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MEMORANDUM

TO:

FROM: Hwa-Young Heo and Jason Cook, Spring Wheat Breeders

DATE:

RE: Proposal for licensed cultivar release of MT21174

Motion: Release hard red spring wheat line MT21174 for Montana rain-fed growing environments for licensing.

Pedigree: DAGMAR//MT1142/MT1225

CONTRIBUTORS

- Dr. Jason Cook, Mr. Lucas Wright, Mr. Jared Lile, Ms. Mei Ling Wong, Ms. Deanna Nash, Dr. Hwa-Young Heo, MSU Bozeman, MT
- Dr. Jed Eberly, Mr. Simon Fordyce, MSU-CARC, Moccasin, MT
- Dr. Chengci Chen, Ms. Calla Kowatch-Carlson, and Dr. Frankie Crutcher, MSU-EARC, Sidney, MT
- Ms. Peggy Lamb MSU-NARC, Havre,
- Dr. Kent McVay, MSU-SARC, Huntley, MT
- Dr. Jessica Torrion, Dr. Joseph Jenson MSU-NWARC, Creston, MT
- Mr. Doug Holen, MSU Foundation Seed, Bozeman, MT
- Mr. Donny Gray, 2nd Nature Research, LLC, Bozeman, MT
- Dr. Dale Clark and Mr. Trevor Schafer, Nutrien Ag Solutions, Bozeman, MT

Seed Availability: Breeder's seed (F4:10) was planted in the spring of 2025 in Bozeman, MT, and planted again for further increase during the fall of 2025 in Yuma, AZ. The Yuma seed increase was contracted with 2nd Nature Research. We are aiming to have 20 bushels of breeder seed available for the spring 2026 growing season.

Key characteristics:

- Characteristics similar to Dagmar

Table 1. Grain yield (bu/ac) grown in 20 Advanced Yield trial (AYT) rain-fed locations in 2023 - 2025.

Loc.	Bozeman (rain-fed)	Conrad	Fort Benton	Havre	Hingham	Moccasin	Sidney (rain-fed)	Overall mean
Year	2023, 2025	2023-2025	2023-2025	2023-2025	2023-2025	2023-2025	2023-2025	
MT 21487	**107.8**	**41.8**	**56.2**	**55.6**	**41.5**	**40.5**	**80.1**	**60.5**
VIDA	**100.4**	**37.6**	**62.2**	**54.1**	**45.7**	**43.3**	**77.8**	**60.2**
MT DUTTON	**104.8**	**40.4**	**55.6**	**52.5**	**45.4**	**38.0**	**80.8**	**59.6**
MT UBET	**108.1**	35.8	**52.0**	**52.1**	**46.5**	**41.6**	**81.2**	**59.6**
MT 21484	**103.6**	**42.6**	**55.3**	**55.2**	40.5	**41.9**	**76.9**	**59.4**
MT CARLSON	**102.2**	**41.1**	**55.5**	**54.4**	**43.5**	36.9	**79.9**	**59.1**
DAGMAR	**101.0**	**41.2**	**55.9**	**54.4**	40.6	**43.0**	**76.8**	**59.0**
ROCKER	**99.9**	**40.6**	**61.4**	**50.4**	**41.9**	36.1	74.9	**57.9**
MT 21074	**100.6**	**40.0**	**61.1**	**52.4**	40.6	**38.9**	71.4	**57.9**
MT 21174	**102.4**	**40.8**	50.0	**53.7**	40.1	**41.6**	74.7	**57.6**
NS PRESSER CLP	**98.3**	**38.3**	**58.7**	**49.2**	**42.5**	36.7	75.6	**57.0**
LCS ASCENT	**102.6**	34.6	46.4	**53.9**	**42.6**	36.4	**79.2**	56.5
LANNING	**100.8**	33.6	49.2	**52.1**	41.1	34.4	**79.1**	55.8
DUCLAIR	**98.8**	**36.7**	**55.8**	**49.2**	**42.0**	**38.0**	68.4	55.6
WB GUNNISON	87.2	**38.6**	**59.6**	**53.9**	**43.9**	34.6	66.2	54.9
SY LONGMIRE	**97.6**	36.2	**55.1**	48.3	41.2	32.4	72.5	54.8
ND STAMPEDE	**102.4**	32.2	46.1	**50.1**	**43.4**	34.9	73.0	54.6
SY ROCKFORD	**102.9**	33.1	42.6	**54.0**	37.0	35.2	75.7	54.4
REEDER	**100.6**	35.7	43.6	**49.1**	**42.3**	33.2	73.1	53.9
WB 9879 CLP	**93.6**	35.1	**53.7**	48.6	40.0	36.6	69.5	53.9
McNEAL	88.9	32.7	46.8	48.3	**44.3**	35.8	73.4	52.9
LCS BOOM	**95.6**	33.4	42.5	**51.0**	**42.6**	30.6	72.2	52.6
AP GUNSMOKE CL2	91.7	34.7	42.1	**49.5**	38.5	33.6	74.7	52.1
AP SMITH	**95.2**	33.2	40.3	48.9	36.8	33.7	73.1	51.6
AAC CONCORD	87.1	35.7	49.6	44.9	40.5	34.4	65.0	51.0
THATCHER	73.4	25.9	39.1	39.9	40.5	29.3	57.6	43.7
Mean (n=26)	**98.0**	**36.6**	**51.4**	**51.0**	**41.7**	**36.6**	**74.0**	**55.6**
C.V.	7.8	10.0	13.1	8.0	7.6	9.2	4.0	6.7
Prob. (line)	<0.05	<0.001	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001
LSD (0.05)	**15.7**	**6.0**	**11.0**	**6.7**	**5.2**	**5.5**	**4.9**	**4.0**

Table 2. Grain yield (bu/ac) grown in 29 Advanced Yield trial (AYT) rain-fed and irrigated locations in 2023 - 2025.

Loc.	Bozeman (rainfed)	Conrad	Fort benton	Havre	Hingham	Moccasin	Sidney (rainfed)	Bozeman (irrigated)	Kalispell (high rainfall)	Sidney (irrigated)	Overall mean
Year	2023, 2025	2023-2025	2023-2025	2023-2025	2023-2025	2023-2025	2023-2025	2023-2025	2023-2025	2023-2025	N=29
MT DUTTON	**104.8**	**40.4**	**55.6**	**52.5**	**45.4**	**38.0**	**80.8**	**115.1**	**119.5**	**114.5**	**76.7**
MT 21487	**107.8**	**41.8**	**56.2**	**55.6**	**41.5**	**40.5**	**80.1**	**109.6**	**113.3**	**117.6**	**76.4**
MT CARLSON	**102.2**	**41.1**	**55.5**	**54.4**	**43.5**	36.9	**79.9**	**113.7**	**119.2**	**112.9**	**75.9**
DAGMAR	**101.0**	**41.2**	**55.9**	**54.4**	40.6	**43.0**	**76.8**	**110.6**	**119.8**	**112.8**	**75.6**
MT 21484	**103.6**	**42.6**	**55.3**	**55.2**	40.5	**41.9**	**76.9**	**107.8**	**112.4**	**118.0**	**75.4**
VIDA	**100.4**	**37.6**	**62.2**	**54.1**	**45.7**	**43.3**	**77.8**	**107.9**	**110.9**	**111.7**	**75.2**
MT UBET	**108.1**	35.8	**52.0**	**52.1**	**46.5**	**41.6**	**81.2**	**108.8**	**108.9**	**114.4**	**74.9**
LCS ASCENT	**102.6**	34.6	46.4	**53.9**	**42.6**	36.4	**79.2**	**116.5**	**116.9**	**114.4**	**74.4**
MT 21174	**102.4**	**40.8**	50.0	**53.7**	40.1	**41.6**	74.7	**110.5**	**114.7**	**111.1**	**74.0**
MT 21074	**100.6**	**40.0**	**61.1**	**52.4**	40.6	**38.9**	71.4	**113.4**	107.9	105.0	73.1
ROCKER	**99.9**	**40.6**	**61.4**	**50.4**	**41.9**	36.1	74.9	104.2	105.2	**112.3**	72.7
NS PRESSER CLP	**98.3**	**38.3**	**58.7**	**49.2**	**42.5**	36.7	75.6	102.6	105.1	109.0	71.6
SY LONGMIRE	**97.6**	36.2	**55.1**	48.3	41.2	32.4	72.5	**107.6**	**110.1**	**113.8**	71.5
LANNING	**100.8**	33.6	49.2	**52.1**	41.1	34.4	**79.1**	102.7	**110.4**	110.5	71.4
DUCLAIR	**98.8**	**36.7**	**55.8**	**49.2**	**42.0**	**38.0**	68.4	**108.3**	106.6	109.8	71.4
ND STAMPEDE	**102.4**	32.2	46.1	**50.1**	**43.4**	34.9	73.0	**110.3**	102.5	**115.7**	71.1
WB 9879 CLP	**93.6**	35.1	**53.7**	48.6	40.0	36.6	69.5	104.8	**110.1**	**111.8**	70.4
REEDER	**100.6**	35.7	43.6	**49.1**	**42.3**	33.2	73.1	101.7	**109.4**	109.5	69.8
SY ROCKFORD	**102.9**	33.1	42.6	**54.0**	37.0	35.2	75.7	**108.8**	100.2	107.9	69.7
LCS BOOM	**95.6**	33.4	42.5	**51.0**	**42.6**	30.6	72.2	104.4	**110.0**	**110.9**	69.3
WB GUNNISON	87.2	**38.6**	**59.6**	**53.9**	**43.9**	34.6	66.2	102.1	108.7	96.2	69.1
AP GUNSMOKE CL2	91.7	34.7	42.1	**49.5**	38.5	33.6	74.7	103.1	104.5	**115.5**	68.8
AP SMITH	**95.2**	33.2	40.3	48.9	36.8	33.7	73.1	102.4	107.6	108.7	68.0
McNEAL	88.9	32.7	46.8	48.3	**44.3**	35.8	73.4	98.2	101.1	106.0	67.6
AAC CONCORD	87.1	35.7	49.6	44.9	40.5	34.4	65.0	92.3	100.6	95.0	64.5
THATCHER	73.4	25.9	39.1	39.9	40.5	29.3	57.6	83.4	90.4	90.5	57.0
Mean (n=26)	**98.0**	**36.6**	**51.4**	**51.0**	**41.7**	**36.6**	**74.0**	**105.8**	**108.7**	**109.8**	**71.4**
C.V.	7.8	10.0	13.1	8.0	7.6	9.2	4.0	6.6	6.2	4.1	5.5
Prob. (line)	<0.05	<0.001	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
LSD (0.05)	**15.7**	**6.0**	**11.0**	**6.7**	**5.2**	**5.5**	**4.9**	**11.4**	**11.1**	**7.4**	**3.5**

Table 3. Grain protein content (%) collected from 30 Advanced Yield trial (AYT) rain-fed and irrigated locations in 2023 - 2025.

Loc.	Bozeman (rainfed)	Conrad	Fort benton	Havre	Hingham	Moccasin	Sidney (rainfed)	Bozeman (irrigated)	Kalispell (high rainfall)	Sidney (irrigated)	Overall mean
Year	2023, 2025	2023-2025	2023-2025	2023-2025	2023-2025	2023-2025	2023-2025	2023-2025	2023-2025	2023-2025	N=29
AP GUNSMOKE CL2	**15.2**	**15.6**	**15.6**	16.6	**13.1**	13.7	**13.8**	**14.9**	**13.1**	**14.3**	**14.6**
LANNING	**15.2**	15.2	**15.8**	16.5	**13.0**	13.2	**13.6**	14.6	**13.6**	**14.8**	**14.6**
DAGMAR	**15.0**	15.1	**15.4**	16.1	**12.8**	13.3	**14.0**	14.7	**13.4**	**14.9**	**14.5**
MT 21074	**15.1**	15.3	15.0	**16.8**	**12.8**	13.4	13.3	**15.1**	**13.2**	14.2	**14.4**
AAC CONCORD	**15.2**	14.6	**15.3**	16.6	11.9	13.3	**13.9**	**15.2**	**13.1**	**14.6**	**14.4**
REEDER	**15.1**	15.1	**15.2**	16.1	**12.7**	13.4	**13.6**	**14.9**	**13.4**	14.0	**14.4**
MT 21174	**15.0**	15.0	**15.3**	16.7	**12.5**	**13.9**	**13.7**	14.6	12.6	14.2	**14.4**
AP SMITH	**15.1**	15.0	14.7	16.3	**13.2**	13.4	**13.8**	14.5	**13.6**	13.8	14.3
WB 9879 CLP	**14.8**	15.0	**15.2**	16.3	**12.9**	13.5	**14.0**	14.4	**12.9**	13.7	14.3
MT 21484	14.5	15.1	**15.2**	16.3	**12.9**	12.9	**13.4**	**15.0**	12.8	**14.6**	14.3
MT 21487	**15.0**	15.1	14.9	16.2	**12.5**	13.4	13.3	**14.9**	12.3	**14.4**	14.2
SY LONGMIRE	**14.7**	15.0	**15.2**	16.7	12.4	13.2	13.1	14.5	**13.1**	13.8	14.2
LCS BOOM	**14.7**	15.1	14.8	15.9	**12.9**	13.0	**13.5**	14.5	**13.2**	14.1	14.2
THATCHER	**14.8**	14.3	14.4	16.5	12.2	13.5	**13.5**	**14.9**	**12.9**	14.0	14.1
McNEAL	**15.0**	14.9	14.9	16.0	12.2	13.7	**13.6**	14.7	12.0	13.9	14.1
MT UBET	14.5	15.4	14.9	16.1	12.4	13.0	12.8	14.5	**13.0**	14.2	14.1
DUCLAIR	**14.7**	15.0	14.5	16.5	**12.5**	13.6	13.0	14.4	12.8	13.8	14.1
MT DUTTON	**14.6**	14.9	15.0	16.1	**12.5**	12.7	12.9	14.6	**13.0**	14.2	14.1
ND STAMPEDE	**14.9**	14.9	14.6	16.6	**12.9**	13.4	13.3	14.4	11.8	13.4	14.0
ROCKER	**14.7**	14.4	14.7	16.1	11.8	13.4	13.2	14.6	12.7	13.7	13.9
MT CARLSON	14.5	14.4	14.6	15.9	12.3	13.2	13.0	14.1	12.4	13.7	13.8
VIDA	14.5	14.8	14.6	15.5	12.0	13.0	12.7	14.4	12.6	13.9	13.8
NS PRESSER CLP	**14.6**	14.6	14.7	15.8	11.4	13.1	12.8	14.4	12.2	13.4	13.7
SY ROCKFORD	13.8	14.8	14.1	15.9	**12.6**	13.2	12.6	13.7	12.5	13.1	13.6
WB GUNNISON	14.1	14.0	13.8	15.2	11.9	**13.9**	12.8	13.8	12.4	13.1	13.5
LCS ASCENT	14.0	14.5	13.4	15.4	12.4	12.9	12.6	13.7	12.5	13.3	13.5
Mean (n=26)	**14.7**	**14.9**	**14.8**	**16.2**	**12.5**	**13.3**	**13.3**	**14.5**	**12.8**	**14.0**	**14.1**
C.V.	3.0	3.9	2.9	3.7	3.8	4.7	3.1	2.1	3.7	3.1	2.2
Prob. (line)	<0.05	ns	<0.001	ns	<0.01	ns	<0.001	<0.001	<0.001	<0.001	<0.001
LSD (0.05)	**0.7**	**-**	**0.7**	**-**	**0.8**	**-**	**0.7**	**0.5**	**0.8**	**0.7**	**0.3**

Table 4. Agronomic traits collected from 30 Advanced Yield trial (AYT) rain-fed and irrigated locations in 2023 - 2025.

Traits	Test weight (lb/bu)	Heading date (Julian Days)	Plant height (inch)	Stem solidness (5-25)	Sawfly cutting (%)
Loc/Years	**30**	**17**	**27**	**Bozeman (23-25)**	**Fort benton (24-25)**
WB GUNNISON	61.4	174.5	29.5	10.9	**16.7**
MT 21074	61.7	176.2	31.0	17.8	**21.7**
ROCKER	61.8	176.4	30.9	11.8	**21.7**
WB 9879 CLP	60.4	175.2	30.4	**23.1**	**24.2**
VIDA	60.5	175.3	31.6	14.8	**33.3**
DAGMAR	61.4	172.5	31.9	19.0	40.0
MT 21174	61.0	173.2	32.9	18.0	40.0
AAC CONCORD	60.2	176.1	36.0	20.7	42.5
MT 21487	61.2	173.4	32.0	15.0	44.2
NS PRESSER CLP	59.8	177.3	33.0	9.1	45.0
MT 21484	61.5	173.1	32.0	17.4	47.5
DUCLAIR	60.0	172.6	31.5	**21.3**	50.0
SY LONGMIRE	61.6	174.3	30.0	**21.6**	51.7
MT DUTTON	60.3	174.8	31.4	12.1	58.3
MT CARLSON	60.8	173.5	30.7	18.6	62.5
AP SMITH	61.3	175.8	28.2	10.5	62.5
THATCHER	59.5	176.8	**40.0**	8.5	65.8
McNEAL	60.3	176.4	32.5	8.9	70.8
LCS ASCENT	61.8	**171.7**	30.7	7.8	71.7
LANNING	60.9	172.9	30.6	9.2	75.9
SY ROCKFORD	59.9	176.5	31.2	8.5	76.7
ND STAMPEDE	60.0	173.3	31.4	8.7	76.7
LCS BOOM	**62.4**	**171.3**	30.0	8.7	79.2
REEDER	61.2	174.8	32.7	9.1	82.5
AP GUNSMOKE CL2	61.0	174.2	30.3	8.6	85.0
MT UBET	60.8	173.6	30.6	13.9	89.2
Mean (n=26)	**60.9**	**174.4**	**31.7**	**13.6**	**55.4**
C.V.	0.8	0.3	2.5	8.9	21.2
Prob. (line)	<0.001	<0.001	<0.001	<0.001	<0.001
LSD (0.05)	**0.4**	**0.6**	**0.7**	**2.0**	**23.8**

Table 5. End-Use quality combined analysis of six Advanced Yield Trial (AYT) location-years in 2023 to 2024.

Variety/Line	Flour yield (%)	Flour protein (%, 14% m.b.)	Mixing tolerance	Mixo mixing time (min.)	Mixo water absorption (%)	Bake mix time (min.)	Bake water absorption (%)	Loaf volume (cc)
WB GUNNISON	67.0	12.7	**4.5**	**8.1**	66.4	**16.3**	77.2	1082
ND Stampede	69.1	**14.0**	**4.0**	5.3	**72.0**	12.8	**82.0**	**1127**
McNEAL	67.5	**14.0**	**4.0**	**7.8**	**71.2**	**15.7**	**80.5**	**1178**
SY LONGMIRE	69.6	13.9	**4.0**	4.9	67.8	12.1	77.7	**1131**
MT 21487	70.4	13.7	**3.8**	5.7	68.8	**15.0**	78.7	1101
AP SMITH	69.6	**14.5**	**3.8**	**7.3**	69.7	**16.8**	78.9	1038
AAC CONCORD	**71.6**	**14.5**	3.7	4.4	68.4	13.0	79.1	1079
ROCKER	67.9	13.8	3.5	6.7	67.7	13.5	77.7	**1129**
MT 21484	70.6	13.4	3.5	3.8	66.9	9.4	77.1	1080
DAGMAR	70.4	13.7	3.5	3.9	67.9	10.1	77.5	1120
SY INGMAR	70.1	**14.3**	3.3	6.3	**71.2**	13.8	**79.8**	**1152**
MT 21174	69.3	**14.4**	3.3	3.5	68.0	7.9	77.3	**1208**
DUCLAIR	69.0	13.8	3.3	4.5	67.7	11.1	77.6	**1130**
MT 21074	68.1	**14.0**	3.0	4.1	66.7	7.5	76.0	**1131**
AP GUNSMOKE CL2	69.2	**14.2**	3.0	5.0	67.8	11.6	77.5	898
SY ROCKFORD	69.6	13.1	2.8	4.1	67.7	9.2	77.6	1028
LCS BOOM	**71.2**	13.8	2.8	3.8	68.5	9.2	77.9	1119
LANNING	69.3	**14.1**	2.8	3.9	67.9	9.1	77.8	1123
THATCHER	69.2	**14.3**	2.7	3.9	67.8	9.9	77.4	1110
LCS ASCENT	70.6	12.7	2.7	4.2	65.7	10.1	75.2	1023
MT Ubet	70.8	13.6	2.7	3.7	65.6	8.4	75.1	1036
MT Carlson	67.4	13.7	2.5	3.3	66.4	7.4	76.2	1088
REEDER	68.0	**14.0**	2.0	3.1	66.6	6.7	75.8	1082
MT Dutton	70.0	13.2	1.8	2.6	65.7	4.9	75.1	1078
NS PRESSER CLP	70.4	13.5	1.5	3.4	65.9	8.6	74.7	1058
VIDA	**71.5**	13.2	1.3	3.4	66.2	7.5	76.0	1117
WB 9879 CLP	67.6	**14.1**	1.3	1.9	65.1	3.6	73.3	1017
MEAN (n=27)	**69.5**	**13.7**	**3.0**	**4.4**	**67.4**	**10.3**	**77**	**1094**
CV	1.2	3.9	23.1	19.8	3.0	21.5	2.8	6.6
PAROBA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
LSD	**1.0**	**0.6**	**0.8**	**1.0**	**2.3**	**2.5**	**2.5**	**82**

bold : highest or earliest value within a column

bold : equal value to highest or earliest value within a column based LSD(0.05)

Table 6 . 2024 Yield and agronomic traits grown in the Spring Wheat Off-Station Yield Trial.

	YIELD (bu/ac)			TEST WEIGHT (lb/bu)			GRAIN PROTEIN (%)			HEADING DATE (Julian)			HEIGHT (Inches)			SAWFLY CUT (%)	FALLING NUMBER
No. of environments	12	3	**15**	12	3	**15**	12	3	**15**	1	2	**3**	12	3	**15**	**3**	**4**
Variety/Line	RAINFED	IRRI	**TOTAL**	RAINFED	IRRI	**TOTAL**	RAINFED	IRRI	**TOTAL**	RAINFED	IRRI	**TOTAL**	RAINFED	IRRI	**TOTAL**	**TOTAL**	**TOTAL**
MT 21484	**43.7**	**96.2**	**54.2**	59.0	60.9	59.4	14.7	**15.6**	14.9	**164.6**	**166.8**	**166.0**	**28.2**	**31.5**	**28.9**	**6.5**	383
MT UBET	**44.1**	92.7	**53.8**	58.5	60.5	58.9	14.5	**15.6**	14.7	165.5	168.0	**167.1**	27.3	30.6	27.9	21.9	332
MT CARLSON	**44.1**	91.2	**53.5**	58.7	59.9	58.9	14.3	14.3	14.3	165.3	169.5	168.1	27.3	**32.8**	**28.4**	15.2	364
DAGMAR	**42.5**	92.9	**52.6**	59.2	60.9	59.5	15.1	**15.3**	15.1	165.3	168.4	**167.4**	**27.7**	**31.9**	**28.6**	**4.8**	388
MT DUTTON	**43.3**	89.3	**52.5**	57.5	59.9	58.0	14.8	**15.1**	14.9	167.0	169.8	168.9	**27.7**	**31.4**	**28.4**	16.7	**395**
VIDA	**42.0**	88.0	**51.2**	58.5	60.6	58.9	14.3	13.9	14.2	167.4	168.5	168.1	**27.5**	**32.1**	**28.4**	**11.4**	373
ROCKER	39.7	90.6	49.9	**59.6**	**62.0**	**60.1**	14.7	**15.0**	14.8	168.3	168.2	168.2	**27.4**	**31.2**	28.2	**11.4**	**448**
MT 21174	40.3	85.2	49.3	58.7	59.8	58.9	15.2	**15.4**	15.2	165.7	168.6	**167.6**	**27.8**	**31.6**	**28.6**	**3.9**	**422**
LCS ASCENT	40.3	84.0	49.0	**59.9**	61.1	**60.1**	14.3	14.2	14.2	**163.9**	168.5	**166.9**	27.0	30.0	27.6	19.1	**415**
MT SIDNEY	39.0	86.8	48.6	59.0	60.8	59.4	14.9	13.9	14.7	164.9	167.9	**166.9**	27.2	**30.8**	27.9	22.5	371
LANNING	38.9	86.2	48.4	58.2	60.6	58.7	15.1	**15.6**	15.2	**164.1**	169.2	**167.5**	26.9	30.1	27.5	24.9	389
MT 21074	39.3	81.8	47.8	**59.5**	**61.5**	**59.9**	15.2	**15.0**	15.2	169.1	171.1	170.4	26.6	**31.7**	27.6	**7.6**	385
REEDER	37.3	87.3	47.3	58.5	**61.6**	59.1	15.0	14.8	15.0	167.7	168.9	168.5	**28.2**	**32.9**	**29.1**	20.2	**406**
SY LONGMIRE	36.8	87.4	46.9	**59.6**	**61.8**	**60.0**	15.0	14.5	14.9	168.4	168.5	168.4	26.8	30.4	27.5	**10.4**	**420**
SY ROCKFORD	37.2	85.0	46.8	57.4	59.5	57.8	14.8	14.1	14.6	168.4	170.5	169.8	**27.5**	**32.5**	**28.5**	23.1	**405**
WB 9879CLP	39.1	75.2	46.3	58.4	59.4	58.6	15.0	**15.5**	15.1	168.3	170.4	169.7	27.0	**31.5**	27.9	**4.3**	**402**
AP SMITH	35.7	87.0	45.9	58.7	61.0	59.1	15.2	14.6	15.1	168.3	167.1	**167.5**	25.6	29.7	26.4	23.9	392
WB GUNNISON	35.9	83.6	45.5	58.8	61.1	59.2	14.4	14.0	14.3	167.3	168.1	**167.8**	26.6	30.5	27.4	**8.3**	**437**
WB 9668	35.8	76.1	43.9	59.1	59.6	59.2	**16.2**	**16.2**	**16.2**	**164.0**	168.2	**166.8**	24.5	27.1	25.0	**8.1**	394
Mean (n=19)	**40.0**	**87.1**	**49.4**	**58.7**	**60.6**	**59.1**	**14.8**	**14.8**	**14.8**	**166.5**	**168.7**	**168.0**	**27.2**	**31.1**	**27.9**	**12.8**	**391.0**
C.V.	9.2	12.0	11.1	1.1	0.7	1.1	3.2	5.2	3.8	0.3	0.7	0.8	3.9	4.4	4.0	40.2	9.8
Prob. (line)	<0.001	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	ns	<0.01	<0.001	<0.05	<0.001	<0.001	<0.05
LSD (0.05)	**3.0**	**-**	**3.9**	**0.5**	**0.7**	**0.5**	**0.4**	**1.3**	**0.4**	**0.9**	**-**	**2.1**	**0.9**	**2.3**	**0.8**	**8.5**	**54.0**

bold : highest or earliest value within a column

bold : equal value to highest or earliest value within a column based LSD(0.05)