

# 'SY Clearstone 2CL' Winter Wheat

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**SY Clearstone 2CL** is a 2-gene CLEARFIELD hard red winter wheat developed by Montana Agricultural Experiment Station in 2012 and licensed exclusively to Syngenta Seeds. SY Clearstone 2CL wheat is very similar to Yellowstone. It is a medium maturing, medium tall, white chaffed wheat with average winter hardiness. It is a high yielding wheat (Tables 1,2) with average test weight and protein (Table 3). SY Clearstone 2CL is resistant to stripe rust and has moderate resistance to stem rust, the latter an improvement over Yellowstone. SY Clearstone 2CL is a medium PPO variety with average mill and above average bake properties (Table 4). PVP, Title V has been issued (Certificate# 201300357). Additionally, the CLEARFIELD genes are patented.

**Table 1. Yield of SY Clearstone 2CL vs. a set of recommended varieties, 2012-2016<sup>1/</sup>**

Variety	Districts							All Locations
	1 Kalispell	2 Bozeman <sup>2/</sup>	3 Huntley <sup>3/</sup>	4 Moccasin <sup>4/</sup>	5 Conrad <sup>5/</sup>	5 Havre <sup>6/</sup>	6- Sidney & Williston	
location-years	5	7	31	26	21	15	7	112
<b>Yellowstone</b>	<b>116.9</b>	<b>76.3</b>	<b>67.0</b>	<b>57.1</b>	<b>75.2</b>	<b>59.0</b>	59.2	<b>67.5</b>
<b>Colter</b>	<b>134.2</b>	<b>72.1</b>	<b>66.9</b>	<b>55.2</b>	<b>72.2</b>	<b>56.3</b>	58.1	<b>66.5</b>
<b>SY Clearstone 2CL</b>	<b>117.9</b>	<b>77.7</b>	<b>65.8</b>	<b>56.0</b>	<b>72.9</b>	<b>57.6</b>	51.2	<b>65.9</b>
<b>CDC Falcon</b>	74.6	59.1	63.2	53.0	69.0	54.8	55.6	60.6
<b>Decade</b>	50.5	62.0	<b>63.7</b>	53.6	70.4	52.8	51.3	59.7
<b>Jerry</b>	51.4	58.0	57.5	49.6	62.9	46.9	55.8	54.9
<b>LSD (0.05)</b>	<b>19.3</b>	<b>11.2</b>	<b>3.4</b>	<b>2.5</b>	<b>3.3</b>	<b>3.6</b>	ns	<b>2.5</b>

**bold** = indicates highest value within a column

ns = non-significant

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

1/ = 2012-2016 Intrastate and Off Station tests

2/ includes data from Dry Creek, Willow Creek

3/ includes data from Forsyth, Fort Smith, Hardin area, Hysham, Lodge Grass, Molt, Rapelje

4/ includes data from Belt, Denton, Geraldine, Highwood, Winifred

5/ includes data from Choteau, The Knees, Shelby

6/ includes data from Ft. Benton, Loma, Turner

**Table 2. Yield of SY Clearstone 2CL vs. a set of CLEARFIELD varieties: 2015-2016 Intrastate Test**

Variety	Districts							All Locations
	1 Kalispell	2 Bozeman	3 Huntley <sup>7/</sup>	4 Moccasin	5 Conrad	5 Havre <sup>8/</sup>	6- Sidney & Williston	
location-years	2	2	1	2	2	3	3	14
<b>SY Clearstone 2CL</b>	124.6	86.4	<b>112.5</b>	<b>61.3</b>	90.4	76.1	53.6	<b>81.8</b>
<b>WB4623CLP</b>	130.5	85.6	<b>102.5</b>	51.2	81.9	65.7	43.1	<b>75.1</b>
<b>Brawl CL Plus</b>	72.5	76.3	<b>108.8</b>	54.6	89.5	72.1	50.0	<b>70.7</b>
<b>WB4059CLP</b>	48.1	54.5	96.6	55.4	77.1	62.4	48.7	60.0
<b>LSD (0.05)</b>	ns	ns	<b>7.8</b>	<b>5.7</b>	ns	ns	ns	<b>11.7</b>

7/ = not planted in 2015

8/ = includes Ft. Benton data

**Table 3. Agronomic characteristics of SY Clearstone 2CL vs. a set of recommended varieties, 2012-2016<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	112	5	47		111	19	109	12	8	2
<b>CDC Falcon</b>	58.7	<b>62</b>	160.2	9-Jun	29.9	18	12.9	23	53	2.9
<b>Colter</b>	<b>59.3</b>	<b>57</b>	162.3	11-Jun	33.1	14	<b>13.1</b>	31	<b>22</b>	2.9
<b>Decade</b>	58.9	<b>59</b>	159.5	9-Jun	31.5	20	<b>13.1</b>	20	71	3.2
<b>Jerry</b>	58.1	<b>66</b>	161.4	10-Jun	35.3	27	<b>13.1</b>	29	76	3.2
<b>SY Clearstone 2CL</b>	58.5	44	161.5	11-Jun	33.9	20	12.8	25	<b>34</b>	3.0
<b>Yellowstone</b>	<b>58.9</b>	54	161.6	11-Jun	33.3	18	12.8	24	<b>33</b>	2.7
<b>LSD (0.05)</b>	<b>0.4</b>	<b>12</b>	<b>0.4</b>		<b>0.4</b>	<b>ns</b>	<b>0.2</b>	<b>6</b>	<b>13</b>	<b>0.2</b>

<sup>1/</sup> = 2012-2016 Intrastate and Off Station tests

ns = non-significant

**bold** = indicates highest value within a column

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

**Table 4. Mill and bake characteristics of SY Clearstone 2CL vs. a set of recommended varieties, 2012-2015**

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	16	16	16	16	16	16	16	16	16	16	16
<b>Colter</b>	0.280	81.4	<b>68.4</b>	<b>11.6</b>	<b>0.42</b>	<b>5.0</b>	9.1	<b>64.2</b>	18.1	<b>75.6</b>	1049
<b>Decade</b>	0.300	77.2	<b>68.2</b>	<b>11.9</b>	<b>0.42</b>	<b>4.8</b>	8.3	<b>65.0</b>	19.0	<b>75.6</b>	1073
<b>SY Clearstone 2CL</b>	0.310	80.3	67.5	11.3	0.44	4.1	6.3	61.7	9.8	72.0	1057
<b>Yellowstone</b>	<b>0.214</b>	81.6	<b>68.9</b>	11.5	0.43	<b>4.7</b>	8.4	63.7	15.6	74.5	1068
<b>LSD (0.05)</b>	<b>0.035</b>	<b>2.2</b>	<b>0.7</b>	<b>0.3</b>	<b>0.01</b>	<b>0.4</b>	<b>1.1</b>	<b>1.0</b>	<b>2.2</b>	<b>1.0</b>	<b>ns</b>

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ns = non-significant

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

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