

2019 Montana Barley Crop Quality Report

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This is the tenth annual 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 (NASS) 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

According to the USDA – NASS September 2019 Small Grains Summary,

920 thousand acres of barley were planted in Montana. Of these barley acres, 765 thousand acres were harvested. This is a twenty-eight percent increase from the 600 thousand acres harvested in 2018.

The USDA reported an average yield of 58 bushels per acre (bu/acre) (3.1 metric tons per hectares (mt/ha)) an increase of 2 bu/acre (0.1 mt/ha) over the previous average yield of 56 bu/acre (3.0 mt/ha) observed in 2018.

The increase in acreage and yield resulted in a seventeen percent rise in production from the previous year. The 2019 barley production was estimated by the USDA to be 44.4 million bushels (966 thousand metric tons).

Materials and Methods

The 2019 Montana barley crop survey region consists of four districts within the state (Table 1). The objective of the crop quality survey was to collect a representative number of samples from each district within the survey region. The number of barley samples collected was determined by previous and projected barley production in the counties and districts of the survey region.

During harvest, a total of 65 two-rowed barley samples weighing between 1 and 2 pounds were collected from farms and grain elevators in selected counties in Montana. The variety of individual barley samples was provided by the grower.

Montana Two-Rowed Malting Barley Quality Snapshot

- > A total of sixty-five two-rowed malting barley samples from 12 counties in Montana were collected at harvest
- > Harvested acreage, yield and production were up from the previous year
- > Average protein levels ranged from 10.5% in western to 11.7% in northwestern Montana
- > District average test weight ranged from 48.1 lb/bu in northwestern Montana to 49.6 lb/bu in southern Montana
- > District composite samples received the grade of U.S. No. 2 Two-Rowed Malting Barley or better

Table 1. 2019 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
South	Two-rowed malting, dryland and irrigated	Yellowstone, Treasure, Big Horn

Table 2. Montana Sample Collection by Two-Rowed Barley Variety

State	AC Metcalfe	BC 100	Hockett	ABI Voyager	Merit 57	Other or Unidentified
Number of Samples Collected	28	11	10	4	3	9
Percentage of Samples Collected	43%	17%	15%	6%	5%	14%

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

State and District	Number of Samples	Moisture Content (%)	Test Weight		1000 Kernel Weight (g)	Protein Content (%)	Color*	Kernel Assortment	
			(lb/bu)	(kg/hl)				% Plump	% Thin
Northwest	28	12.3	48.1	61.9	42.1	11.7	2	80.8	2.8
West	17	11.6	48.7	62.7	44.9	10.5	3	87.2	2.0
Central	10	12.6	48.6	62.6	40.5	10.7	2	82.1	2.3
South	10	10.7	49.6	63.8	44.5	10.7	5	91.0	1.3
State	65	11.9	48.6	62.6	42.9	11.1	3	84.3	2.3

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	0.1	U.S. No. 2 Two-Rowed Malting Barley	48.8	62.8	100.0	100.0	0.6	1.2
West	0.4	U.S. No. 2 Two-Rowed Malting Barley	49.5	63.7	100.0	100.0	0.4	1.1
Central	0.2	U.S. No. 2 Two-Rowed Malting Barley	48.4	62.3	100.0	100.0	0.5	0.8
South	0.1	U.S. No. 1 Two-Rowed Malting Barley	50.1	64.5	100.0	100.0	0.4	0.6

*Color is based on a scale of 1 to 10, with a lower score indicating brighter barley.

**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.

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. All samples collected were cleaned on a Carter dockage tester prior to further analysis. Dockage content was determined for each district composite sample.

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

Varieties

The majority of barley acreage in Montana was planted to malting varieties. Recently, AC Metcalfe, BC 100, Moravian 165 and Hockett have been the among the most commonly planted two-rowed malting varieties in Montana. The most collected barley variety in 2019 was AC Metcalfe, it comprised forty-three percent of the barley samples (Table 2). BC 100 was the next most collected variety at seventeen percent, followed by Hockett at fifteen percent.

Quality of Two-Rowed Malting Barley Varieties

State and district averages of individual two-rowed malting barley samples are presented in Table 3. The average moisture for the 65 two-rowed barley samples was 11.9 percent. The average two-rowed barley test weight was 48.6 lb/bu (62.6 kg/hl) and average one thousand kernel weight was 42.9 grams. Barley protein content was 11.1 percent and a kernel color score of 3 was observed. The average kernel assortment was 84.3 percent plump with 2.3 percent thin kernels.

Northwest District

The northwestern district had the lowest average test weight at 48.1 lb/bu (61.9 kg/hl). The average one thousand kernel weight was 42.1 grams. The average protein content was the highest observed at 11.7 percent and an average kernel color score of 2 was observed. This district had the lowest average kernel plumpness at 80.8 percent with 2.8 percent thin kernels.

West District

The western district average test weight was 48.7 lb/bu (62.7 kg/hl) and average one thousand kernel weight was 44.9 grams. This district had the lowest barley protein content at 10.5 percent. A kernel color score of 3 was observed. The average kernel assortment was 87.2 percent plump with 2.0 percent thin kernels.

Central District

The central district average test weight was 48.6 lb/bu (62.6 kg/hl). This district had the lowest average one thousand kernel weight at 40.5 grams. Barley protein content was 10.7 percent and a kernel color score of 2 was observed. The average kernel assortment was 82.1 percent plump with 2.3 percent thin kernels.

South District

The southern district average test weight of 49.6 lb/bu (63.8 kg/hl) was the highest observed. The district had the highest average one thousand kernel weight at 44.5 grams. Barley protein content was 10.7 percent and a kernel color score of 5 was observed. This district had the highest average kernel plumpness at 91.0 percent plump with 1.3 percent thin kernels.

Barley Grades

Montana district composite samples were inspected for an official grade (Table 4). The two-rowed barley southern district received the grade U.S. No. 1 Two-Rowed Malting Barley. As a result of test weight below 50 lb/bu (64.4 kg/hl) the two-rowed barley northwestern, western and central districts received the grade U.S. No. 2 Two-Rowed Malting Barley.

References

Small Grains 2019 Summary (September 2019)
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