

# 'Flathead' Winter Wheat

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Flathead is a hard red winter wheat developed by the Montana Agricultural Experiment Station and available to certified seed growers in fall 2019. Flathead is derived from a composite of 2 crosses involving Yellowstone and a Washing State University line, PI 640431, that carries 2 stripe rust seedling resistance genes. Flathead is an early maturing (especially for a Montana line), hollow-stemmed, medium height wheat with white chaff (Table 2). Flathead has average yield, above average test weight, and average protein, with average winter survival. Flathead out-yields other early maturing varieties, such as Brawl CI Plus (Table 1). Flathead has excellent resistance to stripe rust and is moderately resistant to both stem rust and dwarf bunt. Flathead has medium PPO and above average milling and baking characteristics (Table 3). To be sold by variety name only as a class of certified seed. Montana State University Research Fees due on seed sold. PVP, Title V is pending.

**Table 1. Yield of Flathead vs. a set of varieties, 2017-2019<sup>(1/)</sup>**

Variety	District 1 Kalispell	District 2 Bozeman	District 3 Huntley <sup>2/</sup>	District 4 Moccasin <sup>3/</sup>	District 5 Conrad	District 5 Havre <sup>5/</sup>	District 6 Sidney / Williston	All Locations	Relative Maturity
location-years	2	3	12	10	10	10	5	52	
<b>Brawl CL Plus</b>	98.5	101.4	85.8	58.1	<b>63.7</b>	51.7	41.5	66.8	<b>V. Early</b>
<b>Flathead</b>	<b>121.6</b>	<b>128.0</b>	90.8	60.2	60.0	52.9	50.5	71.2	<b>Early</b>
<b>SY Monument</b>	102.6	<b>122.2</b>	92.6	<b>70.6</b>	<b>63.0</b>	56.7	52.9	74.0	<b>Medium</b>
<b>Decade</b>	81.7	99.8	91.7	<b>66.1</b>	59.9	55.2	57.0	70.4	<b>Medium</b>
<b>FourOsix</b>	<b>110.8</b>	<b>122.5</b>	88.0	64.2	<b>62.2</b>	54.8	55.4	71.8	<b>M-L</b>
<b>Keldin</b>	<b>118.4</b>	<b>131.7</b>	<b>103.7</b>	65.4	<b>67.5</b>	57.4	57.3	<b>78.2</b>	<b>M-L</b>
<b>LCS Jet</b>	<b>134.0</b>	<b>138.7</b>	<b>102.2</b>	<b>67.1</b>	<b>66.0</b>	52.7	48.3	<b>77.1</b>	<b>Late</b>
<b>Northern</b>	<b>108.7</b>	<b>127.8</b>	94.5	<b>67.2</b>	<b>66.0</b>	56.2	61.1	<b>75.7</b>	<b>Late</b>
<b>LSD (0.05)</b>	<b>27.1</b>	<b>24.6</b>	<b>7.1</b>	<b>4.7</b>	<b>5.0</b>	<b>ns</b>	<b>ns</b>	<b>3.4</b>	

- **bold underline** indicates highest value within a column
- **bold** indicates highest value within a column based on Fisher's Protected LSD ( $p = 0.05$ )
- 1/ indicates 2017-2019 Intrastate and 2018-2019 Off Station tests
- 2/ includes data from Billings, Fort Smith, Hardin area, Hysham, Molt, Rapelje
- 3/ includes data from Belt, Denton, Geraldine, Highwood, Winifred
- 5/ includes data from Choteau, Cut Bank, The Knees, Shelby
- 6/ includes data from Carter, Loma, Turner

**Table 2. Agronomic characteristics of Flathead vs. a set of varieties, 2017-2018<sup>(1/)</sup>**

Variety	Test Weight (lb/bu)	Winter Survival %	Heading date		Plant Height (in)	Lodging %	Protein %	Sawfly Cutting %	Stripe Rust %	Coleoptile Length (in)
			Julian	Calendar						
location-years	52	4	23		50	5	52	15	2	1
<b>Brawl CL Plus</b>	<b><u>62.4</u></b>	42	155.5	5-Jun	28.3	11	<b><u>13.4</u></b>	35	70	<b>3.5</b>
<b>Flathead</b>	61.6	<b>50</b>	157.7	7-Jun	29.6	11	12.7	50	<b>3</b>	2.6
<b>SY Monument</b>	60.4	<b>52</b>	159.8	9-Jun	28.5	7	12.0	51	<b>4</b>	3.1
<b>Decade</b>	60.9	<b><u>59</u></b>	160.6	10-Jun	31.0	8	13.0	39	74	2.9
<b>FourOsix</b>	61.0	<b>46</b>	161.4	10-Jun	29.2	6	12.6	58	<b>6</b>	2.8
<b>Keldin</b>	61.5	45	162.2	11-Jun	30.0	7	12.5	49	41	2.8
<b>LCS Jet</b>	58.6	19	162.5	12-Jun	26.9	4	12.3	51	<b><u>2</u></b>	<b><u>3.6</u></b>
<b>Northern</b>	61.0	45	164.0	13-Jun	30.1	11	12.8	49	<b>8</b>	2.6
<b>LSD (0.05)</b>	<b>0.3</b>	<b>13</b>	<b>0.6</b>		<b>0.5</b>	<b>ns</b>	<b>0.2</b>	<b>9</b>	<b>23</b>	<b>0.2</b>

- 1/ = 2017-2019 Intrastate and 2018-2019 Off Station tests
- **bold underline** indicates highest value within a column
- **bold** indicates highest value within a column based on Fisher's Protected LSD ( $p = 0.05$ )

**Table 3. Mill and bake characteristics of Flathead vs. a set of varieties 2017-2018: Intrastate Tests only**

Variety	PPO <sup>1/</sup>	Kernel Hardness	Flour			Mixograph			Baking		
			Yield %	Protein %	Ash %	Tolerance (1-6)	Mix Time (min)	Absorption %	Mix Time (min)	Absorption %	Volume (cc)
location-years	8	4	8	8	8	8	8	8	8	8	8
<b>FourOsix</b>	0.246	77.7	<b>72.4</b>	<b><u>12.3</u></b>	0.42	2.6	5.2	<b>67.8</b>	10.3	<b>77.8</b>	<b><u>1111</u></b>
<b>Northern</b>	<b><u>0.126</u></b>	85.6	70.4	<b>12.1</b>	0.45	2.8	3.4	64.9	4.6	74.3	1075
<b>Flathead</b>	0.247	74.2	<b><u>73.1</u></b>	<b>12.0</b>	0.41	<b><u>3.9</u></b>	9.1	<b>68.1</b>	17.1	<b>78.6</b>	1068
<b>Decade</b>	0.265	78.4	71.0	<b>12.1</b>	<b>0.40</b>	3.0	6.8	<b><u>69.0</u></b>	15.9	<b><u>79.2</u></b>	1066
<b>Brawl CL Plus</b>	0.275	75.5	70.8	<b>12.0</b>	<b>0.39</b>	2.9	4.0	65.5	6.4	75.4	1050
<b>SY Monument</b>	0.181	80.1	72.2	11.1	0.40	<b>3.5</b>	7.9	66.0	14.4	76.1	1018
<b>Keldin</b>	0.311	68.0	70.4	11.7	0.44	2.8	5.1	65.2	7.8	75.2	1014
<b>LCS Jet</b>	0.278	69.8	<b>72.5</b>	11.5	<b><u>0.39</u></b>	3.1	5.3	66.0	8.5	76.5	973
<b>LSD (0.05)</b>	<b>0.044</b>	<b>5.2</b>	<b>0.8</b>	<b>0.5</b>	<b>0.02</b>	<b>0.7</b>	<b>1.4</b>	<b>1.8</b>	<b>2.8</b>	<b>2.0</b>	<b>32</b>

- **bold underline** indicates highest value within a column
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- 1/ indicates low is best for noodles