions

**2023 Colorado Winter Wheat  
Variety Performance Trials**

**2023 Colorado Certified  
Seed Directory**

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## Overview of 2022-2023 Eastern Colorado Winter Wheat Trials

Sally Jones-Diamond

Colorado State University researchers provide current, reliable, and unbiased wheat variety information to Colorado producers. Support of our research keeps public variety testing thriving in Colorado. Our work in Colorado is possible due to the support and cooperation of the entire Colorado wheat industry, the Colorado Wheat Administrative Committee, the Colorado Wheat Research Foundation, seed companies who enter varieties, and Colorado farmers who donate their resources and time to host wheat variety trials.

The Eastern Colorado winter wheat trials are conducted under a broad range of environmental conditions to best determine expected performance of new varieties. We have a regional uniform variety testing program, meaning that dryland varieties entered in our northeast region are tested across our seven test locations in northeast Colorado, and varieties entered in our southeast region are tested across our six test locations in southeast Colorado. All irrigated varieties are tested in all three irrigated trials across northeast Colorado. In the dryland trials, there were 46 varieties tested, including experimental lines across the two regions of the 13 total dryland trial locations. The three irrigated trials had 23 varieties each. The variety trials included a combination of public and private varieties and experimental lines. Seed companies with entries in the variety trials included AgriPro Syngenta, CROPLAN by WinField United, Limagrain Cereal Seeds, and Meridian Seeds. There were entries from the Colorado marketing organization PlainsGold, the Kansas Wheat Alliance, the University of Nebraska-Lincoln, and Crop Research Foundation of Wyoming.

All dryland and irrigated trials were planted in a randomized complete block design with three replicates. Plot sizes were approximately 150 ft<sup>2</sup> (except the Fort Collins irrigated trial, which was 80 ft<sup>2</sup>). All varieties were planted at 700,000 seeds per acre for dryland trials and 1.2 million seeds per acre for irrigated trials. Plot sizes for the Collaborative On-Farm Tests ranged from 0.20 to 1.5 acres per variety in side-by-side strips with seeding rates conforming to the seeding rate used by the collaborating farmer. Yield was corrected to 12% moisture. Variety trial plot weight, test weight, and grain moisture content information were obtained from a HarvestMaster H2 GrainGage™.

Protein content was corrected to 12% moisture and obtained using a FOSS Infratec™ NOVA grain analyzer.

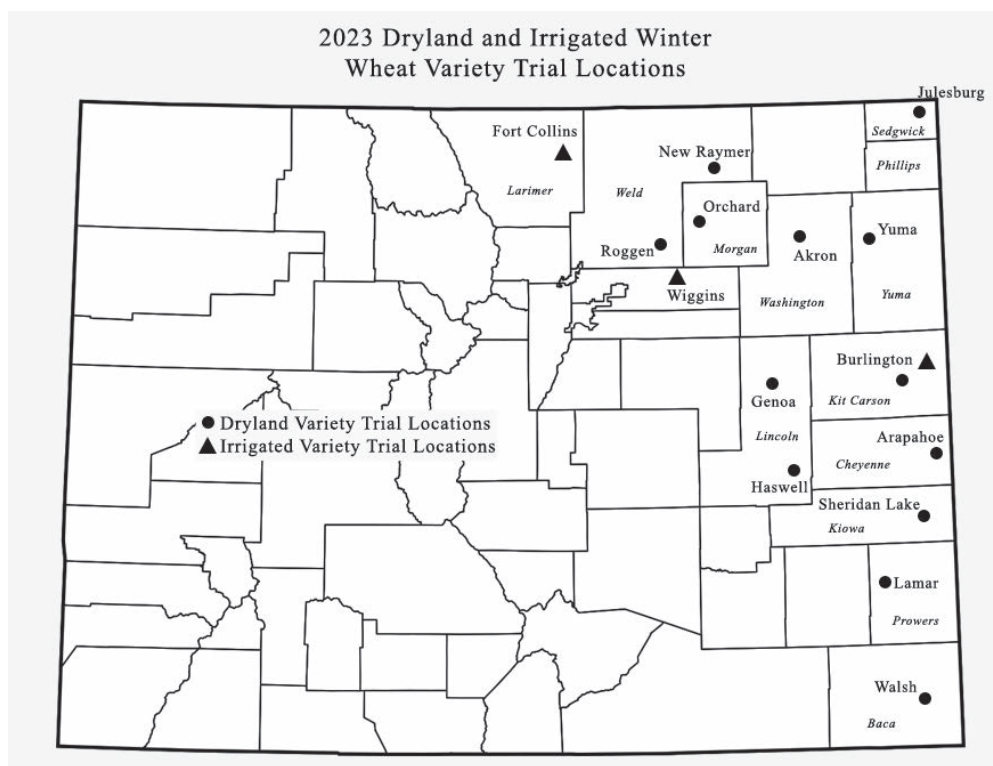
### General Conditions Affecting the 2022 Colorado Wheat Crop

Sally Jones-Diamond and Ron Meyer

Fall 2022 was drier than normal in east-central and northeast Colorado. Rainfall received in September allowed for most wheat to be planted into adequate moisture. However, soil moisture conditions quickly deteriorated throughout eastern Colorado, especially in Sedgwick and Phillips counties in the northeast. Temperatures in the fall were above average and precipitation was well below normal. Most of northeast Colorado was experiencing moderate to exceptional drought conditions during the planting season and through the fall. Baca County in southeast Colorado moved from abnormally dry conditions at planting into extreme drought conditions by mid-November. Winter precipitation helped improve drought conditions for most of eastern Colorado. Frequent and heavy rains from the spring through harvest pulled the region out of the drought. With the rain came isolated hail events which destroyed or severely damaged wheat fields for a number of producers.

Stripe rust disease was not an issue until June and July when frequent precipitation and high humidity favored the spread of the disease. Many growers sprayed fungicides if the crop was not yet in the grain-fill period. Brown wheat mite infestations ranged from low levels in east-central Colorado to high levels in southeast Colorado that required chemical control. Wheat Stem Sawfly (WSS) was widespread across many northeast Colorado counties, albeit at lower numbers than previous seasons. Some producers swathed their wheat to avoid lodging and decrease harvest losses. Some wheat in east-central and northeast Colorado showed lodging due to high moisture and wind (which usually shows up first) combined with wheat stem sawfly cutting.

Wheat yields in northeast Colorado were above average while yields south of I-70 were recorded at below normal levels. Some wheat fields south of I-70 were abandoned due to the early drought conditions which resulted in poor stands.



## 2023 Wheat Trial Management and Characteristics

Location	Dryland Locations										Irrigated Locations						
	Akron	Arapahoe	Burlington	Genoa	Haswell	Julesburg	Lamar	New Raymer	Orchard	Roggen	Sheridan Lake	Walsh	Yuma	Burlington	Fort Collins	Wiggins	
Average Yield (bu/ac)	88	-	91	54	15	66	-	57	56	77	37	48	63	77	117	97	
GPS Coordinates (Lat/Long)	40.151038, -103.141808	38.91339, -102.31567	39.31518, -102.31567	39.359785, -103.510437	38.632866, -103.265932	40.83667, -102.373352	38.012394, -102.62329	40.57115, -103.8973	40.481426, -104.07898	40.07075, -104.28144	38.53187, -102.43544	37.43116, -102.31043	40.186218, -102.65899	39.4107331, -102.15088	40.652947, -104.9992	39.9953, -104.10592	
County	Washington	Cheyenne	Kit Carson	Lincoln	Lincoln	Sedgwick	Provers	Weld	Morgan	Weld	Kiowa	Baca	Yuma	Kit Carson	Larimer	Adams	
Soil Type	Rago silt loam	Wiley complex	Kuma and Keith silt loams	Weld silt loam	Bocid silt loam	Rago and Kuma silt loams	Manvel silt loam	Olney fine sandy loam	Platner sandy loam	Weld loam	Wiley loam	Wiley loam	Platner loam	Norka silt loam	Fort Collins loam	Truckton sandy loam	
Soil Organic Matter	1.6%	1.9%	2.0%	1.8%	1.9%	1.8%	1.6%	-	1.6%	1.5%	1.4%	-	1.4%	2.1%	-	1.1%	
Soil pH	6.2	8	7.8	7.7	7.4	7.3	7.6	-	7.1	7.4	7.6	-	7.2	8.1	-	7.8	
Soil Nutrients at planting (N-P-K lb/ac)	134 - 38	129 - 6	125 - 28	121 - 20	89 - 14	46 - 20	75 - 22	-	82 - 60	111 - 24	87 - 12	-	76 - 34	108 - 10	-	64 - 14	
Applied Fertilizer in Season* (N-P-K lb/ac)	70 - 0 - 0	-	12 - 41.5 - 0	-	-	6 - 22 - 0	-	8.7 - 30 - 0	-	16 - 55.5 - 0	-	-	14 - 47.5 - 0	5 - 16 - 0	-	54 - 30 - 0	
Tillage	No-Till	No-Till	Tilled	Tilled	Sweep Plow 1x	No-Till	No-Till	No-Till	No-Till	No-Till	Tilled	No-Till	No-Till	Tilled	Tilled	Tilled	
Previous Crop	Proso Millet	Sunflower	Corn	Sunflower	Corn	Corn	Fallow	Corn	Proso Millet	Fallow	Corn	Fallow	Fallow	Corn	Dry Bean	Dry Bean	
Planting Date	9/29/2022	9/26/2022	9/26/2022	9/20/2022	9/5/2022	9/27/2022	9/5/2022	9/26/2022	9/27/2022	9/15/2022	9/5/2022	9/21/2022	9/19/2022	10/17/2022	9/29/2022	10/18/2022	
Harvest Date	8/5/2023	-	7/13/2023	7/27/2023	7/17/2023	7/26/2023	-	7/31/2023	7/29/2023	7/19/2023	7/14/2023	7/17/2023	7/17/2023	7/27/2023	8/9/2023	7/28/2023	
Biotic Stress	Wheat Stem Sawfly Stripe Rust	-	Wheat Stem Sawfly	Wheat Stem Sawfly	-	Wheat Stem Sawfly Stripe Rust	-	Wheat Stem Sawfly	Wheat Stem Sawfly	Wheat Stem Sawfly	-	Stripe Rust	Wheat Stem Sawfly	Wheat Stem Sawfly	-	Wheat Stem Sawfly	
Abiotic Stress	-	Drought	-	Hail	Drought and Hail	-	Hail	Drought and Hail	-	-	Winter Kill	Hail	Hail	-	-	-	
Total Rain: January 1 to Harvest	19.2"	-	13.2"	18"	12.3"	15"	-	18.7"	19.1"	19.1"	14.5"	11.1"	15.4"	17.9"	17.1"	20.5"	
GDD (Jan 1 - Harvest, 32°F base)	4,014	-	3,367	3,611	3,671	3,770	-	3,795	3,749	3,490	3,719	4,274	3,338	3,908	4,115	3,847	
General Comments	Planted about 2" deep into excellent moisture. Excellent fall emergence and stands, although field was dry in mid-October. Wheat stem sawfly was present at moderate levels, but lodging was due to high yield in the season - trial was not sprayed.	Trial lost due to severe drought and poor stands. Excellent fall emergence and stands, although field was dry in mid-October. Wheat stem sawfly was present at low levels, but lodging was due to high yield.	Planted about 2" deep into tilled corn residue. Excellent fall emergence. Trial had lush spring growth. Wheat stem sawfly was present at low levels, but lodging was due to high yield.	Planted 2" deep into good moisture and heavy corn residue. Very dry conditions in fall, emergence and stands were above average. Wheat stem sawfly was present but minimal lodging observed at moderate levels. Minor hail damage received in early July.	Planted 2" deep into excellent moisture and corn residue. Fall emergence was very good and stands were above average. Wheat stem sawfly was present at moderate levels. Minor hail damage received in early July.	Planted 1.5" deep into good moisture and heavy corn residue. Very dry conditions in fall, emergence and stands were average with some areas of spotty emergence. Wheat stem sawfly was present but minimal lodging was observed at moderate levels. Minor hail damage received in mid-July.	Trial lost due to severe hail damage in June.	Planted about 1.5" deep into good moisture and millet residue. Very good fall emergence, although field was dry in mid-October. Trial had lush spring growth. Wheat stem sawfly was present at low levels, but lodging was due to high yield.	Planted about 2" deep into good moisture and millet residue. Very good fall emergence, although field was dry in mid-October. Trial had lush spring growth. Wheat stem sawfly was present at low levels, but lodging was due to high yield.	Planted about 2" deep into good moisture and wheat residue. Very good fall emergence. Trial had lush spring growth. Wheat stem sawfly was present at low levels, but lodging was due to high yield.	Planted 1.5" deep into excellent moisture and corn residue. Fall emergence was very good. Trial showed winterkill in some varieties in early spring. June and a high wind event in early July. There was moderate to heavy stripe rust pressure in late June, trial was not sprayed.	Planted 1.5" deep into excellent moisture and corn residue. Fall emergence was very good. Trial showed winterkill in some varieties in early spring. June and a high wind event in early July. There was moderate to heavy stripe rust pressure in late June, trial was not sprayed.	Planted 1.5" deep into excellent moisture and heavy residue. Fall emergence and growth was good. Trial showed winterkill in some varieties in early spring and slow green-up due to residue. Wheat stem sawfly present but minimal lodging was observed. Minor hail damage in July.	Planted about 1.5" deep into fall emergence and very late to green-up in the spring due to late planting date. Wheat stem sawfly was present at low levels, but lodging was due to high yield.	Planted about 1.5" deep into fall emergence and very late to green-up in the spring due to late planting date. Wheat stem sawfly was present at low levels, but lodging was due to high yield.	Planted about 1.5" deep into fall emergence and very late to green-up in the spring due to late planting date. Wheat stem sawfly was present at low levels, but lodging was due to high yield.	Planted about 1.5" deep into fall emergence and very late to green-up in the spring due to late planting date. Wheat stem sawfly was present at low levels, but lodging was due to high yield.

\* 8 and 28 lb/ac of N and P were applied at planting as starter by Crops Testing  
Dashes denote missing information, N/A means not applicable



## Summary of 2023 Dryland Winter Wheat Variety Performance Results



Brand/Source	Market Class	Variety <sup>a</sup>	2023 Multi-Location Average					2023 Individual Trial Yield <sup>b</sup>									
			Yield <sup>b</sup> bu/ac	Yield percent of average	Test		Heading <sup>d</sup> days from average	New					Sheridan				
					Weight lb/bu	Protein <sup>c</sup> percent		Akron	Burlington	Genoa	Julesburg	Raymer	Orchard	Roggen	Lake	Walsh	Yuma
PlainsGold	HWW	Monarch	76.3	111%	57	10.5	0	<b>101.5</b>	<b>103.0</b>	60.5	70.5	81.0	97.5	83.5	43.5	54.5	<b>71.0</b>
PlainsGold	HWW	Snowmass 2.0	72.5	105%	57	10.7	-1	96.0	101.5	54.0	69.5	71.0	<b>103.0</b>	81.5	35.5	53.0	62.0
CROPLAN	HRW	CP7017AX	72.4	105%	58	10.6	0	93.0	97.0	53.0	<b>72.0</b>	81.5	96.0	77.5	41.0	51.0	65.5
Frenchman Valley Coop	HWW	Valley	72.0	104%	57	11.0	0	<b>99.0</b>	<b>103.0</b>	44.5	<b>73.0</b>	75.0	92.0	81.0	38.0	46.0	67.0
PlainsGold	HRW	Crescent AX	70.2	102%	58	11.0	-1	90.5	99.5	60.0	63.0	77.5	97.5	76.0	31.0	46.0	59.0
PlainsGold	HRW	Whistler	69.7	101%	56	10.2	1	76.0	75.0	62.0	68.0	<b>90.0</b>	89.0	81.0	<b>48.5</b>	53.5	67.0
PlainsGold	HRW	Amplify SF	69.6	101%	57	11.3	0	88.0	85.5	58.5	68.0	80.0	89.0	78.0	36.0	45.0	64.0
PlainsGold	HRW	Avery	69.6	101%	56	10.0	1	86.5	91.0	53.5	63.5	81.5	95.0	79.0	32.0	54.5	64.5
PlainsGold	HWW	Sunshine	69.2	101%	57	11.0	-1	<b>97.5</b>	91.0	58.5	66.0	80.5	87.0	75.0	31.0	49.0	62.5
PlainsGold	HRW	Byrd	69.2	100%	57	10.3	0	84.5	90.5	56.0	67.5	78.0	93.5	79.0	33.5	47.0	61.5
Meridian Seeds	HRW	MS Maverick	68.1	99%	57	11.2	0	<b>98.5</b>	81.0	55.0	68.0	76.0	89.0	73.0	36.5	53.5	60.0
PlainsGold	HRW	Byrd CL Plus	68.1	99%	56	10.5	0	89.0	91.0	56.5	67.0	77.0	92.5	78.0	34.5	37.0	61.5
PlainsGold	HRW	Kivari AX	67.9	99%	55	10.2	0	85.5	75.0	56.0	66.5	81.0	85.5	81.5	37.5	52.0	65.0
PlainsGold	HRW	Canvas	67.7	98%	57	11.1	0	76.0	87.5	46.0	69.5	83.5	86.5	77.0	40.0	55.0	60.0
PlainsGold	HWW	Breck	67.4	98%	58	10.6	0	82.5	77.0	53.5	61.5	74.0	91.5	73.0	38.5	<b>60.5</b>	63.0
PlainsGold	HRW	Guardian	66.7	97%	58	11.0	0	76.5	85.5	53.0	60.0	79.5	94.0	80.0	36.0	50.5	57.5
PlainsGold	HRW	Langin	66.6	97%	56	10.9	-2	77.0	88.5	62.0	60.5	71.0	94.5	83.0	31.5	36.0	61.0
PlainsGold	HRW	Brawl CL Plus	66.4	96%	57	11.6	-1	96.0	95.0	50.5	59.0	71.5	90.5	70.0	32.0	45.5	57.0
Limagrain	HRW	LCS Steel AX	66.1	96%	58	11.0	-2	84.0	<b>107.0</b>	56.5	59.0	65.5	88.0	74.0	33.0	45.0	58.0
PlainsGold	HRW	Hatcher	65.5	95%	56	10.6	0	78.0	84.5	55.5	59.0	74.0	83.0	74.5	37.5	51.5	58.5
PlainsGold	HWW	Windom SF	64.3	93%	57	10.6	-1	84.0	64.5	52.5	68.5	<b>87.5</b>	72.5	68.0	40.0	47.5	61.5
PlainsGold	HRW	Fortify SF	63.2	92%	57	10.5	0	73.5	74.5	47.5	61.0	76.0	96.0	74.0	32.0	34.5	67.5
Limagrain	HRW	LCS Atomic AX	59.7	87%	57	11.0	-1	80.0	100.0	48.0	65.0	57.5	84.5	75.5	21.5	10.5	56.0
PlainsGold	HRW	Ray	54.2	79%	52	11.7	6	58.5	60.5	41.5	46.0	68.0	77.5	66.0	33.5	42.0	52.5
<b>Experimentals</b>																	
Colo. State University exp.	HRW	CO19410R	75.6	110%	58	10.9	1	<b>98.0</b>	100.0	<b>69.0</b>	66.5	85.5	95.0	78.5	40.0	54.0	<b>71.5</b>
Colo. State University exp.	HRW	CO19393R	73.5	107%	57	10.8	0	92.0	101.0	58.5	67.0	83.0	95.0	<b>87.5</b>	43.0	45.0	63.5
Colo. State University exp.	HRW	CO20D108R	73.0	106%	57	10.8	1	86.5	99.0	53.0	66.5	82.0	90.5	82.0	39.5	56.5	67.0
Colo. State University exp.	HWW	CO18D007W	73.0	106%	57	10.4	0	<b>97.0</b>	93.0	53.5	67.0	70.0	<b>102.0</b>	82.0	40.5	54.0	68.5
Colo. State University exp.	HRW	CO19D087R	72.3	105%	56	10.9	-1	86.5	<b>107.0</b>	56.5	70.0	76.5	96.0	82.5	40.5	54.0	58.5
Colo. State University exp.	HRW	CO19D304R	71.9	104%	56	10.6	1	84.0	92.5	54.5	68.0	<b>90.0</b>	91.5	79.5	<b>45.5</b>	<b>58.0</b>	64.5
Colo. State University exp.	HRW	CO18D297R	71.9	104%	58	11.1	0	94.5	98.0	62.0	67.5	67.0	<b>100.0</b>	78.5	41.0	48.0	64.5
Colo. State University exp.	HWW	CO19S129W	71.7	104%	57	10.6	0	96.5	<b>103.0</b>	49.5	69.5	82.5	88.0	74.5	38.5	47.0	65.0
Colo. State University exp.	HWW	CO19S135W	70.6	103%	57	10.6	-1	96.5	<b>103.5</b>	53.5	70.5	77.0	94.0	82.0	31.5	39.5	66.5
Colo. State University exp.	HWW	CO19S085W	70.3	102%	57	11.4	0	90.0	94.0	55.5	65.5	78.5	95.0	79.5	38.0	49.0	61.0
Colo. State University exp.	HRW	CO18042RA	68.3	99%	57	10.5	1	88.5	96.0	61.0	62.5	74.5	84.5	78.5	35.0	42.0	59.5
Colo. State University exp.	HRW	CO19S053R	68.2	99%	57	10.5	0	77.5	84.5	57.0	64.0	<b>87.0</b>	92.0	77.5	37.0	49.5	63.5
Colo. State University exp.	HRW	CO18035RA	68.1	99%	56	11.1	-2	91.5	85.0	56.5	63.0	79.0	88.5	80.5	35.0	43.5	63.0
Colo. State University exp.	HRW	CO200037R	66.8	97%	57	11.0	1	83.5	90.5	50.5	64.5	76.0	87.0	72.0	36.0	52.5	60.5
		<b>Average</b>	<b>68.9</b>	<b>100%</b>	<b>57</b>	<b>10.8</b>	<b>0</b>	<b>87.0</b>	<b>91.0</b>	<b>55.0</b>	<b>65.5</b>	<b>77.5</b>	<b>91.0</b>	<b>77.5</b>	<b>36.5</b>	<b>47.5</b>	<b>62.5</b>
		<sup>c</sup> LSD (0.30)	2.8					5.0	5.0	5.0	2.0	3.0	4.0	3.0	3.5	3.0	2.0
		<sup>c</sup> LSD (0.05)	5.3					9.5	9.0	9.5	4.5	6.0	7.0	5.0	7.0	5.5	4.5

<sup>a</sup>Varieties grouped according to released varieties or experimentals, and then ranked from highest to lowest yield across ten trials in 2023. Varieties not entered at all ten locations were not included to provide fair comparisons. Varieties entered in a single testing region (southeast or northeast Colorado) appear in the associated 2023 Colorado regional summary table.

<sup>b</sup>Yield adjusted to 12% moisture content. Variety yield values in the top least significant difference (LSD) yield group across the locations and within each location are in bold. Multi-location yield values for each variety are least squares means and not arithmetic averages.

<sup>c</sup>Protein adjusted to 12% moisture content and averaged across seven trials in 2023.

<sup>d</sup>Varieties with positive values headed later than the trial averages and varieties with negative values headed earlier than average. Based on three trials in 2023.

<sup>e</sup>Farmers selecting a variety based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding varieties are the same when they are actually different). Companies or researchers may use the LSD (.05) to avoid false positive conclusions (concluding varieties are different when they are actually the same).

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## Summary of 2023 Dryland Winter Wheat Variety Performance Results - Northeast Region



Brand/Source	Market Class	Variety <sup>a</sup>	2023 Multi-Location Average					2023 Individual Trial Yield <sup>b</sup>							
			Yield <sup>b</sup> bu/ac	Yield percent of average	Test Weight lb/bu	Protein <sup>c</sup> percent	Heading <sup>d</sup> days from average	Akron	Genoa	Julesburg	New			Roggen	Yuma
											Raymer	Orchard	bu/ac		
PlainsGold	<b>HWW</b>	Monarch	<b>79.8</b>	<b>109%</b>	57	10.4	0	<b>101.5</b>	60.5	70.5	81.0	97.5	83.5	<b>71.0</b>	
Crop Research Foundation of WY	HRW	Steamboat	<b>77.0</b>	<b>105%</b>	59	10.5	1	95.0	63.5	<b>73.0</b>	77.5	91.5	80.0	67.5	
AgriPro	HRW	AP Solid	76.1	104%	57	11.0	1	90.0	59.5	64.0	75.5	98.0	74.0	68.5	
CROPLAN	HRW	CP7017AX	76.1	104%	58	10.6	0	93.0	53.0	<b>72.0</b>	81.5	96.0	77.5	65.5	
PlainsGold	<b>HWW</b>	Snowmass 2.0	76.0	104%	57	10.6	-1	96.0	54.0	69.5	71.0	<b>103.0</b>	81.5	62.0	
Frenchman Valley Coop	<b>HWW</b>	Valley	75.4	103%	58	10.9	0	<b>99.0</b>	44.5	<b>73.0</b>	75.0	92.0	81.0	67.0	
PlainsGold	HRW	Amplify SF	75.2	103%	58	11.3	0	88.0	58.5	68.0	80.0	89.0	78.0	64.0	
PlainsGold	HRW	Crescent AX	74.7	102%	58	10.9	-1	90.5	60.0	63.0	77.5	97.5	76.0	59.0	
PlainsGold	HRW	Whistler	74.3	102%	56	10.0	1	76.0	62.0	68.0	<b>90.0</b>	89.0	81.0	67.0	
PlainsGold	<b>HWW</b>	Sunshine	74.2	102%	57	11.0	-1	<b>97.5</b>	58.5	66.0	80.5	87.0	75.0	62.5	
PlainsGold	HRW	Avery	74.1	101%	57	9.8	1	86.5	53.5	63.5	81.5	95.0	79.0	64.5	
Kansas Wheat Alliance	HRW	KS Territory	74.1	101%	57	11.3	1	93.5	54.0	64.0	82.5	90.0	74.5	64.5	
PlainsGold	HRW	Byrd	74.0	101%	58	10.2	0	84.5	56.0	67.5	78.0	93.5	79.0	61.5	
PlainsGold	HRW	Byrd CL Plus	74.0	101%	57	10.5	0	89.0	56.5	67.0	77.0	92.5	78.0	61.5	
PlainsGold	HRW	Kivari AX	73.4	101%	55	10.2	0	85.5	56.0	66.5	81.0	85.5	81.5	65.0	
Meridian Seeds	HRW	MS Maverick	72.9	100%	58	11.0	0	<b>98.5</b>	55.0	68.0	76.0	89.0	73.0	60.0	
AgriPro	HRW	AP Bigfoot	72.6	99%	58	10.7	-1	<b>97.5</b>	44.0	68.0	72.5	88.0	74.5	68.0	
PlainsGold	HRW	Langin	72.6	99%	56	10.9	-2	77.0	62.0	60.5	71.0	94.5	83.0	61.0	
PlainsGold	<b>HWW</b>	Breck	71.0	97%	59	10.5	0	82.5	53.5	61.5	74.0	91.5	73.0	63.0	
PlainsGold	HRW	Canvas	70.6	97%	57	11.1	0	76.0	46.0	69.5	83.5	86.5	77.0	60.0	
PlainsGold	HRW	Guardian	70.6	97%	58	10.8	0	76.5	53.0	60.0	79.5	94.0	80.0	57.5	
PlainsGold	HRW	Fortify SF	70.3	96%	57	10.5	0	73.5	47.5	61.0	76.0	96.0	74.0	67.5	
PlainsGold	<b>HWW</b>	Windom SF	70.1	96%	56	10.6	-1	84.0	52.5	68.5	<b>87.5</b>	72.5	68.0	61.5	
PlainsGold	HRW	Brawl CL Plus	69.8	95%	58	11.6	-1	96.0	50.5	59.0	71.5	90.5	70.0	57.0	
PlainsGold	HRW	Hatcher	68.8	94%	56	10.4	0	78.0	55.5	59.0	74.0	83.0	74.5	58.5	
Limagrain	HRW	LCS Steel AX	67.9	93%	58	10.9	-2	84.0	56.5	59.0	65.5	88.0	74.0	58.0	
Limagrain	HRW	LCS Atomic AX	66.2	91%	57	10.9	-1	80.0	48.0	65.0	57.5	84.5	75.5	56.0	
PlainsGold	HRW	Ray	58.0	79%	51	11.8	6	58.5	41.5	46.0	68.0	77.5	66.0	52.5	
<b>Experimentals</b>															
Colorado State University exp.	HRW	CO19410R	<b>79.9</b>	<b>109%</b>	58	10.9	1	<b>98.0</b>	<b>69.0</b>	66.5	85.5	95.0	78.5	<b>71.5</b>	
Colorado State University exp.	HRW	CO19393R	77.7	106%	57	10.8	0	92.0	58.5	67.0	83.0	95.0	<b>87.5</b>	63.5	
Colorado State University exp.	<b>HWW</b>	CO18D007W	<b>77.3</b>	<b>106%</b>	58	10.3	0	<b>97.0</b>	53.5	67.0	70.0	<b>102.0</b>	82.0	68.5	
Colorado State University exp.	<b>HWW</b>	CO19S135W	76.2	104%	57	10.5	-1	96.5	53.5	70.5	77.0	94.0	82.0	66.5	
Colorado State University exp.	HRW	CO20D108R	76.1	104%	57	10.7	1	86.5	53.0	66.5	82.0	90.5	82.0	67.0	
Colorado State University exp.	HRW	CO18D297R	75.7	104%	58	11.1	0	94.5	62.0	67.5	67.0	<b>100.0</b>	78.5	64.5	
Colorado State University exp.	<b>HWW</b>	CO19S129W	75.1	103%	57	10.5	0	96.5	49.5	69.5	82.5	88.0	74.5	65.0	
Colorado State University exp.	<b>HWW</b>	CO19S085W	74.3	102%	57	11.5	0	90.0	55.5	65.5	78.5	95.0	79.5	61.0	
Colorado State University exp.	HRW	CO19D304R	74.3	102%	56	10.5	1	84.0	54.5	68.0	<b>90.0</b>	91.5	79.5	64.5	
Colorado State University exp.	HRW	CO19D087R	74.3	102%	56	10.8	-1	86.5	56.5	70.0	76.5	96.0	82.5	58.5	
Colorado State University exp.	HRW	CO18035RA	73.9	101%	56	11.1	-2	91.5	56.5	63.0	79.0	88.5	80.5	63.0	
University of Nebraska-Lincoln exp.	<b>HWW</b>	PSB13NEDH-14-83W	72.9	100%	58	10.3	0	<b>101.5</b>	52.5	69.5	67.0	92.0	74.5	63.0	
Colorado State University exp.	HRW	CO19S053R	72.9	100%	57	10.5	0	77.5	57.0	64.0	<b>87.0</b>	92.0	77.5	63.5	
Colorado State University exp.	HRW	CO18042RA	72.1	99%	57	10.3	1	88.5	61.0	62.5	74.5	84.5	78.5	59.5	
Colorado State University exp.	HRW	CO200037R	69.7	95%	57	10.9	1	83.5	50.5	64.5	76.0	87.0	72.0	60.5	
University of Nebraska-Lincoln exp.	HRW	NHH17450	61.8	85%	57	11.8	0	85.5	37.5	60.0	60.5	84.0	66.5	45.0	
		<b>Average</b>	<b>73.1</b>	<b>100%</b>	57	10.7	0	<b>88.0</b>	<b>54.5</b>	<b>65.5</b>	<b>77.0</b>	<b>91.0</b>	<b>77.0</b>	<b>62.5</b>	
		<sup>c</sup> LSD (0.30)	3.0					5.0	5.0	2.0	3.0	4.0	3.0	2.0	
		<sup>c</sup> LSD (0.05)	5.6					9.5	9.5	4.5	6.0	7.0	5.0	4.5	

<sup>a</sup>Varieties grouped according to released varieties or experimentals, and then ranked from highest to lowest yield across seven northeast Colorado region trials in 2023.

<sup>b</sup>Yield adjusted to 12% moisture content. Variety yield values in the top least significant difference (LSD) yield group across the locations and within each location are in bold. Multi-location yield values for each variety are least squares means and not arithmetic averages.

<sup>c</sup>Protein adjusted to 12% moisture content and averaged across seven trials in 2023.

<sup>d</sup>Varieties with positive values headed later than the trial averages and varieties with negative values headed earlier than average. Based on three trials.

<sup>e</sup>Farmers selecting a variety based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding varieties are the same when they are actually different). Companies or researchers may use the LSD (.05) to avoid false positive conclusions (concluding varieties are different when they are actually the same).

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## Summary of 2023 Dryland Winter Wheat Variety Performance Results - Southeast Region



Brand/Source	Market Class	Variety <sup>a</sup>	2023 Multi-Location Average				2023 Individual Trial Yield <sup>b</sup>		
			Yield <sup>b</sup>		Test Weight		Burlington	Sheridan Lake	Walsh
			bu/ac	percent of average	lb/bu	percent			
PlainsGold	<b>HWW</b>	Monarch	67.0	114%	57	11.1	<b>103.0</b>	43.5	54.5
Kansas Wheat Alliance	<b>HWW</b>	KS Big Bow	64.0	109%	57	11.4	99.5	40.5	52.0
PlainsGold	<b>HWW</b>	Snowmass 2.0	63.4	108%	56	11.5	101.5	35.5	53.0
CROPLAN	HRW	CP7017AX	63.1	108%	58	11.0	97.0	41.0	51.0
Frenchman Valley Coop	<b>HWW</b>	Valley	62.3	106%	57	11.2	<b>103.0</b>	38.0	46.0
Limagrain	HRW	LCS Steel AX	61.7	105%	58	11.9	<b>107.0</b>	33.0	45.0
PlainsGold	HRW	Canvas	60.9	104%	57	11.2	87.5	40.0	55.0
PlainsGold	HRW	Avery	59.1	101%	56	10.9	91.0	32.0	54.5
PlainsGold	HRW	Whistler	59.0	101%	55	11.3	75.0	<b>48.5</b>	53.5
PlainsGold	HRW	Crescent AX	58.7	100%	57	11.3	99.5	31.0	46.0
PlainsGold	<b>HWW</b>	Breck	58.6	100%	57	11.4	77.0	38.5	<b>60.5</b>
PlainsGold	HRW	Hatcher	57.9	99%	56	11.4	84.5	37.5	51.5
PlainsGold	HRW	Brawl CL Plus	57.4	98%	57	12.0	95.0	32.0	45.5
PlainsGold	HRW	Guardian	57.4	98%	57	11.8	85.5	36.0	50.5
PlainsGold	HRW	Byrd	57.1	97%	57	11.0	90.5	33.5	47.0
Meridian Seeds	HRW	MS Maverick	57.1	97%	55	12.6	81.0	36.5	53.5
PlainsGold	<b>HWW</b>	Sunshine	57.0	97%	56	11.5	91.0	31.0	49.0
PlainsGold	HRW	Amplify SF	55.5	95%	56	11.5	85.5	36.0	45.0
PlainsGold	HRW	Kivari AX	54.7	93%	55	10.1	75.0	37.5	52.0
PlainsGold	HRW	Byrd CL Plus	54.1	92%	56	11.1	91.0	34.5	37.0
PlainsGold	HRW	Langin	51.9	89%	56	10.8	88.5	31.5	36.0
PlainsGold	<b>HWW</b>	Windom SF	50.7	86%	57	11.2	64.5	40.0	47.5
PlainsGold	HRW	Fortify SF	46.9	80%	56	10.6	74.5	32.0	34.5
PlainsGold	HRW	Ray	45.2	77%	53	11.1	60.5	33.5	42.0
Limagrain	HRW	LCS Atomic AX	44.0	75%	56	11.6	100.0	21.5	10.5
<b>Experimentals</b>									
Colorado State University exp.	HRW	CO19D087R	67.1	115%	55	11.3	<b>107.0</b>	40.5	54.0
Colorado State University exp.	HRW	CO19D304R	65.2	111%	56	10.8	92.5	<b>45.5</b>	<b>58.0</b>
Colorado State University exp.	HRW	CO20D108R	65.0	111%	57	11.2	99.0	39.5	56.5
Colorado State University exp.	HRW	CO19410R	64.7	110%	57	11.2	100.0	40.0	54.0
Colorado State University exp.	HRW	CO19393R	63.1	108%	56	11.3	101.0	43.0	45.0
Colorado State University exp.	<b>HWW</b>	CO19S129W	63.0	107%	57	11.4	<b>103.0</b>	38.5	47.0
Colorado State University exp.	<b>HWW</b>	CO18D007W	62.5	107%	56	10.6	93.0	40.5	54.0
Colorado State University exp.	HRW	CO18D297R	62.4	106%	58	11.4	98.0	41.0	48.0
Colorado State University exp.	<b>HWW</b>	CO19S085W	60.3	103%	56	11.3	94.0	38.0	49.0
Colorado State University exp.	HRW	CO200037R	59.6	102%	57	11.3	90.5	36.0	52.5
Colorado State University exp.	<b>HWW</b>	CO19S135W	58.1	99%	56	11.8	<b>103.5</b>	31.5	39.5
Colorado State University exp.	HRW	CO18042RA	57.7	98%	56	11.2	96.0	35.0	42.0
Colorado State University exp.	HRW	CO19S053R	57.1	98%	57	10.9	84.5	37.0	49.5
Colorado State University exp.	HRW	CO18035RA	54.6	93%	56	11.0	85.0	35.0	43.5
<b>Average</b>			<b>58.6</b>	<b>100%</b>	<b>56</b>	<b>11.3</b>	<b>91.0</b>	<b>37.0</b>	<b>48.0</b>
<sup>d</sup> LSD (0.30)							5.0	3.5	3.0
<sup>d</sup> LSD (0.05)							9.0	7.0	5.5

<sup>a</sup>Varieties grouped according to released varieties or experimentals, and then ranked from highest to lowest yield across three southeast Colorado region trials in 2023.

<sup>b</sup>Yield adjusted to 12% moisture content. Variety yield values in the top least significant difference (LSD) yield group within each location are in bold. Multi-location yield values for each variety are arithmetic averages from across the three sites and could not be statistically analyzed due to the wide variation among locations.

<sup>c</sup>Protein adjusted to 12% moisture content and from Burlington trial in 2023.

<sup>d</sup>Farmers selecting a variety based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding varieties are the same when they are actually different). Companies or researchers may use the LSD (.05) to avoid false positive conclusions (concluding varieties are different when they are actually the same).

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## Summary of 2-Year (2022-2023) Dryland Winter Wheat Variety Performance Results



Variety <sup>b</sup>	Brand/Source	Market Class <sup>c</sup>	2-Year Average <sup>a</sup>					
			Yield bu/ac	Yield % trial average	Test Weight lb/bu	Test Weight % trial average	Plant Height in	Protein percent
Monarch	PlainsGold	<b>HWW</b>	67.0	111%	58	101%	26	11.4
CO18D007W	Colo. State University exp.	<b>HWW</b>	63.6	106%	58	101%	27	11.4
CO18D297R	Colo. State University exp.	HRW	63.2	105%	58	102%	29	12.0
CP7017AX	CROPLAN	HRW	63.2	105%	59	102%	26	11.5
Valley	Frenchman Valley Coop	<b>HWW</b>	62.9	105%	58	101%	28	11.8
Whistler	PlainsGold	HRW	62.5	104%	56	98%	30	11.2
Snowmass 2.0	PlainsGold	<b>HWW</b>	62.4	104%	57	100%	26	11.5
Avery	PlainsGold	HRW	62.2	103%	57	99%	29	10.9
Crescent AX	PlainsGold	HRW	61.6	102%	58	102%	28	11.9
Byrd	PlainsGold	HRW	61.0	101%	58	101%	28	11.1
CO18035RA	Colo. State University exp.	HRW	61.0	101%	57	100%	26	11.6
Kivari AX	PlainsGold	HRW	60.9	101%	56	98%	27	11.1
Amplify SF	PlainsGold	HRW	60.7	101%	58	101%	29	12.1
MS Maverick	Meridian Seeds	HRW	60.3	100%	57	100%	27	12.0
CO18042RA	Colo. State University exp.	HRW	60.2	100%	57	100%	28	11.4
Canvas	PlainsGold	HRW	60.2	100%	58	100%	27	11.9
Sunshine	PlainsGold	<b>HWW</b>	60.0	100%	57	100%	26	12.1
Byrd CL Plus	PlainsGold	HRW	59.8	99%	57	99%	30	11.5
Breck	PlainsGold	<b>HWW</b>	59.4	99%	59	102%	28	11.7
Guardian	PlainsGold	HRW	59.1	98%	58	102%	27	11.8
Langin	PlainsGold	HRW	58.6	97%	57	99%	27	11.8
Brawl CL Plus	PlainsGold	HRW	57.7	96%	58	101%	27	12.4
Hatcher	PlainsGold	HRW	57.3	95%	57	99%	26	11.4
Windom SF	PlainsGold	<b>HWW</b>	56.4	94%	57	99%	26	11.8
Fortify SF	PlainsGold	HRW	55.5	92%	57	100%	28	11.5
Ray	PlainsGold	HRW	47.1	78%	52	91%	32	12.9
<b>Average</b>			<b>60.1</b>	<b>100%</b>	<b>57</b>	<b>100%</b>	<b>28</b>	<b>11.7</b>

<sup>a</sup>The 2-year average yield and test weight are based on 13 trials (ten 2023 and three 2022 trials). Plant heights and protein are based on 10 trials (seven 2023 and three 2022 trials).

<sup>b</sup>Varieties ranked from highest to lowest average 2-year yield.

<sup>c</sup>Market class: HRW=hard red winter wheat; **HWW**=hard white winter wheat.

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Contact Sally Jones-Diamond (sally.jones@colostate.edu)*



## Summary of 3-Year (2021-2023) Dryland Winter Wheat Variety Performance Results

Variety <sup>b</sup>	Brand/Source	Market Class <sup>c</sup>	3-Year Average <sup>a</sup>					
			Yield bu/ac	Yield % trial average	Test Weight lb/bu	Test Weight % trial average	Plant Height in	Protein percent
Monarch	PlainsGold	<b>HWW</b>	62.7	107%	57	100%	28	11.6
Snowmass 2.0	PlainsGold	<b>HWW</b>	61.2	104%	57	100%	28	12.2
CO18D007W	Colo. State University exp.	<b>HWW</b>	61.1	104%	57	100%	29	12.3
CO18D297R	Colo. State University exp.	HRW	60.6	103%	58	102%	31	12.5
CP7017AX	CROPLAN	HRW	60.0	102%	57	101%	29	12.1
Crescent AX	PlainsGold	HRW	59.4	101%	57	101%	31	12.5
Avery	PlainsGold	HRW	59.3	101%	56	99%	31	11.8
Byrd	PlainsGold	HRW	59.3	101%	57	101%	31	11.8
Langin	PlainsGold	HRW	59.1	101%	56	99%	29	12.3
Kivari AX	PlainsGold	HRW	58.7	100%	55	97%	30	11.8
Canvas	PlainsGold	HRW	58.6	100%	57	99%	30	12.4
Whistler	PlainsGold	HRW	58.5	100%	55	98%	32	11.9
Amplify SF	PlainsGold	HRW	58.2	100%	57	101%	32	12.3
Byrd CL Plus	PlainsGold	HRW	57.2	98%	56	99%	32	12.3
Breck	PlainsGold	<b>HWW</b>	57.1	98%	58	102%	31	12.5
Brawl CL Plus	PlainsGold	HRW	56.0	96%	58	101%	31	12.8
Guardian	PlainsGold	HRW	55.5	95%	57	101%	31	12.6
Fortify SF	PlainsGold	HRW	55.1	94%	57	101%	31	12.0
Hatcher	PlainsGold	HRW	54.7	93%	56	98%	30	11.9
<b>Average</b>			<b>58.5</b>	<b>100%</b>	<b>57</b>	<b>100%</b>	<b>30</b>	<b>12.2</b>

<sup>a</sup>The 3-year average yield and test weight are based on 22 trials (ten 2023, three 2022, and nine 2021). Plant heights are based on 18 trials (seven 2023, three 2022, and eight 2021). Protein based on 16 trials (seven 2023, three 2022, and six 2021).

<sup>b</sup>Varieties ranked according to average 3-year yield.

<sup>c</sup>Market class: HRW=hard red winter wheat; **HWW**=hard white winter wheat.

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## 2023 Collaborative On-Farm Test (COFT) Variety Performance Results

Sally Jones-Diamond, Ron Meyer, Kat Caswell, and Michaela Mattes

The COFT program is in its 27th year and the majority of Colorado’s winter wheat acreage is planted to varieties that have been tested in the program. On-farm testing leads to more rapid replacement of old inferior varieties and wider and faster adoption of improved varieties. It also brings Colorado State University wheat results to rural communities. The varieties tested in COFT this year fit different farmer needs and producers are encouraged to study the tables in the Description of Winter Wheat Varieties in Eastern Colorado and the Dryland Decision Tree for more information.

In the fall of 2022, twenty-six eastern Colorado wheat producers received seed for five varieties of wheat and planted them in side-by-side strips under the same conditions as the wheat in the rest of the field. Ten viable harvest results were obtained due to drought conditions and hail that occurred during the growing season. The objective of our on-farm testing program is to compare the performance of wheat varieties of interest for Colorado farmers under their field conditions. Each of the five varieties tested has potential advantages for farmers and should be chosen on a case-by-case basis depending on the specific farm needs.

The same five varieties were included in all tests. Amplify SF, Fortify SF, Kivari AX, and Whistler are hard red winter wheat varieties and Windom SF is a hard white winter wheat variety. Three semi-solid stemmed varieties were included in the test to help combat the wheat stem sawfly (WSS): Amplify SF, Fortify SF, and Windom SF. One CoAXium® variety was also included for grass weed control, Kivari AX. Additionally, it is important to note that all varieties tested in the COFT this year except Whistler are Certified Seed Only (CSO), which means saving back harvested seed is illegal.

Amplify SF is a CSU release (2021), marketed by PlainsGold. Amplify SF has a semi-solid stem, is medium maturity, and has good standability under severe WSS pressure with an average yield.

Fortify SF is a CSU release (2019). Fortify SF was the first Colorado-bred semi-solid wheat to combat the wheat stem sawfly. It has a medium-early maturity, carries wheat curl mite resistance, but has a below-average yield in our three-year trial average.

Windom SF is a CSU release (2022) and a non-premium variety with medium maturity. It is a hard white wheat with a semi-solid stem and a below-average yield in our two-year trial average.

Kivari AX is a CSU release (2020) marketed by PlainsGold. Higher yielding and slightly later maturing than Crescent AX, it shows intermediate reaction to stripe rust and carries wheat curl mite resistance. The CoAXium® Wheat Production System is based on the Aggressor® herbicide, a different class of compounds from Beyond®, and provides excellent control of winter annual grasses. It has an average yield in our three-year trial average.

Whistler is a CSU release (2018), marketed by PlainsGold. It is later maturing, tall, has marginal straw strength, good stripe and stem rust resistance, and carries wheat curl mite resistance from the Byrd parent. It has an average yield in the three-year trial average.



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### Summary of 2023 Collaborative On-Farm Test (COFT) Winter Wheat Variety Performance Results



2023 Varieties (ranked left to right by highest yield)

County/Nearest Town	Amplify SF			Windom SF			Kivari AX			Whistler			Fortify SF			COFT Average		
	Yield <sup>a</sup> bu/ac	Weight lb/bu	Protein percent	Yield <sup>a</sup> bu/ac	Weight lb/bu	Protein percent	Yield <sup>a</sup> bu/ac	Weight lb/bu	Protein percent	Yield <sup>a</sup> bu/ac	Weight lb/bu	Protein percent	Yield <sup>a</sup> bu/ac	Weight lb/bu	Protein percent	Yield <sup>a</sup> bu/ac	Weight lb/bu	Protein percent
Adams/Byers	83	58	10	73	59	9	86	57	9	80	58	10	74	58	9	79	58	10
Adams/Prospect Valley	64	60	9	53	60	8	52	59	9	47	60	9	51	58	9	53	59	9
Baca/Walsh	30	59	13	35	61	13	32	58	13	35	59	13	30	60	13	32	59	13
Kiowa/Eads	24	59	9	19	60	10	19	56	8	25	58	9	19	57	9	21	58	9
Kit Carson/Bethune	26	57	12	26	59	12	24	55	11	20	56	11	25	58	11	24	57	11
Logan/Leroy	105	61	12	101	62	12	92	60	11	94	61	11	87	60	12	96	61	11
Sedgwick/Julesburg	44	56	12	34	53	13	36	54	11	37	55	12	33	57	12	37	55	12
Sedgwick/Julesburg S	40	56	12	41	54	12	38	51	11	30	51	12	43	57	11	38	54	12
Washington/Otis	64	58	12	57	58	12	53	55	10	60	57	12	51	55	10	57	56	11
Yuma/Yuma	19	56	9	19	59	9	18	57	9	19	57	9	18	59	9	19	57	9
<b>Average</b>	<b>50</b>	<b>58</b>	<b>11</b>	<b>46</b>	<b>58</b>	<b>11</b>	<b>45</b>	<b>56</b>	<b>10</b>	<b>45</b>	<b>57</b>	<b>11</b>	<b>43</b>	<b>58</b>	<b>11</b>	<b>46</b>	<b>58</b>	<b>11</b>

Yield Significance<sup>b</sup>

LSD (P<0.30) for yield = 1.9 bu/ac, for test weight = 0.6 lb/bu, and for protein = 0.2 percent

<sup>a</sup>All yield and protein data are corrected to 12% moisture.

<sup>b</sup>Yield significance: varieties with different letters have yields that are significantly different from one another.



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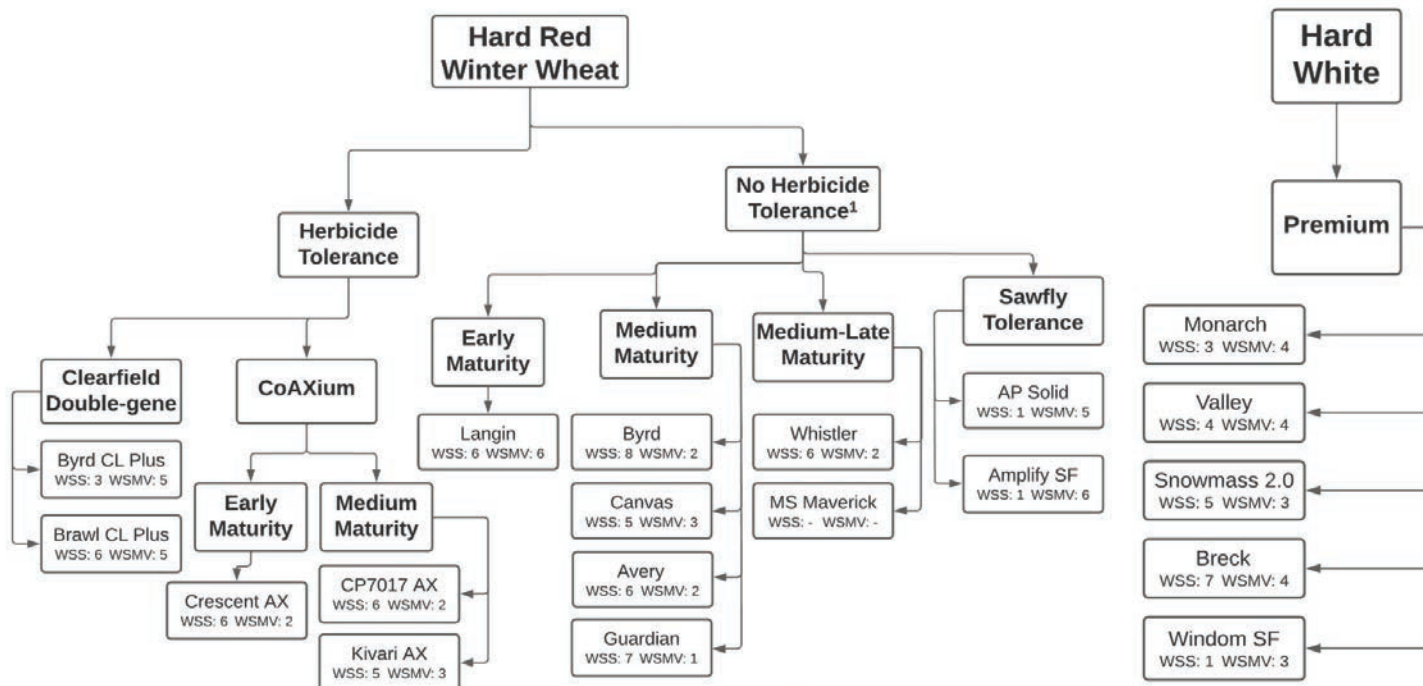
## Summary of 2023 Collaborative On-Farm Test (COFT) Winter Wheat Variety Results (10 tests included)

Variety	Yield <sup>a</sup> bu/ac	Test Weight lb/bu	Protein <sup>a</sup> percent
Amplify SF	49.9	58.0	11.1
Windom SF	45.6	58.5	11.0
Kivari AX	45.1	56.2	10.1
Whistler	44.5	57.1	10.7
Fortify SF	43.1	57.9	10.5
<b>Average</b>	<b>45.7</b>	<b>57.5</b>	<b>10.7</b>
LSD <sub>(0.30)</sub>	1.9	0.6	0.2
Coefficient of Variation (CV)	9.1%	2.1%	3.3%

<sup>a</sup>Yield and protein corrected to 12% moisture.

## CSU Fall 2023 Dryland Winter Wheat Decision Tree

Sally Jones-Diamond



WSS=wheat stem sawfly and WSMV=wheat streak mosaic virus. Rating scale is 1=resistant and 9=susceptible. WSS ratings are based on field evaluation of tolerance to wheat stem sawfly cutting in Colorado. Values do not represent the level of stem solidness expression.  
<sup>1</sup>No tolerance to herbicides used in Clearfield or CoAXium wheat production systems.  
 Varieties in each section are listed from highest to lowest yield based on multi-year trial averages.



## Summary of 2023 Irrigated Winter Wheat Variety Performance Results



Brand/Source	Market Class	Variety <sup>a</sup>	2023 Multi-Location Average						2023 Individual Trial Yield <sup>b</sup>		
			Yield <sup>b</sup>	Yield	Test		Lodging	Heading <sup>d</sup>	Burlington	Fort Collins	Wiggins
					Weight	Protein <sup>c</sup>					
bu/ac	percent of average	lb/bu	percent			bu/ac					
Colorado State University exp.	HRW	CO18D297R	<b>107.4</b>	111%	59	12.2	3	1	<b>84.5</b>	<b>127.5</b>	<b>109.0</b>
PlainsGold	<b>HWW</b>	Monarch	<b>106.0</b>	110%	58	11.3	1	1	<b>84.5</b>	<b>128.5</b>	<b>105.5</b>
PlainsGold	HRW	Amplify SF	<b>103.5</b>	107%	58	12.4	4	2	80.0	<b>128.0</b>	103.0
PlainsGold	HRW	Guardian	<b>102.3</b>	106%	58	12.6	3	2	82.5	122.0	101.5
Frenchman Valley Coop	<b>HWW</b>	Valley	<b>102.2</b>	106%	59	11.8	3	1	80.5	<b>127.0</b>	98.5
PlainsGold	HRW	Byrd CL Plus	101.1	104%	57	11.6	5	2	82.5	118.5	103.0
CROPLAN	HRW	CP7017AX	100.6	104%	58	11.7	3	0	79.0	116.0	<b>108.0</b>
Colorado State University exp.	<b>HWW</b>	CO18D007W	99.8	103%	57	11.9	2	-1	74.0	<b>127.5</b>	96.5
Colorado State University exp.	HRW	CO19D304R	99.4	103%	57	11.9	7	2	81.5	<b>124.5</b>	93.0
PlainsGold	HRW	Crescent AX	99.0	102%	59	12.1	6	-2	<b>84.0</b>	113.5	100.5
Colorado State University exp.	HRW	CO18035RA	98.3	102%	57	11.7	6	-2	82.5	116.5	97.0
Limagrain	HRW	LCS Steel AX	98.2	101%	58	12.5	3	-3	<b>83.5</b>	110.5	98.5
PlainsGold	<b>HWW</b>	Snowmass 2.0	97.6	101%	56	12.1	4	-1	77.0	122.0	92.0
PlainsGold	HRW	Canvas	97.6	101%	57	12.2	2	0	69.0	122.5	102.0
AgriPro	HRW	SY Wolverine	96.1	99%	56	12.5	1	0	75.5	121.5	91.0
CROPLAN	HRW	CP7266AX	93.3	96%	58	12.1	7	0	<b>90.0</b>	95.0	96.5
Limagrain	HRW	LCS Atomic AX	93.1	96%	58	12.0	5	0	<b>85.0</b>	97.5	96.5
PlainsGold	<b>HWW</b>	Windom SF	92.0	95%	56	12.2	3	-1	73.0	111.0	93.5
PlainsGold	<b>HWW</b>	Breck	92.0	95%	57	12.1	1	0	62.0	122.5	91.0
Colorado State University exp.	HRW	CO18042RA	91.2	94%	58	12.0	6	0	68.0	114.5	90.5
PlainsGold	HRW	Kivari AX	88.5	91%	56	11.0	8	0	70.0	110.5	82.5
PlainsGold	HRW	Brawl CL Plus	87.7	91%	58	13.3	2	-1	70.5	103.0	89.0
PlainsGold	HRW	Ray	79.3	82%	50	12.4	3	9	46.5	111.0	81.0
<b>Average</b>			<b>96.8</b>	<b>100%</b>	<b>57</b>	<b>12.0</b>	<b>4</b>	<b>0</b>	<b>77.0</b>	<b>117.0</b>	<b>96.5</b>
‡LSD (0.30)			6.1						7.0	4.0	5.0
‡LSD (0.05)			11.7						13.0	7.5	9.5

<sup>a</sup>Varieties ranked from highest to lowest yield across three irrigated trials in 2023.

<sup>b</sup>Yield adjusted to 12% moisture content. Variety yield values in the top least significant difference (LSD) yield group across the locations and within each location are in bold. Multi-location yield values for each variety are least squares means and not arithmetic averages.

<sup>c</sup>Protein adjusted to 12% moisture content and averaged across two trials in 2023.

<sup>d</sup>Varieties with positive values headed later than the trial averages and varieties with negative values headed earlier than average. Based on one trial.

<sup>e</sup>Lodging score: 1 equals no lodging and 9 is severe lodging. Scores from three trials in 2023.

<sup>f</sup>Farmers selecting a variety based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding varieties are the same when they are actually different). Companies or researchers may use the LSD (.05) to avoid false positive conclusions (concluding varieties are different when they are actually the same).

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## Summary of 2-Year (2022-2023) Irrigated Winter Wheat Variety Performance Results



Variety <sup>b</sup>	Brand/Source	Market Class <sup>c</sup>	2-Year Average <sup>a</sup>					
			Yield	Yield	Test Weight	Test Weight	Plant Height	Protein
			bu/ac	% trial average	lb/bu	% trial average	in	percent
CO18D297R	Colorado State University exp.	HRW	96.6	110%	60	102%	28	13.2
Monarch	PlainsGold	<b>HWW</b>	93.5	107%	59	101%	28	12.5
CO18D007W	Colorado State University exp.	<b>HWW</b>	92.9	106%	59	101%	28	13.2
CP7017AX	CROPLAN	HRW	91.0	104%	60	102%	26	13.2
Valley	Frenchman Valley Coop	<b>HWW</b>	90.8	104%	59	101%	31	13.3
Crescent AX	PlainsGold	HRW	90.0	103%	60	102%	29	13.2
CO18035RA	Colorado State University exp.	HRW	89.9	103%	59	100%	28	13.1
Canvas	PlainsGold	HRW	89.7	102%	59	101%	29	13.5
Byrd CL Plus	PlainsGold	HRW	89.3	102%	59	100%	32	13.1
Guardian	PlainsGold	HRW	88.3	101%	60	102%	30	13.9
Windom SF	PlainsGold	<b>HWW</b>	86.4	99%	59	99%	27	13.3
Breck	PlainsGold	<b>HWW</b>	86.4	99%	60	101%	27	13.7
CO18042RA	Colorado State University exp.	HRW	85.5	98%	59	100%	30	13.4
Kivari AX	PlainsGold	HRW	84.1	96%	58	99%	31	12.3
CP7266AX	CROPLAN	HRW	83.0	95%	59	101%	29	13.5
Snowmass 2.0	PlainsGold	<b>HWW</b>	82.1	94%	59	99%	29	13.7
Brawl CL Plus	PlainsGold	HRW	81.1	93%	60	101%	29	14.5
Ray	PlainsGold	HRW	76.3	87%	52	88%	35	13.9
<b>Average</b>			<b>87.6</b>	<b>100%</b>	<b>59</b>	<b>100%</b>	<b>29</b>	<b>13.4</b>

<sup>a</sup>The 2-year average yield and test weight are based on six trials (three 2023 and three 2022). Plant heights and protein are based on five trials (two 2023 and three 2022).

<sup>b</sup>Varieties ranked from highest to lowest average 2-year yield.

<sup>c</sup>Market class: HRW=hard red winter wheat; **HWW**=hard white winter wheat.

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## Summary of 3-Year (2021-2023) Irrigated Winter Wheat Variety Performance Results



Variety <sup>b</sup>	Brand/Source	Market Class <sup>c</sup>	3-Year Average <sup>a</sup>					
			Yield	Yield	Test Weight	Test Weight	Plant Height	Protein
			bu/ac	% trial average	lb/bu	% trial average	in	percent
CO18D007W	Colorado State University exp.	<b>HWW</b>	95.7	107%	59	100%	30	13.2
CO18D297R	Colorado State University exp.	HRW	94.8	106%	59	100%	30	13.2
Monarch	PlainsGold	<b>HWW</b>	93.8	105%	59	100%	30	12.4
CP7017AX	CROPLAN	HRW	91.1	102%	60	101%	28	13.4
Canvas	PlainsGold	HRW	90.4	101%	59	100%	30	12.9
Crescent AX	PlainsGold	HRW	90.1	101%	60	101%	32	13.1
Breck	PlainsGold	<b>HWW</b>	87.1	97%	60	101%	29	13.5
Snowmass 2.0	PlainsGold	<b>HWW</b>	87.0	97%	59	99%	31	13.0
Brawl CL Plus	PlainsGold	HRW	85.7	96%	60	101%	31	14.3
Guardian	PlainsGold	HRW	85.1	95%	60	101%	32	13.6
Kivari AX	PlainsGold	HRW	82.9	93%	58	98%	32	12.5
<b>Average</b>			<b>89.4</b>	<b>100%</b>	<b>59</b>	<b>100%</b>	<b>30</b>	<b>13.2</b>

<sup>a</sup>The 3-year average yield and test weight are based on nine trials (three each year). Plant heights and protein are based on seven trials (two 2023, three 2022, and three 2021).

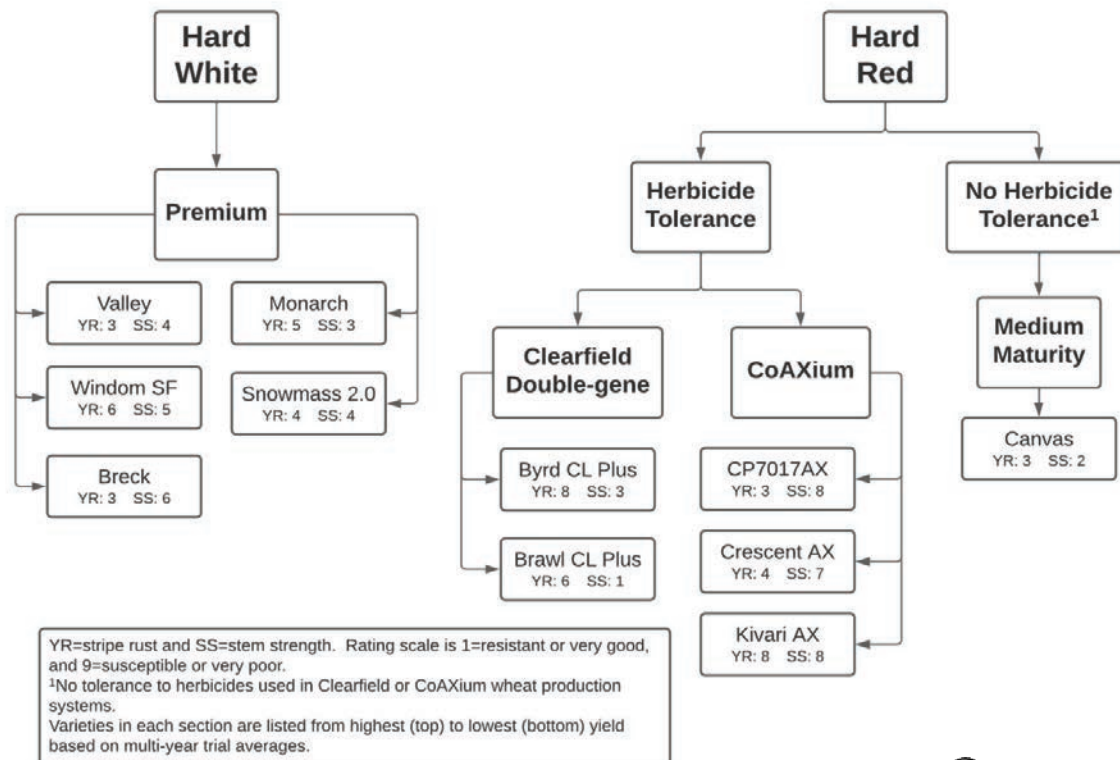
<sup>b</sup>Varieties ranked from highest to lowest average 2-year yield.

<sup>c</sup>Market class: HRW=hard red winter wheat; HWW=hard white winter wheat.

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## CSU Fall 2023 Irrigated Winter Wheat Decision Tree

Sally Jones-Diamond





## Important Variety Selection Considerations

Sally Jones-Diamond

It is not possible to accurately predict which variety will perform best in each field every year. However, there are some selection guidelines to improve the ability to select superior varieties. The variety performance summary tables and decision trees in this report provide useful information to farmers for improving variety selections. Guidelines are below.

- Focus on multi-year and location yield summary results when selecting a variety. Use results from the three-year variety performance trials or the collaborative on-farm tests. Comparing results across years and locations is a better predictor of how a variety will perform on your farm than looking at single year or location data. You can also use the wheat variety database, which is an excellent resource found at [www.wheattrials.com](http://www.wheattrials.com).
- Plant more than one variety on your farm to spread your risk of crop failure due to drought, disease, herbicide, pest, or other issues.
- Pay attention to ratings for maturity, disease tolerance, insect resistance, and end-use quality characteristics that are relevant to you. Refer to the Description of Winter Wheat Varieties in Eastern Colorado Dryland and Irrigated Trials (2022-2023) for variety-specific information.
- Control volunteer wheat and weeds to avoid loss of valuable soil moisture and to avoid creating a green bridge. A green bridge is an area where the presence of weeds or volunteer wheat allows for unimpeded disease spread. Green bridges can lead to serious virus disease infections vectored by the wheat curl mite (wheat streak mosaic virus, High Plains wheat mosaic virus, and Triticum mosaic virus) or vectored by aphids (barley yellow dwarf virus and cereal yellow dwarf virus).
- Be aware of current ratings for stripe rust resistance and pay attention to the potential of new races of stripe rust to develop. If variety susceptibility, market prices, expected yield, and fungicide and application costs warrant an application, consult the North Central Regional Committee on Management of Small Grain Diseases (NCERA-184) fungicide efficacy chart.
- Plant treated seed for protection against seed-borne diseases. Information on seed treatments is available from Kansas State University at: [tinyurl.com/jgeznu](http://tinyurl.com/jgeznu)
- Soil sample to determine optimum fertilizer application rates. Sampling should be done prior to planting. Soil samples can be sent to the CSU Soil, Water, and Plant Testing Laboratory. For more information, visit: [www.agsci.colostate.edu/soiltestinglab/](http://www.agsci.colostate.edu/soiltestinglab/)
- Plant in seeds per acre and not in pounds per acre. Different varieties and seed lots can vary widely in seed size. Reassess and adjust your seeding rate as necessary when changing varieties, switching seed lots, and as planting season progresses.

Description of Winter Wheat Varieties in Eastern Colorado Dryland and Irrigated Trials (2022-2023)

Name/Class/Pedigree	Origin	HD	HT	SS	COL*	YR	LR	SR	WSMV**	TWWSS+PRO+MILL	BAKE	Comments			
Amplify SF	CSU 2021	6	7	4	6	4	1	5	4	6	6	CSU release (2021), marketed by PlainsGold. Medium height, medium maturity. Carries the semi-solid stem trait (17 out of 25 rating) for partial resistance to the wheat stem sawfly. Certified seed only.			
Hard red winter Bearpaw/Antero//Antero															
AP Bigfoot	AgriPro 2022	3	4	3	3	4	2	2	4	1	--	4	6	Agripro release (2021). First entered in CSU variety trials in 2022. Early to med-early variety with very good test weight and WSMV tolerance.	
Hard red winter Undisclosed															
AP Roadrunner	AgriPro 2020	6	4	4	4	1	2	3	8	4	7	4	3	3	Agripro release (2020). First entered in CSU variety trials in 2020. Medium-late variety with good winter hardiness and resistance to WSMV. Good leaf and stripe rust resistance.
Hard red winter Undisclosed															
AP Solid	AgriPro 2021	8	2	2	4	6	6	5	5	2	1	3	1	4	Agripro release (2021). First entered in CSU variety trials in 2020. Medium-late semi-solid stem variety for use in managing wheat stem sawfly. Very good test weight and straw strength.
Hard red winter Undisclosed															
Avery	CSU 2015	6	7	8	5	8	8	8	2	5	6	6	4	3	CSU release (2015), marketed by PlainsGold. Doubled haploid-derived line, similar to Byrd with higher yield potential, larger kernels and slightly improved quality. Carries wheat curl mite resistance from TAM 112 parent. Susceptible to stripe rust.
Hard red winter TAM 112/Byrd															
Brawl CL Plus	CSU 2011	2	7	1	7	6	6	7	5	4	6	1	3	3	CSU release (2011), marketed by PlainsGold. Two-gene Clearfield wheat. Excellent test weight, straw strength, milling and baking quality. Early maturity, medium height, long coleoptile. Intermediate reaction to both stripe rust and leaf rust. Certified seed only.
Hard red winter Teal 11A/Above//CO99314															
Breck	CSU 2017	5	7	6	7	3	5	2	4	2	7	2	2	3	CSU release (2017), marketed by PlainsGold in CWRP-Arden Mills UltraGrain Premium Program. Good stripe rust resistance, sprouting tolerance, straw strength, grain protein deviation, and quality. Very high test weight, lower polyphenol oxidase (PPO) activity for improved whole grain bread and noodle quality. Certified seed only.
Hard white winter Denali/HV9W07-482W//Antero															
Byrd	CSU 2011	4	6	6	4	8	7	8	2	5	8	5	4	3	CSU release (2011), marketed by PlainsGold. Excellent drought tolerance (from TAM 112) and quality. Average test weight and straw strength. Moderately susceptible to stripe rust. Carries wheat curl mite resistance from TAM 112 parent.
Hard red winter TAM 112/CO970547-7															
Byrd CL Plus	CSU 2018	5	8	3	4	8	5	8	5	5	3	6	5	5	CSU release (2018), marketed by PlainsGold. Two-gene Clearfield wheat in Byrd background. Highly similar to Byrd with exception of tolerance to Beyond herbicide. Has shown some non solid-stem based tolerance to wheat stem sawfly. Certified seed only.
Hard red winter CO06072/4*Byrd															

**Column Key** - heading date (HD), plant height (HT), straw strength (SS), coleoptile length (COL), stripe rust resistance (YR), leaf rust resistance (LR), stem rust resistance (SR), wheat streak mosaic virus tolerance (WSMV), wheat stem sawfly tolerance (WSS), test weight (TW), protein (PRO), milling (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/long.

\* Coleoptile length ratings range from 1=very short (~50 mm or ~2 in) to 9=very long (~100 mm or ~4 in). Coleoptile lengths should be interpreted for relative variety comparisons only.

\*\* WSMV ratings are based on field evaluations in Colorado under pressure from wheat curl mite transmitted viruses. Scores may reflect both resistance to the wheat curl mite and resistance to mite-transmitted viruses.

+WSS ratings are based on field evaluation of tolerance to wheat stem sawfly cutting in Colorado. Values do not represent the level of stem solidness expression.

++ PRO ratings represent "grain protein deviation" (relative grain protein level accounting for differences in grain yield).

## Description of Winter Wheat Varieties in Eastern Colorado Dryland and Irrigated Trials (2022-2023)

Name/Class/Pedigree	Origin	HD	HT	SS	COL*	YR	LR	SR	WSSV**	TW	WSS+PRO**	MILL	BAKE	Comments
Canvas Hard red winter Denali/Antero//Byrd	CSU 2018	6	3	2	6	3	6	2	3	4	5	4	3	3 CSU release (2018), marketed by PlainsGold. Hard red winter, medium maturing, medium-short, good straw strength. Good stripe and stem rust resistance and carries wheat curl mite resistance from Byrd parent. Good test weight and milling and baking quality.
CO18035RA Hard red winter (AF28/Byrd//AF26/Byrd)//2*Byrd//AF10 M3/2*Byrd//AF10 M3/2*Byrd//AF26/Byrd//2*Byrd/ (AF28/Byrd//AF26/Byrd)//2*Byrd/Langin	CSU EXP	2	5	5	4	4	7	6	4	5	6	4	3	2 CSU experimental line. Three gene CoAXium wheat for winter annual grassy weed control. Acidic soil tolerance. Wheat curl mite resistance from Byrd. Very good milling and baking quality. Potential release in 2023.
CO18042RA Hard red winter (AF28/Byrd//AF26/Byrd)//2*Byrd//AF10 M3/2*Byrd//AF10 M3/2*Byrd//AF26/Byrd//2*Byrd/ (AF28/Byrd//AF26/Byrd)//2*Byrd/Langin	CSU EXP	5	6	6	5	2	--	6	4	5	6	6	3	2 CSU experimental line. Three gene CoAXium wheat for winter annual grassy weed control. Acidic soil tolerance. Wheat curl mite resistance from Byrd and excellent stripe rust resistance. Very good milling and baking quality. Potential release in 2023.
CO180007W Hard white winter CO12D906/CO07W722-F5	CSU EXP	4	4	1	5	4	6	1	4	5	8	2	2	3 CSU experimental line. Hard white winter wheat. Excellent straw strength and overall performance in irrigated and dryland environments. Very good milling and baking. Potential release in 2023.
CO18D297R Hard red winter CO12D906/CO11D1353//Monarch	CSU EXP	5	6	6	6	2	1	5	3	8	3	2	3	3 CSU experimental line. Good overall performance and excellent resistance to stripe rust. Very good milling and baking quality. Potential release in 2023.
CP7017AX Hard red winter Undisclosed	Croplan 2020	4	3	8	4	3	4	1	2	4	6	6	2	6 CROPLAN by WinField United release (2020). First entered into CSU trials in 2020. CoAXium wheat for winter annual grassy weed control. Strong yield potential, strong drought tolerance, tolerates acid soils and resistant to soilborne mosaic virus. Certified seed only.
CP7266AX Hard red winter Undisclosed	Croplan EXP	5	5	1	6	2	1	5	--	5	--	6	3	5 CROPLAN by WinField United release (2021). First entered into CSU trials in 2022. CoAXium wheat for winter annual grassy weed control.
Crescent AX Hard red winter (AF28/Byrd)//(AF10/2*Byrd)	CSU 2018	3	7	7	4	4	6	--	2	4	6	7	3	3 CSU release (2018), marketed by PlainsGold. CoAXium wheat for winter annual grassy weed control. Approximately 66% Byrd and 34% Hatcher parentage. Earlier and much improved yield and test weight relative to Incline AX. Intermediate reaction to stripe rust and carries wheat curl mite resistance from Byrd parent. Certified seed only.
Fortify SF Hard red winter Byrd/Bearpaw//Byrd	CSU 2019	4	6	5	4	7	7	4	2	3	2	5	5	6 CSU release (2019), marketed by PlainsGold. Medium height, medium maturity. Carries wheat curl mite resistance from Byrd parent and semi-solid stem trait (13 out of 25 rating) for partial resistance to the wheat stem sawfly. Certified seed only.

**Column Key** - heading date (HD), plant height (HT), straw strength (SS), coleoptile length (COL), stripe rust resistance (YR), leaf rust resistance (LR), stem rust resistance (SR), wheat streak mosaic virus tolerance (WSSV), wheat stem sawfly tolerance (WSS), test weight (TW), protein (PRO), milling (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/long.

\* Coleoptile length ratings range from 1=very short (~50 mm or ~2 in) to 9=very long (~100 mm or ~4 in). Coleoptile lengths should be interpreted for relative variety comparisons only.  
 \*\* WSSMV ratings are based on field evaluations in Colorado under pressure from wheat curl mite transmitted viruses. Scores may reflect both resistance to the wheat curl mite and resistance to mite-transmitted viruses.  
 +WSS ratings are based on field evaluation of tolerance to wheat stem sawfly cutting in Colorado. Values do not represent the level of stem solidness expression.  
 ++ PRO ratings represent "grain protein deviation" (relative grain protein level accounting for differences in grain yield).

Description of Winter Wheat Varieties in Eastern Colorado Dryland and Irrigated Trials (2022-2023)

Name/Class/Pedigree	Origin	HD	HT	SS	COL*	YR	LR	SR	WSMV**	TWSSS*	PRO**	MILL	BAKE	Comments	
Guardian	CSU 2019	6	7	7	5	3	4	2	1	3	7	2	4	3	CSU release (2019), marketed by PlainsGold. Medium height, medium maturity. Excellent resistance to WSMV due to combination of resistance to wheat curl mite and the virus itself. Good combined resistance to all three rusts, good test weight, good milling and baking quality, high grain protein deviation. Certified seed only.
Hard red winter															
Antero/Snowmass/Byrd															
Hatcher	CSU 2004	5	4	6	4	4	7	3	6	6	4	7	5	4	CSU release (2004), marketed by PlainsGold. Medium maturing semidwarf. Good test weight, moderate resistance to stripe rust, good milling and baking quality. Develops "leaf speckling" condition.
Hard red winter															
Yuma/PI 372129/IT AM-200/3/4*Yuma/4/KS91H184/Vista															
Kivari AX	CSU 2020	6	6	8	5	8	8	5	3	6	5	8	5	3	CSU release (2020), marketed by PlainsGold. CoAXium wheat for winter annual grassy weed control. Higher yielding and slightly later maturing than Crescent AX. Intermediate reaction to stripe rust and carries wheat curl mite resistance from Byrd parent. Certified seed only.
Hard red winter															
(AF28/Byrd)/(AF10/2*Byrd)															
KS Big Bow	KS-Manhattan 2022	5	5	4	3	4	--	2	2	3	--	5	4	4	KSU release (2022), marketed by the Kansas Wheat Alliance. First tested in 2023. Medium maturity and medium height. Resistant to WSMV.
Hard white winter															
KS050223M-2/KS11W15															
KS Dallas	KS-Hays 2019	5	4	7	7	4	2	1	2	4	5	4	3	3	KSU release (2019), marketed by the Kansas Wheat Alliance. First entered in CSU variety trials in 2020. Medium maturity, medium height, average straw strength, medium-long coleoptile, moderate to intermediate resistance to stripe rust, good leaf rust resistance, very good wheat streak mosaic virus resistance, good quality.
Hard red winter															
KS08HW112-6//TX03A0148/Danby TR															
KS Hamilton	KS-Hays 2020	5	1	5	3	5	5	4	3	5	3	4	5	5	KSU release (2020), marketed by the Kansas Wheat Alliance. First entered in CSU variety trials in 2020. Medium maturity, medium height, and good resistance to WSMV. Intermediate reaction to stripe rust and leaf rust.
Hard red winter															
KS08HW176-4//Bill Brown/KS08HW61-2															
KS Silverado	KS-Hays 2019	2	2	3	5	4	2	2	3	1	6	3	3	3	KSU release (2019), marketed by the Kansas Wheat Alliance. First entered in CSU variety trials in 2020. Early maturity, medium-short, good straw strength, good to moderate resistance to stripe rust, leaf rust, and wheat streak mosaic virus. Good test weight, good milling and baking quality, good pre-harvest sprouting tolerance.
Hard white winter															
KS05HW122-5-2//KS05HW15-2-2//KS06HW46-3															
KS Territory	KS-Hays 2022	5	5	1	3	4	4	4	2	5	--	5	4	4	KSU release (2022), marketed by the Kansas Wheat Alliance. First tested in the trial in 2023. Medium maturity, excellent straw strength, and resistant to WSMV and Triticum mosaic virus (TriMV).
Hard red winter															
KS11HW15/TX10A001006															
Langin	CSU 2016	1	4	8	4	3	6	8	6	5	6	6	5	2	CSU release (2016), marketed by PlainsGold. Early maturing semidwarf. Good drought stress tolerance and winterhardness, stripe rust resistance, and quality. Medium coleoptile. Carries wheat curl mite resistance from Byrd parent. Very high yield potential for irrigation, but straw strength requires use of growth regulator.
Hard red winter															
CO050270/Byrd															

**Column Key** - heading date (HD), plant height (HT), straw strength (SS), coleoptile length (COL), stripe rust resistance (YR), leaf rust resistance (LR), stem rust resistance (SR), wheat streak mosaic virus tolerance (WSMV), wheat stem sawfly tolerance (WSS), test weight (TW), protein (PRO), milling (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/long.

\* Coleoptile length ratings range from 1 = very short (~50 mm or ~2 in) to 9 = very long (~100 mm or ~4 in). Coleoptile lengths should be interpreted for relative variety comparisons only.

\*\* WSMV ratings are based on field evaluations in Colorado under pressure from wheat curl mite transmitted viruses. Scores may reflect both resistance to the wheat curl mite and resistance to mite-transmitted viruses.

+WSS ratings are based on field evaluation of tolerance to wheat stem sawfly cutting in Colorado. Values do not represent the level of stem solidness expression.

++ PRO ratings represent "grain protein deviation" (relative grain protein level accounting for differences in grain yield).

## Description of Winter Wheat Varieties in Eastern Colorado Dryland and Irrigated Trials (2022-2023)

Name/Class/Pedigree	Origin	HD	HT	SS	COL	YR	LR	SR	WSMV*	TW	WSS*	PRO**	MILL	BAKE	Comments
LCS Atomic AX	Limagrain 2019	2	5	3	3	1	2	9	--	4	8	4	2	4	Limagrain release (2019), first entered in CSU Variety Trials in 2021. CoAXium wheat for winter annual grassy weed control. Excellent straw strength and resistance to stripe rust. Certified seed only.
Hard red winter Undisclosed															
LCS Steel AX	Limagrain 2021	9	7	1	5	8	2	8	--	3	--	--	3	5	Limagrain release (2021). First entered into the trials in 2023. CoAXium wheat for winter annual grass weed control. Broad adaptation, very good leaf rust resistance and excellent straw strength. Certified seed only.
Hard red winter LCH13KSDH-20-87 / ACC 7-38															
Monarch	CSU 2018	6	2	3	5	5	5	2	4	4	3	7	5	4	CSU release (2018), marketed by PlainsGold. Hard white winter with excellent straw strength and very high irrigated yield potential. Good stripe rust resistance. Quality more similar to Breck, but very low PPO. Certified seed only.
Hard white winter CO07W722-F5/Snowmass/CO07W722-F5															
MS Maverick	Meridian Seeds 2022	7	5	3	5	1	1	3	--	2	--	5	3	5	Meridian Seeds Release (2021). Good overall disease package. Good grain quality
Hard red winter Undisclosed															
Ray	MT State 2018	9	9	7	3	2	--	8	--	6	--	4	4	4	Forage line available through the PlainsGold Brand with improved grain yield compared to other forage varieties.
Hard red winter Yellowstone*298X168E1															
Snowmass 2.0	CSU 2018	3	4	4	5	4	5	1	3	5	5	4	4	1	CSU release (2018), marketed by PlainsGold in CWRP-Ardent Mills Ultragrain Premium Program. Hard white wheat, quality profile very similar to Snowmass but low PPO and better grain protein deviation. Good stripe and stem rust resistance and wheat streak mosaic virus resistance. Good straw strength, good test weight. Certified seed only.
Hard white winter CO07W722-F5/Snowmass/Brawl CL Plus															
Steamboat	CSU 2020	6	9	7	6	3	3	3	2	3	5	6	3	4	CSU release (2020), marketed by Crop Research Foundation of Wyoming. Medium maturing, tall, marginal straw strength. Good resistance to all three rusts and carries resistance to the wheat curl mite from Byrd. Good test weight and milling and baking quality.
Hard red winter TAM 114/Antero/Byrd															
Sunshine	CSU 2014	3	6	7	5	5	6	2	7	6	6	4	4	3	CSU release (2014), marketed by PlainsGold in CWRP-Ardent Mills Ultragrain Premium Program. Hard white wheat. Excellent quality, good sprouting tolerance and straw strength, intermediate reaction to stripe rust. Very susceptible to mite-transmitted viruses. Certified seed only.
Hard white winter KS01HW152-6/HV9W02-267W															
SY Legend CL2	AgriPro 2018	4	3	5	2	3	3	--	4	5	7	2	6	5	AgriPro release (2018), first entered in CSU trials in 2018. Two-gene clearfield herbicide tolerance technology. Medium early and medium tall with good test weight. Above average leaf disease package.
Hard red winter AgriPro Exp/AP503 CL2 sib															

**Column Key** - heading date (HD), plant height (HT), straw strength (SS), coleoptile length (COL), stripe rust resistance (YR), leaf rust resistance (LR), stem rust resistance (SR), wheat streak mosaic virus tolerance (WSMV), wheat stem sawfly tolerance (WSS), test weight (TW), protein (PRO), milling (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/long.

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+WSS ratings are based on field evaluation of tolerance to wheat stem sawfly cutting in Colorado. Values do not represent the level of stem solidness expression.

++ PRO ratings represent "grain protein deviation" (relative grain protein level accounting for differences in grain yield).

Description of Winter Wheat Varieties in Eastern Colorado Dryland and Irrigated Trials (2022-2023)

Name/Class/Pedigree	Origin	HD	HT	SS	COL	YR	LR	SR	WSMV	TW	WSS	PRO	MILL	BAKE	Comments
SY Wolverine	Agripro 2019	4	1	2	5	4	2	2	4	5	6	2	2	6	Agripro release (2019), first entered in CSU trials in 2019. Good overall disease resistance, good straw strength. Similar to SY Wolf in reaction to wheat streak mosaic virus. Good test weight. Certified seed only.
Hard red winter Everest/Platte//SY Wolf															
Valley	CSU 2022	6	6	4	3	3	6	4	4	5	4	4	6	1	CSU release (2018), marketed by PlainsGold in CWRP-Ardent Mills Ultragrain Premium Program. White-seeded with excellent quality and good pre-harvest sprouting tolerance. Moderately resistant to stripe, leaf, and stem rust. Medium height and medium maturity.
Hard white winter CO07W722-F5/Antero//Snowmass															
Whistler	CSU 2018	7	8	9	5	3	6	1	2	6	6	5	7	3	CSU release (2018), marketed by PlainsGold. Hard red winter, later maturing, tall, marginal straw strength. Good stripe and stem rust resistance and carries wheat curl mite resistance from Byrd parent. Very good milling and baking quality.
Hard red winter CO08W218/Snowmass//Byrd															
Windom SF	CSU 2022	5	4	5	7	6	8	1	3	2	1	5	2	2	CSU release (2021), marketed by PlainsGold in CWRP-Ardent Mills Ultragrain Premium Program. White-seeded with strong mixing and baking properties. Semi-solid stem (16/25) for partial resistance to the wheat stem sawfly. Wsm2 for resistance to wheat streak mosaic virus. Very good test weight, long coleoptile, tolerance to lower pH. Certified
Hard white winter Warhorse/Breck//CO12D1028															

**Column Key** - heading date (HD), plant height (HT), straw strength (SS), coleoptile length (COL), stripe rust resistance (YR), leaf rust resistance (LR), stem rust resistance (SR), wheat streak mosaic virus tolerance (WSMV), wheat stem sawfly tolerance (WSS), test weight (TW), protein (PRO), milling (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/long.

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\*\* WSMV ratings are based on field evaluations in Colorado under pressure from wheat curl mite transmitted viruses. Scores may reflect both resistance to the wheat curl mite and resistance to mite-transmitted viruses.

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++ PRO ratings represent "grain protein deviation" (relative grain protein level accounting for differences in grain yield).

## Forage Wheat Trial Results

Sally Jones-Diamond and Joe Brummer

The 2022-2023 growing season was the second season of testing winter annual forages as a potential dual-purpose crop. There is little external information available on the quality and yield of forage for dual-purpose wheats as they have not been widely grown in our region. It is critical to possess local information about wheat varieties that have favorable forage characteristics with a potential for grain production and vice versa. This season we included two traditional grain wheat varieties to determine their suitability for potential forage production.

**Testing Methods:** Eight varieties were planted in small plots (6' by 30') next to the regular wheat variety trials at three dryland locations: Akron, Burlington, and Yuma. The eight varieties were Ray, Willow Creek, MTF1435, TAM 204, OK Corral, AP Baldy, Fortify SF, and Whistler. Forage sub-samples were cut from the center of the plots in May or June as each variety reached the early heading stage to determine forage yield and quality. Forage wet and dry weights were obtained and used to calculate dry matter yield along with hay quality information based on NIR analyses done at CSU. The remainder of the plots were harvested for grain (yield area adjusted to account for forage sampling), and grain test weight and protein analyses were performed.

Yield, test weight, and dry matter yield values were statistically analyzed, and least significant differences are provided under each location table to compare varieties within a location.

**Results:** We harvested forage and grain from all three sites. Forage dry matter yield, harvest moisture, and quality, along with grain yield and quality from the three locations are shown on the next page.

Wheat varieties developed for forage often produce low grain yields, as shown by Willow Creek, which produces a lot of dry matter but very low grain yield. Grain yield has been improved in the two newer varieties out of Montana, Ray and MTF-1435, to the point they would be acceptable dual-purpose wheats. OK Corral out of the Oklahoma breeding program produced acceptable forage yields and had the highest grain yield at two of the sites. At the Yuma site, the traditional wheat varieties, Whistler and Fortify SF, produced the highest grain yields.

When comparing forage quality among varieties, you want to see higher crude protein (CP), in vitro true dry matter digestibility (IVTDMD48), digestible neutral detergent fiber (dNDF48), and relative feed value (RFV) and lower acid detergent fiber (ADF), neutral detergent fiber (aNDF), and lignin. As with many forages, as dry matter yield increases, forage quality decreases which was evident with some of the varieties evaluated in this trial. The varieties developed in Montana (Willow Creek, Ray, and MTF-1435) tended to have higher forage yields but were lower in CP and higher in fiber (ADF and NDF), especially at the Yuma site. The higher yield was related to more stem production which tends to be lower in quality. A surprising variety was Fortify SF, which is a semi-solid stemmed variety. While it did not have the forage yield like some of the other varieties, it was leafy, had a soft texture, and an overall higher forage quality. If you had to pick one variety out of the ones evaluated for dual-purpose use, OK Corral would be a good choice due to its potential grain yield, intermediate forage yield, and high forage quality.

### Contributors

Sally Jones-Diamond, Director - Crops Testing Program, CSU Dept. of Soil & Crop Sciences, Phone: 970-214-4611, E-mail: sally.jones@colostate.edu

Dr. Esten Mason, Associate Professor & Wheat Breeder, CSU Dept. of Soil & Crop Sciences, Phone: 970-491-5787, E-mail: esten.mason@colostate.edu

Ed Asfeld, Research Associate - Crops Testing Program, CSU Dept. of Soil & Crop Sciences, Phone: 970-554-0980, E-mail: ed.asfeld@colostate.edu

Ron Meyer, Agronomy Specialist - Golden Plains Area, CSU Extension, Phone: 719-346-5571, E-mail: rf.meyer@colostate.edu

Michaela Mattes, Agronomy Specialist - Southeast Area, CSU Extension, E-mail: michaela.mattes@colostate.edu

Kat Caswell, Agronomy Specialist - Washington and Weld Counties, CSU Extension, Phone: 970-381-8533, E-mail: kat.caswell@colostate.edu

Dr. Joe Brummer, Emeritus Associate Professor & Forage Specialist, CSU Dept. of Soil & Crop Sciences, Phone: 970-430-9357 (cell), E-mail: joe.brummer@colostate.edu

Judy Harrington, Research Associate - Crops Testing Program, CSU Dept. of Soil & Crop Sciences, E-mail: judy.harrington@colostate.edu

Ayden Marler, Undergraduate Research Assistant - Crops Testing Program, CSU Dept. of Soil & Crop Sciences, E-mail: ayden.marler@colostate.edu

Kevin Larson, Superintendent & Research Scientist - Plainsman Research Center, CSU Agricultural Experiment Station, Phone: 719-324-5643, E-mail: kevin.larson@colostate.edu

Dr. Kyle Mankin, Research Leader, USDA-ARS Water Management and Systems Research Unit, Phone: 970-492-7401, E-mail: kyle.mankin@usda.gov

Dr. Peter Kleinman, Research Leader, USDA-ARS Soil Management and Sugarbeet Research Unit, Phone: 970-492-7200, E-mail: peter.kleinman@usda.gov

Brett Pettinger, Research Associate - Plainsman Research Center, CSU Agricultural Experiment Station, Phone: 719-324-5643, E-mail: brett.pettinger@colostate.edu

#### Additional Resources

Colorado State University Crop Variety Testing Program: [www.csucrops.com](http://www.csucrops.com) and on Twitter with the handle @CSUCrops

Colorado State University Wheat Breeding Program: [www.agsci.colostate.edu/wheat/](http://www.agsci.colostate.edu/wheat/)  
Wheat Variety Performance Database: [www.wheattrials.com](http://www.wheattrials.com)

Colorado Wheat Administrative Committee (CWAC), Colorado Association of Wheat Growers (CAWG), and Colorado Wheat Research Foundation (CWRWF): [www.coloradowheat.org](http://www.coloradowheat.org)

### Acknowledgments

The authors are grateful for support received from Colorado State University and for the funding received from the Colorado Wheat Administrative Committee and the Colorado Wheat Research Foundation. We are thankful to Kierra Jewell (Dept. of Soil & Crop Sciences); Emily Hudson-Arms, Scott Seifert, John Stromberger, and Amanda Amsberry (Wheat Breeding Program); Karl Whitman (Agricultural Research, Development and Education Center, Fort Collins); and Cody Hardy, Dave Poss, and Paul Campbell (USDA-ARS Central Great Plains Research Center, Akron), for their work and collaboration that make these trials and this report possible.

The authors are thankful for the cooperation and selfless contributions of land, labor, and equipment made by the following Colorado wheat farmers who consented to having wheat variety performance trials conducted on their farms: Stulp Farms (Lamar, Prowers County), Scherler Farms (Brandon, Kiowa County), Matt Campbell (Arapahoe, Cheyenne County), Hinkhouse and Yahn (Burlington, Kit Carson County), Carlson Farms (Julesburg, Sedgwick County), Cooksey Farms LLC (Hoyt, Adams County), Cooksey Family Farms (Roggen, Weld County), Homestead Farms (Genoa, Lincoln County), Wickstrom Farms (Orchard, Morgan County), Gold Track Farms (Haswell, Lincoln County), Mertens Bros. Inc. (New Raymer, Weld County), Tim Dorman (Burlington, Kit Carson County), and Andrews Brothers Farms (Yuma, Yuma County). We thank Syngenta Crop Protection for their generous donation of seed treatment product used for the variety performance trials.

We are very thankful for the efforts and sacrifices made by Colorado wheat producers who contributed time, land, and equipment to the success of the Collaborative On-Farm Test (COFT) program. Participating COFT farmer-collaborators in 2022-2023 were: Alan Linnebur, Darren Bauder, Shelby Britten, Brian Brooks, Matt Campbell, John Deering, Jim Diamond, Joel Dracon, Tom Jacobs, Andy Jones, Tabor Kalcevic-Erker, Kelly Kinney, Kevin Larson, Josh Lechman, Rex May, Nate McCaffrey, Laura and Jayce Negley, Gary Price, John Sauter, Brett Shelton, Tim Stahlecker, Brian Starkebaum, Rod Strand, Jensen Stulp, Jeremy Stulp, and Galen Travis. We appreciate the Tempel Grain elevator (Wiley, CO) for analyzing COFT grain samples for protein.

\*\*Mention of a trademark proprietary product does not constitute endorsement by the Colorado Agricultural Experiment Station.

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## 2023 Dryland Winter Forage Variety Performance Trials at Akron, Burlington, and Yuma



Brand/Source	Variety	Grain Harvest			Forage Harvest		Forage Quality <sup>a</sup>							
		Yield bu/ac	Test Weight lb/bu	Protein percent	Dry Matter Yield ton/ac	Moisture % at harvest	Harvest Date	CP	ADF	aNDF	dNDF48 percent	LIGNIN	IVTDMD48	RFV
<b>Akron</b>														
Montana State Univ.	MTF1435	56.0	47	12.7	<b>4.4</b>	79	7-Jun	7.0	37.8	66.4	36.4	5.4	73.9	83
PlainsGold	Ray	57.5	42	12.9	<b>4.2</b>	78	8-Jun	6.3	37.2	65.7	37.9	4.6	75.4	85
Watley Seed	TAM 204	77.0	49	12.9	<b>4.2</b>	78	28-May	9.3	31.4	59.8	37.3	4.1	80.6	101
Montana State Univ.	Willow Creek	31.5	48	13.8	3.8	80	13-Jun	6.3	40.4	67.1	36.2	5.9	71.9	80
Oklahoma Genetics, Inc	OK Corral	<b>94.0</b>	<b>52</b>	12.0	3.6	79	31-May	11.1	31.8	60.4	38.7	3.8	82.2	99
PlainsGold	Whistler	77.5	50	11.9	3.3	80	31-May	9.3	32.2	61.5	37.2	4.0	79.8	97
AgriPro	AP Baldy	71.0	<b>52</b>	12.3	3.2	80	31-May	10.7	33.1	60.2	35.6	4.0	79.6	98
PlainsGold	Fortify SF	76.5	<b>52</b>	11.1	3.1	75	28-May	9.9	31.8	59.4	36.5	3.9	81.2	101
	Average	67.5	49	12.5	3.7	79	2-Jun	8.7	34.4	62.6	37.0	4.5	78.1	93
	LSD (0.30) <sup>b</sup>	6.0	1		0.5									
	LSD (0.05) <sup>b</sup>	12.0	3		NS									
	Coefficient of Variation (CV)	10.1	3.1		13.7									

Brand/Source	Variety	Grain Harvest			Forage Harvest		Forage Quality <sup>a</sup>							
		Yield bu/ac	Test Weight lb/bu	Protein percent	Dry Matter Yield ton/ac	Moisture % at harvest	Harvest Date	CP	ADF	aNDF	dNDF48 percent	LIGNIN	IVTDMD48	RFV
<b>Burlington</b>														
Montana State Univ.	Willow Creek	42.5	54	13.5	<b>4.4</b>	77	7-Jun	5.1	41.4	69.4	34.2	6.7	66.8	76
PlainsGold	Whistler	84.5	54	11.4	<b>4.2</b>	86	22-May	10.7	31.3	61.6	37.2	3.8	79.6	97
Montana State Univ.	MTF1435	77.0	53	11.4	<b>4.2</b>	78	26-May	7.2	35.7	65.3	34.5	4.6	72.7	87
PlainsGold	Ray	73.5	44	11.7	<b>4.1</b>	78	26-May	10.6	31.3	59.4	36.2	3.0	81.0	101
Oklahoma Genetics, Inc	OK Corral	<b>92.0</b>	55	11.7	3.3	85	22-May	10.5	29.2	58.2	37.2	3.3	82.4	106
AgriPro	AP Baldy	83.0	<b>58</b>	11.8	3.3	77	22-May	10.9	29.5	59.0	35.8	4.1	79.8	104
PlainsGold	Fortify SF	79.0	56	10.7	2.9	78	19-May	12.3	29.3	58.8	35.8	3.3	81.4	104
Watley Seed	TAM 204	<b>91.5</b>	55	11.9	2.8	78	19-May	11.0	30.2	59.8	35.0	3.6	79.3	102
	Average	78.0	54	11.8	3.6	80	24-May	9.8	32.2	61.4	35.7	4.0	77.9	97
	LSD (0.30) <sup>b</sup>	4.0	1		0.3									
	LSD (0.05) <sup>b</sup>	8.0	1		0.7									
	Coefficient of Variation (CV)	5.7	1.4		10.0									

Brand/Source	Variety	Grain Harvest			Forage Harvest		Forage Quality <sup>a</sup>							
		Yield bu/ac	Test Weight lb/bu	Protein percent	Dry Matter Yield ton/ac	Moisture % at harvest	Harvest Date	CP	ADF	aNDF	dNDF48 percent	LIGNIN	IVTDMD48	RFV
<b>Yuma</b>														
Montana State Univ.	MTF1435	45.5	49	11.6	<b>4.2</b>	78	7-Jun	2.2	41.1	72.1	35.8	5.8	66.1	73
Montana State Univ.	Willow Creek	26.0	50	12.8	<b>4.1</b>	75	13-Jun	4.9	38.2	67.6	36.3	5.1	71.2	82
PlainsGold	Ray	49.5	48	11.0	3.4	78	7-Jun	3.5	38.2	66.8	37.0	4.5	73.0	83
Oklahoma Genetics, Inc	OK Corral	55.5	55	12.5	3.2	76	28-May	7.2	31.2	60.0	36.7	3.1	79.6	100
PlainsGold	Whistler	<b>62.0</b>	55	14.5	3.2	78	31-May	4.4	35.0	66.5	36.5	4.3	73.1	86
PlainsGold	Fortify SF	<b>66.5</b>	<b>58</b>	12.8	3.0	79	28-May	7.5	33.8	64.4	37.4	3.7	76.9	91
Watley Seed	TAM 204	54.0	52	10.9	2.8	77	28-May	7.7	31.5	61.6	36.7	3.6	77.9	98
AgriPro	AP Baldy	53.5	55	11.4	2.3	81	31-May	7.5	32.0	61.3	35.6	4.2	76.9	97
	Average	51.5	53	12.2	3.3	78	2-Jun	5.6	35.1	65.1	36.5	4.3	74.3	89
	LSD (0.30) <sup>b</sup>	4.5	1		0.4									
	LSD (0.05) <sup>b</sup>	9.0	1		0.8									
	Coefficient of Variation (CV)	9.6	1.5		12.9									

<sup>a</sup>All forage quality analyses results are dry basis values. CP=crude protein; ADF=acid detergent fiber; aNDF=neutral detergent fiber; dNDF48= digestible neutral detergent fiber at 48 hours; IVTDMD48=in vitro true dry matter digestibility at 48 hours; and RFV=relative feed value.

<sup>b</sup>If the difference between two variety yields equals or exceeds the LSD value, the difference is significant. Farmers selecting a variety based on yield should use the LSD (0.30) to protect from false negative decisions. Companies or researchers may be interested in the LSD (0.05) to avoid false positive conclusions.

Trials were harvested for grain on July 13 (Burlington), July 19 (Yuma), and August 5 (Akron).

The data included in this table may not be republished without permission.  
 Contact Sally Jones-Diamond (sally.jones@colostate.edu) or Joe Brummer (joe.brummer@colostate.edu)



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 Craig Schenck, Vice President ..... Holly  
 Walter Henes, Secretary ..... Dolores  
 Steve Andrews, Treasurer ..... Yuma

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 Linda Munk ..... Certification Manager  
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 Melanie Lingo ..... Wheat Inspector  
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Barry Ogg ..... Manager  
 Laura Pottorff ..... Director of Seed Programs

## Colorado Seed Laboratory

Randy Crowl ..... Manager  
 Laura Pottorff ..... Director of Seed Programs  
 Rochelle Gorman ..... Analyst  
 Lauren Ross ..... Analyst

## Foreword

The Colorado Seed Growers Association (CSGA) is a non-profit educational and service organization, affiliated with Extension of Colorado State University and authorized by the Colorado State Legislature as the official seed certifying agency in Colorado. Growers listed in this directory are members of the CSGA, producing certified seed in accordance with the rules and regulations of the Association. CSGA is a member of the Association of Official Seed Certifying Agencies (AOSCA). AOSCA is an organization composed of agencies responsible for seed certification in the United States, Canada, Argentina, Australia, Chile, New Zealand, Panama and South Africa. The following listings include fields eligible for certification in 2022. Each seed producer is responsible for maintaining the integrity of the certifiable seed listed herein. Final certification and the right to represent the seed as certified is dependent upon the results of field inspection, proper seed conditioning and laboratory analysis.

Growers warrant that seed sold by them conforms to the standards of the CSGA and to applicable state and federal seed laws. Certified seed may be sold bagged or in bulk. Bagged seed must be packaged in new containers and have an official certified tag or label attached to each bag. Each sale of certified seed in bulk must be accompanied by a bulk sales certificate completed and signed by the producer.

Colorado Seed Law requires that each container be labeled as to its origin, the germination percentage and date tested, percent by weight pure seed, other crop seed, weed seed and inert matter. In addition, the label must contain a lot number or lot identification, along with the name and address of the person who labeled or sold the seed.

The CSGA assumes no financial responsibility for seed listed in this directory or for disagreements over sales which may arise from this list. However, any complaints or irregularities should be reported to the CSGA office.

## Foundation Seed

Foundation seed of public varieties is produced by CSU Agronomy Foundation Seed, Department of Soil and Crop Sciences, Colorado State University.

Foundation seed of the following varieties is available for planting in the Fall of 2022. Foundation Seed orders will be accepted until August 17, 2022, after which the seed will be allocated. Individual orders should be placed with Tyler Benninghoven with Colorado Wheat. Please call Tyler at 970-702-1460 (cell) or 970-449-6994 (office). You may also email Tyler at tbenninghoven@coloradowheat.org.

CSU Agronomy Foundation Seed is located at the Ag Research Development and Education Center (ARDEC) on the east frontage road along I-25 north of Fort Collins; shipping can be handled with prior arrangements. Any seed ordered but not paid for or picked up by September 15, 2022 will be released to other growers.

**Foundation seed will be treated and packaged in 2,000 lb totes!**

## SEED AVAILABLE TO CWRP PARTICIPANTS - FALL 2022

### HARD RED WINTER WHEAT

Amplify SF	Avery	Byrd
Canvas		Fortify SF
Guardian		Langin
Ray		Whistler

**Clearfield:** Brawl CL Plus and Byrd CL Plus

**CoAXium:** Crescent AX, Incline AX and Kivari AX

### HARD WHITE WINTER WHEAT

Antero	Breck
Monarch	Sunshine
Snowmass	Snowmass 2.0

## Seed Arbitration

The Colorado Seed Law mandates for the arbitration of disputes between seed buyer and seller. The law states that all seed sold shall be tagged with a notice of the required arbitration.

If the seed buyer believes that the seed did not perform as warranted, a claim may be filed with the Colorado Commissioner of Agriculture. The law provides for a board who will hear testimony, review evidence and decide the validity of the claim. Findings of the board are not binding but may be used as evidence in any civil suit.

Further information on arbitration or assistance in filing for arbitration should be directed to the Colorado Department of Agriculture at 303-869-9070.

**NOTICE: Listings are based on acres applied for. Eligibility for certification will depend on satisfactory field and seed inspections.**

## Wheat Stem Sawfly Tolerant Wheats

The wheat stem sawfly (WSS) is a native grass insect that has emerged as a significant threat to winter wheat in Colorado. Female sawflies lay eggs when they emerge in the spring, inserting eggs into the first available internode. Larvae develop and move down the stem, feeding as they go. Feeding injury weakens the wheat stems, and cutting at the base of the stem by the larvae just prior to harvest causes lodging. Wheat breeding programs are aimed at finding varieties that can tolerate sawfly damage and continue to stand up while sustaining some level of damage from larval feeding.

Several wheat varieties are now available with tolerance to wheat stem sawfly. These varieties contain a gene called 'Sst1' that confers stem solidness of varying degrees depending on the variety. The solid stem characteristic has been shown to be effective in reducing damage caused by wheat stem sawfly.

Several wheat breeding programs around the region are incorporating the solid stem trait into their varieties, include CSU, Syngenta, and WestBred. The wheat breeding program at Colorado State University is initiating long term research into novel methods for making the wheat plant less attractive to the sawfly. CSU entomologists are also researching the presence and effectiveness of natural enemies to supplement solid stem wheat breeding tactics for sawfly management.

### Fact Sheet:

Wheat Stem Sawfly: A New Pest of Colorado  
 Wheat - 5.612 - Extension (colostate.edu)

Seed Classes

Seed certification relies on a generation sequence of seed increase from the original Breeder seed through two or three subsequent generations. The number of generations beyond Breeder seed is determined by the originator at the time a variety is formally released. These generations are often identified as classes, and each class is produced and handled to maintain genetic purity. The primary advantage is that seed sold to a farmer is never more than a limited number of multiplications from that produced under the breeder's control. The limited generation system, when coupled with strict production and seed standards, assures genetically pure high-quality seed.

**Breeder** - Breeder seed shall be that seed or vegetative propagating material directly controlled by the originating or sponsoring plant breeder, institution, or firm which provides the source for the initial and recurring increase of Foundation seed. (B)

**Registered** - Registered seed is the progeny of Foundation seed. Registered seed, when a Registered class is designated, is the parent stock for the production of Certified seed. (R)

**Foundation** - Foundation seed is produced from Breeder seed and maintained by state agricultural experiment stations or private companies. Foundation seed is the source of Registered and/or Certified seed. (F)

**Certified** - Certified seed is the progeny of Foundation or Registered seed. Certified seed is the planting stock recommended for commercial production. (C)

Plant Variety Protection Act and Federal Seed Law, Title V

The Plant Variety Protection ACT (PVPA) was signed into law on December 24, 1970. The PVPA's objective is to encourage the development of novel varieties of sexually-reproduced plants and make them available to the public, providing protection to those who breed, develop, or discover them, and thereby promoting agricultural progress in the public interest. The U.S. Dept. of Agriculture is responsible for administering the Act.

A Certificate of Protection is valid 20 years from date of issuance in most cases. The owner has the right to exclude others from selling, offering for sale, reproducing, importing, or exporting the variety during this time. The owner is responsible for enforcing these rights.

Two options for plant variety protection are available to the developer of the variety. The first option enables the developer to sell or authorize for sale either certified or uncertified seed of the variety. The second option is the "certification only" option which utilizes provisions of Title V of the Federal Seed Act. A variety protected in this manner may be sold by variety name only as a class of certified seed. Sale of non-certified seed by variety name is in violation of both the certificate owner's rights and federal and state seed laws. Seed may be called "Certified" only after meeting all requirements and standards of a member of the Association of Official Seed Certifying Agencies (AOSCA). Violators of Title V may be prosecuted by the federal or state government. Most newly released varieties are protected under the "certification only" option. Contact CSGA with questions regarding PVP status of varieties.

Utility Patents

Utility patents are another means of protection for developers of new plant varieties. The CLEARFIELD and COAXIUM wheat technologies are protected under U.S. Patent law and can be used by farmers only if they sign an appropriate Stewardship Agreement for the year in which they will grow CLEARFIELD or COAXIUM wheat. The agreement requires that the farmer, among other things, use CLEARFIELD or COAXIUM wheat solely for planting a single commercial crop.

Questions and Answers on Plant Variety Protection

**Q:** What are the benefits of PVP for farmers?

**A:** The Plant Variety Protection Act was designed to promote the development of new plant varieties. It allows the breeder to recoup some of the development costs, often through royalties, to reinvest in future variety development programs.

**Q:** What does PVPA Title V protection mean?

**A:** The variety can only be SOLD as a class of certified seed. Sales of non-certified seed of these varieties is illegal.

**Q:** Can a farmer save seed of a protected variety?

**A:** For varieties protected under 1994 PVPA, yes. A farmer can save seed to plant on his own holdings (land owned, leased, or rented). For varieties protected by CLEARFIELD or COAXIUM Utility Patent, no. New certified seed must be purchased each year.

**Q:** Can a farmer sell seed of a protected variety?

**A:** For varieties protected under 1994 PVPA or Utility Patent, no, unless permission is given by the variety owner. Contact CSGA if you do not know what protection a variety is covered by.

**Q:** In an effort to get around the law, can a farmer advertise farmer-saved seed of a protected variety as "Variety Not Stated" (VNS)?

**A:** No, selling a protected variety as VNS is a violation of the law.

**Q:** Can I condition/clean seed for a farmer?

**A:** Yes, but any actions taken as a step in marketing farmer-saved seed infringes upon the rights of the variety owner. Under the 1994 PVPA, cleaning or storing farmer-saved seed for sale are infringements. Anyone who cleans or conditions farmer-saved seed should keep written documentation from the farmer stating that the seed being cleaned is not in violation of PVP laws or patents.

Approved Certified Seed Conditioners

The Approved Conditioner Program in Colorado is designed to fill the need for efficient cleaning and distribution of Colorado Certified Seed. Approved seed conditioners are regular members of the Colorado Seed Growers Association and provide quality assurance for the seed producer and the seed customer. An approved conditioner is not only responsible for cleaning certified seed, but also serves as a connection between the seed producer and the seed trade. Approved conditioners include: 1) firms that are authorized to purchase field-approved seed and move it into their plants for conditioning, submit samples for laboratory analysis, order tags, labels or bulk sales certificates, and merchandise the finished product, and 2) firms that provide seed cleaning and handling services which prepare the certifiable seed to be marketed by its grower. According to CSGA standards, all certifiable hard red winter wheat must be cleaned by an approved conditioner that has secondary equipment capable of removing jointed goatgrass. Such conditioners are noted with \*. The following list does not include seed producers approved to condition only their own seed.

<b>AAA Vidas Mobile Seed Cleaning*</b> .... Goodland, KS (Portable).....	409-795-0123
<b>Andrews Brothers Seed*</b> ..... Yuma.....	970-848-0709
<b>Colorado Seed, LLC*</b> ..... Monte Vista.....	719-852-3505
<b>Cooksey Farm*</b> ..... Roggen (Portable).....	970-396-9084;
	970-396-8041
<b>Grain Conditioning 2 Inc.*</b> ..... Conifer (Portable).....	724-650-5774
<b>Heritage Seed &amp; Grain, LLC*</b> ..... Flagler.....	719-760-9768
<b>Kalcevic Farms Inc.*</b> ..... Bennett.....	303-644-3443
<b>Midcap Seed &amp; Grain*</b> ..... Wiggins.....	970-483-5265
<b>The Pachner Outfit*</b> ..... Gage, OK (Portable).....	580-273-5094
<b>Paoli Farmers Coop*</b> ..... Paoli.....	970-774-7234
<b>Perry Bros. Seed, Inc.*</b> ..... Otis.....	970-246-3401
<b>Producers Co-op</b> ..... Olathe.....	970-650-2520
<b>Progressive Capital</b> ..... Byers.....	720-244-6775
<b>Revolution Soil and Seed*</b> ..... Fort Lupton.....	970-556-5425
<b>Roggen Farmers Elevator</b> ..... Roggen.....	303-849-5506
<b>Southwest Seed Inc.</b> ..... Dolores.....	970-565-8722
<b>Splitter Farms*</b> ..... Sheridan Lake (Portable).....	719-729-3567
<b>Twin Peaks Seed &amp; Grain, LLC*</b> ..... Longmont.....	303-772-7333
<b>Wagers Seed*</b> ..... Woodrow (Portable).....	970-554-0057
<b>Worley Family Farms, LLC</b> ..... Monte Vista (Portable).....	719-852-4097

## HARD RED WINTER WHEAT

**AMPLIFY SF HARD RED WINTER WHEAT** - Amplify SF hard red winter wheat was released by Colorado State University (CSU) in 2021. Amplify SF has a semi-solid stem conferring partial resistance to the wheat stem sawfly and has shown much less stem cutting than hollow-stem varieties under severe sawfly pressure. Amplify SF has a stem solidness rating of 16.5 on a scale of 5 to 25, with 5 being completely hollow and 25 being completely solid. Amplify SF is derived from the cross Bearpaw/Antero//Antero, and is thus 75% Antero by parentage. Amplify SF is an awned, white-chaffed, medium-late maturing wheat with medium plant height, a medium-long coleoptile, very good test weight, and good straw strength in the absence of the wheat stem sawfly. Amplify SF has shown good dryland yields (better under sawfly pressure), good drought stress tolerance and winterhardiness, intermediate grain protein content (measured as "grain protein deviation"), and average milling and baking quality. Amplify SF is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand. Certified seed of Amplify SF will be sold as "Certified Seed Only", grain production may not be saved for replanting under any circumstances. Unauthorized Propagation Prohibited – To Be Sold By Variety Name Only As A Class Of Certified Seed – U.S. Protected Variety – 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Adams</b>		
Kalcevic Farms Inc.	Bennett	303-644-3443 R & C
Progressive Capital	Byers	720-244-6775 R & C
Trupp's Certified Seed	Bennett	303-644-3646 R & C
<b>Elbert</b>		
Kochis Farms	Matheson	719-775-2596 C
<b>Kit Carson</b>		
Eastern Colorado Seeds, LLC.	Burlington	866-655-7380 C
Farm S Inc. (Tim Stahlecker)	Bethune	719-342-3197 R & C
<b>Logan</b>		
Anderson Wheat Farms	Haxtun	970-774-4143 R & C
Jaeger Farms	Merino	970-520-3056 R
Ring, Terry	Crook	970-253-5009 R & C
<b>Morgan</b>		
Midcap Seed & Grain	Wiggins	970-483-5566 R & C
Wickstrom, Inc.	Orchard	970-768-1384 R & C

<b>Phillips</b>			
Eagle Farms	Holyoke	970-854-5328	C
<b>Washington</b>			
Pachner Agri-Enterprises	Akron	970-554-0645	R & C
Wagers Seed	Woodrow	970-842-2022	C
<b>Weld</b>			
Cooksey Farms	Roggen	970-396-9084	R & C
		970-396-8041	
Mertens Bros.	New Rayermer	970-370-0153	R & C
<b>Yuma</b>			
Andrews Brothers Seed, Inc.	Yuma	970-848-0709	C

**AP BIGFOOT HARD RED WINTER WHEAT** - AP Bigfoot is a hard red winter wheat developed by Syngenta Crop Protection AG. AP Bigfoot was selected for height, maturity and green leaf duration. Selection in future generations was based on yield, disease, and quality. The area of adaptation includes Central, Southern, and Western Plains. No claims are made regarding pest resistance. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS	
<b>Sedgwick</b>			
Carlson Grain	Julesburg	970-474-2715	C
<b>Yuma</b>			
Andrews Brothers Seed, Inc.	Yuma	970-848-0709	C

**AP ROADRUNNER HARD RED WINTER WHEAT** - AP RoadRunner is a hard red winter wheat developed by Syngenta Crop Protection AG. AP RoadRunner was selected for height, maturity, green leaf duration, disease reaction, and end use quality. AP RoadRunner is a well-adapted bread wheat to the irrigated and dryland production areas of the Central Dryland and Western Dry and Irrigated High Plains. AP RoadRunner is moderately resistant to common races in the Central Plains of leaf rust and moderately susceptible to common races of stripe rust in the Central Plains. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety - 1994 PVPA.

**WB4733CLP | WB4792**

## SEIZE THE SEASON WITH WHEAT THAT'S CENTRAL REGION STRONG.

To get the most out of your fields, you need wheat that can endure the region's toughest challenges. Varieties like **WB4733CLP**, a Clearfield® Plus variety, offer excellent standability, while **WB4792** has excellent yield potential and test weight. Trust WestBred® to help you get the most out of every acre.

**Now's the Time. Boldly Grow. Seize the Season.**



COUNTY/NAME/CITY	PH	CLASS
<b>Logan</b> Ring, Terry	Crook	970-253-5009 C
<b>Sedgwick</b> Carlson Grain	Julesburg	970-474-2715 C

**AP SOLID HARD RED WINTER WHEAT** - AP Solid is a hard red winter wheat developed by Syngenta Crop Protection AG. AP Solid was selected for height, maturity, stem solidness, green leaf duration, disease reaction, and end use quality in yield and disease test plots following doubled haploid method. AP Solid was tested in Kansas, Oklahoma, Colorado, Nebraska, South Dakota and Montana and is well-adapted as to be a high yielding bread wheat in Montana. AP Solid is moderately susceptible to common stripe rust races in the Central Plains. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Variety Protection Applied For - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Kit Carson</b> Heritage Seed & Grain	Flagler	719-760-9768 R & C
<b>Logan</b> Ring, Terry	Crook	970-253-5009 R & C
<b>Sedgwick</b> Carlson Grain	Julesburg	970-474-2715 C
<b>Washington</b> Wagers Seed	Woodrow	970-842-2022 R & C
<b>Yuma</b> Andrews Brothers Seed, Inc.	Yuma	970-848-0709 R & C

**AVERY HARD RED WINTER WHEAT** - Avery hard red winter wheat was released by Colorado State University (CSU) in 2015. Avery is an awned, white-chaffed, medium maturing wheat with medium -tall height, a medium coleoptile, good straw strength, and good test weight. Avery is derived from the cross TAM 112/Byrd. Avery is very similar to Byrd in having good winterhardness, excellent drought stress tolerance, and very high yield potential. Avery differs from Byrd in having slightly larger kernels, and being two days later in heading date, Avery is susceptible to prevalent races of stripe rust, leaf rust and stem rust, but performs very well against wheat streak mosaic virus due to presence of the wheat curl mite resistance gene. Avery is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety. - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Baca</b> Brooks, Bill	Walsh	719-523-4473 C
<b>Elbert</b> Kochis Farms	Matheson	719-775-2596 C
<b>Kit Carson</b> Farm S Inc. (Tim Stahlecker)	Bethune	719-342-3197 C
<b>Logan</b> Anderson Wheat Farms	Haxtun	970-774-4143 R & C

Ring, Terry	Crook	970-253-5009 C
<b>Yuma</b> Andrews Brothers Seed, Inc.	Yuma	970-848-0709 C

**BRAWL CL PLUS HARD RED WINTER WHEAT** - Brawl CL Plus was released by Colorado State University in 2011. It is an awned, white-chaffed, medium height, early maturing wheat with excellent straw strength and very good test weight. Brawl CL Plus is moderately susceptible to stripe rust, leaf rust and stem rust. Brawl CL Plus is a two-gene Clearfield wheat which allows growers to add methylated seed oil to the tank mix with Beyond™ herbicide and increase effectiveness of the herbicide, especially on jointed goatgrass. Brawl CL Plus makes protein very well and has very good milling and baking quality. **Grain production of Brawl CL Plus may not be saved for replanting under any circumstances.** Brawl CL Plus is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety. - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Adams</b> Progressive Capital	Byers	720-244-6775 C
<b>Elbert</b> Kochis Farms	Matheson	719-775-2596 R
<b>Logan</b> Dickinson, Danny	Crook	970-253-5005 C
Ring, Terry	Crook	970-253-5009 R & C
<b>Phillips</b> Eagle Farms	Holyoke	970-854-5328 R & C
<b>Sedgwick</b> Carlson Grain	Julesburg	970-474-2715 C

**BYRD HARD RED WINTER WHEAT** - Byrd was released by Colorado State University (CSU) in 2011. It is an awned, white-chaffed, medium-early wheat that is medium in height, has very good test weight and fair straw strength. Byrd is susceptible to stripe rust, leaf rust, and stem rust. Byrd is resistant to prevailing biotypes of the wheat curl mite, the vector of wheat streak mosaic and other viruses. Byrd shows high dryland and irrigated yields, excellent drought stress tolerance, and very good milling and baking quality. Byrd is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety. - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Yuma</b> Andrews Brothers Seed, Inc.	Yuma	970-848-0709 C

**BYRD CL PLUS HARD RED WINTER WHEAT**- Byrd CL Plus was released by Colorado State University (CSU) in 2018 and is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand. It is an awned, white-chaffed, medium-tall, and medium maturing wheat with a medium-short

NEW SEASON.  
NEW VARIETIES.





WHEAT  
ALLIANCE

KS TERRITORY

HARD RED WINTER



WHEAT  
ALLIANCE

KS BIG BOW

HARD WHITE WINTER

HARD RED WINTER

KS PROVIDENCE  
KS WESTERN STAR  
OAKLEY CL

HARD WHITE WINTER

KS SILVERADO • JOE

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COMING FALL 2024

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coleoptile, moderate straw strength, good milling and baking quality, and average test weight. Byrd CL Plus is a two-gene Clearfield wheat which allows growers to add methylated seed oil to the tank mix with Beyond™ herbicide and increase effectiveness of the herbicide, especially on jointed goatgrass. Byrd CL Plus is susceptible to stripe rust and stem rust, susceptible to stem rust, intermediately susceptible to leaf rust, and shows an intermediate reaction to wheat streak mosaic virus. **Grain production of Byrd CL Plus may not be saved for replanting under any circumstances.** Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety. - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Adams</b> Kalcevic Farms Inc.	Bennett	303-644-3443 R
<b>Kit Carson</b> Eastern Colorado Seeds, LLC.	Burlington	866-655-7380 C
Farm S Inc. (Tim Stahlecker)	Bethune	719-342-3197 C
<b>Logan</b> Anderson Wheat Farms	Haxtun	970-774-4143 R & C
<b>Moffat</b> Wayne Counts	Craig	970-326-8572 R
<b>Morgan</b> Midcap Seed & Grain	Wiggins	970-483-5566 C
<b>Sedgwick</b> Carlson Grain	Julesburg	970-474-2715 C
<b>Washington</b> Pachner Agri-Enterprises	Akron	970-554-0645 C
<b>Weld</b> Cooksey Farms	Roggen	970-396-9084 C 970-396-8041
Johnston Family Farms	Erie	303-591-8830 C
Mertens Bros.	New Raymer	970-370-0153 C
<b>Yuma</b> Andrews Brothers Seed, Inc.	Yuma	970-848-0709 C

**CANVAS HARD RED WINTER WHEAT** - Canvas hard red wheat was released by Colorado State University (CSU) in 2018. Canvas is an awned, white-chaffed, medium maturing wheat with medium-short plant height, a medium length coleoptile, and excellent straw strength and test weight. Canvas is derived from the cross Denali/Antero//Byrd, and is thus 50% Byrd and 25% each Denali and Antero by parentage. Canvas has shown high dryland yields and particularly good adaptation to high management under irrigation. Canvas has good winterhardiness, intermediate grain protein content (measured as "grain protein deviation"), and excellent milling and baking quality. Canvas is moderately resistant to prevalent races of stripe rust (including both 2010 and 2012 races), intermediate to leaf rust, resistant to stem rust, moderately resistant to wheat soilborne mosaic virus, susceptible to prevalent biotypes of Hessian fly, and resistant to the wheat curl mite which effectively reduces infection by wheat streak mosaic virus. Canvas is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Kit Carson</b> Eastern Colorado Seeds, LLC.	Burlington	866-655-7380 C
Farm S Inc. (Tim Stahlecker)	Bethune	719-342-3197 C
<b>Phillips</b> Eagle Farms	Holyoke	970-854-5328 R & C
<b>Prowers</b> Doug Melcher Seeds	Holly	719-537-6214 R & C
<b>Weld</b> Cooksey Farms	Roggen	970-396-9084 C

**CRESCENT AX HARD RED WINTER WHEAT** - Crescent AX was released by Colorado State University (CSU) in 2018 and is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand. It is an awned, white-chaffed, medium height, and early maturing wheat with moderate straw strength, very good milling and baking quality and good test weight. The pedigree of Crescent AX is (AF28/Byrd)/(AF10/2\*Byrd), and thus is approximately 66% Byrd by parentage. Crescent AX carries two genes for tolerance to Aggressor® herbicide which has shown excellent selective control of cheatgrass, downy brome, feral rye, and jointed goatgrass with fall or spring herbicide application at labelled rates by weed species. Growers should note that Crescent AX is not tolerant to Beyond™ herbicide. Crescent AX has an intermediate reaction to stripe rust and leaf rust and is resistant to the wheat curl mite which effectively reduces infection by wheat streak mosaic virus. Growers must sign the CoAXium® Wheat Production System Stewardship Agreement at point of sale. **Grain production of Crescent AX may not be saved for replanting under any circumstances.** Unauthorized

Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety. - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Adams</b> Trupp's Certified Seed	Bennett	303-644-3646 C
<b>Kit Carson</b> Farm S Inc. (Tim Stahlecker)	Bethune	719-342-3197 C
<b>Logan</b> Anderson Wheat Farms	Haxtun	970-774-4143 R & C
Ring, Terry	Crook	970-253-5009 R & C
<b>Morgan</b> Midcap Seed & Grain	Wiggins	970-483-5566 C
<b>Phillips</b> Eagle Farms	Holyoke	970-854-5328 R & C
<b>Sedgwick</b> Carlson Grain	Julesburg	970-474-2715 R & C
<b>Washington</b> Pachner Agri-Enterprises	Akron	970-554-0645 C

**FORTIFY SF HARD RED WINTER WHEAT** - Fortify SF hard red winter wheat was released by Colorado State University (CSU) in 2019. Fortify SF has a semi-solid stem conferring partial resistance to the wheat stem sawfly and

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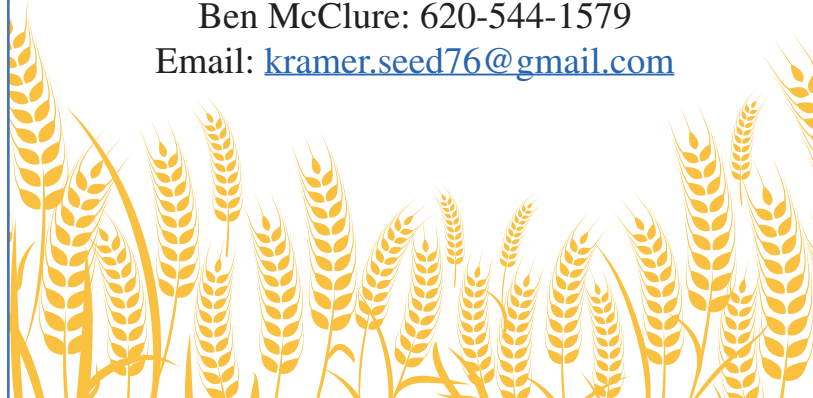
### 2023 VARIETIES

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 AP LONGJACK      SY WOLVERINE  
 AP ROADRUNNER      SY RUGGED  
 SY GRIT      TAM 115

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has shown much less stem cutting than hollow-stem varieties under severe sawfly pressure. Fortify SF has a stem solidness rating of 12.3 on a scale of 5 to 25, with 5 being completely hollow and 25 being completely solid. Fortify SF is derived from the cross Byrd/Bearpaw//Byrd, and is thus 75% Byrd parentage. Fortify SF is an awned, white-chaffed, medium maturing wheat with medium plant height, a medium length coleoptile, good test weight, and fair straw strength in the absence of the wheat stem sawfly. Fortify SF has shown good dryland yields (better under sawfly pressure), good drought stress tolerance and winterhardiness, intermediate grain protein content (measured as “grain protein deviation”), and average milling and baking quality. Fortify SF is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand. Certified seed of Fortify SF will be sold as “Certified Seed Only”, **grain production may not be saved for replanting under any circumstances.** Unauthorized Propagation Prohibited – To Be Sold By Variety Name Only As A Class Of Certified Seed – U.S. Protected Variety – 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Adams</b>		
Kalcevic Farms Inc.	Benett	303-644-3443 R
<b>Kit Carson</b>		
Farm S Inc. (Tim Stahlecker)	Bethune	719-342-3197 C
<b>Logan</b>		
Dickinson, Danny	Crook	970-253-5005 C
Jaeger Farms	Merino	970-520-3056 C
<b>Weld</b>		
Mertens Bros.	New Raymer	970-370-0153 C

**GUARDIAN HARD RED WINTER WHEAT** - Guardian hard red winter wheat was released by Colorado State University (CSU) in 2019. Guardian is derived from the cross Antero/Snowmass//Byrd, and is thus 50% Byrd by parentage. Guardian carries industry-leading resistance to wheat streak mosaic virus via excellent resistance to the wheat curl mite (from the Byrd parent) and excellent resistance to the virus itself (from the Snowmass parent). Guardian is an awned, white-chaffed, medium maturing wheat with medium plant height, a medium length coleoptile, average straw strength, and excellent test weight. Guardian has shown good dryland yields, good drought stress tolerance and winterhardiness, excellent grain protein content (measured as “grain protein deviation”), and very good milling and baking quality. In addition to excellent resistance to wheat streak mosaic virus, Guardian is resistant to moderately resistant to prevalent races of stripe rust, leaf rust, and stem rust and susceptible to wheat soilborne mosaic virus and prevalent biotypes of Hessian fly. Guardian is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand. Certified seed of Guardian will be sold as “Certified Seed Only”, **grain production may not be saved for replanting under any circumstances.** Unauthorized Propagation Prohibited – To Be Sold By Variety Name Only As A Class Of Certified Seed – U.S. Protected Variety – 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Adams</b>		
Trupp’s Certified Seed	Bennett	303-644-3646 C
<b>Prowers</b>		
Doug Melcher Seeds	Holly	719-537-6214 C
Schenck, Craig	Holly	719-688-6203 C

**KIVARI AX HARD RED WINTER WHEAT** - Kivari AX was released by Colorado State University (CSU) in 2020 and is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ brand. It is an awned, white-chaffed, medium-height, and medium-early maturing wheat with fair straw strength, very good baking quality, and good test weight. The pedigree of Kivari AX is (AF28/Byrd)//(AF10/2\*Byrd), and thus is approximately 66% Byrd by parentage. Kivari AX carries two genes for tolerance to Aggressor® herbicide, which has shown excellent selective control of cheatgrass, downy brome, feral rye, and jointed goatgrass with fall or spring herbicide application at labelled rates by weed species. Growers should note that Kivari AX is not tolerant to Beyond™ herbicide. Kivari AX is susceptible to stripe and leaf rust and is resistant to the wheat curl mite which effectively reduces infection by mite-transmitted viruses including wheat streak mosaic virus. Growers must sign the CoAXium® Wheat Production System Stewardship Agreement at point of sale. **Grain production of Kivari AX may not be saved for replanting under any circumstances.** Unauthorized Propagation Prohibited – To Be Sold By Variety Name Only As A Class Of Certified Seed – U.S. Protected Variety. – 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Adams</b>		
Progressive Capital	Byers	720-244-6775 R & C
Trupp’s Certified Seed	Bennett	303-644-3646 R & C
<b>Moffat</b>		
Wayne Counts	Craig	970-326-8572 R
<b>Weld</b>		
Cooksey Farms	Roggen	970-396-9084 R & C 970-396-8041

**Yuma**  
 Andrews Brothers Seed, Inc. Yuma 970-848-0709 R

**KS DALLAS HARD RED WINTER WHEAT** - KS Dallas is a hard red winter wheat developed at the Agricultural Research Center in Hays, KS – Kansas State University. KS Dallas is adapted to dryland production systems and was selected for its good test weight, baking quality and winter hardiness. It is resistant to wheat streak mosaic virus, stripe rust and stem rust. It is moderately resistant to leaf rust. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety. - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Logan</b> Anderson Wheat Farms	Haxtun	970-774-4143 C

**KS HAMILTON HARD RED WINTER WHEAT** - KS Hamilton is a hard red winter wheat variety developed at the Agricultural Research Center-Hays, Kansas State University. KS Hamilton was selected for test weight, grain yield, baking quality, disease resistance (WSMV, stripe rust, leaf rust, stem rust, SBMV, Hessian fly), and other agronomic traits (PPO, coleoptile length, grain shattering, lodging, winter hardiness, maturity). KS Hamilton was extensively tested in Kansas and is adapted to the dryland production system in western Kansas. KS Hamilton is resistant to wheat streak mosaic virus, stem rust, soilborne mosaic virus, and Hessian fly. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety. - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Prowers</b> Schenck, Craig	Holly	719-688-6203 C

**KS PROVIDENCE HARD RED WINTER WHEAT** - KS Providence is a medium to medium-early maturing hard red winter wheat developed by the Kansas Agricultural Experiment Station and owned by the Kansas State University Research Foundation. It is a high yielding wheat with acceptable milling and baking properties. KS Providence is resistant to current races of leaf rust and intermediate to stripe rust in Kansas. It is susceptible to Hessian fly but resistant to soil borne mosaic virus. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety. - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Logan</b> Anderson Wheat Farms	Haxtun	970-774-4143 R & C

**KS TERRITORY HARD RED WINTER WHEAT** - KS Territory is a hard red winter wheat developed at the Agricultural Research Center - Hays, Kansas State University. KS Territory is considered to have high yield potential, good drought tolerance, good standability and a strong disease package. This variety has resistance to wheat streak mosaic virus and Hessian fly, moderate resistance to stripe rust, and intermediate resistances to *Triticum* mosaic virus and barley yellow dwarf virus. KS Territory has also shown resistance to stem rust but susceptibility to leaf rust. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety. - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Logan</b> Anderson Wheat Farms	Haxtun	970-774-4143 R

**LANGIN HARD RED WINTER WHEAT** - Langin hard red winter wheat was released by Colorado State University (CSU) in 2016. Langin is an awned, white-chaffed, early maturing wheat with medium-short height, a medium length coleoptile, fair straw strength, and good test weight. Langin is derived from the cross CO050270/Byrd (CO050270 = Hatcher/NW97S295 pedigree). Langin is similar to Byrd and Avery in having good winterhardiness, excellent drought stress tolerance, and very high yield potential. Langin differs from Byrd in having improved stripe rust resistance and slightly improved baking quality characteristics. Langin is moderately resistant to prevalent races of stripe rust, susceptible to leaf rust and stem rust, moderately susceptible to wheat streak mosaic virus, and resistant to the wheat curl mite and wheat soil borne mosaic virus. Langin is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand. Unauthorized Propagation Prohibited – To Be Sold By Variety Name Only As A Class Of Certified Seed – U.S. Protected Variety. – 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Adams</b> Trupp's Certified Seed	Bennett	303-644-3646 C

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<b>Elbert</b>			
Kochis Farms	Matheson	719-775-2596	C
<b>Kit Carson</b>			
Farm S Inc. (Tim Stahlecker)	Bethune	719-342-3197	R & C
<b>Logan</b>			
Anderson Wheat Farms	Haxtun	970-774-4143	R & C
<b>Phillips</b>			
Eagle Farms	Holyoke	970-854-5328	R & C
<b>Prowers</b>			
Doug Melcher Seeds	Holly	719-537-6214	C
Schenck, Craig	Holly	719-688-6203	C
<b>Sedgwick</b>			
Carlson Grain	Julesburg	970-474-2715	C
<b>Washington</b>			
Pachner Agri-Enterprises	Akron	970-554-0645	C
<b>Yuma</b>			
Andrews Brothers Seed, Inc.	Yuma	970-848-0709	R & C

**LCS JULEP HARD RED WINTER WHEAT** - LCS Julep is a newer release from Limagrain Cereal seeds. This variety comes from the LCS Mint pedigree, and acts very similar with added benefits. Released in 2019, this variety is a true medium with excellent end-use quality. LCS Julep's straw strength, quick emergence, and drought tolerance package are its main assets. It has a very high tiller count and late spring green up which has allowed this variety to handle late freezes very well. LCS Julep is a nice step up from an already great variety in LCS Mint. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety - 1994 PVPA.

<b>COUNTY/NAME/CITY</b>	<b>PH</b>	<b>CLASS</b>
<b>Prowers</b>		
Schenck, Craig	Holly	719-688-6203 R

**RAY HARD RED WINTER WHEAT** - Ray is a dual-purpose forage/grain hard red winter wheat licensed from Montana Ag Experiment Station by Colorado Wheat Research Foundation, being marketed under the PlainsGold™ brand in

Colorado as a Certified Seed Only variety. Ray is a winter hardy, late maturing, tall, very awnless variety with forage yield and quality similar to Willow Creek but superior grain yield compared to Willow Creek. Ray has good test weight and grain protein if taken for grain, but should be primarily utilized for grazing, hay, or haylage. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class of Certified Seed - U.S. Protected Variety. - 1994 PVPA.

<b>COUNTY/NAME/CITY</b>	<b>PH</b>	<b>CLASS</b>
<b>Kit Carson</b>		
Eastern Colorado Seeds, LLC.	Burlington	866-655-7380 R
<b>Phillips</b>		
Eagle Farms	Holyoke	970-854-5328 R & C
<b>Washington</b>		
Pachner Agri-Enterprises	Akron	970-554-0645 R

**SY LEGEND CL2 HARD RED WINTER WHEAT** - SY Legend CL2 is a hard red winter wheat bred and developed by Syngenta Participations AG. SY Legend CL2 was selected for type, disease, Greenleaf duration, herbicide tolerance, test weight, yield and quality. SY Legend CL2 is primarily adapted to Western High Plains spanning from Texas panhandle through Oklahoma panhandle, western Kansas, eastern Colorado, and western Nebraska and panhandle. SY Legend CL2 demonstrates good tolerance to leaf rust, stripe rust, barley yellow dwarf virus and soil born mosaic virus. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety - 1994 PVPA.

<b>COUNTY/NAME/CITY</b>	<b>PH</b>	<b>CLASS</b>
<b>Logan</b>		
Ring, Terry	Crook	970-253-5009 R

**SY MONUMENT HARD RED WINTER WHEAT** - SY Monument is a hard red winter wheat bred and developed by Syngenta Seeds, Inc. SY Monument is the result of a cross made in 2003 by Syngenta Seeds, Inc. in Junction City, KS. SY Monument was selected for height, straw strength, yield, bread making quality and resistance to leaf and stripe rust. SY Monument is best adapted to the winter wheat growing areas of the High Plains. Syngenta Seeds, Inc. maintains seed stock and certified classes of Foundation, Registered and Certified. Certified seed will be

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available in the fall of 2015. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Larimer</b> Revolution Soil and Seed	Fort Collins	970-666-1878 C

**SY SUNRISE HARD RED WINTER WHEAT** - SY Sunrise is a hard red winter wheat and is the result of a cross made in 2006 by Syngenta Seeds, Inc. from an AgriPro experimental, CDC Falcon, and a University of Nebraska experimental. SY Sunrise was selected for test weight, height, green leaf duration, quality, winter hardiness and yield. SY Sunrise is adapted throughout the winter wheat growing areas of the United States Central Plains based on tests conducted in Kansas, Colorado, Nebraska, Wyoming and South Dakota. Target market is irrigated and high management dryland. Syngenta Seeds, Inc. maintains seed stock and certified classes of Foundation, Registered and Certified. Certified seed will be available in the Fall of 2016. Certified Seed will be sold as "Certified Seed Only" and growers are required to sign a stewardship agreement. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Yuma</b> Andrews Brothers Seed, Inc.	Yuma	970-848-0709 C

**SY WOLVERINE HARD RED WINTER WHEAT** - SY Wolverine is a hard red winter wheat developed by Syngenta Participations AG. SY Wolverine was selected for height, maturity, green leaf duration, disease reaction and end use quality. SY Wolverine has shown above average tolerance to leaf rust. It is broadly adapted across the Northern, Central, and Western Plains. Certified seed became available Fall - 2020. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Kit Carson</b> Heritage Seed & Grain	Flagler	719-760-9768 C

<b>Logan</b> Ring, Terry	Crook	970-253-5009 R & C
<b>Morgan</b> Kniesel Seed	Wiggins	970-483-6166 C
<b>Sedgwick</b> Carlson Grain	Julesburg	970-474-2715 R & C
<b>Yuma</b> Andrews Brothers Seed, Inc.	Yuma	970-848-0709 C

**WB4418 HARD RED WINTER WHEAT** - WB4418, a Hard Red Winter wheat variety, Semi- Solid stem variety with excellent stand-ability and tolerance to the Wheat Stem Sawfly. a medium maturing variety with excellent yield potential Widely adapted from east to west, this variety provides very good resistance to leaf rust, strip rust and WSMV. Unauthorized Propagation Prohibited. U.S. Protected Variety- 1994 PVPA

COUNTY/NAME/CITY	PH	CLASS
<b>Logan</b> Ring, Terry	Crook	970-253-5009 R & C

**WB4422 HARD RED WINTER WHEAT** - WB4422 is a hard red winter wheat developed by Bayer Crop Science. WB4422 is a broadly adapted variety with excellent yield potential and standability. WB4422 is a key companion product to WB4792 and WB4595 with excellent winter hardiness and very good protein content. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Logan</b> Anderson Wheat Farms	Haxtun	970-774-4143 R & C
<b>Kit Carson</b> Eastern Colorado Seeds, LLC.	Burlington	866-655-7380 C



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**WB4483 HARD RED WINTER WHEAT** - WB4483 is a Hard Red Winter wheat variety, a medium maturing solid stem variety which give excellent tolerance to the wheat stem sawfly. Also includes excellent winter hardiness and drought tolerance. This medium-tall variety also offers excellent test weight and overall great leaf health package. Unauthorized Propagation Prohibited. U.S. Protected Variety- 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Logan</b>		
Anderson Wheat Farms	Haxtun	970-774-4143 R & C
Ring, Terry	Crook	970-253-5009 R & C
<b>Morgan</b>		
Midcap Seed & Grain	Wiggins	970-483-5566 R & C
<b>Washington</b>		
Pachner Agri-Enterprises	Akron	970-554-0645 C
Wagers Seed	Woodrow	970-842-2022 C

**WB4595 HARD RED WINTER WHEAT** - WB4595, a Hard Red Winter wheat variety, Western High Plains medium-maturing, high tillering wheat variety with excellent yield potential. It carries an overall good disease resistance package with very good Leaf Rust and stripe resistance. This variety also has excellent winter hardiness, drought tolerance and tolerance to WSMV. Unauthorized Propagation Prohibited. U.S. Protected Variety- 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Kit Carson</b>		
Farm S Inc. (Tim Stahlecker)	Bethune	719-342-3197 C

**WB4733CLP HARD RED WINTER WHEAT** - WB4733CLP is a hard red winter wheat developed by Bayer Crop Science. WB4733CLP is a Clearfield Plus Variety and has a solid stem for improved wheat stem sawfly management. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Logan</b>		
Anderson Wheat Farms	Haxtun	970-774-4143 R & C
Ring, Terry	Crook	970-253-5009 C
<b>Morgan</b>		
Midcap Seed & Grain	Wiggins	970-483-5566 R & C
<b>Washington</b>		
Pachner Agri-Enterprises	Akron	970-554-0645 C
Wagers Seed	Woodrow	970-842-2022 C

**WB4792 HARD RED WINTER WHEAT** - WB4792, a Hard Red Winter wheat variety, is a medium-late maturing wheat variety with excellent straw strength and drought tolerance. It has a very good overall health package in part due to its very good resistance to Leaf Rust and Yellow (Stripe) Rust and BYD. This medium height Hard Red Winter wheat variety also has very good winter hardiness and tolerance to WSMV. Unauthorized Propagation Prohibited. U.S. Protected Variety- 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Kit Carson</b>		
Farm S Inc. (Tim Stahlecker)	Bethune	719-342-3197 C
<b>Logan</b>		
Anderson Wheat Farms	Haxtun	970-774-4143 R & C
Ring, Terry	Crook	970-253-5009 R & C
<b>Washington</b>		
Wagers Seed	Woodrow	970-842-2022 C

**WHISTLER HARD RED WINTER WHEAT** - Whistler hard red wheat was released by Colorado State University (CSU) in 2018. Whistler is an awned, white-chaffed, late maturing wheat with tall plant height, a medium length coleoptile, and fair straw strength and test weight. Whistler is derived from the cross CO08W218/Snowmass//Byrd, and is thus 50% Byrd and 25% Snowmass by parentage. Whistler has shown high dryland yields, good drought stress tolerance and winterhardiness, intermediate grain protein content (measured as "grain protein deviation"), and excellent baking quality. Whistler is moderately resistant to prevalent races of stripe rust, intermediate to leaf rust, resistant to stem rust, resistant to wheat soilborne mosaic virus, susceptible to prevalent biotypes of Hessian fly, and resistant to the wheat curl mite which effectively reduces infection by wheat streak mosaic virus. Whistler is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Prowers</b>		
Schenck, Craig	Holly	719-688-6203 C
<b>Washington</b>		
Pachner Agri-Enterprises	Akron	970-554-0645 R

## HARD WHITE WINTER WHEAT

**BRECK HARD WHITE WINTER WHEAT** -Breck was released by Colorado State University (CSU) in 2017. Breck is an awned, white-chaffed, medium maturing wheat with medium height, a medium-long coleoptile, very good straw strength, and excellent test weight. Breck is derived from the cross Denali/HV9W07-482W//Antero, and is thus 50% Antero and 25% Denali by parentage. Breck has shown high dryland and irrigated yields, good drought stress tolerance and winterhardiness, and excellent milling and baking quality. Breck expresses a lower level of polyphenol oxidase (PPO) in the grain which favors its use in whole grain flour products. Breck is resistant to prevalent races of stripe rust, intermediate to leaf rust, resistant to stem rust, moderately susceptible to wheat soilborne mosaic virus, intermediate to wheat streak mosaic virus, and resistant to prevalent biotypes of Hessian fly. Breck has very good pre-harvest sprouting tolerance, better than Snowmass, Antero, and Sunshine and at least as good as most adapted hard red winter wheat varieties grown in Colorado. Breck is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand as a Certified Seed Only variety. Grain of Breck is available for contracting in the CWRF-Arden Mills Ultragrain® Premium Program. Participants in the program will need to sign a Grain Pricing Schedule with Arden Mills which details contract terms and requires planting of certified seed. Breck is also available as a non-exclusive variety in the grain trade to other millers. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Adams</b>		
Progressive Capital	Byers	720-244-6775 R & C
<b>Phillips</b>		
Eagle Farms	Holyoke	970-854-5328 C
<b>Sedgwick</b>		
Carlson Grain	Julesburg	970-474-2715 R & C
<b>Weld</b>		
Cooksey Farms	Roggen	970-396-9084 C 970-396-8041

**MONARCH HARD WHITE WINTER WHEAT** - Monarch hard white wheat was released by Colorado State University (CSU) in 2018. Monarch is an awned, white-chaffed, medium maturing wheat with medium-short plant height, a medium length coleoptile, excellent straw strength, and good test weight. Monarch is derived from a three-way cross that involves CO07W722-F5 (pedigree = KS02HW89 1/BC97ROM-41W) as 75% and Snowmass as 25% of the parentage. Monarch has shown superior grain yield under irrigation, good dryland yields, good drought stress tolerance and winterhardiness, medium grain protein content (measured as "grain protein deviation"), and good milling and baking quality. Monarch expresses a very low level of polyphenol oxidase (PPO) in the grain which favors its use in whole grain flour and noodle products. Monarch is moderately resistant to prevalent races of stripe rust, intermediate to leaf rust, resistant to stem rust, resistant to wheat soilborne mosaic virus, moderately tolerant of wheat streak mosaic virus, and susceptible to prevalent biotypes of Hessian fly. Monarch is moderately susceptible to pre-harvest sprouting. Monarch is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand as a Certified Seed Only variety and is available as a non-exclusive variety in the grain trade. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Kit Carson</b>		
Eastern Colorado Seeds, LLC.	Burlington	866-655-7380 C

**NUGRAIN HARD WHITE WINTER WHEAT** - NuGrain was released by Syngenta in 2006. NuGrain's parentage is one-half Platte. It is a medium height semidwarf with medium late maturity. NuGrain has good straw strength and winter survival, with an intermediate reaction to stripe rust and moderate resistance to leaf rust. NuGrain has excellent test weight and grain quality, and is high in polyphenol oxidase. NuGrain is adapted to western Kansas, eastern Colorado, and southwestern Nebraska. Unauthorized Propagation Prohibited - To Be Sold By Variety Name Only As A Class Of Certified Seed - U.S. Protected Variety - 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Yuma</b> Andrews Brothers Seed, Inc.	Yuma	970-848-0709 R

**SNOWMASS 2.0 HARD WHITE WINTER WHEAT** - Snowmass 2.0 hard white wheat was released by Colorado State University (CSU) in 2018. Snowmass 2.0 is an awned, white-chaffed, medium-early maturing wheat with medium height, a medium length coleoptile, and very good straw strength and test weight. Snowmass 2.0 is derived from the cross CO07W722-F5/Snowmass//Brawl CL Plus, and is thus 50% Brawl CL Plus and 25% Snowmass by parentage. While Brawl CL Plus is in the parentage, growers should note that Snowmass 2.0 is not tolerant to Beyond™ herbicide. Snowmass 2.0 has shown high dryland and irrigated yields, good drought stress tolerance and winterhardiness, good grain protein content (measured as “grain protein deviation”), and excellent milling and baking quality. Snowmass 2.0 expresses a significantly lower level of polyphenol oxidase (PPO) in the grain which favors its use in whole grain flour and noodle products. Snowmass 2.0 is moderately resistant to prevalent races of stripe rust, intermediate to leaf rust, resistant to stem rust, moderately susceptible to wheat soilborne mosaic virus, moderately resistant to wheat streak mosaic virus, and susceptible to prevalent biotypes of Hessian fly. Snowmass 2.0 has moderate pre-harvest sprouting tolerance, similar to Snowmass, Antero, and Sunshine and at least as good as most adapted hard red winter wheat varieties grown in Colorado. Snowmass 2.0 is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand. Grain of Snowmass 2.0 may only be grown under contract in the CWRF-Arden Mills Ultragrain® Premium Program. Participants in the program will need to sign a Grain Pricing Schedule with Arden Mills which details contract terms and requires planting of certified seed. Unauthorized Propagation Prohibited – To Be Sold By Variety Name Only As A Class Of Certified Seed – U.S. Protected Variety – 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Adams</b> Progressive Capital	Byers	720-244-6775 R & C
<b>Logan</b> Anderson Wheat Farms	Haxtun	970-774-4143 R & C
Ring, Terry	Crook	970-253-5009 R & C
<b>Phillips</b> Eagle Farms	Holyoke	970-854-5328 C
<b>Sedgwick</b> Carlson Grain	Julesburg	970-474-2715 C
<b>Weld</b> Cooksey Farms	Roggen	970-396-9084 R 970-396-8041

**SUNSHINE HARD WHITE WINTER WHEAT** - Sunshine was released by Colorado State University (CSU) in 2014. Sunshine is an awned, white-chaffed, early maturing wheat with medium height, a medium-long coleoptile, very good straw strength, and good test weight. Sunshine is derived from the cross KS01HW152-6/HV9W02-267W. Sunshine has shown good dryland and irrigated yields and very good milling and baking quality. Sunshine shows an intermediate reaction to prevalent races of stripe rust, moderate susceptibility to leaf rust, resistance to stem rust, moderate susceptibility to wheat soilborne mosaic virus, and good pre-harvest sprouting tolerance (similar to Hatcher, slightly better than both Snowmass and Antero). Sunshine is marketed by the Colorado Wheat Research Foundation under the PlainsGold™ Brand. Unauthorized Propagation Prohibited – To Be Sold By Variety Name Only As A Class Of Certified Seed – U.S. Protected Variety. – 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Prowers</b> Schenck, Craig	Holly	719-688-6203 C

**WINDOM SF HARD WHITE WINTER WHEAT** - Windom SF hard white winter wheat was released by Colorado State University (CSU) in 2022. Windom SF has a semi-solid stem conferring partial resistance to the wheat stem sawfly and has shown much less stem cutting than hollow-stem varieties under severe sawfly pressure. It is the first hard white wheat with a semi-solid stem adapted to Colorado. Windom SF has a stem solidness rating of 16.5 on a scale of 5 to 25, with 5 being completely hollow and 25 being completely solid. Windom SF is derived from the cross Warhorse/Breck//CO12D1028. Windom SF is an awned, white-chaffed, medium-late maturing wheat with medium plant height, a medium-long coleoptile, good test weight, and good straw strength in the absence of the wheat stem sawfly. Windom SF has shown good dryland and irrigated yields (better under sawfly pressure), carries the WSM2 gene for resistance to wheat streak mosaic virus, and has average grain protein content (measured as “grain protein deviation”). Windom SF has excellent milling and baking characteristics, similar to Snowmass 2.0; grain may only be grown from Certified seed under contract in the CWRF-Arden Mills Ultragrain® Premium Program. Windom SF is marketed by the Colorado Wheat

Research Foundation under the PlainsGold™ Brand. Certified seed of Windom SF will be sold as “Certified Seed Only”, grain production may not be saved for replanting under any circumstances. Unauthorized Propagation Prohibited – To Be Sold By Variety Name Only As A Class Of Certified Seed – U.S. Protected Variety – 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Adams</b> Progressive Capital	Byers	720-244-6775 R
<b>Elbert</b> Kochis Farms	Matheson	719-775-2596 R
<b>Logan</b> Anderson Wheat Farms	Haxtun	970-774-4143 R & C
<b>Phillips</b> Eagle Farms	Holyoke	970-854-5328 R
<b>Washington</b> Pachner Agri-Enterprises	Akron	970-554-0645 R
<b>Weld</b> Cooksey Farms	Roggen	970-396-9084 R 970-396-8041

## SOFT WHITE WINTER WHEAT

**SY ASSURE SOFT WHITE WINTER WHEAT** - SY Assure is a Soft White Winter Wheat developed by Syngenta Seeds, Inc. SY Assure was selected for high yield potential and test weight, lodging resistance and resistance to stripe rust. SY Assure has shown good adaptation in the high to moderate rainfall regions of western Idaho, eastern Washington, north-central and northeastern Oregon and irrigated production in the southern Snake River region of Idaho and the irrigated production areas of Washington. SY Assure is resistant to the current predominant races of stripe rust and has no known insect resistance. Unauthorized Propagation Prohibited – To Be Sold By Variety Name Only As A Class Of Certified Seed – U.S. Protected Variety. – 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Larimer</b> Revolution Soil and Seed	Fort Collins	970-666-1878 C

**SY OVATION SOFT WHITE WINTER WHEAT** - SY Ovation is a soft white winter wheat bred and developed by Syngenta Seeds, Inc. SY Ovation has shown good adaptation in the high to moderate rainfall regions of western Idaho, eastern Washington, north-central and northeastern Oregon and irrigated production in the southern Snake River region of Idaho and the irrigated production areas of Washington. SY Ovation is resistant to current predominant races of stripe rust. Unauthorized Propagation Prohibited – To Be Sold By Variety Name Only As A Class Of Certified Seed – U.S. Protected Variety. – 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Larimer</b> Revolution Soil and Seed	Fort Collins	970-666-1878 C

## TRITICALE

**SY TF 813 TRITICALE** - SY TF 813 is a tall semi-dwarf cultivar of winter triticale which is shorter statured than 348 triticale. It matures earlier and is more productive than 348 but somewhat later than TAMCALE 5019. Grain yields of SY TF 813 have been substantially higher than the silage variety 348 and significantly greater than the forage cultivar TAMCALE 5019. SY TF 813 is well suited for multiple uses. Its vegetative biomass production in the fall is superior to 348 and TAMCALE 5019 and silage harvests also have been equal to or greater than check cultivars. SY TF 813 is uniformly awnletted which is preferred for hay and silage over fully awned cultivars. SY TF 813 generally produces silage with higher crude protein and higher relative feed value than either 348 or TAMCALE 5019. SY TF 813 is sufficiently winter hardy to withstand the cold temperatures characteristic of the Texas Panhandle and western Kansas. Unauthorized Propagation Prohibited – To Be Sold By Variety Name Only As A Class Of Certified Seed – U.S. Protected Variety – 1994 PVPA.

COUNTY/NAME/CITY	PH	CLASS
<b>Kit Carson</b> Eastern Colorado Seeds, LLC.	Burlington	866-655-7380 C
<b>Sedgwick</b> Green Cover Seed	Bladen, NE	402-469-6784 C
<b>Weld</b> Revolution Soil and Seed	Fort Lupton	970-666-1878 C

# WEST GAINES SEED

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## WINTER WHEAT

### WEST GAINES SEED

Grazer Pro | Weathermaster (*Beardless*)

### AGRIPRO®

TAM 111 | SY Razor (*Beardless*)

## TRITICALE

### WEST GAINES SEED

**NEW!** NexTrit Plus (*Beardless*)

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## FOR MORE INFORMATION, PLEASE CONTACT:

### BRADY ROBERTS

[broberts@westgainesseed.com](mailto:broberts@westgainesseed.com)

806.698.6174 ext 156

### BRAXTON COOR

[bcoor@westgainesseed.com](mailto:bcoor@westgainesseed.com)

806.698.6174 ext 106