

# 2015 Montana Barley Crop Quality Report

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This is the sixth annual Regional Crop Quality Report for barley grown in Montana. Collection of barley samples was coordinated by the U.S. Department of Agriculture (USDA) National Agriculture Statistics Services in Montana and North Dakota. Grain quality evaluations were performed by the Department of Plant Sciences at North Dakota State University and grade information was determined by the North Dakota Grain Inspection Service Inc. The Montana Wheat and Barley Committee provided financial support.

## Production and Varieties

According to the USDA National Agricultural Statistics Service (NASS)

Small Grains Summary of September 30th, 850 thousand acres were harvested in Montana. This is a 10 percent increase from the previous year.

The 2015 average yield of 52 bu/acre (2.8 kg/ha) is 6 bu/acre (0.3 kg/ha) below what was observed in 2014. Increased acreage combined with decreased yield resulted in a one percent reduction in production at 44.2 million bushels (962 thousand metric tons).

Well over two-thirds of barley acreage in Montana was planted to malting varieties. For several years the top three malting varieties have been the two -rowed varieties AC Metcalfe, Hockett and Moravian 115. Seventy-one percent of the barley samples collected in 2015

were of these varieties. Eleven percent of the barley samples collected were of the six-rowed malting barley variety Tradition.

## Materials and Methods

The Montana barley crop survey region consists of six districts within the state (Table 1). The objective of the crop quality survey was to collect a representative number of samples from each county and district within the survey region. The number of barley samples was determined by previous and projected barley production in the counties and districts of the survey region.

During harvest a total of 72 samples weighing between 1 and 2 pounds were collected from farms and

## Montana Two-Rowed Malting Barley Quality Snapshot

- > A total of seventy-two barley samples (63 two-rowed malting barley) from 15 counties in Montana were collected at harvest
- > Acreage was up, yield was down from the previous year
- > State averages for protein, test weight and kernel assortment were good
- > Average protein levels ranged 10.2% in the south to 12.1% in the northwest
- > District average test weight ranged from 50.0 lb/bu in the northwest to 45.7 lb/bu in central Montana
- > The average grade for the crop was U.S. No. 1 Two-Rowed Malting

Table 1. 2015 Barley Survey Districts in Montana

District	Barley Varieties Collected, Mode of Farming	Counties
Northwest	Two-rowed malting, dryland	Glacier, Toole, Pondera
West	Two-rowed malting, dryland and irrigated	Lewis & Clark, Cascade, Teton
Central	Two-rowed malting, dryland and irrigated	Judith Basin, Fergus
Northeast	Two-rowed and Six-rowed malting, irrigated	Roosevelt, Sheridan
East	Two-rowed and Six-rowed malting, irrigated	Dawson, Richland
South	Two-rowed malting, dryland and irrigated	Yellowstone, Treasure, Big Horn

**Table 2. Montana State and District Two-Rowed Barley Crop Quality**

State and District	Samples	Moisture Content (%)	Test Weight		1000 Kernel Weight (g)	Protein Content (%)	Color	Kernel Assortment	
			(lb/bu)	(kg/hl)				% Plump	% Thin
Northwest	26	11.1	50.0	64.4	45.9	12.1	2	90.8	1.3
West	16	10.1	49.3	63.5	43.6	11.5	2	86.3	1.9
Central	6	10.2	45.7	58.8	36.4	11.0	1	75.0	2.1
Northeast	3	11.4	48.6	62.6	47.8	10.8	3	93.0	0.9
East	2	12.4	49.8	64.1	45.2	10.7	4	93.6	1.0
South	10	9.4	47.1	60.6	39.0	10.2	4	90.2	1.2
<b>State</b>	<b>63</b>	<b>10.6</b>	<b>48.9</b>	<b>62.9</b>	<b>43.4</b>	<b>11.4</b>	<b>2</b>	<b>88.3</b>	<b>1.5</b>

**Table 3. Montana State and District Six-Rowed Barley Crop Quality**

State and District	Samples	Moisture Content (%)	Test Weight		1000 Kernel Weight (g)	Protein Content (%)	Color	Kernel Assortment	
			(lb/bu)	(kg/hl)				% Plump	% Thin
Northeast	3	12.5	48.6	62.6	36.9	12.7	4	86.8	0.8
East	6	10.4	49.2	63.3	40.3	12.2	3	92.2	1.0
<b>State</b>	<b>9</b>	<b>11.1</b>	<b>49.0</b>	<b>63.1</b>	<b>39.2</b>	<b>12.3</b>	<b>4</b>	<b>90.4</b>	<b>0.9</b>

**Table 4. Montana Barley Grade**

District	Dockage	Grade*	Test Weight		Suitable Malting Types (%)	Sound Barley** (%)	Skinned and Broken Kernels (%)	Thin Barley (%)
			(lb/bu)	(kg/hl)				
Northwest	0.4	U.S. No. 1 Two-Rowed Malting Barley	50.2	64.6	100.0	100.0	0.7	0.6
West	0.3	U.S. No. 1 Two-Rowed Malting Barley	50.0	64.4	100.0	100.0	0.3	1.0
Central	0.4	U.S. No. 2 Two-Rowed Barley	45.7	58.8	100.0	100.0	0.3	1.3
Northeast	0.2	U.S. No. 2 Two-Rowed Malting Barley	48.8	62.8	100.0	99.8	0.2	0.4
East	0.1	U.S. No. 1 Two-Rowed Malting Barley	50.0	64.4	100.0	99.8	0.3	0.6
South	0.2	U.S. No. 1 Two-Rowed Barley	47.6	61.3	100.0	100.0	0.6	0.6
Northeast (Six-rowed)	0.3	U.S. No. 1 Six-Rowed Malting Barley	48.8	62.8	100.0	99.0	0.2	0.4
East (Six-rowed)	0.3	U.S. No. 1 Six-Rowed Malting Barley	50.0	64.4	100.0	99.0	0.0	0.5

\*Grade specifications provided in United States of Agriculture Grain Inspection, Packers and Stockyard Administration Federal Grain Inspection Service Grain Inspection Handbook, Book II, Barley, July 30, 2013.

\*\*Injured-by-frost kernels and injured-by-mold kernels are not considered damaged or considered against sound barley.

grain elevators in selected counties in Montana. Two- and six-rowed samples were differentiated by varietal identification by the grower or kernel morphology.

Two-rowed barley was found in all of the Montana crop survey districts and sixty-three samples were collected. Nine six-rowed barley samples were collected in the northeastern and eastern districts of Montana.

Upon receipt, the initial barley moisture content was recorded and samples in excess of 13.5 percent were allowed to air-dry prior to subsequent analyses. A portion of each sample was removed and bulked to create regional composite samples. Prior to further analysis, all samples collected were cleaned on a Carter dockage tester. Dockage content was determined on each district composite sample.

Test weight, protein, kernel assortment, 1,000 kernel weight, and kernel color were determined on each of the dockage free samples. Percent total protein, reported on a dry-matter basis, was determined by near infrared transmittance on a Foss Infratec 1241 grain analyzer. Color (brightness) was determined with a HunterLab ColorFlex Model CFLX-45 spectrophotometer. Color is ranked on a scale of 1 to 10, with 1 being bright barley.

Scores of 3 and higher indicate progressively darker, more weathered, grain.

The values for state and district averages represent the average of all individual sample results for the respective quality parameters. State and district averages were calculated for both two- and six-rowed barley. The district composite samples were submitted to the North Dakota Grain Inspection Service Inc. for determination of grade.

### **Quality of Two-Rowed Malting Barley Varieties**

State and district averages of individual two-rowed malting barley samples are presented in Table 2. The state two-rowed barley average test weight was 48.9 lb/bu (62.9 kg/hl), protein was 11.4 percent and kernel assortment was 88.3 percent plump.

#### **Northwest District**

The northwestern district displayed the highest district average test weight at 50.0 lb/bu (64.4 kg/hl) and the highest average protein at 12.1 percent. Average kernel assortment was 90.8 percent plump.

#### **West District**

The western district average test weight was 49.3 lb/bu (63.5 kg/hl), protein was 11.5

percent and kernel plumpness was 86.3 percent.

#### **Central District**

The Central district displayed the lowest averages for test weight, one thousand kernel weight and kernel plumpness. The average test weight was 45.7 lb/bu (58.8 kg/hl). Average one thousand kernel weight was 36.4 grams and kernel assortment was 75.0 percent plump. The central district average protein was 11.0 percent.

#### **Northeast District**

The northeastern district had the highest average one thousand kernel weight at 47.8 grams. The district average test weight was 48.6 lb/bu (62.6 kg/hl), protein was 10.8 percent and kernel plumpness was 93.0 percent.

#### **East District**

The Eastern district average test weight was 49.8 lb/bu (64.1 kg/hl) and protein was 10.7 percent. The district observed the highest kernel assortment at 93.6 percent plump.

#### **South District**

The southern district average test weight was 47.1 lb/bu (60.6 kg/hl). The district observed the lowest average for protein at 10.2 percent and an average kernel plumpness at 90.2 percent plump.

### **Quality of Six-Rowed Malting Barley Varieties**

State and district averages of the six-rowed malting barley samples are presented in Table 3. The state six-rowed barley average test weight was 49.0 lb/bu (63.1 kg/hl), protein was 12.3 percent and kernel assortment was 90.4 percent plump.

#### **Barley Grades**

Three of the two-rowed barley district composite samples received grades of U.S. No. 1 Two-Rowed Malting Barley (Table 4). These districts were the northwest, west and east. As a result of composite sample test weight less than 50 lb/bu (64.4 kg/hl) the northeast district received the grade of U.S. No. 2 Two-Rowed Malting Barley. With test weight below 48 lbs/bu (61.8 kg/hl) the south district received a grade of U.S. No. 1 Two-Rowed Barley. Due to a composite sample test of 45.7 lb/bu (58.8 kg/hl) the central district received the grade of U.S. No. 2 Two-Rowed Barley.

Composite samples were created for six-rowed barley in the northeastern and eastern districts. Both districts received the grade of U.S. No. 1 Six-Rowed Malting Barley.

#### **References**

Small Grains 2015 Summary (September 2015)  
USDA, National Agricultural Statistics Service

*United States of Agriculture Grain Inspection, Packers and Stockyard Administration Federal Grain Inspection Service Grain Inspection Handbook, Book II, Barley, July 30, 2013*