



**On-Farm Cereal Variety and Advanced Breeding Line
Testing across Montana for Environment Specific
Cultivar Recommendations:**



Spring Wheat Off-Station Variety Performance, Chester, MT

Principal Investigator:

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Project Personnel:

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Cooperator:

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Objectives:

Commercially available spring wheat varieties and advanced breeding lines were evaluated for agronomic performance and fit at on-farm locations across Montana. Sites chosen for the research considered the environment, growing conditions and soil types, and represent the major land areas for producers in those regions served by Northern Agricultural Research Center. The Liberty County location near Chester entered its tenth year of spring wheat testing in crop year 2025.

Methods:

The uniform off-station spring wheat variety performance trial was seeded into chemical fallow ground during 2025. The trial consisted of 25 entries seeded in replicated, three-row, 22-foot plots on a 12-inch row spacing, utilizing a self-propelled cone seeder with Atom Jet paired row openers. All plots were trimmed to a harvest length of approximately 17 feet with a three-point rototiller. Plant height was measured from the soil surface to the top of the head, excluding awns, and percent sawfly cutting was visually estimated for each plot immediately prior to harvest. A 'Wintersteiger' small plot combine, funded in part by the Montana Wheat and Barley Committee, was used to harvest each three-row plot. Prior to measuring plot weight for yield determination, seed was either cleaned or weighed in-dirt as per protocols. Protein, test weight, and moisture content were determined on a clean sample using a Foss Infratec 1241 near infrared analyzer. Falling number was determined using a Perten FN1700 according to the FGIS Directive 9180.38. Other variables specific to each individual trial are listed with the current year's data tables.

Please note that research trial seed yield results recorded under wheat stem sawfly pressure are likely much higher than a producer should expect. Small plot variety trials are managed to assess maximum yield potential and are harvested in such a way that all stems and heads are picked up by the combine, regardless of lodging or cutting due to wheat stem sawfly. Pickup guards, coupled with an exceptionally slow ground speed and a low cutting height, help researchers collect all heads to assess seed yield.

potential. If you are a producer in a wheat stem sawfly environment, although hollow stemmed varieties may be high yielding in research trials in your area, we strongly recommend against growing those hollow stemmed varieties. Please be aware that if you seed hollow stemmed varieties with wheat stem sawfly present, you are only creating a breeding ground for future generations of sawfly in your area and not helping combat the pest population.

Results:

This report contains both single-year and long-term data summaries limited to the most recent ten years. It should be noted that the 2025 data table in this report represents varietal performance for a single crop year at a single location, therefore cannot be considered representative of performance expected when differing conditions due to location, year and management are imposed. By itself, 2025 data shall not constitute in any form a recommendation for or against any variety or breeding line included.

Spring wheat seed yields near Chester averaged just over 44 bu/ac (Table 1). Breeding line 'MT 21487' was the top yielding entry producing nearly 50 bu/ac. 'LCS Ascent', 'MT Carlson', 'MT Dutton', 'MT UBet', 'Reeder', 'Rocker', 'SY Rockford', 'Vida' and four other MSU breeding lines produced yields statically equal to that of MT 21487. Test weights of all spring wheat entries for this site averaged just under 59 lb/bu. Very minimal wheat stem sawfly cutting was observed in the trial. Yield, test weight, protein, falling number, plant height and sawfly cutting data for the 2025 Chester dryland spring wheat trial are summarized in Table 1.

Comparable averages are calculated using a standard check variety when not all entries are present in a specific trial for all years. Variety means are adjusted by multiplying the actual check mean by the ratio of the individual variety mean compared to the check mean for the same years as tested. All varieties are then directly comparable to each other when in the same nursery. At least three years of data is needed to be included in the comparable average calculation. Ten-year comparable averages (2016-2025) for spring wheat seed yield and test weight at Chester are summarized in Table 2, while ten-year comparable averages for protein content and wheat stem sawfly cutting are summarized in Table 3. Based on the comparable average calculations, MT Carlson, MT UBet, Dagmar, 'Duclair', and Vida are the highest yielding varieties at Chester.

Summary:

Upon establishment, the Chester site had very good stand uniformity, however limited timely precipitation during tillering and during grain fill resulted in increased seed yields and test weight. Rain events after maturity delayed harvest of the spring cereal trials.

This work has been strongly supported by producers in the Chester area, and by the Northern Agricultural Research Center Advisory Board. With budget and other resources allowing, it is planned to continue off-station spring wheat variety and breeding line testing in this area. The Chester location was reestablished in 2014 following a prolonged absence of uniform off-station spring cereal testing in Liberty County.

Recognition:

This research would not have been possible without the assistance of the following seasonal employees: David Bischoff, Baylor Davis, Ty Golie, Simone Gomes, Brady Kueffler, Lirio McKenzie, Teresa Miller, Jason Rice, and Lily Smith.

TABLE 1. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Kammerzell Farm, Chester. Northern Agricultural Research Center. Havre, Montana. 2025.
(Exp# 25-9953-SW)

ID	1/ YIELD bu/ac	TEST WT lb/bu	2/ PROTEIN %	3/ FN seconds	4/ PLNT HT inches	4/ SAWFLY %
AP SMITH	41.8	59.0	15.6	441	24.2	1.0
DAGMAR	42.0	59.5	15.9	421	25.9	0.7
LANNING	41.8	58.3	16.2	386	25.1	1.0
LCS ASCENT	45.5	60.6	15.2	451	27.7	1.0
MT CARLSON	47.3	58.2	15.4	431	26.0	0.7
MT DUTTON	47.8	58.3	16.1	450	25.5	0.7
MT UBET	47.9	58.7	15.7	486	24.0	2.0
ND STAMPEDE	38.2	58.0	16.1	412	26.3	3.7
REEDER	45.5	59.4	15.7	457	26.8	2.3
ROCKER	47.5	60.3	15.2	463	27.1	1.0
SY LONGMIRE	43.0	59.6	15.7	477	25.8	0.3
SY ROCKFORD	45.6	58.2	15.4	438	26.8	1.0
VIDA	47.7	58.7	15.1	400	26.7	1.0
WB GUNNISON	41.2	59.6	14.6	429	25.7	0.0
MT 21074	48.3	60.1	16.1	423	25.8	0.0
MT 21174	43.4	58.6	16.2	439	25.7	0.0
MT 21484	47.2	59.0	16.1	436	26.5	0.3
MT 21487	49.9	58.6	15.8	439	26.3	0.3
MT 22073	40.1	56.4	16.6	411	23.9	0.7
MT 22083	38.8	60.2	15.8	429	26.0	1.0
MT 22182	44.2	57.2	15.2	414	25.9	0.7
MT 22205	45.4	58.4	16.0	427	25.4	2.3
MT 22345	48.8	57.0	15.5	425	27.2	2.0
WB 9668	36.7	59.4	17.1	417	21.0	1.0
WB 9879CLP	42.1	58.2	16.0	475	26.4	0.0
EXPERIMENTAL MEANS	44.3	58.8	15.8	435.1	25.7	1.0
LSD (0.05)	5.3	0.9	0.4	31.8	1.8	-
C.V.%	7.3	0.9	1.4	4.5	4.2	-
P-VALUE (Varieties)	<.0001	<.0001	<.0001	<.0001	<.0001	NS

1/ Volumetric yields are based on plot weights adjusted to uniform 13 percent grain moisture and 60 lbs/bu as the standard test weight for wheat.

2/ Protein values are adjusted to 13 percent grain moisture.

3/ FN is the falling number value reported in seconds adjusted to 14 percent flour moisture.

4/ Sawfly rating is reported as the percentage of cut stems.

Bold indicates the highest or lowest value within a column (whichever is most desirable for the specific characteristic).

Bold indicates values equal to the underlined value within a column based on Fisher's protected LSD (P=0.05).

NS for non-significant replaces the LSD when the probability value (P-Value) exceeds 0.05.

Management Information (25-9953-SW)

Seeding Date:	April 15, 2025
Harvest Date:	August 26, 2025
Fertility:	68-14-7-7 side banded
System:	No Till
Herbicide:	n/a
Insecticide:	n/a
Previous Crop:	Chemical Fallow-Spring Wheat
Precipitation:	5.6" seeding to harvest maturity

TABLE 2. Ten-Year Yield and Test Weight Summary on Selected Entries from Dryland Fallow Spring Wheat Variety Nurseries Grown Off-Station at the Kammerzell Farm, Chester. Northern Agricultural Research Center. Havre, Montana. 2016-2025 (Exp# 9953)

2/ VARIETY	3/ No. of YEARS TESTED	1/ YIELD (Bushels Per Acre)							TEST WEIGHT (Pounds Per Bushel)									
		2021 2022 2023 2024 2025					4/ % for YEARS TESTED	5/ 10-YR COMP. CHECK AVE.	2021 2022 2023 2024 2025					3/ AVE. for YEARS TESTED	4/ % of CHECK	5/ 10-YR COMP. AVE.		
		YEARS	TESTED	YIELD	YIELD	YIELD			2021	2022	2023	2024	2025					
MT CARLSON (+)	5	25.6	29.4	61.1	32.1	47.3	39.1	107.1	43.0	52.7	55.8	56.2	53.7	58.2	55.3	99.5	54.9	
MT UBET (+)	4		28.1	61.0	31.9	47.9	42.2	106.5	42.7		56.8	55.8	55.1	58.7	56.6	101.4	56.0	
DAGMAR (+)	7	25.7	31.4	56.5	34.8	42.0	44.7	105.1	42.2	55.2	57.1	57.2	54.0	59.5	57.3	103.0	56.8	
DUCLAIR (+)(sawfly tol)	8	21.7	30.6	50.2			41.0	101.4	40.7	52.9	54.7	54.9			54.4	99.0	54.7	
VIDA (+)	10	23.9	27.6	52.8	30.6	47.7	40.1	100.0	40.1	54.7	55.1	55.2	54.3	58.7	55.2	100.0	55.2	
MT DUTTON (+)	5	23.1	26.7	52.8	32.0	47.8	36.5	99.9	40.1	53.6	54.7	54.6	53.2	58.3	54.9	98.7	54.5	
SY LONGMIRE (P+)	3			53.1	33.4	43.0	43.2	98.8	39.7						59.6	55.8	99.4	54.9
BRENNAN (P+)	8	23.4	26.9	50.6			39.3	97.3	39.1	55.9	58.2	57.2			57.7	105.1	58.0	
ROCKER (P+)	3			52.3	28.0	45.6	42.0	96.1	38.6						60.3	57.4	102.3	56.5
CORBIN (P+)	8	24.2	26.3	51.5			38.6	95.6	38.4	55.1	56.2	57.5			55.7	101.4	56.0	
LANNING (+)	10	21.9	27.2	52.4	31.1	41.8	38.3	95.5	38.3	52.8	54.9	53.5	51.9	58.3	54.2	98.0	54.1	
REEDER (+)	10	19.5	23.1	51.0	35.9	45.5	38.1	94.9	38.1	54.1	55.0	56.0	53.7	59.4	55.5	100.4	55.4	
WB GUNNISON (P+)(sawfly tol)	9	25.4	26.4		33.4	41.2	36.5	94.2	37.8	55.2	56.4		53.3	59.6	56.0	101.3	55.9	
SY SOREN (P+)	8	20.4	25.1	55.1			38.1	94.2	37.8	54.1	55.9	53.9			54.7	99.7	55.0	
WB9879CLP (P+)	9	25.5	27.5	48.6	34.9		36.8	93.5	37.5	54.1	55.5	55.8	54.1		55.0	100.3	55.4	
NS PRESSER CLP (P+)	8	23.7	31.7	45.7			36.5	90.4	36.3	54.4	54.2	53.8			53.7	97.7	53.9	
MT SIDNEY (+)	6	20.5	20.3	47.6	29.3		38.4	90.1	36.2	54.2	56.8	56.8	54.8		56.7	101.8	56.2	
SY INGMAR (P+)	7	18.5	21.3	45.5			36.6	85.4	34.3	54.6	55.0	53.1			55.2	98.9	54.6	
MEANS (For Entries Listed)		22.9	26.8	52.2	32.3	45.3			38.9	54.2	55.8	55.4	53.8	59.0		55.4		

6/ Growing Season Precipitation (in.)	n/a	5.00	5.11	4.99	5.66	5.30
Soil PAW (in.) to SD @ Planting	12.74	9.08	4.69	n/a	8.97	8.87
Total Plant Available Water (in.)	n/a	14.10	9.80	n/a	14.60	12.83
Soil NO3 (lbs.) to SD at Planting	197	276	142	n/a	292	226.8
SD (Sampling Depth in Inches)	48	48	45	n/a	48	47.4
Fertilizer Applied	(# N)	100	46	46	68	85.3
	(# P ₂ O ₅)	20	9	9	14	16.6
	(# K ₂ O)	10	5	5	7	8.4
	(# S)	10	5	5	7	8.4

Check variety is Vida.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at <http://plantsciences.montana.edu/> for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selection decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 Pending.

3/ Only the most recent 5 years are shown, but summary calculations include all years noted.

4/ Percent of Vida yield or test weight for the same data years as those in which a given entry was tested.

5/ 10-Yr Comparable Average = $(x/y) * z$ where x = average yield or test weight of a given entry for years tested, y = average yield or test weight for Vida for the same years, and z = 10-Yr average yield or test weight for the check variety Vida.

6/ Seeding to 14 days prior to harvest.

TABLE 3. Ten-Year Protein and Sawfly Summary on Selected Entries from Dryland Fallow Spring Wheat Variety Nurseries Grown Off-Station at the Kammerzell Farm, Chester. Northern Agricultural Research Center. Havre, Montana. 2016-2025 (Exp# 9953)

2/ VARIETY	3/ No. of YEARS TESTED	1/ PROTEIN % (Adjusted to 13% grain moisture)								SAWFLY RATING (% of cut and lodged stems)									
		2021 2022 2023 2024				5/ 10-YR COMP. AVE.	3/ AVE. for YEARS TESTED	4/ % of CHECK	2021 2022 2023 2024				5/ 10-YR COMP. AVE.	3/ AVE. for YEARS TESTED	4/ % of CHECK	2021 2022 2023 2024			
		2025	TESTED	PROTEIN	PROTEIN				2025	TESTED	PROTEIN	PROTEIN							
WB GUNNISON (P+)(sawfly tol)	9	15.6	15.2		18.1	14.6	16.0	97.2	16.0	0.0	1.7	2.3	0.0	1.1	21.5	1.0			
DAGMAR (+)	7	16.4	16.3	16.5	17.8	15.9	16.3	100.1	16.4	4.0	0.0	3.7	2.3	0.7	2.4	42.0	2.0		
WB9879CLP (P+)	9	16.6	16.6	16.3	17.2		16.5	99.7	16.4	5.3	0.7	0.0	2.3		2.6	48.6	2.3		
ROCKER (P+)	3			17.2	17.7	15.7	16.9	100.7	16.5			0.3	0.7	0.3	0.4	48.7	2.4		
DUCLAIR (+)(sawfly tol)	8	16.2	16.5	17.1			16.6	101.8	16.7	3.7	3.7	0.7			3.6	68.7	3.3		
CORBIN (P+)	8	16.2	16.6	16.9			16.8	103.3	16.9	10.3	2.3	0.3			4.4	85.2	4.1		
MT DUTTON (+)	5	16.7	17.3	16.8	17.2	16.1	16.8	102.1	16.8	21.7	3.7	3.7	0.0	0.7	5.9	95.8	4.6		
SY LONGMIRE (P+)	3			17.3	17.9	15.2	16.8	100.5	16.5			0.7	1.0	1.0	0.9	100.0	4.8		
VIDA (+)	10	15.7	16.5	16.4	18.7	15.1	16.4	100.0	16.4	20.0	8.3	1.0	0.7	1.0	4.8	100.0	4.8		
MT CARLSON (+)	5	15.8	15.8	16.1	18.4	15.4	16.3	98.9	16.2	28.3	3.7	0.7	0.7	0.7	6.8	109.8	5.3		
NS PRESSER CLP (P+)	8	15.4	15.9	16.7			16.5	101.5	16.7	11.7	10.0	1.0			7.5	127.9	6.2		
MT SIDNEY (+)	6	16.1	16.8	16.2	18.7		16.5	100.7	16.5	25.0	5.0	0.3	0.3		9.8	158.0	7.6		
SY INGMAR (P+)	7	16.9	17.0	17.7			17.0	105.6	17.3	25.0	8.3	0.3			11.1	187.5	9.1		
SY SOREN (P+)	8	16.6	16.9	16.9			16.9	103.7	17.0	20.0	6.7	0.3			9.9	190.5	9.2		
MT UBET (+)	4			15.6	16.2	17.3	15.7	16.2	15.9			15.0	1.0	3.3	2.0	5.3	193.9	9.4	
BRENNAN (P+)	8	16.3	16.2	16.7			16.3	99.9	16.3	18.3	12.0	0.7			10.7	206.9	10.0		
REEDER (+)	10	16.2	16.5	17.0	16.7	15.7	16.5	100.7	16.5	25.0	11.7	2.3	2.3	2.3	11.5	238.6	11.5		
LANNING (+)	10	15.9	16.8	16.8	17.9	16.2	16.7	101.9	16.7	25.0	13.3	2.3	0.7	1.0	11.9	246.2	11.9		
MEANS (For Entries Listed)		16.2	16.4	16.8	17.8	15.5			16.5	16.2	6.6	1.1	1.4	1.0		6.1			

6/ Growing Season Precipitation (in.)	n/a	5.00	5.11	4.99	5.66	5.30
Soil PAW (in.) to SD @ Planting	12.74	9.08	4.69	n/a	8.97	8.87
Total Plant Available Water (in.)	n/a	14.10	9.80	n/a	14.60	12.83
Soil NO ₃ (lbs.) to SD at Planting	197	276	142	n/a	292	227
SD (Sampling Depth in Inches)	48	48	45	n/a	48	47
Fertilizer Applied	(# N)	100	46	46	68	85
	(# P ₂ O ₅)	20	9	9	14	17
	(# K ₂ O)	10	5	5	7	8
	(# S)	10	5	5	7	8

Check variety is Vida.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at <http://plantsciences.montana.edu/> for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selection decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 Pending.

3/ Only the most recent 5 years are shown, but summary calculations include all years noted.

4/ Percent of Vida protein or sawfly rating for the same data years as those in which a given entry was tested.

5/ 10-Yr Comparable Average = (x/y) * z where x = average protein or sawfly rating of a given entry for years tested, y = average protein or sawfly rating for Vida for the same years, and z = 10-Yr average protein or sawfly rating for the check variety Vida.

6/ Seeding to 14 days prior to harvest.