

2020 Montana Barley Crop Quality Report

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This is the eleventh 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 2020 Small Grains Summary,

890 thousand acres of barley were planted in Montana. Of these barley acres, 725 thousand acres were harvested. This is down five percent from the 760 thousand acres harvested in 2019.

The USDA reported an average yield of 63 bushels per acre (bu/acre) (3.4 metric tons per hectares (mt/ha)). This was an increase of 4 bu/acre (0.2 mt/ha) over the 2019 average yield of 59 bu/acre (3.2 mt/ha).

Even with acreage down, increased yield resulted in a seventeen percent rise in production from the previous year. The 2020 barley production was estimated by the USDA to be 45.7 million bushels (994 thousand metric tons).

Materials and Methods

The 2020 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 of each district.

During harvest, a total of 73 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 seventy-three two-rowed malting barley samples from 13 counties in Montana were collected at harvest
- > Harvested acreage was down, yield and production were up from the previous year
- > District average protein levels ranged from 10.2% in western and southern Montana to 10.6% in northwestern Montana
- > District average test weight ranged from 50.5 lb/bu in northwestern Montana to 52.5 lb/bu in western Montana
- > All district composite samples received the grade of U.S. No. 1 Two-Rowed Malting Barley

Table 1. 2020 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 and Clark, Teton
Central	Two-rowed malting, dryland and irrigated	Chouteau, Fergus, Judith Basin
South	Two-rowed malting, dryland and irrigated	Big Horn, Gallatin, Treasure, Yellowstone

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

State	AC Metcalfe	Bill Coors 100	Hockett	ABI Voyager	Moravian 165	Other or Unidentified
Number of Samples Collected	33	13	13	5	3	6
Percentage of Samples Collected	45%	18%	18%	7%	4%	8%

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	10.6	50.5	65.0	44.1	10.6	2	83.1	1.7
West	17	10.5	52.5	67.6	48.6	10.2	2	94.3	0.8
Central	15	10.3	50.4	64.9	42.3	10.4	1	81.4	2.0
South	13	11.1	51.6	66.4	47.6	10.2	3	91.3	1.2
State	73	10.6	51.1	65.8	45.4	10.4	2	86.8	1.4

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	0.4	U.S. No. 1 Two-Rowed Malting Barley	50.5	65.0	99.7	100.0	0.1	0.7
West	0.3	U.S. No. 1 Two-Rowed Malting Barley	52.2	67.2	99.4	99.9	0.2	0.4
Central	0.4	U.S. No. 1 Two-Rowed Malting Barley	50.8	65.4	99.8	100.0	0.3	0.8
South	0.3	U.S. No. 1 Two-Rowed Malting Barley	52.5	67.6	99.5	100.0	0.1	0.5

*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 Infracore 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. AC Metcalfe, Bill Coors 100, Hockett and Moravian 165 have been the among the most commonly planted two-rowed malting varieties in Montana. The most collected barley variety in 2020 was AC Metcalfe. It comprised forty-five percent of the samples (Table 2). Bill Coors 100 and Hockett were the next most collected varieties, both at eighteen percent. They were followed by ABI Voyager at seven 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 of the 73 two-rowed barley samples was 10.6 percent. The average two-rowed barley test weight was 51.1 lb/bu (65.8 kg/hl) and average one thousand kernel weight was 45.4 grams. Barley protein content was 10.4 percent and a kernel color score of 2 was observed. The average kernel assortment was 86.8 percent plump with 1.4 percent thin kernels.

Northwest District

The northwest district average test weight was 50.5 lb/bu (65.0 kg/hl). The average one thousand kernel weight was 44.1 grams. The average protein content of the northwest district samples was the highest observed at 10.6 percent. The district had an average kernel color score of 2. The average kernel plumpness was 83.1 percent with 1.7 percent thin kernels.

West District

The west district average test weight of 52.5 lb/bu (67.6 kg/hl) was the highest observed. The district had the highest average one thousand kernel weight at 48.6 grams. This district and the south district had the lowest average barley protein content at 10.2 percent. A kernel color score of 2 was observed. The west district had the highest average kernel plumpness at 94.3 percent with 0.8 percent thin kernels.

Central District

The central district had the lowest average test weight at 50.4 lb/bu (64.9 kg/hl) and the lowest average one thousand kernel weight at 42.3 grams. Barley protein content was 10.4 percent and the brightest average kernel color score of 1 was observed. This district

had the lowest average kernel plumpness at 81.4 percent with 2.0 percent thin kernels.

South District

The southern district average test weight was 51.6 lb/bu (66.4 kg/hl). The average one thousand kernel weight was 47.6 grams. This district and the western district had the lowest average barley protein content at 10.2 percent. A kernel color score of 3 was observed. The average kernel plumpness was 91.3 percent plump with 1.2 percent thin kernels.

Barley Grades

Montana district composite samples were inspected for an official grade (Table 4). All two-rowed barley districts received the grade U.S. No. 1 Two-Rowed Malting Barley. Very low values for skinned and broken kernels were observed in all composite samples. Each district composite sample had test weight above 50 lb/bu (64.4 kg/hl). The southern district composite sample had the highest test weight at 52.5 lb/bu (67.6 kg/hl).

References

Small Grains 2020 Summary (September 2020)
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