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**MEMORANDUM**

**TO:** Wheat Cultivar Release & Recommendation Committee

**FROM:** Phil Bruckner and Jim Berg, Winter wheat breeders

**DATE:** December 28, 2010

**RE:** Proposal for recommendation of Decade hard red winter wheat

The following motion and supporting documentation is presented for consideration at the 2011 MAES Cultivar Release and Recommendation Meeting in Bozeman:

**Motion:** That Decade hard red winter wheat be recommended for production in Montana cropping districts 3, 4, 5, and 6.

**‘Decade’ Winter Wheat**

**Phil Bruckner and Jim Berg, Winter Wheat Breeding Program, Montana State University**  
**Updated 12/2010**

Decade is a white-chaffed hard red winter wheat developed by the Montana Agricultural Experiment Station and released to seed growers in 2010. Decade is a joint release with the North Dakota Agricultural Experiment Station. Decade was selected from a composite of three closely related F1 populations. Decade is a very high yielding (Table 1) winter hardy variety well adapted to western North Dakota and eastern Montana with medium to high test weight, early maturity, reduced height, and medium to high grain protein (Table 2). Decade has excellent milling and baking quality (Table 3). It is resistant to stem rust, but susceptible to stripe rust. Relative to CDC Falcon, Decade is equivalent in yield potential and winter survival, with improved test weight, earlier maturity, higher grain protein content, superior milling characteristics and higher water absorption. PVP, Title V is pending.

**Table 1. Yield of Decade, 2007-2010, compared to a set of recommended winter wheat varieties.**

Variety	Districts							All Locations
	1 Kalispell	2 Bozeman <sup>1/</sup>	3 Huntley <sup>2/</sup>	4 Moccasin <sup>3/</sup>	5 Conrad <sup>4/</sup>	5 Havre <sup>5/</sup>	6- Sidney & Williston	
location-years	4	7	20	13	6	9	6	65
<b>Yellowstone</b>	<b>126.3**</b>	<b>68.6**</b>	<b>74.6*</b>	<b>54.6**</b>	<b>68.7**</b>	<b>60.2*</b>	<b>50.7*</b>	<b>69.2**</b>
<b>Wahoo</b>	113.8	<b>64.2*</b>	<b>75.5**</b>	50.2	<b>66.6*</b>	<b>62.8**</b>	49.3	<b>67.4*</b>
<b>Decade</b>	112.5	61.4	<b>75.0*</b>	<b>52.8*</b>	<b>66.7*</b>	<b>60.2*</b>	<b>52.2*</b>	<b>67.3*</b>
<b>Jagalene</b>	<b>124.2*</b>	57.9	<b>73.7*</b>	51.6	61.9	<b>59.3*</b>	42.8	65.5
<b>CDC Falcon</b>	<b>118.4*</b>	59.5	68.9	48.9	<b>66.0*</b>	58.6	<b>54.0*</b>	64.6
<b>Pryor</b>	109.0	<b>63.4*</b>	70.9	51.3	<b>67.2*</b>	56.3	44.8	64.5
<b>Promontory</b>	<b>120.6*</b>	<b>63.9*</b>	69.3	50.4	58.9	57.2	42.6	63.8
<b>Norris (CL)</b>	109.1	58.2	<b>73.1*</b>	48.2	62.1	55.0	46.0	63.5
<b>Ledger</b>	116.4	60.3	70.7	46.9	61.9	57.2	40.3	62.8
<b>Neeley</b>	106.5	60.5	69.0	47.3	62.4	52.4	45.0	61.6
<b>Jerry<sup>6/</sup></b>	99.2	57.8		47.3	59.6	53.8	<b>55.5**</b>	
<b>LSD (0.05)</b>	<b>12.1</b>	<b>5.6</b>	<b>4.3</b>	<b>3.2</b>	<b>5.4</b>	<b>3.9</b>	<b>5.8</b>	<b>2.0</b>

\*\* = indicates highest value within a column

\* = indicates varieties with values equal to highest variety within a column based on Fisher's protected LSD (p=0.05)

1/ includes data from Dry Creek, Willow Creek

4/ includes data from The Knees, Shelby

2/ includes data from Forsyth, Hardin area, Lodge Grass, Molt, Rapelje

5/ includes data from North Havre, Loma

3/ includes data from Denton, Geraldine, Winifred

6/ Jerry not grown at Huntley (SARC) in 2008

**Table 2. Agronomic characteristics of Decade, 2007-2010, compared to a set of recommended winter**

**wheat varieties**

Variety	Test weight lb/bu	Winter survival %	Heading date		Plant height in	Lodging score 1/ (0-9)	Protein %	Sawfly cutting %	Stripe rust %	Coleoptile length in
			Julian	Calendar						
location-years	64	4	34		63	6	66	4	5	3
<b>CDC Falcon</b>	59.7	<b>50*</b>	165.9	15-June	30.1	1.7	12.1	21	9	2.8
<b>Decade</b>	60.6	<b>53*</b>	164.6	14-June	31.8	2.2	<b>12.4**</b>	18	16	3.0
<b>Jagalene</b>	<b>61.8**</b>	30	164.1	13-June	31.7	2.8	12.2	23	7	3.1
<b>Jerry<sup>2/</sup></b>		<b>57**</b>						34	11	3.1
<b>Ledger</b>	60.6	29	165.9	15-June	31.3	4.0	11.8	23	12	3.2
<b>Neeley</b>	59.8	44	168.2	17-June	35.3	4.8	11.9	23	25	3.4
<b>Norris (CL)</b>	61.2	36	163.3	12-June	34.9	3.3	12.1	23	18	3.4
<b>Promontory</b>	<b>61.6*</b>	30	166.0	15-June	33.4	3.2	11.5	39	1	2.6
<b>Pryor</b>	59.7	40	167.7	17-June	30.6	1.9	11.6	9	24	2.8
<b>Wahoo</b>	59.1	48	162.7	12-June	32.3	3.1	11.8	27	11	2.8
<b>Yellowstone</b>	59.8	45	167.5	16-June	33.7	3.0	11.9	22	1	2.6
<b>LSD (0.05)</b>	<b>0.3</b>	<b>9</b>	<b>0.5</b>		<b>0.5</b>	<b>1.7</b>	<b>0.2</b>	<b>13</b>	<b>16</b>	<b>0.2</b>

\*\* = indicates highest value within a column

<sup>1/</sup> 0 = best

\* = indicates varieties with values equal to highest variety within a column based on Fisher's protected LSD (p=0.05)

<sup>2/</sup> Jerry not grown at Huntley in 2008

**Table 3. Mill and bake characteristics of Decade, 2007-2009, compared to a set of recommended winter wheat varieties**

Variety	PPO <sup>1/</sup>	Kernel hardness	Flour yield %	Flour protein %	Flour Ash %	Mixograph mix time min	Mixograph absorption %	Baking mix time min	Baking absorption %	Loaf volume cc
<b>CDC Falcon</b>	0.991	66.8	66.1	11.2	0.43	4.9	61.2	8.8	71.2	<b>1083*</b>
<b>Decade</b>	0.980	73.3	68.7	<b>11.8**</b>	<b>0.40**</b>	7.6	<b>65.9**</b>	16.3	<b>76.4**</b>	<b>1095**</b>
<b>Jagalene</b>	0.999	75.5	70.9	11.5	0.41	4.5	62.2	6.2	72.3	<b>1066*</b>
<b>Ledger</b>	0.870	69.7	<b>72.0**</b>	11.0	<b>0.40**</b>	5.0	61.4	9.3	71.5	<b>1066*</b>
<b>Neeley</b>	0.746	73.5	66.7	11.2	0.42	4.9	61.3	6.8	71.4	1036
<b>Norris (CL)</b>	0.794	72.7	68.8	11.2	<b>0.40*</b>	4.9	61.6	7.7	72.3	1025
<b>Promontory</b>	0.280	76.5	70.4	10.7	0.41	4.9	60.8	6.3	70.6	1039
<b>Pryor</b>	0.876	75.4	69.1	10.8	<b>0.40*</b>	3.3	60.1	4.5	69.0	1018
<b>Wahoo</b>	0.892	71.8	67.8	11.1	0.41	4.6	61.2	6.3	70.9	994
<b>Yellowstone</b>	0.684	78.2	69.0	11.1	0.41	8.3	62.8	13.0	73.7	<b>1088*</b>
<b>LSD (0.05)</b>	<b>0.130</b>	<b>2.8</b>	<b>0.8</b>	<b>0.3</b>	<b>0.01</b>	<b>0.8</b>	<b>1.0</b>	<b>1.6</b>	<b>1.2</b>	<b>32</b>

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<sup>1/</sup> low is best for noodles