

Winter Wheat Variety Performance Bulletin

2025



Winter Wheat Breeding Program

Department of Plant Sciences and Plant Pathology

<http://plantsciences.montana.edu/crops>

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2025 MONTANA WINTER WHEAT VARIETY PERFORMANCE REPORT

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Introduction

Intrastate trials are conducted by the Montana Agricultural Experiment Stations (MAES) across diverse agro-climatic zones in Montana and at Williston Research Extension Center (WREC), Williston, North Dakota, to evaluate the performance of newly developed hard red winter wheat varieties and breeding lines in comparison with released and widely grown cultivars. The data presented are provided by research personnel from MAES, WREC, and Nutrien Ag Solutions. Data from some locations are unavailable due to winterkill, hail, or other unavoidable circumstances.

Variety testing methods

1. Locations, experimental design and seeding method

2025 Winter Wheat Intrastate Trials were evaluated at eight locations in Montana and one location in North Dakota. Figure 1 shows the test locations which include, Conrad, Ft. Benton and Havre (North Central District), Moccasin (Central District), Huntley (Southern District), Kalispell (Northwest District) and Bozeman (Southwest District), Sidney (Northeast District) and Williston, ND. The trials at Conrad and Ft. Benton were contracted through Nutrien Ag solutions.

The trial consists of 49 entries with 3 replicates and arranged in a 7x7 lattices or a randomized complete block design at each location. Plot size varies by location, from 35 ft² at Conrad to 60 ft² at Havre. Row number also varies; Bozeman and Havre are 3-row, Conrad, Huntley, and Ft. Benton are 4-row, Moccasin (5-row), Kalispell and Sidney (7-row), and Williston (8-row). Row spacing at most locations was on 1 ft. centers, except at Williston and Kalispell (6" centers) and Sidney at (7.5" center). All plots were seeded at 1 million seeds/acre, except at Kalispell (1.25 million) and Williston (1.17 million seeds/acre). Information on cropping history, seeding date, fertilizer applications, and harvest date is available for most testing locations in Table 1. All seed for each nursery, were treated with CruiserMaxx Vibrance Cereals® seed treatment and Gaucho® insecticide seed treatment, at recommended rates, before seeding.

2. Entries in Intrastate trial 2025

A total of 49 hard red winter wheat varieties and experimental breeding lines were evaluated in 2025 as part of the Intrastate trial. Of these, 19 were from private industries and 30 from public institutions (Table 2). Eighteen of the public entries were experimental lines.

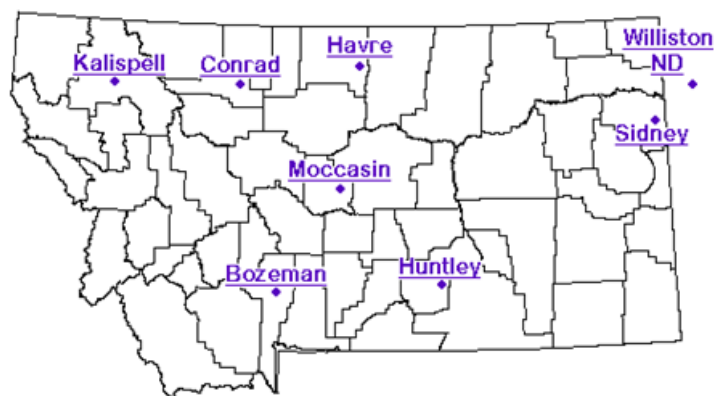


Figure 1. Locations of Intrastate trials for winter wheat performance tests in 2025

3. Data Collection

I. Days to Heading (DTH)

DTH was recorded when 50% of the heads in a plot are extended above the flag-leaf collar. DTH was then calculated days between head date and January 1st, 2025.

II. Days to Maturity (DTM)

DTM refers to the number of days from planting until the crop reaches physiological maturity, when grain filling is complete and kernels have reached maximum dry weight; typically indicated by loss of green color in the peduncle.

III. Plant Height (PH)

PH was observed in inches as a length of a plant from ground to top of head/spike (excluding awns). Data was collected 20 days after heading.

IV. Grain Yield (GY)

Plots are harvested using an experimental plot combine, and GY is measured prior to harvesting. GY is reported in bushels per acre, based on a standard bushel weight of 60 pounds. In addition to yields obtained in 2025, data are presented as two-year (2024–2025), three-year (2023–2025), four-year (2022–2025), and five-year (2021–2025) averages for hard wheat entries tested in previous cropping seasons.

V. Test Weight (TW)

TW is determined for each plot using a DICKEY-john® Grain Analysis Computer (GAC) or FOSS 1241 NIR. At some locations, a Seedburo® test weight apparatus is used. In this method, a grain sample is dropped through a funnel from a fixed height into a quart container; excess grain is removed using a flat stick, and the remaining grain is weighed on a gram scale. Grams per quart are then converted to pounds per bushel.

VI. Grain Protein

Grain protein is sampled from a composite of all 3 replicated plots at each location. It is reported as a percentage by NIR (near-infrared reflectance) using an Infratec® whole grain analyser. Samples are adjusted to a 12% moisture basis.

VII. Wheat Stem Sawfly Cutting

Wheat stem sawfly (WSS) is a persistent and economic problem for wheat growers in Montana. Host plant resistance in the form of stem solidness has been effective in reducing sawfly losses in both spring and winter wheat. Current MSU/MAES solid-stemmed winter wheat varieties include Judee, (released in 2011), Warhorse (2013), Loma (2016), Bobcat (2019), StandClear CLP (2020) MT WarCat (2022) and MT Meadowlark (2024). Sawfly cutting (SSF) percentage is scored on a scale of 0-100%, with 0 having no cutting and 100% having all stems in the plot cut and lodged due to wheat stem sawfly infestation. In 2025, heavy sawfly pressure was observed at Ft. Benton and plots were rated for sawfly cutting. Sawfly cutting percentage was noted at Ft Benton location, where sawfly pressure was present.

VIII. Stem Solidness Scoring (SS)

For stem solidness scoring (SS) stem samples were collected at Havre and Ft. Benton. Ten stems from each plot were collected around mid-grain filling and were processed at the Plant Growth Center, Montana State University, Bozeman. All internodes were rated between 1-5 scale, with 1 being hollow and 5 being solid and summed to get a solidness score between 5-25. Average scores across 10 stems have been reported in the tables.

IX. Disease reactions

Yellow rust severity (YR) was scored as percentage on a scale of 0 (resistant) to 100 (highly susceptible). Screening was conducted in three locations by the USDA-ARS at Pullman, Washington

X. Pre-Harvest sprouting (PHS)

PHS refers to a physiological process involving premature germination of cereal grains before harvest. A study was conducted to evaluate PHS in fifteen winter wheat varieties grown in Montana (Table19). Twenty spikes were collected from each variety around harvest time from the winter wheat yield trials at Arthur J. Post Agronomy Farm, Bozeman, Montana. A misting chamber was set up in a growth room at Plant Growth Center, Montana State University, Bozeman, Montana. The wheat spikes were placed on a netted tray in a high-moisture environment inside a misting chamber. The heads were irrigated by sprayers for one minute, every five minutes for seven days. After this period, the heads were scored according to the sprouted grains following a scale from 0 to 7 by Ricardo Javier Leiton Cubillo. The mean score between the heads was calculated to classify the PHS susceptibility of each variety.

4. Statistical analyses and interpretation

The data collected at each winter wheat location was analysed as a three-replication lattice or randomized complete block design. Least significant difference at the 0.05 probability level (LSD, $p = 0.05$) and coefficients of variation (CV) were calculated from analysis of variance at each location. The LSD is used to compare the performance of two specific varieties at a time. If the difference between two varieties exceeds the LSD, this is interpreted as a true difference because a difference between two varieties this large will only occur 5% of the time due to chance.

5. 2025 Winter Wheat Overview

According to the USDA Agricultural Statistics Service reported statewide winter wheat yields at 47 bushels per acre (bu/ac) nearly equal to 2024 season. This year, a total of 99.6-million-bushel of winter wheat was harvested from 2.1 million acres, which is nearly 15% more acres harvested than in 2024 and a 9% increase in average bushels per acre. Information was provided by USDA National Agricultural Statistics Service <https://quickstats.nass.usda.gov/results>. In 2025, the trial at Huntley suffered 100% loss due to hail damage and therefore, no data is reported.

6. Variety Selection

Performance summary for the hard red winter wheat varieties and experimental lines is presented in tables 3 through 13 from trials conducted at each research center sites and statewide. Across year performance of a variety or experimental line is presented for those that have been evaluated for two, three or four years. Variety selection should be based on yield stability at a particular location or within a particular district over a period of years. It is also important to consider other traits such as winter hardiness, heading data, test weight, protein, plant height, stem-solidness and disease resistance in the process of selection.

Table 1: Information on cropping history, seeding date, fertilizer applications, and harvest date at each intrastate testing site

Location	Conditions	District	Field Cropping History		Fertilizer Application* (lb/ac)					Dates		Notes
					N		P ₂ O ₅	K ₂ O	S			
			2023	2024	Fall '24	Spring '25				Seeding	Harvest	
Arthur H. Post Agronomy Farm	Dry land	Bozeman	--	Fallow	--	--	--	--	--	10/5/25	8/4/25	Huskie @ 15oz/A, Axial Bold @ 13 oz/A & Spret @ 2qts/100 gal
Western Triangle Agricultural Research Center	Dry land	Conrad	--	--	--	--	--	--	--	--	--	No trials in 2025
Nutrien Agri Solutions	Dry land	Fort Benton	--	--	--	--	--	--	--	--	--	
Nutrien Agri Solutions	Dry land	Conrad	--	--	--	--	--	--	--	--	--	
Northern Agricultural Research Center	Dry land	Havre	Spring Barley	Chemical Fallow	47	98	2	3	3	10/5/2024	8/1/25	
Southern Agriculture Research Center	Dry land	Huntley	--	--	--	--	--	--	--	--	--	100% Hail Damage
Northwestern Agricultural Research Center	Dry land/High rainfall	Kalispell	--	Canola	63	97	--	--	--	10/9/2024	09/06/25	
Central Agricultural Research Center	Dry land	Moccasin	--	--	--	--	--	--	--	10/1/2024	08/04/25	Plots 114, 115, 128 & 129 did not emerge.
Eastern Agricultural Research Center	Dry land	Sidney	--	Fallow	35 (F), 46 (B)	--	13	--	--	10/1/24	7/30/25	
Research Extension Center	Dry land	Williston, ND	--	--	--	--	--	--	--	--	--	

* = Fall nitrogen (N), phosphorus (P₂O₅), and potassium (K₂O) were preplant applied and incorporated.

-- = Data not available

Topdress (T), Furrow (F), Broadcast (B)

Table 2: Public and private hard winter wheat varieties and experimental lines in the 2025 intrastate test

Variety	Experimental Designation	Origin	Release Year	Pedigree (PVP)	Entity
AAC Coldfront		Alberta/ SECAN		--	Private
AAC Vortex		Alberta/ SECAN		--	Private
AAC Wildfire	W512/LK1064	Alberta/ SECAN	2020	(L99-1236' x 'AC Bellatrix) PVP# 202000008	Private
AP Solid	NP1300500#49	Syngenta	2023	(Judee x SY Wolf) PVP# 202200427	Private
AP Sunbird	CP15CW3388#011	Syngenta	2024	(Byrd x SY Sunrise//SY Wolf) PVP# 202400230	Private
AP24AX		Syngenta			Private
Bobcat	MTS1588	MAES	2020	Bobcat is of unknown pedigree, derived from a 2 single composite crosses. 1) MT0598 / 96X366-E29-1 = MT0598 [MT9859 (SMN62164 / SMN82140 // Rocky / Tiber) /3/ S87-101 (Norstar *2/ Yorkstar) /4/ Pronghorn] / 98X366-E29-1 [Heyne / Rampart // Bigsky sib]. SMN denotes Idaho experimental lines of unknown pedigree. 2) 01X258-C1 / MT0598 = 01X256-C1 [Lew / Tiber // Redwin /3/ Judith / Arapahoe /4/ Pryor // Genou] / MT0598 [MT9659 (SMN82164 / SMN82140 // Rocky / Tiber) /3/ S87-101 (Norstar *2/ Yorkstar) /4/ Pronghorn). PVP# 202000177	Public
Brawl CL Plus	CO06052	Colorado: Plainsgold/ Colorado Research Foundation	2014	Teal 11A/Above//(CO99314, TX91V4931/ Halt) PVP# 201200434	Public
	CO21SF191RA	Colorado State		--	Experimental
	CO21SF263RA	Colorado State		--	Experimental
	CP7017AX	Winfield United		--	Private
	CP 7462	Winfield United		--	Private
	CP 7869	Winfield United		--	Private
CS Bridger CLP	MTCL19151	Circle S, MAES	2024	(MT0871/06X445B1-2) PVP# 202400210	Public
Flathead	MT1564	MAES	2021	Selection from a composite of 2 crosses: Yellowstone (PI 643428) •2/PI 640431 and Yellowstone/PI 640431/4/Yellowstone•5f3N'ellowston~ sib//Rampart' (PI 593869) 0 2/Judith' (PI 584526). PI640431 (WA007900-4t4NvA007900// Yr5/6"Avocet'(PI 464644)/3/WA007900/N'r15/6• Avocet) PVP# 202000202	Public
FourOsix	MT1465	MAES	2020	Selection from a composite of 5 crosses: 1) Yellowstone/MT0684 (composite cross of 5 single crosses to XNH1881), 2) Yellowstone/MT06102 (composite cross of 2 single crosses to W94-137), 3) Yellowstone/MT06110 (SD93528/MT0409), 4) Yellowstone/MT06123 ('2174'[PI602595]/MT9449//BigSky' [PI619166], and 5) Yellowstone/98X168-1 (MTS9720//PI91303/Elkhorn' [PI596352] PVP# 201900053	Public
Judee	MTS0713	MAES	2014	(Vanguard/Norstar//Judith dwf, 93X312E14)/3/ NuHorizon, PVP# 201200161	Public
Keldin	ACS55017	Peter Franck: Seed-Link Inc.;	2014	(Barenburg 235 x Carlisle) I TRX-A16-3-2 PVP# 201300462	Private

Variety	Experimental Designation	Origin	Release Year	Pedigree (PVP)	Entity
		Ontario, Canada, Westbred LLC			
LCS Atomic AX	LCH 15ACC-7-7	Limagrain LLC	2021	(T153/ACC12) The pedigree of T153 Is (Jagger/T811)/T151 (T81/KS93U206). The pedigree of ACC12 is AF10/2*Byrd//AF26/Byrd)//2*Byrd. PVP# 202000234	Private
LCS Missile	LWH19-0192	Limagrain LLC	2025	Cross between OR2100081H x LCS Jet PVP # 202300275	Private
LCS Radar		Limagrain LLC	2025	PVP # 202400389	Private
LCS Steel AX	LCS 18-7071	Limagrain LLC	2021	Cross from LCS Chrome/ACC?-38. The pedigree of LCS Chrome is HV9W03-696R-2/KS020617-9. The pedigree of ACC?-38 is (AF28/Byrd//AF26/Byrd)//2*Byrd. < PVP# 202100229	Private
Loma	MTS1224	MAES	2019	Cross from 'Yellowstone' (PI643428)//MTS0112/MTS0125 PVP# 201700021	Public
MT Meadowlark	MTS2068	MAES	--	(Judee sib, MTS0819)//08X350-A6/Warhorse PVP # 202600080	Public
MT Barrett	MTV2164	MAES	--	MT1265*2/Joe	Public
MT WarCat	MTS18149	MAES	--	Loma*2/AAC Gateway PVP# 202400184	Public
	MT2142	MSU	--	MT10114/MT10128//MTW1251	Experimental
	MT2230	MSU	--	MT1450/OK09528	Experimental
	MT2270	MSU	--	MT1747*2/Flathead	Experimental
	MT2327	MSU	--	MT1469//MT1454/MT1445	Experimental
	MT2335	MSU	--	MV-Kolompos/MT1332	Experimental
	MTAX21203	MSU	--	Crescent AX/Bobcat	Experimental
	MTAX22120	MSU	--	Crescent AX/FourOsix	Experimental
	MTCS22127	MSU	--	Bobcat/MTCS18195	Experimental
	MTCS22128	MSU	--	Bobcat/MTCS18195	Experimental
	MTCS2264	MSU	--	<u>Judee*3/MTCS1301</u>	Experimental
	MTFHS23316	MSU	--	MTS1596//Judee/Emerson	Experimental
	MTS21103	MSU	--	-Bobcat//LCS Jet/MTS1703	Experimental
	MTS2286	MSU	--	MT1747*2/Flathead	Experimental
	MTS2294	MSU	--	Bobcat/(CO15SFD092, Fortify SF sib)	Experimental
	MTS23103	MSU	--	MTS1591//MTS1404/OK1059060	Experimental
	MTV2164	MSU	--	MT1265*2/Joe	Experimental

Variety	Experimental Designation	Origin	Release Year	Pedigree (PVP)	Entity
	NAS-25MT-01	Nutrien	--	--	Private
	NAS-25MT-02	Nutrien	--	--	Private
Northern	MT0978	MAES	2016	selection from a composite of 2 crosses: [MT9962//MTW0072/NW97151 and MIW0047//MTW0072/NW97S151] PVP # 201600092	Public
DG Ramsay	ACS 14138-7653	Stephanie Franck Nutrien	2024	(Keldin x Tribute) PVP# 202300014	Private
StandClear CLP	MTCS1601	MAES/ Loveland Products Inc; Loveland, CO	2020	[MTS0531/(MTS0532/6/96X17E69/3/MTCL0309/CDC Teal11A//MTW01143/41 MTCL0510/5/ MTS0531] PVP# 202000183	Private
SY Clearstone 2CL	MTCL1077	Syngenta Seed, MAES	2014	Yellowstone*4/3/MTCL01158/Teal 11A//Jagalene PVP# 202000183	Private
Warhorse	MTS0808	MAES	2014	Warhorse is of an unknown pedigree, derived from a composite of three topcrosses made to the same F1 population in 2000 [MT9908//Nuplains/MTS9862; Nuplains/MTS9862//MTW0047and Nuplains/MTS9862//MTS0028] PVP# 201400131	Public
Yellowstone	MT00159	MAES	2007	F ₂ composite of Promontory/Judith and Judith-dwarf/Promontory, PVP# <u>200600284</u>	Public

--: information not available

MAES: Montana Agricultural Experiment Stations

MSU: Montana State University

Table 3: Arthur H. Post Agronomy Farm, Bozeman (Location 1)

Genotype	DTH (days)	PH (in)	TW (lb/bu)	Protein (%)	GY (bu/ac)				
					2025	2024-25	2023-25	2022-25	2021-25
AAC Coldfront	162	35.3	64.9	12.5	66.5	--	101.7	107.9	96.9
AAC Vortex	162	36.4	63.3	12.8	61.0	--	--	--	--
AAC Wildfire	162	37.3	63.4	11.9	66.9	--	93.4	95.5	86.0
AP Solid	161	31.9	63.7	13.9	67.2	--	101.8	106.9	95.8
AP Sunbird	162	33.6	65.5	12.7	73.0	--	--	--	--
AP24AX	161	36.0	62.7	11.9	65.9	--	--	--	--
Bobcat	162	32.2	63.0	12.8	63.1	--	92.0	99.0	88.2
Brawl CL Plus	158	34.4	64.5	13.0	65.5	--	91.8	102.9	94.4
CO21SF191RA	161	35.3	63.7	12.9	71.4	--	--	--	--
CO21SF263RA	162	35.8	62.6	12.8	65.5	--	--	--	--
CP7017AX	159	32.4	64.5	12.3	66.6	--	101.3	106.5	95.8
CP7462	160	28.5	60.7	13.2	64.5	--	--	--	--
CP7869	157	34.1	64.1	11.4	65.8	--	--	--	--
CS Bridger CLP	163	31.0	61.4	12.3	64.3	--	--	--	--
Flathead	162	34.7	64.6	12.8	71.7	--	99.9	110.9	100.6
FourOsix	161	34.9	64.6	12.1	70.4	--	103.5	105.9	94.8
Judee	162	35.3	63.1	12.8	61.9	--	96.8	100.5	89.0
Keldin	160	35.7	63.0	11.6	71.6	--	113.6	121.3	108.5
LCS Atomic AX	160	34.5	65.3	13.1	62.2	--	--	--	--
LCS Missile	161	34.4	63.4	13.1	69.7	--	--	--	--
LCS Radar	156	34.1	65.9	13.0	65.5	--	--	--	--
LCS Steel AX	162	36.0	64.2	12.2	70.2	--	104.4	110.9	99.8
Loma	165	32.9	64.0	13.0	66.0	--	102.7	109.5	98.6
MT Meadowlark	160	32.7	64.1	11.5	73.8	--	101.8	107.7	96.6
MT WarCat	161	33.6	64.2	12.6	73.0	--	105.2	108.4	97.3
MT2142	163	33.2	65.0	12.5	68.8	--	--	--	--
MT2230	162	32.0	63.3	11.6	62.3	--	--	--	--
MT2270	162	33.7	65.2	12.5	69.5	--	--	--	--
MT2327	161	32.0	62.5	--	64.9	--	--	--	--
MT2335	161	34.8	63.5	12.1	68.4	--	--	--	--
MTAX21203	160	34.6	63.9	13.3	65.5	--	--	--	--
MTAX22120	159	34.8	64.4	12.3	73.2	--	--	--	--
MTCS22127	161	35.7	64.3	13.5	61.4	--	--	--	--
MTCS22128	163	33.1	63.5	12.0	67.1	--	--	--	--
MTCS2264	162	31.2	65.1	12.8	65.0	--	--	--	--
MTFHS23316	163	34.9	64.3	12.4	58.3	--	--	--	--
MTS21103	163	32.4	63.4	12.9	68.8	--	--	--	--
MTS2286	160	33.2	62.6	13.8	63.9	--	--	--	--
MTS2294	162	34.6	64.6	13.5	67.4	--	--	--	--
MTS23103	160	33.6	65.8	12.4	66.8	--	--	--	--
MT Barrett (MTV2164)	161	38.3	63.6	12.5	71.4	--	109.2	115.3	104.3
NAS-25MT-01	163	36.0	62.3	12.6	67.0	--	--	--	--
NAS-25MT-02	161	32.9	65.1	13.5	74.9	--	--	--	--
Northern	164	35.6	63.9	12.5	71.7	--	107.0	109.8	98.9
Ramsay	163	34.9	64.6	12.8	71.5	--	109.2	118.3	107.2
StandClear CLP	163	34.0	61.5	12.8	62.8	--	101.3	106.2	94.5
SY Clearstone 2CL	163	36.7	61.6	13.0	63.4	--	92.3	99.3	88.8
Warhorse	163	35.0	63.0	13.2	55.6	--	92.1	96.6	85.7
Yellowstone	163	37.5	61.5	14.1	70.2	--	104.1	110.7	99.9
Grand Mean	161	34.2	63.7		67.0		101.7	108.2	97.0
LSD	2.8	2.1	2.1		7.7				
CV	1.1	3.8	2		7.1				
Genotype significance	***	***	***		***		NS	***	***
GenxEnv significance							*	***	***
Env significance							***	***	**

--: information not available

Bold: highest value reported for the respective trait, Significance levels: $p \leq 0.001$ ***, $p \leq 0.01$ **, $p \leq 0.05$ *, NS: non-significant

Table 4: Nutrien Ag. Solutions, Conrad (Location 2)

Genotype	DTH (days)	PH (in)	TW (lb/bu)	Protein (%)	GY (bu/ac)				
					2025	2024-25	2023-25	2022-25	2021-25
AAC Coldfront	--	23.7	--	12.8	31.4	32.5	--	--	41.0
AAC Vortex	--	22.3	--	13.9	20.6	--	--	--	--
AAC Wildfire	--	22.7	--	12.8	26.6	30.9	--	--	37.0
AP Solid	--	21.3	--	14.3	26.8	30.6	--	--	39.1
AP Sunbird	--	20.0	--	13.4	27.6	--	--	--	--
AP24AX	--	22.0	--	12.9	30.4	--	--	--	--
Bobcat	--	22.0	--	13.7	36.0	36.8	--	--	42.9
Brawl CL Plus	--	22.3	--	13.8	25.0	28.3	--	--	35.1
CO21SF191RA	--	24.3	--	13.5	37.6	--	--	--	--
CO21SF263RA	--	26.0	--	14.0	29.0	--	--	--	--
CP7017AX	--	18.0	--	13.4	23.2	26.3	--	--	36.2
CP7462	--	19.3	--	13.9	26.2	--	--	--	--
CP7869	--	21.0	--	14.7	22.5	--	--	--	--
CS Bridger CLP	--	20.0	--	14.5	22.9	--	--	--	--
Flathead	--	23.0	--	14.8	27.8	30.9	--	--	41.5
FourOsix	--	23.0	--	13.7	29.4	32.0	--	--	43.6
Judee	--	23.0	--	15.9	27.1	29.1	--	--	37.5
Keldin	--	23.7	--	13.5	24.4	29.5	--	--	37.0
LCS Atomic AX	--	20.7	--	13.7	23.2	--	--	--	--
LCS Missile	--	21.7	--	13.6	27.5	--	--	--	--
LCS Radar	--	21.0	--	13.7	28.4	--	--	--	--
LCS Steel AX	--	23.0	--	12.7	31.0	32.3	--	--	40.8
Loma	--	22.3	--	15.3	26.2	28.7	--	--	43.1
MT Meadowlark	--	23.7	--	12.9	37.7	29.4	--	--	49.7
MT WarCat	--	25.3	--	12.9	36.5	35.0	--	--	43.5
MT2142	--	20.7	--	14.2	28.4	--	--	--	--
MT2230	--	19.7	--	14.6	21.4	--	--	--	--
MT2270	--	20.7	--	12.9	26.0	--	--	--	--
MT2327	--	21.0	--	13.6	26.5	--	--	--	--
MT2335	--	22.3	--	14.9	21.6	--	--	--	--
MTAX21203	--	23.0	--	14.0	30.8	--	--	--	--
MTAX22120	--	21.3	--	13.2	25.1	--	--	--	--
MTCS22127	--	23.7	--	14.0	27.8	--	--	--	--
MTCS22128	--	25.0	--	13.4	31.2	--	--	--	--
MTCS22264	--	20.7	--	15.2	32.4	--	--	--	--
MTFHS23316	--	21.3	--	15.7	22.9	--	--	--	--
MTS21103	--	21.0	--	14.2	34.3	--	--	--	--
MTS2286	--	23.0	--	14.0	36.5	--	--	--	--
MTS2294	--	21.3	--	14.4	29.7	--	--	--	--
MTS23103	--	21.7	--	15.5	24.8	--	--	--	--
MT Barrett (MTV2164)	--	24.7	--	14.0	23.1	29.5	--	--	38.0
NAS-25MT-01	--	23.3	--	13.8	26.7	--	--	--	--
NAS-25MT-02	--	22.7	--	13.6	39.1	--	--	--	--
Northern	--	22.0	--	14.6	26.5	28.9	--	--	38.2
Ramsay	--	22.7	--	13.7	28.9	32.2	--	--	40.7
StandClear CLP	--	23.7	--	14.0	27.2	31.1	--	--	38.6
SY Clearstone 2CL	--	25.3	--	14.0	23.6	27.8	--	--	36.2
Warhorse	--	21.0	--	14.7	18.9	26.2	--	--	34.2
Yellowstone	--	25.3	--	13.7	25.7	30.6	--	--	42.8
Grand Mean		22.3		14.0	27.8	30.9			39.1
LSD		1.8		0.8	6.2				
CV		4.9		3.5	13.9				
Genotype significance		***		***	***	NS			NS
GenxEnv significance						***			NS
Env significance						***			***

--: information not available

Bold: highest value reported for the respective trait; Significance levels: $p \leq 0.001$ ***, $p \leq 0.01$ **, $p \leq 0.05$ *, NS: non-significant

Table 5: Nutrien Ag Solutions, Fort Benton (Location 3)

Genotype	DTH (days)	PH (in)	SSF (%)	TW (lb/bu)	Protein (%)	GY (bu/ac)				
						2025	2024-25	2023-25	2022-25	2021-25
AAC Coldfront	--	30.0	60.0	63.1	13.4	55.1	54.5	61.2	53.6	52.2
AAC Vortex	--	30.3	56.7	62.2	14.3	51.8	--	--	--	--
AAC Wildfire	--	31.7	40.0	60.7	14.0	55.5	52.7	55.0	46.5	43.3
AP Solid	--	27.7	43.3	64.2	13.7	68.6	64.1	68.2	58.3	56.9
AP Sunbird	--	26.3	96.7	63.2	12.9	52.4	--	--	--	--
AP24AX	--	30.0	60.0	61.6	12.8	63.2	--	--	--	--
Bobcat	--	26.0	8.3	62.9	13.8	65.7	64.0	63.3	54.7	50.9
Brawl CL Plus	--	30.3	70.0	63.6	13.7	59.6	54.5	53.6	45.5	46.7
CO21SF191RA	--	31.3	60.0	61.1	13.4	57.3	--	--	--	--
CO21SF263RA	--	32.3	53.3	61.4	13.8	60.3	--	--	--	--
CP7017AX	--	26.7	80.0	63.6	13.2	66.6	63.0	51.2	48.5	46.4
CP7462	--	24.7	25.0	60.7	13.5	67.4	--	--	--	--
CP7869	--	27.0	93.3	62.0	13.3	51.2	--	--	--	--
CS Bridger CLP	--	27.3	63.3	62.7	13.1	55.6	--	--	--	--
Flathead	--	30.0	66.7	63.3	13.7	59.7	57.9	55.1	47.3	47.9
FourOsix	--	29.0	53.3	62.0	13.9	60.3	57.9	54.3	47.7	46.2
Judee	--	30.0	60.0	62.4	14.2	51.6	51.0	53.6	47.3	44.3
Keldin	--	30.3	36.7	62.7	12.9	72.2	65.6	69.8	59.0	58.3
LCS Atomic AX	--	30.3	83.3	62.2	12.7	64.2	--	--	--	--
LCS Missile	--	28.7	63.3	60.3	13.6	52.6	--	--	--	--
LCS Radar	--	26.7	100	61.4	13.4	48.1	--	--	--	--
LCS Steel AX	--	31.0	66.6	62.6	12.7	61.8	56.3	59.1	52.0	50.6
Loma	--	29.0	40.0	62.1	13.4	63.8	58.4	58.7	50.3	48.6
MT Meadowlark	--	29.0	13.3	62.1	13.5	67.9	64.2	69.9	46.4	56.9
MT WarCat	--	29.3	18.3	62.3	13.8	66.6	58.2	61.6	53.3	52.0
MT2142	--	27.0	73.3	62.2	13.0	56.5	--	--	--	--
MT2230	--	27.7	36.6	63.8	13.9	57.9	--	--	--	--
MT2270	--	29.0	33.3	63.1	12.5	66.4	--	--	--	--
MT2327	--	28.3	73.3	62.2	12.6	61.9	--	--	--	--
MT2335	--	30.3	56.7	60.8	14.1	61.1	--	--	--	--
MTAX21203	--	30.0	30.0	63.6	13.4	65.1	--	--	--	--
MTAX22120	--	28.0	50.0	62.1	12.5	65.4	--	--	--	--
MTCS22127	--	30.3	56.7	61.8	13.4	58.2	--	--	--	--
MTCS22128	--	29.3	32.3	63.0	13.1	71.0	--	--	--	--
MTCS2264	--	25.7	53.3	63.4	14.8	59.0	--	--	--	--
MTFHS23316	--	30.7	53.3	62.9	14.3	51.5	--	--	--	--
MTS21103	--	27.7	26.6	60.7	14.1	62.0	--	--	--	--
MTS2286	--	28.7	33.3	61.3	14.0	66.1	--	--	--	--
MTS2294	--	30.0	46.7	63.6	13.1	62.3	--	--	--	--
MTS23103	--	29.0	40.0	62.5	14.3	69.8	--	--	--	--
MT Barrett (MTV2164)	--	32.0	43.3	62.1	13.1	63.3	60.1	57.1	49.5	48.1
NAS-25MT-01	--	31.0	33.3	61.7	13.4	64.7	--	--	--	--
NAS-25MT-02	--	29.7	15.0	63.3	12.6	71.6	--	--	--	--
Northern	--	31.3	41.7	62.1	13.8	59.2	54.6	58.0	50.1	47.4
Ramsay	--	29.7	26.6	62.7	13.2	71.1	66.3	60.5	52.4	51.0
StandClear CLP	--	28.7	56.7	62.8	13.1	60.5	58.6	58.3	51.3	49.3
SY Clearstone 2CL	--	33.0	76.7	61.1	13.1	60.2	55.6	50.3	43.7	41.8
Warhorse	--	30.0	21.6	61.2	14.3	56.0	56.2	61.6	51.7	48.2
Yellowstone	--	31.7	66.7	60.0	12.8	60.1	52.6	48.0	42.6	42.2
Grand Mean		29.3	50.8	62.3	13.5	61.2	58.1	58.0	50.5	49.1
LSD		1.4	19.3	1.0	0.6	8.9				
CV		2.9	24.9	1.0	2.9	9.0				
Genotype significance		***	*	***	***	***	*	NS	NS	*
GenxEnv significance							NS	***	***	***
Env significance							***	*	***	***

--: information not available

Bold: highest value reported for the respective trait; Significance levels: $p \leq 0.001$ ***, $p \leq 0.01$ **, $p \leq 0.05$ *, NS: non-significant

Table 6: Northern Agricultural Research Center, Havre (Location 4)

Genotype	DTH (days)	DTM (Days)	PH (in)	SSF (%)	TW (lb/bu)	Protein (%)	GY (bu/ac)				
							2025	2024-25	2023-25	2022-25	2021-25
AAC Coldfront	153	191	27.3	2	60.5	14.2	57.9	71.8	58.1	58.0	51.2
AAC Vortex	156	190	28.2	0.3	59.9	14.5	61.0	--	--	--	--
AAC Wildfire	156	191	29.1	1.7	59.8	14.2	65.8	72.3	58.8	56.0	48.5
AP Solid	149	189	26.2	0	61.7	14.3	55.1	74.1	58.7	59.0	52.3
AP Sunbird	148	188	27.7	0.3	61.2	14.0	62.3	--	--	--	--
AP24AX	150	189	27.6	0.7	59.6	13.2	63.1	--	--	--	--
Bobcat	153	189	25.1	0	60.3	14.6	63.7	73.1	60.5	61.8	54.6
Brawl CL Plus	147	189	28.2	0.3	60.6	14.7	55.9	70.8	57.3	57.4	51.8
CO21SF191RA	151	189	28.5	0.7	59.6	14.2	64.8	--	--	--	--
CO21SF263RA	151	190	30.1	0	59.6	14.8	59.9	--	--	--	--
CP7017AX	148	188	26.8	0	60.7	13.4	61.8	74.7	58.7	59.9	54.3
CP7462	148	188	26.2	0	59.0	13.7	56.5	--	--	--	--
CP7869	147	189	28.8	0	59.6	14.7	58.8	--	--	--	--
CS Bridger CLP	150	190	24.6	0	60.4	14.7	53.8	--	--	--	--
Flathead	148	188	30.4	0	61.1	14.6	57.5	72.5	59.4	58.7	54.2
FourOsix	151	190	27.7	0	60.2	14.5	57.3	73.8	59.5	59.3	52.5
Judee	154	189	27.4	0	61.0	15.4	52.8	63.7	53.2	52.5	45.7
Keldin	153	190	29.2	0	60.7	14.0	69.4	83.8	68.6	66.9	59.2
LCS Atomic AX	148	189	27.5	0.7	59.4	14.2	53.6	--	--	--	--
LCS Missile	156	191	25.0	2	59.7	14.3	58.1	--	--	--	--
LCS Radar	148	189	26.3	0.3	60.3	15.3	48.8	--	--	--	--
LCS Steel AX	151	190	28.4	0	60.9	12.7	72.5	79.9	65.7	64.9	58.2
Loma	156	190	24.4	0.3	59.8	15.1	51.6	65.7	55.4	54.9	48.6
MT Meadowlark	155	190	28.9	0	60.8	14.1	62.3	75.2	61.9	61.7	55.0
MT WarCat	156	191	28.0	0	60.6	14.2	62.9	69.0	56.6	56.8	50.0
MT2142	152	189	25.1	0.3	60.5	14.9	52.9	--	--	--	--
MT2230	147	189	28.3	0.3	60.7	15.2	49.7	--	--	--	--
MT2270	151	189	27.9	0.3	60.9	13.5	71.9	--	--	--	--
MT2327	150	188	26.8	0.3	60.0	14.6	63.0	--	--	--	--
MT2335	150	191	26.8	0.7	59.1	16.1	51.1	--	--	--	--
MTAX21203	148	189	28.4	0	61.4	14.3	57.0	--	--	--	--
MTAX22120	148	188	27.9	0	60.4	13.4	63.7	--	--	--	--
MTCS22127	150	188	28.8	0	59.0	14.8	56.5	--	--	--	--
MTCS22128	155	188	28.6	0	59.9	14.0	56.5	--	--	--	--
MTCS2264	152	189	24.6	0	61.6	15.6	53.5	--	--	--	--
MTFHS23316	155	190	26.2	0.3	60.7	15.9	48.2	--	--	--	--
MTS21103	154	190	25.7	0.7	59.3	14.5	60.4	--	--	--	--
MTS2286	156	192	26.3	0.7	59.5	15.2	54.0	--	--	--	--
MTS2294	152	189	27.6	0.7	61.2	14.2	63.8	--	--	--	--
MTS23103	150	189	28.7	0	59.0	15.9	52.9	--	--	--	--
MT Barrett (MTV2164)	150	188	30.5	0	59.7	14.0	63.6	77.0	64.6	64.5	57.8
NAS-25MT-01	156	191	28.0	0	59.6	13.9	55.9	--	--	--	--
NAS-25MT-02	153	191	26.2	1	61.0	13.6	54.8	--	--	--	--
Northern	154	191	27.3	0.3	60.8	14.9	53.8	72.7	59.4	59.1	51.7
Ramsay	152	190	28.6	0.3	60.5	13.8	66.3	80.6	63.9	64.5	57.8
StandClear CLP	153	188	28.6	0.3	60.4	14.6	66.9	72.3	59.2	58.7	51.6
SY Clearstone 2CL	153	190	30.2	0.3	59.7	15.2	52.9	72.8	58.8	58.0	50.1
Warhorse	153	190	27.3	0	60.8	15.3	52.5	63.0	50.8	51.6	45.1
Yellowstone	154	190	29.1	0.3	59.6	14.8	60.0	75.1	62.1	62.3	55.5
Grand Mean	<i>152</i>	<i>190</i>	<i>27.6</i>	<i>0.3</i>	<i>60.3</i>	<i>14.5</i>	<i>58.6</i>	<i>73.1</i>	<i>59.7</i>	<i>59.7</i>	<i>53.0</i>
LSD	2.2	1.7	1.9	0.48	0.7	0.6	8.3				
CV	0.9	0.6	4.3	231.2	0.6	2.5	8.3				
Genotype significance	***	***	***	NS	***	***	***	NS	NS	**	**
GenxEnv significance								***	***	***	***
Env significance								***	***	***	***

'--': information not available

Bold: highest value reported for the respective trait; Significance levels: p≤0.001***, p≤0.01**, p≤0.05*, NS: non-significant.

Table 7: Southern Agriculture Research Center, Huntley (Location 5)

Genotype	DTH (days)	DTM (Days)	PH (in)	SSF (%)	TW (lb/bu)	Protein (%)	GY (bu/ac)				
							2025	2024-25	2023-24	2022-24	2021-24
AAC Coldfront							--	--	70.7	--	--
AAC Vortex							--	--	--	--	--
AAC Wildfire							--	--	69.9	58.8	55.6
AP Solid							--	--	74.9	68.7	65.9
AP Sunbird							--	--	--	--	--
AP24AX							--	--	--	--	--
Bobcat							--	--	46.8	47.1	50.0
Brawl CL Plus							--	--	54.2	52.1	53.7
CO21SF191RA							--	--	--	--	--
CO21SF263RA							--	--	--	--	--
CP7017AX							--	--	--	--	--
CP7462							--	--	--	--	--
CP7869							--	--	--	--	--
CS Bridger CLP							--	--	55.5	53.4	56.1
Flathead							--	--	54.1	50.4	51.5
FourOsix							--	--	47.6	45.4	49.6
Judee							--	--	67.9	60.1	58.5
Keldin							--	--	79.3	66.6	65.7
LCS Atomic AX							--	--	--	--	--
LCS Missile							--	--	--	--	--
LCS Radar							--	--	--	--	--
LCS Steel AX							--	--	79.7	69.0	64.9
Loma							--	--	58.3	55.1	57.1
MT Meadowlark							--	--	--	37.0	44.3
MT WarCat							--	--	66.0	59.6	58.8
MT2142							--	--	--	--	--
MT2230							--	--	--	--	--
MT2270							--	--	--	--	--
MT2327							--	--	--	--	--
MT2335							--	--	--	--	--
MTAX21203							--	--	--	--	--
MTAX22120							--	--	--	--	--
MTCS22127							--	--	--	--	--
MTCS22128							--	--	--	--	--
MTCS2264							--	--	--	--	--
MTFHS23316							--	--	--	--	--
MTS21103							--	--	--	--	--
MTS2286							--	--	--	--	--
MTS2294							--	--	--	--	--
MTS23103							--	--	--	--	--
MT Barrett (MTV2164)							--	--	60.6	--	--
NAS-25MT-01							--	--	--	--	--
NAS-25MT-02							--	--	--	--	--
Northern							--	--	67.7	60.9	59.3
Ramsay							--	--	76.6	64.8	64.6
StandClear CLP							--	--	55.5	52.2	53.7
SY Clearstone 2CL							--	--	50.3	44.9	49.5
Warhorse							--	--	62.6	56.4	55.3
Yellowstone							--	--	52.8	48.3	50.9
Grand Mean									64.2	58.0	57.3
LSD											
CV											
Genotype significance											
GenxEnv significance									NS	NS	NS
Env significance									***	***	***

100% of trial lost due to hailstorm at late tillering stage.

--: information not available

Bold: highest value reported for the respective trait; Significance levels: $p \leq 0.001$ ***, $p \leq 0.01$ **, $p \leq 0.05$ *, NS: non-significant

Table 8: Northwestern Agricultural Research Center, Kalispell (Location 6)

Genotype	DTH (days)	DTH (days)	PH (in)	TW (lb/bu)	Protein (%)	GY (bu/ac)				
						2025	2024-25	2023-25	2022-25	2021-25
AAC Coldfront	155	196	36.0	59.6	12.7	162.7	170.1	165.0	158.2	153.1
AAC Vortex	156	196	36.2	60.6	12.9	148.1	--	--	--	--
AAC Wildfire	160	198	40.0	60.7	11.5	150.1	159.5	149.6	146.1	142.8
AP Solid	154	195	32.9	60.2	12.7	143.7	147.3	137.9	135.4	130.3
AP Sunbird	152	189	30.6	60.6	13.0	155.3	--	--	--	--
AP24AX	154	196	33.6	59.5	12.0	175.5	--	--	--	--
Bobcat	154	193	31.9	59.4	13.0	154.5	169.3	161.0	154.2	148.7
Brawl CL Plus	151	192	33.2	60.1	13.6	145.6	156.7	142.5	135.1	129.8
CO21SF191RA	154	194	37.0	60.0	12.6	162.9	--	--	--	--
CO21SF263RA	155	195	39.0	59.9	12.5	160.5	--	--	--	--
CP7017AX	152	191	32.0	61.6	13.4	128.2	138.0	139.0	134.8	127.4
CP7462	152	190	28.8	59.4	13.5	166.2	--	--	--	--
CP7869	151	189	30.8	58.1	12.6	154.6	--	--	--	--
CS Bridger CLP	154	192	32.5	59.0	12.5	166.3	--	--	--	--
Flathead	152	191	34.6	61.0	13.4	161.7	177.4	170.2	160.3	154.9
FourOsix	154	195	33.8	59.8	13.0	171.9	181.9	172.5	160.9	156.1
Judee	154	194	34.1	60.8	12.8	141.6	155.2	156.1	146.5	136.8
Keldin	154	194	34.9	60.1	12.4	167.4	175.1	169.3	163.7	157.9
LCS Atomic AX	152	193	34.5	59.9	13.6	161.3	--	--	--	--
LCS Missile	155	194	33.2	59.5	12.4	170.0	--	--	--	--
LCS Radar	152	189	32.7	60.2	13.1	160.8	--	--	--	--
LCS Steel AX	154	196	35.3	60.6	12.3	166.0	170.7	153.8	148.0	142.9
Loma	156	197	33.7	60.1	12.9	160.5	172.8	167.9	156.5	153.1
MT Meadowlark	158	196	33.9	60.2	12.7	180.1	189.9	178.4	163.1	158.0
MT WarCat	160	195	35.1	60.9	12.5	160.7	175.1	166.6	155.7	150.7
MT2142	156	194	32.7	60.2	13.0	162.5	--	--	--	--
MT2230	153	192	33.7	60.0	12.9	145.7	--	--	--	--
MT2270	154	195	33.6	57.9	12.5	172.1	--	--	--	--
MT2327	153	190	32.5	58.1	11.9	153.6	--	--	--	--
MT2335	153	195	35.1	59.2	13.4	158.7	--	--	--	--
MTAX21203	153	194	33.2	59.0	12.7	148.8	--	--	--	--
MTAX22120	153	192	33.3	57.9	11.9	163.0	--	--	--	--
MTCS22127	153	192	36.3	60.3	13.4	162.4	--	--	--	--
MTCS22128	160	195	33.5	60.2	12.9	163.4	--	--	--	--
MTCS2264	154	193	32.6	61.2	13.6	146.0	--	--	--	--
MTFHS23316	156	196	37.1	59.7	13.9	144.9	--	--	--	--
MTS21103	156	195	32.2	59.6	12.2	163.1	--	--	--	--
MTS2286	160	197	34.8	60.2	12.7	163.6	--	--	--	--
MTS2294	154	191	33.9	60.9	12.4	145.0	--	--	--	--
MTS23103	152	190	33.0	60.5	13.5	151.5	--	--	--	--
MT Barrett (MTV2164)	153	194	38.7	58.3	12.8	160.7	184.3	173.0	166.1	161.0
NAS-25MT-01	159	197	35.8	59.8	11.9	161.8	--	--	--	--
NAS-25MT-02	154	190	33.0	60.4	12.4	163.4	--	--	--	--
Northern	158	196	35.7	60.1	11.9	166.0	151.6	154.7	148.5	144.4
Ramsay	154	193	34.7	60.2	12.0	160.7	180.8	173.7	163.9	158.8
StandClear CLP	154	191	32.4	60.4	12.8	147.6	163.3	158.0	150.5	142.7
SY Clearstone 2CL	154	194	38.7	59.8	12.7	163.7	176.5	171.5	164.8	158.6
Warhorse	155	194	35.3	60.8	13.7	151.5	155.5	146.2	141.7	134.9
Yellowstone	155	195	36.7	60.4	13.4	167.0	178.0	168.0	157.6	154.4
Grand Mean	<i>155</i>	<i>194</i>	<i>34.3</i>	<i>59.9</i>	<i>12.8</i>	<i>158.4</i>	<i>166.4</i>	<i>158.7</i>	<i>152.0</i>	<i>147.0</i>
LSD	<i>1.9</i>	<i>1.8</i>	<i>2.1</i>	<i>2.2</i>	<i>1.0</i>	<i>19.0</i>				
CV	<i>0.8</i>	<i>0.6</i>	<i>3.7</i>	<i>2.3</i>	<i>4.9</i>	<i>7.3</i>				
Genotype significance	***	***	***	NS	***	***	NS	**	**	***
GenxEnv significance							NS	NS	NS	NS
Env significance							**	***	***	***

'--': information not available

Bold: highest value reported for the respective trait; Significance levels: p≤0.001***, p≤0.01**, p≤0.05*, NS: non- significant

Table 9: Central Agricultural Research Center, Moccasin (Location 7)

Genotype	DTH (days)	DTH (days)	PH (in)	TW (lb/bu)	Protein (%)	GY (bu/ac)				
						2025	2024-25	2023-25	2022-25	2021-25
AAC Coldfront	157	--	30.3	63.2	12.2	77.9	54.6	54.6	50.0	44.9
AAC Vortex	159	--	31.0	62.2	12.5	75.3	--	--	--	--
AAC Wildfire	156	--	28.7	62.3	11.6	86.2	58.0	58.0	53.5	47.3
AP Solid	156	--	27.7	64.6	11.5	81.8	61.3	61.3	59.9	54.7
AP Sunbird	153	--	27.3	63.0	11.2	78.4	--	--	--	--
AP24AX	156	--	30.3	61.4	10.7	80.7	--	--	--	--
Bobcat	160	--	30.4	62.6	12.5	79.4	58.0	58.0	53.5	48.2
Brawl CL Plus	151	--	28.3	63.2	12.4	72.9	53.1	53.1	50.0	46.7
CO21SF191RA	156	--	30.0	61.9	12.1	76.7	--	--	--	--
CO21SF263RA	157	--	32.7	61.9	11.2	72.8	--	--	--	--
CP7017AX	151	--	27.7	62.2	10.9	87.4	63.3	63.3	56.0	50.1
CP7462	153	--	25.7	61.3	11.4	83.9	--	--	--	--
CP7869	151	--	26.0	61.7	11.9	75.1	--	--	--	--
CS Bridger CLP	154	--	27.3	61.2	11.8	73.8	--	--	--	--
Flathead	156	--	30.3	62.8	12.6	85.6	62.3	62.3	58.3	52.5
FourOsix	155	--	28.7	62.3	12.2	87.1	62.9	62.9	57.2	50.6
Judee	155	--	29.7	62.3	12.3	77.0	58.2	58.2	53.0	48.1
Keldin	157	--	29.7	62.3	12.2	86.5	58.6	58.6	55.6	50.5
LCS Atomic AX	153	--	29.0	62.2	10.7	71.5	--	--	--	--
LCS Missile	159	--	28.3	60.2	12.2	78.4	--	--	--	--
LCS Radar	151	--	27.7	62.5	12.9	75.9	--	--	--	--
LCS Steel AX	155	--	30.4	62.2	10.7	81.0	61.2	61.2	57.5	52.3
Loma	159	--	29.3	62.3	11.6	82.7	57.6	57.6	53.3	48.8
MT Meadowlark	160	--	28.4	63.0	11.3	84.1	62.7	62.7	52.8	47.6
MT WarCat	160	--	29.9	62.5	11.4	77.3	56.6	56.6	51.6	46.4
MT2142	157	--	28.0	62.5	12.3	81.2	--	--	--	--
MT2230	152	--	30.3	62.9	12.8	83.0	--	--	--	--
MT2270	158	--	29.7	62.5	11.7	85.8	--	--	--	--
MT2327	156	--	28.0	61.7	11.6	77.9	--	--	--	--
MT2335	157	--	30.3	60.6	11.8	88.8	--	--	--	--
MTAX21203	154	--	31.0	63.2	11.6	81.9	--	--	--	--
MTAX22120	154	--	29.7	62.1	11.9	89.3	--	--	--	--
MTCS22127	155	--	30.7	61.5	11.9	80.6	--	--	--	--
MTCS22128	159	--	31.7	63.4	11.1	87.1	--	--	--	--
MTCS2264	156	--	27.7	63.6	12.2	86.7	--	--	--	--
MTFHS23316	156	--	29.7	63.5	12.5	81.7	--	--	--	--
MTS21103	159	--	28.3	61.2	11.4	78.6	--	--	--	--
MTS2286	159	--	30.3	61.1	11.7	79.9	--	--	--	--
MTS2294	157	--	31.0	63.1	12.0	84.2	--	--	--	--
MTS23103	153	--	28.0	61.7	12.5	79.0	--	--	--	--
MT Barrett (MTV2164)	157	--	32.3	62.4	12.0	76.9	55.3	55.3	50.8	45.6
NAS-25MT-01	159	--	32.0	61.7	12.1	85.4	--	--	--	--
NAS-25MT-02	157	--	29.7	62.6	10.7	87.6	--	--	--	--
Northern	158	--	32.0	61.9	12.3	74.8	55.0	55.0	49.2	46.2
Ramsay	158	--	29.0	63.5	11.6	83.9	60.3	60.3	55.7	50.5
StandClear CLP	157	--	31.7	62.6	11.8	84.2	59.7	59.7	53.4	47.7
SY Clearstone 2CL	160	--	34.7	62.8	11.7	85.6	60.5	60.5	57.7	52.1
Warhorse	157	--	28.7	61.8	12.5	71.1	54.6	54.6	51.7	47.4
Yellowstone	160	--	33.5	61.5	12.0	87.1	62.9	62.9	58.7	52.7
Grand Mean	<i>156</i>		<i>29.7</i>	<i>62.3</i>	<i>11.8</i>	<i>81.1</i>	<i>58.9</i>	<i>58.9</i>	<i>54.0</i>	<i>48.9</i>
LSD	<i>2.6</i>		<i>2.4</i>	<i>1.2</i>	<i>0.9</i>	<i>13.7</i>				
CV	<i>1.0</i>		<i>4.9</i>	<i>1.2</i>	<i>4.8</i>	<i>9.9</i>				
Genotype significance	***		***	***	***	NS	NS	NS	NS	NS
GenxEnv significance							NS	NS	NS	NS
Env significance							***	***	***	***

'--': information not available

Bold: highest value reported for the respective trait; Significance levels: $p \leq 0.001$ ***, $p \leq 0.01$ **, $p \leq 0.05$ *, NS: non-significant.

Table 10: Eastern Agricultural Research Center, Sidney (Location: 8)

Genotype	DTH	PH (in)	TW	Protein	WS	GY				
						2025	2024-25	2023-25	2022-25	2021-25
AAC Coldfront	163	29.8	63.5	11.7	76.7	82.7	88.6	93.1	87.6	79.8
AAC Vortex	165	29.5	61.7	11.7	88.3	73.0	--	--	--	--
AAC Wildfire	168	30.6	61.7	12.0	80.0	80.6	89.3	92.9	84.5	78.3
AP Solid	161	24.7	62.8	13.2	26.7	37.5	58.5	68.8	67.0	59.2
AP Sunbird	158	22.3	63.1	10.9	60.0	46.3	--	--	--	--
AP24AX	161	25.9	61.5	10.7	41.7	62.4	--	--	--	--
Bobcat	168	25.3	63.6	11.8	51.7	62.1	79.5	83.5	79.9	73.2
Brawl CL Plus	155	25.1	62.7	12.4	60.0	46.4	65.9	71.3	68.1	58.8
CO21SF191RA	165	27.8	62.5	12.4	58.3	58.7	--	--	--	--
CO21SF263RA	167	27.8	62.2	12.6	60.0	52.3	--	--	--	--
CP7017AX	159	21.7	61.2	11.4	46.7	43.8	62.3	73.9	68.8	60.6
CP7462	159	22.6	59.9	11.1	58.3	53.5	--	--	--	--
CP7869	156	24.2	62.6	11.6	46.7	55.3	--	--	--	--
CS Bridger CLP	161	26.1	62.2	12.2	76.7	77.0	--	--	--	--
Flathead	158	25.6	62.8	11.9	40.0	54.9	80.3	84.0	78.6	71.8
FourOsix	166	25.2	63.0	12.0	45.0	57.0	80.9	86.1	80.8	73.1
Judee	168	23.9	62.2	14.3	28.3	32.0	59.1	68.3	65.4	56.1
Keldin	168	27.2	63.2	11.8	36.7	53.9	78.9	86.2	78.8	71.1
LCS Atomic AX	160	24.9	62.7	11.2	63.3	53.2	--	--	--	--
LCS Missile	166	23.6	59.6	12.5	10.0	19.5	--	--	--	--
LCS Radar	160	23.9	62.3	12.2	71.7	50.7	--	--	--	--
LCS Steel AX	164	26.6	62.5	10.2	46.7	58.3	79.6	87.2	80.3	72.5
Loma	167	25.6	61.4	12.4	55.0	71.9	85.0	89.5	82.9	76.2
MT Meadowlark	169	26.5	62.0	11.9	50.0	59.9	78.5	83.3	80.4	72.7
MT WarCat	170	27.6	62.1	12.0	40.0	57.6	77.0	82.9	78.9	71.1
MT2142	164	26.5	62.9	11.4	60.0	69.0	--	--	--	--
MT2230	161	25.3	63.4	12.8	45.0	44.0	--	--	--	--
MT2270	165	26.4	63.5	10.4	46.7	72.2	--	--	--	--
MT2327	162	25.3	62.2	12.5	35.0	51.0	--	--	--	--
MT2335	165	24.5	59.2	15.2	21.7	31.9	--	--	--	--
MTAX21203	161	25.6	63.4	12.3	41.7	37.9	--	--	--	--
MTAX22120	161	23.1	62.7	11.5	30.0	46.0	--	--	--	--
MTCS22127	164	26.8	62.0	12.1	60.0	60.8	--	--	--	--
MTCS22128	168	28.0	63.1	11.3	53.3	76.1	--	--	--	--
MTCS2264	166	23.1	61.2	13.8	18.3	31.7	--	--	--	--
MTFHS23316	169	26.5	62.7	13.4	31.7	48.0	--	--	--	--
MTS21103	168	25.6	61.6	11.9	46.7	62.0	--	--	--	--
MTS2286	168	28.0	62.7	11.5	60.0	66.6	--	--	--	--
MTS2294	164	24.1	63.8	11.8	28.3	58.7	--	--	--	--
MTS23103	163	24.8	62.5	13.6	38.3	39.8	--	--	--	--
MT Barrett (MTV2164)	162	29.8	61.3	11.3	55.0	73.5	88.8	93.1	87.6	79.8
NAS-25MT-01	167	29.4	62.6	10.8	68.3	69.8	--	--	--	--
NAS-25MT-02	166	25.7	62.9	12.6	18.3	38.9	--	--	--	--
Northern	167	27.4	62.3	12.6	55.0	69.1	89.7	93.4	85.2	77.2
Ramsay	169	26.8	63.3	11.7	25.0	57.0	79.5	86.1	78.4	70.6
StandClear CLP	166	27.8	63.4	11.9	83.3	69.4	85.3	89.1	83.1	75.6
SY Clearstone 2CL	166	30.6	62.2	12.4	66.7	62.0	84.4	85.0	79.6	71.7
Warhorse	167	24.7	61.6	12.5	56.7	63.3	76.6	80.8	76.5	69.5
Yellowstone	165	28.7	62.3	11.7	68.3	73.4	89.9	93.6	86.8	79.2
Grand Mean	<i>164</i>	<i>26.1</i>	<i>62.3</i>	<i>12.1</i>	<i>49.6</i>	<i>56.6</i>	<i>78.8</i>	<i>84.5</i>	<i>78.9</i>	<i>71.0</i>
LSD	<i>2.8</i>	<i>2.6</i>	<i>1.3</i>	<i>0.8</i>	<i>28.9</i>	<i>14.6</i>				
CV	<i>1.0</i>	<i>6.2</i>	<i>1.3</i>	<i>4.0</i>	<i>35.9</i>	<i>15.9</i>				
Genotype significance	***	***	***	***	***	***	*	***	***	***
GenxEnv significance							***	***	***	***
Env significance							***	***	***	***

'--': information not available

WS- winter Survival, Grain yield Data was not adjusted for winter kill

Bold: highest value reported for the respective trait; Significance levels: $p \leq 0.001^{***}$, $p \leq 0.01^{**}$, $p \leq 0.05^{*}$, NS: non-significant

Table 11: Research Extension Center, Williston-North Dakota (Location: 9)

Genotype	DTH	DTM	PH (in)	TW	Protein	GY				
						2025	2024-25	2023-25	2022-25	2021-25
AAC Coldfront	Insufficient Results					--	--	--	--	--
AAC Vortex						--	--	--	--	--
AAC Wildfire						--	--	--	42.4	36.1
AP Solid						--	--	--	30.8	29.0
AP Sunbird						--	--	--	--	--
AP24AX						--	--	--	--	--
Bobcat						--	--	--	35.2	32.2
Brawl CL Plus						--	--	--	29.5	24.8
CO21SF191RA						--	--	--	--	--
CO21SF263RA						--	--	--	--	--
CP7017AX						--	--	--	30.9	28.8
CP7462						--	--	--	--	--
CP7869						--	--	--	--	--
CS Bridger CLP						--	--	--	--	--
Flathead						--	--	--	50.4	34.0
FourOsix						--	--	--	57.8	40.5
Judee						--	--	--	46.6	35.8
Keldin						--	--	--	50.2	36.9
LCS Atomic AX						--	--	--	--	--
LCS Missile						--	--	--	--	--
LCS Radar						--	--	--	--	--
LCS Steel AX						--	--	--	37.4	33.1
Loma						--	--	--	37.7	34.0
MT Meadowlark						--	--	--	42.6	38.7
MT WarCat						--	--	--	35.2	31.4
MT2142						--	--	--	--	--
MT2230						--	--	--	--	--
MT2270						--	--	--	--	--
MT2327						--	--	--	--	--
MT2335						--	--	--	--	--
MTAX21203						--	--	--	--	--
MTAX22120						--	--	--	--	--
MTCs22127						--	--	--	--	--
MTCs22128						--	--	--	--	--
MTCs2264						--	--	--	--	--
MTFHS23316						--	--	--	--	--
MTS21103						--	--	--	--	--
MTS2286						--	--	--	--	--
MTS2294						--	--	--	--	--
MTS23103						--	--	--	--	--
MT Barrett (MTV2164)						--	--	--	41.9	38.0
NAS-25MT-01						--	--	--	--	--
NAS-25MT-02						--	--	--	--	--
Northern						--	--	--	33.4	30.9
Ramsay						--	--	--	39.5	35.6
StandClear CLP						--	--	--	31.7	28.6
SY Clearstone 2CL						--	--	--	37.6	32.6
Warhorse						--	--	--	34.3	31.0
Yellowstone						--	--	--	37.4	34.8
Grand Mean									35.5	31.7
LSD										
CV										
Genotype significance									NS	*
GenxEnv significance									**	**
Env significance									***	***

--: information not available

Bold: highest value reported for the respective trait; Significance levels: $p \leq 0.001$ ***, $p \leq 0.01$ **, $p \leq 0.05$ *, NS: non-significant

Table 12: Performance across locations, disease reaction and stem sawfly cutting scores in cropping season 2025

Genotype	DTH (days)	DTM (days)	PH (in)	TW (lb/bu)	Protein (%)	GY (bu/ac)
AAC Coldfront	158	194	30.4	62.5	12.8	76.3
AAC Vortex	160	193	30.6	61.7	13.3	70.1
AAC Wildfire	160	195	31.4	61.4	12.7	76.0
AP Solid	156	192	27.5	62.9	13.3	68.7
AP Sunbird	154	189	26.8	62.8	12.6	70.8
AP24AX	156	193	29.3	61.1	12.1	77.3
Bobcat	159	191	27.5	62.0	13.2	75.0
Brawl CL Plus	152	190	28.8	62.5	13.5	67.3
CO21SF191RA	157	192	30.6	61.4	13.0	75.6
CO21SF263RA	159	192	32.0	61.2	13.2	71.5
CP7017AX	154	190	26.5	62.3	12.6	68.0
CP7462	154	189	25.1	60.2	12.8	74.0
CP7869	152	189	27.4	61.3	13.1	69.0
CS Bridger CLP	156	191	27.0	61.2	13.2	73.4
Flathead	155	190	29.8	62.6	13.5	74.0
FourOsix	158	193	28.9	62.0	13.2	76.2
Judee	158	191	29.1	62.0	14.2	63.4
Keldin	158	192	30.1	62.0	12.8	77.9
LCS Atomic AX	155	191	28.8	62.0	12.7	69.9
LCS Missile	159	193	27.9	60.6	13.1	68.0
LCS Radar	153	189	27.5	62.1	13.4	68.3
LCS Steel AX	157	193	30.1	62.2	11.9	77.5
Loma	161	194	28.2	61.6	13.4	74.6
MT Meadowlark	160	193	29.0	62.0	12.7	81.0
MT WarCat	161	193	29.9	62.1	12.8	76.5
MT2142	158	192	27.6	62.2	13.1	74.2
MT2230	155	191	28.1	62.3	13.7	66.3
MT2270	158	192	28.7	62.2	12.2	80.6
MT2327	156	189	27.7	61.1	12.8	71.4
MT2335	157	193	29.2	60.4	14.3	68.8
MTAX21203	155	192	29.4	62.4	13.1	69.6
MTAX22120	155	190	28.3	61.6	12.4	75.1
MTCS22127	157	190	30.3	61.5	13.3	72.5
MTCS22128	161	192	29.9	62.2	12.6	78.9
MTCS2264	158	191	26.5	62.7	14.2	67.8
MTFHS23316	160	193	29.5	62.3	14.3	65.1
MTS21103	160	193	27.6	61.0	13.1	75.6
MTS2286	161	194	29.2	61.3	13.2	75.8
MTS2294	158	190	29.0	62.8	13.0	72.9
MTS23103	156	190	28.4	62.0	14.2	69.2
MT Barrett (MTV2164)	157	191	32.3	61.2	12.9	76.1
NAS-25MT-01	161	194	30.8	61.3	12.7	75.9
NAS-25MT-02	158	190	28.6	62.5	12.6	75.8
Northern	160	193	30.2	61.9	13.4	74.5
Ramsay	159	191	29.5	62.5	12.7	77.0
StandClear CLP	158	190	29.5	61.8	13.0	74.1
SY Clearstone 2CL	159	192	32.8	61.2	13.2	73.1
Warhorse	159	192	28.9	61.5	13.8	67.0
Yellowstone	159	193	31.8	60.9	13.1	77.6
Grand Mean	<i>158</i>	<i>192</i>	<i>29.1</i>	<i>61.8</i>	<i>13.1</i>	<i>73.0</i>
LSD	<i>1.9</i>	<i>0.6</i>	<i>1.2</i>	<i>0.8</i>	<i>3.8</i>	<i>7.6</i>
CV	<i>1.0</i>	<i>0.6</i>	<i>4.4</i>	<i>1.5</i>	<i>3.8</i>	<i>10.0</i>
Genotype significance	NS	***	NS	NS	NS	***
GenxEnv significance	***	***	***	***	***	***
Env significance	***	***	***	***	***	***

Bold: highest value reported for the respective trait; Significance levels: $p \leq 0.001$ ***, $p \leq 0.01$ **, $p \leq 0.05$ *, NS: non-significant.

Table 13: Stem solidness (SS) for selected intrastate entries at Ft. Benton and Havre

Variety	Fort Benton	Havre	Pooled
AAC Coldfront	--	--	--
AAC Vortex	--	--	--
AAC Wildfire	--	--	--
AP Solid	7.6	22.6	15.2
AP Sunbird	--	--	--
AP24AX	--	--	--
Bobcat	18.3	24.3	21.4
Brawl CL Plus	--	--	--
CO21SF191RA	5.4	11.8	8.5
CO21SF263RA	6.6	13.2	9.8
CP7017AX	--	--	--
CP7462	--	--	--
CP7869	--	--	--
CS Bridger CLP	--	--	--
Flathead	--	--	--
FourOsix	--	--	--
Judee	13.3	22.6	18.1
Keldin	--	--	--
LCS Atomic AX	--	--	--
LCS Missile	--	--	--
LCS Radar	--	--	--
LCS Steel AX	--	--	--
Loma	13.1	22.6	17.8
MT Meadowlark	20.8	24.1	22.7
MT WarCat	16.9	24.1	20.9
MT2142	--	--	--
MT2230	--	--	--
MT2270	6.0	7.7	6.7
MT2327	--	--	--
MT2335	--	--	--
MTAX21203	10.5	18.4	14.2
MTAX22120	--	--	--
MTCS22127	13.9	22.1	18.1
MTCS22128	21.4	24.3	23.1
MTCS2264	13.9	22.0	18.0
MTFHS23316	14.5	24.7	19.8
MTS21103	15.3	24.8	22.7
MTS2286	12.1	24.6	18.3
MTS2294	9.2	14.1	11.5
MTS23103	15.3	21.8	18.7
MT Barrett (MTV2164)	--	--	--
NAS-25MT-01	--	--	--
NAS-25MT-02	--	--	--
Northern	--	--	--
Ramsay	--	--	--
StandClear CLP	11.3	20.4	15.8
SY Clearstone 2CL	--	--	--
Warhorse	16.7	24.1	20.9
Yellowstone	6.6	5	5.6
Grand Mean	12.8	20.1	16.6
LSD	3.4	3.4	5.1
CV	13.1	8.3	10.2
Genotype significance	***	***	***
GenxEnv significance			***

'--': information not available

Bold: highest value reported for the respective trait; Significance levels: $p \leq 0.001$ ***, $p \leq 0.01$ **, $p \leq 0.05$ *, *NS*: non-significant.

Table 14: Stripe rust infection type (IT^a) and severity (%) in the intrastate trial.

Line	Pullman ^b		Mount Vernon ^c				Central Ferry	
	6/17		4/16		6/4		5/20	
	Fks 11		Fks 5		Fks 11		Fks 10.54	
	IT	%	IT	%	IT	%	IT	%
AAC Coldfront	2	5	2	20	3	30	8	10
AAC Vortex	2	10	2	20	2	15	8	20
AAC Wildfire	2	5	5	50	2	20	8	10
AP Solid	8	30	3	30	5	40	8	50
AP Sunbird	8	30	2	20	3	40	8	50
AP24AX	8	10	3	30	5	40	5	30
Bobcat	2	5	3	30	2	15	2	5
Brawl CL Plus	2	5	7	60	3	30	8	40
CO21SF191RA	2	5	3	30	3	30	3	10
CO21SF263RA	2	5	3	30	3	30	2	10
CP7017AX	8	20	5	50	8	90	5	50
CP7462	2	5	2	20	2	10	2	2
CP7869	8	10	3	30	2	20	8	50
CS Bridger CLP	2	5	3	30	2	20	2	5
Flathead	2	5	2	10	2	10	2	2
FourOsix	2	5	5	50	2	20	2	5
Judee	2	5	2	20	2	15	3	10
Keldin	2	5	2	30	5	30	8	30
LCS Atomic AX	8	10	3	30	3	30	8	10
LCS Missile	2	2	2	20	2	5	2	2
LCS Radar	2	5	2	20	5	40	8	20
LCS Steel AX	8	20	5	50	5	40	8	50
Loma	2	5	5	50	2	15	2	5
MT Meadowlark	2	5	3	30	2	10	2	3
MT WarCat	2	5	2	20	2	10	3	10
MT2142	2	5	2	20	2	5	2	2
MT2230	8	40	3	30	5	50	8	30
MT2270	2	5	2	30	2	15	2	5
MT2327	8	15	5	50	3	20	8	20
MT2335	2	5	2	20	2	10	2	5
MTAX21203	5	20	5	50	5	30	8	30
MTAX22120	2	10	3	30	2	15	2	5
MTCS22127	8	20	3	30	2	10	8	20
MTCS22128	2	5	3	30	2	10	3	10
MTCS2264	2	10	3	30	2	20	3	15
MTFHS23316	2	5	3	30	2	10	2	2
MTS21103	8	10	5	40	2	20	2	5
MTS2286	8	20	5	40	5	40	5	20
MTS2294	8	30	3	30	3	20	5	30
MTS23103	2	2	3	30	3	20	2	10
MT Barrett (MTV2164)	8	10	3	30	2	15	3	10
NAS-25MT-01	8	30	5	40	5	40	8	20
NAS-25MT-02	2	2	2	20	2	10	8	5
Northern	2	5	5	50	2	20	2	5
Ramsay	8	20	5	40	3	20	8	20
StandClear CLP	2	5	2	10	2	15	2	5
SY Clearstone 2CL	2	5	2	30	2	10	5	10
Warhorse	5	8	4	40	2	10	2	4
Yellowstone	5	8	3	30	2	13	4	10

^aInfection Type (IT) was recorded based on the 0-9 scale with ITs 8 and 9 combined as 8 (the most susceptible reaction) in field data. Generally, IT 0-3 are considered resistant, 4-6 intermediate, and 7-9 susceptible. Heterogenous reactions of an entry were indicated by two or more ITs separated by "," for most plants with the first IT and few plants with the second IT or connected with "-" for entries containing plants with continuous ITs.

^b Inoculated with urediniospores collected from the same location in 2024.

^c Entries with a high IT in the first note, but a low IT in the second note at Mt. Vernon may indicate that they have high-temperature, adult-plant (HTAP) resistance

Table 15: Average monthly weather data of intrastate testing sites during winter wheat cropping season 2024-25

Network ID	Location	Month	Year	T _{min}	T _{max}	T _{avg}	PRCP	SNOW	SNWD	Note
USC00241047	Bozeman	October	2024	65.7	31.9	48.8	0.75	T	0.8	
USC00241047	Bozeman	November	2024	43.0	19.7	31.4	0.87	12.3	0.0	
USC00241047	Bozeman	December	2024	42.3	21.9	32.1	0.17	2.3	1.0	
USC00241047	Bozeman	January	2025	26.8	2.5	14.7	0.16	13.2	6.7	
USC00241047	Bozeman	February	2025	24.2	1.6	12.9	1.27	26.8	5.8	
USC00241047	Bozeman	March	2025	48.9	26.5	37.7	1.05	4.0	2.1	
USC00241047	Bozeman	April	2025	56.4	28.8	42.6	2.41	4.2	0.0	
USC00241047	Bozeman	May	2025	68.8	39.4	54.1	1.37	0.0	0.4	
USC00241047	Bozeman	June	2025	79.2	45.1	62.2	0.36	0.0	0.0	
USC00241047	Bozeman	July	2025	85.9	50.3	68.1	0.59	0.0	0.0	
USC00241047	Bozeman	August	2025	84.0	49.6	66.8	0.97	0.0	0.0	
USC00241047	Bozeman	September	2025	78.3	42.7	60.5	1.21	0.0	0.0	
USC00241974	Conrad	October	2024	64.8	32.8	48.8	0.09	0.0	0.7	
USC00241974	Conrad	November	2024	38.9	18.3	28.6	0.38	3.0	0.0	
USC00241974	Conrad	December	2024	42.1	18.3	30.2	0.62	8.0	0.0	
USC00241974	Conrad	January	2025	30.6	12.0	21.3	0.91	12.0	1.9	
USC00241974	Conrad	February	2025	19.4	-0.1	9.6	1.16	13.5	3.3	
USC00241974	Conrad	March	2025	50.3	26.0	38.1	0.35	2.0	0.5	
USC00241974	Conrad	April	2025	59.2	28.3	43.7	0.62	5.0	0.0	
USC00241974	Conrad	May	2025	71.5	39.5	55.5	1.00	0.0	0.0	
USC00241974	Conrad	June	2025	76.3	47.2	61.8	1.76	0.0	0.0	
USC00241974	Conrad	July	2025	85.9	52.2	69.1	0.08	0.0	0.0	
USC00241974	Conrad	August	2025	81.5	52.5	67.0	2.58	0.0	0.0	
USC00241974	Conrad	September	2025	79.6	46.6	63.1	0.09	0.0	0.0	
USC00243113	Fort Benton	October	2024	68.6	32.4	50.5	0.17	0.0	1.0	
USC00243113	Fort Benton	November	2024	44.0	21.4	32.7	0.37	2.5	0.0	
USC00243113	Fort Benton	December	2024	43.5	18.8	31.2	0.52	4.4	0.0	
USC00243113	Fort Benton	January	2025	33.3	15.7	24.5	0.79	9.2	3.3	
USC00243113	Fort Benton	February	2025	21.6	-1.4	10.1	1.09	11.6	2.5	
USC00243113	Fort Benton	March	2025	53.7	27.4	40.5	0.41	2.7	1.0	
USC00243113	Fort Benton	April	2025	60.1	29.8	45.0	0.32	5.2	0.0	
USC00243113	Fort Benton	May	2025	72.4	42.8	57.6	1.43	0.0	0.0	
USC00243113	Fort Benton	June	2025	77.7	48.9	63.3	1.96	0.0	0.0	6/15 Hail
USC00243113	Fort Benton	July	2025	86.0	55.0	70.8	2.20	0.0	0.0	
USC00243113	Fort Benton	August	2025	85.4	56.5	71.0	3.27	0.0	0.0	
USC00243113	Fort Benton	September	2025	83.9	46.1	65.0	0.05	0.0	0.0	
USC00244345	Huntley	October	2024	68.8	32.9	50.9	0.56	0.0	0.5	
USC00244345	Huntley	November	2024	45.6	19.6	32.6	0.48	3.9	0.0	
USC00244345	Huntley	December	2024	45.5	21.2	33.4	0.81	2.7	0.0	
USC00244345	Huntley	January	2025	31.3	9.4	20.3	0.72	10.5	0.5	
USC00244345	Huntley	February	2025	21.5	-4.5	8.5	1.14	29.3	0.7	
USC00244345	Huntley	March	2025	55.3	28.0	41.7	1.02	3.1	0.2	
USC00244345	Huntley	April	2025	60.1	31.3	45.7	2.93	7.0	0.0	
USC00244345	Huntley	May	2025	70.8	42.7	56.8	2.33	0.0	0.0	
USC00244345	Huntley	June	2025	79.6	49.4	64.5	2.70	0.0	0.0	6/16 Hail
USC00244345	Huntley	July	2025	86.3	56.1	71.2	2.02	0.0	0.0	
USC00244345	Huntley	August	2025	86.3	55.3	70.8	1.23	0.0	0.0	
USC00244345	Huntley	September	2025	80.7	47.5	64.1	1.19	0.0	0.0	
USC00244563	Kalispell	October	2024	61.3	28.1	44.7	0.34	T	0.1	
USC00244563	Kalispell	November	2024	40.8	27.5	34.2	2.78	9.0	0.0	
USC00244563	Kalispell	December	2024	37.0	25.6	31.3	0.99	3.2	0.3	
USC00244563	Kalispell	January	2025	29.5	14.7	22.1	0.76	6.6	6.9	
USC00244563	Kalispell	February	2025	30.0	12.3	21.1	1.14	14.7	6.3	
USC00244563	Kalispell	March	2025	50.9	29.1	40.0	1.80	1.8	0.2	
USC00244563	Kalispell	April	2025	56.5	28.1	42.3	1.32	0.5	0.0	
USC00244563	Kalispell	May	2025	69.4	38.0	53.7	1.79	0.0	0.0	5/11 Hail

Network ID	Location	Month	Year	T _{min}	T _{max}	T _{avg}	PRCP	SNOW	SNWD	Note
USC00244563	Kalispell	June	2025	75.6	43.7	59.6	2.15	0.0	0.0	
USC00244563	Kalispell	July	2025	81.9	50.1	66.0	1.16	0.0	0.0	
USC00244563	Kalispell	August	2025	82.3	49.9	66.0	0.66	0.0	0.0	
USC00244563	Kalispell	September	2025	78.8	43.6	61.2	0.72	0.0	0.0	
USC00329430	Williston	October	2024	66.7	37.4	52.0	0.21	-	1.1	
USC00329430	Williston	November	2024	37.2	20.5	28.9	0.96	6.8	0.4	
USC00329430	Williston	December	2024	28.3	13.0	20.7	0.68	7.4	0.5	
USC00329430	Williston	January	2025	21.8	3.9	12.9	0.08	1.7	0.8	
USC00329430	Williston	February	2025	16.3	-1.9	7.2	0.23	3.0	0.2	
USC00329430	Williston	March	2025	47.6	24.7	36.2	0.21	0.1	1.5	
USC00329430	Williston	April	2025	59.1	32.6	45.9	2.25	0.3	0.0	
USC00329430	Williston	May	2025	70.5	45.5	58.0	4.16	0.0	0.0	
USC00329430	Williston	June	2025	76.8	54.1	65.5	0.83	0.0	0.0	6/18 Hail
USC00329430	Williston	July	2025	82.7	58.8	70.7	5.48	-	0.0	
USC00329430	Williston	August	2025	81.3	58.7	70.0	2.08	0.0	0.0	
USC00329430	Williston	September	2025	78.6	51.8	65.2	0.19	0.0	0.0	
USW00094012	Havre	October	2024	66.5	31.9	49.2	0.02	T	0.8	
USW00094012	Havre	November	2024	47.8	25.3	36.5	0.67	4.3	0.1	
USW00094012	Havre	December	2024	34.7	16.7	25.7	0.28	2.3	0.0	
USW00094012	Havre	January	2025	28.3	11.2	19.8	0.63	11.5	3.4	
USW00094012	Havre	February	2025	17.6	-4.1	6.8	0.8	10.1	2.9	
USW00094012	Havre	March	2025	50.7	26.0	38.4	0.41	1.9	1.1	
USW00094012	Havre	April	2025	59.9	28.8	44.4	0.72	2.2	0.0	
USW00094012	Havre	May	2025	72.7	43.0	57.8	1.24	0.0	0.0	
USW00094012	Havre	June	2025	77.3	47.5	62.4	2.08	0.0	0.0	
USW00094012	Havre	July	2025	85.5	53.7	69.3	2.27	0.0	0.0	
USW00094012	Havre	August	2025	82.1	54.6	68.3	3.21	0.0	0.0	8/20 Hail
USW00094012	Havre	September	2025	80.6	45.0	62.8	0.07	0.0	0.0	
USC00245761	Moccasin	October	2024	--	--	--	--	--	--	
USC00245761	Moccasin	November	2024	--	--	--	--	--	--	
USC00245761	Moccasin	December	2024	--	--	--	--	--	--	
USC00245761	Moccasin	January	2025	--	--	--	--	--	--	
USC00245761	Moccasin	February	2025	--	--	--	--	--	--	
USC00245761	Moccasin	March	2025	--	--	--	--	--	--	
USC00245761	Moccasin	April	2025	--	--	--	--	--	--	
USC00245761	Moccasin	May	2025	--	--	--	--	--	--	
USC00245761	Moccasin	June	2025	--	--	--	--	--	--	
USC00245761	Moccasin	July	2025	--	--	--	--	--	--	
USC00245761	Moccasin	August	2025	--	--	--	--	--	--	
USC00245761	Moccasin	September	2025	--	--	--	--	--	--	
NDAWN	Sidney	October	2024	32.1	66.3	49.2	0.17	--	--	
NDAWN	Sidney	November	2024	18.5	39.2	28.9	0.81	--	--	
NDAWN	Sidney	December	2024	13.6	32.4	23.0	0.28	--	--	
NDAWN	Sidney	January	2025	7.1	24.4	15.8	0.15	--	--	
NDAWN	Sidney	February	2025	-3.6	16.6	6.5	0.28	--	--	
NDAWN	Sidney	March	2025	24.5	50.2	37.4	0.10	--	--	
NDAWN	Sidney	April	2025	30.3	58.2	44.3	2.15	--	--	
NDAWN	Sidney	May	2025	43.9	69.6	56.8	3.35	--	--	
NDAWN	Sidney	June	2025	51.8	77.7	64.8	1.16	--	--	
NDAWN	Sidney	July	2025	57.0	82.7	69.9	3.04	--	--	
NDAWN	Sidney	August	2025	55.0	82.6	68.8	1.69	--	--	
NDAWN	Sidney	September	2025	46.4	78.7	62.6	0.39	--	--	

T_{MIN}: Average minimum temperature (F); T_{MAX}: Average maximum temperature (F); T_{AVG}: Average temperature (F); PRCP: SUM of precipitation (in); SNOW: SUM of snowfall (in) T=Trace; SNWD: Average snow depth (in)
Data has been sourced from National weather service (NWS) provided by National Oceanic and Atmospheric Administration of the United States of America and North Dakota Agricultural Weather Network (NDAWN)
ASOS: Automated Surface Observing System

Table 15: Pre-Harvest Sprouting data from greenhouse of the Montana Winter Wheat Varieties in 2025

Variety	Score	Classification*
MT WarCat	0	HR
MT Cash	1	MR
Ray	1	MR
Standclear CLP	2	MR
MT Barrett (MTV 2164)	3	PR
Bobcat	4	PR
CS Bridger CLP	4	PR
Flathead	4	PR
Warhorse	4	PR
Yellowstone	4	PR
Brawl CL Plus	5	MS
Keldin	5	MS
Ramsay	5	MS
Northern	7	HS
Willow Creek	7	HS

*Winter wheat varieties are rated as HR = Highly Resistant (0), MR = Moderately Resistant (1-2), PR = Partially Resistant (3-4), MS = Moderately Susceptible (5-6), HS = Highly Susceptible (7).

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