Montana Wheat & Barley Survey Results Summary

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Montana Wheat & Barley Survey Results Summary

The following tables summarize survey responses from the 2019 Montana Wheat and Barley Survey. This survey was administered by Anton Bekkerman, Kate Fuller and the Montana State University HELPS Lab with funding from the Montana Wheat and Barley Committee. Contacts were acquired from a Freedom of Information Act request submitted by the PIs.

We mailed a total of 4,200 surveys, targeted proportionately to the total wheat and barley acres planted in each Montana county over the past five years. We received a total of 501 completed surveys; a response rate of 11.9%. After our initial round was of 3,000 surveys were sent June 10, 2019, we sent a follow-up round of 1,200 surveys on August 26.

Any questions can be addressed to Anton Bekkerman (anton.bekkerman@montana.edu) or Kate Fuller (kate.fuller@montana.edu).

Table 1.

Winter Wheat		Spring Wheat		Durum Wheat		Barley	
Warhorse	28.0%	Vida	23.8%	Alzada	22.8%	Metcalfe	21.3%
Brawl CL Plus	13.2%	SY Soren	11.5%	Joppa	20.5%	Hockett	19.1%
Yellowstone	13%	Reeder	10.4%	Mountrail	19.4%	Bill Coors 100	11.3%
Keldin	9.2%	SY Ingmar	9.6%	Divide	16.7%	Haxby	8.5%
Judee	8.1%	Corbin	6.8%	Tioga	4.8%	Lavina	7.0%
Loma	3.6%	WB Gunnison	5.5%	Carpio	1.0%	Merit 57	4.8%
SY Monument	3.4%	Duclair	5.1%	Kyle	0.8%	Haybet	4.2%
Decade	3.4%	Brennan	3.9%	Other	17.5%	Other	23.8%
SY Wolf	2.8%	Mott	2.5%				
CDC Falcon	1.8%	WB 9879	2.0%				
Rampart	1.3%	Lanning	1.5%				
Other	12.1%	Other	17.5%				

Table 1 shows the proportion of acres planted in Montana for Winter Wheat, Spring Wheat, Durum Wheat, and Barley, by variety. Warhorse represents the largest proportion of Winter Wheat planted (28%), Vida for Spring Wheat (23.8%), Alzada for Durum Wheat (22.8%), and Metcalfe for Barley (21.3%). Most prominent changes from 2018 to 2019 are with Durum Wheat and Barley Varieties. Alzada planting increased from 9.4% in 2018 to 22.8%, surpassing the previous year's top variety Joppa, which decreased from 45.5% to 20.5%. Metcalfe plantings also experienced a decline from 52.1% in 2018 to 21.3% in 2019. (See Appendix A.1 for detail on calculations.)

Table 2.

Winter Wheat		Spring Wheat		Durum Wheat		Barley	
Warhorse	37.0%	Vida	23.0%	Joppa	24.4%	Metcalfe	31.8%
Yellowstone	12.5%	SY Soren	19.3%	Mountrail	23.2%	Hockett	29.8%
Judee	11.8%	SY Ingmar	13.7%	Divide	19.8%	Merit 57	8.4%
Brawl CL Plus	9.0%	Reeder	12.8%	Alzada	14.5%	Bill Coors 100	6.5%
Keldin	7.1%	WB Gunnison	4.9%	Tioga	5.5%	Haxby	2.4%
SY Monument	4.1%	Duclair	4.5%	Carpio	0.8%	Haybet	1.9%
Decade	3.0%	Corbin	3.5%	Kyle	0.5%	Lavina	0.4%
Rampart	1.9%	Brennan	2.7%	Other	11.2%	Other	18.9%
CDC Falcon	1.9%	O'Neal	2.2%				
Loma	1.3%	Mott	2.1%				
Other	10.48%	Elgin-ND	2.1%				
		Other	9.2%				

Table 2 provides estimates for the proportion of acres planted to a particular variety of wheat or barley in the top five producing counties in Montana. The top five counties represent 37% of Warhorse planted, 23% of Vida, 24.4% of Joppa, and 31.8% of Metcalfe. Major changes from 2018 to 2019 were the reduced proportion of acres planted in Joppa for Durum Wheat (45.5% to 24.4%) and Metcalfe for Barley (52.1% to 31.8%). Additionally, the Spring Wheat variety SY Soren has become much more popular in the last year going from 3.8% to 19.3%. (See Appendix A.2 for detail on calculations.)

Table 3.

	Winter Wheat							
	Northwest	***North Central***	***Northeast***	***Central***	***Southwest***	***South Central***	***Southeast***	***State***
Warhorse	—	38.4%	—	7.0%	—	12.9%	—	28.0%
Brawl CL Plus	—	3.9%	—	16.2%	—	67.9%	—	13.2%
Yellowstone	—	11.2%	22.3%	19.2%	58.1%	1.9%	—	13.0%
Keldin	—	13.1%	—	2.4%	—	—	—	9.2%
Judee	—	9.6%	—	6.6%	—	2.6%	—	8.1%
Loma	—	4.2%	—	3.0%	—	—	—	3.6%
SY Monument	—	3.0%	—	5.7%	—	—	—	3.4%
Decade	—	1.8%	34.3%	5.3%	—	—	—	3.4%
SY Wolf	—	1.0%	14.9%	0.5%	—	13.8%	—	2.8%
CDC Falcon	—	2.4%	—	—	—	—	—	1.8%
Rampart	—	1.6%	—	—	—	—	—	1.3%
SY Clearstone	—	0.2%	—	—	29.0%	—	—	0.7%
Other	—	9.6%	28.5%	18.9%	12.9%	1.0%	—	11.5%
Unknown/Unreported	100.0%	0.0%	0.0%	15.3%	0.0%	0.0%	100.0%	0.0%
Observations	1	254	24	54	6	13	2	354

Table 3 offers estimates for the proportion of planted Winter Wheat varieties within Agricultural Districts, as well as total state proportions planted. Of the 354 observations, the North Central Agriculture District provided the most observations (254) followed distantly by the Central Agriculture District with 54 observations. Between the two districts, they show the most diversity in varieties planted. (See Appendix A.3 for detail on calculations.)

Table 4.

	Spring Wheat							
	Northwest	***North Central***	***Northeast***	***Central***	***Southwest***	***South Central***	***Southeast***	***State***
Vida	—	36.6%	14.9%	14.4%	—	—	—	23.8%
SY Soren	—	—	22.3%	—	—	—	—	11.5%
Reeder	—	—	19.4%	6.9%	—	—	—	10.4%
SY Ingmar	—	3.6%	13.7%	19.9%	—	—	—	9.6%
Corbin	—	13.9%	1.6%	—	—	—	—	6.8%
WB Gunnison	—	12.8%	0.0%	—	—	—	—	5.5%
Duclair	—	10.8%	0.9%	—	—	—	—	5.1%
Brennan	—	—	7.3%	—	—	—	—	3.9%
Mott	—	1.4%	3.5%	—	—	—	—	2.5%
WB 9879	—	2.7%	—	15.9%	—	—	—	2.0%
Lanning	—	2.9%	0.4%	—	—	—	—	1.5%
O'Neal	—	2.5%	—	—	—	—	—	1.2%
Elgin-ND	—	—	2.4%	—	—	—	—	1.2%
Choteau	—	2.8%	0.1%	—	—	—	—	1.0%
SY Valda	—	2.3%	—	—	—	—	—	0.9%
Other	5.0%	7.8%	11.1%	20.7%	80.9%	—	—	13.2%
Unknown/Unreported	95.0%	0.0%	2.4%	22.1%%	19.1%	100.0%	100.0%	0.0%
Observations	2	235	156	49	6	11	0	459

Table 4 shows estimates for the proportion of planted Spring Wheat varieties within Agricultural Districts, as well as total state proportions planted. Of the 459 observations, the North Central and Northeast Agriculture Districts provided the most observations--235 and 156, respectively. Both districts reported a variety of Spring Wheat varieties planted, but North Central primarily planted Vida (36.6%) and Northeast primarily planted SY Soren (22.3%). (See Appendix A.3 for detail on calculations.)

Table 5.

	Durum Wheat							
	Northwest	***North Central***	***Northeast***	***Central***	***Southwest***	***South Central***	***Southeast***	***State***
Alzada	—	77.3%	9.8%	—	—	—	—	22.8%
Joppa	—	—	24.8%	—	—	—	—	20.5%
Mountrail	—	—	23.6%	—	—	—	—	19.4%
Divide	—	—	20.2%	—	—	—	—	16.7%
Tioga	—	—	5.6%	—	—	—	—	4.8%
Carpio	—	—	0.8%	—	—	—	—	1.0%
Kyle	—	—	0.5%	—	—	—	—	0.8%
Other	—	22.7%	11.4%	—	—	—	—	13.9%
Unknown/Unreported	100.0%	0.0%	3.4%	100.0%	100.0%	100.0%	100.0%	0.0%
Observations	0	217	96	0	0	0	0	313

Table 5 provides estimates for the proportion of planted Durum Wheat varieties within Agricultural Districts, as well as total state proportions planted. Observations were only reported from the North Central and Northeast Agriculture Districts with North Central Montana planting mainly Alzada (77.3%) and the Northeast primarily planting Joppa (24.8%) along with an assortment of other Durum Wheat varieties. (See Appendix A.3 for detail on calculations.)

Table 6.

	Barley							
	Northwest	***North Central***	***Northeast***	***Central***	***Southwest***	***South Central***	***Southeast***	***State***
Metcalfe	—	29.6%	—	14.0%	—	—	—	21.3%
Hockett	—	30.2%	—	1.2%	—	—	—	19.1%
Bill Coors 100	—	5.2%	—	26.9%	—	4.5%	71.5%	11.3%
Haxby	—	2.1%	35.4%	20.0%	—	—	—	8.5%
Lavina	—	6.9%	16.3%	3.5%	4.9%	—	—	7.0%
Merit 57	—	6.7%	—	—	—	—	—	4.8%
Haybet	—	1.7%	31.5%	1.3%	—	—	—	4.2%
Other	—	17.7%	16.9%	17.0%	82.0%	37.2%	—	23.8%
Unknown/Unreported	100.0%	0.0%	0.0%	16.1%	13.1%	58.4%	28.5%	0.0%
Observations	0	254	67	50	6	12	2	391

Table 6 displays estimates for the proportion of planted Barley varieties within Agricultural Districts, as well as for total state proportions planted. Of the 391 observations, the majority came from the North Central Montana Agriculture District (254) with Central and Northeast Agriculture Districts following distantly with 50 and 67 observations, respectively. The North Central and Central observations report the greatest diversity of Barley varieties, with Hockett representing the largest proportion of acreage planted in North Central (30.2%) and Bill Coors 100 in Central Montana (26.9%). (See Appendix A.3 for detail on calculations.)

Table 7.

Decisions in Selecting Seed Varieties

Factor in making seed variety decision	Responses	Average Importance	Standard Deviation	Weighted Median	Most Common Response
Overall yield potential	381	8.81	0.35	9	10
Overall protein content potential	373	8.47	0.39	9	10
Your past experience with variety	369	8.11	0.45	8	8
Disease resistance	369	8.11	0.41	8	8
Pest resistance	367	7.94	0.45	8	8
Market conditions/prices	364	7.82	0.57	8	10
Cost of seed	371	7.08	0.55	7	10
Recommendation from MSU information	356	6.54	0.59	7	8
Recommendation by another producer	360	6.54	0.47	7	8
Variety was developed by a public university	347	6.10	0.62	6	5
Knowledge about demand in export markets	322	6.06	0.62	6	5
Desire to try something new	361	6.00	0.61	6	5
Recommendation by elevator/processor	348	5.37	0.59	5	5
Recommendation by another source	166	4.71	0.66	5	5
Other reasons	36	7.14	0.68	8	10

Table 7 shows responses about the importance of different factors in making the decision to use a particular seed variety. Respondents were asked to rank importance of each factor on a scale of 1 to 10. Overall yield potential and protein content potential were the top two factors, with the lowest variability in those choosing the two production factors as being most important. Past experience, disease and pest resistance, and market prices represent the second tier of factors influencing seed variety choice. Cost of the seed and information provided by Montana State University resources and other producers represent the next set of factors.

Table 8.

Price per Acre for Standing Hay Crop Within County

	N	Mean	SD	Min	Max
Dryland	62	57.15	34.49	0	180
Irrigated	21	85.24	85.24	40	200

Table 8 shows the average reported price of hay acres planted by irrigation practice. Respondents were asked, "What is the going price or share for standing hay crop ("hay on the stump") in your county?". The majority of respondents had non-irrigated (Dry) hay production (62 out of 83). We did not receive adequate responses for share rates to report an average.

Table 9.

Number of Hay Cuttings

	N	Mean	SD	Min	Max
Hay Cuttings	212	1.48	.66	1	3

Table 9 presents the average amount of hay cuttings Montana farmers estimate their county had in the last year. Specifically, Montana farmers were asked "How many cuttings are typical in your county?". On average Montana farmers estimate their county has 1.48 cuttings with a high of 3 and a low of 1.

Table 10.

Types of Hay Produced

	Freq.	Percent	Cum.
Alfalfa	123	53.02	53.02
Other	109	46.98	100.00
Total	**232**	**100.00**	

Table 10 shows the typical types of hay Montana farmers estimate are produced within their county in the last year, with a majority reporting alfalfa (53.02%).

Table 11.

Organic Transitional Acreage

	N	Mean	SD	Min	Max
Acres transitioned to organic	365	56.64	306.47	0	4000

Table 11 displays the total acres planted as transitional organic acreage and overall organic acreage planted. Specifically, farmers were asked “How many acres did you transition to organic crop production in the last five years?”. In total, respondents reported transitioning a total of 20,673 acres to organic during that time period. Of 29 respondents reporting reasons for transitioning to organic, price or profitability were the most common reported reason.

Table 12.

In the next 12 months, do you think Montana farmers' profitability will:

	Freq.	Percent	Cum.
Improve	44	10.40	10.40
Diminish	218	51.54	61.94
Stay the same	161	38.06	100.00
Total	**423**	**100**	

Table 12 shows the percent of Montana farmers that believe their profitability will improve, diminish, or stay the same within the next 12 months. Out of the 423 respondents, 10.40% believe their profitability will improve, 51.54% thought it would diminish, and 38.06% believe it will stay the same.

Table 13.

Compared to one year ago, your operation is financially...

	Freq.	Percent	Cum.
Better off	16	3.75	3.75
Worse off	231	54.10	57.85
About the same	180	42.15	100.00
Total	**427**	**100**	

Table 13 shows the percentage of Montana farmers that think their operation is financially better off, worse off, or roughly the same as it was a year ago. Of 427 respondents. 3.75% think they are better off, 54.10% are worse off, and 42.15% believe they are about the same financially.

Table 14.

Changes in Crop Rotation

	N	Mean	SD	Min	Max
Crop rotation change	419	24%	20.16	0	100%

Table 14 presents the average amount of Montana farmers who made a major crop rotation change in the last year. If answering yes to making a crop rotation change respondents were listed as a 1, if no they were listed as a 0. Out of the 419 respondents 24% said yes to making a major crop rotation change.

Table 15.

If Yes to Change in Crop Rotation

Main Reason for Change?	Freq.	Percent	Cum.
Changes in the 2018 farm bill/farm progress	2	2.15	2.15
Disease/pest management	8	8.60	10.75
Market prices	25	26.88	37.63
Production conditions	12	12.90	50.54
Trade/marketing uncertainty	3	3.23	53.76
Other	43	46.24	100.00

Table 15 shows the primary reasons why Montana farmers made a crop rotation switch in the last year. If answering yes to the question from Table 14 respondents were asked to list their primary reason for the change. Market prices was the most prevalent reason listed for making the change (26.88%), however 46.24% respondents listed “Other” as their reason. Many of the “other” responses indicated some combination of the listed main reasons for change.

APPENDIX

A.1 State Estimates:

To estimate a state-level proportion of acres planted to a particular variety of wheat or barley, we combine responses from producers across Montana counties with county-level planted acres reported by the USDA National Agricultural Statistical Service. Specifically, we use the following weighting procedure separately for winter wheat, spring wheat (excluding durum), durum wheat, and barley.

First, for each county, we aggregate the total acreage planted to a particular variety in that county, as reported by survey respondents. We then calculate the proportion of acreage planted to a particular variety in the county by dividing acres in a variety by the sum of acres for all planted varieties. For example, if in county A producers reported that the total number of acres planted to variety 1 was 2,000 acres and the total number acres planted to all varieties in county A was 10,000 acres, then the proportion of acreage planted to variety 1 was 20%. This calculation was repeated for all varieties.

Second, we calculate the proportion of total acres planted in a county relative to the total acres planted in Montana as estimated by USDA NASS. For example, if county A reported to have planted 100,000 winter wheat acres and the total planted acres in Montana was 1.5 million, then county A represented 6.7% of total state winter wheat acres. This proportion is used as the state-level weight for determining state-level variety plantings.

Third, the proportion of a planted variety in a county was then multiplied by the proportion of planted acres that the county had relative to the state-level total acres. That is, if producers in county A planted 20% of winter wheat using variety 1, and county A represented 6.7% of total winter wheat acres planted in Montana, then variety 1 in county A is estimated to represent (20%x6.7%) = 1.34% of total winter wheat acres planted in Montana.

Lastly, when the above calculations were completed for all each variety in all counties, the weighted county-level planted acres for each variety were summed together across all Montana counties with production of the particular wheat or barley (i.e., this was done separately for winter wheat, spring wheat, durum, and barley).

A.2 Top Five Planted Acre Counties Estimates:

To estimate the proportion of acres planted to a particular variety of wheat or barley in the top five counties that planted each of these crops, we combine responses from producers across those counties with county-level planted acres reported by the USDA National Agricultural Statistical Service. Specifically, we use the following weighting procedure separately for winter wheat, spring wheat (excluding durum), durum wheat, and barley.

First, for each of the top-five counties, we aggregate the total acreage planted to a particular variety in that county, as reported by survey respondents. We then calculate the proportion of acreage planted to a particular variety in the county by dividing acres in a variety by the sum of acres for all planted varieties. For example, if in county A producers reported that the total

number of acres planted to variety 1 was 2,000 acres and the total number acres planted to all varieties in county A was 10,000 acres, then the proportion of acreage planted to variety 1 was 20%. This calculation was repeated for all varieties.

Second, we calculate the proportion of total acres planted in a county relative to the total acres planted in the top-five counties producing that crop as estimated by USDA NASS. For example, if county A reported to have planted 100,000 winter wheat acres and the total planted acres in the top-five counties was 800,000, then county A represented 12.5% of total winter wheat acres in the top-five counties. This proportion is used as the top-five county weight for determining variety plantings.

Third, the proportion of a planted variety in a county was then multiplied by the proportion of planted acres that the county had relative to the top-five counties total acres. That is, if producers in county A planted 20% of winter wheat using variety 1, and county A represented 12.5% of total winter wheat acres planted in the top-five counties, then variety 1 in county A is estimated to represent (20%x12.5%) = 2.5% of total winter wheat acres planted in the top-five counties.

Lastly, when the above calculations were completed for all each variety in all counties, the weighted county-level planted acres for each variety were summed together across all of the top-five planted acres counties with production of the particular wheat or barley (i.e., this was done separately for winter wheat, spring wheat, durum, and barley).

A.3 Agricultural District estimates:

To estimate the proportion of acres planted to a particular variety of wheat or barley in a USDA NASS Agricultural District that planted each of these crops, we combine responses from producers across those counties with county-level planted acres reported by the USDA National Agricultural Statistical Service. Specifically, we use the following weighting procedure separately for winter wheat, spring wheat (excluding durum), durum wheat, and barley.

First, for each of the counties in a particular agricultural district, we aggregate the total acreage planted to a particular variety in that county as reported by survey respondents. We then calculate the proportion of acreage planted to a particular variety in the county by dividing acres in a variety by the sum of acres for all planted varieties. For example, if in county A producers reported that the total number of acres planted to variety 1 was 2,000 acres and the total number acres planted to all varieties in county A was 10,000 acres, then the proportion of acreage planted to variety 1 was 20%. This calculation was repeated for all varieties.

Second, we calculate the proportion of total acres planted in a county relative to the total acres planted in the counties producing that crop within an agricultural district as estimated by USDA NASS. For example, if county A reported to have planted 100,000 winter wheat acres and the total planted acres in the counties within the agricultural district was 200,000, then county A

represented 50% of total winter wheat acres planted in the agricultural district. This proportion is used as the agricultural district weight for determining district-level variety plantings.

Third, the proportion of a planted variety in a county was then multiplied by the proportion of planted acres that the county had relative to the total acres in the agricultural district. That is, if producers in county A planted 20% of winter wheat using variety 1, and county A represented 50% of total winter wheat acres planted in the agricultural district, then variety 1 in county A is estimated to represent (20%x50%) = 10% of total winter wheat acres planted in the agricultural district.

Lastly, when the above calculations were completed for all each variety in all counties, the weighted district-level planted acres for each variety were summed together across all of the planted acres within the agricultural district with production of the particular wheat or barley (i.e., this was done separately for winter wheat, spring wheat, durum, and barley)