

# 2016 Montana Barley Crop Quality Report

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This is the seventh 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, as of September 30th, 990 thousand acres of barley were planted in Montana. Of these barley acres, 780 thousand acres were harvested. This is a nine percent reduction in harvested acreage from the previous year. The USDA reported an average yield of 60 bu/acre (3.2 mt/ha) an increase of 8 bu/acre (0.4 mt/ha) over the yield of 52 bu/acre (2.8 mt/ha) observed in 2015. Even though acreage was lower in 2016 when compared to 2015 the increased yield resulted in 2 million additional bushels. The state barley production was estimated by the USDA to be 46.8 million bushels (1,019 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-five percent of the barley samples collected in 2016 were of these varieties. No six-rowed barley varieties were collected in the 2016 quality survey.

## 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 collected was determined by previous

## Montana Two-Rowed Malting Barley Quality Snapshot

- > A total of seventy-five two-rowed malting barley samples from 16 counties in Montana were collected at harvest
- > Yield and production was up, harvested acreage was down from the previous year
- > Average protein levels ranged from 10.1% in the south to 11.4% in the northwest
- > District average test weight ranged from 48.0 lb/bu in central Montana to 50.9 lb/bu in the east
- > The average grade for the crop was U.S. No. 1 Two-Rowed Malting

Table 1. 2016 Barley Survey Districts in Montana

District	Barley Varieties Collected, Mode of Farming	Counties
Northwest	Two-rowed malting, dryland	Glacier, Pondera, Toole
West	Two-rowed malting, dryland and irrigated	Cascade, Lewis & Clark, Teton
Central	Two-rowed malting, dryland and irrigated	Chouteau, Fergus, Judith Basin
Northeast	Two-rowed malting, irrigated	Daniels, Roosevelt
East	Two-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	28	11.9	50.2	64.6	45.5	11.4	4	92.5	0.8
West	17	11.5	50.0	64.4	47.1	10.9	2	94.3	0.6
Central	8	11.1	48.0	61.8	41.5	11.3	2	87.6	0.9
Northeast	4	11.5	50.8	65.4	49.8	11.3	6	96.2	0.6
East	8	12.2	50.9	65.5	48.5	11.2	4	87.2	2.6
South	10	10.0	48.5	62.4	40.9	10.1	3	91.8	1.1
<b>State</b>	<b>75</b>	<b>11.5</b>	<b>49.8</b>	<b>64.1</b>	<b>45.4</b>	<b>11.1</b>	<b>3</b>	<b>91.9</b>	<b>1.0</b>

**Table 3. Montana Sample Collection by Two-Rowed Barley Variety**

State	AC Metcalfe	Moravian 115	Hockett	ABI Voyager	Merit 57	Other or Unidentified
Number of Samples Collected	34	13	10	5	4	9
Percentage of Samples Collected	45%	17%	13%	7%	5%	12%

**Table 4. Montana Barley Grades**

District	Dockage	Grade*	Test Weight		Suitable Malting Types (%)	Sound Barley** (%)	Skinned and Broken Kernels (%)	Thin Barley (%)
			(lb/bu)	(kg/hl)				
Northwest	0.7	U.S. No. 1 Two-Rowed Malting Barley	50.6	65.1	100.0	100.0	1.0	0.1
West	0.6	U.S. No. 1 Two-Rowed Malting Barley	51.1	65.8	100.0	100.0	1.6	0.1
Central	1.3	U.S. No. 2 Two-Rowed Malting Barley	48.2	62.0	100.0	100.0	1.2	0.3
Northeast	0.7	U.S. No. 1 Two-Rowed Malting Barley	51.1	65.8	100.0	99.8	1.5	0.3
East	1.1	U.S. No. 1 Two-Rowed Malting Barley	51.2	65.9	100.0	99.8	1.4	1.5
South	1.5	U.S. No. 2 Two-Rowed Malting Barley	48.5	62.4	100.0	100.0	1.6	0.6

\*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.

and projected barley production in the counties and districts of the survey region.

During harvest a total of 75 samples weighing between 1 and 2 pounds were collected from farms and grain elevators in selected counties in Montana. The two-rowed barley samples were identified by the grower. Two-rowed barley was collected in all of the Montana crop survey districts.

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. 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 average moisture for the 75 samples analyzed was 11.5 percent. The state two-rowed barley average test weight was 49.8 lb/bu (64.1 kg/hl). The average one thousand kernel weight was 45.4 grams. Protein was reported at 11.1 percent and kernel color scored a brightness value of three, indicating barley relatively undamaged by the weather. The average kernel assortment was 91.9 percent plump with only 1.0 percent thin kernels.

### **Northwest District**

The northwestern district displayed the highest district average test weight at 50.2 lb/bu (64.6 kg/hl) and the highest average protein at

11.4 percent. The average kernel assortment was 92.5 percent plump.

### **West District**

The western district average test weight was 50.0 lb/bu (64.4 kg/hl) and average one thousand kernel weight was 47.1 grams. District averages for protein was 10.9 percent and kernel plumpness was 94.3 percent plump. Barley in this district was bright yielding an average kernel color score of two.

### **Central District**

The Central district displayed the lowest average test weight at 48.0 lb/bu (61.8 kg/hl). Average one thousand kernel weight was 41.5 grams and kernel assortment was 87.6 percent plump. The central district average protein was 11.3 percent. Similar to the western district, an average color score of two was observed in the central district.

### **Northeast District**

The northeastern district had the highest average one thousand kernel weight at 49.8 grams. The district average test weight was 50.8 lb/bu (65.4 kg/hl) and protein was 11.3 percent. The district had the highest average kernel plumpness at 96.2 percent.

### **East District**

The Eastern district average

test weight of 50.9 lb/bu (65.5 kg/hl) was the state's highest. One thousand kernel weight was 48.5 grams and protein was 11.2 percent. The district observed the lowest average kernel assortment at 87.2 percent plump.

### **South District**

The southern district average test weight was 48.5 lb/bu (62.4 kg/hl). The district observed the lowest average one thousand kernel weight at 40.9 grams and the lowest average protein at 10.1 percent. The district observed an average kernel plumpness of 91.8 percent plump.

### **Barley Grades**

Composite samples from all six of the Montana barley districts were inspected for an official grade. Four 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, northeast and east. As a result of composite sample test weight less than 50 lb/bu (64.4 kg/hl) the central and south districts received the grade of U.S. No. 2 Two-Rowed Malting Barley.

### **References**

Small Grains 2016 Summary (September 2016)  
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*