

Full 2025 yield trial dataset located at this link:

**General Variety Descriptions:** Descriptions are based on performance in multi-year/location yield trials that were grown using recommended conventional wheat farming practices. Actual variety performance may vary, depending on local growing conditions and farming methods. All varieties listed are PVP protected.

**MT MEADOWLARK:** (MAES release, 2025): is semi-solid stemmed hard red winter wheat with high yields relative to other solid and semi solid varieties. MT Meadowlark was developed by the Montana Agricultural Experiment Station and will be released to certified seed growers in fall 2025. It is awned, medium-late maturing semi-dwarf selected from a composite cross with Warhorse, Judee and Spur in its pedigree. Spur is a semi-solid variety developed in Montana and released in Wyoming. MT Meadowlark also carries the *ALMT1* gene and demonstrated tolerance to low pH. MT Meadowlark has done particularly well in field testing sites at Fort Benton and Havre with average yields 10% or higher than Warhorse. MT Meadowlark has low PPO (polyphenol oxidase) with average test weights and protein content. It has strong dough mixing characteristics with high water absorption. MT Meadowlark has excellent stripe rust resistance though susceptible to stem and leaf rust. PVP Title V (PVP #20260080) is pending.

**MT WARCAT:** (MAES release, 2022): is a semi-solid stemmed hard red winter wheat with high-yielding and good resistance to cutting by wheat stem sawfly. MT WarCat was developed by the Montana Agricultural Experiment Station and released to certified seed growers in Fall 2022. It has Loma in its pedigree, a variety released in 2016, and has inherited the medium to later maturity, semi-solidness and excellent stripe resistance. MT WarCat had 10% higher grain yields compared to other solid stem cultivars Judee and Warhorse. It has a low PPO (polyphenol oxidase), acceptable test weight, grain protein content, and milling and baking quality. MT WarCat has also exhibited good aluminum/acid soil tolerance. PVP Title V has been issued (Certificate #202400210). Additionally the CLEARFIELD genes are patented.

**BOBCAT:** (MAES release, 2019): is a solid stemmed hard red winter wheat with improved yield potential relative to other solid stemmed varieties. Bobcat was developed by the Montana Agricultural Experiment Station and was released to certified seed growers in fall 2019. Bobcat is a selection from a composite cross of 2 unreleased MT solid-stemmed experimental lines with an unreleased MT hollow-stemmed line. Bobcat is an awned, white-glumed, semi-dwarf wheat with medium to late maturity. Bobcat is the top performing line in locations where sawfly cutting has occurred. Stem solidness is excellent, significantly higher than Warhorse. Bobcat has above average test weight and average protein, and average winter hardiness. Bobcat is resistant to prevalent races of stripe and stem rust, but susceptible to leaf rust. Bobcat is a medium high PPO (polyphenol oxidase) variety with above average mill and bake properties (Table 3). PVP Title V (Certificate #202000177).

**JUDEE:** (MAES release, 2011): hard red winter wheat developed by the Montana Agricultural Experiment Station in 2011. Judee is a white-glumed, solid-stem, semi-dwarf (*Rht1*) wheat with medium maturity. Judee has average yield, test weight, and protein, and below average winter hardiness. Judee is susceptible to prevalent races of stem and leaf rust but resistant to stripe rust. Stem-solidness of Judee is most similar to Genou. Judee is a high PPO (polyphenol oxidase) variety with average mill and above average bake properties. PVP Title V has been issued (Certificate #201200161).

**LOMA:** (MAES release, 2016): is a semi-solid stemmed hard red winter wheat with improved yield potential relative to other solid stemmed varieties. Loma was developed by the Montana Agricultural Experiment Station and released to seed growers in 2016. Loma (Yellowstone//MTS0112/MTS0125) was a cross between Yellowstone and 2 unreleased solid-stemmed experimental lines. Loma is an awned, white-glumed, medium-short wheat with medium to late maturity. Loma performs well in locations where sawfly cutting has occurred. Stem solidness is less than that to Judee and WB Quake. Loma has average test weight and protein, and average winter hardiness (Table 1). Loma is resistant to prevalent races of stripe and stem rust, but susceptible to leaf rust. Loma is a medium low PPO (polyphenol oxidase) variety with above average mill and bake properties. PVP Title V has been issued (Certificate #201700021).

**STANDCLEAR CLP:** (MAES release, 2020) hard red winter wheat developed by the Montana Agricultural Experiment Station for exclusive license to Nutrien Ag Solutions (Loveland Products Inc., Loveland, CO) with a full partnership agreement with BASF Chemical Company. StandClear CLP was available to certified seed growers in fall 2020. StandClear CLP is a medium maturing, semisolid-stemmed, medium height wheat with white chaff. StandClear CLP has average yield, above average test weight, and average protein, with good winter survival. StandClear CLP has high PPO (polyphenol oxidase) and average milling and baking characteristics. PVP Title V has been issued (Certificate #202000183). Additionally, the CLEARFIELD genes are patented.

**WARHORSE:** (MAES release, 2013): is an awned, white glumed, solid-stemmed hard red winter wheat released in 2013 by the Montana Agricultural Experiment Station. Warhorse has medium maturity and has medium short, semi-dwarf height. Warhorse's winter hardiness, rated at 4 on 0-5 scale, is an improvement over other solid stem variety. Stem solidness is similar to that of Bearpaw and Rampart, while sawfly cutting of stems is very low (like Rampart). Warhorse yield is similar to Judee, while test weight and protein are above average. Warhorse is resistant to both stem and stripe rust. Warhorse has acceptable mill and bake qualities. PVP Title V has been issued (Certificate

Table 1: Grain yield and agronomic characteristics of hollow stemmed winter wheat varieties from 2022-2025

Varieties	Grain Yield (bu/ac)	Days to Heading (days)	Plant Height (in)	Sawfly Cutting (%)	Test Weight (lb/ac)	Protein (%)	Stripe Rust (%)	Winter Survival (%)
<i>Location x years</i>	29	23	29	6	24	24	3	3
Amplify SF	79.4	158	30.5	13.5	61.6	11.9	59.6	87.7
AP Solid	62.8	160	28.0	24.2	62.4	13.1	58.3	78.5
Bobcat	76.6	162	27.5	9.8	60.7	13.4	9.6	86.6
Fortify SF	54.4	161	29.0	29.7	60.9	12.6	--	82.5
Judee	66.2	162	29.5	21.9	60.9	14.1	--	82.3
Loma	77.0	164	28.7	16.9	59.7	13.6	10.9	84.5
MT Meadowlark	74.8	165	29.0	10.4	60.0	13.4	5.1	80.3
MT WarCat	76.4	165	28.3	9.8	60.0	13.5	4.2	90.0
StandClear CLP	75.2	162	30.3	21.5	61.1	13.5	4.2	88.7
Warhorse	68.0	163	29.7	9.9	59.8	14.0	8.2	85.9
LSD (0.05)	9.8	2.4	1.2	14.1	0.9	0.45	46.7	13.9

Table 2: Grain yield for solid stemmed winter wheat varieties in each testing location from 2022-2025

Varieties	NWARC-Kalispell	PF-Bozeman	SARC-Huntley	CARC-Moccasin	NARC-Havre	Nutrien Ag-Carter	Nutrien Ag-Conrad	EARC-Sidney	NSDU-Williston
Amplify SF	149.3	108.7	31.0	36.3	60.4	57.3	--	90.7	45.2
AP Solid	138.0	101.2	42.5	59.9	59.0	57.1	26.8	67.0	30.8
Bobcat	151.4	97.6	34.4	49.7	61.8	54.7	36.0	79.9	35.2
Fortify SF	126.2	124.8	42.3	46.8	45.6	43.6	--	79.6	35.3
Judee	145.9	101.0	32.8	54.9	52.5	47.3	27.1	65.4	35.8
Loma	153.0	110.2	37.6	51.6	54.9	50.3	26.2	82.9	37.7
MT Meadowlark	151.4	107.7	46.4	57.5	52.9	57.1	37.7	74.2	42.6
MT WarCat	152.4	105.2	36.9	47.9	56.7	53.3	36.5	78.9	35.2
StandClear CLP	148.7	107.8	36.5	53.4	58.7	51.3	27.2	83.1	31.7
Warhorse	142.5	92.5	34.1	53.5	51.6	51.7	18.9	76.5	34.3
LSD(0.05)	17.4	10.7	ns	ns	ns	8.5	5.0	ns	ns

Table 3. Milling and baking quality of selected solid stemmed varieties from 2023-2024

Variety	PPO	Single Kernel Hardness (%)	Wheat protein, % (12 m.b.)	Flour Yield (%)	Mixograph Tolerance	Mixograph Time (min)	Water Absorption (%)	Loaf Volume (CC)
<i>Location*years</i>	9	9	9	9	9	9	9	9
Warhorse	0.280	88	13.8	67.8	1.25	3.4	71.8	1036
Judee	0.287	82	14.0	69.2	3.00	3.5	72.3	1110
Loma	0.145	84	13.7	70.8	2.75	4.5	73.5	1115
Bobcat	0.372	72	13.3	70.3	3.25	4.3	71.8	1026
StandClear CLP	0.308	75	13.7	70.1	3.25	3.7	71.8	1008
AP Solid	0.223	83	13.0	69.0	2.50	2.5	68.7	936
Amplify SF	0.286	73	12.8	69.8	1.75	2.3	66.7	884
MT WarCat	0.136	78	13.7	71.4	3.25	4.8	72.9	1114
MT Meadowlark	0.102	77	12.9	70.3	2.7	4.2	74.1	1067
LSD (0.05)	0.060	8.7	0.8	1.5	1.0	4.0	1.5	76.7