Application to MSU Variety Release Committee for Public Release of MT Double Barrel (MT17F02410)

BY

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In collaboration with:
MSU Foundation Seed Program
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With support from USDA NIFA (CULTIVAR DEVELOPMENT: SUPERIOR FORAGE BARLEY VARIETIES FOR THE NORTHERN GREAT PLAINS (2022-67014-37174) and the Montana Wheat and Barley Committee.

SAVE this form to your desktop or computer.
Enter required information and upon completion, return to nvrb@aosca.org
by clicking on this link and attaching the application.

*** if unable to submit in Word format, please contact the AOSCA office for assistance.**

ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES
SMALL GRAIN VARIETY REVIEW BOARD
BARLEY APPLICATION – PART B – 2023

This application – Part B – must be submitted along with Part A
(please remember, you may submit ONE Part A application for multiple Part B applications)

Please email the completed applications to: nvrb@aosca.org

All information provided on this application shall be maintained in complete confidence by the Association of Official Seed Certifying Agencies (AOSCA), its staff, and individual members of the AOSCA Variety Review Board. Each member of the Review Board will be required to sign a statement to this effect prior to their receipt of any applications for review. Upon completion of the review process, reviewers will be required to destroy or delete all applications in their possession. One copy of each application will be maintained on file in the AOSCA office.

APPLICATION FOR REVIEW OF SMALL GRAIN VARIETIES FOR CERTIFICATION

BARLEY (*Hordeum vulgare* L.)

Applicant Jamie D Sherman Date 01/24/25

Variety Name MT Double Barrel Experimental Designation MT17F02410

IT IS THE APPLICANT'S RESPONSIBILITY TO SUBMIT AN AMENDMENT APPLICATION FOR NAME CHANGE WHEN THE PERMANENT VARIETY NAME HAS BEEN SELECTED.

REQUIRED INFORMATION
(For reference, see U.S. Federal Seed Act §201.68)

1. Origin and Breeding History:

MT17F02410 is a spring, 2-row, hulled, hooded, dual purpose barley developed for feed and forage production in Montana. MT17F02410 has an erect growth habit, lax head type, white aleurone and long rachilla hairs. MT17F02410 is an F4 derived selection from Lavina by ND24388 cross made in 2016. 'Lavina' (MT981397), one of the top barley forage producers in Montana, is a two rowed hooded spring barley and is a cross between 'Haybet' and 'Baronesse'. 'Haybet'(PI 533600), and was developed by USDA-ARS and the Montana Experiment Station, while 'Baronesse (PI 568246) was developed in Germany and both were released in 1989. ND24388 (ND17274/ND19119//ND19854) is an experimental line from North Dakota with the stay green phenotype (personal communication Rich Horsley, 2016). MT17F02410 was advanced by single seed descent from the F1 through F4 generations. It was increased from a F4 plant to produce seed for preliminary grain and forage yield testing in 2020. MT17F02410 was first tested in replicated full plots for agronomic and forage traits in 2021 in Bozeman and Kalispell and around the state beginning in 2022 through 2024.

We purified MT17F02410 in 2023 by planting 100 F8-derived F9 head-rows at Bozeman Post farm. We evaluated for phenotypic uniformity before bulking all head-rows. The 2024 breeder strips appeared

uniform and were regularly rogued by barley breeding employees and Foundation staff. MT17F02410 was further increased in AZ in the winter of 2024/25 and will be in Foundation seed production in summer of 2025.

MT17F02410 is well-suited for production across all feed and forage barley growing regions of Montana and is being released due to grain and forage yield performance. High tillering makes up for shorter stature as far as biomass production. Higher grain yield and perhaps shorter stature contribute to improved nutritional quality, with lower NDF and ADF. MT Double Barrel is similar to Hays in stature and late heading and is being released as a Hays replacement.

Agronomic Strengths

- High performing feed line
- High performing forage line
- Later heading
- Large seed

Quality Strengths

- Improved nutritional quality with lower NDF and ADF

Weaknesses

- Low Test weight likely due to large seed size
- Shorter height but likely related to increased grain yield and is compensated for in biomass with higher tillering.

2. VARIETY OBJECTIVE DESCRIPTION

BARLEY (*Hordeum vulgare* L.)

Variety Name: MT Double Barrel

Instructions: Select **one (1)** descriptor (except where otherwise instructed) by entering 'X' in the appropriate field.

1. GROWTH HABIT:

   Winter ____ Spring x Other ____

2. SPIKE:

   Two-row x Six-row ____

3. COLEOPTILE COLOR:

   Green x Purple ____ Other ____

4. JUVENILE GROWTH HABIT:

   Prostate ____ Semi-erect or Semi-prostrate ____ Erect x

5. PLANT TILLERING:

   Low ____ Intermediate ____ High x

6. LEAF COLOR AT BOOT:

   Yellow-Green ____ Green x

   Dark Green ____ Blue-Green ____

7. FLAG LEAF AT BOOT:

   Erect x Recurved ____

   Twisted ____ Not-Twisted x

   Waxy Bloom x No Waxy Bloom ____

8. PUBESCENCE ON LEAF BLADE:

   Yes ____ No x

9. PUBESCENCE ON LEAF SHEATH:

   Yes ____ No x

10. AURICLE COLOR:

    White x Purple ____ Other ____

11. HEADING DATE / ANTHESIS: (select one)

    Average number of day(s) to 50% heading is 177.4

    This averages . Day(s) Earlier 2.5 Day(s) Later

    OR ____ The Same as MT Cowgirl (known variety)

12. STEM COLOR:

White ___x___ Purple _____ Other _____

13. NECK SHAPE:

Straight ___x___ Snaky _____ Other _____

14. COLLAR SHAPE:

V-Shaped _X(small)_ Open _____ Closed _____

15. SPIKE EXSERTION:

Slight _____ Intermediate ___x___ Full _____

16. PLANT HEIGHT: (select one)

Average number in centimeters: _72.5_____

This averages _____ cm TALLER _6.3_ cm SHORTER

OR _____ The Same as _MT Cowgirl_____ (known variety)

SPIKE CHARACTERISTICS

17. SHAPE:

Fusiform _____ Oblong ___x___ Clavate _____ Other _____

18. DENSITY:

Lax _____ Mid-Dense ___x___ Dense _____

19. POSITION AT MATURITY:

Erect _____ Inclined _____ Nodding ___x___

20. HAIRINESS OF RACHIS EDGE:

Lacking _____ Few _____ Covered ___x___

21. RACHILLA HAIR LENGTH:

Short _____ Long ___x___

LEMMA CHARACTERISTICS

22. AWNS:

Awnless _____ Elevated Hoods _____ Sessile Hoods ___X___ Straight _____

23. AWN LENGTH:

Short _____ Equal To Spike _____ Long _____

24. AWN SURFACE:

Smooth _____ Semi-smooth _____ Rough _____

GLUME CHARACTERISTICS

25. HAIRINESS:

None _____ Middle Only _____ Banded ___x___ Covered _____

26. AWN SURFACE:

Smooth _____ Semi-smooth _____ Rough ___x___

KERNEL CHARACTERISTICS

27. GLUME/LEMMA ADHERENCE:

Covered ___x___ Naked _____

28. TEXTURE, IF COVERED:

Wrinkled ___x___ Semi-Wrinkled _____ Slightly Wrinkled _____

29. ALUERONE COLOR:

Colorless ___x___ Blue _____

30. AVERAGE 1,000-KERNEL WEIGHT (Insert weight for comparison)

__44.2__ Grams, Which is: _____ Grams Lighter Than __0.5__ Grams Heavier Than

OR _____ The Same as MT Cowgirl (known variety)

30. List or state any other traits or special markers that may be helpful in identifying the variety, including characteristics determined using biochemical methods (e.g. phenol reaction or electrophoresis):

3. Supporting Information:

Agronomic performance and characteristics:

Table 1 compares MT17F02410 to the forage control varieties Haymaker, Hays Lavina and MT Cowgirl. Note that MT Double Barrel's mean performance across locations where it coincided with the control is reported in column 4 (blue highlight), while each control mean performance is reported in column 3. Across all environments, MT17F02410 was equal to or better than the controls for forage yield and grain yield. MT17F02410 is shorter than the controls except Hays. Like Hays, MT17F02410 tillers more than most varieties, likely in support of forage yields at least in some environments (data not shown). MT17F02410 tends to head later than all the controls but Hays. Later heading as well as shorter stature can contribute to better nutritional quality. MT17F02410 has the lowest ADF and NDF across comparisons. We have observed later heading, shorter stature and more tillers all correlate with increased nutritional quality (Bathini et al in preparation). Also, since grain is more easily digested than leaf tissue, the high grain yield of MT Double Barrel likely contributes to higher digestibility when cut during grain filling. A conservative estimate is that a one percent increase in forage digestibility can lead to a three percent increase in the average daily weight gains of steers (Casler & Vogel, 1999; Mohammed, Anderson, Safley, & Barth, 1967). MT17F02410 has a quality improvement of more than 1% over MT Cowgirl and Haymaker. Therefore, if equal amounts of forage are fed, livestock fed Double Barrel over MT Cowgirl

and Haymaker could gain more weight. MT17F02410 has slightly higher test weights than the other forage lines listed. MT17F02410 is lower in percent grain protein than MT Cowgirl and Haymaker likely related to higher grain yields.

Location specific data: Forge yield, grain yield and quality are reported by location in Table 2, which provides information to support region specific decisions. In most locations, the same patterns are observed as reported in Table 1. Exceptions include: Lavina has higher grain yield in Havre and Conrad, and Haymaker has lower NDF in Kalispell.

To provide comparisons with feed lines, MT Double Barrel was included in the off-station nursery in 2024 across seven locations but was hailed out at the Post Farm. Table 3a reports an across location summary, while Table 3b reports location specific grain yield. MT Double Barrel has similar or higher test weights than most forage lines, but lower test weight than most feed lines. In most locations, MT Double Barrel had higher grain yield than the forage lines, Lavina, MT Cowgirl, Hays, Haymaker and Haybet. It also competed well with the feed lines Haxby, Odyssey, MT Boy Howdy, and Hockett, as well as out-performing for grain yield most malt lines. It is important to note, the Off-station is not tested for forage performance.

In Montana's dryland environments we normally do not observe lodging. However, from an irrigated trial in Powell, Wy lodging data is available (Table 4). MT Double Barrel has less lodging than all the released varieties at this location.

MT Double Barrel has higher 1,000 kernel weight than any forage or feed line tested and is only lower than the 3 malt lines Hockett, Buzz and MT Endurance. The large seed weight reduces then number of seeds per pound (Table 5).

It is our goal to evaluate MT Double Barrel at different fertilities, seeding rates and environments to inform grower management recommendations in 2025. We hope to collect data on grain and forage yield, test weight, forage quality, and nitrates.

Table 1: Comparison of *MT Double Barrel* Agronomic and Quality Traits with Four Controls across Co-occurring Environments from 2021 – 2024.

Trait	Control	Control Mean	MT Double Barrel (MT17F0 2410) Mean	MT Double Barrel % of Control Mean	# obs
Grain Yield (bu/ac)	Lavina	70.86	75.4	106.4	29
	MT Cowgirl	63.45	72.77	**114.7****	26
	Haymaker	67.25	75.4	**112.1****	29
	Hays	74.12	71.29	**96.2***	5
Forage Yield (tons/ac)	Lavina	4.12	4.26	103.3	21
	MT Cowgirl	4.02	4.2	104.5	18
	Haymaker	4.09	4.26	**104.1****	21
	Hays	4.26	4.61	108.2	3
Heading (jul)	Lavina	175.6	177.43	**101****	23
	MT Cowgirl	174.87	177.39	**101.4****	21
	Haymaker	176.75	177.43	100.4	23
	Hays	177.75	177.95	100.1	2
Maturity (jul)	Lavina	204.02	204.88	**100.4****	12
	MT Cowgirl	204.54	205.07	**100.3***	11
	Haymaker	204.08	204.88	**100.4****	12
	Hays	204.2	202.7	99.3	1
Test Weight (lbs/bu)	Lavina	48.7	48.96	100.5	27
	MT Cowgirl	48.57	48.8	100.5	24
	Haymaker	49.39	48.96	99.1	27
	Hays	50.33	50.47	100.3	5
Protein (%)	Lavina	12.83	12.88	100.4	24
	MT Cowgirl	13.47	12.87	**95.6****	22
	Haymaker	13.87	12.88	**92.9****	24
	Hays	13.36	13.74	102.8	4
Height (cm)	Lavina	75.53	72.32	**95.8****	29
	MT Cowgirl	78.76	72.47	**92****	26
	Haymaker	79.28	72.32	**91.2****	29
	Hays	64.68	64.86	100.3	5
ADF	Lavina	33.69	32.98	97.9	13
	MT Cowgirl	34.95	32.9	**94.1****	10
	Haymaker	34.4	32.98	**95.9***	13
	Hays	33.69	33.24	98.7	3
NDF	Lavina	60.78	59.62	98.1	13
	MT Cowgirl	62.35	59.48	**95.4****	10
	Haymaker	(Ctrl)	59.62	98.3	13
	Hays	61.04	60.09	98.4	3

Lattice square design, 25 entries, 3 replications in each location
** indicates highest value within a column, if significantly different from other selected varieties
* indicates value equal to highest value within a column based on Fisher's Protected LSD (p=0.05)
No designated values within a column indicates that there is no significant difference between selected varieties
** indicates lowest value within a column, if significantly different from other selected varieties
* indicates value equal to lowest value within a column based on Fisher's Protected LSD (p=0.05)
No designated values within a column indicates that there is no significant difference between selected varieties

Table 2: Location specific data from Forage Intrastate Trials 2022-2024 comparing *MT Double Barrel* Agronomic and Quality Traits with Three Controls.

Grain Yield (bu/ac)							
	Bozeman	Moccasin	Powell	Sidney	Havre	Kalispell	Conrad
MT Cowgirl	103.6	35.5	**119.7**	89.1	63.5	78.7	44.3
Lavina	107.3	**43.7**	112.9	**97.9**	**69.9**	84.9	**73.7**
Haymaker	101.9	33.1	111.2	82.5	60.0	94.6	**62.7**
MT17F02410	**119.0**	**39.4**	**132.2**	**93.9**	63.5	**121.4**	57.6
Grand Mean	109.3	40.2	118.7	90.9	64.8	94.5	60.3
LSD	8.1	8.0	14.1	5.7	4.2	10.4	12.5
C.V.	7.4	20.5	9.8	6.5	6.7	11.0	16.6
P	0.007	0.002	0.044	<0.001	<0.001	<0.001	<0.001
# obs	2	3	2	3	3	2	1

Forage Yield (tons/ac)							
	Bozeman	Moccasin	Powell	Sidney	Havre	Kalispell	Conrad
MT Cowgirl	**5.89**	2.24	**6.14**	**2.63**	2.39	**5.05**	4.80
Lavina	**5.75**	2.36	**6.49**	**2.75**	2.53	**4.99**	5.90
Haymaker	**5.95**	2.33	5.02	**2.66**	**2.60**	**5.65**	5.52
MT17F02410	**5.72**	2.40	**5.71**	**2.59**	**2.85**	**5.94**	5.39
Grand Mean	5.65	2.39	5.73	2.66	2.63	5.21	5.39
LSD	0.6	NS	1.2	0.5	0.3	1.1	NS
C.V.	11.4	18.5	18.0	18.4	11.6	21.2	14.3
P	0.023	0.16	0.046	0.006	0.022	0.013	0.17
# obs	3	3	2	3	3	3	1

ADF (%)							
	Bozeman	Moccasin	Powell	Sidney	Havre	Kalispell	Conrad
MT Cowgirl	36.25	**33.11**	**34.40**	35.11	34.59	36.00	25.77
Lavina	**34.34**	**32.43**	35.39	32.23	34.34	**35.39**	23.11
Haymaker	35.93	33.99	36.04	32.32	31.44	**34.05**	25.69
MT17F02410	**33.70**	**31.77**	**34.64**	33.17	**28.47**	**35.28**	23.80
Grand Mean	34.60	32.47	34.46	32.97	32.38	34.87	24.32
LSD	1.38	1.39	0.78	NS	1.23	1.40	NS
C.V.	4.96	5.35	1.49	6.58	3.80	5.00	6.01
P	<0.001	0.01	<0.001	0.45	<0.001	0.04	0.13
# obs	2	3	1	1	2	3	1

Table 2: Location specific data from Forage Intrastate Trials 2022-2024 (continued from previous page).

NDF (%)							
	Bozeman	Moccasin	Powell	Sidney	Havre	Kalispell	Conrad
MT Cowgirl	63.30	60.20	**60.83**	65.61	64.03	61.44	52.65
Lavina	**61.00**	59.78	**61.09**	61.97	63.75	61.26	48.23
Haymaker	62.30	61.04	62.73	59.69	58.51	**57.40**	52.22
MT17F02410	**59.63**	59.06	**60.36**	62.94	**54.08**	60.48	48.41
Grand Mean	61.05	59.54	60.06	62.45	60.41	59.94	49.86
LSD	2.42	NS	1.88	NS	2.29	2.24	NS
C.V.	4.94	5.10	2.06	5.97	3.78	4.66	5.60
P	0.03	0.19	<0.001	0.47	<0.001	0.02	0.17
# obs	2	3	1	1	2	3	1

RCB design with three replications per location. **Bold** indicates top performer**. Bold** indicates lines not different from top performer.

Table 3a: Feed/Forage Off-station Trial 2024 Agronomic Traits across 6 Locations

Name1	Yield	Protein	Test Weight	Height
Lavina	55.9	13.7	47.5	69.7
MT Cowgirl	50.1	14.1	48.9	72.0
Hays	57.3	13.6	48.6	67.7
Haymaker	49.0	**15.0**	49.3	70.9
Haybet	41.7	**14.6**	49.0	75.4
MT16F01601	52.0	13.4	48.9	70.0
MT17F02410	**59.4**	13.8	48.5	66.4
Hockett	55.8	13.0	**52.6**	64.9
Buzz	48.0	12.1	51.8	60.6
MT Endurance	47.6	12.4	51.8	67.6
MT Boy Howdy	**59.9**	11.5	50.6	62.9
AC Metcalfe	50.7	14.1	51.8	67.7
Merit 57	57.7	13.5	49.8	63.8
AAC Synergy	57.8	12.9	50.6	65.9
ABI Voyager	53.2	13.5	50.1	64.8
ABI Eagle	**59.5**	13.4	49.8	**59.3**
LCS Genie	**60.6**	13.8	50.4	**57.8**
LCS Odyssey	**62.4**	13.0	50.1	**57.2**
Haxby	**59.6**	13.0	**53.2**	65.0
MT18M10106	**60.1**	11.8	51.9	67.3
MT18M11004	57.1	13.6	51.2	65.3
MT19_M022_10	56.0	12.7	49.2	**58.0**
MT19_M034_16	**61.3**	12.3	50.1	60.9
MT19_M095_04	**59.6**	12.4	52.2	64.7
MT20_F108_13	56.0	14.5	49.0	65.9
Grand Mean	55.5	13.3	50.3	65.3
LSD	4.0	0.4	0.8	2.6
C.V.	10.85	4.41	2.54	6.01
Prob. Entry	<0.001	<0.001	<0.001	<0.001
# obs	6	6	6	6

RCB design with three replications per location. **Bold** indicates top performer**. Bold** indicates lines not different from top performer.

Table 3b: Location specific Grain Yield (bu/ac) from Feed/Forage Off-station Trial 2024

Name	All Loc	Huntley	Havre	Geraldine	Billings	Broadview	Denton
Lavina	55.9	89.6	100.0	**48.1**	33.5	46.0	12.6
MT Cowgirl	50.1	83.5	94.5	37.2	**34.9**	43.5	11.6
Hays	57.3	88.4	**101.8**	**55.2**	**36.7**	43.9	**21.6**
Haymaker	49.0	65.0	95.8	**51.8**	32.9	40.0	10.5
Haybet	41.7	60.9	85.3	35.1	27.9	23.4	13.6
MT17F02410	**59.4**	97.1	**103.6**	**49.6**	**36.2**	**51.5**	**19.0**
Hockett	55.8	86.4	100.2	**51.0**	**35.3**	44.5	**16.6**
Buzz	48.0	67.0	93.8	40.1	32.0	39.3	**15.7**
MT Endurance	47.6	69.1	89.1	41.6	33.7	38.1	14.9
MT Boy Howdy	**59.9**	101.9	**104.5**	**50.1**	**37.9**	**50.4**	**15.5**
AC Metcalfe	50.7	86.0	85.7	47.3	33.4	42.4	**17.0**
Merit 57	57.7	105.1	97.7	43.6	32.1	**51.1**	**16.5**
AAC Synergy	57.8	97.2	97.2	**55.8**	**36.7**	43.3	12.8
ABI Voyager	53.2	89.0	90.9	44.7	**39.1**	39.9	10.3
ABI Eagle	**59.5**	110.0	87.4	**59.1**	**37.2**	**51.2**	11.8
LCS Genie	**60.6**	107.6	99.8	**50.5**	**35.1**	**53.3**	14.7
LCS Odyssey	**62.4**	**120.2**	**107.3**	**48.5**	**34.0**	**52.3**	13.9
Haxby	**59.6**	91.6	**105.5**	**56.9**	**37.5**	**49.7**	**18.0**
Grand Mean	55.53	91.41	97.87	47.80	35.42	45.55	15.11
LSD	3.95	9.90	6.97	11.61	5.18	6.75	6.43
C.V.	10.85	7.86	5.17	17.63	10.61	10.75	25.84
P value	<0.001	<0.001	<0.001	<0.1	<0.01	<0.001	0.04

RCB design with three replications per location. **Bold** indicates top performer**. Bold** indicates lines not different from top performer.

Table 4: Location specific data from Powell WY Irrigated Intrastate 2023

Name	Yield	Tons/Acre	Test Weight	Height	Lodging
Lavina	115.3	**6.27***	**50.5***	104.0	**13.2***
MT Cowgirl	**123.5***	**6.81***	48.2	105.0	19.7
Haymaker	107.8	5.80	46.7	**108.2***	79.4
MT16F01601	121.2	**6.00***	**50.7****	**108.7***	**9.4***
MT17F02410	**136.5****	5.61	48.1	102.4	**9.0***
MT18F00503	**134.8***	5.51	**49***	104.5	**10.2***
MT18F00507	109.2	4.67	47.6	**107.8***	**10.6***
MT18F00607	119.5	5.66	44.9	**107.7***	55.0
MT18F00803	**128***	**6.57***	44.8	94.4	30.6
MT19_F01_01	103.9	4.23	47.6	103.3	19.7
MT19_F04_02	113.7	**6.53***	45.3	**109.7****	**15.4***
MT20_F097_01	117.2	5.82	47.3	**109***	56.9
MT20_F098_01	**122.1***	**5.98***	48.5	**105.4***	49.5
MT20_F098_24	**121.5***	5.52	47.2	102.3	**17.5***
MT20_F099_02	**123.3***	**7.42***	**49.7***	**105.4***	27.2
MT20_F099_05	**126.7***	**7.54****	**50.5***	103.5	**12.2***
MT20_F108_13	**130.8***	5.36	**49.3***	102.5	**13.3***
MT20_F109_04	**134.4***	4.34	47.3	**105.5***	32.6
MT20_F109_08	**133.1***	5.55	**49.2***	**107.4***	25.2
MT20_F109_22	**124.7***	5.69	47.1	96.0	19.7
MT20_F110_04	116.0	**6.03***	**49.3***	104.0	**17.5***
MT20_F110_12	106.9	5.06	48.0	99.6	51.2
MT20_F110_17	114.4	5.03	48.3	**105.9***	74.8
MT20_F110_19	**125***	5.71	**49.3***	104.6	**3.4****
MT20_F111_15	**122.7***	5.40	46.9	**107.3***	38.7
Grand Mean	121.3	5.76	48.0	104.6	28.5
LSD	15.0	1.62	1.7	4.7	14.2
C.V.	8.1	17.8	2.5	3.2	41.3
Prob. Entry	<0.001	<0.001	<0.001	<0.001	<0.001

Lattice square design, 25 entries, 3 replications in each location
** indicates highest value within a column, if significantly different from other selected varieties
* indicates value equal to highest value within a column based on Fisher's Protected LSD (p=0.05)
No designated values within a column indicates that there is no significant difference between selected varieties
** indicates lowest value within a column, if significantly different from other selected varieties
* indicates value equal to lowest value within a column based on Fisher's Protected LSD (p=0.05)
No designated values within a column indicates that there is no significant difference between selected varieties

Table 5: Comparison of Kernal Weight, Seeds/ Pound and Test Weight between Feed, Forage and Malt Lines

Variety	1000 KW (g)	# Seeds/lb	Test WT (lbs/bu)
Haymaker	37.4	12128.07	46.7
Lavina	39.7	11425.44	50.7
Hays	40.4	11227.48	50.5
MT Boy Howdy	43.4	10451.38	50.6
Haxby	43.6	10403.44	53.2
MT Cowgirl	43.7	10379.63	48.2
MT Double Barrel	44.2	10262.22	48.1
Hockett	46.7	9712.85	52.6
Buzz	47.7	9509.22	50.7
MT Endurance	48.6	9333.13	51.8

MT Double Barrel
Experimental Designation (MT17F02410)

MT Double Barrel (MT17F02410) is a two-row spring dual purpose barley developed for feed and forage and marketed by Montana State University and the Montana Agriculture Experiment Station.

MT Double Barrel was inbred by single seed descent and selected for high grain yield, forage yield, and quality.

MT Double Barrel was tested across Montana and is well-adapted as a feed or forage barley across Montana and in similar areas of the Northern Great Plains, especially as a replacement for Hays, which is no longer available in MT.

MT Double Barrel is being released without disease response claims due to limited data.

MT Double Barrel resulted from a cross of *Lavina* (hooded) and *ND24388* (awned) and although usually hooded can occasionally (5 out of 10,000) have awned spikes.

Recognized classes of *MT Double Barrel* are breeder, foundation, registered, and certified. MSU Foundation Seed will maintain the variety from breeder seed as needed and will produce all foundation seed. No royalty fees or licensing agreements are anticipated.

Certified class seed will likely be available for the 2027 growing season, if accepted as eligible.

Application for PVP Title V is anticipated with the option that *MT Double Barrel* can be sold by variety name only as a class of certified seed.

Certified seed production acreage may be published by AOSCA and certifying agencies.

Barley

MT Double Barrel
MT17F02410

1. MT Double Barrel (MT17F02410) is a two row, hooded, dual purpose barley for feed and forage developed by Montana State University and the Montana Ag Experiment Station.
2. MT Double Barrel in bred via single seed descent and was selected for high forage and grain yield, and good forage quality.
3. MT Double Barrell (MT17F02410) was tested across MT under dryland conditions with varying precipitation and under irrigation in Powell Wy.
4.

Identifying characteristics –

1. Growth Habit:	Spring	16. Plant Height (see below):	72.5
2. Spike:	Two-row	17. Spike Shape:	Oblong
3. Coleoptile Color:	Green	18. Spike Density:	Mid Dense
4. Juvenile Growth Habit:	Erect	19. Spike Position at Maturity:	nodding
5. Plant Tillering:	High	20. Hairiness of Rachis Edge:	Covered
6. Leaf Color at Boot:	Green	21. Rachilla Hair Length:	Long
7. Flag Leaf at Boot:	Erect	22. Lemma Awns:	Sessile hoods
8. Pubescence on Leaf Blade:	No	23. Length of Lemma Awns:	Na
9. Pubescence on Leaf Sheath:	No	24. Lemma Awn Surface:	Na
10.:Auricle Color:	White	25. Glume Hairiness:	Banded
11.Heading Date (see below):	177.4	26. Glume Awn Surface:	Rough
12. Stem Color:	White	27. Glume/Lemma Adherence:	Covered
13. Neck Shape:	Straight	28. Texture (if covered):	Wrinkled
14. Collar Shape:	V shaped	29. Aleurone Color:	Colorless
15. Spike Exsertion:	Intermediate	30. Avg 1,000 Kernel Wt (grams:	40.3

Heading date: 177.4 which is: 2.5 Day(s) LATER than: MT Cowgirl

Plant height: 72.5 cm, which is 6.3 cm SHORTER than: MT Cowgirl

Physiological or Biochemical Traits:

Variants and Frequency:

Awns in 5 out of 10,000 spikes