



2017 Small Grains Report

Southcentral and Southeast Idaho Cereals Research & Extension Program

Juliet Marshall, Chad Jackson, Tod Shelman, Linda Jones, Suzette Arcibal, and Katherine O'Brien

Cover: Clockwise from top left: 'Xena' two-row spring barley, 'Bobtail' soft white winter wheat, 'Millennium' six-row spring barley, 'Klasic' hard white spring wheat with Fusarium Head Blight infection.

Southcentral and Southeastern Idaho Cereals Research and Extension Program
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Alan Baum - Ashton
Luke Adams - Rupert
Marc Thiel - Idaho Falls

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Disclaimer Statement

This report represents research in progress and results may change with additional testing. Recommendations for use or non-use of any variety tested in these trials is not stated or implied. Inclusion of a variety in these trials cannot be construed as recommending that variety over varieties not included in the trials.

ALWAYS read and follow the instructions printed on pesticide labels. The pesticide recommendations in this UI publication do not substitute for instructions on the label. Due to constantly changing pesticide laws and labels, some pesticides may have been cancelled or had certain uses prohibited. Use pesticides with care. Do not use a pesticide unless both the pest and the plant, animal, or other application site are specifically listed on the label. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock. Trade names are used to simplify information; no endorsement or discrimination is intended.

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2017 Small Grains Report for Southcentral and Southeastern Idaho

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Additions and Changes:

For 2017, we expanded the plot length of our spring trials from 14' to 20', which was sprayed back to a final 16'. Due to flooding in the winter, we abandoned the Rupert winter barley nursery. We expanded our Soda Springs winter wheat nurseries to include 4 replications like other locations. We also included a small Soft White Winter Wheat nursery in Rockland.

Introduction

Increases in cereal grain yields result from a combination of genetic improvements in varieties and from improved agronomic practices. Studies have shown that genetic improvements have contributed more than 50 percent of the total improvement in yield over the past 30 or 40 years. The objective of the University of Idaho Small Grain Performance Trials is to provide an unbiased appraisal and evaluation of currently available varieties and advanced experimental lines. This information will assist Idaho growers in comparing and selecting varieties best suited to their particular area and growing conditions.

Varietal development programs strive not only for greater yield potential, but also for improved end-use quality, better disease and insect resistance, yield stabilization through improved winter hardiness, better straw strength, etc. Bringing a new variety to the market place is a cooperative effort by many individuals.

Varieties are best evaluated by comparing performance over a number of locations and preferably over more than one year. Varietal performance can change in response to both environmental and cultural/management conditions. This report summarizes small grain trials

conducted throughout Southcentral and Southeastern Idaho that were harvested in 2017, as well as milling and baking data from trials harvested in 2016.

Materials & Methods

Locations

Cereal trials were established at six winter and five spring locations throughout SC and SE Idaho during the fall of 2016 and the spring of 2017. For location details, please see the descriptions on pages 5 to 11. The Ririe, Rockland & Soda Springs winter and Soda Springs spring trials were grown under dryland conditions and all other trials were grown under irrigation. The trials at Aberdeen and Kimberly were grown at UI Research and Extension Centers, and the remaining trials were grown in producers' fields.

Agronomic Practices

Treated seed was planted at the following rates:

- Irrigated Wheat: 1,000,000 seeds per acre or approximately 95 pounds per acre.
- Irrigated Barley: 800,000 seeds per acre or approximately 80 pounds per acre.
- Dryland Wheat: 700,000 seeds per acre or approximately 65 pounds per acre.
- Dryland Barley: 600,000 seeds per acre or approximately 60 pounds per acre.

Row spacing was set at 7 inches using double disk openers for all irrigated locations and the Soda Springs winter and spring dryland locations. The Ririe dryland location used a 10-inch row spacing and

hoe-type openers and the Rockland location used a 12-inch row spacing with shanks preceding double disk openers. Plots at all winter locations except for Aberdeen were planted 5 feet wide by 14 feet long then reduced back to 10 feet long using glyphosate herbicide or tillage. Aberdeen plots were planted 5 feet wide by 13.3 feet long then sprayed back to 9.3 feet long. Spring locations, except Soda Springs, were planted 5 feet wide by 20 feet long then sprayed back to 16 feet. Soda Springs was planted at 14 feet long and tilled back to 10 feet. All entries were replicated 4 times at each location in a randomized complete block design. Except for planting and harvest operations, nitrogen fertilization, and miscellaneous maintenance, trials established in producers' fields received the same "grower management" or cultural operations as applied to the surrounding commercial wheat or barley field.

Nitrogen fertilizer in irrigated locations was managed according to the following methodology: Yield goals (bu/A) were set for each class at each location using historical yield data. These yield goals were used to calculate optimal fertility amounts according to the following methods: Soft white winter wheat, soft white spring wheat, and winter barley: lbs/acre nitrogen needed = 2 times yield goal. Hard winter and hard spring wheat; lbs/acre nitrogen needed = 2.5 times yield goal, plus 40 lbs nitrogen/acre topdressed at flowering. Spring 2 row and 6 row barley: lbs/acre nitrogen needed = 1.7 times the yield goal. Hard wheat nurseries received the remaining balance of nitrogen in urea (46-0-0) topdressed at heading using hand broadcast spreaders. Fertilizers and pesticides applied are listed on pages 6 to 11. Planting and harvesting operations by university personnel were timed to approximately coincide with corresponding cooperator operations.

Description of Agronomic Data

Each entry at each location was measured for grain yield, test weight, plant

height, heading date, and lodging (when present).

- Yield is calculated at 60 pounds per bushel for wheat, and 48 pounds per bushel for barley.
- Test weight is reported in pounds per standard bushel.
- Plant height is reported in inches from the soil surface to the tip of the heads, awns excluded.
- Heading date is reported as the date when 50 percent of heads are fully emerged from the boot.
- Lodging is reported as the percent of the plot area that was not standing straight prior to harvest.

Description of End-use Quality Data

Grain protein for each variety in 2017 was analyzed with a Foss 6500 NIR grain analyzer. Protein data are found in conjunction with the agronomic data noted above in tables 4 to 59. These protein values are best utilized in comparisons between varieties within a nursery.

Due to the time necessary to complete milling and baking evaluations, test results from the Idaho Wheat Quality Laboratory are not available for the 2017 harvest in this report. Data are given for these characteristics from the 2016 harvest and are found in tables 68-79.

Milling and baking tests and plump seed evaluations use standardized testing methods and are described below:

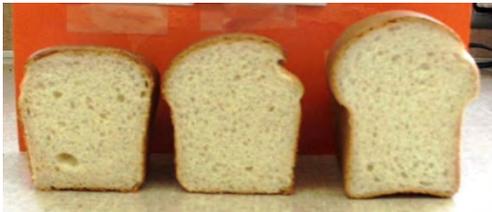
- Flour protein: this is the flour protein content, measured on a fixed 14 percent moisture basis. Lower numbers are better for soft wheat; higher numbers are preferred for hard wheat.
- Break flour yield: represents ease of milling or kernel softness; higher numbers are preferred.
- Flour yield: the percent of flour obtained from a sample of wheat; higher percentages are better.

- Whole grain protein percent: protein content of the whole grain on a 12 percent moisture basis. Lower percentages are preferred for soft wheat; higher percentages are preferred for hard wheat.
- Hardness value: a measure of kernel hardness; generally soft white wheats are below 45, hard wheats are above 45.

Additional evaluations include the following:

Hard Wheats

Bake volume: This is the volume of an experimental loaf of bread measured in cubic centimeters and reflects protein quality per unit of protein; higher volume is preferred.



Soft Wheats

Cookie diameter: Diameter of a cookie in centimeters; larger numbers are better.



Barley

- Plump: Percent plump is the percent of a sample that stayed on top of a 5.5/64 screen after shaking and consists of the 6/64 and 5.5/64 percentages combined. Both screen

percentages are included in the report for increased precision.

- Thins: the percent of a sample that passed through a 5.5/64 screen after shaking.

Statistical Analyses

Data from each nursery were analyzed using SAS 9.4 software with the PROC GLM procedure. Fisher's protected LSD ($\alpha=.05$) was used for mean comparisons.

Statistical Interpretation

Most tables have a least significant difference (LSD) statistic at the bottom of the table. This statistic is given at the 5 percent error level and is an aid in comparing varieties. If the measured values of any two varieties within a table differ by the LSD value or more, they may be considered different with a confidence level of 95 percent. If the measured values are less than the LSD value, the differences may be due to random error rather than real differences. Coefficient of variation (CV percent) statistic is a general measurement of the precision of each experiment. Lower CV values indicate less experimental variation and greater precision. Most tables that do not have the LSD and CV statistic are averages over locations or years where specific statistical analyses were not run on the combined data or are from data obtained from only one replication or are from a composite sample of all replications (e.g. quality data). Most tables from individual locations also contain yield data from two previous years. The average, LSD, and CV for these data represent the original data set, not just the selected varieties presented in these tables. The Pr>F value shows the validity of the LSD value above it; if the Pr>F value is equal to or greater than .05 (e.g. .1504; .6250), then the LSD value is void. This does not mean there are not differences between the varieties in a category with a void LSD, it simply means

differences cannot be determined at the 95% confidence level we set.

Varieties Tested

A list of released varieties tested in 2016-2017 is given in Table 1. Included in this table are seed size, number of seeds per pound, and the adjusted seeding rate. Information is also given on the year of release and the releasing agency or company. A short description of selected varieties is given in Table 2. Additional information is available from the releasing agency or company.

Seasonal average measurements of several plant growth characteristics from the variety trials are shown in Table 3 for the time period of 2007-2017.

Southcentral & Southeast Idaho Cereal Variety Trial Locations



Winter Locations

Kimberly	Irrigated
Rupert	Irrigated
Aberdeen	Irrigated
Ririe	Dryland
Rockland	Dryland
Soda Springs	Dryland

Spring Locations

Rupert	Irrigated
Aberdeen	Irrigated
Idaho Falls	Irrigated
Ashton	Irrigated
Soda Springs	Dryland

Location Descriptions

Kimberly Winter Irrigated:

Kimberly Research & Extension Center
3825 N. 3600 E. Kimberly, ID

Coordinates: 42°32'54.86"N, 114°20'53.64"W
Elevation: 3903 ft.
Soil Type: #98 Rad silt loam, 0-2% slopes
Previous Crop: Sugar Beets
Planting Date: October 13, 2016
Harvest Date: July 28 & 31, 2017
Chemicals applied: Starane Ultra 6 oz/A, Axial XL 16 oz/A, Huskie 15 oz/A

Fertility:

	Organic matter	pH	Hard winter wheat N#/A	Soft white winter wheat & winter barley N #/A	P	K	S
12" soil test results (N & S= 0-24")	1.5	8.3	41	41	9 ppm	128 ppm	
Fertilizer applied (lbs/A)			349	240	160#	50#	50#
Total	1.5	8.3	390	281	9+ ppm	128+ ppm	

Rupert Winter Irrigated:

Cooperator: Luke Adams
Located at approximately 430 E. 700 N. Rupert, Idaho

Coordinates: 42°43'19.60"N, 113°35'3.11"W
Elevation: 4210 ft.
Soil Type: #24 Portneuf silt loam, 1-4% slopes
Previous Crop: Sugar Beets
Planting Date: October 4, 2016
Harvest Dates: July 27, 2017
Chemicals applied: Aproach, MCP Ester, Palisade, Affinity, Grizzly

Fertility:

	Organic Matter	pH	Free Lime %	Hard winter wheat N#/A	Soft white winter wheat & winter barley N #/A	P	K	S
12" soil test results (N & S= 0-24")	1.4	7.9	6.7	65	65	30 ppm	228 ppm	45 ppm
Fertilizer applied (lbs/A)				194	154	40#	50#	4#
Total	1.4	7.9	6.7	259	219	30+ppm	228+ppm	45+ppm

Location Descriptions

Aberdeen Winter Irrigated:

**Aberdeen Research & Extension Center
1693 S. 2700 W. Aberdeen, ID**

Coordinates: 42°57'51.68"N, 112°49'15.31"W
Elevation: 4403 ft.
Soil Type: DeA Declo loam, 0-2% slopes
Previous Crop: Green Manure Oats
Planting Date: October 5, 2016
Harvest Dates: August 7 & 8, 2017
Chemicals applied: Huskie 15 oz/A, Starane Ultra 6 oz/A
 Quilt Xcel 12 oz/A

Fertility:

	Organic Matter	pH	Free Lime %	Hard winter wheat N#/A	Soft white winter wheat & winter barley N #/A	P	K	S
12" soil test results (N & S= 0-24")	1.1	8.3	8.3	248	248	31 ppm	417 ppm	51 ppm
Fertilizer applied (lbs/A)				167	50		20#	
Total	1.1	8.3	8.3	415	298	31 ppm	417+ ppm	51 ppm

Ririe Winter Dryland:

Cooperator: Trevor Davey

Approximately 2 ½ miles south of Ririe Reservoir Dam on Meadow Creek Rd Ririe, ID

Coordinates: 43°33'17.01"N, 111°43'2.60"W
Elevation: 5531 ft.
Soil Type: #42 Ririe silt loam, 4-12% slopes
Previous Crop: Fallow
Planting Date: September 28, 2016
Harvest Date: August 1 & 2, 2017
Chemicals applied: 16 oz/A Goldsky, 5.5 oz/A LV6, .5 oz/A Powerflex

Fertility:

	Organic Matter	pH	Free Lime %	Hard winter wheat N#/A	Soft white winter wheat & winter barley N #/A	P	K	S
12" soil test results (N & S= 0-24")	1.2	7.2	4.3	40	40	25 ppm	257 ppm	16 ppm
Fertilizer applied (lbs/A)				6	6	30 #		
Total	1.2	7.2	4.3	46	46	25+ppm	257 ppm	16 ppm

Location Descriptions

Rockland Winter Dryland:

Cooperators: Gilbert and Carl Hofmeister
 ¼ mile west of Rock Creek Rd on Deeg Rd Rockland, ID

Coordinates: 42°39'40.68"N, 112°56'59.33"W
 Elevation: 4645 ft.
 Soil Type: #51 Newdale silt loam, 4-12% slopes
 Previous Crop: Fallow
 Planting Date: September 16, 2016
 Harvest Date: July 27, 2017
 Chemicals applied: Starane Ultra 6.4 oz/A, Huskie 12 oz/A
 Maverick 2/3 oz/A

Fertility:

	Organic Matter	pH	Free Lime %	Winter wheat N#/A	P	K	S
Fertilizer applied (lbs/A)				50			20

Soda Springs Winter Dryland:

Cooperators: Mark and Craig Ozburn
 1 ½ mile west of Govt Dam Rd on Ten Mile Pass Rd Soda Springs, ID

Coordinates: 42°45'54.55"N, 111°40'23.70"W
 Elevation: 6177 ft.
 Soil Type: 485AA - Foundem-Rexburg complex, cool, 1-8% slopes
 Previous Crop: Fallow
 Planting Date: September 29, 2016
 Harvest Date: August 24 & 25, 2017
 Chemicals applied: Huskie 15 oz/A, Starane Ultra 6 oz/A,
 Quilt Xcel 12 oz/A, Axial XL 16 oz/A

Fertility:

	Organic Matter	pH	Free Lime %	Winter wheat N#/A	P	K	S
12" soil test results (N & S= 0-24")	2.1	7.6	<1.0	118	52 ppm	349 ppm	13 ppm
Fertilizer applied (lbs/A)				45	52#		
Total	2.1	7.6	<1.0	163	52+ppm	349 ppm	16+ppm

Location Descriptions

Rupert Spring Irrigated:

Cooperator: Grant 4-D Farms
Approximately 830 E. 700N. Rupert, ID

Coordinates: 42°43'12.28"N, 113°30'23.04"W
Elevation: 4253 ft.
Soil Type: #36 Sluka silt loam, 1-4% slopes
Previous Crop: Sugar Beets
Planting Date: April 12, 2017
Harvest Dates: August 10 & 11, 2017
Chemicals applied: Brox-M 1 pt/A, Starane Ultra 6 oz/A, Axial XL 16 oz/A, Quilt Xcel 12 oz/A

Fertility:

	Organic Matter	pH	Free Lime %	Hard Spring wheat N#/A	Soft white spring wheat & spring barley N #/A	P	K	S
12" soil test results (N & S= 0-24")	1.2	8.0	7.4	90	90	16 ppm	243 ppm	21 ppm
Fertilizer applied (lbs/A)				275	165			
Total	1.2	8.0	6.9	365	255	16 ppm	243 ppm	21 ppm

Aberdeen Spring Irrigated:

Aberdeen Research & Extension Center
1693 S. 2700 W. Aberdeen, ID

Coordinates: 42°57'8.83"N, 112°49'32.74"W
Elevation: 4404 ft.
Soil Type: DeA Declo loam, 0-2% slopes
Previous Crop: Green Manure Oats
Planting Date: April 13, 2017
Harvest Date: August 17-18, 2017
Chemicals applied: Brox-M 1 ½ pt/A, Starane Ultra 6 oz/A, Quilt Xcel 12 oz/A

Fertility:

	Organic Matter	pH	Free Lime %	Hard Spring wheat N#/A	Soft white spring wheat & spring barley N #/A	P	K	S
12" soil test results (N & S= 0-24")	0.9	8.1	8.2	173	173	25 ppm	260 ppm	44 ppm
Fertilizer applied (lbs/A)				189	80	20#	20#	100# S, 20# SO ₄
Total	0.9	8.1	8.2	362	253	25+ppm	260+ ppm	44+ppm

Location Descriptions

Idaho Falls Spring Irrigated:

Cooperator: Marc Thiel
Approximately 2500 S. on 45th West Idaho Falls, ID

Coordinates: 43°28'33.70"N, 112° 7'19.96"W
Elevation: 4680 ft.
Soil Type: #22 Pancheri silt loam, 0-2% slopes
Previous Crop: Potatoes
Planting Date: April 11, 2017
Harvest Date: August 23, 2017
Chemicals applied: Brox-M 1 pt/A, Starane Ultra 6 oz/A, Quilt Xcel 12 oz/A, Axial XL 16 oz/A

Fertility:

	Organic Matter	pH	Free Lime %	Hard Spring wheat N#/A	Soft white spring wheat N #/A	P	K	S
12" soil test results (N & S= 0-24")	1.7	8.1	5.6	73	73	10 ppm	120 ppm	26 ppm
Fertilizer applied (lbs/A)				253	122	31#		
Total	1.7	8.1	5.6	326	195	10+ppm	120 ppm	26 ppm

Ashton Spring Irrigated:

Cooperator: Alan Baum
Approximately 3775 E. 1200 N. Ashton, ID

Coordinates: 44° 4'15.25"N, 111°23'59.26"W
Elevation: 5361 ft.
Soil Type: #24 Greentimber – Marystown – Robinlee silt loams, 1-4% slopes
Previous Crop: Potatoes
Planting Date: May 4, 2017
Harvest Date: August 30 & 31, 2017
Chemical applied: Brox-M 1 ½ pt/A, Axial XL 16 oz/A, Starane Ultra 6 oz/A, Quilt Xcel 12 oz/A

Fertility:

	Organic Matter	pH	Free Lime %	Hard Spring wheat N#/A	Soft white spring wheat & spring barley N #/A	P	K	S
12" soil test results (N & S= 0-24")	2.9	6.4	<1.0	106	106	12 ppm	205 ppm	25 ppm
Fertilizer applied (lbs/A)				118	78	17#		17#
Total	2.9	6.4	<1.0	224	184	12+ppm	205 ppm	25+ppm

Location Descriptions

Soda Springs Spring Dryland:

Cooperators: Kyle Wangemann and Scott Brown
9/10 mile North of Meadowville Rd on DeKay Rd Soda Springs, ID

Coordinates: 42°45'45.98"N, 111°36'13.94"W
Elevation: 6081 ft.
Soil Type: 225AA Ririe-Lostine complex, 1-8% slopes
Previous Crop: Spring Barley
Planting Date: May 10, 2017
Harvest Date: September 5, 2017
Chemicals applied: Axial XL 1 pt/A, Starane Ultra 8 oz/A, Talinor 13.7 oz/A, CoAct+ 2.75 oz/A

Fertility:

	Organic Matter	pH	Free Lime %	Hard Spring wheat N#/A	Soft white spring wheat N #/A	P	K	S
12" soil test results (N & S= 0-24")	2.5	6.1	<1.0	58	58	49 ppm	449 ppm	18 ppm
Fertilizer applied (lbs/A)				60	60			
Total	2.5	6.1	<1.0	118	118	49 ppm	449 ppm	18 ppm

Temperature and irrigation/precipitation totals for all locations, recorded with on-site weather station provided with financial support from the Idaho Wheat Commission.

Variety Trial Site	Dates of station recording range	Maximum temperature °F	Minimum temperature °F	# of days above 90°F	# of days below 50°F	# of days below 40°F	Precipitation and Irrigation (in.)
Kimberly	June 2 - July 24, 2017	103.7	38.4	27	17	2	11.69
Rupert winter	June 2 - July 24, 2017	102.7	35.9	24	33	5	6.68
Ririe	June 7 - August 1, 2017	110.6	35.7	31	24	6	1.56
Rockland	June 2 - July 24, 2017	106.3	34.2	31	24	5	1.02
Soda Springs winter	June 2 - August 24, 2017	94.0	30.4	15	78	27	3.27
Rupert spring	June 2 - August 9, 2017	104.1	36.8	36	30	2	12.03
Idaho Falls	June 7 - August 17, 2017	98.9	39.8	25	48	2	11.33
Ashton	June 7 - August 30, 2017	94.8	38.0	13	49	5	8.55
Soda Springs spring	June 2 - August 24, 2017	95.7	34.5	18	70	20	1.42

Table 1. Released varieties tested in 2016-2017 with seed size and adjusted seeding rate.

Variety	Exp. No.	1000 Kernel Weight (g)	Seeds per Pound	Adjusted Seeding Rate ¹ (lb/A)	Year Released	Developer(s)/Distributor of variety
Soft White Winter Wheat						
Bobtail	OR208047P94	42	10,930	91	2013	Oregon AES, USDA
Brundage	ID86-14502B	30	15,120	66	1996	Idaho AES
Bruneau	ID93-64901A	37	12,427	80	2009	Idaho AES
Eltan	WA7431	26	17,788	56	1990	Washington State University and USDA-ARS
Jasper	WA 8169	42	10,800	93	2015	Washington State University and USDA-ARS
LCS Artdeco	NSA06-2153A	45	10,080	99	2011	Limagrain Cereal Seeds, LLC
LCS Drive	LWW12-7105	48	9,549	105	2015	Limagrain Cereal Seeds, LLC
LCS Hulk	LWW14-73163	42	10,800	93	2018	Limagrain Cereal Seeds, LLC
LCS Shark	LWW14-71195	54	8,400	119	2018	Limagrain Cereal Seeds, LLC
Norwest Duet	LOR-092	44	10,428	96	2015	OSU /Limagrain Cereal Seeds, LLC
Norwest Tandem	LOR-334	40	11,340	88	2016	OSU /Limagrain Cereal Seeds, LLC
Otto	WA008092	34	13,341	75	2011	Washington State University and USDA-ARS
Stephens	OR65-116	47	9,651	104	1977	Oregon AES, USDA
SY Assure	SY 96-2	41	11,063	90	2016	Syngenta Cereals
SY Banks	SY 5#25	47	9,651	104	2017	Syngenta Cereals
SY Command	SY 66-7	47	9,651	104	2017	Syngenta Cereals
SY Dayton	SY 62#18	48	9,549	105	2017	Syngenta Cereals
SY Ovation	03PN108#21	45	10,193	98	2011	Syngenta Cereals
UI Castle CLP	IDN 09-DH10	40	11,484	87	2015	Idaho AES / Limagrain Cereal Seeds
UI Magic CLP	IDN 09-DH11	45	10,193	98	2015	Idaho AES / Limagrain Cereal Seeds
UI Palouse CLP	IDN 3_5_10	42	10,800	93	2015	Idaho AES / Limagrain Cereal Seeds
UI Sparrow	IDO1108DH	37	12,427	80	2016	Idaho AES
UI-WSU Huffman	IDN-03-29902A	44	10,309	97	2014	UI, WSU / Limagrain Cereal Seeds
WB 456	BU6W99-456	36	12,600	79	2008	WestBred / Monsanto
WB-528	BZ6W98-528	44	10,428	96	2005	WestBred / Monsanto
WB1070CL	BZ6WM04-1070	57	8,028	125	2011	WestBred / Monsanto
WB1376CLP	WB-1030CL	37	12,427	80	2015	WestBred / Monsanto
WB1529	BZ6W07-436	43	10,549	95	2014	WestBred / Monsanto
WB1604	BZ6W07-458	42	10,800	93	2013	WestBred / Monsanto
WB1783	BZ6W09-471	43	10,673	94	2016	WestBred / Monsanto
Hard Red and White (W) Winter Wheat						
Bearpaw	MTS0721	23	20,160	50	2011	Montana AES
Curlew	UT9325-55	34	13,341	75	2009	Utah AES, USDA
Deloris	UT2030-32	27	17,117	58	2002	Utah AES, USDA
Golden Spike (W)	UT1944-158	28	16,200	62	1999	Utah AES, USDA
Greenville	UT9743-42	30	15,120	66	2011	Utah AES, USDA
Juniper	IDO 575	36	12,600	79	2005	Idaho AES, USDA
Keldin	ACS55017	46	9,861	101	2011	WestBred / Monsanto
LCS Jet	NSA 7208	48	9,450	106	2015	Limagrain Cereal Seeds, LLC
LCS Rocket	NSA10-2196	50	9,072	110	2018	Limagrain Cereal Seeds, LLC
LCS Yeti (W)	LCH13DH-2222	42	10,800	93	2018	Limagrain Cereal Seeds, LLC
Loma	MTS1224	32	14,175	71	2016	Montana AES
Lucin-CL	UT10322	33	13,745	73	2011	Utah AES, USDA
Mandala		46	9,861	101		Tri State Seed
Metropolis		39	11,631	86	2016	Tri State Seed
Northern	MT0978	37	12,427	80	2015	Montana AES
Norwest 553	ORN00B553	37	12,427	80	2007	Oregon State AES, USDA-ARS, Limagrain U.K.
Promontory	UT1567-51	41	11,063	90	1990	Utah AES, USDA
Rebelde		40	11,484	87	2012	Tri State Seed
SY Clearstone 2CL	MTCL1077	39	11,631	86	2012	Syngenta Cereals
SY Touchstone (W)	04PN028B-3	37	12,427	80	2016	Syngenta Cereals
UI Silver (W)	IDO658B	36	12,600	79	2011	Idaho AES, USDA
UI SRG	IDO656	46	9,969	100	2012	Idaho AES, USDA
UICF-Grace (W)	IDO651	42	10,800	93	2009	Idaho AES, USDA
Utah 100	UT1650-150	33	13,957	72	1997	Utah AES, USDA
Warhorse	MTS0808	38	11,937	84	2013	Montana AES
WB3768 (W)	MTW08168	41	11,200	89	2013	Montana AES / WestBred
WB4303		35	13,148	76	2017	WestBred / Monsanto
WB4623CLP		33	13,745	73	2017	WestBred / Monsanto
Whetstone	W98-344	34	13,540	74	2009	Syngenta Cereals
Yellowstone	MT00159	31	14,632	68	2005	Montana AES

¹Adjusted to plant 1 million seeds per acre under irrigation according to the number of seeds per pound for each variety.

Table 1 (cont'd). Released varieties tested in 2016-2017 with seed size and adjusted seeding rate.

Variety	Exp. No.	1000 Kernel Weight (g)	Seeds per Pound	Adjusted Seeding Rate ¹ (lb/A)	Released	Developer(s)/Distributor of variety
Soft White Spring Wheat						
Alturas	IDO526	30	15,120	66	2002	Idaho AES, USDA
Louise	WA7921	40	11,340	88	2004	Washington AES, USDA
Melba (club wheat)	WA8193	39	11,631	86	2016	Washington AES, USDA
Seahawk	WA8162	41	11,063	90	2014	Washington AES, USDA
SY Saltese	SY3024-2	45	10,080	99	2016	Syngenta Cereals
Tekoa	WA8189	40	11,340	88	2016	Washington AES, USDA
UI Pettit	IDO632	25	18,144	55	2006	Idaho AES, USDA
UI Stone	IDO599	31	14,632	68	2012	Idaho AES / Limagrain Cereal Seeds
WB6121	BZ608-121	86	5,274	190	2016	WestBred / Monsanto
WB6341	BZ608-014	40	11,340	88	2017	WestBred / Monsanto
WB6430	BZ608-125	28	16,200	62	2014	WestBred / Monsanto
Hard Red Spring Wheat						
Alum	WA8186	37	12,259	82	2015	Washington AES, USDA
Cabernet	95WV10616	38	11,937	84	2007	Syngenta Cereals
Jefferson	IDO462	28	16,200	62	1998	Idaho AES, USDA
LCS Iron	11SB0096	37	12,259	82	2015	Limagrain Cereal Seeds, LLC
SY Basalt	04W40240R	24	18,900	53	2014	Syngenta Seeds, Inc
SY Coho	04W40292R	44	10,309	97	2015	Syngenta Seeds, Inc
SY Gunsight	06PN3015-08	43	10,549	95	2016	Syngenta Seeds, Inc
SY Selway	04PN3001-2	42	10,800	93	2015	Syngenta Seeds, Inc
WB9350		38	11,937	84	2016	WestBred / Monsanto
WB9411	BZ908-418	33	13,745	73	2015	WestBred / Monsanto
WB9433	XA9503	38	11,937	84	2017	WestBred / Monsanto
WB9518		40	11,340	88	2015	WestBred / Monsanto
WB9578		42	10,800	93	2016	WestBred / Monsanto
WB9668	BZ908-552	34	13,341	75	2014	WestBred / Monsanto
Hard White Spring Wheat						
Dayn	WA8123	35	12,960	77	2012	Washington AES, USDA
Klasic	NK77S1817	30	15,120	66	1982	Northrup-King Co., Minneapolis, MN
LCS Star	08SB0658-B	31	14,632	68	2013	Limagrain Cereal Seeds, LLC
Snow Crest	BZ998-247W	25	18,144	55	2004	WestBred / Monsanto
SY Teton	SY10136	40	11,340	88	2015	Syngenta Seeds, Inc
UI Platinum	IDO694C	35	12,960	77	2014	Idaho AES, Limagrain Cereal Seeds
WB-Paloma	BZ904-331WP	29	15,641	64	2010	WestBred / Monsanto
WB7202CLP	XA7320	38	11,937	84	2017	WestBred / Monsanto
WB7328	BZ9S09-0133W	35	12,960	77	2015	WestBred / Monsanto
WB7589	BZ9S09-0735W	42	10,800	93	2015	WestBred / Monsanto
Spring Durum Wheat						
Imperial	PH833-15				1987	WestBred
Alzada	YU894-75	43	10,549	95	2004	WestBred / Monsanto
Winter Barley						
Alba	OR77	43	10,549	76	2010	Oregon AES, USDA
Buck ²	09-OR-86	34	13,540	59	2014	Oregon AES, USDA
Charles (malt)	94Ab1274	45	10,193	78	2005	USDA-ARS, Aberdeen
Delicatessen		55	8,247	97	2016	Secobra
Eight-Twelve	79Ab812	36	12,600	63	1988	Idaho AES, USDA
Endeavor (malt)	95Ab2299	40	11,340	71	2008	Idaho AES, USDA
Etincel		45	10,080	79	2016	Secobra
LCS Calypso		54	8,479	94	2017	Limagrain Cereal Seeds, LLC
Lightning	10.0860	45	10,080	79	2016	Oregon AES, USDA
Madness		48	9,549	84	2016	Secobra
Maltesse		54	8,479	94	2016	Secobra
Rubinesse		48	9,549	84	2016	Secobra
Schuyler	NY5619B-3B	32	14,175	56	1969	Cornell AES, USDA
Sprinter	BU583-50	37	12,259	65	1987	WestBred / Monsanto
Sunstar Pride	SDM204-B	28	16,200	49	1995	Sunderman Breeding, Twin Falls, ID
Thunder	10.0777	41	11,200	71	2016	Oregon AES, USDA
Verdant	OR712	35	12,960	62	2014	Oregon AES, USDA
Voyel		42	10,800	74	2016	Secobra
Wintmalt		49	9,353	86	2014	Oregon AES, USDA

¹Adjusted to plant 1 million (800,000) seeds per acre for wheat (barley) under irrigation according to the number of seeds per pound for each variety.

²Hullless

Table 1 (cont'd). Released varieties tested in 2017 with seed size and adjusted seeding rate.

Usage:	Variety	Exp. No.	1000 Kernel Weight (g)	Seeds per Pound	Adjusted Seeding Rate ¹ (lb/A)	Year Released	Developer(s)/Distributor of variety
Two-Row Spring Barley							
feed	Altorado	BZ509-601	42	10,800	74	2016	Highland Specialty Grains
feed	Champion	YU501-385	47	9,651	83	2007	Highland Specialty Grains
feed	Claymore	BZ509-216	44	10,309	78	2015	Highland Specialty Grains
feed	Clearwater ²	01ID435H	37	12,259	65	2007	Idaho AES, USDA
feed	Harriman	08ID2661	48	9,450	85	2015	Idaho AES, USDA
feed	Idagold II	C32	42	10,800	74	2002	Coors Brewing Co. Inc., Burley, ID
feed	Lenetah	01Ab11107	43	10,549	76	2008	Idaho AES, USDA
feed	Oreana	BZ509-448	42	10,800	74	2015	Highland Specialty Grains
feed	RWA 1758	RWA 1758	44	10,309	78	2014	Highland Specialty Grains
feed	Sawtooth ²	08ID1549	41	11,063	72	2015	Idaho AES, USDA
feed	Xena	BZ594-19	46	9,861	81	2000	Highland Specialty Grains
food	CDC Fibar ²	HB373	37	12,259	65	2003	CDC University of Saskatchewan, Saskatoon
food	Julie ²	03AH6561-94	35	12,960	62	2010	Idaho AES, USDA
food	Kardia	2Ab09-X06F084-51	51	8,894	90	2016	Idaho AES, USDA
food	Transit ²	03AH3054-51	38	11,937	67	2010	Idaho AES, USDA
malt	ABI Balster	B0811	43	10,549	76	2015	Busch Agricultural Resources, LLC, Ft. Collins, CO
malt	ABI Growler	2B09-3425	43	10,549	76	2015	Busch Agricultural Resources, LLC, Ft. Collins, CO
malt	ABI Voyager	B3719	47	9,651	83	2011	Busch Agricultural Resources, LLC, Ft. Collins, CO
malt	AC Metcalfe	TR232	43	10,549	76	1994	Agriculture Canada
malt	AAC Synergy	TR09208	44	10,309	78	2015	Agriculture Canada
malt	Bill Coors 100	M150	46	9,861	81	2016	Coors Brewing Co. Inc., Burley, ID
malt	CDC Copeland	TR150	46	9,861	81	1999	CDC University of Saskatchewan, Saskatoon
malt	CDC Meredith	TR05104	44	10,309	78	2008	CDC University of Saskatchewan, Saskatoon
malt	Conrad	B5057	42	10,800	74	2004	Busch Agricultural Resources, LLC, Ft. Collins, CO
malt	Explorer		47	9,651	83		
malt	Harrington	S76333	42	10,800	74	1981	University of Saskatchewan
malt	Hockett	MT910189	44	10,309	78	2010	Montana AES
malt	LCS Genie	NSL07-8424-A	42	10,800	74	2011	Limagrain Cereal Seeds, LLC
malt	LCS Odyssey	NSL08-4556-A	44	10,309	78	2015	Limagrain Cereal Seeds, LLC
malt	LCS Opera		42	10,800	74	2016	Limagrain Cereal Seeds, LLC
malt	LCS Sienna		51	8,894	90	2016	Limagrain Cereal Seeds, LLC
malt	Merem	02Ab17271	45	10,080	79	2014	USDA ARS, Idaho AES
malt	Moravian 169	M169	43	10,549	76	2016	Coors Brewing Co. Inc., Burley, ID
malt	Moravian 69	C69	49	9,257	86	2005	Coors Brewing Co. Inc., Burley, ID
malt	ND Genesis	2ND25276	42	10,800	74	2015	North Dakota State University, NDAES
malt	SY Sirish		45	10,080	79	2016	Syngenta
Six-Row Spring Barley							
malt	Celebration	6B01-2218	35	12,960	62	2008	Busch Agricultural Resources, LLC, Ft. Collins, CO
feed	Goldeneye	UT95B1216-4087	35	12,960	62	2005	Utah AES, USDA
feed	Herald	00ID1550	37	12,259	65	2006	Idaho AES, USDA
malt	Lacey	M98	39	11,631	69	2000	Minnesota AES, USDA
feed	Millennium	UT004603	38	11,937	67	2000	Utah AES, USDA
malt	Quest	M122	36	12,600	63	2010	Minnesota AES, USDA
malt	Tradition	6B95-2482	38	11,937	67	2003	Busch Agricultural Resources, LLC, Ft. Collins, CO

¹Adjusted to plant 800,000 seeds per acre under irrigation according to the number of seeds per pound for each variety.

² Hullless

RESULTS AND DISCUSSION

Planting Conditions

The fall of 2016 provided good conditions for planting winter grain on both irrigated and dryland ground. September and October precipitation exceeded 10-year and 103-year averages (see Chart 1). Post-planting irrigation was required in irrigated trials for seed to adequately germinate and establish. The dryland conditions benefited from some September-October rains that improved the soil moisture prior to planting in eastern Idaho. Subsoil moisture was good going into the winter.

Spring planting conditions were good for stand establishment, and moisture in April was above average, resulting in excellent establishment and early growth. Timely seeding resulted in good tillering and early season growth. Wet soils from heavy winter snows delayed some planting, but most locations were seeded at similar timings to the previous year.

Weather Conditions

Natural precipitation was below the 10-year and 103-year averages in November and March during the growing season, and below in May, July and August (see Chart 1). The long, warm fall contributed to high aphid populations and the subsequent transmission of barley yellow dwarf virus, but it was not as damaging as in the previous years. Extra precipitation assisted plants in withstanding and recovering from infection. Winter temperatures, especially mid-January through April, were below average resulting in excellent snow accumulation in all elevations. Early spring rains resulted in excellent growing conditions until irrigation was available after April. Higher than expected spring rains contributed to subsoil moisture reserves, which was able to provide needed moisture to dryland grains and provide a subsoil buffer for irrigated production.

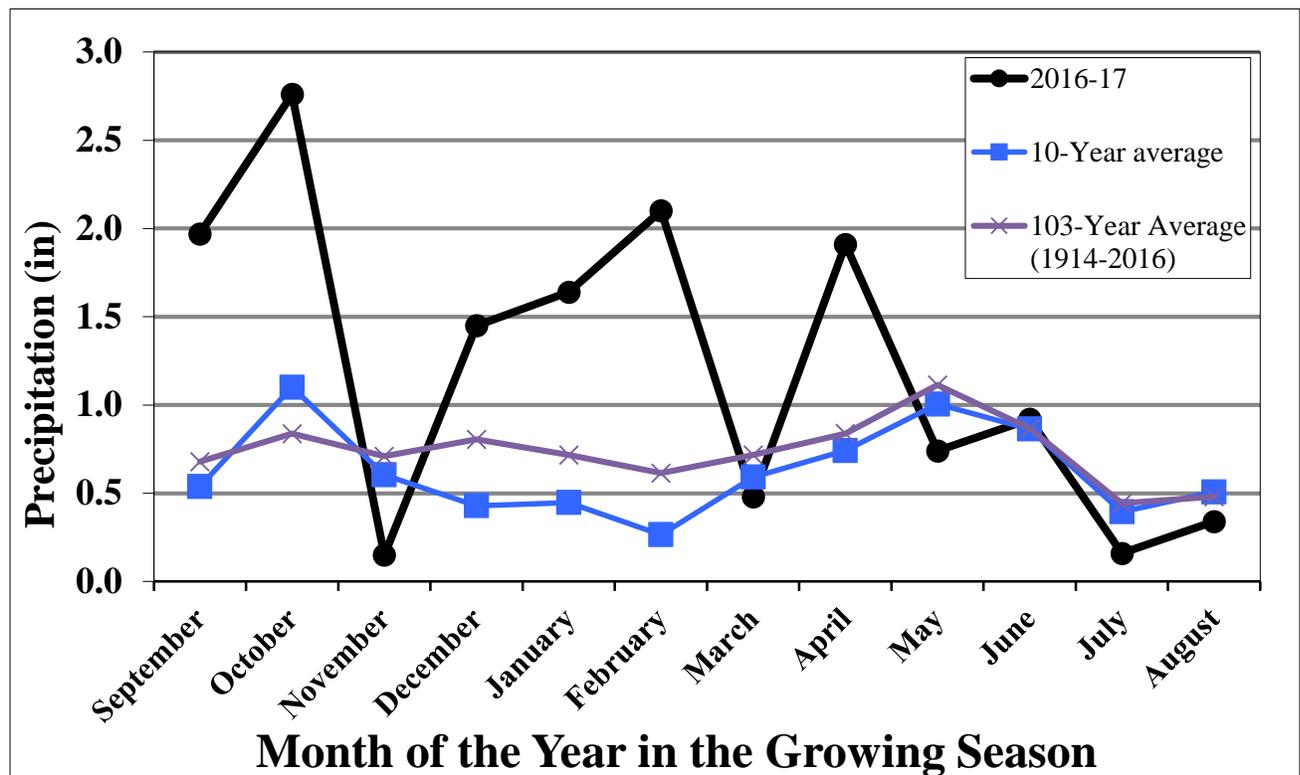


Chart 1. 2016-2017 growing year precipitation recorded at Aberdeen, ID, versus 10-year and 103-year averages. Source: NWS & Agrimet data.

The precipitation in May through August were average or below average, but there was enough subsoil moisture to finish off the dryland winter crop and in some cases, the dryland spring crop.

There was quite a lot of winter damage in irrigated winter wheat and winter barley due to unusually high snowfall amounts and repeated freezing and thawing events, resulting in large areas of ponding in late winter. The flooding was extensive enough for FEMA to issue a disaster declaration. These environmental conditions damaged the nurseries resulting in large amounts of variability. This significantly reduces the reliability of the data, resulting in the withdrawal of tables where the CV for yield was greater than 15%. The Rupert winter barley nursery was plowed and replaced with spring barley in order to reduce the impact from weeds.

A very moderate weather pattern was established in May and continued into June with temperatures being similar to the historical average, but July was hotter than average with the monthly average temperature being almost four degrees above the historical average. Heading dates for winter nurseries were similar to the average of the previous 10 years (Table 3), and spring crops were slightly earlier. Plant heights were significantly shorter for winter and spring wheat, and a little less than average for spring barley. Lodging was very low for winter and spring wheat, and relatively low for spring barley. Interestingly, trial yields for winter wheat were below average, and above average for spring wheat and barley. Test weights were all above average for winter wheat, spring wheat and barley.

While grower yields were average throughout the area, crop quality was considered excellent.

Disease and Insect Problems

Wireworms (of various species) were damaging in many areas across the entire region, reducing stand and yield of spring wheat and barley in dryland production, but the severity in 2017 was not as great as in previous years. Winter grain could be used to avoid wireworm damage as wireworms are less active in warmer, drier soils when winter wheat would be planted. However, emergence in dry soils is problematic, and winter kill increases under dry conditions. Insecticides applied as seed treatments reduce but do not control wireworms and the resultant feeding damage.

Wheat stem sawfly (*Cephus cinctus* Norton) was not as damaging in dryland spring grain when compared to previous years, but in some areas damage was estimated at close to 40%. The discovery of Hessian fly (*Mayetiola destructor* Say) in southern Idaho in 2015 raised a great deal of concern, as many of our currently grown varieties are not Hessian Fly resistant. The Hessian fly larvae were discovered in late-planted spring wheat in the Parma area, and also can damage spring barley. There were no additional reports of Hessian Fly in the 2016 nor the 2017 season.

Volunteer grain continues to contribute to green bridge conditions. Early planted winter wheat and barley suffered from barley yellow dwarf (BYD) and wheat streak mosaic virus (WSMV) infections. Stripe rust infected susceptible varieties of fall planted wheat. This facilitated carryover, especially in western Idaho to the 2017 spring grains of stripe rust and virus diseases. Overall, the growing conditions during the spring of 2017 prevented crop stress and reduced impact from virus diseases, but facilitated strawbreaker foot rot and stripe rust infection.

Stripe rust (*Puccinia striiformis* f.sp. *tritici*) may have overwintered near the Oregon –

Idaho border, and was found in Brundage soft white winter wheat and in susceptible spring wheat varieties, even under dryland conditions. Surprisingly, it did not spread as much as expected, especially given the extra precipitation through early spring in many production areas. Susceptible spring wheat became severely infected late in the season, resulting in 20-25% yield loss compared to fungicide treated plots. Actively scouting fields of susceptible varieties is highly recommended in order to identify infection as early as possible. Fungicides can then be applied to prevent yield loss especially should stripe rust infect wheat plants prior to flowering. Susceptible varieties, such as Brundage, may need two fungicide applications to control stripe rust. Two-rowed barleys tend to have greater levels of resistance to stripe rust than do the six-rowed varieties, but little to no barley stripe rust was found in 2017.

Barley scald (*Rhynchosporium secalis*) did not reach the damaging levels of the previous years and was seen at very low levels. In most years, low levels of early season scald infection do little to affect the barley crop and yield, and can be ignored. Previous years (2009-2011) were not by any means typical, and scald ran rampant in fields in 2009 where application of fungicides would have prevented significant crop loss. This will be a disease to watch in future years, especially as production of winter barley increases the chances of high levels of disease developing which then may affect early development in spring barley. Barley scald will also increase in minimum and no-till situations where the fungus may reside in residue.

Strawbreaker foot rot (formerly *Pseudocercospora herpotrichoides*) is usually a stem-based disease in winter wheat and barley, but in some years, like last spring, can be found in spring wheat and barley. Infection occurs from residue-borne fungi when there is excess moisture,

humidity and cool temperatures through the winter and spring. Characteristic elliptical lesions form at the lower nodes of the stem, weakening the tiller and increasing lodging. This disease is exacerbated by rainy spring conditions and successive years of grain production. High rates of nitrogen also promote the disease, especially when applied alone without other 'balancing' nutrients. The most effective means of reducing this disease is through crop rotation. However, if detected early in the spring, this disease is reduced with the application of benomyl fungicides like Benlate, Topsin M, or Mertect.

Fusarium spp. causing foot rot, some **Rhizoctonia spp.** and **Take-all** (*Gaeumannomyces graminis* var. *tritici*) were prevalent in areas where grain followed grain. Where irrigation was not increased to compensate for moisture deficits, dry land foot rot was present but not severe. There were several spring wheat fields with severe Pythium and Rhizoctonia infections that occurred when volunteer plants were killed with herbicide immediately prior to planting. It is highly recommended that burn down of volunteer grain happens in the fall prior to winter conditions, or at least two to three weeks prior to spring sowing. Diseases from dying grain can cause a great deal of damage to the developing roots and seedlings of the newly planted crop.

Luckily, growing conditions in 2017 were not conducive to grain infections of **Fusarium head blight (FHB)** (also called Head Scab, causal organisms *Fusarium graminearum* and other *Fusarium* spp.). While there were some localized problems in spring wheat and spring barley, especially in fields planted in and near corn residue, overall the environment was not conducive to widespread FHB infection. A significant problem in 2015, FHB reduced yields and contaminated grain with toxins over multiple years - in 2011, 2012, 2014 and

2015. In 2015, *Fusarium graminearum* was widespread but **was not** restricted to where wheat follows corn production. This disease was also severe where spring barley followed corn, as the fungus reproduces extensively on corn residue. Rejectable levels of deoxynivalenol toxin, (abbreviated as DON and also called VOM, short for vomitoxin), which is a by-product of the fungal infection process, contaminated 2015 malt barley. It is highly recommended that irrigated spring grain be treated with an appropriate fungicide at flowering to reduce infection, especially when a hard white or hard red spring wheat or barley follows corn production. It is essential that a **triazole** fungicide be utilized, as strobilurin fungicides are ineffective in reducing the accumulation of toxins. (See Addendum 6 for 2017 data of spring wheat reaction to FHB infection, and Addendum 7 for spring barley.)

The “**Spot Form of Net Blotch**” (SFNB) of barley *Pyrenophora teres* f.sp. *maculata* was first diagnosed in a few fields near Blackfoot in 2013. In 2014, SFNB became severe in many areas throughout Idaho and Montana. This disease occurs widely in North Dakota and can reduce yields by up to 50% and grain weight by 20%. SFNB was still problematic in 2015, especially in no-till situations, but was not as severe in 2015, and was at a very low incidence and severity in 2016 and 2017. Areas that have reduced tillage and low crop diversity are at increased risk as this disease survives in barley stubble. Some varieties are more susceptible than others. Crop rotation and fungicide applications significantly reduce the impact of this disease. Fields that had been sprayed with fungicides at herbicide timing have been observed to have significantly less disease. Additional testing to develop control recommendations in our environment is required.

Cereal cyst nematode (*Heterodera avenae*) (CCN) damage was extensive in spring

wheat and spring barley fields in the northern Snake River Plain, with visible damage in crops from Rexburg, Plano, and St. Anthony through the Ashton area. CCN affects all grassy crop species, and can even infect grassy weeds. Research conducted in St. Anthony with Dr. Richard Smiley (Professor Emeritus, Oregon State University) identified resistant and tolerant varieties of spring wheat and barley, and was published in 2015. Results of those screening trials are presented in Addenda 8 for wheat and 9 for barley. Crop rotation to broadleaf crops will reduce CCN populations in the soil.

Green Bridge, 2016 to 2017.

A “green bridge” is generally defined as the overlap of different cropping cycles (or crop generations) within a year. This means there is a constant availability of living, green host material of a given crop. This occurs in many locations in southern and southeast Idaho for several reasons: 1) late maturing tillers (in 2010) winter wheat stay green and growing even after harvest; 2) windy conditions causes shattering of spring grains (in 2010) prior to complete maturity of the crop; 3) hail storms induce shattering of grains prior to crop maturity. Shattered grain germinates and results in the continuous presence of living host material, which means there is a constant supply of host plant material for disease-causing organisms and insects; 4) In most years, volunteer grain blown out of the combine at harvest germinates and provides a green bridge, increasing the likelihood and risk of higher disease and insect problems for the next growing season. Many growers use the volunteer growth as feed or forage for livestock, but can result in extensive carryover of pathogenic organisms from year-to-year.

Other examples include heavy, unusual rains in August of 2014 prior to harvest, which resulted in extensive losses due to sprout but also set up green bridge conditions when

grain shattered and germinated before harvesting of the 2014 crop could occur. Because of the green bridge, aphids and certain disease causing organisms can jump to the emerging winter crop, causing direct damage and / or transmitting viruses. In 2015, many growers irrigated the volunteer for forage. With an early harvest and a long warm fall of 2015, the volunteer from the spring crop was in grain fill prior to a killing frost in November. The green bridge situation resulted in extensive BYD and stripe rust infection in the fall volunteer. Once again, in the fall of 2014, 2015 and 2016, high populations of aphids moved into the earliest emerging winter wheat and barley, contributing to a widespread occurrence of BYD in southern Idaho. Corn is a 'silent' host of barley yellow dwarf virus, hosting high concentrations of the virus without symptoms or damage to corn. Late in the fall season, aphids (especially English grain aphids and Bird-cherry oat aphids) move from corn to winter cereals, landing on the newly emerged grain and transmitting the virus to the new crop. Aphid populations may build up before a killing frost occurs. Severe stunting and yellowing of grain in the spring becomes apparent, resulting in yield reductions of over 50% in the most severely affected fields. However, in the spring of 2017, lower levels of fall transmission and excellent growing conditions prevented widespread losses from BYD.

2017 Report: Discussion of Location Conditions and Results

Kimberly Research and Extension Center, Winter Grain

Winter wheat nurseries were planted late behind sugar beets – and were planted into drier than optimal conditions. Fall rains were timely, right after planting and precluded the need to irrigate the winter trial immediately following planting. Soils were well-prepared and soil moisture was adequate for fall germination. The crop

suffered a little winter damage and was planted late enough (October 13, 2016) to avoid BYDV infection. Stripe rust was not damaging. Soft white winter wheat yields were about 32 bu/A less than 2016, while hard winter wheat yields were about 20 bu/A less than 2016. Plots were harvested July 28th, and July 30th, similar to the 2016 harvest. NASS reports that Idaho 2017 wheat yields at 80 bu/A were more in line with 5-year averages, but well below the record-breaking yields in 2016. However, quality was reported as excellent.

The hard winter wheat group (Table 25) yield ranged from 117 to 159 bu/A. LCS Jet, Keldin, and Northern were the highest yielding varieties, yielding 159, 152 and 148 bu/A, respectively. The mixed planting of Norwest 553 and Yellowstone yielded 155 bu/A, second in yield in the nursery, planted with the objective of having Yellowstone in place to protect against the winter tender Norwest 553. Planted alone, Norwest 553 spring stand was 92%. Planted together, spring stand was 100%. In many years, Norwest 553 suffers extensive winter-kill. Planted in a dual mix, a grower could hedge bets between the winter hardiness of Yellowstone, the stripe rust resistance of Norwest 553, while combining the high yield potential of both. Site average for yield of the hard winter group was 136 bu/A, similar to 2016 but 20 bu less than 2016. Test weight average was 62.7 lbs/bu, excellent for winter wheat, and grain protein average for the location was 11.5%, even with total N available at 309 lbs N/acre. Optimal grain protein for hard red winter wheat should be 12.5% or greater. The ratio of applied N to (average) bu/A yield was 2.3, below the 3.0 to 3.5 ratio needed for optimal protein in hard winter wheat.

Averaged over all irrigated locations, the highest yielding hard winter wheat varieties in 2017 (Table 18) were Keldin (155 bu/A), Norwest 553/ Yellowstone blend (150 bu/A), Yellowstone (147 bu/A), and LCS Jet (144

bu/A). The hard white winter wheat W3768 yield of 143 bu/A was not significantly different from the above yields. **Three-year averages** over all locations (Table 4) put LCS Jet, Keldin, Yellowstone and Norwest 553 at the top with 144, 138, 134 and 133 bu/A, respectively. Taking a look at combined irrigated averages for 2017 (Table 18), Keldin, Norwest 553/ Yellowstone blend, Yellowstone, and LCS Jet, yielded 155, 150, 147, and 144 bu/A, respectively.

In the soft white winter group (Table 31), yield varied from 80 to 143 bu/A, a wider range than average with high CV's for the location. Bruneau (140 bu/A), UI Sparrow (127 bu/A), SY Assure (125 bu/A) and SY Ovation (119 bu/A) were the highest yielding varieties. Test weight averaged 60.9 lbs/bu, and grain protein average for the location was at 9.3%, lower than optimal even with a total of 281 lbs available N in the nursery (see site description on page 6). Average yield for soft white winter wheat nursery was 136 bu/A, which calculates to 2.1 lbs of nitrogen per bushel of yield.

Bruneau, Bobtail, Norwest Duet and SY Dayton were the top named varieties in the **combined irrigated trials in 2017** at 150, 142, 137 and 136 bu/A, respectively (Table 19). The top yielding soft white winter varieties **over the last three years** over all locations (Table 5) are Bobtail (138 bu/A), SY Ovation (138 bu/A) and Bruneau (135 bu/A). Average dryland yields for soft white winter were 51.4 bu/A, with the top yielding varieties included WB1783 (66 bu/A, Otto (64 bu/A), and Norwest Tandem (63 bu/A).

Rupert, Luke Adams, Winter Grain

Plots were planted Oct 4th in silt loam soil following sugar beets into good soil moisture. Spring stands of the winter wheat nurseries were good, with some damage from excessive snow and freeze-thaw cycles. However, this resulted in extensive damage and the removal of the entire winter barley nursery that was in a low area of the field.

There were no visual symptoms of BYD occurring at this site. Plots were harvested July 27th.

Average yield for the hard winter wheat trial (Table 26) was 131 bu/A, 38 bushels greater than 2016. Yield ranged from 109 (XA4104) to 156 bu/A for Keldin. Test weight averaged 62.5 lbs/bu, and protein averaged 11.5%. The ratio of average yield to total N was $259 / 131.3 = 2.0$, below the 3.0-3.5 recommended to obtain high protein hard red winter wheat. Keldin, WB3768, WB4303 and LCS Jet were the highest yielding named lines at 156, 149, 146 and 143 bu/A, respectively. Stripe rust did not significantly impact yield, and there was no lodging. The ratio of available and applied N (259 lbs N/A) to average bushel yield (131.3) was 2.0 lbs N/bu. As a result, the proteins were lower than optimal with the trial average at 11.5%.

The soft white winter group (Table 32) ranged in yield from 113 to 158 bu/A. The highest yielding varieties were Bobtail (158 bu/A), Bruneau (152 bu/A), Norwest Duet (147 bu/A), and UI Castle (147 bu/A). Test weights were below 60 lbs/bu, averaging 59.7 lbs/bu. The ratio of available and applied N (219 lbs N/A) to average bushel yield (134) was 1.6 lbs N/bu. As a result, the proteins were lower than optimal with the trial average at 9.2%. There was no lodging in the soft winter wheat nurseries.

Aberdeen Research and Extension Center, Winter Grain

The winter trials in Aberdeen were planted October 5th and harvested August 7th and 8th. BYD was not observed in the winter grain. The preceding crop was green manure oats.

The winter barley at Aberdeen had extensive winter damage this year, and average spring stands were at 8-76%. The plots were irrigated in the fall, to reduce the compounding effect of cold temperatures with drought that increases winter-kill, but

with high snow fall and several freeze-thaw cycles, the spring stand was significantly reduced. This was the only surviving winter barley nursery, so the results are reported even though the CV's are too high for reliable results. Yields were as high as 170 bu/A with an overall average of 119 bu/A (Table 37), 21.6 bu/a less than the previous year. High yielding varieties included Schuyler (170 bu/A), Thunder (165 bu/A), Voyel (156 bu/A) and Delicatesse (154 bu/A). Charles and Endeavor, two winter malt varieties, yielded 102 and 112 bu/A, respectively, with poor spring stands (43 and 35% stand, respectively). Test weight averaged 50.7 lbs/bu, with only slight lodging, and grain protein averaged 11.8%. The ratio of applied N to average bushel yield was 2.5 lbs N/bu.

The hard winter wheat survival (Table 27) averaged 82%. Overall yields were higher than from 2016 by 34 bu/A, probably due to later planting to avoid BYD damage. Lodging was unusually low at 0%. Stripe rust did not significantly impact yield. The highest yielding line was WA8252, an advanced hard white winter from the Washington State breeding program. The 50/50 mix of Norwest 553 and Yellowstone yielded 168 bu/A, while the other high yielding lines included Yellowstone (163 bu/A), and Keldin (163 bu/A). For an internal "Quality Control" (QC) Keldin was included twice as Keldin QC – from this as well as from the CV you can estimate the degree of variability of the test. The CV for this trial is low (7.9%) as indicated by the two separate entries of Keldin yielding closely at 163 and 156 bu/A. Test weights were very good at 61.6 lbs/bu for overall average. Grain protein averaged 13.1%. The ratio of applied N to average bushel yield was 2.8 lbs N/bu.

The overall yield average in the Aberdeen soft white winter trial (Table 33) was 144 bu/A, 7 bu/A greater than 2016, ranging from the low of 125 bu/A (LWW14-71195)

to a high of 160 bu/A. The highest yielding named varieties were Bobtail (160 bu/A), Norwest Duet (159 bu/A), Bruneau (157 bu/A), SY Dayton (156 bu/A) and WB1783 (155 bu/A). The test weights averaged at 59.6 lbs/bu and the overall grain protein was at 11.5%. The ratio of applied N to average bushel yield was 2.1 lbs N/bu. There was no lodging.

Ririe, LDS Church Farm, Trevor Davey, Winter Wheat

This is a high elevation location (5500 ft.) and is our main location to test grain for winter hardiness under dryland conditions. Soil moisture was good down to two feet when grain was planted September 28th. Grain was planted into moisture at 1.25 to 1.5 inches deep. Similar to the past couple of years, symptoms of physiological leaf spot (PLS) began to appear at flag leaf emergence and increased in severity. (The second year of PLS testing occurred at this location for variety and fertilization response to KCl.) For 2017, the spring stand for winter wheat (Tables 28 and 34) was good, but yields were lower than the previous two years. The average of 31 bu/A for hard wheat was 11 bu/A less than 2016, as was soft winter wheat at 33 bu/A for 2017. The trials were harvested August 1-2nd.

The hard winter wheat group (Table 28) had average yields of 31 bu/A, in comparison to 2016 at 42 bu/A, 2015 at 45 bu/A, 2014 at 21 bu/A, 2013 at 15.5 bu/A, and 2012 at 18 bu/A. The 2017 yield range went from a low of 21 bu/A to a high of 41 bu/A (Eltan soft white winter was included as a check and was the highest yielding variety). Juniper, Utah 100, UI Silver, Deloris and UI SRG were the top yielding hard winter wheat varieties, at 38, 38, 38, 37 and 36 bu/A, respectively. Average grain protein was low at 11.4%, reflecting inadequate nitrogen levels to meet yield or protein in this season. Test weights were excellent and averaged 63 lbs/bu. There was no lodging. The ratio of

applied N to average bushel yield was 1.1 lbs N/bu.

WB3768 (hard white), SY Clearstone CL2, UI SRG and Keldin with in-furrow 11-52-0 were the highest yielding hard wheats when averaged under Ririe and Rockland dryland conditions, with trial averages at 48.2 bu/A. Soda Springs yields were significantly higher, averaging 72 bu/A, and was not included in the average for dryland trials. Dryland yields **averaged over all locations and 3 years** (Table 7) averaged 53.2 bu/A, with the top yielding varieties including SY Clearstone 2CL, UI Silver, Yellowstone, WB3768 and Curlew (61, 60, 59, 59 and 57 bu/A, respectively).

The soft white winter wheat (Table 34) yields varied from 24 bu/A to 41 bu/A, with the site averaging 33 bu/A, 11 bu/A less than 2016. Average proteins were low for this soft group at 10.0%, but test weights were excellent and averaged 61.1 lbs/bu. The ratio of applied N to average bushel yield was 1.4 N/bu. The top-yielding varieties were Otto, Norwest Duet, Jasper, SY Ovation, and UI Sparrow (41, 40, 38, 37, and 37 bu/A, respectively). Over the **past three years**, the top yielding soft white winter varieties over three locations (Table 8) were UI Sparrow, Bobtail, Otto, Jasper, and Bruneau yielding 71, 68, 67, 66 and 64 bu/A, respectively. The three-year average for grain protein was at 10.0%. Test weights were 58.3 lbs/bu, and average plant height was 27 inches.

Rockland, Gilbert and Carl Hofmeister, Hard and Soft White Winter Wheat

The hard red and white winter wheat trial at the Hofmeisters' was planted September 29th and harvested August 24th and 25th. Snow mold diseases were not a significant problem, and spring stands were good for hard winter wheat (Table 29) and soft winter wheat (Table 35). Dwarf bunt (*Tilletia controversa* Kuhn) was not a problem this year, but all winter varieties were included in dwarf bunt testing in Logan, UT, by Dr. David Hole, Utah State University professor

and wheat breeder. Results of the dwarf bunt variety trial screening are in Addendum 1. When using varieties that are susceptible to dwarf bunt, it is highly recommended that an appropriate seed treatment is used to prevent dwarf bunt infection.

The hard winter wheat yield average was 42 bu/A, a little lower than the 2016 yield average of 43, the 2015 average of 47, and greater than 2014 at 37 bu/A. Previous years' yield averages include 2013 at 18 bu/A, 2012 at 30 bu/A, 2011 at 27 bu/A, and 2010 yield average of 39 bu/A. The 2017 yield ranged from 35 to 60 bu/A. The top yielding varieties this year were LCS Jet (60 bu/A), Keldin (52 bu/A), and UICF Grace (50 bu/A). The Keldin + 11-52-0 included an in-furrow application of monoammonium phosphate at 20 lbs phosphate per acre, but yields (48 bu/A) were not significantly different than Keldin without the in-furrow fertilizer. The ratio of available and applied N (105 lbs N/A) to average bushel yield (41.8) was 2.5 lbs N/bu. As a result, the grain proteins were low (8.4%), indicating a deficit in available nitrogen.

A small soft white winter nursery was included at this location, which is well-suited for hard winter wheat production. The soft white winter varieties Jasper, SY Banks, SY Command, WB1604 as well as two advanced lines from Washington (WSU) averaged 36 bu/A (Table 35). Jasper yielded 44 bu/A and SY Banks yielded 43 bu/A. The test weights were low, averaging 58.4 lbs/bu, as was grain protein at 8.4%, below the optimum for soft white winter, indicating a deficit of available N in the soil. There was no lodging.

Soda Springs, Mark and Craig Ozburn, Dryland Winter Wheat

The two small dryland winter wheat trials of both hard and soft winter wheat were increased to full nurseries at Soda Springs at the request of area growers. The trial was planted September 29th and harvested

August 24th and 25th. Fifty-one varieties of hard red and hard white wheat were included as well as one check with in-furrow phosphorus fertilizer and two variety blends. Thirty-two soft white winter wheat varieties were included in a separate nursery.

Fall germination was good resulting in an average 92-94% spring stand. A dry summer resulted in yields about 20 bu/A less than in 2016 and very high CV's. Average yield for the hard red nursery was 72 bu/A (Table 30). Protein average was 11.8%, and test weight was 60.4 lbs/bu. There was no lodging. Highest yielding hard varieties included WB3768 (97 bu/A), Keldin with 11-52-0 (90 bu/A, 28 bu/A higher than Keldin with no preplant 11-52-0), UI SRG (90 bu/A), and the 50/50 blend of Norwest 553 and Yellowstone (89 bu/A). Test weights were good at 60.4 lbs/bu and proteins were low (11.8%). The ratio of available and applied N (118 lbs N/A) to average bushel yield (72.2) was 1.6 lbs N/bu. As a result, the proteins were low with the trial average of 11.8%.

Average yield for the soft white winter (Table 36) wheat was 76 bu/A, with 58.2 lbs/bu test weight and 10.5% protein. There was no lodging. High yielding soft whites included WB1783 (97 bu/A), Norwest Tandem (92 bu/A), Otto (87 bu/A), UI Sparrow (87 bu/A) and Eltan (87 bu/A). The ratio of available and applied N (118 lbs N/A) to average bushel yield (76.4) was 1.6 N/bu. As a result, the proteins were low with the trial average of 10.5%.

If risking planting winter wheat in this area, it is highly recommended that varieties with snow mold tolerance and dwarf bunt resistance be grown. Varieties susceptible to dwarf bunt should only be grown following appropriate seed treatments for dwarf bunt control.

Rupert, Duane Grant 4-D Farms and Alan Mohlman, Spring Grain

The variety trials in Rupert were planted April 12th and harvested August 10th and 11th. The preceding crop was sugar beets. There were no major weather-related problems. County temperature average for June was 3.2° F warmer than average, and July was 5.3° F higher than average.

There was no lodging for the **hard spring wheat** nursery (Table 38). Average yield was 110 bu/A, compared to 125 bu/A in 2016, and 105 bu/A in 2015. Test weight average was 60.6 lbs/bu, and average protein was at 14.2%. The top yielding named varieties were Dayn (127 bu/A and 13.9% protein), SY Teton (123 bu/A and 13.7% protein), SY Coho (122 bu/A and 13.9% protein), and LCS Iron (119 bu/A and 13.5% protein). The ratio of available and applied N (365 lbs N/A) to average bushel yield (109.9) was 3.3 lbs N/bu. The average grain protein for this trial was 14.2%.

Over **three years over all locations**, the highest yielding varieties under irrigation (Table 9) were Dayn (hard white spring wheat at 125 bu/A), SY Teton (hard white at 119 bu/A), SY Basalt (hard red at 114 bu/A), and LCS Iron (hard red at 112 bu/A). The average 3-year test weight was 61.6 lbs/bu, and the average grain protein was 14.5%. High protein lines were WB9668 (16.3%), WB9411 (15.3%) and WB7328 (15.5%). The 2017 combined irrigated average for hard spring wheat (Table 20) was 107 bu/A. Dayn averaged 130 bu/A, SY Teton 118 bu/A, and SY Coho 117 bu/A.

The **soft white spring wheat** yield (Table 43) average was 119 bu/A. In 2016 it was 124 bu/A, in 2015 it was 105 bu/A, and in 2014 the average yield at the Rupert location was 130 bu/A. In 2017, Tekoa yielded 130 bu/A at 9.4% grain protein, UI Stone yielded 128 bu/A at 9.9% protein, Alturas yielded 125 bu/A at 13.4% protein. Grain protein average was at 10.8%. The ratio of available and applied N (255 lbs N/A) to average bushel yield (109.9) was 2.3 lbs N/bu.

Three-year averages over all locations (Table 10) put UI Stone at the high yield (121 bu/A), followed by WB6430 (119 bu/A), and Seahawk (118 bu/A). The 2017 combined irrigated average for soft white spring wheat (Table 21) was 121 bu/A. Tekoa averaged 130 bu/A, Alturas 128 bu/A, and Seahawk 125 bu/A.

The **six-row spring barley** trial at Rupert (Table 48) had average yields of 136 bu/A, about 8 bu/A less than 2016, with a yield range from 113 to 149 bu/A. Lodging was greater in the malt lines than the feed lines, averaging 11% overall. Lacey six-rowed was the top yielding malt barley (142 bu/A), and Herald was the highest yielding (named) feed barley (147 bu/A). Test weights averaged 50.0 lbs/bu, proteins were 10.5%, and percent plumps were 96%. The ratio of available and applied N (255 lbs N/A) to average bushel yield (109.9) was 2.3 lbs N/bu.

Over three years, Goldeneye and Millennium were the highest yielding feed varieties (Table 11) at 141 and 144 bu/A, respectively, and Lacey was the highest yielding malt variety at 128 bu/A. In the combined 2017 irrigated trials (Table 22), the top yielding named varieties were Millennium (153 bu/A), Goldeneye (149 bu/A), and Lacey (141 bu/A).

Two-rowed malt barley yields (Table 52) at the Rupert location averaged 138 bu/A, compared to the 2016 average of 150 and the 2015 average of 119 bu/A. Previous year's yields are 2010 average of 122 bu/A, 2011 average of 108 bu/A, 2012 average of 135 bu/A, 2013 at 120 bu/A and the 2014 average of 140 bu/A. Yields varied from 117 (Hockett) to 159 bu/A. The new varieties LCS Odyssey (159 bu/A) and ACC Synergy (156 bu/A) had the highest yields followed by ABI Balster (153) and LCS Genie (148 bu/A). The ratio of available and applied N (255 lbs N/A) to average bushel yield

(138.2) was 1.8 lbs N/bu with an average site grain protein of 12.2%.

Three-year averages for the malt varieties (Table 12) puts LCS Odyssey, ABI Voyager, ACC Synergy, and ABI Balster at the top (140, 136, 136, and 135 bu/A, respectively). Taking a look at **combined irrigated averages** for 2017 (Table 23), Moravian 169, ABI Voyager, ABI Balster, and LCS Odyssey yielded 140, 137, 136, and 136 bu/A, respectively.

The average yield for two-rowed feed barley in Rupert for 2017 (Table 56) was 14 bu/A less than 2016, but 20 bu/A greater than 2015. The high yielding two-rowed feed varieties were Claymore (153 bu/A), Oreana (152 bu/A), Xena (146 bu/A) and Altorado (142 bu/A). Average test weight for this trial was high for hulled lines (52.9 lbs/bu). The hullless, high beta-glucan food barleys Julie, CDC Fibar, and Transit yielded 115, 96, and 97 bu/A but also had high test weights (58, 58.6 and 58.4 lbs/bu, respectively). Sawtooth and Clearwater are hullless feed barleys with low-phytate endosperm, and yields were 125 and 99 bu/A respectively. For these feed barleys, the ratio of available and applied N (255 lbs N/A) to average bushel yield (128.1) was 2.0 lbs N/bu with an average site grain protein of 11.9%.

The feed varieties Claymore, Xena, Oreana, and Lenetah were the top yielding feed lines **over three years** and all irrigated locations (Table 13) at 148, 140, 138 and 137 bu/A, respectively. In 2017, the highest yielding varieties under irrigation (**combined irrigated** results in Table 24) included Claymore (154 bu/A), Oreana (146 bu/A), Altorado (141 bu/A), and Xena (139 bu/A).

Aberdeen Research and Extension Center, Spring Grain

Spring variety trials were planted April 13th and plots were harvested August 17th and 18th. The preceding crop was green manure oats. Stripe rust of wheat was present late in

the season and there were some yield impacts in the susceptible varieties. The CV's for the Aberdeen spring trials were very low, with the CV for the hard spring wheat nursery at 5% for yield. The top three varieties for yield in the hard red and white trial (Table 39) were the hard white spring Dayn (140 bu/A), and the hard reds SY Gunsight (124 bu/A), and SY Basalt (121 bu/A). Test weights for the hard spring wheat's averaged 60.3 lbs/bu. There was no lodging and the grain protein average was 14.1%. (All hard spring wheat trials are top-dressed at flowering with 40 units of N to promote higher protein hard spring wheat.) The high protein wheats included Alum (16.2%), WB9668 (15.7%), SY Coho (15.1%) and Alzada (durum 15.0%). The ratio of available and applied N (362 lbs N/A) to average bushel yield (112.0) was 3.2 lbs N/bu with an average site grain protein of 14.1%.

The soft white spring wheat yields at Aberdeen (Table 44) averaged 124 bu/A with a range from 104 (WB6121) to 134 bu/A. Highest yields of named varieties were obtained from Seahawk (134 bu/A), Melba (club at 134 bu/A), Tekoa (133 bu/A) and UI Stone (129 bu/A). Test weights averaged 61.1 lbs/bu and grain protein averages were 11.2%. The ratio of available and applied N (253 lbs N/A) to average bushel yield (124.0) was 2.0 lbs N/bu with an average site grain protein of 11.2%.

Six-row barley in Aberdeen (Table 49) averaged 154 bu/A, slightly more than 2016 (151 bu/A) and greater than 2015 (127 bu/A). Yields ranged from 121 bushels to 170 bu/A. Millennium and Goldeneye were the two top yielding feed barley varieties, at 170 and 165 bu/A. For the six-row malt lines, Tradition, Lacey, Quest and Celebration yielded 153, 151, 134, and 129 bu/A, respectively. Grain protein for the malt lines was not highly variable, ranging from 10.8% to 11.9%. Test weight was 49.8 lbs/bu. The ratio of available and applied N

(253 lbs N/A) to average bushel yield was 1.8 lbs N/bu with an average site grain protein of 11.3%.

Two-rowed malt barley lines averaged 132 bu/A (Table 53), a little lower than 2016, and ranged from 104 (AC Metcalfe) to 157 bu/A. The top yielding lines were LCS Odyssey (157 bu/A), LCS Sienna (157 bu/A), LCS Opera (154 bu/A), Conrad (150 bu/A) and SY Sirish (150 bu/A). Grain protein averaged 12.2%. The ratio of available and applied N (253 lbs N/A) to average bushel yield (132 bu/A) was 1.9 lbs N/bu with an average site grain protein of 12.2%.

For the feed varieties (Table 57), Claymore, Xena, Oreana, and Idagold II yielded 163, 159, 156 and 152 bu/A, respectively. Test weight averaged 52.8 lbs/bu for hulled lines and 56.5 lbs/bu for hullless lines. Hullless lines Julie, Sawtooth, Clearwater, Transit, and CDC Fibar yields were 128, 118, 116, 103, and 99 bu/A, respectively. Lodging averaged 8% and grain protein 11.4% (hulled). These trials were not treated with growth regulators. The ratio of available and applied N (253 lbs N/A) to average bushel yield (136 bu/A) was 1.9 lbs N/bu with an average site grain protein of 12.3%.

Idaho Falls, Marc Thiel, Spring Grain

The Idaho Falls location followed potatoes, was planted April 11th and harvested August 23rd. The surrounding field was in wheat. The six-rowed barley (Table 50) averaged 170 bu/A, about 56 bu/A more than 2016. High yielding varieties include the advanced numbered line UTSB10905-72 at 204 bu/A, the malt lines Lacey at 178 bu/A, and feed barley Millennium at 177 bu/A. Test weight averaged 48 lbs/bu and proteins were averaging 10.6%. The ratio of available and applied N (195 lbs N/A) to average bushel yield (170) was 1.1 lbs N/bu, below optimum.

Two-rowed malt barley yields (Table 54) averaged 134 bu/A, about 18 bu/A more than in 2016. Harrington yielded 104 bu/A while the highest yielding variety (ND Genesis) hit 170 bu/A. Top yielding named varieties included ND Genesis (170 bu/A), ABI Voyager (159 bu/A), ABI Balster (156 bu/A), and CDC Copeland (147 bu/A). Test weight average was 48.0 lbs/bu, protein average was 11.3% and lodging was 58%. The ratio of available and applied N (195 lbs N/A) to average bushel yield (133.6) was 1.5 lbs N/bu with an average site grain protein of 11.3%.

Two-rowed feed barley trial (Table 58) averaged 132 bu/A, with the top yielding lines averaging 169 bu/A (Claymore), 157 (Oreana), 147 (Altorado), and 139 bu/A (Harriman). The test weight average for the feed lines was 48.9 lbs/bu and protein average was 10.9%. The presence of hulless food barleys in the trial will pull the test weight averages higher so they were averaged separately. Test weight of the hulless lines averaged 53.7 bu/A and the protein was at 12.4%. The ratio of available and applied N (195 lbs N/A) to average bushel yield (132.3) was 1.47 lbs N/bu with an overall average site grain protein of 11.4%.

Average grain yield for the hard spring wheat (Table 40) was 126 bu/A, which was 38 bushels greater than the average in 2016 of 88 bu/A. Hard spring wheat ranged in yield from 101 (Snow Crest) to 148 bu/A (WestBred advanced line XA9301). Average grain protein was at 14.8%, and test weight was at 61.2 lbs/bu. The four highest yielding named varieties were Dayn hard white (147 bu/A and 14.5% protein), WB9518 (144 bu/A and 14.8% protein), SY Coho (136 bu/A and 15.7% protein) and WB9411 (135 bu/A and 15.7% protein). Lodging was low (1%) and grain protein averaged 14.8%. The ratio of available and applied N (326 lbs N/A) to average bushel yield (126.0) was 2.6 lbs N/bu. For premium

protein levels, a range of N to expected bushel of yield for hard spring wheat ranges from 3 to 3.5. That ratio occurred for the low yielding varieties, but not at the higher yields. For example, the highest yielding line (XA9301) yielded 148 bu/A but had low protein at 12.9%. The N applied to yield ratio was only 2.2 lbs N/bu. Additional nitrogen would have improved grain protein, especially if applied at flowering.

WB6430, Alturas, and WB6341 topped the yield chart (Table 45) for the soft white spring wheat varieties at Idaho Falls at 148, 148, and 146 bu/A, respectively, with an overall average of 138 bu/A, 47 bu/A greater than the previous year (2016). Yields ranged from 121 bu/A (Louise) to 148 bu/A. Test weights were good at 61.8 lbs/bu, and grain proteins were at 11.2%. The ratio of available and applied N (195 lbs N/A) to average bushel yield (138.1) was 1.4 lbs N/bu.

Ashton, Alan Baum, Spring Grain

The Ashton location was planted May 4th. The preceding crop was potato. Stripe rust was also present in most areas of the upper valley, but in most cases was not severe. Plots were harvested August 30th – 31st.

Two factors are important in plant health and reducing yield potential (above stripe rust impacting crop) in this area. Soil pH can be low, sometimes below 6 which can contribute to high micro-nutrient accumulations (magnesium, manganese, iron and boron). This location was good at pH 6.4. Other fields in the area demonstrated symptoms of leaf necrosis (browning) as the pH varied from 5.3 to 6.0. In addition, high levels of nematode damage were found throughout the region, from Ashton through St. Anthony, to Rexburg and Plano. Both factors contribute to general unthriftiness, stunting, reduced tillering and yellowing of wheat and barley. Soil amendments such as lime should help reduce the toxic accumulation of

micronutrients, but crop rotation to broadleaves is the only way to reduce the impact of cereal cyst nematodes (CCN). There are different levels of resistance and tolerance in our spring wheat and barley varieties. The results from screening trials conducted in St. Anthony are provided in 2016 Small Grains Report available online <http://www.uidaho.edu/extension/cereals/scs/uidaho/sgr>.

The average yield for the hard spring wheat (Table 41) was 83.3 bu/A, compared to 2016 at 88 bu/A, 2015 at 94 bu/A and 2014 at 100 bu/A. The range in yield varied from 48 bu/A (Snow Crest hard white spring) to 113 bu/A (advanced hard red 12SB0224). Test weights were high at 63.0 lbs/A, and protein averaged 16.6%. The high yielding varieties were Alum (108 bu/A), Dayn (106 bu/A), SY-Teton (100 bu/A) and WB-Paloma (95 bu/A). The highest proteins were seen in WB9668 (19.4%), WB7328 (18.9%), and WB9518 (18.3%). Lower yielding varieties would have extra nitrogen for higher protein, but even the highest yielding varieties were above 15% grain protein. The ratio of available and applied N (224 lbs N/A) to average bushel yield (83.3) was 2.7 lbs N/bu. As in Idaho Falls, the previous crop of potatoes influenced grain protein higher than what was expected from the total N: yield obtained.

In the soft spring wheat trial (Table 46), Tekoa yielded 118 bu/A, followed by Alturas (113 bu/A), Melba (111 bu/A) and Seahawk (110 bu/A). The average yield for the soft white spring trial was 103 bu/A, higher than in 2016 by 7 bu/A, and ranged from a low of 87 bu/A (IDO1403S) to a high of 118 bu/A. The test weight average was a 63.4 lbs/A, with a little lodging (especially WB6341 and WA 8277). Grain protein averaged 12.5%, a little high for soft white spring wheat. The ratio of available and applied N (184 lbs N/A) to average bushel yield (103) was 1.8 lbs N/bu. As with the hard spring wheat nursery, previous crop of

potatoes influenced grain protein higher than what was expected from the total N: yield obtained.

In the six-rowed barleys at Ashton (Table 51), the yield average was 105 bu/A, similar to the previous year (2016) at 107 bu/A. In the feed barley, Goldeneye out-yielded the others at 122 bu/A, 52.3 lbs/bu test weight and 97% plumps. Millennium was the closest next variety at 119 bu/A, 52.3 lbs/bu test weight and 97% plumps. The malt line Quest yielded 101 bu/A, with 53.9 lbs/bu test weight and 98% plumps. The N: bu ratio calculates as 1.75 lbs N/bu (available and applied N) 184 lbs N/A to average bushel yield (105). With an site-average protein at 11.9%, the previous crop of potatoes may have helped to push the grain protein level of the malt barleys a little too high (to 12.2%).

Two-rowed malt barley yields (Table 55) ranged from 96 (ND Genesis) to 125 bu/A. The average was 107 bu/A, over 9 bu/A less than in 2016 and 27 bu/A less than 2015 with the highest named lines being CDC Copeland (125 bu/A), LCS Sienna (121 bu/A), ABI Voyager (121 bu/A), and LCS Opera (111 bu/A). There was only one variety that had slight lodging. Overall test weight was 54.4 lbs/bu, protein averages were 11.6% and plumps were above 97%. The N: bu ratio calculates as 1.7 lbs N/bu.

The feed lines averaged 109 bu/A with Claymore (132 bu/A), Champion (126 bu/A), Altorado (124 bu/A) and Kardia (122 bu/A) as the top yielding varieties (Table 59). Kardia is a hulled, high beta-glucan line. The hulled lines had a test weight of 54.6 lbs/bu and hulless lines had a test weight of 59.1 lbs/bu. Proteins averaged 12.8%, with a N: bu ratio of 1.7 lbs N/bu.

Soda Springs, Kyle Wangemann and Scott Brown, Spring Wheat

The only spring dryland extension trials in Soda Springs were the spring wheat trials.

The nursery was planted May 10th and harvested September 5th. The previous crop was spring barley. Similar to Ashton, this location has relatively low soil pH (6.1). This location was affected by stripe rust, significantly reducing yields of susceptible varieties.

Yield averages for the hard red and hard white spring nursery (Table 42) were 28 bu/A, reflecting low summer precipitation. The range in yield went from 21 to 33 bu/A (Dayn). The five highest yielding named varieties were the hard white Dayn (33 bu/A), hard red Alum (32 bu/A), hard white LCS Star (31 bu/A), hard red SY Selway (31 bu/A), and hard red WB9411 (31 bu/A). Test weights averaged 62.0 lbs/bu, and proteins were very low, averaging 10.3%, with the highest proteins in WB9668 (12.5%). The N: bu ratio calculates as (hard spring wheat N at 118 lbs/A/ 28 bu average

yield) 4.2 lbs N/bu, and grain protein should have been high. Possible explanations may include good conditions for early vegetative growth followed by dry conditions and poor root growth, resulting in high levels of residual N that the crop could not access. The tillers that formed had good test weight.

For the soft white spring wheat (Table 47), the nursery averaged 34 bu/A, similar to 2016. The yield ranged from 30 to 38 bu/A. Louise, SY Saltese and WB6430 were the three top yielding varieties at 38, 37, and 35 bu/A, respectively. Test weight average was 61.0 lbs/bu, and proteins were at 9.0%. The N:bu ratio calculates as 3.5 lbs N/bu, and the grain protein should have been very high. Despite the high levels of N, grain protein remained surprisingly low. Like with the hard spring wheat, drought conditions probably limited root growth thereby limiting plant access to soil nitrogen.

Table 2. Variety Descriptions

SPRING BARLEY

ABI Balster (B0811) – one of two 2015 releases from Busch Agricultural Resources, ABI Balster is a high yielding two-rowed spring malt barley comparable to ABI Voyager in yield but about 3-4 inches shorter, and shorter than average. ABI Balster is on average in many other agronomic characteristics and lower than Voyager for test weight.

ABI Growler (2B09-3425) – the second of two 2015 releases from Busch Agricultural Resources, ABI Growler also exhibits high irrigated yield potential, although the three-year average was average to other spring two-rowed malt barley in these trials. Growler hits the average for test weight, heading date, proteins and plumps, and is about two inches shorter than average.

ABI Voyager (B3719) – a 2011 release from Busch Agricultural Resources, Voyager consistently out yields other two-rowed malt varieties. Three-year average yields were equivalent to LCS Odyssey, ACC Synergy, and ABI Balster. Voyager is similar to Conrad in test weight, heading date, lodging and protein, but is taller (2-4 inches).

AC Metcalfe (TR232) – two-rowed malting barley released in 1994 by Agriculture and Agri-Food Canada with higher yield potential and plumper kernels than Harrington. AC Metcalfe yields are lower than average and similar to Hockett and Harrington. It is widely adapted to western US and Canadian conditions, but is tall and may lodge under higher production conditions. Malting quality and extract are excellent.

ACC Synergy – released in 2015 by Agriculture Canada, ACC Synergy is a two-rowed malt barley in the third year of testing in these trials. Yield in 2017 was slightly above average, with higher than average test weight and lodging, and high plumps. In Fusarium head blight (FHB) screening trials, ACC Synergy had one of the lowest indices for infection. ACC Synergy also expressed high levels of resistance to foliar pathogens. (It is being marketed by Syngenta in the US.)

Altorado (BZ509-601) – Altorado is a new 2016 release from Highland Specialty Grains. Altorado is a two-rowed feed barley with high yield potential. Average irrigated yield was greater than Champion and was the top yielder for 2016, and lower than Claymore and Oreana for 2017 (Table 24). Altorado is similar to Champion in heading date, test weight, plant height, lodging, and grain protein.

Bill Coors 100 = Moravian 150 – one of two new two-rowed releases from the MillerCoors breeding program in Burley, Moravian 150 yield was greater than Moravian 69 in 2017, but lower than Moravian 169. Test weight was lower and heading date 7 days earlier than M69. It was an inch taller with slightly more lodging than M69. In 2016, it headed three days later and was a little shorter than M 69. Plumps and protein are comparable to M69. In the FHB screening nursery, it was more susceptible to FHB than M69 or M169.

CDC Copeland (TR150) – a two-rowed malt variety developed by the Crop Development Centre, University of Saskatchewan and released in 1999, Copeland has been in the trials since 2009 in southern Idaho. Copeland yields are similar to Conrad and Moravian 69, and much

Spring Barley (cont.)

higher than Harrington. Copeland was 3-4 in taller than average, and was average for grain protein and lodging, with good test weight. In 2017 Fusarium head blight (FHB) screening trials, CDC Copeland had the low indices for FHB infection.

CDC Fibar (HB373) – a high beta-glucan (waxy), hulless two-rowed food barley released by Crop Development Centre, University of Saskatchewan, Saskatoon in 2003. Of the hulless food barleys, CDC Fibar is lowest in yield but with a high average value of beta-glucan (soluble fiber) levels per 100g of 8-10g, or 8-10%. The ratio of starch type is 100% amylopectin, 0% amylose. CDC Fibar has high test weight, tends to be tall and will lodge, has good shattering resistance, and fair to good drought tolerance.

CDC Meredith (TR05104) – CDC Meredith is a Canadian two-rowed malt line released in 2008 by Crop Development Centre, University of Saskatchewan, Saskatoon. Yield is similar to CDC Metcalfe, with lower test weight and later maturity. Height, plumps and protein were average. Lodging was higher and heading date was 1 day later than average.

Celebration – a six-rowed malt barley released in 2008 by Busch Agricultural Resources, LLC. Released for the Midwest, Celebration has some resistance to Fusarium head blight and consistently lower toxin (DON) content in the grain. Yields are less than Tradition and slightly better than Quest, with average test weight, while protein and lodging were a little higher than average.

Champion – a 2007 release from WestBred, LLC, now handled by Highland Specialty Grain. Champion is a very high yielding,

two-rowed spring feed barley. Combined over locations and years, Champion yields were comparable to Xena and Lenetah under irrigation with higher test weight and plumps. Champion has average height, less than average protein, and heads 1-2 days earlier than trial average.

Claymore (BZ509-216) – two-rowed feed originally developed through WestBred, Claymore is carried by Highland Specialty Grains. In three-year averages, Claymore out-yielded all other feed lines, including Xena, Lenetah and Champion, and had lower than average lodging. 2017 results also show high yields, while test weight and proteins were below trial average. Claymore is 1 inch taller than Champion (Table 13) with similar lodging.

Clearwater (01ID435H) – a 2007 release from the USDA-ARS in Aberdeen and the Idaho Ag Experiment Station, Clearwater is the first named variety that is a low-phytic acid, hulless, two-rowed spring feed barley. The hulless, low-phytate characteristic should be valuable in the feed industry for monogastric animals, especially fish, where there is concern about high phosphorus concentrations in the waste stream. Clearwater, because of the hulless characteristic, has high test weight and protein with lower yields. Maturity and height are average, and Clearwater has high grain protein and higher than average lodging.

Conrad (B5057) – two-rowed spring malt barley released by Busch Agricultural Resources in 2005. Conrad has average yields and test weight. Conrad is 3 inches shorter than ABI Voyager, is average for lodging, and has slightly lower protein than average. Conrad has yielded well in the dryland upper elevation areas. Conrad may have lower FHB indices, but higher DON.

Spring Barley (cont.)

Explorer – a newer introduction from Secobra, Explorer is a two-rowed malting barley in the first year of these trials. Explorer was at trial averages in grain yield (Table 23), protein, plump, and test weight. Explorer has good resistance to leaf diseases and is widely adapted. Explorer is a French maltsters preferred variety with excellent malting and brewing, and is good for brewing and distilling (whiskey).

Goldeneye (UT95B1216-4087) – is a six-rowed feed barley released by Utah State in 2005. Goldeneye has very high yields under irrigated conditions (similar to Millennium), above average yields under dryland production, and above average test weight. When cut at soft dough, Goldeneye has proven to be a high-yielding and high quality forage variety. Goldeneye is susceptible to FHB and will accumulate high levels of DON.

Harriman (08IS1549) – hulled, low phytate, two-rowed feed barley. Compared to the previously released hulled, low-phytate variety 'Herald' (six-rowed), Harriman has similar grain yield, higher test weight, higher inorganic P, and lower phytate P. Three-year average yields were comparable to Oreana and Champion (Table 13). This variety can contribute to animal production and sustainable agriculture by reducing or eliminating the need for dietary phytase supplementation and by reducing the amount of phosphorus released into the environment from animal production facilities.

Harrington – the industry standard for malt quality, Harrington is a 2-rowed malting barley released in 1981 by the University of Saskatchewan. Harrington is one of the lowest yielding malt varieties in our trials,

with higher than average lodging. Under appropriate high-yield management, including the use of plant growth regulators, yield and lodging improve greatly.

Herald (00ID1550) – Herald is a low-phytate, hulled, six-rowed feed barley released by the USDA-ARS and Idaho AES in 2006. Seed characteristics make this an excellent feed barley for monogastric animals (swine), as phosphorus is reduced in the waste stream. Depending on the year and environment, Herald has high yield potential and may also prove useful in the fish food industry. Herald is agronomically similar to its parent, Colter, but has lower test weight and higher plump.

Hockett (MT910189) – a two-rowed malt barley released in 2010 by Montana State University. Under dryland and irrigated conditions in southeast Idaho, Hockett is agronomically similar to Harrington with higher yield, test weight, and plumps. Hockett heads 3 days earlier than Harrington, is 3 inches shorter, and like Harrington, will lodge under irrigation. Under high-yield and input conditions, the use of plant growth regulators is encouraged.

Idagold II (C32) – a two-rowed spring feed and malt line developed by Coors Brewing Company in Burley and released in 2002. Idagold II is a short, low test-weight feed line with lower than average lodging. Protein is higher than Baronesse, with similar plumps.

Julie (03AH6561-94) – a two-rowed hulless barley released by the USDA-ARS and the University of Idaho AES in 2010 for high-beta-glucan content and intended for human consumption. Julie has high test weight

Spring Barley (cont.)

(due to the hulless characteristic) and protein, similar to other food barleys, with greater percentage of seed beta-glucan (averaging 7%) than other industry standards such as CDC McGwire. Julie is the highest yielding hulless waxy barley, out yielding CDC Fiber by 20 bu/A. Lodging of Julie is less than average, and heading date 4-5 days later than Champion.

Kardia (2Ab09-X06F084-51) – Kardia is a two-rowed, hulled food barley line released in 2016 by the USDA-ARS in Aberdeen as a replacement for Salute. Yield of Kardia was higher than the hulless lines Julie and Transit and in the first three years of testing was similar in yield to Baronesse. Kardia 3-yr average yields are similar to Idagold II (Table 13). The beta-glucan level of Kardia is 8.5% compared to 6.5% in Salute.

Lacey (M98) – a six-rowed malt variety released in 2000 by the Minnesota AES and USDA. Lacey has excellent malt quality with yields similar to Tradition and higher test weight. Lacey is average in height, lodging and protein.

LCS Genie – a European malt barley released in the U.S. through Limagrain Cereal Seeds, Genie is a short-statured two-rowed malt variety with yields similar to ABI Voyager. Protein and plumps of Genie were at trial averages. LCS Genie is about 3 inches shorter than average with average lodging. Genie has excellent malt quality and can also be used in distilling.

LCS Odyssey – LCS Odyssey is a European two-rowed malt barley released and distributed through Limagrain Cereal Seeds. Like Genie, Odyssey has excellent malt quality and can also be used in distilling. In the first year of testing (2016), LCS Odyssey

yielded very well, comparable to ABI Balster and ABI Voyager. 2017 yields were significantly higher than other varieties (Table 12). Test weights were lower and lodging was average even though the variety is 4-5 inches shorter than the trial average. Heading date is two-three days later than average, and similar to LCS Genie. Proteins were average, and plumps were good. LCS Odyssey is more susceptible than current U.S. malt varieties for FHB and has higher levels of DON accumulation.

LCS Opera – LCS Opera is another two-rowed European malt from Limagrain Cereal Seeds. Like Genie, LCS Odyssey has excellent malt quality and can also be used in distilling. In the first year of testing (2017), LCS Opera yields were similar to ND Genesis and Bill Coors 100. Test weight was below average, and heading date is three days later than trial average (Table 23). LCS Opera is shorter than average (3 inches), with average lodging and protein. LCS Opera is more susceptible than current U.S. malt varieties for FHB and has higher levels of DON accumulation.

LCS Sienna – a two-rowed malt from Limagrain Cereal Seeds in the first year of testing in the 2017 trials. LCS Sienna yields were similar to Conrad and slightly higher than LCS Opera. LCS Sienna was similar agronomically to the trial average (Table 23), and is more susceptible than current U.S. malt varieties for FHB with higher levels of DON accumulation. Like Genie, Sienna has excellent malt quality and can also be used in distilling.

Lenetah (01Ab11107) – a 2008 release from the USDA-ARS and Idaho AES, Lenetah is a high yielding two-rowed feed variety particularly well-adapted to the rain-fed conditions of northern Idaho, but also doing well in irrigated southern Idaho

Spring Barley (cont.)

conditions. In southern Idaho, Lenetah has above average yield, test weight and plump, average heading date, lodging, and height. Lenetah yields are similar Champion.

Merem (2Ab17271) – a two-rowed malt variety released in 2014 by the USDA-ARS in Aberdeen and the University of Idaho. Merem yields are slightly less than Copeland and Conrad and a little below trial averages (Table 12), but higher than Harrington. Quality characteristics make it particularly suited for the Craft Malting Industry. Test weights, lodging, protein and plumps are average, and Merem is 2 inches taller than Harrington with less lodging. Merem has shown low FHB infection and low levels of DON.

Millennium (UT004603) – a six-row spring feed barley released in 2000 through Utah AES, Millennium does very well under irrigation, and has been in the top-yielding groups under dryland conditions when moisture was adequate. Millennium also has excellent straw strength, showing minimal lodging even under high-yield conditions. Millennium is of average height and protein, lower test weight and plump, and heads several days earlier than average. Millennium is susceptible to FHB and will accumulate high levels of DON.

Moravian 69 (C69) - two-rowed spring malt barley released by Coors Brewing Co. in 2005. Moravian 69 has very high yield potential, especially in the Magic Valley area where it is widely grown, with 3-year yield average over all locations similar to ABI Growler and Conrad. 2017 yields in Rupert were comparable to LCS Genie and Moravian 169, while yields averaged all locations were below average (Table 23). M69 is short (2-4 inches below average)

with low lodging. Protein is at average in these trials. Test weight was below average.

Moravian 169 – one of two new two-rowed barley releases from the MillerCoors breeding program in Burley, Moravian 169 test weight, plant height, and grain protein are comparable to Moravian 69. In 2017, Moravian 169 was the highest yielding malt variety across all locations (Table 23). In its first year of testing (2016), heading date was two days later than Moravian 69, but in 2017 the heading date was seven days earlier.

ND Genesis (2ND25276) – ND Genesis is a two-rowed malt variety released in 2015 by North Dakota State University. In 2015, ND Genesis showed excellent resistance to foliar diseases like the spot form of net blotch (SFNB). Yields in the past three year's testing were below average, with excellent test weight, early heading, and excellent plumps. 2015 yields were at trial averages. ND Genesis is taller than average (similar to CDC Copeland and ABI Voyager) with low lodging. Genesis has lower susceptibility to FHB and shows lower DON accumulation.

Oreana (BZ509-448) – a two-rowed feed barley originally developed through WestBred, Oreana is carried by Highland Specialty Grains. In its third year of testing in these trials, Oreana had yields similar to Xena and Lenetah, good test weight, and was 4-5 inches shorter than average. Under some highly productive environments, including 2016 and 2017 trials, Oreana yields were excellent, comparable to Claymore and Altorado (Table 24). Oreana showed intermediate reaction to FHB and DON accumulation (Addendum 2).

Quest (M122) – a six-rowed spring malt line released in 2010 for its resistance to Fusarium head blight and reduced accumulation of the DON toxin produced

Spring Barley (cont.)

during the infection process. Released by the University of Minnesota AES, it yields less than Tradition and Celebration. In Idaho, Quest yields were below average for 6-rowed malt lines, with average test weight and maturity, with high plumps and high lodging.

RWA 1758 (RWA1758) – a two-rowed spring feed barley that is essentially a Russian Wheat Aphid resistant Baronesse developed by the USDA-ARS in Aberdeen, now handled by Highland Specialty Grains. RWA 1758 is very similar to Baronesse with greater yield potential. RWA 1758 yields averaged below Champion, but similar to Idagold II.

Sawtooth (08ID2661) – a two-rowed, hulless spring barley released in 2015 by the USDA-ARS in cooperation with the IAES. Sawtooth is a low-phytate feed line that, like Harriman, should prove useful in animal feed to reduce phosphorus in the waste stream. Sawtooth yields were less than Champion, and similar to RWA1758 and Idagold II in the 3-year averages, but due to its hulless characteristic, has very high test weights and protein. Sawtooth had low FHB disease ratings and average DON levels.

SY Sirish – SY Sirish is a European two-rowed spring malt barley marketed by Syngenta. In its first year of testing, SY Sirish had above average yields, comparable to Conrad, and was four inches shorter with lower test weight than Conrad (Table 23). SY Sirish is more susceptible than current U.S. malt varieties for FHB and has higher levels of DON accumulation.

Tradition – six-rowed malt released by Busch Agricultural Resources, Inc. in 2003. Tradition yields are greater than Celebration

and Quest in southern Idaho, with higher test weight and plumps than test averages of other six-rowed malt lines. Tradition was low in FHB disease rating, and intermediate in DON accumulation.

Transit (03AH3054-51) – a two-rowed hulless variety released by the USDA-ARS and the University of Idaho AES in 2010 for high-beta glucan content (waxy) and intended for human consumption. Seed beta-glucan content (9-10%) is higher than other industry standards such as CDC Fibar and CDC McGwire. Transit yields are lower but the percent beta-glucan is higher than Julie. As a hulless line, test weights are high for barley. Transit yields are also greater than CDC Fibar. Transit had low disease ratings for FHB and DON levels.

Xena (BZ594-19) – a two-rowed spring feed barley released by Western Plant Breeders that is now handled by Highland Specialty Grain. Xena has had very high yields over the locations tested from 2010-2017, similar to Champion. Its yield has been similar to Oreana, and is about one inch taller than average with average straw strength. Test weight tends to be slightly higher than average, but less than Champion. Xena has shown low FHB disease and lower DON levels.

WINTER BARLEY

Alba (OR77) – a six-rowed winter feed and malt variety released in 2010 by the Oregon AES and the USDA-ARS. Yields over the past three years have been comparable to Eight-Twelve and Endeavor. Winter hardiness is above average and better than Endeavor and Charles (both are two-rowed winter malt varieties). Lodging, test weight, protein, and heading date are less than

Winter Barley (cont.)

average. Alba has good resistance to foliar pathogens (stripe rust and scald).

Buck (09-OR-86) – Oregon State University hulless, six-rowed winter food barley with intermediate levels of beta-glucan content in the seed, developed for human consumption and the heart-healthy food campaign. Buck is genetically related to #STRKR with better threshability. Buck yields are low if compared to hulled varieties, but yield is still high with a very high test weight (57 lbs/bu) due to the hulless seed (Table 6). At Aberdeen, Buck yields (85 bu/A) were low due to poor winter survival. Buck is awned and can be used as food, feed or malt. Plumps are low.

Charles (94Ab1274) – Charles is the first AMBA approved two-rowed winter malt variety released by the USDA-ARS and the IAES in 2005. Charles yields and test weights are lower than the winter feed variety average. Charles is short, early maturing and has a tendency to lodge. Charles has excellent plumps and yields very well in the Twin Falls area, even when harsh winter conditions reduce stand. Both Charles and Endeavor can suffer significant stand losses under cold, dry winter conditions.

Delicatesse – a winter two-rowed malt variety from Secobra in the first year of testing. Due to poor winter conditions, only the Aberdeen location was successfully completed, but even with a spring stand of 76%, Delicatesse yielded 154 bu/A. Test weight was above average, and heading date was three days earlier than the trial average (Table 37). Plumps and protein were excellent.

Eight-Twelve – a six-rowed winter feed barley released by the USDA-ARS and the Idaho AES in 1991. Eight-Twelve has high yield potential, averaging 170 bu/A under irrigation in 2014-2016, but this year's averages were lower. Eight-twelve yielded at trial average for 2015-2017 (Table 6), but did poorly at Aberdeen due to very low spring stand.

Endeavor (95Ab2299) – Endeavor is the second two-rowed winter malt variety released by the USDA-ARS and the Idaho AES approved by AMBA for malt quality. Released in 2008, Endeavor has improved malt quality and yield over Charles, especially in the Magic Valley area where winter kill is less of a problem than in eastern Idaho. Endeavor has good test weight and protein, but had relatively low plumps for malt (Table 6).

Lightning (10.0860) – Lightning is a two-rowed winter malt released from Oregon State University in 2016. In the first year of testing in southern Idaho, Lightning showed excellent yield potential in Aberdeen (averaging 166 bu/A, 2016). In 2017, spring stand was high compared to other winter malt types and Lightning had yield slightly above trial average. Heading date was early, and height was three inches less than average. Test weight was below trial averages.

Madness – a winter two-rowed malt variety from Secobra in the first year of testing. Due to poor winter conditions, only the Aberdeen location was successfully completed. Madness had poor winter survival at Aberdeen, surviving the winter at 37% of stand. Madness yielded 100 bu/A. Test weight was above average, and heading date and protein were at the trial average (Table 37). Plumps and protein were excellent.

Winter Barley (cont.)

Maltesse –another winter two-rowed malt variety from Secobra in the first year of testing. Due to poor winter conditions, only the Aberdeen location was successfully completed, but even with a spring stand of 60%, Maltesse yielded 141 bu/A. Test weight was above average at 51.8 lb/bu, and heading date was four days earlier than the trial average (Table 37). Plumps and protein were excellent.

Rubinesse – a winter two-rowed malt variety from Secobra. Due to poor winter conditions, only the Aberdeen location was successfully completed, but even with a spring stand of 76%, Rubinesse yielded 149 bu/A. Test weight was a little above average, and heading date was two days later than the trial average (Table 37) and five days later than Delicatesse. Plumps and protein were excellent.

Schuyler (NY5619B-3B) – a six-rowed winter feed barley released in 1969 by Cornell AES, yields are below average but winter survival is good for a winter barley. Yield in 2017 was excellent at Aberdeen at 170 bu/A, especially in light of the heavy winter kill.

Sprinter – a high yielding, winter six-rowed feed barley released by WestBred in 1987, Sprinter is facultative (not requiring vernalization) and can be planted in the spring. Yields of Sprinter are comparable to Eight-Twelve and Sunstar Pride, with higher test weights and plumps (Table 6).

Sunstar Pride (SDM204-B) – winter six-rowed barley released by Sunderman Breeding in 1995. Sunstar Pride consistently has been one of the highest yielding varieties in the trials, similar to Sprinter and Eight-Twelve. Test weight is below and

plant height is average. Heading date is up to a week later than average, with low plumps.

Thunder (10.0777) – Thunder is a two-rowed winter malt release from Oregon State University (2016), and in the first year of testing in southern Idaho, showed excellent yield potential in Aberdeen (averaging 165 bu/A in 2016 and 2017, Table 37). Heading date was early, and height was five inches less than average. Test weight and plump were above average and lodging was below trial averages.

Verdant (OR712) – an Oregon State University release in 2014, in the third year of testing in these trials. Verdant is a six-rowed, hooded, winter forage barley. Winter survival in 2016-17 was poor. Yield, test weight and plumps were low in three years of testing. Verdant is tall and heads seven days later than trial average. Verdant is licensed to Tri-State Seeds.

Voyel –a winter two-rowed malt variety from Secobra. Due to poor winter conditions, the Rupert nursery was terminated and the Aberdeen location was successfully completed, but even with a spring stand of 63%, Voyel yielded 154 bu/A. Voyel is early, has above average test weight, has lower protein and very high plumps (Table 37).

Wintmalt – a shorter, two-rowed winter malt developed by KWS Lochow (Germany) and imported from Europe. Wintmalt has good foliar disease resistance, is being produced in the PNW and is an AMBA approved malt variety. In the first year of production, Wintmalt heading date, lodging, protein, yields and test weight were average. In 2017, tough winter conditions reduced survival in Aberdeen, and the winter barley trial in Rupert was terminated.

Wintmalt yields in Aberdeen were below average, heading was later than average, but plumps were excellent. Conditions resulted in very high variability associated with the 2017 winter production, therefore use the 2016 data for accurate data.

SPRING WHEAT

Alturas (IDO526) – a soft white spring wheat released by Idaho AES and USDA-ARS in 2002. Alturas has a partial waxy endosperm which may make it vulnerable to low falling numbers. Alturas is adapted to both irrigated and dryland conditions, but performs best under irrigation. It is average in yield, test weight, heading date and height. Alturas is susceptible to the current races of stripe rust and is moderately susceptible to Fusarium head blight (FHB).

Alum (WA8186) – hard red spring wheat released in 2015 for tolerance to aluminum in low pH soils. In the first two years of the trials, Alum has had above average yields, similar to Bullseye for yield and test weight, but higher in protein. Alum heads about two days later than Bullseye, is three to four inches taller, and may lodge under high input production conditions. Alum has moderate resistance to moderate susceptibility to stripe rust and moderate resistance to Hessian fly. Alum would be suited for the Ashton area where acidic soils are problematic, and it did well in dryland.

Alzada (YU894-75) – durum wheat released in 2004 by WestBred (a unit of Monsanto) for excellent durum quality. Alzada yields are less than the average of other locally adapted hard red and white spring wheats, with average test weight and grain protein. Alzada is very susceptible to FHB, and is susceptible to the current races of stripe rust.

Cabernet (95WV10616) – a 2007 hard red spring wheat from Resource Seeds, now Syngenta Cereals, Cabernet yields are similar to Jefferson and WB9411. Cabernet is a little shorter than average, (2 inches shorter than WB9411, 4 inches shorter than Jefferson), has average test weight and may have lower protein unless appropriately managed with nitrogen applied at or shortly after heading. Cabernet was moderately resistant to the local 2016 race of stripe rust, and susceptible to FHB.

Dayn (WA8123) – Dayn is a hard white spring wheat released in 2012 by Washington AES and the USDA-ARS, and being handled in southern Idaho through Syngenta Cereals. Dayn was the highest yielding spring wheat over the past four years of the irrigated trials. Test weight is above average and heading date was average. Protein was a little below average. Dayn was 2-3 inches taller than average but has good lodging resistance. End use quality is acceptable. Dayn is resistant to stripe rust and among the “least susceptible” hard white spring wheat for FHB.

Jefferson (IDO462) – hard red spring wheat released by Idaho AES and USDA-ARS in 1998. Jefferson is primarily intended as a dryland variety due to it being taller than average (about four inches under irrigation) and susceptible to lodging under irrigation. Irrigated and dryland yields have been at or below nursery averages. Jefferson has good quality when there is adequate soil nitrogen and sulfur, and when there’s a minimum of 13% grain protein. Jefferson is susceptible to the current races of stripe rust and very susceptible to FHB, but resistant to Hessian Fly.

Klasic (NK77S1817) – a well-established hard white spring wheat with exceptional quality characteristics. Klasic was released

Spring Wheat (cont.)

in 1982 by Northrup-King, and while yields in the extension trials are low, yields can be excellent with appropriate irrigation practices. Klasic is average for test weight, 5-6 inches shorter than average, and is earlier in heading and maturity. Klasic is very susceptible to stripe rust, FHB and Cereal Cyst nematode. While in certain years, FHB symptom development may be low due to earlier heading, the DON toxins from FHB can be high, as in 2016 trials. Triazole fungicides applied at flowering are highly recommended as a standard practice in growing Klasic.

LCS Iron (11SB0096) – a 2015 release from Limagrain Cereal Seeds, LCS Iron is a high-yielding hard red spring wheat that has been in these trials for three years. Yields were similar to WB9411, with lower test weight, about 1-3 days later in heading, and 1-2% lower in grain protein. LCS Iron is resistant to current races of stripe rust, and was among the least susceptible hard red spring wheat to FHB (although still considered “moderately susceptible”). Top-dressing nitrogen at flowering is highly recommended to achieve hard red spring wheat targets.

LCS Star (08SB0658-B) – a hard white spring wheat imported from Europe by Limagrain Cereal Seeds. LCS Star had above average yield, average grain protein, plant height and lodging, and lower test weight (Table 9). Grain quality is good. LCS Star is moderately resistant to local races of stripe rust, and is among the least susceptible to FHB, similar to Dayn.

Louise (WA7921) – soft white spring wheat released in 2004 from Washington State University’s spring wheat breeding program and used as a long-term check for soft white

spring wheat. Louise is a later maturity, tall soft spring wheat with below average yields, and high lodging potential under irrigated conditions. Louise is susceptible to stripe rust and FHB.

Melba (WA8193) – a soft white spring club wheat released in 2016 by Washington State Ag Experiment Station with good yield potential, similar to Seahawk and UI Stone in these southeastern Idaho conditions. Melba is average in height with low protein. Melba is resistant to stripe rust, and had a similar “moderately resistant” reaction to FHB as Seahawk.

Seahawk (WA8162) – a soft white spring wheat released from Washington State University’s spring wheat breeding program in 2014 adapted to dryland and irrigated production areas. Seahawk has resistance to Hessian fly, is very resistant to stripe rust, and one of the least susceptible soft white spring wheats to FHB. Seahawk has tolerance to high aluminum, low pH soils. Yield and test weight has been one the highest of all currently available soft white springs, with slightly less yield than UI Stone and WB6430. Plant height is a little above average and heading date 1 day later than average. Seahawk may have a tendency to lodge under high production practices.

Snow Crest (BZ904-331WP) – a 2004 release by the WestBred program, (a unit of Monsanto), Snow Crest is a high quality hard white spring wheat typically with higher or similar yields to Klasic and similar grain protein. Test weight is average, but similar to Klasic, and it is earlier maturing and a little shorter than average. Snow Crest is very susceptible to stripe rust and less susceptible than Klasic to FHB.

Spring Wheat (cont.)

SY Basalt (04W40240R) – a hard red spring wheat released in 2014 by Syngenta Seeds, SY Basalt has high yield potential under high input environments (Tables 8, 20, 39), comparable to LCS Iron. In the three-year averages, SY Basalt had high yields, but lower test weight and protein. Maturity is about 3-5 days later than average. SY Basalt is moderately resistant to current races of stripe rust and susceptible to FHB.

SY Coho (SY40292R) – released in 2015 by Syngenta Cereals, SY Coho has been tested in these trials for three years (see Table 9, but SY Coho was not included in the lower yielding irrigated site of Ashton). SY Coho is a hard red spring wheat with average yields, but having lower than average test weight and average protein. SY Coho suffers yield loss if irrigation is lower than needed late in the growing season (as in the Idaho Falls irrigated location). SY Coho is moderately resistant to susceptible to Stripe rust and susceptible to FHB.

SY Gunsight (06PN3015-08) – Syngenta released this hard red spring in 2017. Yields were similar to Cabernet and SY Basalt (Table 20). Test weight and protein are average, with a slightly earlier heading date than SY Basalt. It is moderately resistant to FHB.

SY Saltese (SY3024-2) – a soft white spring wheat released in 2016 by Syngenta Cereals. SY Saltese has yield potential similar to Seahawk. Averaged over three irrigated locations, SY Saltese yielded 123 bu/A while Seahawk yielded 125 bu/A and WB6430 122 bu/A (see Table 21). SY Saltese also has good test weight, resistance to stripe rust, and is susceptible to FHB.

SY Selway (SY3001-2) – 2015 release from Syngenta Cereals, SY Selway is a hard red dryland spring wheat that in the third year of extension testing yielded slightly above average with average test weight and protein (Table 42). SY Selway was similar to LCS Star and Alum for yield with good test weight and 3 inches taller than average, but was a percentage lower in protein. SY Selway was susceptible to FHB (under the irrigated, inoculated FHB screening trial at Aberdeen), but under dryland conditions, FHB should not be problematic. SY Selway should have good resistance to stripe rust.

SY Teton (SY10136) – Syngenta Cereals released this hard white spring wheat in 2015. In the past three years, SY Teton was one of the highest averaging for yield of the hard white and hard red spring wheat group (Table 9, 20). SY Teton was comparable to Dayn for yield but with lower test weight and three inches shorter. Heading date is very early, and grain protein is less than average and less than Dayn. Reaction to head blight was similar to Dayn, which was less susceptible than the majority of hard white spring wheat varieties. SY Teton is moderately susceptible to stripe rust.

Tekoa (WA8189) – a Washington State University 2016 release, Tekoa is a soft white spring wheat released for higher rainfall areas and will do well under irrigated conditions. Tekoa did not yield as well in areas where irrigation was restricted at the end of the growing season. In 2017, Tekoa yielded the highest of the soft white springs and had good test weight. Tekoa is adapted to low pH soils where aluminum toxicity can occur. Tekoa is a little later in maturity (heading date) than average. Tekoa is resistant to stripe rust, and moderately resistant to FHB, similar to Seahawk.

Spring Wheat (cont.)

UI Pettit (IDO632) – is a soft white spring wheat released in 2006 through the Idaho AES. Yields and test weight are lower than average. UI Pettit is short and heads 3-5 days earlier than Alturas. UI Pettit is very susceptible to current races of stripe rust and to FHB.

UI Platinum (IDO694C) – a University of Idaho and IAES hard white spring wheat, UI Platinum is an average yielding hard white spring wheat with average test weight and lodging. Over the last three years, yield has been comparable to WB7589 and the red wheat Cabernet, and less than Dayn (W) and SY Teton. In some environments, UI Platinum will show dark chaff discoloration similar to black chaff infection, which is not a disease but a genetic trait. UI Platinum is susceptible to stripe rust and very susceptible to FHB.

UI Stone (IDO599) - a soft white spring wheat released by Idaho AES in 2012, UI Stone has high yield potential, consistently greater than UI Pettit and Alturas (Table 10). UI Stone was selected for reduced FHB susceptibility, and carries the Fhb1 resistance gene. In 2017, UI Stone yielded slightly below Seahawk and about 7 bu/A below Tekoa (Table 21). The FHB reaction in UI Stone is similar to Seahawk. UI Stone also has tolerance (not resistance) to Cereal Cyst Nematode, and is susceptible to the current races of stripe rust. Grain protein, height and lodging are average.

WB6121 (BZ608-121) – soft white spring wheat released by WestBred (a unit of Monsanto) in 2015 intended for irrigated production areas. WB6121 has a Nick background but has good resistance to stripe rust. Tested for the second year in these trials, WB6121 yields were below average

(Table 21). In 2016, WB6121 had excellent test weight, with better yield than Alturas. It is 3 inches shorter than average and about two days earlier in heading than average. FHB disease reaction in 2017 showed greater levels of resistance than Seahawk and UI Stone.

WB6341 (BZ608-014) – a new soft white spring wheat in 2017 released by WestBred (a unit of Monsanto). Irrigated average yield of WB6341 (Table 21) was above average, with average test weight, and it was a little shorter than average. Levels of grain protein were less than average, which is optimal for soft white spring wheats. Reaction to FHB was similar to Seahawk and UI Stone, but not as good as WB6121. Yields are a little less than UI Stone under irrigated and dryland conditions with good resistance to stripe rust.

WB6430 (BZ608-125) – a soft white spring wheat released by WestBred (a unit of Monsanto) in 2014. WB6430 is a UI Pettit-type of soft white spring wheat with very high yield potential, good test weight, and resistance to stripe rust. Maturity is slightly earlier than average, but 3 days later than UI Pettit. WB6430 is also 3 inches shorter than average. WB6430 is moderately resistant to stripe rust and susceptible to FHB. FHB reaction is similar to Seahawk, which is moderately resistant.

WB7202CLP (XA7320) – a new hard white spring wheat released by Westbred (a unit of Monsanto). In the first year of testing, the irrigated average of WB7202CLP was similar to LCS Star and UI Platinum and was above trial average. Test weight and heading date were at trial average, and it was one inch shorter than average. WB722CLP is a two-gene Clearfield wheat with tolerance to imazamox herbicide Beyond®. Additional use of Clearfield

Spring Wheat (cont.)

tolerant wheat includes planting following beans where imazamox may have a residual presence in the soil, or to reduce wheat red volunteer in white spring wheat production. The FHB reaction was similar to Dayn, which is one of the least susceptible hard white spring wheats.

WB7328 (BZS09-0133W) – most similar to Snow Crest, WB7328 is a hard white spring wheat with similar agronomic characteristics as Snow Crest, but is a little shorter. Released in 2015 by WestBred (a unit of Monsanto) as a Snow Crest replacement, WB7328 has better resistance to stripe rust and higher yield potential. In 2016, a year with high stripe rust pressure, WB7328 showed some susceptibility to stripe rust. Like almost all hard white spring wheat, WB7328 is susceptible to FHB.

WB7589 (BZ9S09-0735W) – a short-statured, hard white spring wheat most similar to Klasic in agronomic and end-use quality. WB7589 was released in 2015 by WestBred (a unit of Monsanto) as a replacement for Klasic, having better resistance to stripe rust and higher yield potential. WB7589 yields similar to UI Platinum (Table 9). Under heavy pressure, WB7589 was moderately resistant to stripe rust in 2016. Like all hard white spring wheat, WB7589 is susceptible to FHB.

WB9350 – a hard red spring wheat released by WestBred (a unit of Monsanto) in 2017, average irrigated yields were below average and similar to WB9668. Test weight was below average. Heading date is at average, and plant height was five inches shorter than trial average and similar to Klasic. WB9350 is moderately susceptible to FHB.

WB9411 (BZ908-418) – hard red spring wheat released by WestBred (a unit of Monsanto) in 2014 intended for irrigated and high rainfall production areas. WB9411 was similar in yield to LCS Iron with significantly higher grain protein (Table 9, 20). Test weight, heading date and plant height were at trial averages. End-use (baking) quality is excellent. WB9411 is resistant to current races of stripe rust, and moderately resistant to FHB.

WB9518 – hard red spring wheat released by WestBred (a unit of Monsanto) in 2016 intended for irrigated and high rainfall production areas, and agronomically similar to WB9411. Yields were less, and heading date was three days later, but protein was higher than WB9411. WB9518 was very resistant to stripe rust in 2016.

WB9578 - a red spring wheat released by WestBred (a unit of Monsanto) in 2017, and new in the trials. In the first year of testing, WB9578 was average for many agronomic characteristics with slightly higher than average yield, test weight, height and protein, and performed well in the Rupert area. Reaction for FHB was similar to WB9411, considered moderately resistant.

WB9668 (BZ908-552) – a hard red spring wheat intended as a replacement for WestBred 936, WB9668 was tested in the trials for the first time in 2014. Three-year data shows WB9668 to be lower than average for yield with excellent grain protein. WB9668 is 2 inches shorter than average with high test weight, lower lodging and an average heading date. WB9668 is very resistant to the current races of stripe rust and intermediate in susceptibility to FHB. WB9668 is also among the most resistant hard red spring wheats for cereal cyst nematodes (CCN).

WINTER WHEAT

Bearpaw (MTS0721) – a hard red winter wheat released in 2011 by the Montana AES for dryland wheat production. Bearpaw is an awned, white-glumed, semi-dwarf with solid stems. As a result of the solid-stem characteristic, Bearpaw has resistance to cutting by the wheat-stem sawfly at levels similar to Judee. Bearpaw is resistant to stem rust, but susceptible to stripe rust. Yields of Bearpaw were low in the dryland conditions in southern Idaho (Table 7) and test weight was average. Bearpaw is susceptible to dwarf bunt (DB).

Bobtail (OR208047P4) - a 2013 release from Oregon State University and the USDA-ARS, Bobtail is a soft white winter wheat with excellent yield potential, good lodging tolerance, and disease resistance. Test weight of Bobtail is very low, however, and lodging, protein and height were average over three years in the irrigated trials (Table 5). Heading date was about 2 days later than average. Bobtail is susceptible to dwarf bunt (DB).

Brundage (ID86-14502B) – a soft white winter wheat released in 1996 by the Idaho AES. Irrigated yield potential of Brundage is excellent, as is the end use quality. Yields in the last three years have been 90% of average as Brundage is very susceptible to several diseases, including stripe rust, dwarf bunt and *Cephalosporium* stripe. In 2016, stripe rust reduced Brundage yield significantly – by as much as 50% or greater of expected. In 2017, (Table 33) Brundage yielded 79% of SY Ovation.

Bruneau (93-64901A) – soft white winter wheat released in 2009 by the University of Idaho AES. Bruneau has been a very high yielding variety, but performed poorly in 2016 compared to past years. In 2017,

Bruneau was the top yielding variety averaged across all irrigated locations. Bruneau had yield over the past three years, comparable to SY Ovation and Bobtail. Bruneau is taller than average and may lodge under high production conditions, is moderately resistant to stripe rust, and has good end use quality, and low protein. It is moderately susceptible to dwarf bunt.

Curlew (UT9325-55) – a hard red winter wheat released by the Utah AES for the dryland production areas of southern Idaho and northern Utah in 2009. Curlew yields are comparable to Yellowstone and Utah 100 under dryland conditions and is agronomically similar to Utah 100 with medium maturity, and an inch taller with better test weight. Curlew is very resistant to dwarf bunt, and is moderately resistant to stripe rust.

Deloris (UT2030-32) – a very high end-use quality hard red winter variety for dryland production. Deloris was released in 2002 by the Utah AES and yields well under dryland conditions when stripe rust is absent. Plant height is two inches taller than average (Table 7). Deloris is very susceptible to stripe rust and very resistant to dwarf bunt.

Eltan (WA7163) – soft white winter wheat released in 1990 by the Washington AES. Eltan has wide adaptability in the dryland production areas with good snow mold tolerance and resistance to dwarf bunt. Yields are still consistently good in dryland trials. Eltan will lodge under irrigation and is one of the latest varieties for heading date, but is still a good choice for dry land production areas. Under heavy stripe rust pressure this year, Eltan was susceptible to stripe rust, and is moderately resistant to dwarf bunt.

Winter Wheat (cont.)

Golden Spike (UT1944-158) – a 1999 release from Utah AES for dry land production, Golden Spike is a hard white winter wheat with a partial waxy endosperm. Golden Spike will lodge under irrigation. Under dryland conditions, Golden Spike's plant height and test weight are below average, with average yield, and low grain protein. Golden Spike is very resistant to dwarf bunt, but is susceptible to Stripe rust.

Greenville (UT9743-42) – Utah AES released Greenville hard red winter wheat in 2010 for irrigated production. Greenville is short, has good yield potential under irrigation, and was below average under dryland conditions. Three-year averages for 2015-2017, irrigated yields of Greenville were at trial average (Table 4). Test weight and lodging were below average, heading date and grain protein were average. Greenville currently is moderately resistant to stripe and dwarf bunt.

Jasper (WA 8169) – Jasper is a soft white winter wheat that was officially released by the Washington State AES and the USDA-ARS in 2015. It is a mid-maturity line with good cold tolerance, stripe rust resistance, eyespot foot rot resistance, and very good end-use quality. It is broadly adapted with yields comparable to WB 528 but with lower test weight. Jasper seems to adapt very well to high rainfall and irrigation and does very well when water becomes limited later in the season. Under dryland conditions, Jasper yields were comparable to Otto and Bruneau. Jasper was better than Eltan for snow mold resistance, is resistant to moderately resistant to stripe rust, but is very susceptible to dwarf bunt.

Juniper (IDO 575) – hard red winter wheat released in 2005 by the Idaho AES for dry land production areas. Juniper has moderate yield potential under dryland production, is extremely tall and will lodge under irrigation. Juniper has very good test weight and protein. Juniper performs similar to Deloris, is very resistant to dwarf bunt and moderately resistant to stripe rust.

Keldin (ACS55017) – a hard red winter wheat distributed by WestBred (a unit of Monsanto) for irrigated production, Keldin had the second highest average yield of the hard red winter wheat tested in these trials from 2015-2017 (Table 4). Comparable to Yellowstone and Norwest 553, yields are excellent under irrigated and dryland conditions (Table 28). Keldin is a little shorter than average for height, has very high test weight (see Table 4), and is below average for grain protein. Keldin is susceptible to dwarf bunt and in 2016 was moderately susceptible to current races of stripe rust.

LCS Artdeco (NSA06-2153A) – Limagrain Cereal Seeds introduced several European lines into the US in 2011, including LCS Artdeco, a soft white winter wheat. In the third year in the trials, LCS Artdeco yields were similar to WB 528 and Bruneau. The test weight was below average, and height was 1-2 inches shorter than average. LCS Artdeco is moderately resistant to moderately susceptible to stripe rust, and very susceptible to dwarf bunt.

LCS Drive (LWW12-7105) – a 2015 release from Limagrain Cereal Seeds, LCS Drive is a soft white winter wheat with yields similar to SY Ovation and Bruneau (Table 5) and in 2016 were well above average. 2017 yields were above average.

Winter Wheat (cont.)

LCS Drive has low test weight and runs 3-5 inches shorter than average with excellent straw strength. Proteins were below average. LCS Drive is susceptible to dwarf bunt, but should be grown under irrigated conditions where dwarf bunt pressure is low and with appropriate seed treatment. LCS Drive was very resistant to 2016 races of stripe rust.

LCS Jet (NSA 7208) – a hard red winter with released in 2015 by Limagrain Cereal Seeds. LCS Jet has excellent yield potential (Table 4, 18) and has been the top yielding hard red winter for the previous four years of irrigated testing. It was above average for 2015 dry land yield and was the top yielding variety in the Rockland dry land trial (Table 29). Test weight, grain protein and lodging has been below average, and LCS Jet has been 2-4 inches shorter than average. LCS Jet is very susceptible to dwarf bunt and resistant to stripe rust.

Loma (MTS1224) – Loma is a hard red winter wheat released from Montana State in 2016. Loma yields were similar to Warhorse under irrigated conditions (Table 16). Test weight and plant height were below average. Loma was later than average for heading date. Loma is susceptible to dwarf bunt and seed should be treated to reduce smut under conditions where dwarf bunt is endemic. Loma was moderately susceptible to stripe rust under high disease pressure. Dryland yields were best under higher rainfall locations.

Lucin-CL (UT89099) – Utah AES released this hard red winter single-gene Clearfield line in 2010. Clearfield wheats have resistance to imazamox herbicides such as to Beyond® herbicide for hard-to-control grassy weeds. Lucin-CL is adapted to dryland production conditions, and is

agronomically similar to Deloris. It is susceptible to dwarf bunt and will show severe symptoms of physiological leaf spot under dry land conditions. Lucin-CL is very susceptible to stripe rust and to dwarf bunt. Dry land yields have been similar to Deloris.

Mandala – a European hard red winter wheat distributed through Tri-State Seeds, and tested for the first time in 2017. Yield and test weight over irrigated locations were at nursery average, and winter survival was above average in a stressed environment. Dryland yield performance was at trial average. Protein was average and Mandala was a little taller than average. Mandala is very susceptible to dwarf bunt.

Metropolis – Metropolis is a hard red winter wheat distributed through Tri-State Seeds. In 2017, Metropolis had average yields, good test weight, and high lodging under irrigation (Table 18). Protein was a little higher than average. Yields under dryland conditions were below average. Metropolis is very susceptible to dwarf bunt.

Northern (MT0978) – a Montana State University 2015 release, Northern is a hard red winter wheat in the third year of these trials. Northern 2017 yields were above average and similar to Utah 100, with low test weight. Three-year averages were lower than most varieties and a little better than Utah 100. Heading date was 3 days later than trial average, it was two inches taller than average and had average protein. Dry land yield was at average. Northern is very susceptible to dwarf bunt and moderately resistant to stripe rust.

Norwest 553 (ORN00B553) – a hard red winter wheat released by Oregon State in cooperation with the USDA-ARS and developed by Nickerson U.K.

Winter Wheat (cont.)

Norwest 553 is resistant to stripe rust and tolerant to Fusarium crown rot, and has yielded very well (Table 4) under irrigation, comparable to Keldin and Yellowstone. Norwest 553 is 4-5 inches shorter than average with excellent lodging resistance and good test weight. Grain protein was average. Winter hardiness is a problem in some years especially when entering the winter under dry conditions, and Norwest 553 is susceptible to dwarf bunt, but very resistant to stripe rust.

Norwest Duet (LOR-092) – Norwest Duet was released in 2015 by Oregon State University jointly with Limagrain Cereal Seeds. It is a very tall soft white winter wheat that in 2015-2017 irrigated combined data performed above trial average for yield and below for test weight. Heading date was four to five days later than average for the trial. Grain protein was slightly above average. Norwest Duet is moderately susceptible to dwarf bunt.

Norwest Tandem (LOR-334) – a soft white winter wheat that was released in 2016 by Oregon State University jointly with Limagrain Cereal Seeds, LLC. Norwest Tandem yields were average in 2015-2017 combined data, similar to WB528 and SY Assure, but with lower test weight, and later in heading date with stronger straw strength. Dry land yields were at trial averages. Norwest Tandem is susceptible to dwarf bunt, with good resistance to stripe rust.

Otto (WA008092) – a soft white winter released September 2011 by Washington AES, Otto is similar agronomically to Eltan and a day later in heading than Eltan, about four days later than average. Otto has higher yield potential than Eltan, similar to Jasper and UI Sparrow with similar test weight to

Eltan. Otto will have similar snow mold tolerance to Eltan and also is moderately resistant to dwarf bunt.

Promontory (UT1567-51) – a hard red winter wheat released by Utah AES in 1990. Promontory is a dryland variety with good test weight. Yield under irrigation has been above average, but it will lodge. Promontory has short coleoptiles and may have trouble emerging when planted deep in dry soils. Promontory is resistant to dwarf bunt and moderately susceptible to stripe rust.

Rebelde – a European hard red winter wheat distributed through Tri-State Seeds, and tested for the first time in 2017. Rebelde had below average yields and good test weight and higher grain protein. Rebelde performed best at Kimberly and Rupert. Rebelde was short with slightly earlier heading date. Rebelde was very susceptible to dwarf bunt.

Stephens (OR65-116) – a 1977 soft white winter release from Oregon AES, Stephens is still widely grown in southern and southwestern Idaho. Yield and test weight under irrigation are average. Stephens heads about two days earlier than average and has a little higher protein. End-use quality is poor. Stephens is moderately susceptible to dwarf bunt, and does not have good resistance to snow mold or stripe rust.

SY Assure (SY 96-2) – a soft white winter wheat released in 2016 by Syngenta Cereals, yield in 2015-2017 irrigated trials was comparable to WB-528 (Table 18) with very good test weight. Heading was earlier than the trial average by five days, and three days earlier than WB-528. SY Assure is moderately resistant to moderately susceptible to dwarf bunt, and resistant to stripe rust.

Winter Wheat (cont.)

SY Banks (SY5#25) – a soft white winter wheat derived from a Xerpha x Madsen cross, SY Banks was released by Syngenta in 2017 for dryland production areas. SY Banks did well in Ririe (Table 34), had average maturity and below average test weight. SY Banks was moderately susceptible to dwarf bunt.

SY Clearstone 2CL (MT CL1077) – a hard red winter wheat 2014 release by Syngenta, SY Clearstone 2CL is a two-gene Clearfield line agronomically similar to Yellowstone. Clearfield wheats have resistance to imazamox herbicides such as to Beyond® herbicide for hard-to-control grassy weeds. Under dryland conditions yields were excellent, similar to UI Silver and Yellowstone. Like Yellowstone, SY Clearstone 2CL is taller than average and may lodge under irrigation. SY Clearstone 2CL is moderately resistant to dwarf bunt, and moderately resistant to stripe rust.

SY Command (SY66-7) – Syngenta released SY Command in 2017, a soft white winter wheat intended for dryland production areas. SY Command yields in 2017 were similar to Stephens with lower test weight than Stephens and two days earlier in heading. SY Command had very low grain protein and was slightly taller than average. SY Command is susceptible to dwarf bunt.

SY Dayton (SY62#18) – a soft white winter wheat adapted to the Dayton, WA area and released by Syngenta in 2017. Yield for SY Dayton in 2017 was similar to Norwest Duet with the same test weight and heading date, but Dayton was five inches shorter. SY Dayton is susceptible to dwarf bunt.

SY Ovation (03PN108#21) – a soft white winter wheat released by Syngenta Cereals in 2011. SY Ovation has had excellent yields over the past four years, similar to Bobtail with much better test weight. Heading date, height, lodging and protein were average, with higher than average test weight (see Table 5). SY Ovation is moderately resistant to current races of stripe rust and susceptible to dwarf bunt.

SY Touchstone (04PN028B-3) – SY Touchstone is a short hard red winter wheat that performed similar to Norwest 553 in 2016 irrigated trials, but below average in 2017 (Table 18). Released by Syngenta Cereals in 2016, SY Touchstone is shorter in plant height than Keldin with good straw strength and average protein. It is susceptible to dwarf bunt and resistant to stripe rust.

UI Castle CLP (IDN 09-DH10) – UI Castle CLP is a soft white winter wheat and is a two-gene Clearfield line. Clearfield wheats have resistance to imazamox herbicides such as to Beyond® herbicide for hard-to-control grassy weeds. UI Castle CLP was released in 2015 as a joint release from the Idaho AES and LCS seeds, and in the second year of testing, the irrigated yields were below average. It was four days later in heading than average, six days later than WB-528 and eight days later than WB456. Test weight of UI Castle was average, and dryland yields were average. UI Castle is resistant to stripe rust, and susceptible to dwarf bunt.

UI Magic CLP (IDN 09-DH11) – UI Magic is a soft white winter wheat and is a two-gene Clearfield line. Clearfield wheats have resistance to imazamox herbicides such as to Beyond® herbicide for hard-to-control grassy weeds.

Winter Wheat (cont.)

UI Magic was released in 2015 as a joint release from the Idaho AES and LCS seeds. Yields in 2015-2017 were below trial average (Table 5). Test weight, heading date and lodging are at trial averages. UI Magic is susceptible to stripe rust and to dwarf bunt.

UI Palouse CLP (IDN 3_5_10) – UI Palouse CLP is a soft white winter wheat and a two-gene Clearfield line. Clearfield wheats have resistance to imazamox herbicides such as to Beyond® herbicide for hard-to-control grassy weeds. UI Palouse CLP was released in 2015 as a joint release from the Idaho AES and LCS seeds. Irrigated yields in 2015-2017 were below UI Castle CLP and UI Magic CLP. UI Palouse is moderately resistant to moderately susceptible to stripe rust, and very susceptible to dwarf bunt.

UI Silver (IDO658B) – a hard white winter wheat released in 2011 by the University of Idaho AES. UI Silver yields very well under dry land conditions with excellent test weight (Table 7). UI Silver has good end use quality for both bread and Asian noodles. UI Silver has resistance to stripe rust (high temperature adult plant or HTAP), dwarf bunt, and carries the SrTmp gene for resistance to stem rust. It is susceptible to black chaff and lodging, which can be a problem under irrigation. Like Golden Spike, UI Silver is a partial waxy winter wheat. UI Silver is very resistant to dwarf bunt and moderately resistant to stripe rust.

UI Sparrow (IDO1108) – a new release from the University of Idaho, UI Sparrow is a soft white winter wheat with high yield potential in dryland production. UI Sparrow is adapted to both irrigated and dryland production systems, but has a higher

tendency to lodge under irrigated production. Irrigated conditions in 2015 were more favorable for high yield of UI Sparrow than 2016 and 2017. Three-year yield was below average and similar to UI Castle. UI Sparrow has lower test weight and a later heading date than average. UI Sparrow is very resistant to dwarf bunt, which is a huge benefit under organic production systems. It is also moderately resistant to stripe rust, similar to SY Ovation, and in most years will not need fungicides in dryland conditions to control stripe rust.

UI SRG (IDO656B) – a hard red winter wheat released in 2012 by the Idaho AES for the dryland conditions of southern Idaho and northern Utah. SRG will lodge under irrigation without the use of growth regulators. Yields in the past three years have been well above dryland average, comparable to Bobtail (Table 8). UI SRG is very resistant to dwarf bunt and resistant to stripe rust.

UI-WSU Huffman (IDN-03-29902A) – a soft white winter wheat released by the Idaho AES northern breeding program jointly with WSU in honor of Brad Huffman. Yields in southern Idaho under irrigation have been comparable to UI Sparrow and Norwest Tandem and better than Brundage (Table 5), with low test weight, later heading, and taller with greater tendency to lodge. UI-WSU Huffman is susceptible to dwarf bunt, not snow mold tolerant, and moderately resistant to stripe rust.

UICF Grace (IDO 651) – a hard white winter Clearfield wheat released in 2009 for the rainfed production areas. UICF Grace has resistance to imazamox herbicides (one-gene imi) such as Beyond®, and will be useful in areas where jointed

Winter Wheat (cont.)

goatgrass and cheatgrass are problems. Yields are comparable to Golden Spike, but with much higher protein. UICF Grace is tall and susceptible to black chaff, making it suited to dryland production. UICF Grace is resistant to dwarf bunt, but susceptible to stripe rust.

Utah 100 (UT1650-150) – a hard red winter wheat released in 1997 by the Utah AES. Utah 100 has consistently done well under both irrigated and dryland conditions for yield, and as a dry land variety may lodge under irrigated conditions. Utah 100 is very resistant to dwarf bunt and is moderately resistant to current races of stripe rust.

Warhorse (MT) – Warhorse is a 2014 release from Montana AES. Warhorse is a hard red winter wheat adapted to dry land conditions, having below average yields in 2015-2017 with very high protein (Table 7). Test weight was a little below average. Warhorse is a solid-stemmed wheat resistant to the wheat stem sawfly. Warhorse is susceptible to dwarf bunt, and moderately resistant to moderately susceptible to stripe rust.

WB 456 (BU6W99-456) – a soft white winter wheat from WestBred (a unit of Monsanto). WB 456 was released as an improvement over WB 470 and as a replacement for WB 528. WB 456 yielded less than WB 528 in the past five years and had higher test weight. WB 456 is two inches shorter than WB 528 with improved lodging resistance. WB 456 has an early heading date, 3-5 days earlier than average, and moderately resistant to stripe rust. Three-year average yields were below average, but test weights were excellent. WB 456 is susceptible to dwarf bunt.

WB 528 (BZ6W98-528) – soft white winter wheat released in 2005 by WestBred (a unit of Monsanto) with good yield potential under irrigation. Three year average yields and test weight were above trial average (Table 5), with average grain protein. Plant height and lodging were slightly above average. WB 528 is moderately susceptible to dwarf bunt and moderately resistant to stripe rust.

WB1070CL – WestBred released WB1070CL soft white winter wheat with one gene for resistance to imazimox for tolerance to BASF's grass herbicide Beyond®, and will be useful in areas where jointed goatgrass and cheatgrass are problems or where there may be residual imazimox in the soil. WB1070CL yields are below average with excellent test weight. Heading date was two days earlier and it is one inch shorter than average. WB1070CL is moderately resistant to dwarf bunt.

WB1376CLP (WB-1038CL) – soft white winter wheat released by WestBred (a unit of Monsanto) in 2015. WB1376CLP is an imi-tolerant, soft white winter wheat, containing two genes for tolerance to BASF's grass herbicide Beyond®. Yields were below average (similar to WB1070CL and above UI Magic) but with excellent test weights (Table 5, 17, 19). Height is average and 1-2 inches taller than WB 456. WB1376CLP is susceptible to dwarf bunt, and moderately resistant to moderately susceptible to stripe rust.

WB1529 (BZ6W07-436) – soft white winter wheat released in 2014 by WestBred (a unit of Monsanto). Yields of WB1529 under irrigation are similar to or greater than WB 528 in 2015-2017 (Table 5 and 19), with higher test weight and similar lodging potential.

Winter Wheat (cont.)

Grain protein was at nursery averages. WB1529 is resistant to current races of stripe rust and resistant to dwarf bunt.

WB1604 (BZ6W07-458) – a new soft white winter wheat tested in 2017, WB1604 is an early maturing WestBred (a unit of Monsanto) variety with less than average yield in 2017, but higher than average test weight. WB1604 is an inch shorter than average and is susceptible to dwarf bunt.

WB1783 (BZ6W09-471) – a high yielding soft white winter wheat released in 2015 by WestBred (a unit of Monsanto). Irrigated yield in 2016 averaged higher than SY Ovation, similar to LCS Drive and SY Assure, with excellent test weight and good straw strength. Yield in 2017 was a little above average (Table 19). WB1783 is very resistant to stripe rust and very susceptible to dwarf bunt.

WB3768 (W) (MTW08168) – hard white winter wheat released in 2015 with excellent yield potential, yielding 106% of Golden Spike under irrigation with higher grain protein and significantly less lodging, even though plant height was 6 inches greater than average and 3 inches greater than Golden Spike (2015 SGR). Under dry land conditions in 2016, it was agronomically similar to SY Clearstone 2CL, though yielding a little less (Table 16). WB3768 is moderately resistant to moderately susceptible to dwarf bunt and stripe rust.

WB4303 - a hard red winter wheat released by WestBred (a unit of Monsanto), had above average yield in the first year of testing and average test weight and protein. Heading date is three days earlier than average. WB4303 is susceptible to dwarf bunt.

WB4623CLP – a hard red winter wheat released by WestBred (a unit of Monsanto), WB4623CLP is a two-gene Clearfield wheat. Clearfield wheats have resistance to imazamox herbicides to Beyond® herbicide for hard-to-control grassy weeds. WB4623CLP had average yields with excellent test weight and protein (Table 18). Heading date was average, and plant height was one inch taller than average. WB4623CLP is susceptible to dwarf bunt.

Whetstone (W98-355) – is a hard red winter wheat from AgriPro, now Syngenta Cereals, released in 2009. Whetstone is a medium height semi-dwarf with buckskin colored chaff at maturity. Whetstone is an early-maturing wheat heading five to six days earlier than trial averages (Table 4). Whetstone has a good level of winter-hardiness, but is moderately susceptible to the current prevalent races of stripe rust (2011 and 2016). Yield in the past three years has been below average (Table 4), with good test weight and grain protein with very good loaf volume. Whetstone is very susceptible to dwarf bunt.

Yellowstone (MT00159) – a hard red winter wheat with excellent yield potential in both irrigated and dryland conditions of southeast Idaho. Yellowstone was released by Montana State University and the AES in 2005 and has above average test weight and height, and average grain protein. End use quality is average, with above average loaf volume. Under very high production inputs, Yellowstone will lodge under irrigation. It is susceptible dwarf bunt and moderately susceptible to stripe rust.

Table 3. Ten year averages of selected agronomic characteristics, 2007-2016 compared to 2017.

NOTE: "Average" values are for years 2007 to 2016

Winter Wheat (all market classes and locations)

YIELD			TEST WEIGHT			PLANT HEIGHT			HEADING DATE				LODGING		
Year	# of Loc.	bu/A	Year	# of Loc.	lb/bu	Year	# of Loc.	in.	Year	# of Loc.	date	Days fr. Jan.1	Year	# of Loc.	%
2015	6	103	2008	5	60.9	2015	6	35	2011	5	6/19	171	2014	5	25
2009	5	102	2017	6	60.8	2016	6	35	2010	5	6/18	171	2010	5	21
2012	5	102	2007	4	60.3	2009	5	35	2008	5	6/14	166	2009	5	17
2014	4	101	2010	5	60.3	2010	5	34	2009	5	6/9	162	Avg.	---	11
2007	4	96	2011	5	60.2	2011	5	32	Avg.	---	6/7	160	2016	6	11
2010	5	95	2009	5	60.0	Avg.	---	32	2017	6	6/6	159	2011	5	9
2016	6	94	2012	5	59.7	2014	5	32	2013	5	6/5	158	2007	4	9
Avg.	---	94	2016	6	59.4	2013	5	31	2014	5	6/4	157	2013	5	8
2017	6	91	Avg.	---	59	2012	5	30	2012	5	6/3	156	2012	5	5
2011	5	86	2013	5	59.4	2007	4	30	2016	6	5/31	152	2015	6	4
2008	5	80	2015	6	58.1	2008	4	30	2015	6	5/31	152	2008	5	4
2013	5	79	2014	4	56.1	2017	6	29	2007	4	5/30	151	2017	6	0

Spring Wheat (all market classes and locations)

YIELD			TEST WEIGHT			PLANT HEIGHT			HEADING DATE				LODGING		
Year	# of Loc.	bu/A	Year	# of Loc.	lb/bu	Year	# of Loc.	in.	Year	# of Loc.	date	Days fr. Jan.1	Year	# of Loc.	%
2014	5	107	2016	5	61.9	2014	4	34	2008	5	7/9	192	2014	4	16
2009	5	107	2009	5	61.8	2009	5	34	2010	5	7/9	192	2007	5	5
2008	5	102	2017	5	61.6	2010	5	33	2011	5	7/9	192	2010	5	5
2017	5	98	2013	5	61.4	2011	5	32	2009	5	7/3	185	Avg.	---	4
2015	5	97	2012	5	61.4	Avg.	---	31	Avg.	---	6/27	180	2011	5	3
2011	5	96	2015	5	61.0	2016	5	31	2012	5	6/24	177	2016	5	3
Avg.	---	95	2008	5	60.7	2007	5	30	2017	5	6/23	176	2015	5	2
2010	5	91	2010	5	60.6	2008	5	30	2013	5	6/22	175	2013	5	2
2016	5	91	Avg.	---	60	2015	5	30	2007	5	6/21	173	2017	5	1
2012	5	90	2011	5	59.2	2012	5	30	2016	5	6/20	173	2008	5	0.5
2013	5	86	2007	5	58.6	2017	5	28	2015	5	6/18	170	2012	5	0.4
2007	5	81	2014	5	56.5	2013	5	28	2014	5	6/18	170	2009	5	0

Spring Barley (all market classes and locations)

YIELD			TEST WEIGHT			PLANT HEIGHT			HEADING DATE				LODGING		
Year	# of Loc.	bu/A	Year	# of Loc.	lb/bu	Year	# of Loc.	in.	Year	# of Loc.	date	Days fr. Jan.1	Year	# of Loc.	%
2016	5	129	2016	5	53.6	2010	4	37	2008	5	7/11	193	2014	4	56
2012	4	129	2009	4	52.5	2014	4	36	2011	5	7/9	191	2007	5	35
2017	4	128	2010	4	51.7	2009	4	34	2010	4	7/4	187	2013	4	33
2014	4	127	2013	4	51.6	2011	5	33	2009	4	6/30	183	2011	5	26
2015	4	124	2011	5	51.6	2013	4	33	Avg.	---	6/27	179	2015	4	24
2013	4	122	2017	4	51.4	2015	4	33	2012	4	6/24	177	Avg.	---	24
2009	4	118	2012	4	51.4	Avg.	---	32	2017	4	6/24	176	2010	4	24
Avg.	---	118	Avg.	---	51	2017	4	31	2014	4	6/23	176	2017	4	17
2008	5	114	2008	5	50.7	2008	5	31	2007	5	6/23	175	2008	5	15
2011	5	112	2015	4	50.6	2016	5	31	2013	4	6/20	173	2009	4	13
2010	4	106	2007	5	49.2	2012	4	30	2016	5	6/20	172	2016	5	11
2007	5	99	2014	4	48.8	2007	5	27	2015	4	6/15	168	2012	4	0.4

Table 4. Hard Winter Wheat Irrigated Nurseries, 3-Year Averages (2015-2017; 9 site-years)

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
LCS Jet	143.7	58.8	94	5/24	33	6	12.1
Keldin	138.1	61.7	98	5/24	36	10	11.9
Yellowstone	133.9	60.2	95	5/27	40	13	12.6
Norwest 553	133.2	60.3	94	5/26	33	2	12.5
Greenville	130.1	59.0	96	5/25	32	1	12.3
IDO1101 (W)	129.0	60.9	97	5/25	34	15	12.6
WB3768 (W)	128.7	60.2	95	5/29	43	11	12.7
Whetstone	128.5	60.8	93	5/21	38	11	13.1
Northern	126.5	58.9	93	5/29	39	13	12.9
Utah 100	123.4	58.4	96	5/29	44	6	12.6
Average	131.5	59.9	95	5/26	37	9	12.5
LSD ($\alpha = .05$)	6.2	0.6	3.5	0.7	0.9	6.8	0.5
CV%	10.1	2.1	7.9	1.1	5.5	169.9	4.3
Pr > F	<.0001	<.0001	0.1117	<.0001	<.0001	0.0001	<.0001

(W) = White

Table 5. Soft White Winter Wheat Irrigated Nurseries, 3-Year Averages (2015-2017; 9 site-years)

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
Bobtail	138.4	56.5	95	5/28	35	8	10.0
SY Ovation	138.0	59.0	96	5/26	37	6	9.8
Bruneau	135.3	58.4	95	5/30	38	10	9.6
IDN-02-29001A	135.0	59.8	98	5/26	37	5	10.4
LCS Artdeco	134.3	56.6	94	5/25	33	0	9.5
LCS Drive	133.9	56.7	95	5/23	32	0	9.5
WB1529	133.1	60.8	97	5/25	36	6	10.3
IDN06-03303B	131.7	57.6	97	5/27	36	6	10.3
Norwest Duet	131.4	58.0	97	5/30	41	8	10.5
WB-528	131.3	59.4	98	5/23	37	9	9.7
IDN-01-10704A	131.3	58.2	97	5/27	40	7	9.8
SY Assure	130.3	59.7	97	5/21	34	7	10.2
Norwest Tandem	129.7	58.2	96	5/25	34	2	10.2
Jasper	129.4	57.2	96	5/28	38	5	10.5
UI-WSU Huffman	127.6	57.8	96	5/30	38	8	10.2
UI Sparrow	126.0	56.8	94	6/1	40	10	10.2
UI Castle	124.1	58.6	96	5/29	38	12	10.5
WB 456	123.7	60.9	96	5/22	35	4	10.2
WB1376CLP	122.4	61.5	97	5/25	37	0	11.2
Stephens	122.4	57.9	97	5/26	36	7	10.2
UI Magic	120.3	59.3	93	5/25	35	6	10.0
UI Palouse	120.0	57.9	95	5/28	36	3	10.7
Brundage	116.3	58.7	96	5/23	36	2	10.4
Average	129.0	58.5	96	5/26	36	6	10.2
LSD ($\alpha = .05$)	6.5	0.5	2.8	0.7	1.0	3.8	0.5
CV%	10.8	1.9	6.3	1.0	6.1	138.5	5.7
Pr > F	<.0001	<.0001	0.1571	<.0001	<.0001	<.0001	<.0001

Table 6. Winter Barley Irrigated Nurseries, 3-Year Averages (2015-2017; 5 site-years)

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	(>6/64)	Plumps (>5.5/64)	% thin
UTWB10201-15	149.9	46.7	88	5/16	35	20	11.4	58.5	24.4	17.8
Sprinter	147.5	47.9	88	5/17	37	22	11.0	75.2	15.2	10.2
02Ab671	147.2	50.6	87	5/18	37	25	11.4	88.9	6.5	5.1
Sunstar Pride	144.4	44.7	86	5/28	37	10	10.4	28.4	23.0	49.1
Schuyler	143.8	48.3	90	5/22	41	36	10.9	49.4	28.4	22.7
Alba	143.1	48.8	88	5/18	37	23	10.9	81.9	12.4	6.5
02Ab669	141.7	51.1	82	5/17	36	24	11.3	88.4	7.7	4.5
05ARS561-208	141.1	47.8	85	5/23	33	28	11.0	76.7	13.9	9.8
02Ab431	140.5	51.1	85	5/15	36	24	11.3	91.9	5.3	3.2
Endeavor	140.4	50.4	85	5/16	38	30	11.3	76.1	13.8	10.4
Eight-Twelve	137.5	47.0	82	5/18	37	29	10.8	61.8	21.3	17.5
Charles	131.7	48.5	86	5/14	33	17	11.3	88.7	7.0	5.0
Buck*	126.5	57.0	77	5/20	39	28	13.5	37.6	27.6	35.5
05ARS748-270*	117.3	58.5	77	5/22	37	20	15.5	72.1	19.1	9.3
Verdant	103.8	41.9	86	5/26	44	19	11.3	59.7	22.9	18.2
Average	137.1	49.3	85	5/19	37	24	11.6	69.0	16.6	15.0
LSD (a =.05)	15.2	0.8	5.9	1.1	1.7	11.6	0.5	12.7	6.8	10.4
CV%	17.8	2.8	11.3	1.3	7.3	78.7	3.7	14.5	32.2	54.6
Pr > F	<.0001	<.0001	0.0002	<.0001	<.0001	0.0064	<.0001	<.0001	<.0001	<.0001

* indicates hulless variety

Table 7. Hard Winter Wheat Dryland Nurseries 3-Year Averages (2015-2017; 9 site-years)

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
SY Clearstone 2CL	61.3	61.3	96	6/7	32	0	10.7
IDO1101 (W)	60.5	62.5	96	6/6	26	0	10.6
UI Silver (W)	60.1	61.8	95	6/8	31	0	10.2
Yellowstone	59.0	61.1	93	6/6	30	0	11.0
WB3768 (W)	58.6	61.7	94	6/8	31	0	10.6
Curlew	57.5	61.7	95	6/6	32	1	10.7
Utah 100	54.4	60.2	94	6/8	32	0	10.8
UI SRG	54.1	60.9	96	6/6	33	4	10.8
Golden Spike (W)	53.4	60.5	95	6/8	30	0	8.9
Promontory	53.1	61.9	95	6/4	30	0	11.0
Northern	52.9	60.5	89	6/9	28	0	11.5
UICF Grace (W)	52.6	60.6	94	6/5	36	1	10.8
Juniper	52.5	61.7	96	6/7	36	1	11.4
Deloris	52.1	61.5	94	6/9	32	0	10.8
Lucin-CL	52.1	61.4	95	6/8	32	0	11.5
Warhorse	51.4	60.5	95	6/6	27	0	12.3
LCS Jet	49.5	59.0	90	6/4	25	0	9.4
Norwest 553	49.2	59.9	93	6/5	25	0	10.8
Greenville	48.0	59.8	94	6/6	24	0	10.5
Whetstone	42.3	61.1	93	6/3	27	0	11.4
Bearpaw	42.1	61.0	92	6/5	28	0	11.5
Average	53.2	61.0	94	6/6	30	0	10.8
LSD ($\alpha = .05$)	3.9	0.3	2.1	0.6	1.2	1.7	1.0
CV%	14.9	1.0	4.6	0.8	7.8	983.3	9.6
Pr > F	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001

(W) = White

Table 8. Soft White Winter Wheat Dryland Nurseries, 3-Year Averages (2015-2017; 7 site-years)

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
UI Sparrow	71.2	57.7	95	6/17	30	0	9.5
Bobtail	67.5	55.6	94	6/15	26	0	9.7
Otto	67.0	59.2	95	6/17	28	0	10.4
Jasper	66.2	56.5	97	6/12	27	0	9.8
Bruneau	64.2	58.6	95	6/15	28	0	9.8
IDN-01-10704A	60.8	57.5	96	6/12	28	0	10.3
Eltan	60.7	59.1	96	6/16	28	0	9.9
UI-WSU Huffman	60.7	57.5	95	6/14	27	0	9.5
Norwest Tandem	60.2	58.4	95	6/10	25	0	9.9
WB1376CLP	58.9	61.3	94	6/11	29	0	11.9
UI Castle	58.5	59.2	96	6/14	26	0	10.3
Stephens	57.6	57.5	95	6/12	27	0	10.7
UI Palouse	55.6	57.7	95	6/12	25	0	10.3
UI Magic	52.2	58.7	95	6/10	25	0	10.3
Norwest Duet	49.0	58.9	98	6/9	27	0	9.3
Brundage	33.9	60.0	95	6/3	24	0	9.1
Average	59.0	58.3	95	6/12	27	0	10.0
LSD ($\alpha = .05$)	5.9	0.5	1.8	0.5	1.0	0.0	0.8
CV%	15.2	1.2	3.0	0.5	5.9	.	6.6
Pr > F	<.0001	<.0001	0.0145	<.0001	<.0001	.	<.0001

Table 9. Hard Spring Wheat Irrigated Nurseries, 3-Year Averages (2015-2017; 12 site-years)

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
Dayn (W)	124.5	62.3	100	6/16	32	0	14.0
SY-Teton (W)	119.3	59.9	100	6/14	29	0	13.8
SY Basalt	113.9	60.4	99	6/20	29	0	13.4
LCS Iron	112.4	60.9	99	6/19	31	0	13.8
LCS Star (W)	112.0	61.1	99	6/18	30	1	13.7
WB9411	110.8	61.6	99	6/15	29	0	15.3
IDO1203-A (W)	109.8	62.4	99	6/14	29	0	14.3
Cabernet	108.8	61.9	99	6/17	27	1	14.4
UI Platinum (W)	107.5	62.1	99	6/14	28	0	13.8
WB7589 (W)	106.0	61.4	100	6/16	25	2	14.7
WB-Paloma (W)	104.4	61.9	100	6/15	29	1	14.6
Jefferson	103.8	61.9	100	6/17	32	4	14.6
WB9668	103.5	62.4	99	6/16	28	0	16.3
Alzada (D)	99.9	61.8	99	6/15	30	1	14.9
WB7328 (W)	99.4	61.9	99	6/14	26	0	15.5
Klasic (W)	96.7	61.4	100	6/14	24	0	14.3
Snow Crest (W)	87.3	61.3	98	6/14	26	0	15.1
Average	107.1	61.6	99	6/16	28	1	14.5
LSD ($\alpha = .05$)	3.9	0.2	0.8	0.3	0.8	1.6	0.5
CV%	9.0	0.9	2.0	0.5	6.7	736.4	4.0
Pr>F	<.0001	<.0001	<.0001	<.0001	<.0001	0.0016	<.0001

(W) = White

(D) = Durum

Table 10. Soft White Spring Wheat Irrigated Nurseries, 3-Year Averages (2015-2017; 12 site-years)

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
UI Stone	120.8	61.4	99	6/17	34	1	10.3
WB6430	118.7	61.7	99	6/17	31	0	10.3
Seahawk	117.8	62.5	99	6/20	34	5	10.6
Alturas	116.3	61.5	99	6/19	34	0	10.4
Tekoa	114.3	62.8	99	6/20	35	3	10.4
UI Pettit	102.7	60.7	99	6/15	31	0	10.3
Average	115.1	61.8	99	6/18	33	2	10.4
LSD ($\alpha = .05$)	3.5	0.2	1.0	0.3	0.6	2.5	0.5
CV %	7.5	0.8	2.5	0.5	4.4	393.4	6.1
Pr > F	<.0001	<.0001	0.7581	<.0001	<.0001	0.0019	0.8639

Table 11. 6-Row Spring Barley Irrigated Nurseries, 3-Year Averages (2015-2017; 12 site-years)

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	(> 6/64)	Plump (>5.5/64)	% Thin
Feed										
Millennium	143.6	49.0	100	6/13	34	2	11.1	81.6	12.9	6.4
Goldeneye	140.5	49.1	100	6/14	35	4	11.0	78.1	15.0	7.6
Herald	130.9	49.4	99	6/17	33	6	10.8	88.8	7.8	4.3
Malt										
01Ab9663	128.0	51.8	98	6/18	36	8	10.6	94.1	4.3	2.5
Lacey	127.6	52.0	99	6/16	35	8	11.3	95.3	4.1	1.3
Tradition	118.1	51.4	99	6/17	35	9	11.2	95.3	4.0	1.5
Celebration	116.2	50.5	99	6/17	34	12	11.5	93.3	5.3	2.2
Quest	115.6	51.1	99	6/17	35	15	11.2	90.6	7.2	3.0
Average	127.5	50.5	99	6/16	35	8	11.1	89.6	7.6	3.6
LSD ($\alpha = .05$)	4.7	0.3	0.9	0.5	1.0	6.1	0.2	3.6	2.1	1.6
CV%	9.2	1.6	2.4	0.7	6.9	191.5	2.5	5.0	34.4	55.2
Pr > F	<.0001	<.0001	0.0217	<.0001	<.0001	0.0017	<.0001	<.0001	<.0001	<.0001

Table 12. 2-Row Spring Malt Barley Irrigated Nurseries, 3-Year Averages (2015-2017; 12 site-years)

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump (> 6/64)	Plump (5.5/64)	% Thin
LCS Odyssey	140.1	49.9	99	6/23	27	25	11.3	92.5	5.4	3.0
2Ab07-X031098-31	136.4	52.7	97	6/20	32	12	11.4	93.0	5.0	2.8
ABI Voyager	136.2	52.1	98	6/19	33	27	11.0	96.2	2.6	2.0
ACC Synergy	135.5	52.3	99	6/20	32	20	11.2	96.2	2.8	1.8
ABI Balster	133.5	51.4	99	6/21	29	18	11.3	93.9	4.2	2.8
LCS Genie	131.4	51.5	99	6/23	26	16	11.3	91.3	5.4	3.6
2Ab08-X05M010-82	129.4	51.4	98	6/22	31	28	11.0	89.0	6.9	5.0
CDC Copeland	129.2	51.8	99	6/21	34	28	11.2	93.9	4.3	2.8
Conrad	129.0	52.2	99	6/20	30	25	11.0	94.4	4.0	2.5
ABI Growler	126.4	51.5	99	6/21	29	16	11.2	90.4	5.9	4.6
Moravian 69	126.1	49.8	98	6/22	26	22	11.1	84.9	9.4	6.5
Merem	124.0	51.2	99	6/24	33	22	11.2	88.6	5.9	5.5
ND Genesis	122.6	53.0	99	6/19	33	6	11.2	96.7	3.0	1.5
CDC Meredith	120.0	50.7	99	6/22	31	36	11.3	91.2	5.9	3.7
AC Metcalfe	118.8	52.4	99	6/20	33	22	11.3	93.0	4.3	3.6
Hockett	116.6	52.5	99	6/19	29	35	11.4	91.8	5.2	3.9
Harrington	113.3	51.7	99	6/22	32	34	11.4	85.5	8.9	6.5
Average	127.6	51.6	99	6/21	31	23	11.2	91.9	5.2	3.7
LSD ($\alpha = .05$)	5.4	0.4	1.0	0.4	0.9	7.8	0.2	4.2	2.2	2.3
CV%	10.5	2.0	2.6	0.6	6.8	82.7	2.3	5.6	52.6	76.9
Pr > F	<.0001	<.0001	0.0004	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001

Table 13. 2-Row Spring Feed Barley Irrigated Nurseries, 3-Year Averages (2015-2017; 12 site-years)

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump (> 6/64)	Plump (5.5/64)	% Thin
Claymore	148.3	51.9	99	6/21	32	19	10.7	91.0	6.0	3.8
Xena	139.7	52.7	99	6/20	32	25	10.9	92.7	4.9	3.2
Oreana	138.2	51.8	99	6/22	27	24	11.2	86.7	8.8	5.2
Lenetah	137.3	52.8	99	6/17	32	20	11.1	93.3	4.2	3.2
Harriman	135.9	52.2	99	6/22	31	13	10.7	92.7	5.3	2.9
Champion	135.2	53.4	100	6/19	31	20	11.2	92.6	4.5	3.0
RWA 1758	128.7	52.4	99	6/20	29	29	10.7	90.4	6.0	4.4
Idagold II	127.9	51.9	99	6/21	29	15	11.1	89.4	6.9	4.6
Kardia	126.7	50.8	100	6/23	32	30	11.4	86.9	8.3	5.7
Julie*	114.6	57.8	98	6/23	32	11	13.9	89.2	7.8	3.8
Sawtooth*	113.5	57.0	92	6/22	32	14	12.5	80.3	14.3	6.1
Clearwater*	104.5	58.1	97	6/21	31	25	14.0	83.0	11.6	6.3
2Ab09-X06F058HL-31*	101.2	59.5	98	6/21	31	31	14.6	89.7	7.3	3.5
Transit*	96.3	57.3	99	6/22	33	19	14.0	81.5	14.0	5.3
CDC Fibar*	93.1	57.9	95	6/21	33	31	14.4	87.7	9.6	3.4
Average	122.7	54.5	98	6/21	31	22	12.2	88.5	8.0	4.3
LSD ($\alpha = .05$)	4.8	0.4	1.1	2.6	0.8	6.9	0.7	3.7	2.4	1.7
CV%	9.8	2.0	2.9	3.8	6.8	79.4	7.1	5.1	36.9	49.7
Pr > F	<.0001	<.0001	<.0001	0.0006	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001

*indicates hullless variety

Table 14. Hard Spring Wheat Dryland Nurseries, 3-Year Averages (2015-2017; 3 site-years)

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
Dayn (W)	48.6	62.3	93	7/2	25	0	11.6
IDO1202S (W)	44.0	62.5	94	7/4	26	0	10.9
LCS Star (W)	39.0	62.2	95	7/2	22	0	10.8
SY Selway	38.9	62.2	96	7/2	25	0	11.9
WB9411	38.4	61.5	94	7/1	22	0	11.5
UI Platinum (W)	38.1	62.7	94	6/30	22	0	10.9
LCS Iron	36.9	61.0	95	7/4	23	0	11.7
WB9668	35.4	62.5	95	7/1	21	0	13.7
Jefferson	34.5	62.5	94	7/2	24	0	11.7
IDO1203-A (W)	32.2	63.7	95	6/30	22	0	10.6
Klasic (W)	27.4	61.5	94	6/29	18	0	10.9
Average	37.6	62.2	94	7/1	23	0	11.5
LSD ($\alpha = .05$)	6.3	0.9	2.2	0.8	1.5	0.0	1.1
CV%	20.6	1.8	2.9	0.5	8.2	.	5.9
Pr>F	<.0001	<.0001	0.5663	<.0001	<.0001	.	0.001

(W) = White

Table 15. Soft White Spring Wheat Dryland Nurseries, 3-Year Averages (2015-2017; 3 site-years)

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
UI Stone	48.9	61.1	95	7/2	24	0	10.0
Alturas	45.7	61.0	96	7/4	23	0	10.0
WB6430	45.2	61.3	95	7/2	21	0	10.3
UI Pettit	37.4	61.7	94	6/30	20	0	10.6
Average	44.3	61.3	95	7/2	22	0	10.2
LSD ($\alpha = .05$)	3.8	0.8	3.1	0.5	1.5	0.0	0.9
CV%	10.1	1.6	3.9	0.4	8.2	.	4.6
Pr > F	<.0001	0.3374	0.5238	<.0001	<.0001	.	0.4205

Table 16. Dryland Hard Winter Wheat Data Combined from Rockland and Ririe, 2017.

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in)	Lodging (%)	Protein (%)
Eltan (SWW)	58.9	60.1	93	6/16	27	0	9.3
IDO1101 (W)	57.6	62.9	96	6/9	23	0	9.4
WB3768 (W)	56.9	62.0	94	6/13	30	0	10.5
SY Clearstone 2CL	56.6	61.9	95	6/9	28	0	10.2
UI SRG	56.4	61.8	96	6/11	32	0	10.3
Keldin + 11-52-0	56.0	61.9	91	6/10	27	0	10.2
WA 8267 (W)	56.0	60.4	94	6/12	24	0	9.5
Curlew	55.7	62.3	93	6/10	30	0	10.3
Yellowstone	55.2	61.9	92	6/11	28	0	10.5
Deloris	55.0	62.1	93	6/13	30	0	10.4
UICF Grace (W)	54.9	60.9	94	6/9	36	0	9.7
Golden Spike (W)	54.9	60.8	94	6/12	29	0	9.9
LCS Jet	54.2	58.7	96	6/10	22	0	8.8
LCS Rocket	54.1	58.1	95	6/9	25	0	9.7
WB-Arrowhead/Keldin	54.1	60.4	95	6/11	27	0	10.1
UI Silver	53.3	62.3	93	6/12	28	0	9.7
Norwest 553/Yellowstone	52.6	61.6	88	6/11	27	0	11.3
Promontory	52.4	63.3	93	6/10	28	0	10.7
Lucin-CL	51.5	61.9	94	6/11	33	0	11.3
XA4103	51.5	62.3	96	6/7	24	0	9.9
Keldin (QC)	51.3	61.9	94	6/9	26	0	10.1
XA4104	51.2	62.4	96	6/8	25	0	10.8
Keldin	49.4	62.1	94	6/10	26	0	9.5
Northern	49.3	61.5	90	6/13	26	0	11.3
WA8252 (W)	49.2	61.5	94	6/10	26	0	9.9
Mandala	49.0	61.2	96	6/12	26	0	10.8
IDO1506 (W)	48.3	60.7	95	6/11	20	0	10.1
Juniper	48.0	61.9	94	6/12	35	0	10.6
Utah 100	48.0	60.9	94	6/13	29	0	10.4
MT1332	47.9	61.7	88	6/11	27	0	10.9
WB4623CLP	47.3	62.0	94	6/9	25	0	11.5
XA3101 (W)	47.2	61.7	96	6/6	24	0	10.1
LCI 13DH14-53 (W)	46.3	62.4	95	6/7	24	0	10.8
LCI 13DH04-16 (W)	46.2	61.4	96	6/7	25	0	11.0
OR2110679 (W)	44.6	60.7	92	6/11	24	0	10.8
OR2111025 (W)	44.6	61.5	93	6/13	25	0	11.0
MT1348	44.4	62.5	88	6/9	25	0	10.1
OR2130118H (W)	44.2	62.6	93	6/10	23	0	11.2
Warhorse	43.7	62.3	95	6/10	24	0	12.1
Loma	43.4	61.1	92	6/13	24	0	10.9
WB4303	43.3	61.7	95	6/8	24	0	10.5
OR2130021R	43.2	60.9	94	6/12	23	0	10.9
SY Touchstone	42.0	61.9	94	6/16	21	0	12.1
LCS Yeti (W)	41.3	62.3	96	6/7	25	0	11.3
LCI 13DH14-83 (W)	41.1	63.3	94	6/8	25	0	10.4
XA4601	40.9	62.9	93	6/11	26	0	10.5
Metropolis	40.7	61.2	94	6/9	23	0	10.7
Bearpaw	39.9	61.2	88	6/11	24	0	11.4
Greenville	39.7	61.2	91	6/10	21	0	10.5
Rebelde	39.2	62.5	93	6/9	24	0	12.1
Norwest 553	39.1	60.7	91	6/11	23	0	10.9
OR2120070R	38.4	60.2	90	6/10	23	0	10.3
Whetstone	38.4	62.1	89	6/8	25	0	11.8
OR2120276H (W)	36.6	61.8	93	6/8	24	0	11.4
Average	48.2	61.6	93	6/10	26	0	10.6
LSD ($\alpha = .05$)	8.8	0.5	3.7	0.9	1.5	0.0	1.1
CV%	22.5	1.1	5.0	0.7	7.1	.	6.4
Pr >F	<.0001	<.0001	<.0001	<.0001	<.0001	.	<.0001

(W) = White

(SWW) = Soft White Winter

Table 17. Dryland Soft White Winter Wheat Data Combined from Ririe, Soda Springs, and Rockland, 2017.

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in)	Lodging (%)	Protein (%)
WB1783	66.0	62.4	95	6/15	26	0	10.6
IDN07-28017B	64.5	61.1	93	6/14	25	0	10.0
Otto	64.3	60.4	92	6/19	26	0	10.4
Norwest Tandem	62.8	59.8	93	6/13	22	0	10.3
Eltan	61.0	61.0	92	6/19	26	0	10.0
UI Sparrow	60.7	58.7	93	6/18	28	0	9.5
LWW14-73161	60.4	59.3	95	6/15	27	0	10.7
UI Sparrow (QC)	59.3	59.3	93	6/17	27	0	9.9
UI-WSU Huffman	58.4	59.1	95	6/17	25	0	9.5
SY Ovation	56.1	59.8	92	6/16	26	0	10.3
UI Palouse	55.9	59.0	93	6/16	23	0	9.9
WB1604	55.7	58.6	95	6/10	26	0	10.8
UI Castle	55.7	60.5	93	6/18	25	0	10.5
IDN-01-10704A	55.5	59.2	94	6/14	26	0	9.8
WB1529	54.2	61.0	95	6/14	23	0	10.2
LCS Hulk	53.4	58.9	92	6/14	25	0	9.7
Bobtail	53.2	56.1	91	6/16	23	0	9.5
Jasper	52.5	57.0	95	6/12	25	0	9.3
Bruneau	51.9	60.1	94	6/18	24	0	10.1
SY Banks	51.7	58.2	96	6/12	26	0	8.9
WA8234	51.5	60.1	94	6/9	25	0	9.0
ORI2150033CF+	51.1	59.5	91	6/16	25	0	11.2
LCS Artdeco	48.5	58.0	95	6/13	21	0	9.5
ORI2150031CF+	48.3	59.5	93	6/17	25	0	11.1
WB1070CL	48.3	61.4	95	6/12	23	0	11.1
WB1376CLP	47.5	62.3	93	6/13	25	0	12.5
WA8232	47.4	60.2	94	6/13	25	0	9.2
SY Command	46.2	57.9	95	6/12	25	0	8.8
UI Magic	45.1	59.5	95	6/13	23	0	10.2
Stephens	44.5	58.8	92	6/14	24	0	10.2
XA1101	42.0	60.3	95	6/13	21	0	11.9
XA1401	41.2	59.9	95	6/14	23	0	11.8
Norwest Duet	40.3	61.1	95	6/8	25	0	9.3
OR2101043	35.4	60.3	93	6/8	22	0	8.9
OR2121086	30.3	61.4	88	6/7	23	0	11.2
Brundage	29.0	61.8	89	6/5	21	0	9.7
Average	51.4	59.8	93	6/14	24	0	10.1
LSD ($\alpha = .05$)	10.8	0.7	2.8	0.9	1.7	0.0	1.4
CV%	20.4	1.2	3.0	0.6	7.0	.	6.9
Pr >F	<.0001	<.0001	0.0008	<.0001	<.0001	.	0.0024

Table 18. Irrigated Hard Winter Wheat Data Combined from Kimberly, Rupert, and Aberdeen, 2017.

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in)	Lodging (%)	Protein (%)
Keldin	155.2	63.2	97	6/1	34	0	11.4
Norwest 553/Yellowstone	150.4	61.6	92	6/2	37	2	11.8
Yellowstone	146.6	62.0	91	6/3	37	0	11.7
WA8252 (W)	146.3	62.7	89	6/3	37	0	11.3
LCS Jet	143.5	60.1	87	5/31	29	0	11.7
Keldin (QC)	143.3	63.3	92	6/1	34	5	11.4
WB3768 (W)	142.5	62.0	95	6/5	40	1	11.7
OR2130118H (W)	142.0	63.1	86	6/2	31	0	11.6
Greenville	141.3	61.9	91	5/31	29	0	11.4
Utah 100	141.3	61.3	95	6/3	41	2	11.6
MT1348	140.9	62.4	91	5/31	34	3	11.7
LCS Rocket	140.8	59.9	89	5/31	30	0	11.0
Northern	140.6	61.3	86	6/3	36	3	12.0
Loma	139.9	61.5	89	6/5	35	7	11.8
OR2120070R	139.3	61.2	84	6/2	32	0	11.7
Whetstone	139.1	62.0	83	5/30	35	4	13.0
XA4601	138.3	63.2	92	6/3	38	8	12.6
WB4303	137.0	62.1	91	5/29	30	1	11.7
Norwest 553	136.0	61.5	87	6/2	31	0	11.6
Mandala	135.8	62.6	93	6/3	34	0	12.2
MT1332	135.6	62.7	91	6/3	37	0	11.9
OR2110679 (W)	135.4	60.6	86	6/3	34	1	11.9
WB4623CLP	134.7	63.3	94	6/1	34	5	13.7
WA 8267 (W)	133.9	60.5	87	6/3	34	6	11.6
OR2130021R	133.5	62.2	89	6/3	32	1	12.6
Metropolis	133.2	62.5	92	5/30	31	5	12.6
IDO1101 (W)	132.8	62.4	94	5/31	31	0	12.0
Keldin + 11-52-0	132.7	63.2	84	6/1	33	4	11.6
WB-Arrowhead/Keldin	132.4	62.0	94	6/2	34	0	11.8
OR2111025 (W)	132.3	62.3	90	6/3	33	0	12.3
Warhorse	131.0	62.5	91	6/3	37	4	13.1
SY Touchstone	130.8	62.7	87	6/2	31	0	11.9
LCS Yeti (W)	130.5	64.0	96	5/29	36	3	12.7
Rebelde	130.1	63.1	90	5/30	29	0	13.2
XA3101 (W)	129.4	63.1	88	5/28	31	0	12.1
OR2120276H (W)	129.1	62.0	89	5/31	31	0	12.4
LCI 13DH14-53 (W)	127.8	63.6	86	5/30	33	3	11.5
XA4103	126.9	63.4	94	5/28	31	0	11.7
XA4104	125.7	63.3	89	5/30	31	0	12.9
IDO1506 (W)	123.9	60.5	92	5/31	27	0	12.1
Average	136.5	62.2	90	6/1	33	2	12.0
LSD ($\alpha = .05$)	13.4	0.8	8.7	1.0	1.8	5.7	0.9
CV%	12.1	1.6	12.0	0.8	6.7	424.7	4.6
Pr >F	0.0005	<.0001	0.2016	<.0001	<.0001	0.2706	<.0001

(W) = White

Table 19. Irrigated Soft White Winter Wheat Data Combined from Kimberly, Rupert, and Aberdeen, 2017.

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in)	Lodging (%)	Protein (%)
Bruneau	149.7	59.6	91	6/5	36	0	12.1
OR2101043	142.4	59.7	89	6/2	35	0	11.7
Bobtail	142.1	57.1	90	6/3	32	0	11.4
IDN-01-10704A	139.6	60.3	95	6/1	37	0	11.4
LCS Hulk	139.0	59.7	91	6/2	35	0	11.6
Norwest Duet	136.8	60.0	93	6/3	37	0	11.9
IDN-02-29001A	136.6	61.2	96	6/1	34	0	11.4
SY Dayton	136.3	60.0	94	6/3	32	0	11.6
IDN06-03303B	135.8	59.3	96	6/2	32	0	11.5
UI Castle	134.3	60.8	92	6/5	36	0	11.3
SY Ovation	134.0	59.8	90	6/3	34	0	11.9
WA8232	134.0	60.9	91	6/5	34	0	12.1
WA8234	133.8	60.9	92	6/2	34	0	11.7
IDN07-28017B	133.4	60.3	95	5/31	33	0	11.7
WB-528	133.2	61.1	95	6/1	34	0	11.7
UI-WSU Huffman	132.9	59.3	94	6/5	36	0	11.7
WB1529	132.5	62.2	92	6/1	32	0	11.7
UI Sparrow (QC)	132.3	57.6	88	6/5	38	0	11.0
SY Assure	131.6	60.9	94	5/30	32	0	11.6
WB1783	130.4	62.1	94	6/1	34	0	11.6
OR2121086	130.3	59.8	89	6/2	33	0	12.4
LCS Artdeco	129.6	58.7	89	6/1	31	0	12.2
LCS Shark	129.1	58.7	96	6/1	32	0	12.0
Norwest Tandem	127.1	59.7	90	5/31	30	0	12.3
Stephens	126.6	59.6	93	6/2	33	0	13.2
IDN09-08357A	126.0	59.9	92	6/2	35	0	12.7
LCS Drive	124.1	58.4	89	5/30	28	0	12.6
ORI2150031CF+	124.0	59.5	91	6/2	35	0	11.6
Brundage	122.4	60.3	91	5/31	32	0	12.0
WB1376CLP	121.3	62.8	94	6/1	33	0	11.9
Jasper	120.3	57.1	93	6/4	35	0	11.8
WB1070CL	120.1	62.0	90	5/30	32	0	11.8
UI Palouse	120.0	59.1	91	6/3	32	0	12.6
ORI2150033CF+	119.1	59.4	90	6/4	35	0	12.6
UI Magic	117.9	60.8	87	6/1	33	0	13.1
UI Sparrow	117.8	57.4	84	6/6	37	0	12.9
WB 456	117.3	62.0	91	5/30	32	0	11.7
WB1604	117.1	61.1	88	5/31	32	0	11.8
XA1101	116.4	61.3	89	6/1	33	0	13.0
XA1401	111.1	61.8	95	6/4	32	0	13.7
Average	129.0	60.1	92	6/2	33	0	12.0
LSD ($\alpha = .05$)	12.6	0.6	7.8	1.2	1.7	0.0	0.9
CV %	12.1	1.1	10.7	1.0	6.4	.	4.6
Pr > F	<.0001	<.0001	0.6326	<.0001	<.0001	.	<.0001

Table 20. Irrigated Hard Spring Wheat Data Combined from Rupert, Idaho Falls, Ashton, and Aberdeen, 2017.

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in)	Lodging (%)	Protein (%)
Dayn (W)	129.7	62.4	99	6/19	33	0	14.3
XA9301	127.1	61.9	100	6/22	29	0	13.2
12SB0224	126.1	60.7	100	6/22	29	0	14.1
SY-Teton (W)	118.0	60.3	99	6/18	29	0	14.7
SY Coho	116.9	60.3	99	6/22	31	0	15.3
WB9411	116.1	62.0	98	6/18	29	0	15.7
IDO1203-A (W)	113.7	62.6	99	6/17	28	0	14.6
12SB0197	113.6	58.8	99	6/23	31	0	14.0
WB-Paloma (W)	113.6	62.4	99	6/19	29	0	15.2
Cabernet	113.3	62.1	99	6/20	27	0	14.7
Alum	113.0	62.3	99	6/22	34	3	16.3
SY Gunsight	112.8	61.1	99	6/21	30	0	14.8
XA9760	112.4	62.5	100	6/21	30	0	16.3
SY Basalt	111.6	60.2	100	6/24	28	0	14.0
LCS Iron	111.4	60.8	99	6/22	31	0	14.3
LCS Star (W)	110.8	61.0	99	6/21	29	0	14.5
WB9518	110.2	61.8	99	6/20	29	0	15.7
HSG 500,709	110.1	60.8	99	6/21	27	0	14.7
WB7202CLP (W)	110.0	61.5	99	6/18	27	0	14.6
WB9578	109.5	62.5	99	6/19	29	0	15.3
UI Platinum (W)	109.1	62.3	99	6/17	28	0	14.2
IDO1602S (W)	109.0	62.4	99	6/20	31	0	14.4
XA9660	109.0	61.8	99	6/18	28	0	15.0
Jefferson	107.3	62.3	99	6/21	32	2	15.3
WB9433	106.2	60.7	99	6/19	25	0	14.9
XA7524 (W)	106.1	62.1	99	6/18	27	0	14.3
XA9502	105.4	59.9	98	6/20	25	0	14.3
Klasic (W)	103.2	62.1	99	6/17	24	0	14.7
WB7589 (W)	103.1	61.2	99	6/19	25	0	15.3
Alzada (D)	103.0	62.0	99	6/18	30	0	15.6
IDO1603S	102.6	61.5	99	6/19	29	0	16.0
XA7523 (W)	102.5	62.4	99	6/16	23	0	14.9
WB9668	100.8	62.1	99	6/19	27	0	16.7
WB9350	97.5	59.2	99	6/19	23	0	14.7
HSG 501,089	97.2	58.7	99	6/20	23	0	14.0
WB7328 (W)	94.3	62.0	99	6/17	26	0	16.2
Snow Crest (W)	82.7	61.6	95	6/17	26	0	15.9
Imperial (D)	82.4	59.2	99	6/19	30	0	18.2
Average	107.8	61.3	99	6/19	28	0	14.9
LSD ($\alpha = .05$)	6.0	0.4	1.2	0.6	1.3	1.3	0.8
CV%	8.0	1.0	1.7	0.5	6.7	1329.6	3.7
Pr > F	<.0001	<.0001	<.0001	<.0001	<.0001	0.0086	<.0001

(W) = White
(D) = Durum

Table 21. Irrigated Soft White Spring Wheat Data Combined from Rupert, Idaho Falls, Ashton, and Aberdeen, 2017.

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in)	Lodging (%)	Protein (%)
Tekoa	130.1	62.6	99	6/23	34	1	11.1
Alturas	128.0	61.9	99	6/21	33	0	11.5
14-SSW-1059	125.6	60.7	100	6/28	34	2	12.4
WA 8278	125.5	61.4	100	6/24	36	5	11.1
Seahawk	125.0	62.6	99	6/23	33	2	11.4
Melba*	123.8	61.7	99	6/26	33	9	10.8
UI Stone	123.5	61.8	99	6/20	33	0	10.8
SY Saltese	123.3	62.2	100	6/19	34	1	11.5
WB6341	123.1	61.5	99	6/20	32	6	10.2
WB6430	122.0	61.5	99	6/20	30	0	10.5
IDO1405S	121.4	61.1	97	6/20	33	0	12.4
IDO1403S	116.8	62.1	99	6/21	30	0	12.7
UI Pettit	115.1	61.5	99	6/18	31	0	10.7
WA 8277	114.2	63.7	100	6/20	35	7	12.1
Louise	112.7	61.3	99	6/23	36	13	11.5
WB6121	111.6	62.2	99	6/20	30	0	12.2
Average	121.1	61.8	99	6/21	33	3	11.4
LSD ($\alpha = .05$)	5.8	0.5	1.5	1.0	1.4	6.8	1.1
CV%	6.9	1.1	2.2	0.8	6.3	332.8	6.7
Pr > F	<.0001	<.0001	0.1037	<.0001	<.0001	0.0007	0.0001

* Indicates club variety

Table 22. Irrigated 6-Row Spring Barley Data Combined from Rupert, Idaho Falls, Ashton, and Aberdeen, 2017.

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in)	Lodging (%)	Protein (%)	Plumps (>6/64)	(>5.5/64)	% Thin
Feed										
UTSB10905-72	161.3	50.9	99	6/18	34	1	11.1	95.0	3.8	1.5
Millennium	152.8	49.5	99	6/15	34	0	11.1	73.2	17.9	9.3
UTSB10902-91	152.6	50.1	99	6/18	32	2	10.8	92.6	5.0	2.6
Goldeneye	148.9	49.4	99	6/16	34	1	11.3	70.2	19.6	10.6
YU510-510	141.4	48.5	98	6/21	23	0	10.7	84.7	10.2	5.5
Herald	140.3	50.1	98	6/21	34	3	10.7	83.7	10.5	6.4
YU510-559	120.8	45.2	96	6/21	22	4	11.2	73.5	16.3	10.4
Malt										
Lacey	141.3	52.9	99	6/19	34	6	11.4	95.2	4.1	1.3
01Ab9663	136.4	52.1	95	6/22	36	11	10.5	91.6	5.5	3.6
Quest	129.0	52.0	98	6/20	35	6	11.1	90.2	7.3	2.9
Tradition	128.1	51.8	98	6/20	34	5	11.3	92.6	5.3	2.4
Celebration	127.7	50.7	98	6/21	34	13	11.6	89.5	8.0	3.0
Average	141.2	50.2	98	6/19	32	4	11.1	86.0	9.5	5.0
LSD ($\alpha = .05$)	8.9	0.6	2.0	0.9	1.7	7.1	0.4	8.3	8.3	4.3
CV%	9.0	1.7	2.9	0.8	7.7	253.0	2.4	6.8	29.2	56.3
Pr > F	<.0001	<.0001	0.0027	<.0001	<.0001	0.0038	<.0001	<.0001	<.0001	<.0001

Table 23. Irrigated 2-Row Spring Malt Barley Data Combined from Rupert, Idaho Falls, Ashton, and Aberdeen, 2017.

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in)	Lodging (%)	Protein (%)	Plumps (>6/64)	Plumps (>5.5/64)	% Thin
Moravian 169	139.5	50.5	98	6/21	27	36	11.6	84.5	9.1	7.3
ABI Voyager	137.2	51.8	99	6/22	33	32	11.3	93.1	4.0	3.3
ABI Balster	136.3	51.4	99	6/25	30	25	11.4	91.1	5.5	3.6
2Ab07-X031098-31	136.1	52.9	98	6/25	34	13	11.4	91.0	6.0	3.5
LCS Odyssey	135.1	50.2	99	6/26	27	21	11.4	90.4	6.2	3.8
CDC Copeland	133.5	51.6	99	6/26	36	37	11.4	89.4	6.4	4.6
ACC Synergy	133.4	51.8	99	6/23	33	43	11.6	91.7	5.1	3.6
LCS Genie	133.0	51.6	99	6/26	27	23	11.4	87.2	7.1	4.9
SY Sirish	132.7	51.2	99	6/25	26	14	11.6	87.3	8.3	5.0
LCS Sienna	132.4	50.5	99	6/26	29	21	11.2	83.8	8.9	7.8
Conrad	132.1	52.3	99	6/24	30	25	11.4	92.5	5.0	2.9
2B11-4949	131.3	52.5	99	6/25	31	22	11.7	90.8	6.3	3.5
ND Genesis	131.0	53.3	99	6/23	34	5	11.1	94.3	4.2	2.1
LCS Opera	129.6	48.9	98	6/27	27	25	11.3	83.5	9.4	7.6
Bill Coors 100	128.7	48.9	99	6/21	28	29	11.0	79.7	11.0	10.0
Explorer	127.5	50.7	98	6/24	26	17	11.7	85.1	8.3	7.1
2Ab08-X05M010-65	126.7	49.5	99	6/24	30	39	11.2	79.6	11.0	9.8
2Ab08-X05M010-82	126.2	50.7	98	6/26	31	30	11.2	82.4	10.0	8.1
CDC Meredith	122.8	50.7	99	6/26	31	43	11.8	86.0	8.4	5.9
ABI Growler	122.4	51.4	99	6/25	29	16	11.4	84.0	8.5	7.8
Moravian 69	122.3	50.2	98	6/28	27	19	11.2	79.6	11.7	8.9
2B11-5166	120.7	51.1	99	6/24	31	30	11.7	86.1	9.0	5.4
Merem	116.9	51.1	99	6/29	34	35	11.4	83.3	6.3	8.3
AC Metcalfe	116.3	51.8	99	6/24	33	36	11.8	85.7	7.4	7.1
Hockett	115.8	51.3	99	6/23	30	43	11.5	84.8	8.5	7.2
Harrington	113.2	50.3	99	6/26	32	40	11.8	72.8	14.5	13.2
Average	128.7	51.0	99	6/24	30	27	11.4	86.1	7.9	6.2
LSD ($\alpha = .05$)	10.5	1.0	1.5	0.8	1.5	13.6	0.5	11.1	5.6	6.2
CV%	11.1	2.8	2.1	0.6	6.6	68.0	2.8	8.7	48.1	68.8
Pr > F	<.0001	<.0001	0.7609	<.0001	<.0001	<.0001	0.0251	0.0317	0.0474	0.0755

Table 24. Irrigated 2-Row Spring Feed Barley Data Combined from Rupert, Idaho Falls, Ashton, and Aberdeen, 2017.

Variety	Yield (bu/A)	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in)	Lodging (%)	Protein (%)	Plumps (>6/64)	(>5.5/64)	% Thin
Claymore	154.1	52.2	99	6/25	33	17	10.7	88.9	6.9	4.5
Oreana	145.5	52.2	99	6/26	28	13	11.3	85.3	9.5	5.6
Altorado	141.1	53.1	100	6/24	31	21	10.7	86.5	8.7	5.3
Xena	139.2	52.7	99	6/23	32	23	11.0	89.3	6.5	4.7
Lenetah	135.0	52.3	99	6/25	33	22	11.1	88.3	6.4	5.8
Harriman	134.9	52.2	99	6/25	31	17	10.7	87.5	8.5	4.6
Champion	134.2	53.6	99	6/23	32	19	11.2	91.7	3.7	2.8
Idagold II	130.3	52.1	99	6/24	29	11	11.2	86.2	8.5	6.1
RWA 1758	129.8	52.4	99	6/23	29	19	10.9	86.4	7.7	6.3
Kardia	120.9	50.0	99	6/26	33	43	11.6	78.4	11.8	10.3
Sawtooth*	119.7	54.1	95	6/26	32	13	11.1	81.4	13.2	5.9
Julie*	118.0	56.5	98	6/27	32	5	13.5	85.7	9.1	5.8
Clearwater*	108.2	57.4	94	6/25	32	11	13.4	82.0	11.5	7.0
2Ab09-X06F058HL-31*	104.0	59.4	98	6/25	31	21	15.1	88.2	7.9	4.4
Transit*	98.1	56.4	97	6/26	34	15	13.3	81.2	13.8	5.8
CDC Fibar*	93.4	57.4	93	6/26	34	13	13.8	88.0	8.9	3.6
Average	126.5	53.9	98	6/25	31	17	11.9	85.9	8.9	5.5
LSD ($\alpha = .05$)	8.6	0.9	1.6	0.6	1.0	11.0	1.0	5.2	3.6	3.0
CV%	9.7	2.5	2.3	0.5	4.5	90.7	6.2	4.2	28.4	38.2
Pr > F	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0004	<.0001	0.0125

* indicates hulless variety

Table 25. Agronomic Data for Winter Wheat at Kimberly, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand%	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2015	2016	2017						
Hard Winter Wheat									
LCS Jet	158.1	169.2	159.2	61.3	99	5/25	31	0	11.1
Norwest 553/Yellowstone	---	---	154.6	61.7	100	5/28	38	6	11.5
Keldin	154.8	162.2	151.9	63.4	99	5/27	35	1	10.5
LCS Rocket	---	---	147.5	60.6	100	5/25	33	0	10.7
Northern	131.6	157.8	147.5	61.8	99	5/29	37	8	10.8
Whetstone	144.8	168.5	146.0	63.2	97	5/25	38	11	12.5
Loma	---	166.5	145.1	62.9	89	5/29	35	20	11.1
Greenville	136.9	159.3	144.5	62.4	99	5/26	30	0	10.9
Keldin (QC)	---	---	141.7	63.7	100	5/26	34	15	10.9
Mandala	---	---	141.7	63.0	98	5/28	34	1	11.1
MT1348	---	---	139.6	63.0	99	5/26	35	10	10.9
XA4601	---	---	139.5	63.5	99	5/27	38	23	12.6
OR2120070R	---	---	139.4	62.2	96	5/28	34	0	10.4
Yellowstone	147.6	166.5	139.1	62.5	97	5/29	36	0	11.0
IDO1506 (W)	---	---	137.9	61.7	100	5/27	26	0	10.9
OR2130118H (W)	---	---	137.7	63.8	95	5/27	31	0	10.9
OR2130021R	---	---	137.1	62.5	99	5/28	34	3	12.3
Keldin + 11-52-0	---	---	137.1	63.5	98	5/26	34	11	11.1
Utah 100	124.4	163.0	136.9	62.0	98	5/29	40	5	11.2
Norwest 553	128.9	162.3	135.6	62.1	92	5/28	31	0	11.5
Rebelde	---	---	134.5	63.7	97	5/26	32	0	12.8
IDO1101 (W)	153.9	158.6	133.2	63.3	98	5/26	31	0	11.0
WA8252 (W)	---	164.5	133.1	63.2	98	5/27	35	0	11.3
WA 8267 (W)	---	---	132.1	61.7	98	5/29	34	19	10.3
XA4103	---	---	132.0	64.0	100	5/25	32	0	11.6
XA4104	---	---	131.8	63.5	98	5/25	33	1	12.8
OR2111025 (W)	---	160.7	131.8	62.8	90	5/29	34	0	11.5
OR2110679 (W)	---	161.1	131.7	61.1	96	5/29	34	4	10.8
MT1332	---	---	131.3	63.1	99	5/29	35	0	11.3
WB4623CLP	---	---	130.6	63.3	99	5/27	34	15	13.2
WB-Arrowhead/Keldin	---	---	130.4	62.4	100	5/29	34	0	11.8
SY Touchstone	---	147.5	129.7	62.3	97	5/28	33	1	11.1
LCI 13DH14-53 (W)	---	157.4	129.2	63.7	99	5/25	34	8	11.1
OR2120276H (W)	---	158.4	128.4	62.7	92	5/28	32	0	11.9
XA3101 (W)	---	---	127.9	63.8	98	5/26	31	1	11.4
Warhorse	---	140.3	127.1	62.4	100	5/28	35	13	12.7
WB3768 (W)	145.5	154.9	126.5	62.5	100	5/30	40	3	10.7
Metropolis	---	---	126.1	62.8	98	5/26	33	14	12.6
WB4303	---	---	120.1	62.0	99	5/25	29	3	11.6
LCS Yeti (W)	---	146.8	117.0	64.4	98	5/25	34	10	12.8
Average	136.5	156.9	136.1	62.7	98	5/27	34	5	11.5
LSD ($\alpha=.05$)	14.2	14.7	22.9	0.9	8.5	1.9	3.2	17.3	
CV %	7.4	6.7	12.0	1.1	6.2	0.9	6.7	245.2	
Pr > F	<.0001	0.0005	0.2537	<.0001	0.8549	<.0001	<.0001	0.2948	

(W) = White

Table 26. Agronomic Data for Winter Wheat at Rupert, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand%	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2015	2016	2017						
Hard Winter Wheat									
Keldin	145.0	103.4	156.4	63.2	99	6/3	32	0	11.3
WA8252 (W)	---	78.0	150.4	62.8	99	6/6	37	0	10.6
WB3768 (W)	132.9	75.0	148.6	62.1	99	6/7	39	0	11.2
WB4303	---	---	145.6	62.5	90	6/1	31	0	11.1
OR2110679 (W)	---	79.6	144.1	61.0	97	6/5	31	0	11.7
LCS Jet	150.7	99.7	142.6	60.8	94	6/3	25	0	10.5
Yellowstone	125.5	88.1	140.3	62.2	100	6/5	34	0	11.5
Greenville	126.4	83.6	138.6	62.8	92	6/3	28	0	10.9
Utah 100	116.5	70.4	138.1	60.7	95	6/7	39	0	10.8
Loma	---	88.8	137.5	61.7	99	6/7	32	0	10.9
LCS Rocket	---	---	136.1	60.4	93	6/4	26	0	9.6
Warhorse	---	63.4	135.8	63.4	99	6/5	37	0	12.7
LCS Yeti (W)	---	97.2	135.0	64.2	99	5/31	36	0	12.3
Keldin (QC)	---	---	135.0	63.4	96	6/4	30	0	11.6
XA4601	---	---	135.0	62.8	98	6/6	36	0	11.9
Norwest 553/Yellowstone	---	---	134.9	62.0	98	6/5	33	0	11.1
OR2130118H (W)	---	---	132.3	63.6	99	6/4	28	0	11.4
OR2120070R	---	---	131.8	61.7	92	6/4	29	0	11.5
Keldin + 11-52-0	---	---	130.1	63.6	94	6/4	31	0	11.2
Rebelde	---	---	129.5	63.5	99	6/3	25	0	12.8
Whetstone	120.0	90.5	129.3	63.4	96	6/1	34	0	11.6
MT1348	---	---	129.2	62.7	98	6/3	31	0	11.7
Norwest 553	133.9	94.5	129.1	61.8	96	6/5	27	0	11.7
IDO1101 (W)	142.1	87.9	129.0	62.0	97	6/3	29	0	11.6
Metropolis	---	---	127.9	62.7	99	6/2	26	0	11.6
WA 8267 (W)	---	---	127.8	61.5	96	6/5	30	0	10.6
WB4623CLP	---	---	127.4	63.5	99	6/4	31	0	12.5
Northern	127.3	76.0	125.8	61.8	98	6/6	35	0	12.0
LCI 13DH14-53 (W)	---	88.8	125.6	64.2	95	6/2	31	0	11.8
MT1332	---	---	125.3	63.2	97	6/6	36	0	11.4
XA3101 (W)	---	---	124.7	63.1	99	5/30	28	0	11.7
OR2130021R	---	---	124.7	62.6	96	6/5	27	0	11.8
OR2120276H (W)	---	85.9	124.6	62.5	95	6/2	27	0	12.2
OR2111025 (W)	---	78.8	121.8	62.6	98	6/6	28	0	11.7
XA4103	---	---	120.8	63.3	95	5/30	29	0	10.8
WB-Arrowhead/Keldin	---	---	120.5	62.2	97	6/5	30	0	11.3
Mandala	---	---	118.7	62.5	96	6/6	28	0	12.0
SY Touchstone	---	97.0	117.6	63.4	95	6/5	27	0	11.2
IDO1506 (W)	---	---	117.5	61.0	96	6/4	26	0	11.4
XA4104	---	---	108.9	63.2	95	6/2	26	0	12.9
Average	126.2	83.7	131.3	62.5	96	6/4	31	0	11.5
LSD ($\alpha=0.05$)	21.1	11.3	24.9	1.1	6.5	1.3	3.7	0.0	.
CV %	11.8	9.6	13.6	1.2	4.8	0.6	8.6	.	.
Pr > F	<.0001	<.0001	0.2	<.0001	0.515	<.0001	<.0001	.	.

(W) = White

Table 27. Agronomic Data for Winter Wheat at Aberdeen, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2015	2016	2017						
Hard Winter Wheat									
WA8252 (W)	---	121.0	168.4	62.3	80	6/6	42	0	12.1
Norwest 553/Yellowstone	---	---	167.5	61.1	80	6/5	40	0	12.9
Yellowstone	128.1	109.4	162.9	61.0	80	6/7	41	0	12.7
Keldin	109.3	102.4	162.5	63.0	93	6/4	37	0	12.5
MT1348	---	---	160.7	62.0	72	6/4	38	0	12.6
OR2130118H (W)	---	---	160.6	63.0	85	6/3	35	0	12.6
Keldin (QC)	---	---	155.6	63.0	87	6/5	38	0	11.7
Utah 100	105.6	107.1	154.7	61.2	95	6/4	44	0	12.8
Mandala	---	113.6	153.3	62.7	93	6/7	40	0	13.5
MT1332	---	---	153.2	62.0	78	6/6	39	0	13.0
SY Touchstone	---	142.2	153.0	62.9	77	6/5	34	0	13.3
OR2130021R	---	---	152.0	61.6	85	6/6	35	0	13.8
Northern	120.4	106.8	151.3	61.4	80	6/6	38	0	13.2
Keldin + 11-52-0	---	---	151.2	62.9	73	6/5	36	0	12.4
WB3768 (W)	118.8	104.1	151.2	61.0	85	6/9	42	0	13.2
LCS Jet	120.1	165.4	151.1	59.6	87	6/2	32	0	13.4
XA4104	---	---	149.2	63.6	90	5/31	34	0	13.0
OR2120070R	---	---	149.2	60.5	82	6/5	36	0	13.3
WA 8267 (W)	---	---	149.1	58.8	73	6/7	38	0	13.9
Metropolis	---	---	147.5	61.8	77	6/1	33	0	13.7
WB4623CLP	---	---	147.0	63.3	88	6/5	38	0	15.4
WB4303	---	---	146.2	61.7	83	5/31	31	0	12.5
WB-Arrowhead/Keldin	---	---	145.6	61.3	83	6/4	38	0	12.3
XA4601	---	---	144.9	62.9	80	6/6	41	0	13.2
OR2111025 (W)	---	141.7	143.2	61.5	80	6/6	36	0	13.8
Whetstone	111.9	106.6	142.9	62.2	77	6/2	37	0	14.7
OR2110679 (W)	---	137.3	142.5	60.2	78	6/4	35	0	13.3
LCI 13DH14-53 (W)	---	77.2	141.2	63.1	75	6/3	34	0	11.7
LCS Yeti (W)	---	99.7	140.7	63.5	92	5/31	38	0	12.8
XA3101 (W)	---	---	140.4	62.5	78	5/29	33	0	13.3
Warhorse	---	114.5	140.2	62.1	92	6/7	39	0	13.9
Norwest 553	121.5	150.0	139.8	60.5	72	6/5	35	0	11.6
IDO1101 (W)	114.1	106.2	139.5	61.8	88	6/2	34	0	13.4
Greenville	129.8	110.0	138.9	60.2	82	6/3	30	0	12.6
OR2120276H (W)	---	146.2	137.8	60.6	85	6/1	35	0	13.1
LCS Rocket	---	---	136.1	58.7	70	6/2	32	0	12.8
Loma	120.1	165.4	135.7	59.6	77	6/9	39	0	13.6
XA4103	---	---	132.8	62.6	88	5/29	33	0	12.8
IDO1506 (W)	---	---	126.5	59.5	87	6/2	29	0	13.9
Rebelde	---	---	123.4	62.0	73	6/1	30	0	14.1
Average	115.3	112.9	147.2	61.6	82	6/4	36	0	13.1
LSD ($\alpha=.05$)	18.7	13.5	19.0	1.2	17.0	2.1	2.5	0.0	
CV %	11.5	8.5	7.9	1.2	12.8	0.8	4.2	.	
Pr > F	0.1628	<.0001	0.0013	<.0001	0.2437	<.0001	<.0001	.	

(W) = White

Table 28. Agronomic Data for Winter Wheat at Ririe, Dryland, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2015	2016	2017						
Hard Winter Wheat									
Eltan (SWW)	---	42.3	40.7	62.2	95	---	23	0	9.9
Juniper	42.9	43.4	38.4	63.2	95	6/8	30	0	12.4
LCS Rocket	---	---	38.2	60.1	94	6/7	22	0	9.9
Utah 100	50.3	43.2	37.9	62.3	95	6/10	29	0	12.1
UI Silver	50.5	46.6	37.7	63.9	97	6/9	23	0	10.0
Deloris	48.5	42.4	36.6	63.5	91	6/12	27	0	12.3
UI SRG	45.3	45.3	36.0	62.5	98	6/6	27	0	11.6
Golden Spike (W)	41.8	45.8	35.1	62.5	92	6/9	24	0	10.8
Curlew	46.8	48.5	34.7	64.2	93	6/6	26	0	11.7
UICF Grace (W)	41.0	40.8	34.1	62.1	96	6/6	30	0	9.7
SY Clearstone 2CL	39.1	49.4	33.9	63.2	94	6/6	25	0	11.2
WA 8267 (W)	---	---	33.7	61.9	92	6/10	19	0	10.0
Promontory	43.7	42.9	33.6	64.6	93	6/7	24	0	11.8
Norwest 553	42.3	39.0	33.2	62.5	94	6/8	21	0	11.6
OR2130021R	---	---	33.2	62.7	94	6/9	20	0	11.4
MT1332	---	---	32.5	63.1	81	6/8	23	0	11.5
XA4103	---	---	32.3	63.5	97	6/5	20	0	10.0
XA3101 (W)	---	---	31.9	63.2	98	6/5	20	0	10.6
LCI 13DH04-16 (W)	---	39.9	31.8	62.8	98	6/5	22	0	11.6
SY Touchstone	---	37.5	31.7	63.4	95	6/9	19	0	12.3
WA8252 (W)	---	42.7	31.6	63.6	94	6/7	24	0	10.8
Lucin-CL	45.9	40.9	31.4	63.1	92	6/9	28	0	13.5
Loma	---	39.1	31.1	62.9	87	6/12	21	0	12.5
Northern	44.5	44.6	30.9	63.1	82	6/10	22	0	12.8
WB4623CLP	---	---	30.7	63.6	93	6/5	20	0	11.9
WB-Arrowhead/Keldin	---	---	30.5	61.1	95	6/9	23	0	11.2
XA4104	---	---	30.4	63.4	98	6/5	21	0	12.8
Yellowstone	45.7	45.5	30.3	62.8	88	6/8	24	0	12.0
Warhorse	48.1	36.4	30.2	63.3	96	6/6	22	0	12.3
Keldin + 11-52-0	---	---	30.0	63.4	94	6/7	22	0	11.5
Norwest 553/Yellowstone	---	---	29.8	62.6	81	6/9	22	0	12.4
IDO1101 (W)	54.7	44.8	29.6	63.9	95	6/6	20	0	10.5
Whetstone	38.8	41.7	29.4	63.8	92	6/5	22	0	12.4
XA4601	---	---	29.1	64.2	92	6/8	24	0	10.2
OR2111025 (W)	---	39.6	29.1	62.8	92	6/10	22	0	11.7
Rebelde	---	---	29.0	63.9	91	6/5	20	0	12.7
WB3768 (W)	44.3	46.0	29.0	63.3	93	6/11	26	0	11.8
Mandala	---	---	28.4	62.7	97	6/7	22	0	12.6
Keldin (QC)	---	---	28.4	63.0	91	6/6	21	0	12.0
OR2120070R	---	---	28.1	62.2	92	6/7	20	0	10.7
IDO1506 (W)	---	---	28.1	62.7	94	6/7	18	0	10.4
Keldin	---	50.8	27.9	63.2	96	6/5	22	0	9.6
Metropolis	---	---	27.8	63.0	93	6/5	20	0	11.6
OR2130118H (W)	---	---	27.7	64.2	95	6/7	21	0	12.5
WB4303	---	---	27.7	63.7	95	6/5	20	0	11.4
LCI 13DH14-53 (W)	---	40.9	27.5	64.6	95	6/5	19	0	12.4
MT1348	---	---	26.5	63.7	86	6/6	21	0	10.6
LCS Yeti (W)	---	48.3	26.5	63.7	98	6/5	20	0	12.4
LCS Jet	46.7	47.8	26.0	59.3	97	6/5	18	0	7.9
OR2110679 (W)	---	40.6	25.8	61.9	92	6/8	21	0	11.5
Greenville	47.8	39.5	25.3	63.1	88	6/8	19	0	11.2
Bearpaw	42.8	31.8	24.1	63.4	79	6/9	20	0	11.6
OR2120276H (W)	---	39.6	24.1	62.9	90	6/4	21	0	12.6
LCI13DH14-83 (W)	---	41.5	20.6	64.8	92	6/5	21	0	10.9
Average	44.9	42.1	30.7	63.0	93	6/7	22	0	11.4
LSD ($\alpha=.05$)	8.6	7.0	7.6	0.5	7.4	1.7	2.0	0.0	
CV %	13.7	11.8	17.6	0.6	5.7	0.8	6.5	.	
Pr > F	0.0627	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	.	

(W) = White

(SWW) = Soft White Winter

Table 29. Agronomic Data for Winter Wheat at Rockland, Dryland, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2015	2016	2017						
Hard Winter Wheat									
LCS Jet	48.8	61.3	59.9	58.9	97	6/1	25	0	7.2
Keldin	---	48.1	52.1	62.4	97	5/31	29	0	7.5
XA4104	---	---	50.8	62.0	97	5/31	28	0	8.1
UICF Grace (W)	37.9	50.5	49.7	61.0	97	5/31	38	0	7.5
WA 8267 (W)	---	---	49.6	59.6	97	6/3	27	0	7.5
Keldin + 11-52-0	---	---	47.8	61.5	96	5/31	30	0	8.2
Eltan (SWW)	---	33.1	47.6	59.5	91	6/8	30	0	6.7
Yellowstone	51.2	48.3	47.4	61.6	96	6/2	30	0	8.4
SY Clearstone 2CL	50.1	46.7	47.2	61.5	96	6/1	30	0	8.6
WB-Arrowhead/Keldin	---	---	47.0	60.4	96	6/1	28	0	8.2
Utah 100	50.7	56.0	46.5	60.0	97	6/6	30	0	7.8
WB3768 (W)	49.7	46.6	46.4	61.5	94	6/5	31	0	8.0
IDO1101 (W)	41.7	47.4	46.1	62.6	97	6/1	24	0	7.3
Keldin (QC)	---	---	46.0	61.7	97	5/31	29	0	7.5
Northern	53.7	44.8	45.8	61.1	96	6/5	26	0	8.8
IDO1506 (W)	---	---	45.6	59.7	95	6/4	21	0	8.3
Juniper	47.9	50.5	45.2	61.6	94	6/5	36	0	8.2
LCS Rocket	---	---	44.7	58.0	96	6/1	26	0	7.0
Curlew	43.3	46.5	44.1	62.1	91	6/2	31	0	7.9
UI SRG	51.0	52.0	43.7	61.3	97	6/4	33	0	8.1
OR2110679 (W)	---	53.1	43.7	60.7	96	6/2	27	0	8.1
WB4303	---	---	42.9	62.0	96	5/30	27	0	8.6
XA4103	---	---	42.1	62.9	96	5/29	26	0	8.0
UI Silver	47.9	53.6	41.9	61.4	91	6/5	29	0	7.8
XA3101 (W)	---	---	41.8	61.9	97	5/29	28	0	8.5
Golden Spike (W)	57.7	41.9	41.7	60.4	96	6/4	30	0	7.4
WA8252 (W)	---	49.1	41.6	61.0	96	6/2	27	0	8.0
Promontory	43.3	48.3	41.4	62.7	96	6/2	28	0	8.2
Loma	---	38.7	40.9	60.8	96	6/5	27	0	8.6
Lucin-CL	49.8	32.6	40.9	61.1	96	6/2	34	0	8.0
Mandala	---	---	40.8	61.1	97	6/5	27	0	8.1
LCI13DH14-83 (W)	---	11.9	40.6	64.0	97	5/30	28	0	8.7
MT1332	---	---	40.2	61.3	95	6/2	29	0	9.0
Deloris	54.3	32.8	40.0	61.3	96	6/5	31	0	7.4
OR2130021R	---	---	39.4	60.6	96	6/4	26	0	8.7
Norwest 553/Yellowstone	---	---	39.1	61.0	95	6/2	28	0	8.7
MT1348	---	---	38.7	62.7	94	5/31	27	0	8.1
LCI 13DH04-16 (W)	---	37.1	38.4	61.0	96	5/29	28	0	9.1
OR2130118H (W)	---	---	38.3	62.2	96	6/1	26	0	9.0
OR2120070R	---	---	37.7	60.2	96	5/31	27	0	8.5
LCS Yeti (W)	---	46.1	37.5	62.5	96	5/29	28	0	9.6
OR2120276H (W)	---	49.8	37.0	62.1	96	5/30	28	0	9.1
OR2111025 (W)	---	47.3	36.6	61.3	96	6/5	27	0	9.0
Warhorse	42.1	40.5	36.4	62.2	96	6/1	26	0	10.4
WB4623CLP	---	---	36.3	61.6	97	6/1	26	0	9.8
Metropolis	---	---	36.2	61.1	97	6/1	25	0	8.5
Bearpaw	43.3	21.4	35.2	60.6	94	6/1	27	0	8.7
LCI 13DH14-53 (W)	---	12.2	34.6	62.8	97	5/30	27	0	9.3
Greenville	48.7	42.7	34.6	61.1	96	6/2	22	0	9.1
Norwest 553	38.7	54.6	33.9	60.1	91	6/3	26	0	9.4
Whetstone	---	---	33.9	62.0	95	5/31	27	0	9.2
XA4601	---	---	28.8	62.6	96	6/1	28	0	8.8
Rebelde	---	---	26.7	61.8	97	5/31	24	0	10.6
Average	46.9	43.3	41.8	61.3	96	6/2	28	0	8.4
LSD (a=.05)	7.7	6.4	7.6	0.7	4.4	1.3	1.7	0.0	
CV %	11.7	10.6	13.1	13.1	3.3	0.6	4.3	.	
Pr >F	<.0001	<.0001	<.0001	<.0001	0.6051	<.0001	<.0001	.	

(W) = White

(SWW) = Soft White Winter

Table 30. Agronomic Data for Winter Wheat at Soda Springs, Dryland, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2015	2016	2017						
Hard Winter Wheat									
IDO1101 (W)	102.7	101.1	97.1	62.3	97	6/22	27	0	10.5
WB3768 (W)	110.5	88.6	95.4	61.3	96	6/24	35	0	11.6
Keldin + 11-52-0	---	---	90.3	60.8	83	6/23	28	0	10.9
UISRG	---	---	89.5	61.5	95	6/23	35	0	11.1
Norwest 553/Yellowstone	---	---	88.7	61.1	89	6/23	31	0	12.8
SY Clearstone 2CL	108.4	97.2	88.7	61.1	95	6/21	30	0	11.0
Eltan (SWW)	---	---	88.5	58.6	93	6/25	28	0	11.4
Curlew	---	---	88.4	60.7	94	6/23	33	0	11.5
Deloris	---	---	88.3	61.6	91	6/23	33	0	11.4
Golden Spike (W)	---	---	87.9	59.7	95	6/24	33	0	11.5
Yellowstone	107.4	101.1	87.7	61.3	91	6/23	30	0	11.2
WA 8267 (W)	---	---	84.7	59.8	93	6/22	25	0	11.1
WB-Arrowhead/Keldin	---	---	84.7	59.6	95	6/22	29	0	10.9
Lucin-CL	---	---	82.4	61.5	93	6/23	37	0	12.4
Promontory	---	---	82.0	62.7	91	6/21	31	0	12.0
UICF Grace (W)	---	---	81.1	59.7	90	6/23	39	0	11.8
UI Silver (W)	115.0	91.1	80.3	61.5	91	6/23	32	0	11.3
XA4103	---	---	80.0	60.6	95	6/17	25	0	11.6
Keldin (QC)	---	---	79.5	61.1	95	6/22	27	0	10.7
LCS Rocket	---	---	79.4	56.3	95	6/21	26	0	12.3
Mandala	---	---	77.9	59.9	93	6/23	29	0	11.7
LCI 13DH14-53 (W)	---	79.9	76.7	59.9	95	6/18	26	0	10.7
LCS Jet	---	---	76.6	57.8	94	6/24	24	0	11.5
WB4623CLP	---	---	74.8	60.7	93	6/22	28	0	12.8
WA8252 (W)	---	---	74.3	60.1	91	6/21	27	0	10.9
XA4104	---	---	72.4	61.8	93	6/19	26	0	11.5
IDO1506 (W)	---	---	71.4	59.6	96	6/20	21	0	11.6
Northern	96.2	78.5	71.2	60.4	93	6/24	29	0	12.2
MT1332	---	---	71.0	60.8	88	6/23	29	0	12.0
LCI 13DH04-16 (W)	---	97.2	68.4	60.5	95	6/18	26	0	12.5
Keldin	---	103.2	68.3	60.8	90	6/23	26	0	11.4
MT1348	---	---	68.1	61.1	85	6/22	27	0	12.3
OR2111025 (W)	---	99.7	68.1	60.6	91	6/24	27	0	11.7
XA3101 (W)	---	---	67.8	60.1	94	6/17	26	0	11.2
OR2130118H (W)	---	---	66.7	61.2	90	6/23	24	0	11.9
XA4601	---	---	64.9	61.7	90	6/23	28	0	12.6
Warhorse	90.4	98.3	64.5	61.4	94	6/23	25	0	13.5
OR2110679 (W)	---	97.5	64.4	59.7	90	6/23	25	0	12.8
LCI13DH14-83 (W)	---	87.8	62.1	61.1	94	6/19	27	0	11.7
Rebelde	---	---	61.8	61.7	90	6/22	26	0	13.0
Juniper	---	---	60.5	61.0	93	6/22	38	0	11.2
Bearpaw	---	---	60.3	59.8	90	6/22	25	0	13.8
LCS Yeti (W)	---	97.1	60.0	60.9	95	6/20	27	0	11.7
Utah 100	97.6	83.8	59.6	60.5	90	6/23	30	0	11.2
WB4303	---	---	59.3	59.3	95	6/19	24	0	11.6
Greenville	78.0	79.6	59.1	59.5	89	6/22	22	0	11.3
Metropolis	---	---	58.1	59.4	94	6/21	24	0	11.9
Loma	---	92.4	58.0	59.7	93	6/23	25	0	11.4
OR2130021R	---	---	57.1	59.3	91	6/24	23	0	12.5
SY Touchstone	---	---	52.4	60.5	94	6/24	23	0	11.9
Whetstone	---	---	52.0	60.6	80	6/21	25	0	13.8
Norwest 553	---	99.8	50.1	59.7	88	6/23	23	0	11.7
OR2120070R	---	---	49.5	58.4	81	6/22	23	0	11.6
OR2120276H (W)	---	89.2	48.7	60.3	91	6/20	24	0	12.6
Average	97.6	91.1	72.2	60.4	92	6/22	28	0.0	11.8
LSD ($\alpha=.05$)	16.0	12.7	23.9	1.3	7.1	1.6	3.6	0.0	
CV %	10.0	8.4	23.7	1.6	5.5	0.7	9.3	.	
Pr > F	<.0001	<.0001	<.0001	<.0001	0.0010	<.0001	<.0001	.	

All varieties are Hard Red Winter unless annotated.

(W) = Hard White Winter

(SWW) = Soft White Winter

Table 31. Agronomic Data for Winter Wheat at Kimberly, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand%	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2015	2016	2017						
Soft White Winter Wheat									
OR2101043	---	---	143.4	60.9	99	5/28	35	0	9.9
Bruneau	131.0	148.9	140.4	60.4	100	5/30	36	0	8.0
LCS Hulk	---	---	130.0	60.5	100	5/27	33	0	10.4
IDN07-28017B	---	138.0	128.1	61.4	100	5/26	33	0	8.2
UI Sparrow (QC)	---	---	127.1	58.8	98	5/31	35	0	7.8
SY Assure	133.0	149.2	124.6	61.5	100	5/25	34	0	8.6
LCS Shark	---	---	122.3	59.5	99	5/27	32	0	10.1
SY Ovation	150.4	147.3	119.0	60.1	100	5/27	33	0	8.6
LCS Artdeco	135.2	136.5	117.5	59.9	99	5/26	29	0	8.4
IDN06-03303B	---	126.2	116.3	59.9	100	5/28	30	0	9.4
ORI2150031CF+	---	---	116.3	60.4	99	5/27	33	0	9.9
Jasper	143.9	156.1	115.1	59.7	99	5/29	32	0	8.8
WA8234	---	150.3	115.1	61.5	95	5/29	32	0	9.4
SY Dayton	---	---	114.0	60.9	99	5/29	30	0	9.3
OR2121086	---	---	112.8	61.1	97	5/29	31	0	9.6
IDN-01-10704A	131.5	126.7	111.7	60.9	100	5/27	34	0	9.0
WA8232	---	171.9	110.5	62.0	98	5/30	32	0	7.9
WB1783	---	146.6	110.3	62.5	100	5/28	31	0	9.7
IDN-02-29001A	143.6	152.8	109.9	61.7	99	5/26	33	0	8.7
UI-WSU Huffman	141.0	138.2	109.7	60.4	99	5/30	32	0	9.3
WB-528	127.1	151.4	109.0	61.5	99	5/26	33	0	8.4
Bobtail	139.4	137.0	108.9	57.9	92	5/28	30	0	8.2
XA1101	---	---	108.3	61.7	99	5/26	32	0	11.7
Brundage	138.7	122.7	105.4	61.1	100	5/25	32	0	9.3
WB1529	137.4	144.8	105.3	62.9	95	5/27	31	0	9.9
Norwest Duet	---	141.1	104.7	61.5	98	5/29	34	0	10.1
UI Palouse	120.3	133.8	103.6	59.4	98	5/29	30	0	8.7
UI Castle	121.4	127.6	103.0	61.8	100	5/31	32	0	9.2
WB1070CL	---	---	102.2	62.2	100	5/25	33	0	10.0
ORI2150033CF+	---	---	100.5	60.5	99	5/30	32	0	10.4
Stephens	135.7	136.9	99.5	60.1	98	5/29	31	0	9.4
UI Sparrow	126.9	152.6	98.9	59.2	99	6/1	32	0	8.8
IDN09-08357A	---	---	96.2	60.2	98	5/27	32	0	8.7
WB 456	138.2	142.2	91.3	62.2	99	5/25	31	0	8.5
LCS Drive	---	149.1	91.3	59.9	99	5/26	26	0	9.5
XA1401	---	---	91.1	61.8	98	5/30	30	0	13.1
UI Magic	131.8	127.7	86.6	61.3	99	5/26	33	0	10.0
WB1376CLP	123.2	138.2	86.4	63.0	99	5/27	30	0	10.3
Norwest Tandem	138.3	140.6	85.7	60.9	99	5/26	28	0	9.3
WB1604	---	---	80.0	61.7	100	5/26	29	0	9.5
Average	133.6	141.2	108.8	60.9	99	5/28	32	0	9.3
LSD ($\alpha=.05$)	15.9	23.0	28.0	0.8	4.5	2.5	3.9	0.0	
CV %	8.5	11.6	18.3	0.9	3.3	1.2	8.7	.	
Pr > F	<.0001	0.0339	0.0034	<.0001	0.7003	<.0001	0.0016	.	

Table 32. Agronomic Data for Winter Wheat at Rupert, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand%	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2015	2016	2017						
Soft White Winter Wheat									
Bobtail	156.4	91.8	157.5	56.5	100	6/6	31	0	9.6
Bruneau	133.0	87.0	151.5	58.7	98	6/8	36	0	8.1
IDN-02-29001A	127.3	85.9	149.3	61.0	98	6/5	34	0	9.2
IDN-01-10704A	140.2	79.8	147.5	59.7	94	6/4	36	0	8.9
Norwest Duet	---	86.2	146.6	59.1	97	6/6	36	0	9.1
UI Castle	117.1	86.2	146.5	59.9	99	6/7	38	0	8.7
LCS Drive	136.4	106.4	143.3	58.3	98	6/2	28	0	8.6
WA8232	---	84.4	141.8	60.8	97	6/7	34	0	8.4
IDN07-28017B	---	85.9	141.1	59.9	98	6/4	32	0	9.5
LCS Shark	---	---	140.5	58.5	100	6/4	31	0	9.3
LCS Hulk	---	91.8	140.4	59.4	97	6/5	34	0	8.5
IDN09-08357A	---	---	140.3	60.2	98	6/5	36	0	9.1
IDN06-03303B	---	95.1	139.7	59.0	100	6/5	33	0	8.8
WB1529	131.4	104.0	139.2	61.9	91	6/4	33	0	9.2
SY Dayton	---	---	138.9	59.6	95	6/6	31	0	8.9
WB1376CLP	127.4	90.5	138.9	62.8	98	6/4	33	0	10.9
WA8234	---	96.2	138.2	60.3	91	6/5	34	0	8.6
OR2101043	---	---	137.6	58.4	97	6/5	33	0	9.3
WB-528	146.4	98.7	136.6	60.2	95	6/5	33	0	9.5
Norwest Tandem	130.1	91.1	136.5	59.1	92	6/2	30	0	9.2
UI Magic	123.4	93.3	136.5	60.3	96	6/4	32	0	9.0
UI-WSU Huffman	126.8	79.9	135.4	58.5	97	6/7	36	0	8.5
Brundage	140.8	89.2	135.2	60.6	97	6/4	32	0	9.3
SY Assure	126.4	103.1	133.6	60.7	94	6/1	29	0	9.7
OR2121086	---	---	131.8	59.4	95	6/6	34	0	8.6
SY Ovation	147.4	96.2	130.7	60.2	90	6/6	33	0	8.4
WB1070CL	---	---	127.3	62.3	96	6/1	30	0	8.9
LCS Artdeco	150.8	101.7	126.8	58.4	92	6/4	30	0	8.8
WB1783	---	94.2	125.7	61.1	95	6/4	33	0	9.6
Stephens	129.9	80.3	125.5	59.3	95	6/5	32	0	8.3
WB1604	---	---	124.9	60.8	76	6/2	32	0	9.1
UI Palouse	127.8	84.6	124.2	59.4	98	6/6	31	0	9.3
UI Sparrow	144.9	77.8	121.4	56.7	88	6/9	38	0	8.5
Jasper	130.8	84.3	118.8	56.8	99	6/6	35	0	10.6
UI Sparrow (QC)	---	---	118.4	56.6	84	6/7	37	0	8.6
WB 456	136.9	91.4	118.0	61.5	87	6/2	30	0	9.2
ORI2150031CF+	---	---	117.7	59.1	86	6/6	34	0	9.2
ORI2150033CF+	---	---	117.3	59.0	92	6/6	35	0	9.5
XA1401	---	---	113.4	62.1	96	6/6	32	0	12.4
XA1101	---	---	113.4	61.3	92	6/5	32	0	10.3
Average	132.7	90.5	133.7	59.7	94	6/5	33	0	9.2
LSD ($\alpha=.05$)	17.6	9.2	19.3	0.7	14.2	1.5	2.6	0.0	
CV %	9.4	7.3	10.3	0.9	10.8	0.7	5.6	.	
Pr > F	<.0001	<.0001	<.0001	<.0001	0.5471	<.0001	<.0001	.	

Table 33. Agronomic Data for Winter Wheat at Aberdeen, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2015	2016	2017						
Soft White Winter Wheat									
Bobtail	151.6	143.0	159.9	56.8	78	6/6	34	0	10.9
IDN-01-10704A	149.0	135.5	159.7	60.2	90	6/5	40	0	11.1
Norwest Duet	---	147.4	159.0	59.6	84	6/6	40	0	11.3
Bruneau	144.0	124.6	157.1	59.8	76	6/8	37	0	11.3
SY Dayton	---	---	156.0	59.4	89	6/6	36	0	10.9
WB1783	---	184.7	155.2	62.8	89	6/3	39	0	11.7
Stephens	127.2	111.7	154.9	59.4	85	6/4	37	0	10.9
WB-528	143.0	134.8	153.9	61.6	90	6/2	35	0	11.1
UI-WSU Huffman	135.5	128.7	153.5	59.2	85	6/9	39	0	11.7
UI Castle	125.5	136.0	153.4	60.6	78	6/8	39	0	12.6
WB1529	148.2	134.5	153.1	61.9	91	6/4	34	0	11.6
SY Ovation	138.6	160.0	152.4	58.9	79	6/7	37	0	11.0
UI Sparrow (QC)	---	---	151.4	57.5	81	6/9	43	0	11.7
IDN06-03303B	---	132.1	151.3	59.0	88	6/4	33	0	11.2
IDN-02-29001A	144.6	151.3	150.5	61.1	90	6/2	35	0	12.1
WA8232	---	160.7	149.7	60.1	79	6/8	37	0	11.7
Norwest Tandem	134.3	150.6	148.8	59.1	80	6/2	32	0	11.5
WA8234	---	146.2	148.0	61.1	89	6/4	37	0	10.7
LCS Hulk	---	160.7	146.5	59.2	76	6/4	37	0	11.6
OR2101043	---	---	146.4	59.8	71	6/6	36	0	11.6
WB1604	---	---	146.4	60.8	90	6/2	35	0	11.7
OR2121086	---	---	146.3	59.0	75	6/4	35	0	10.7
LCS Artdeco	130.8	136.6	144.6	57.8	78	6/4	34	0	10.1
WB 456	118.5	134.7	142.5	62.3	88	6/1	34	0	11.7
IDN09-08357A	---	---	141.5	59.2	80	6/4	38	0	10.9
ORI2150033CF+	---	---	139.5	58.7	80	6/7	38	0	12.0
WB1376CLP	123.7	134.7	138.7	62.8	85	6/4	36	0	11.5
UI Sparrow	151.6	124.8	138.3	56.0	65	6/9	40	0	11.8
ORI2150031CF+	---	---	138.1	59.1	90	6/6	38	0	12.0
LCS Drive	---	173.0	137.8	56.9	69	6/2	30	0	10.6
SY Assure	111.0	155.2	136.5	60.4	88	6/1	32	0	11.7
UI Palouse	130.5	122.8	132.2	58.4	76	6/6	33	0	11.9
IDN07-28017B	---	150.5	131.1	59.7	86	6/1	34	0	11.1
WB1070CL	---	---	131.0	61.5	74	6/1	32	0	11.5
UI Magic	139.5	113.8	130.5	60.9	66	6/4	33	0	11.3
XA1401	---	---	128.7	61.4	91	6/7	35	0	13.7
XA1101	---	---	127.6	61.0	78	6/4	36	0	12.9
Jasper	141.3	147.3	126.9	54.9	83	6/7	39	0	12.6
Brundage	134.1	53.9	126.7	59.2	78	6/2	34	0	11.1
LCS Shark	---	---	124.6	58.1	89	6/2	34	0	11.3
Average	137.1	137.5	144.2	59.6	82	6/4	36	0	11.5
LSD ($\alpha=.05$)	18.9	18.5	17.1	1.3	18.4	2.1	2.3	0.0	
CV %	9.9	9.6	8.4	1.5	16.0	1.0	4.6	.	
Pr > F	<.0001	<.0001	<.0001	<.0001	0.241	<.0001	<.0001	.	

Table 34. Agronomic Data for Winter Wheat at Ririe, Dryland, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2015	2016	2017						
Soft White Winter Wheat									
Otto	55.2	50.1	41.2	61.8	91	6/13	24	0	10.5
Norwest Duet	---	48.8	40.3	61.1	95	6/8	25	0	9.3
Jasper	47.7	51.5	38.4	58.9	94	6/9	21	0	9.8
SY Ovation	---	55.2	37.1	60.8	92	6/9	23	0	9.3
UI Sparrow (QC)	---	---	37.0	59.6	92	6/10	24	0	9.0
Bobtail	61.0	41.2	36.6	57.2	90	6/10	21	0	9.5
SY Command	---	---	36.1	59.1	95	6/9	22	0	9.2
Bruneau	50.0	40.7	35.6	61.5	92	6/10	21	0	9.5
OR2101043	---	---	35.4	60.3	93	6/8	22	0	8.9
SY Banks	---	---	35.4	60.0	97	6/8	23	0	9.3
WB1783	---	50.0	35.3	63.2	94	6/7	23	0	10.6
Eltan	54.0	42.2	35.2	62.1	91	6/13	22	0	10.5
IDN07-28017B	---	---	35.0	62.4	93	6/6	22	0	9.2
LWW14-73161	---	---	34.8	61.1	96	6/7	23	0	10.0
UI Sparrow	54.9	46.1	34.7	59.9	91	6/12	24	0	9.0
Norwest Tandem	47.4	44.8	34.0	61.1	91	6/5	20	0	10.8
UI Magic	49.9	41.5	33.8	61.6	95	6/5	21	0	10.8
UI-WSU Huffman	60.8	44.7	33.8	60.2	94	6/11	22	0	9.1
WA8232	---	45.9	33.4	61.9	92	6/10	22	0	9.4
LCS Hulk	---	51.5	33.2	60.8	94	6/7	23	0	9.1
UI Palouse	48.9	43.6	32.6	60.1	92	6/9	21	0	10.1
WA8234	---	43.2	32.6	61.8	94	6/5	21	0	9.7
UI Castle	52.3	44.8	32.4	61.8	94	6/12	23	0	9.3
ORI2150033CF+	---	---	31.6	60.9	88	6/9	23	0	10.8
ORI2150031CF+	---	---	31.0	61.2	90	6/10	23	0	11.1
IDN-01-10704A	61.5	48.4	30.7	60.5	93	6/7	23	0	9.6
Stephens	52.9	44.8	30.5	60.3	93	6/6	22	0	10.4
OR2121086	---	---	30.3	61.4	88	6/7	23	0	11.2
LCS Artdeco	---	---	29.3	60.4	95	6/5	19	0	9.8
Brundage	38.3	34.3	29.0	61.8	89	6/5	21	0	9.7
WB1529	---	---	29.0	63.2	94	6/8	20	0	9.8
WB1376CLP	37.2	42.8	25.9	63.6	95	6/5	23	0	11.4
XA1101	---	---	25.7	61.6	97	6/6	18	0	10.5
XA1401	---	---	25.5	62.2	95	6/6	21	0	11.4
WB1070CL	---	---	23.6	63.0	94	6/5	20	0	11.3
Average	49.2	44.4	33.0	61.1	93	6/8	22	0	10.0
LSD ($\alpha=.05$)	10.5	8.3	5.0	0.5	3.2	1.6	1.7	0.0	
CV %	15.3	13.3	9.2	0.6	2.5	0.7	5.4	.	
Pr > F	<.0001	0.0003	<.0001	<.0001	<.0001	<.0001	<.0001	.	

Table 35. Agronomic Data for Winter Wheat at Rockland, Dryland, 2017.

Variety	Yield (bu/A) 2017	Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
Soft White Winter Wheat							
Jasper	44.1	56.3	97	6/6	26	0	8.1
SY Banks	43.3	58.0	97	6/5	26	0	7.6
SY Command	34.2	57.5	97	6/4	25	0	8.0
WA8234	32.3	59.5	97	6/1	25	0	7.8
WB1604	31.9	59.1	96	5/31	25	0	10.3
WA8232	27.4	59.8	96	6/5	24	0	8.6
Average	35.5	58.4	96	6/3	25	0	8.4
LSD ($\alpha=.05$)	8.1	0.5	0.9	1.2	1.9	0.0	
CV %	15.1	0.6	0.7	0.5	4.9	.	
Pr > F	0.0024	<.0001	0.2161	<.0001	0.2	.	

Table 36. Agronomic Data for Winter Wheat at Soda Springs, Dryland, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2015	2016	2017						
Soft White Winter Wheat									
WB1783	---	---	96.7	61.6	96	6/22	29	0	10.6
IDN07-28017B	---	---	94.1	59.9	93	6/22	28	0	10.7
Norwest Tandem	---	91.2	91.6	58.5	95	6/21	25	0	9.9
WA8234	---	92.7	89.5	59.1	93	6/20	29	0	9.6
Otto	---	---	87.3	58.9	94	6/25	29	0	10.3
UI Sparrow	120.3	91.5	86.8	57.6	95	6/24	32	0	10.1
Eltan	---	---	86.7	59.8	93	6/25	29	0	9.4
LWW14-73161	---	---	86.1	57.5	95	6/22	30	0	11.3
UI-WSU Huffman	---	88.0	83.0	57.9	95	6/24	27	0	10.0
UI Sparrow (QC)	---	---	81.6	58.9	94	6/24	30	0	10.8
WA8232	---	97.4	81.5	59.1	95	6/23	28	0	9.5
IDN-01-10704A	---	90.4	80.3	57.9	95	6/22	28	0	9.9
WB1604	---	---	79.5	58.1	94	6/19	27	0	11.3
WB1529	---	---	79.5	58.9	95	6/21	25	0	10.6
UI Palouse	---	79.7	79.1	57.9	95	6/23	25	0	9.6
UI Castle	---	92.4	78.9	59.3	93	6/25	27	0	11.8
SY Banks	---	---	76.5	56.7	95	6/24	29	0	9.7
Jasper	132.5	99.2	75.1	55.7	95	6/23	27	0	10.0
SY Ovation	---	---	75.1	58.7	93	6/23	29	0	11.4
LCS Hulk	---	108.3	73.7	57.1	90	6/22	28	0	10.4
WB1070CL	---	---	73.0	59.8	95	6/18	27	0	10.9
ORI2150033CF+	---	---	70.6	58.0	94	6/24	27	0	11.6
Bobtail	124.9	91.9	69.8	55.0	93	6/23	25	0	9.6
WB1376CLP	108.5	89.8	69.1	61.0	90	6/22	28	0	13.5
SY Command	---	---	68.3	57.1	94	6/24	27	0	9.2
Bruneau	119.9	91.7	68.1	58.7	95	6/24	27	0	10.7
LCS Artdeco	---	---	67.6	55.7	95	6/21	23	0	9.3
ORI2150031CF+	---	---	65.7	57.8	95	6/24	27	0	11.0
Stephens	101.2	79.4	58.5	57.4	91	6/22	27	0	10.0
XA1101	---	---	58.3	59.0	94	6/21	24	0	13.2
XA1401	---	---	56.9	57.7	96	6/23	25	0	12.3
UI Magic	---	88.4	56.4	57.4	95	6/21	25	0	9.6
Average	113.7	93.4	76.4	58.2	94	6/22	27	0	10.5
LSD ($\alpha=.05$)	14.2	15.3	21.7	1.4	4.8	0.9	3.1	0.0	
CV %	7.5	9.8	20.2	1.7	3.6	0.4	8.1	.	
Pr > F	<.0001	0.0345	0.0074	<.0001	0.7689	<.0001	<.0001	.	

Table 37. Agronomic Data for Winter Barley at Aberdeen, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2015	2016	2017							(>6/64)	(>5.5/64)	% Thin
Schuyler	179.5	111.6	169.7	49.7	60	6/7	37	0	10.9	50.1	28.3	21.3
Thunder	---	164.8	165.0	51.1	68	5/31	33	0	11.5	97.0	2.4	0.6
06ARS617-25	---	---	157.2	51.7	54	5/31	35	0	11.4	94.6	3.5	1.5
Voyel	---	---	156.4	51.0	63	5/31	31	0	11.4	94.4	4.2	1.8
Delicatesse	---	---	154.4	51.8	76	5/31	32	0	11.7	96.1	2.9	1.1
Rubinesse	---	---	149.0	51.2	76	6/5	38	1	11.8	94.2	4.0	2.0
Sunstar Pride	165.6	127.6	148.1	48.4	41	6/10	33	0	10.4	50.0	28.4	21.7
Sprinter	186.4	128.9	147.5	50.3	53	6/3	36	0	11.2	89.8	7.5	2.7
06ARS633-3	---	---	147.5	50.7	63	6/3	32	0	11.3	83.7	10.9	5.2
02Ab671	164.0	132.3	145.7	52.7	44	6/6	39	0	11.7	97.8	1.3	0.9
Maltesse	---	---	140.6	51.8	60	5/30	30	0	11.2	95.4	2.9	2.1
LCS Calypso	---	---	134.7	50.7	76	5/28	30	0	11.7	94.2	3.4	2.1
Alba	148.4	162.2	129.6	49.7	45	6/3	32	1	11.1	88.0	7.9	4.0
05ARS561-208	162.7	140.6	127.0	49.8	35	6/8	32	0	11.3	90.2	6.2	2.9
UTWB10201-15	159.9	164.5	126.7	47.1	50	6/2	31	0	11.7	69.8	18.3	12.0
02Ab431	154.8	131.3	122.0	51.8	34	6/3	36	0	11.5	96.2	2.4	1.0
Lightning	---	165.5	121.8	48.6	64	5/30	29	1	12.3	91.0	5.5	3.3
Endeavor	159.4	156.0	112.3	50.2	35	6/4	36	0	11.5	91.2	5.6	3.0
Eight-Twelve	178.5	113.6	104.2	47.7	24	6/5	32	0	11.0	61.2	23.0	15.4
Charles	137.2	151.2	101.5	49.1	43	6/2	29	0	11.1	93.7	3.9	2.4
Madness	---	---	99.6	51.1	37	6/2	22	0	11.6	93.0	5.0	2.7
02Ab669	165.7	146.1	98.1	52.2	22	6/6	35	3	11.8	96.4	2.2	0.8
Wintmalt	---	140.2	97.8	49.3	41	6/5	36	0	12.4	91.3	5.8	3.0
Verdant	126.7	91.9	90.2	42.6	39	6/10	43	0	11.9	76.8	17.0	6.8
Buck*	166.7	123.6	85.3	58.9	15	6/5	37	0	14.1	40.9	28.6	30.3
05ARS748-270*	146.4	134.3	82.5	58.4	15	6/6	33	0	15.5	81.3	11.7	6.7
Etincel	---	---	80.5	47.6	42	5/30	25	0	11.0	83.5	10.2	7.1
10.1151	---	---	78.2	55.8	35	5/28	25	0	15.2	48.6	27.4	23.7
DH13004	---	---	62.6	50.8	20	6/2	29	0	12.1	94.6	3.6	2.2
DH130718	---	---	24.6	49.3	8	6/2	26	0	12.1	95.7	2.5	1.4
Average	159.6	140.3	118.7	50.7	45	6/3	32	0	11.8	84.0	9.6	6.4
LSD ($\alpha=.05$)	15.2	30.3	53.7	2.2	31.7	2.8	5.1	1.5				
CV %	6.7	15.2	32.2	3.1	50.6	1.3	11.2	622.0				
Pr > F	<.0001	<.0001	<.0001	<.0001	0.0001	<.0001	<.0001	0.4798				

*indicates hulless variety

Table 38. Agronomic Data for Spring Wheat at Rupert, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand%	Heading Date	Height (in)	Lodging (%)	Protein (%)
	2015	2016	2017						
Hard Spring Wheat									
XA9301	---	---	129.8	61.5	100	6/17	34	0	12.4
Dayn (W)	122.3	154.4	126.5	61.6	100	6/15	34	0	13.9
SY-Teton	123.1	140.4	122.6	59.9	100	6/13	31	0	13.7
IDO1203-A (W)	111.5	119.2	122.3	62.8	100	6/13	33	0	14.3
SY Coho	106.7	138.3	122.0	60.1	100	6/18	32	0	13.9
12SB0224	---	---	119.9	58.7	100	6/18	30	0	12.8
LCS Iron	112.6	129.2	118.5	60.5	100	6/18	32	0	13.5
WB-Paloma (W)	101.0	113.0	118.3	62.0	100	6/13	31	0	14.8
WB9411	116.9	132.3	117.1	61.9	100	6/14	30	0	14.7
XA9760	---	---	115.5	61.9	100	6/18	32	0	15.6
WB9578	---	---	115.4	61.7	100	6/14	31	0	14.3
HSG 500,709	---	---	115.4	59.6	100	6/17	28	0	13.5
Alum	---	132.5	115.3	61.8	100	6/17	35	0	15.5
Cabernet	100.8	130.9	115.0	62.2	100	6/15	28	0	13.5
SY Gunsight	---	116.2	114.9	60.6	100	6/16	32	0	13.8
IDO1603S	---	---	114.6	61.3	100	6/14	31	0	15.5
12SB0197	---	---	113.4	57.1	100	6/19	32	0	12.9
Jefferson	105.6	121.9	113.2	61.9	100	6/16	35	0	13.7
LCS Star (W)	126.0	139.9	110.5	59.1	100	6/17	31	0	13.8
Alzada (D)	91.9	132.9	109.8	61.6	100	6/14	32	1	14.9
IDO1602S	---	136.9	108.8	61.0	100	6/15	32	0	13.4
Klasic (W)	100.1	106.5	107.9	63.2	100	6/12	26	0	14.2
UI Platinum (W)	96.7	134.7	107.6	62.0	100	6/12	29	0	13.6
WB9518	---	122.0	107.1	61.3	100	6/15	30	0	14.7
SY Basalt	114.1	138.6	106.8	58.5	100	6/19	30	0	13.5
WB7328 (W)	99.5	119.9	106.2	62.0	100	6/12	28	0	15.6
XA7524 (W)	---	---	105.7	62.0	100	6/13	28	0	13.9
XA7523 (W)	---	---	105.4	62.2	100	6/11	24	0	14.4
XA9502	---	---	104.7	58.3	100	6/15	27	0	13.9
WB7202CLP (W)	---	---	104.1	59.9	100	6/13	28	0	13.8
WB7589 (W)	107.7	125.3	103.5	60.3	100	6/14	25	0	14.8
XA9660	---	---	102.1	60.9	100	6/14	29	0	14.3
WB9668	97.8	120.1	101.5	61.5	100	6/14	29	0	15.5
WB9433	---	---	101.4	58.9	100	6/13	26	0	15.0
Snow Crest (W)	91.2	94.6	100.7	61.8	100	6/12	27	0	15.4
WB9350	---	---	100.6	57.8	100	6/13	26	0	14.5
HSG 501,089	---	---	96.5	58.2	100	6/15	26	0	13.1
Imperial (D)	---	---	81.0	58.7	100	6/13	31	0	17.5
Average	104.9	124.9	109.9	60.6	100	6/15	30	0	14.2
LSD ($\alpha=.05$)	16.3	11.5	12.4	1.0	0.0	1.3	1.7	0.6	
CV %	11.0	6.5	8.0	1.2	0.0	0.5	4.0	1249.0	
Pr > F	0.0001	<.0001	<.0001	<.0001	.	<.0001	<.0001	0.4824	

All varieties are Hard Red unless annotated.

(W) = Hard White

(D) = Durum

Table 39. Agronomic Data for Spring Wheat at Aberdeen, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2015	2016	2017						
Hard Spring Wheat									
Dayn (W)	140.6	160.2	139.6	61.9	100	6/16	35	0	13.5
XA9301	---	---	134.3	61.1	100	6/17	32	0	12.4
12SB0224	---	---	126.3	60.1	100	6/19	31	0	13.5
SY Gunsight	---	147.4	123.8	60.7	100	6/17	32	0	14.2
IDO1602S	---	132.5	122.9	61.8	100	6/17	33	0	13.7
12SB0197	---	---	121.7	58.6	100	6/19	33	0	13.8
SY Basalt	133.7	148.2	121.0	60.0	100	6/20	29	0	13.5
LCS Star (W)	118.4	152.3	119.8	60.5	100	6/17	30	0	13.3
SY-Teton (W)	126.7	135.2	119.6	59.6	100	6/13	29	0	13.6
SY Coho	125.5	140.2	119.5	59.7	100	6/19	32	0	15.1
UI Platinum (W)	117.8	134.2	119.4	61.4	100	6/14	29	0	13.6
Alum	---	121.6	119.3	62.3	98	6/18	37	0	16.2
XA9760	---	---	119.0	61.9	100	6/17	31	0	16.1
Jefferson	124.7	85.8	118.8	62.3	100	6/17	33	0	14.2
WB7202CLP (W)	---	---	118.4	60.8	100	6/13	29	0	13.9
LCS Iron	---	153.6	118.4	60.5	98	6/19	32	0	13.1
WB9411	111.0	140.4	118.1	61.1	95	6/15	30	0	14.9
IDO1203-A (W)	115.4	100.4	116.4	61.4	100	6/13	30	0	13.2
HSG 500,709	---	---	115.1	59.7	100	6/17	28	0	13.8
Cabernet	110.1	142.3	114.6	60.6	100	6/16	27	0	13.9
Alzada (D)	100.0	136.7	114.2	61.3	100	6/13	33	0	15.0
WB9433	---	---	110.9	59.3	100	6/15	26	0	14.1
XA9660	---	---	109.9	60.6	98	6/14	28	0	14.0
XA7524 (W)	---	---	109.6	60.5	100	6/14	28	0	13.7
WB-Paloma (W)	118.9	92.2	106.9	61.3	100	6/15	30	0	14.8
WB9518	---	146.3	106.9	60.2	100	6/16	30	0	15.0
IDO1603S	---	---	106.7	61.1	98	6/15	31	0	15.8
WB9578	---	---	106.5	60.9	100	6/14	29	0	13.6
WB7589 (W)	109.3	136.4	105.9	60.0	100	6/15	26	0	14.9
XA9502	---	---	105.8	58.9	95	6/15	26	0	13.5
WB9668	107.9	146.0	104.5	61.4	100	6/14	29	0	15.7
WB9350	---	---	103.8	58.2	100	6/14	24	0	13.5
XA7523 (W)	---	---	103.8	60.7	98	6/13	24	0	14.0
HSG 501,089	---	---	100.2	56.5	100	6/16	25	0	13.4
Klasic (W)	103.7	79.6	99.3	60.5	100	6/12	25	0	13.1
WB7328 (W)	106.8	117.0	94.8	61.3	98	6/12	26	0	14.4
Imperial (D)	---	---	86.0	57.0	100	6/14	34	0	18.0
Snow Crest (W)	106.1	75.6	81.2	60.2	83	6/13	28	0	14.8
Average	117.8	120.8	112.0	60.3	99	6/15	30	0	14.1
LSD ($\alpha=0.05$)	13.0	8.3	7.9	0.9	4.5	1.2	1.6	0.0	
CV %	7.9	4.9	5.0	1.0	3.3	0.5	4.0	.	
Pr > F	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	.	

All varieties are Hard Red unless annotated.

(W) = Hard White

(D) = Durum

Table 40. Agronomic Data for Spring Wheat, Idaho Falls, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand%	Heading Date	Height (in)	Lodging (%)	Protein (%)
	2015	2016	2017						
Hard Spring Wheat									
XA9301	---	---	148.2	62.7	98	6/19	24	0	12.9
Dayn (W)	116.1	94.7	146.8	62.5	97.5	6/16	33	0	14.5
12SB0224	---	---	144.9	61.6	98	6/20	29	0	14.2
WB9518	---	75.9	143.7	62.6	97.75	6/19	28	0	14.8
SY Coho	67.8	77.9	135.9	59.7	97	6/19	31	0	15.7
XA9760	---	---	135.8	63.0	98	6/19	30	0	15.2
WB9411	99.8	98.0	135.3	61.9	97.5	6/14	29	0	15.7
HSG 500,709	---	---	135.1	60.9	97.75	6/19	27	0	14.7
SY Basalt	79.1	93.4	134.5	60.4	98	6/21	29	0	13.8
WB-Paloma (W)	98.4	91.4	134.3	62.5	97.75	6/16	30	0	14.7
Cabernet	98.5	96.0	133.2	62.1	97.75	6/17	27	0	14.4
XA9660	---	---	133.0	62.3	98	6/14	27	0	14.2
IDO1203-A (W)	115.5	105.1	131.4	62.5	96.25	6/13	22	0	14.9
SY-Teton	107.8	89.8	130.2	59.7	97.5	6/15	29	0	15.2
LCS Star (W)	80.0	88.7	130.0	60.6	97.75	6/19	31	0	14.9
WB9578	---	---	129.6	63.1	97.5	6/16	29	0	15.5
Alzada (D)	88.2	85.2	129.1	62.2	97.5	6/13	30	0	15.3
Klasic (W)	102.1	94.7	128.8	61.7	97	6/13	24	0	14.3
IDO1602S	---	90.8	128.3	62.0	97.75	6/17	31	0	14.0
XA7524 (W)	---	---	128.2	62.2	97	6/15	27	0	13.9
WB9433	---	---	126.9	61.5	97.75	6/17	25	0	14.4
SY Gunsight	---	96.5	125.1	60.6	97.5	6/18	30	0	14.8
WB7202CLP (W)	---	---	124.2	61.5	97.5	6/14	26	0	15.1
Jefferson	93.7	93.4	121.6	61.4	97.5	6/19	34	8	15.6
WB7589 (W)	101.2	88.1	119.9	60.9	97.5	6/16	25	0	15.1
WB9350	---	---	119.6	59.2	97	6/16	23	0	15.2
WB7328 (W)	105.6	100.7	119.5	62.0	97	6/14	26	0	16.0
WB9668	102.4	84.8	118.6	62.3	97.5	6/16	28	0	16.0
IDO1603S	---	---	118.3	60.7	98	6/16	29	0	15.1
XA7523 (W)	---	---	117.8	62.5	98	6/12	23	0	15.3
12SB0197	---	---	117.7	57.9	97.75	6/18	32	0	14.4
UI Platinum (W)	106.4	84.1	117.4	62.2	98	6/13	28	0	14.0
LCS Iron	---	86.8	117.0	59.2	97.75	6/20	31	0	15.2
XA9502	---	---	113.2	59.0	97.5	6/17	25	0	14.7
Alum	---	91.4	109.9	61.5	98	6/19	34	14	17.2
Imperial (D)	---	---	109.8	60.4	97.5	6/15	30	0	14.9
HSG 501,089	---	---	107.2	58.2	97.75	6/16	23	0	13.9
Snow Crest (W)	107.4	83.2	101.0	61.2	95.75	6/13	26	0	15.2
Average	91.2	87.7	126.0	61.2	98	6/16	28	1	14.8
LSD ($\alpha=0.05$)	14.8	18.3	15.9	0.9	1.1	1.4	4.4	5.3	
CV %	11.6	14.9	9.0	1.1	0.8	0.6	11.2	700.1	
Pr > F	<.0001	0.1707	<.0001	<.0001	0.0289	<.0001	<.0001	0.0179	

All varieties are Hard Red unless annotated.

(W) = Hard White

(D) = Durum

Table 41. Agronomic Data for Spring Wheat at Ashton, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in)	Lodging (%)	Protein (%)
	2015	2016	2017						
Hard Spring Wheat									
12SB0224	---	---	113.2	62.5	100	7/4	27	0	16.1
Alum	111.6	92.2	107.5	63.8	100	7/3	32	0	16.5
Dayn (W)	92.8	94.5	105.9	63.5	100	7/1	29	0	15.3
12SB0197	---	---	101.7	61.4	100	7/5	27	0	15.0
SY-Teton	---	---	99.5	62.0	100	7/1	27	0	16.5
XA9502	---	---	98.0	63.3	100	7/1	24	0	14.9
XA9301	---	---	96.2	62.3	100	7/3	27	0	15.2
WB-Paloma (W)	95.3	88.7	94.9	63.9	100	7/1	27	0	16.7
WB9411	82.5	83.9	94.0	63.1	100	7/1	28	0	17.4
WB7202CLP (W)	---	---	93.4	64.0	100	7/1	24	0	15.5
UI Platinum (W)	86.5	92.7	92.0	63.4	100	7/1	27	0	15.7
LCS Iron	110.2	97.5	91.8	63.0	100	7/3	27	0	15.5
XA9660	---	---	90.9	63.6	100	7/2	27	0	17.4
Cabernet	81.7	91.7	90.5	63.6	100	7/2	25	0	17.0
SY Coho	---	---	90.4	61.8	100	7/4	29	0	16.6
SY Gunsight	---	---	87.4	62.5	100	7/2	28	0	16.5
WB9578	---	---	86.5	64.2	100	7/1	26	0	17.9
WB9433	---	---	85.7	63.0	100	7/1	24	0	16.1
HSG 501,089	---	---	85.1	61.7	100	7/2	21	0	15.4
IDO1203-A (W)	98.6	96.9	84.7	63.9	100	7/1	26	0	16.1
SY Basalt	---	---	84.0	62.0	100	7/5	25	0	15.2
WB9518	---	79.6	83.2	63.1	100	7/2	27	0	18.3
WB7589 (W)	100.6	91.0	83.2	63.5	100	7/1	23	0	16.3
LCS Star (W)	103.9	90.8	83.1	63.7	100	7/2	26	0	15.9
XA7523 (W)	---	---	82.7	64.3	100	7/1	22	0	16.0
XA7524 (W)	---	---	80.9	63.5	100	7/1	25	0	15.6
XA9760	---	---	79.3	63.2	100	7/2	28	0	18.3
WB9668	97.6	82.0	78.5	63.2	100	7/1	25	0	19.4
Klasic (W)	76.7	84.2	77.0	63.3	100	7/1	23	0	17.2
IDO1602S	---	85.2	76.0	64.8	100	7/2	28	0	16.5
Jefferson	99.6	91.2	75.5	63.7	100	7/2	27	0	17.6
HSG 500,709	---	---	74.8	63.1	100	7/2	24	0	17.0
IDO1603S	---	---	70.9	62.8	100	7/1	26	0	17.6
WB9350	---	---	65.9	61.7	100	7/1	21	0	15.7
Alzada (D)	70.5	81.1	58.8	63.0	100	7/2	26	0	17.0
WB7328 (W)	87.3	78.6	56.7	63.0	100	7/1	25	0	18.9
Imperial (D)	---	---	53.0	60.8	100	7/3	25	0	20.1
Snow Crest (W)	79.9	79.2	47.8	63.0	100	7/1	23	0	18.1
Average	93.5	88.0	83.3	63.0	100	7/2	26	0	16.6
LSD ($\alpha=.05$)	18.2	10.6	10.5	0.7	0.6	0.9	1.7	0	
CV %	13.9	8.6	9.0	0.8	0.4	0.3	4.8	.	
Pr > F	<.0001	<.0001	<.0001	<.0001	0.7383	<.0001	<.0001	.	

All varieties are Hard Red unless annotated.

(W) = Hard White

(D) = Durum

Table 42. Agronomic Data for Spring Wheat at Soda Springs, Dryland, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in)	Lodging (%)	Protein (%)
	2015	2016	2017						
Hard Spring Wheat									
Dayn (W)	83.7	29.1	33.1	63.0	94	7/4	23	0	10.3
XA9301	---	---	32.6	61.0	95	7/7	20	0	9.7
XA7524 (W)	---	---	32.5	63.0	95	7/2	19	0	9.8
IDO1202S (W)	68.6	31.1	32.2	62.5	96	7/6	23	0	10.2
Alum	---	31.6	32.1	64.0	95	7/6	22	0	10.4
06PN3017-09	---	---	31.4	62.0	94	7/6	21	0	9.7
LCS Star (W)	62.2	23.4	31.4	62.0	94	7/5	20	0	11.2
SY Selway	62.1	23.3	31.4	63.5	95	7/5	23	0	9.2
WB9411	66.2	17.5	31.4	61.5	95	7/3	21	0	9.8
IDO1203-A (W)	40.0	25.8	30.6	63.5	95	7/2	20	0	10.1
WB7202CLP (W)	---	---	28.9	62.0	95	7/3	19	0	9.7
UI Platinum (W)	61.1	24.8	28.3	62.0	94	7/2	20	0	9.5
Jefferson	48.8	26.4	28.3	62.0	94	7/5	21	0	10.5
WB-Paloma (W)	---	---	28.1	62.0	95	7/4	19	0	8.9
12SB0197	---	---	28.0	60.5	95	7/7	18	0	10.1
WB9350	---	---	27.3	60.5	95	7/2	17	0	10.4
12SB0224	---	---	27.2	61.5	94	7/7	20	0	10.3
XA9760	---	---	26.9	62.0	95	7/5	21	0	10.9
LCS Iron	64.4	19.5	26.8	61.5	94	7/7	20	0	9.8
IDO1602S	---	21.3	26.7	63.0	95	7/4	23	0	10.1
SY Gunsight	---	---	26.4	61.5	96	7/5	18	0	10.4
XA9660	---	---	26.4	63.0	95	7/3	19	0	10.2
WB9668	63.1	16.7	26.3	62.5	95	7/3	21	0	12.5
XA7523 (W)	---	---	26.3	63.0	95	7/1	17	0	10.9
Imperial (D)	---	---	24.8	61.5	95	7/5	20	0	12.1
WB7589 (W)	---	19.1	24.3	62.5	95	7/3	17	0	10.6
IDO1603S	---	---	24.3	62.5	94	7/3	20	0	11.4
Klasic (W)	35.9	22.1	24.2	60.5	93	7/2	17	0	10.2
WB9518	---	15.0	24.1	61.5	94	7/5	21	0	11.8
WB9578	---	---	23.3	62.5	95	7/3	19	0	10.9
WB7328 (W)	---	21.0	22.9	61.0	95	7/1	18	0	10.7
HSG 501,089	---	---	21.3	60.5	95	7/4	17	0	10.8
Average	57.7	22.3	27.8	62.0	95	7/4	20	0	10.3
LSD ($\alpha=.05$)	15.2	5.6	6.3	1.7	2.0	1.0	2.6	0	
CV %	18.6	17.7	16.0	2.0	1.5	0.4	9.3	.	
Pr > F	<.0001	<.0001	0.0027	0.0008	0.4270	<.0001	<.0001	.	

All varieties are Hard Red unless annotated.

(W) = Hard White

(D) = Durum

Table 43. Agronomic Data for Spring Wheat at Rupert, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand%	Heading Date	Height (in)	Lodging (%)	Protein (%)
	2015	2016	2017						
Soft White Spring Wheat									
Tekoa	110.8	122.2	130.0	62.5	100	6/18	35	0	9.4
UI Stone	121.2	133.3	127.7	60.7	100	6/15	35	0	9.9
WA 8278	---	---	127.4	60.3	100	6/19	37	0	9.8
Alturas	112.9	125.0	124.5	61.4	100	6/16	35	0	13.4
IDO1405S	---	131.9	122.6	60.4	100	6/15	35	0	13.3
IDO1403S	---	126.8	122.5	61.7	100	6/17	32	0	13.9
14-SSW-1059	---	---	119.4	59.7	100	6/24	35	0	13.0
UI Pettit	94.1	110.4	119.3	60.8	100	6/13	32	0	9.7
Seahawk	116.7	131.6	117.9	62.0	100	6/18	35	0	10.1
Melba*	---	128.2	117.5	60.3	100	6/21	35	0	9.8
SY Saltese	---	127.0	117.3	62.0	100	6/13	35	0	9.9
WB6341	---	---	116.7	60.4	100	6/15	33	0	9.6
WB6430	111.4	133.3	114.3	60.3	100	6/15	31	0	9.6
WA 8277	---	---	112.1	63.7	100	6/15	36	0	10.4
Louise	---	127.7	109.3	60.6	100	6/18	39	13	10.2
WB6121	---	119.2	107.7	61.5	100	6/15	31	0	10.9
Average	105.4	123.5	119.3	61.1	100	6/17	34	1	10.8
LSD ($\alpha=.05$)	8.5	12.8	18.1	0.8	0.0	1.7	1.6	8.4	
CV %	5.6	7.3	10.7	0.9	0.0	0.7	3.2	848.5	
Pr > F	<.0001	0.0002	0.5068	<.0001	.	<.0001	<.0001	0.4736	

* = indicates club wheat

Table 44. Agronomic Data for Spring Wheat at Aberdeen, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2015	2016	2017						
Soft White Spring Wheat									
Seahawk	140.4	145.1	133.9	62.2	100	6/20	35	0	11.8
Melba*	---	144.0	133.5	61.3	100	6/21	35	0	11.1
Tekoa	115.8	133.8	133.3	62.2	100	6/20	36	0	11.3
WA 8278	---	---	132.6	61.1	100	6/20	38	0	11.2
14-SSW-1059	---	---	129.8	60.4	100	6/24	37	0	11.8
UI Stone	130.6	116.8	128.9	61.2	100	6/16	35	0	11.0
SY Saltese	---	131.8	127.7	61.5	100	6/15	34	0	11.5
IDO1405S	---	139.5	126.6	60.8	90	6/17	33	0	11.7
Alturas	121.0	102.8	126.2	60.8	100	6/17	34	0	10.9
WA 8277	---	---	123.4	63.6	100	6/16	37	0	12.6
Louise	---	107.9	123.4	61.5	100	6/19	38	0	11.4
WB6341	---	---	121.3	60.6	98	6/16	32	0	9.8
WB6430	129.0	137.4	120.6	60.4	96	6/16	31	0	10.3
IDO1403S	---	143.6	118.0	61.2	100	6/16	31	0	11.7
UI Pettit	115.7	69.0	110.1	59.5	100	6/14	33	0	10.1
WB6121	---	150.9	103.7	61.1	98	6/16	31	0	12.8
Average	122.0	116.9	124.0	61.1	99	6/18	34	0	11.2
LSD ($\alpha=.05$)	10.6	10.6	7.8	0.6	6.0	1.0	1.7	0.0	
CV %	6.0	6.4	4.5	0.7	4.2	0.4	3.5	.	
Pr > F	<.0001	<.0001	<.0001	<.0001	0.1638	<.0001	<.0001	.	

*= indicates club wheat

Table 45. Agronomic Data for Spring Wheat, Idaho Falls, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in)	Lodging (%)	Protein (%)
	2015	2016	2017						
Soft White Spring Wheat									
WB6430	103.8	105.3	148.3	61.5	98	6/16	30	0	10.6
Alturas	114.4	98.3	148.1	62.3	97	6/18	34	0	10.2
WB6341	---	---	146.2	61.5	97	6/18	32	0	10.1
14-SSW-1059	---	---	142.0	61.0	98	6/24	36	6	11.6
IDO1405S	---	90.9	140.7	60.8	98	6/17	33	0	11.5
SY Saltese	---	100.5	140.1	61.8	98	6/16	34	0	11.5
UI Stone	125.1	106.2	139.9	61.5	98	6/17	34	1	10.5
IDO1403S	---	84.3	139.6	62.0	97	6/18	30	0	11.5
Tekoa	97.9	77.4	139.1	62.3	98	6/21	35	5	10.7
UI Pettit	102.6	90.5	139.0	61.8	97	6/13	31	0	11.0
Seahawk	88.6	85.9	138.6	62.5	98	6/21	34	6	11.4
WA 8278	---	---	135.8	61.5	98	6/22	36	20	11.1
WB6121	---	84.4	135.4	62.8	97	6/17	31	0	11.9
Melba*	---	73.6	133.7	62.3	98	6/24	35	38	10.9
WA 8277	---	---	128.2	62.5	98	6/16	35	16	12.2
Louise	---	88.6	120.6	60.3	97	6/22	35	36	11.7
Average	104.6	91.5	138.1	61.8	97	6/19	33	9	11.2
LSD ($\alpha=.05$)	13.0	13.1	10.7	1.2	1.2	1.4	4.9	22.8	
CV %	8.7	10.1	5.5	1.3	0.8	0.6	10.5	186.6	
Pr > F	<.0001	0.0002	0.0008	0.0076	0.1454	<.0001	0.0008	0.0054	

*= indicates club wheat

Table 46. Agronomic Data for Spring Wheat at Ashton, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in)	Lodging (%)	Protein (%)
	2015	2016	2017						
Soft White Spring Wheat									
Tekoa	105.3	87.4	118.2	63.5	100	7/4	31	0	12.9
Alturas	110.6	99.1	113.1	63.2	100	7/4	30	0	11.6
14-SSW-1059	---	---	111.3	61.6	100	7/9	30	0	13.4
Melba*	---	104.1	110.5	62.9	100	7/7	29	0	11.4
Seahawk	105.2	99.5	109.7	63.9	100	7/4	29	0	12.4
WB6341	---	---	108.3	63.4	100	7/1	30	23	11.3
SY Saltese	---	---	108.1	63.7	100	7/1	32	4	13.1
WA 8278	---	---	106.2	62.7	100	7/5	31	0	12.3
WB6430	114.6	101.7	104.9	63.8	100	7/2	29	0	11.5
WB6121	---	84.0	99.7	63.4	100	7/1	28	0	13.2
Louise	---	93.9	97.6	62.9	100	7/3	32	4	12.7
UI Stone	115.7	107.0	97.5	63.7	100	7/2	29	0	12.0
IDO1405S	---	88.9	95.8	62.7	100	7/2	31	0	13.1
WA 8277	---	---	93.0	64.9	100	7/2	31	13	13.1
UI Pettit	93.3	96.2	91.9	64.1	100	7/1	28	0	12.0
IDO1403S	---	93.2	86.9	63.4	100	7/2	28	0	13.7
Average	107.1	95.7	102.8	63.4	100	7/3	30	2	12.5
LSD ($\alpha=0.05$)	10.8	10.3	7.4	1.3	0.5	3.1	2.3	13.0	
CV %	7.0	7.5	5.1	1.4	0.3	1.2	5.5	388.1	
Pr > F	<.0001	<.0001	0.0001	0.0064	0.4736	<.0001	0.0003	0.0846	

*= indicates club wheat

Table 47. Agronomic Data for Spring Wheat at Soda Springs, Dryland, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in)	Lodging (%)	Protein (%)
	2015	2016	2017						
Soft White Spring Wheat									
Louise	---	34.6	38.0	62.0	93	7/6	25.5	0.0	8.8
SY Saltese	---	---	36.6	62.0	95	7/4	24.3	0.0	8.7
WB6430	62.1	38.2	35.4	60.5	94	7/5	20.0	0.0	8.5
IDO1405S	---	28.8	34.7	61.0	93	7/5	22.3	0.0	9.1
Alturas	60.9	41.8	34.5	60.5	95	7/7	19.3	0.0	8.0
WB6121	---	33.6	34.4	61.5	95	7/4	21.0	0.0	9.3
UI Stone	70.2	43.3	33.2	60.5	91	7/5	22.5	0.0	8.9
UI Pettit	46.3	33.1	32.8	62.0	94	7/3	19.8	0.0	9.7
IDO1403S	---	32.5	29.6	62.0	95	7/5	20.0	0.0	9.3
14-SSW-1059	---	---	29.5	58.0	95	7/9	20.3	0.0	9.2
Average	62.9	34.6	33.9	61.0	94	7/5	21.5	0.0	9.0
LSD ($\alpha=.05$)	9.2	7.5	4.1	1.3	2.9	0.8	2.3	0.0	
CV %	10.2	15.1	8.4	1.5	2.1	0.3	7.4	.	
Pr > F	<.0001	0.0251	0.004	<.0001	0.0857	<.0001	<.0001	.	

Table 48. Agronomic Data for Spring Barley at Rupert, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2015	2016	2017							(>6/64)	(>5.5/64)	% Thin
6- Row Spring Feed Barley												
UTSB10905-72	---	153.3	148.9	50.7	100	6/13	37	3	10.7	95.2	3.9	1.7
Herald	110.3	146.5	146.8	50.2	100	6/16	36	8	10.3	87.4	9.3	4.9
UTSB10902-91	---	133.6	145.5	50.0	100	6/13	33	4	10.4	93.8	5.1	2.0
Millennium	121.0	165.7	144.9	49.6	100	6/8	36	1	10.6	73.8	17.6	9.6
YU510-510	---	---	141.5	48.2	100	6/17	23	1	9.9	84.3	10.7	6.1
Goldeneye	135.8	146.2	138.3	49.5	100	6/9	35	5	10.6	72.2	18.8	10.2
YU510-559	---	---	125.9	45.4	100	6/17	24	6	10.6	78.3	14.4	8.8
6- Row Spring Malt Barley												
Lacey	108.5	133.2	141.9	52.5	100	6/14	37	23	10.6	93.8	6.2	1.6
01Ab9663	101.4	136.7	131.9	51.6	100	6/17	40	24	10.1	93.6	5.3	3.1
Tradition	106.3	115.3	119.8	51.4	100	6/15	36	5	10.6	93.6	5.1	2.4
Celebration	101.9	119.8	118.5	50.1	100	6/16	36	15	11.0	89.2	9.3	3.0
Quest	97.7	110.3	113.1	51.5	100	6/16	38	5	10.5	88.8	8.5	3.7
Average	111.2	137.6	136.1	50.0	100	6/14	34	8	10.5	87.0	9.5	4.8
LSD ($\alpha=.05$)	16.7	22.1	21.5	1.3	0.0	1.5	2.6	17.4				
CV %	10.3	11.1	11.0	1.9	0.0	0.6	5.3	160.4				
Pr > F	0.0013	0.0002	0.0059	<.0001	.	<.0001	<.0001	0.1123				

Table 49. Agronomic Data for Spring Barley, Aberdeen, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2015	2016	2017							(>6/64)	(>5.5/64)	% Thin
6-Row Spring Feed Barley												
Millennium	142.4	180.0	170.2	48.5	100	6/12	37	0	11.2	75.4	16.8	8.0
UTSB10902-91	---	173.5	167.6	49.7	100	6/14	33	0	11.2	94.7	3.8	1.5
UTSB10905-72	---	170.5	165.6	49.4	100	6/15	34	0	11.6	93.8	3.9	1.4
Goldeneye	145.7	161.5	165.0	48.4	100	6/12	38	0	11.4	69.5	20.6	10.9
YU510-510	---	---	157.7	48.4	100	6/17	27	0	10.9	89.2	6.9	3.9
Herald	137.1	148.5	147.3	49.6	98	6/17	37	0	11.3	86.1	9.5	4.7
YU510-559	---	---	121.3	45.7	94	6/16	23	0	11.2	84.4	11.5	3.7
6-Row Spring Malt Barley												
01Ab9663	135.5	138.9	157.0	52.3	98	6/18	41	0	10.8	94.0	3.9	2.4
Tradition	123.7	132.7	152.7	51.8	100	6/17	35	0	11.2	94.5	3.9	1.7
Lacey	119.9	145.2	151.4	52.6	100	6/16	38	0	11.9	96.3	3.2	0.8
Quest	98.5	117.4	133.9	52.2	100	6/17	36	0	11.1	92.2	6.0	1.9
Celebration	107.9	130.3	128.8	50.5	96	6/18	37	0	11.7	91.9	6.2	2.5
Average	127.0	151.3	153.7	49.8	99	6/15	35	0	11.3	88.5	8.0	3.6
LSD ($\alpha=.05$)	17.0	14.2	13.2	1.0	5.1	1.4	5.7	0.0				
CV %	9.2	6.5	6.0	1.4	3.6	0.6	11.5	.				
Pr > F	<.0001	<.0001	<.0001	<.0001	0.2657	<.0001	<.0001	.				

Table 50. Agronomic Data for Spring Barley at Idaho Falls, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2015	2016	2017							(>6/64)	(>5.5/64)	% Thin
6 - Row Spring Feed Barley												
UTSB10905-72	---	135.5	203.8	49.8	96	6/13	34	0	10.7	92.4	5.7	2.6
UTSB10902-91	---	131.8	182.9	47.5	95	6/14	32	5	10.2	85.0	8.8	6.4
Millennium	130.7	123.0	176.5	47.6	98	6/10	34	0	10.4	57.1	26.8	16.3
Goldeneye	132.6	123.6	170.3	47.6	97	6/13	34	0	10.9	54.6	27.2	18.0
Herald	124.1	111.4	168.9	47.3	95	6/15	33	4	10.4	69.2	17.4	13.6
YU510-510	---	---	166.3	46.0	92	6/20	24	0	10.1	72.7	17.8	9.9
YU510-559	---	---	136.3	39.7	92	6/20	21	10	10.9	40.4	33.3	26.7
6 - Row Spring Malt Barley												
Lacey	144.7	105.5	178.3	51.7	96	6/15	32	0	10.9	92.5	5.8	2.2
Quest	133.4	97.3	167.6	50.6	94	6/15	35	3	10.6	86.0	9.8	4.5
Celebration	137.8	90.8	164.1	49.6	96	6/17	33	18	11.2	83.3	11.5	5.1
01Ab9663	128.4	110.4	164.0	49.8	95	6/17	34	21	10.2	80.1	11.6	8.4
Tradition	132.6	111.7	148.2	49.6	93	6/17	34	14	10.6	84.3	10.7	5.2
Average	135.5	113.5	169.7	48.0	95	6/15	32	6	10.6	74.8	15.5	9.9
LSD ($\alpha=0.05$)	8.5	16.9	18.3	1.7	2.9	2.8	1.7	20.5				
CV %	4.3	10.3	7.5	2.5	2.2	1.2	3.8	252.3				
Pr > F	<.0001	0.0001	<.0001	<.0001	0.0017	<.0001	<.0001	0.3926				

Table 51. Agronomic Data for Spring Barley at Ashton, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2015	2016	2017							(>6/64)	(>5.5/64)	% Thin
6-Row Spring Feed Barley												
UTSB10905-72	---	114.0	126.7	53.9	99	7/2	30	0	11.5	98.4	1.5	0.4
Goldeneye	132.3	112.8	121.9	52.3	100	7/2	27	0	12.4	84.6	11.8	3.3
Millennium	131.8	117.2	119.4	52.3	100	7/2	28	0	12.4	86.5	10.5	3.3
UTSB10902-91	---	112.8	114.6	53.1	100	7/2	31	0	11.6	97.0	2.2	0.6
YU510-510	---	---	100.2	51.6	100	7/3	20	0	11.7	92.5	5.4	2.2
YU510-559	---	---	99.6	50.0	100	7/3	20	0	12.1	90.7	6.0	2.5
Herald	122.6	108.8	98.2	53.2	98	7/5	30	0	10.7	92.0	5.9	2.2
6-Row Spring Malt Barley												
Quest	116.7	100.2	101.3	53.9	100	7/4	32	18	12.2	93.9	4.7	1.4
Celebration	105.0	89.5	99.5	52.7	100	7/4	31	18	12.6	93.6	4.8	1.4
Lacey	110.7	97.8	93.8	54.9	100	7/3	30	3	12.4	98.1	1.3	0.5
01Ab9663	131.0	108.4	92.6	54.9	89	7/5	30	0	11.0	98.8	1.2	0.4
Tradition	100.9	81.1	91.7	54.6	100	7/4	31	0	12.6	97.8	1.5	0.4
Average	120.5	106.6	105.2	53.0	99	7/3	28	3	11.9	93.7	4.7	1.6
LSD ($\alpha=.05$)	15.5	12.0	19.1	0.5	5.6	1.4	2.8	11.5				
CV %	8.9	7.8	12.7	0.6	4.0	0.5	7.0	276.9				
Pr > F	0.0006	<.0001	0.0041	<.0001	0.0376	<.0001	<.0001	0.0113				

Table 52. Agronomic Data for Spring Barley at Rupert, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2015	2016	2017							(>6/64)	(>5.5/64)	% Thin
2-Row Spring Malt Barley												
LCS Odyssey	114.8	179.0	158.6	50.5	100	6/20	27	11	10.7	94.3	4.0	2.6
ACC Synergy	150.7	147.1	155.7	51.8	100	6/16	35	25	10.6	97.3	2.5	1.1
ABI Balster	128.1	152.8	152.6	51.2	100	6/18	31	10	10.6	94.3	4.4	1.8
LCS Genie	107.7	152.5	148.4	51.8	100	6/22	29	25	10.7	94.4	4.7	1.9
Moravian 169	---	161.1	146.9	53.2	100	6/19	27	14	10.8	97.7	2.1	1.6
Moravian 69	110.2	151.1	145.5	50.5	100	6/22	29	14	10.8	82.1	11.6	7.7
2B11-4949	---	---	143.8	52.6	100	6/19	35	18	10.6	95.9	3.6	1.8
2Ab08-X05M010-65	---	---	143.6	48.0	100	6/17	31	49	11.0	74.0	15.5	11.6
SY Sirish	---	---	143.1	50.5	100	6/19	27	13	10.9	88.0	8.7	4.5
LCS Opera	---	---	142.5	48.7	100	6/22	28	13	10.9	87.7	8.5	5.4
2Ab08-X05M010-82	113.8	154.1	140.8	51.4	100	6/19	34	14	10.3	87.6	8.2	5.4
ABI Voyager	129.0	157.1	140.2	52.1	100	6/15	34	19	10.4	96.0	3.0	2.0
CDC Copeland	114.9	153.2	139.2	52.0	100	6/18	39	23	10.8	92.0	5.5	3.3
Conrad	132.4	140.6	138.3	51.6	100	6/17	33	30	10.9	89.8	7.3	3.7
2Ab07-X031098-31	141.7	156.5	138.1	52.0	100	6/20	36	8	10.4	89.6	7.6	4.2
LCS Sienna	---	---	136.4	50.7	100	6/20	29	10	10.5	86.3	8.2	6.5
AC Metcalfe	111.3	135.1	133.7	52.6	100	6/16	35	8	10.6	94.3	4.0	2.6
CDC Meredith	109.3	145.3	133.6	50.8	100	6/21	34	44	10.7	89.6	7.3	4.2
ABI Growler	122.8	150.4	133.4	51.6	100	6/21	32	9	10.6	95.4	3.6	1.8
Harrington	100.8	124.6	132.8	52.2	100	6/19	35	15	11.0	87.7	8.7	4.5
Merem	119.7	162.5	132.4	50.1	100	6/24	37	30	10.4	86.5	9.7	5.0
Explorer	---	---	130.2	51.0	100	6/18	26	7	11.3	91.6	6.7	3.2
Bill Coors 100	---	161.1	126.8	51.4	100	6/22	27	10	10.6	97.5	2.0	1.4
ND Genesis	113.8	115.6	123.3	52.2	100	6/18	37	13	10.9	89.8	7.1	4.5
2B11-5166	---	---	123.0	51.2	100	6/17	35	8	11.0	90.0	7.4	3.9
Hockett	109.4	125.1	117.2	51.6	100	6/17	31	23	11.0	90.4	7.2	3.6
Average	118.6	150.2	138.2	51.2	100	6/19	32	17	10.7	90.8	6.5	3.8
LSD ($\alpha=0.05$)	22.8	18.0	21.4	1.7	0.0	1.1	2.8	26.9				
CV %	13.6	8.5	11.0	2.3	0.0	0.4	6.3	111.8				
Pr > F	0.0064	<.0001	0.0390	<.0001	.	<.0001	<.0001	0.1822				

Table 53. Agronomic Data for Spring Barley, Aberdeen, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2015	2016	2017							(>6/64)	(>5.5/64)	% Thin
2-Row Spring Malt Barley												
LCS Odyssey	164.5	164.8	157.4	50.4	100	6/22	30	0	11.7	96.1	3.2	1.1
LCS Sienna	---	---	156.6	51.0	100	6/22	34	1	12.1	93.6	4.8	2.2
LCS Opera	---	---	153.7	49.5	98	6/23	31	10	11.4	91.6	6.5	2.7
Conrad	138.4	138.1	150.2	52.9	100	6/19	33	8	11.8	97.5	2.0	0.9
SY Sirish	---	---	150.0	51.8	100	6/21	29	0	12.4	92.0	5.9	3.1
LCS Genie	157.4	159.6	148.0	52.3	100	6/22	29	0	11.8	88.4	4.5	2.3
Explorer	---	---	146.2	51.1	98	6/20	29	0	12.2	94.0	4.2	2.3
2Ab08-X05M010-65	---	---	136.3	51.0	100	6/21	33	23	11.5	94.2	4.7	1.6
ABI Growler	138.6	127.5	135.9	52.7	100	6/20	32	8	12.3	90.3	6.7	3.8
ND Genesis	136.5	124.5	135.3	53.7	100	6/18	36	3	11.6	96.4	3.2	1.7
2Ab07-X031098-31	140.3	141.4	134.1	53.0	100	6/22	37	9	12.4	91.4	5.4	3.9
ABI Balster	136.6	144.7	133.3	50.7	100	6/21	34	33	12.0	89.4	6.0	5.2
2B11-4949	---	---	131.4	53.2	100	6/21	35	39	12.4	95.0	4.0	1.8
ABI Voyager	144.2	143.4	129.0	50.5	100	6/20	36	65	12.5	86.7	7.5	6.0
2Ab08-X05M010-82	140.4	155.0	129.0	50.0	96	6/22	37	55	12.1	82.5	9.8	8.2
ACC Synergy	161.2	135.1	128.9	50.3	100	6/19	36	75	12.9	89.2	5.9	5.5
CDC Copeland	126.8	143.6	122.9	52.1	100	6/23	42	53	11.8	94.5	3.7	2.0
CDC Meredith	92.7	124.9	119.7	48.5	100	6/23	34	53	13.1	79.5	11.9	9.0
Moravian 69	130.7	163.3	118.6	50.7	93	6/24	28	18	11.8	91.2	6.3	3.0
2B11-5166	---	---	116.4	50.5	98	6/20	34	43	12.6	85.3	9.7	5.6
Merem	122.1	130.2	111.7	52.2	100	6/25	39	41	12.1	88.7	7.0	4.9
Hockett	127.9	118.8	111.5	51.5	100	6/18	32	76	12.3	89.0	6.5	5.2
Harrington	106.0	132.1	109.8	50.0	98	6/23	35	63	12.9	64.5	20.3	15.9
AC Metcalfe	111.1	137.0	104.1	51.7	100	6/20	37	61	13.2	84.5	8.1	7.3
Average	134.4	144.1	132.1	51.3	99	6/21	34	31	12.2	89.4	6.6	4.4
LSD ($\alpha=.05$)	22.5	21.7	17.4	1.8	5.3	1.4	3.4	35.4				
CV %	11.8	10.7	9.3	2.5	3.8	0.6	7.2	82.2				
Pr > F	<.0001	0.0001	<.0001	<.0001	0.5534	<.0001	<.0001	<.0001				

Table 54. Agronomic Data for Spring Barley at Idaho Falls, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2015	2016	2017							(>6/64)	(>5.5/64)	% Thin
2-Row Spring Malt Barley												
ND Genesis	123.7	103.5	170.1	52.4	97	6/19	34	5	10.3	92.6	5.9	1.8
ABI Voyager	129.4	134.2	159.0	50.8	98	6/17	33	45	10.8	90.8	4.9	4.6
2Ab07-X031098-31	144.4	119.5	157.1	51.6	94	6/21	32	34	11.2	85.6	9.3	5.3
ABI Balster	139.9	108.4	155.9	49.6	96	6/21	29	56	11.2	84.2	9.2	6.5
2B11-4949	---	---	148.8	49.6	96	6/21	30	31	11.4	75.5	15.5	9.6
CDC Copeland	124.4	109.3	147.4	48.8	97	6/20	32	73	11.5	74.0	14.4	11.7
2B11-5166	---	---	145.2	49.2	97	6/20	28	59	11.1	73.8	16.3	10.1
ACC Synergy	144.3	118.0	140.5	50.3	96	6/19	31	70	11.2	82.4	10.9	7.0
Conrad	106.3	121.7	134.1	50.7	96	6/21	30	61	11.1	84.0	9.8	6.6
CDC Meredith	126.2	104.0	133.4	49.5	96	6/21	31	76	11.7	78.8	11.7	9.3
2Ab08-X05M010-82	97.3	124.5	133.1	48.2	96	6/22	30	51	11.0	67.3	18.8	14.6
Moravian 169	---	102.3	132.2	47.8	96	6/22	27	58	12.3	71.2	16.0	12.9
Bill Coors 100	---	109.8	130.5	46.4	98	6/21	28	49	11.4	61.9	19.9	18.5
Explorer	---	---	130.3	45.7	96	6/21	26	63	11.6	56.9	21.4	22.1
SY Sirish	---	---	129.6	47.2	96	6/22	27	52	11.2	71.4	17.2	11.5
LCS Genie	84.2	116.8	128.5	47.4	95	6/22	26	61	11.5	67.7	18.2	14.7
Hockett	111.9	113.7	126.7	47.3	97	6/17	29	71	11.3	65.3	16.5	18.5
Moravian 69	102.6	114.2	126.5	45.8	98	6/24	26	44	11.3	48.4	27.8	23.7
AC Metcalfe	115.4	110.3	125.7	48.0	96	6/21	32	76	11.6	65.6	16.6	18.1
ABI Growler	125.9	114.5	118.9	46.9	96	6/21	28	46	11.4	52.8	22.2	25.0
LCS Odyssey	110.5	138.6	118.0	45.4	97	6/21	27	73	11.3	72.7	16.8	11.0
Merem	121.4	109.4	117.7	47.9	95	6/24	34	68	11.4	63.0	5.6	21.6
LCS Sienna	---	---	115.9	45.5	98	6/22	27	73	11.1	58.0	20.9	21.7
2Ab08-X05M010-65	---	---	112.8	44.9	96	6/21	28	83	11.2	53.2	22.3	25.0
LCS Opera	---	---	111.6	43.9	95	6/24	27	76	11.5	56.8	21.5	21.4
Harrington	111.8	108.6	103.5	45.1	98	6/22	30	81	11.6	40.9	27.8	31.8
Average	116.2	115.9	133.6	48.0	96	6/21	29	58	11.3	69.0	16.1	14.8
LSD ($\alpha=.05$)	18.5	14.5	19.6	3.0	2.7	2.2	2.4	27.0				
CV %	11.3	8.8	10.4	4.4	2.0	0.9	5.9	32.1				
Pr > F	<.0001	<.0001	<.0001	<.0001	0.4419	<.0001	<.0001	<.0001				

Table 55. Agronomic Data for Spring Barley at Ashton, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2015	2016	2017							(>6/64)	(>5.5/64)	% Thin
2-Row Spring Malt Barley												
CDC Copeland	128.7	115.2	124.6	53.6	99	7/11	31	0	11.6	96.9	1.9	1.2
LCS Sienna	---	---	120.8	55.0	100	7/8	25	0	11.1	97.2	1.8	0.7
ABI Voyager	127.8	120.5	120.5	53.7	100	7/8	29	0	11.4	98.8	0.7	0.4
2Ab07-X031098-31	135.8	113.6	114.9	54.9	99	7/9	29	0	11.6	97.2	1.6	0.6
2Ab08-X05M010-65	---	---	114.0	54.2	100	7/9	27	0	11.1	97.1	1.4	0.8
LCS Opera	---	---	110.5	53.5	100	7/10	24	0	11.2	97.7	1.0	0.8
ACC Synergy	128.3	108.1	108.3	54.6	100	7/8	30	0	11.8	98.0	0.9	0.8
SY Sirish	---	---	108.2	55.2	100	7/9	23	0	11.9	97.7	1.4	0.7
Hockett	118.1	111.5	107.8	55.0	100	7/8	27	4	11.6	94.4	3.8	1.5
LCS Genie	134.3	132.0	107.3	55.0	100	7/9	23	5	11.7	98.2	1.1	0.7
Harrington	113.5	110.0	106.7	54.1	100	7/11	29	0	11.6	97.9	1.2	0.7
LCS Odyssey	143.6	124.5	106.3	54.4	100	7/10	24	0	11.8	98.5	0.6	0.6
Merem	137.8	117.2	105.8	54.3	100	7/13	27	0	11.7	94.8	3.0	1.8
Conrad	134.4	108.5	105.6	54.2	100	7/9	25	0	11.7	98.6	0.9	0.4
CDC Meredith	130.1	116.6	104.7	54.0	100	7/10	28	0	11.6	96.2	2.7	1.1
ABI Balster	135.1	111.5	103.3	54.0	100	7/10	26	0	11.9	96.6	2.3	0.9
Explorer	---	---	103.1	54.9	100	7/8	25	0	11.8	98.0	0.9	0.8
2Ab08-X05M010-82	142.3	121.0	102.2	53.4	100	7/12	25	0	11.5	92.3	3.2	4.1
AC Metcalfe	127.6	112.3	101.6	54.9	100	7/8	29	0	11.7	98.4	0.7	0.5
ABI Growler	139.9	107.4	101.4	54.6	100	7/10	25	0	11.6	97.6	1.6	0.7
2B11-4949	---	---	101.2	54.8	100	7/9	25	0	12.1	96.7	2.0	0.7
Moravian 69	---	---	98.8	53.8	100	7/12	24	0	11.0	96.5	1.0	1.1
2B11-5166	---	---	98.4	53.6	100	7/8	28	10	12.1	95.3	2.6	1.9
ND Genesis	118.1	111.6	95.5	55.0	100	7/6	30	0	11.4	98.5	0.7	0.3
Average	134.3	116.1	107.1	54.4	100	7/9	26	1	11.6	97.0	1.6	1.0
LSD ($\alpha=.05$)	16.2	11.8	21.7	0.8	0.9	1.5	2.5	6.6				
CV %	8.5	7.2	14.4	1.0	0.6	0.5	6.8	595.4				
Pr > F	<.0001	0.0041	<.0001	<.0001	0.1524	<.0001	<.0001	0.4773				

Table 56. Agronomic Data for Spring Barley at Rupert, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2015	2016	2017							(>6/64)	(>5.5/64)	% Thin
2-Row Spring Feed Barley												
Claymore	150.4	163.8	153.4	52.5	100	6/18	36	8	10.2	90.4	7.4	3.4
Oreana	112.0	157.6	151.5	52.7	100	6/19	29	10	10.4	85.2	10.1	5.5
Xena	108.6	149.8	146.2	52.2	100	6/17	35	11	10.6	87.9	8.1	5.3
Altorado	---	156.7	141.7	53.8	100	6/18	33	4	10.2	89.8	7.9	3.6
Harriman	129.4	163.5	139.9	53.2	100	6/19	34	20	10.2	91.2	7.0	3.4
RWA 1758	107.7	150.6	139.7	53.5	100	6/17	30	10	10.3	91.1	5.8	3.9
Idagold II	109.8	157.0	135.4	53.6	100	6/18	32	3	10.6	94.0	5.4	2.4
Lenetah	123.7	151.2	132.9	53.6	100	6/19	33	20	10.2	91.8	5.7	3.8
Sawtooth*	97.2	136.7	125.0	55.1	100	6/21	35	18	9.7	82.6	13.7	4.8
Champion	116.5	133.9	122.9	53.9	100	6/17	33	13	10.4	90.6	7.4	3.4
Kardia	86.6	150.5	122.7	49.9	100	6/21	35	50	11.0	72.8	15.2	13.5
Julie*	95.6	136.4	115.3	58.0	100	6/21	36	6	11.7	86.6	9.8	5.0
2Ab09-X06F058HL-31*	80.2	115.7	104.2	60.6	100	6/20	34	24	13.4	85.7	9.9	5.0
Clearwater*	80.7	123.5	99.1	58.4	100	6/20	35	7	11.7	83.4	11.4	6.4
Transit*	74.3	107.0	96.9	58.4	100	6/21	38	23	12.1	85.8	11.9	3.3
CDC Fibar*	78.7	92.8	95.5	58.6	100	6/21	39	21	12.3	86.0	10.9	4.0
Average [†]	107.8	141.9	128.1	52.9	100	6/19	34	14	10.4	87.2	9.2	4.8
Hulless average				58.2					11.8			
LSD ($\alpha=.05$)	23.2	13.3	20.1	1.7	0.0	1.1	2.1	26.1				
CV %	15.2	6.6	11.0	2.2	0.0	0.5	4.4	129.3				
Pr > F	<.0001	<.0001	<.0001	<.0001	.	<.0001	<.0001	0.1200				

* indicates hulless variety

† Average of all varieties except test weight and protein, which have hulless varieties excluded.

Table 57. Agronomic Data for Spring Barley, Aberdeen, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2015	2016	2017							(>6/64)	(>5.5/64)	% Thin
2-Row Spring Feed Barley												
Claymore	164.5	138.7	162.5	53.0	100	6/21	34	21	10.9	95.6	3.7	1.3
Xena	150.2	150.8	158.9	53.7	100	6/18	33	0	10.8	97.1	2.6	1.1
Oreana	155.4	161.3	155.8	52.0	100	6/22	30	0	11.9	90.2	6.9	3.2
Idagold II	141.3	155.3	151.8	52.7	99	6/20	32	0	11.3	92.4	6.3	2.4
Altorado	---	182.2	151.4	53.3	100	6/20	32	18	11.0	90.1	7.2	3.4
Lenetah	146.2	149.0	150.4	53.2	100	6/20	36	13	12.0	93.7	4.6	2.5
Champion	145.3	156.3	149.9	53.6	100	6/18	34	4	11.7	94.6	4.2	2.1
Harriman	139.2	158.8	144.5	52.5	100	6/21	33	1	11.3	93.0	5.4	2.3
RWA 1758	125.4	145.1	139.2	53.2	100	6/19	32	3	11.2	90.4	6.2	3.7
Julie*	121.3	118.9	127.7	57.1	99	6/22	34	0	14.9	94.6	4.0	2.0
Kardia	138.9	144.8	122.9	50.4	100	6/24	36	53	12.1	85.0	9.8	6.0
2Ab09-X06F058HL-31*	103.1	111.3	118.1	59.8	99	6/21	34	0	16.2	94.4	4.9	1.8
Sawtooth*	100.1	103.2	117.8	53.5	89	6/22	34	0	9.9	87.3	9.8	3.1
Clearwater*	97.2	120.9	116.4	56.9	86	6/21	34	0	13.7	89.9	8.5	2.7
Transit*	103.5	104.8	102.9	56.0	96	6/23	35	5	14.5	81.4	13.9	5.5
CDC Fibar*	95.9	102.4	99.3	56.0	83	6/22	36	0	13.0	93.2	5.6	2.2
Average [†]	131.6	140.9	136.3	52.8	97	6/21	33	8	11.4	91.5	6.4	2.8
Hulless average				56.5					13.7			
LSD ($\alpha=0.05$)	20.4	19.8	14.4	0.9	4.7	0.9	2.1	19.5				
CV %	10.9	9.9	7.5	1.2	3.4	0.4	4.3	182.3				
Pr > F	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001				

* indicates hulless variety

† Average of all varieties except test weight and protein, which have hulless varieties excluded.

Table 58. Agronomic Data for Spring Barley at Idaho Falls, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2015	2016	2017							(>6/64)	(>5.5/64)	% Thin
2-Row Spring Feed Barley												
Claymore	139.0	130.7	168.6	49.6	97	6/21	32	40	10.5	72.9	15.0	12.5
Oreana	89.4	118.7	156.9	49.6	97	6/23	28	43	11.1	68.3	19.5	12.8
Altorado	---	116.6	147.0	49.9	98	6/20	31	61	10.7	69.1	17.7	13.6
Harriman	134.8	123.9	139.1	48.8	95	6/21	31	45	10.4	69.4	19.0	11.8
Lenetah	148.1	124.9	138.4	47.7	94	6/21	34	54	11.0	70.6	13.9	15.7
Champion	153.5	117.6	137.8	51.4	96	6/20	31	61	10.9	83.3	2.0	4.9
Xena	147.2	135.9	134.7	50.1	96	6/20	31	66	11.0	75.7	13.3	11.2
Sawtooth*	118.2	94.5	134.0	51.8	94	6/20	31	35	11.0	60.6	25.6	14.5
Idagold II	99.4	112.3	132.5	47.6	96	6/21	28	43	11.0	61.1	20.8	18.6
RWA 1758	123.8	111.6	129.0	47.9	96	6/20	27	63	10.8	65.8	17.6	16.9
Julie*	117.8	107.6	123.2	52.0	91	6/22	32	13	11.4	66.2	20.0	14.4
Clearwater*	102.3	94.2	122.5	54.6	92	6/21	30	38	13.1	60.4	22.6	17.1
Kardia	125.9	131.2	115.8	46.8	96	6/21	32	68	11.2	60.7	18.9	20.6
2Ab09-X06F058HL-31*	97.6	100.8	115.2	55.3	94	6/20	30	60	13.3	76.5	14.1	9.7
Transit*	103.0	90.0	109.1	53.2	94	6/21	33	31	11.7	62.4	25.3	12.9
CDC Fibar*	103.9	84.3	103.4	55.3	92	6/21	33	31	13.7	77.0	16.3	7.0
Average [†]	125.4	113.7	132.3	48.9	95	6/21	31	47	10.9	68.8	17.6	13.4
Hulless average				53.7					12.4			
LSD ($\alpha=.05$)	14.6	16.8	19.5	3.2	4.0	1.3	1.6	29.1				
CV %	8.2	10.4	10.4	4.5	3.0	0.5	3.6	43.6				
Pr > F	<.0001	<.0001	<.0001	<.0001	0.0992	<.0001	<.0001	0.0119				

* indicates hulless variety

† Average of all varieties except test weight and protein, which have hulless varieties excluded.

Table 59. Agronomic Data for Spring Barley at Ashton, Irrigated, 2017.

Variety	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2015	2016	2017							(>6/64)	(>5.5/64)	% Thin
2-Row Spring Feed Barley												
Claymore	144.8	130.6	132.1	53.8	100	7/9	29	0	11.0	96.7	1.6	0.9
Champion	124.0	137.9	126.3	55.7	100	7/8	29	0	11.8	98.1	1.0	0.6
Altorado	---	138.8	124.2	55.3	100	7/7	28	0	11.0	97.0	1.9	0.6
Kardia	135.3	123.8	122.3	53.0	100	7/10	30	1	12.1	95.2	3.3	1.2
Lenetah	133.7	131.0	118.2	54.7	100	7/10	30	0	11.3	97.0	1.5	1.0
Oreana	132.5	149.2	117.9	54.7	100	7/10	25	0	11.8	97.6	1.6	0.7
Xena	139.3	138.0	117.2	54.9	100	7/6	28	15	11.5	96.4	1.9	1.2
Harriman	116.5	125.4	116.0	54.3	99	7/10	28	0	11.0	96.3	2.5	0.7
RWA 1758	122.6	133.3	111.5	55.2	100	7/7	26	0	11.3	98.4	1.1	0.5
Julie*	98.7	106.5	105.9	58.7	100	7/11	27	0	15.9	95.5	2.6	1.6
Sawtooth*	125.5	107.8	101.7	56.0	97	7/10	30	0	11.3	95.0	3.6	1.3
Idagold II	117.4	120.8	101.6	54.7	100	7/9	25	0	11.7	97.3	1.5	0.9
Clearwater*	92.7	109.7	94.8	59.9	97	7/10	30	0	15.2	94.1	3.6	1.9
Transit*	95.9	84.6	83.3	58.2	99	7/10	29	0	14.9	95.1	4.0	1.3
2Ab09-X06F058HL-31*	95.5	99.3	78.4	62.0	99	7/9	27	0	17.5	96.1	2.5	1.0
CDC Fibar*	102.2	83.4	75.5	59.5	97	7/10	28	0	16.1	95.7	2.8	1.3
Average [†]	121.5	121.3	109.3	54.6	99	7/9	28	1	11.4	96.3	2.3	1.0
Hulless average				59.1					15.2			
LSD ($\alpha=.05$)	25.7	14.1	15.1	0.8	1.4	1.6	2.2	10.1				
CV %	14.9	8.2	9.7	1.0	1.0	0.6	5.5	787.2				
Pr > F	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.4865				

* indicates hulless variety

† Average of all varieties except test weight and protein, which have hulless varieties excluded.

Table 60. Hard Winter Wheat Yield Percentage of Location Averages, 2017.

Variety	(100% =Average)						Variety Average
	Kimberly	Aberdeen	Rupert	Ririe	Rockland	Soda Springs	
Eltan (SWW)	---	---	---	132	114	123	123
SY Clearstone 2CL	---	---	---	110	113	123	115
UI SRG	---	---	---	117	105	124	115
UICF Grace (W)	---	---	---	111	119	112	114
Curlew	---	---	---	113	106	122	114
Deloris	---	---	---	119	96	122	112
Golden Spike (W)	---	---	---	114	100	122	112
UI Silver (W)	---	---	---	123	100	111	111
LCS Jet	117	103	109	85	143	106	110
Yellowstone	102	111	107	99	114	121	109
Keldin	112	110	119	91	125	95	109
WB3768 (W)	93	103	113	94	111	132	108
LCS Rocket	108	92	104	124	107	110	108
Promontory	---	---	---	109	99	114	107
Norwest 553/Yellowstone	114	114	103	97	94	123	107
WA 8267 (W)	97	101	97	110	119	117	107
Keldin + 11-52-0	101	103	99	98	114	125	107
Juniper	---	---	---	125	108	84	106
IDO1101 (W)	98	95	98	96	110	134	105
WA8252 (W)	98	114	114	103	100	103	105
Lucin-CL	---	---	---	102	98	114	105
Utah 100	101	105	105	123	111	82	105
Keldin (QC)	104	106	103	92	110	110	104
WB-Arrowhead/Keldin	96	99	92	99	113	117	103
Northern	108	103	96	100	110	99	103
XA4104	97	101	83	99	122	100	100
Mandala	104	104	90	92	98	108	99
MT1332	96	104	95	106	96	98	99
XA4103	97	90	92	105	101	111	99
OR2130118H (W)	101	109	101	90	92	92	98
MT1348	103	109	98	86	93	94	97
WB4623CLP	96	100	97	100	87	104	97
Loma	107	92	105	101	98	80	97
XA3101 (W)	94	95	95	104	100	94	97
OR2110679 (W)	97	97	110	84	105	89	97
OR2130021R	101	103	95	108	94	79	97
LCI 13DH04-16 (W)	---	---	---	103	92	95	97
IDO1506 (W)	101	86	89	91	109	99	96
WB4303	88	99	111	90	103	82	96
Warhorse	93	95	103	98	87	89	94
LCI 13DH14-53 (W)	95	96	96	90	83	106	94
OR2111025 (W)	97	97	93	95	88	94	94
SY Touchstone	95	104	90	103	---	72	93
XA4601	103	98	103	95	69	90	93
OR2120070R	102	101	100	92	90	69	92
Greenville	106	94	106	82	83	82	92
Whetstone	107	97	98	96	81	72	92
Norwest 553	100	95	98	108	81	69	92
Metropolis	93	100	97	90	87	80	91
LCS Yeti (W)	86	96	103	86	90	83	91
Rebelde	99	84	99	94	64	86	88
OR2120276H (W)	94	94	95	78	89	67	86
LCI13DH14-83 (W)	---	---	---	67	97	86	83
Bearpaw	---	---	---	79	84	83	82
Location Average (bu/A)	136	147	131	31	42	72	

All varieties are Hard Red Winter unless annotated.

(W) = Hard White

(SWW) = Soft White Winter

Table 61. Soft White Winter Wheat Yield Percentage of Location Averages, 2017.

Variety	(100% =Average)					Soda Springs	Variety Average
	Kimberly	Aberdeen	Rupert	Ririe	Rockland		
Otto	---	---	---	125	---	114	120
OR2101043	132	101	103	107	---	---	111
Eltan	---	---	---	107	---	113	110
SY Banks	---	---	---	107	122	100	110
Bruneau	129	109	113	108	---	89	110
Norwest Duet	96	110	110	122	---	---	110
LWW14-73161	---	---	---	105	---	113	109
IDN07-28017B	118	91	106	106	---	123	109
WB1783	101	108	94	107	---	127	107
Bobtail	100	111	118	111	---	91	106
UI Sparrow (QC)	117	105	89	112	---	107	106
IDN-02-29001A	101	104	112	---	---	---	106
SY Dayton	105	108	104	---	---	---	106
IDN06-03303B	107	105	104	---	---	---	105
SY Ovation	109	106	98	112	---	98	105
LCS Hulk	119	102	105	101	---	96	105
IDN-01-10704A	103	111	110	93	---	105	104
UI-WSU Huffman	101	106	101	102	---	109	104
Jasper	106	88	89	116	124	98	104
WA8234	106	103	103	99	91	117	103
SY Assure	115	95	100	---	---	---	103
WB-528	100	107	102	---	---	---	103
UI Castle	95	106	110	98	---	103	102
Norwest Tandem	79	103	102	103	---	120	101
LCS Shark	112	86	105	---	---	---	101
WB1529	97	106	104	88	---	104	100
WA8232	102	104	106	101	77	107	99
UI Sparrow	91	96	91	105	---	114	99
OR2121086	104	101	99	92	---	---	99
SY Command	---	---	---	109	96	89	98
IDN09-08357A	88	98	105	---	---	---	97
UI Palouse	95	92	93	99	---	104	96
LCS Artdeco	108	100	95	89	---	89	96
LCS Drive	84	96	107	---	---	---	96
ORI2150031CF+	107	96	88	94	---	86	94
Brundage	97	88	101	88	---	---	93
ORI2150033CF+	92	97	88	96	---	92	93
WB1604	74	101	93	---	90	104	92
Stephens	91	107	94	92	---	77	92
WB 456	84	99	88	---	---	---	90
WB1376CLP	79	96	104	78	---	90	90
UI Magic	80	90	102	102	---	74	90
WB1070CL	94	91	95	71	---	95	89
XA1101	100	88	85	78	---	76	85
XA1401	84	89	85	77	---	75	82
Location Average (bu/A)	109	144	134	33	36	76	

Table 62. Winter Barley Yield Percentage of Location Averages, 2017.

Variety	(100% =Average) Aberdeen
Schuyler	143
Thunder	139
06ARS617-25	132
Voyel	132
Delicatesse	130
Rubinesse	126
Sunstar Pride	125
Sprinter	124
06ARS633-3	124
02Ab671	123
Maltesse	118
LCS Calypso	114
Alba	109
05ARS561-208	107
UTWB10201-15	107
02Ab431	103
Lightning	103
Endeavor	95
Eight-Twelve	88
Charles	86
Madness	84
02Ab669	83
WintMalt	82
Verdant	76
Buck*	72
05ARS748-270*	70
Etincel	68
10.1151	66
DH13004	53
DH130718	21
Location Average (bu/A)	119

* indicates hulless variety

Table 63. Hard Spring Wheat Yield Percentage of Location Averages, 2017.

Variety	(100% = Average)				Soda Springs	Variety Average
	Aberdeen	Rupert	Idaho Falls	Ashton		
Dayn (W)	125	115	116	127	119	120
XA9301	120	118	118	116	117	118
IDO1202S (W)	---	---	---	---	116	116
12SB0224	113	109	115	136	98	114
06PN3017-09	---	---	---	---	113	113
SY Selway	---	---	---	---	113	113
SY-Teton	107	112	103	120	---	110
WB9411	105	106	107	113	113	109
Alum	107	105	87	129	115	109
SY Coho	107	111	108	109	---	109
IDO1203-A (W)	104	111	104	102	110	106
12SB0197	109	103	93	122	101	106
Cabernet	102	105	106	109	---	105
WB-Paloma (W)	95	108	107	114	101	105
LCS Star (W)	107	101	103	100	113	105
SY Basalt	108	97	107	101	---	103
WB7202CLP (W)	106	95	99	112	104	103
SY Gunsight	110	105	99	105	95	103
LCS Iron	106	108	93	110	96	103
XA9760	106	105	108	95	97	102
XA7524	98	96	102	97	117	102
UI Platinum (W)	107	98	93	110	102	102
HSG 500,709	103	105	107	90	---	101
XA9660	98	93	106	109	95	100
Jefferson	106	103	96	91	102	100
IDO1602S (W)	110	99	102	91	96	100
XA9502	94	95	90	118	---	99
WB9433	99	92	101	103	---	99
WB9518	95	97	114	100	87	99
WB9578	95	105	103	104	84	98
XA7523 (W)	93	96	93	99	94	95
WB7589 (W)	95	94	95	100	87	94
WB9668	93	92	94	94	95	94
Alzada (D)	102	100	102	71	---	94
Klasic (W)	89	98	102	92	87	94
IDO1603S	95	104	94	85	87	93
WB9350	93	91	95	79	98	91
HSG 501,089	89	88	85	102	77	88
WB7328 (W)	85	97	95	68	82	85
Imperial (D)	77	74	87	64	89	78
Snow Crest (W)	72	92	80	57	---	75
Location Average (bu/A)	112	110	126	83	28	

All varieties are Hard Red Spring unless annotated.

(W) = Hard White

(D) = Durum

Table 64. Soft White Spring Wheat Yield Percentage of Location Averages, 2017.

Variety	(100% =Average)					Variety Average
	Aberdeen	Rupert	Idaho Falls	Ashton	Soda Springs	
Tekoa	107	109	101	115	---	108
Alturas	102	104	107	110	102	105
WA 8278	107	107	98	103	---	104
Seahawk	108	99	100	107	---	103
SY Saltese	103	98	101	105	108	103
Melba*	108	99	97	107	---	103
WB6341	98	98	106	105	---	102
WB6430	97	96	107	102	105	101
UI Stone	104	107	101	95	98	101
14-SSW-1059	105	100	103	108	87	101
IDO1405S	102	103	102	93	103	100
Louise	99	92	87	95	112	97
UI Pettit	89	100	101	89	97	95
WA 8277	100	94	93	90	---	94
IDO1403S	95	103	101	85	87	94
WB6121	84	90	98	97	102	94
Location Average (bu/A)	124	119	138	103	34	

* indicates club wheat

Table 65. 6-Row Spring Barley Yield Percentage of Location Averages, 2017.

Variety	(100% =Average)				Variety Average
	Aberdeen	Rupert	Idaho Falls	Ashton	
Feed					
UTSB10905-72	109	110	121	121	115
Millennium	112	108	104	114	110
UTSB10902-91	111	108	108	109	109
Goldeneye	109	103	101	116	107
YU510-510	104	105	98	95	101
Herald	97	109	100	94	100
YU510-559	80	93	81	95	87
Malt					
Lacey	100	105	106	89	100
01Ab9663	104	98	97	88	97
Quest	88	84	99	97	92
Celebration	85	88	97	95	91
Tradition	101	89	88	87	91
Location Average (bu/A)	152	135	169	105	

Table 66. 2-Row Spring Malt Barley Yield Percentage of Location Averages, 2017.

Variety	(100% =Average)				Variety Average
	Aberdeen	Rupert	Idaho Falls	Ashton	
ABI Voyager	98	101	119	112	108
2Ab07-X031098-31	102	100	118	107	107
ABI Balster	101	110	117	96	106
LCS Odyssey	119	115	88	99	105
CDC Copeland	93	101	110	116	105
LCS Sienna	119	99	87	113	104
ACC Synergy	98	113	105	101	104
LCS Genie	112	107	96	100	104
SY Sirish	114	104	97	101	104
Conrad	114	100	100	99	103
Moravian 169	---	106	99	---	103
2B11-4949	99	104	111	94	102
ND Genesis	102	89	127	89	102
LCS Opera	116	103	84	103	102
Explorer	111	94	97	96	100
2Ab08-X05M010-65	103	104	84	106	99
2Ab08-X05M010-82	98	102	100	95	99
CDC Meredith	91	97	100	98	96
ABI Growler	103	97	89	95	96
Moravian 69	90	105	95	92	95
Bill Coors 100	---	92	98	---	95
2B11-5166	88	89	109	92	94
Merem	85	96	88	99	92
Hockett	84	85	95	101	91
AC Metcalfe	79	97	94	95	91
Harrington	83	96	77	100	89
Location Average (bu/A)	132	138	134	107	

Table 67. 2-Row Spring Feed Barley Yield Percentage of Location Averages, 2017.

Variety	(100% =Average)				Variety
	Rupert	Aberdeen	Idaho Falls	Ashton	Average
Claymore	119	120	127	121	122
Oreana	114	118	119	108	115
Altorado	111	111	111	114	112
Xena	117	114	102	107	110
Lenetah	110	104	105	108	107
Harriman	106	109	105	106	107
Champion	110	96	104	116	106
RWA 1758	102	109	97	102	103
Idagold II	111	106	100	93	103
Kardia	90	96	88	112	96
Sawtooth*	86	98	101	93	95
Julie*	94	90	93	97	93
Clearwater*	85	77	93	87	86
2Ab09-X06F058HL-31*	87	81	87	72	82
Transit*	76	76	82	76	77
CDC Fibar*	73	75	78	69	74
Location Average (bu/A)	136	128	132	109	

* indicates hulless variety

2017 Winter Grain Yield Percentage Across All Locations Charts

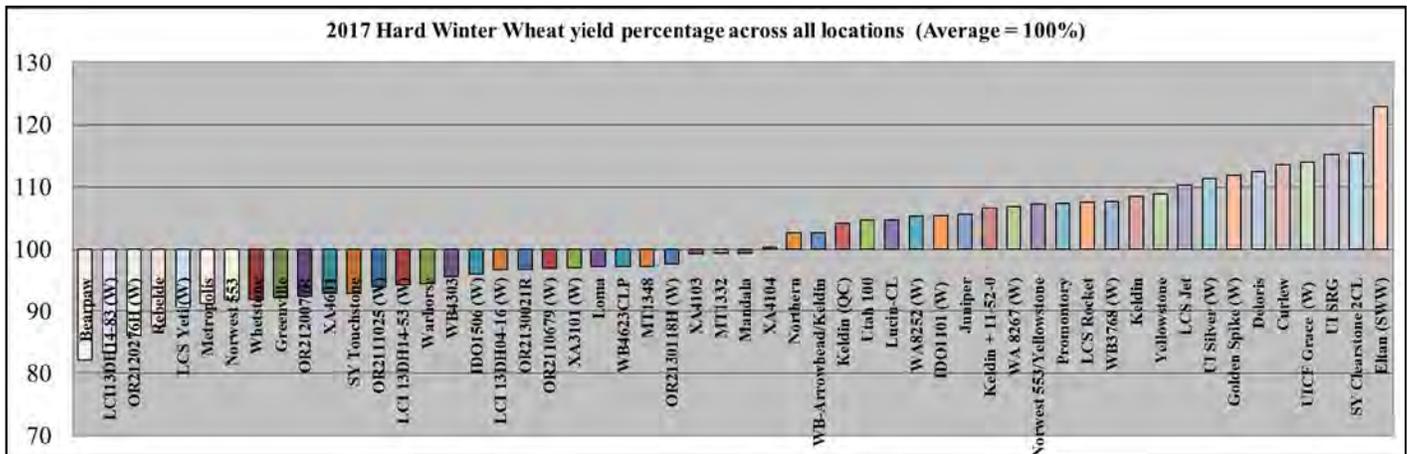


Chart 2. Hard Winter Wheat Yield Percentage Across All Locations.

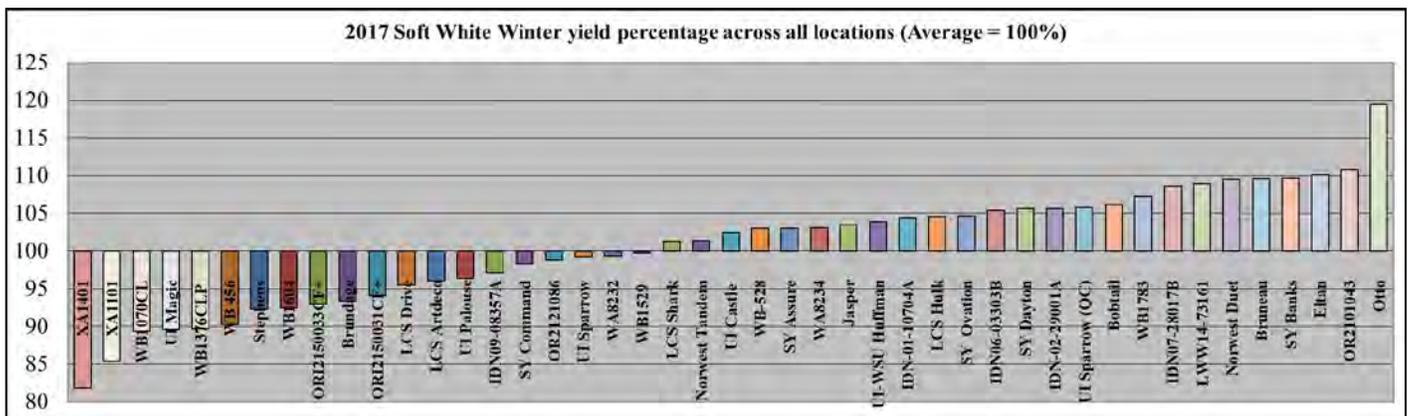


Chart 3. Soft White Winter Wheat Yield Percentage Across All Locations.

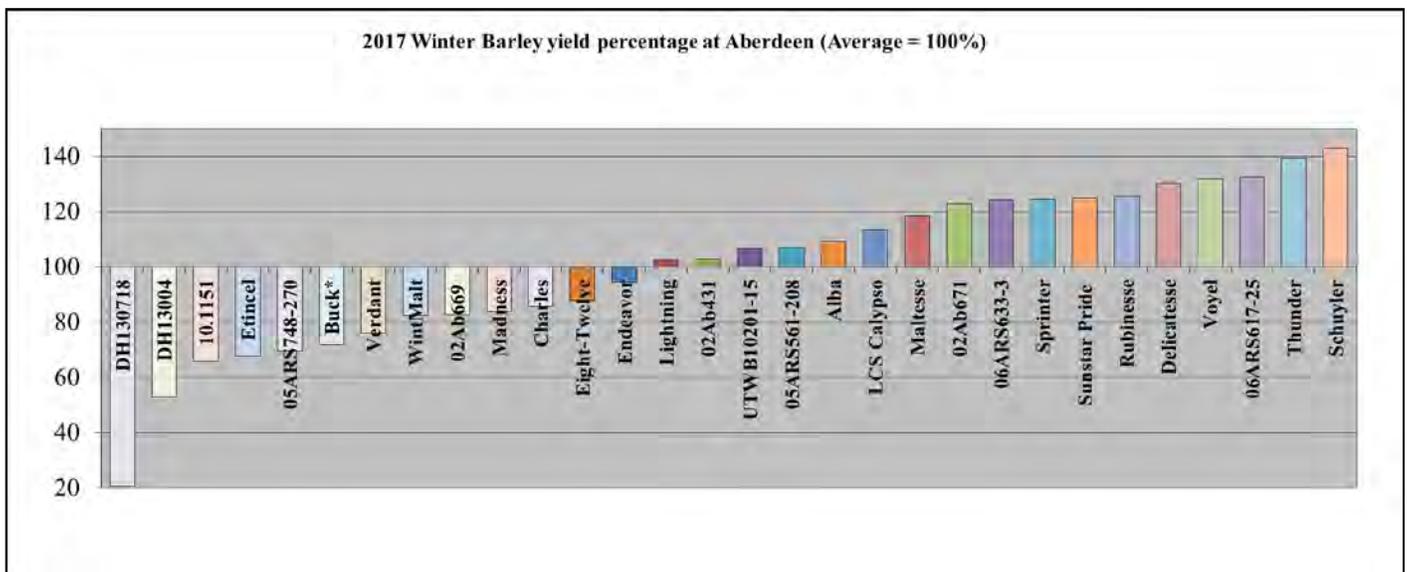


Chart 4. Winter Barley Yield Percentage at Aberdeen

* indicates hullless variety.

2017 Spring Grain Yield Percentages Across All Locations Charts

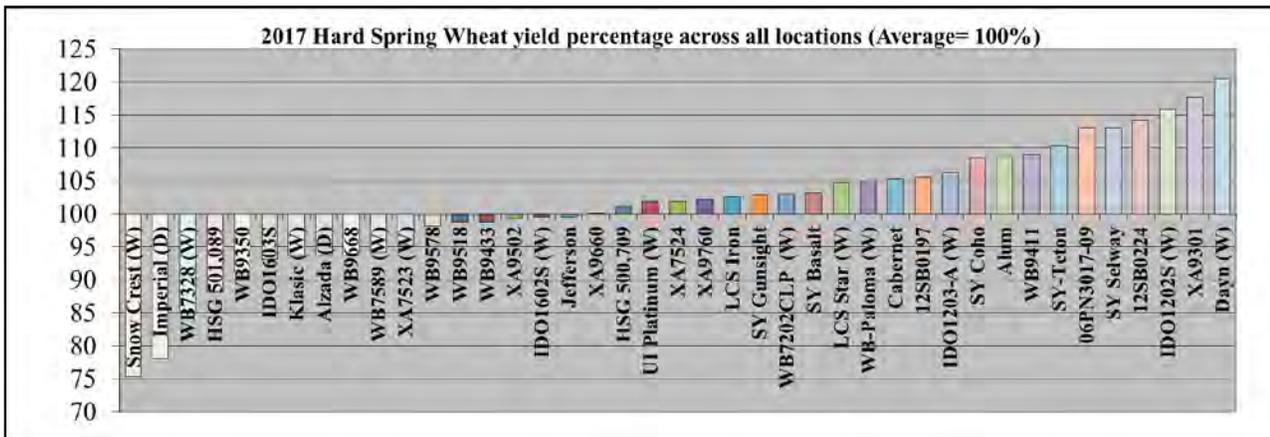


Chart 5. Hard Spring Wheat Yield Percentage Across All Locations.

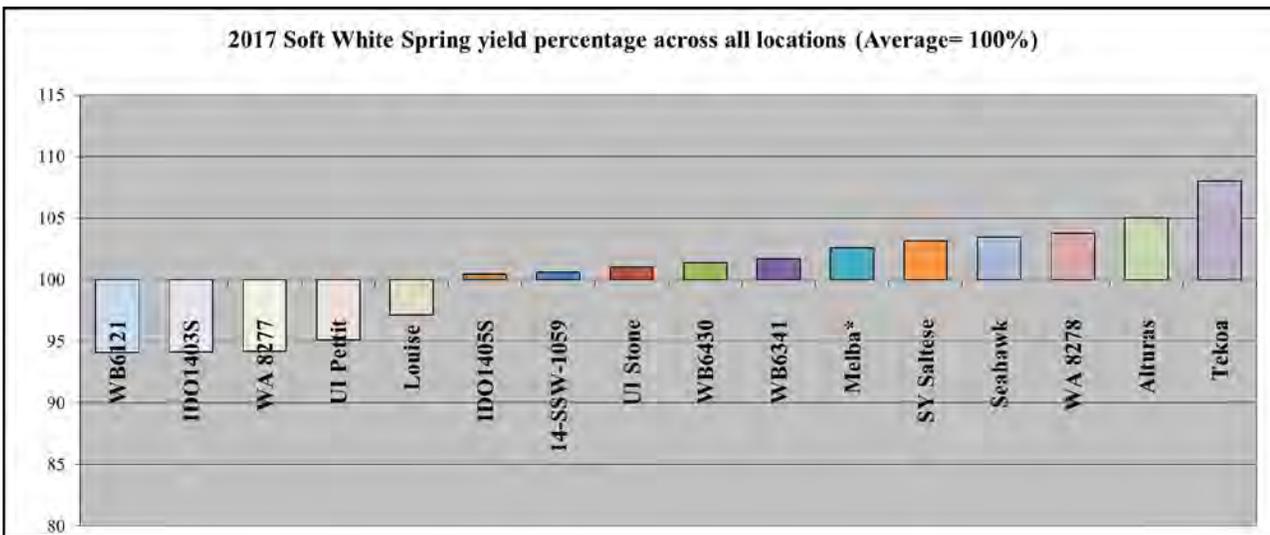


Chart 6. Soft White Spring Yield Percentage Across All Locations.

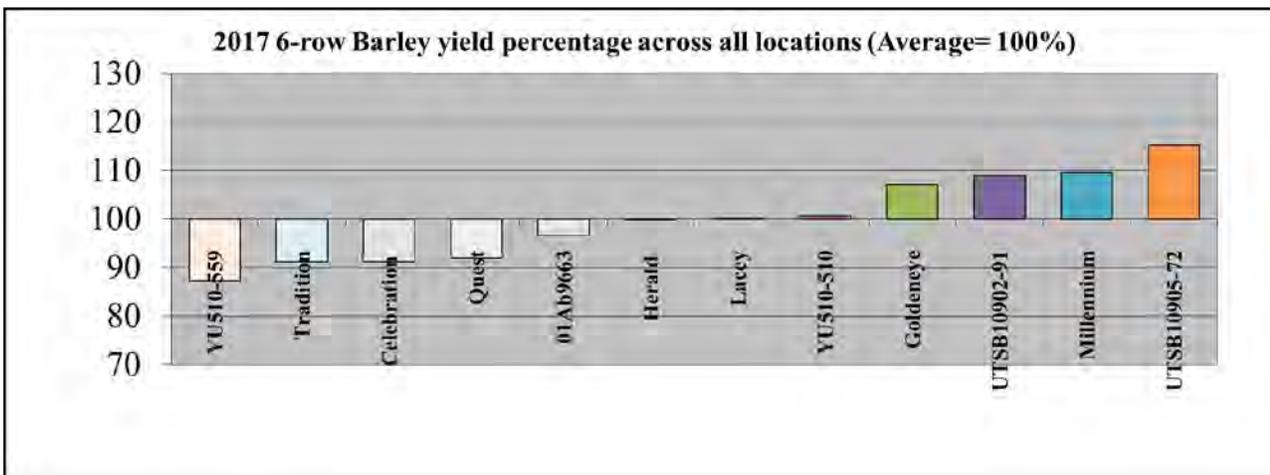


Chart 7. 6-Row Spring Barley Yield Percentage Across All Locations.

2017 2-Row Barley Yield Percentage Across All Locations Charts

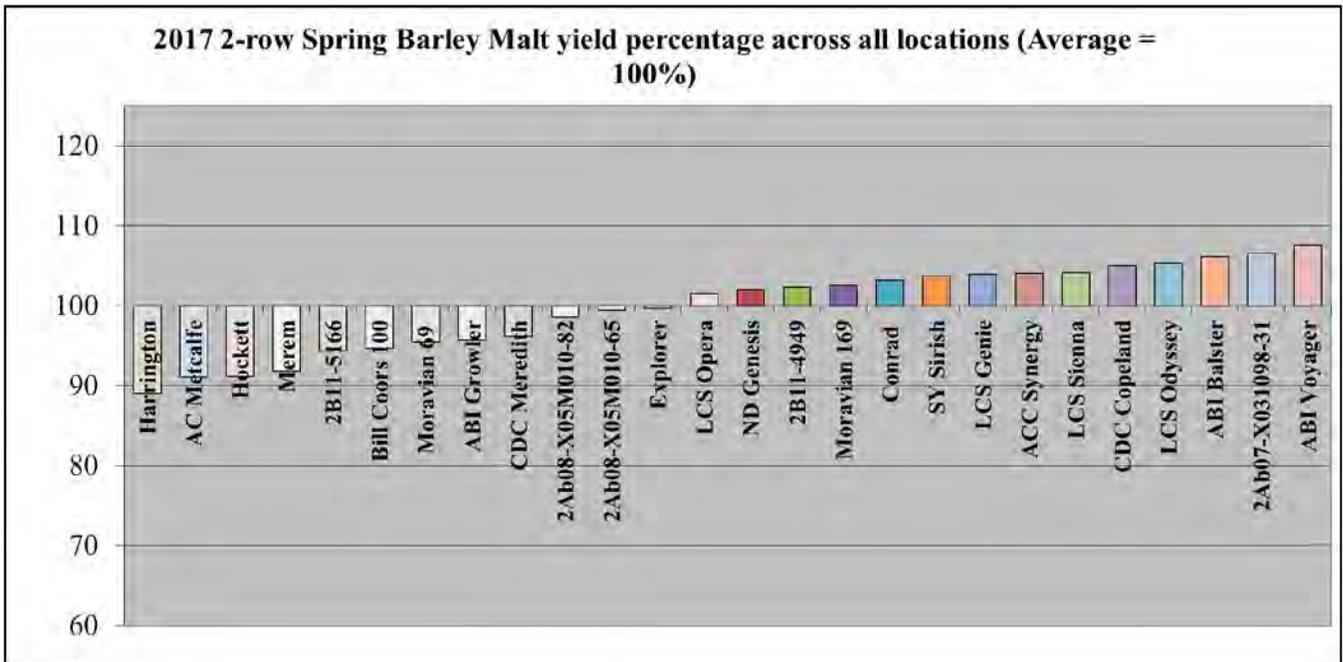


Chart 8. 2-Row Spring Malt Barley Yield Percentage Across All Locations.

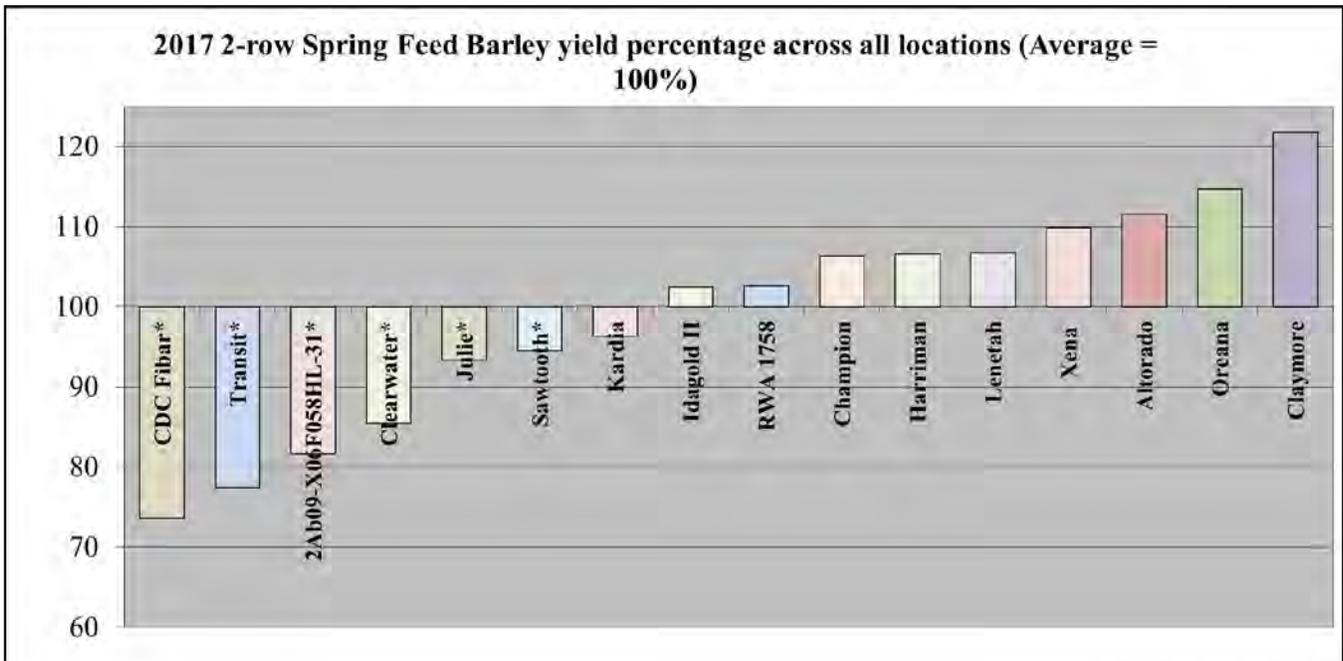


Chart 9. 2-Row Spring Feed Barley Yield Percentage Across All Locations.

*indicates hullless variety.

Table 68. Hard Winter Wheat Grain Protein & Kernel Hardness, 2016.

Variety	-----Grain Protein %-----							-----Kernel Hardness 0-100-----						
	Kimberly	Aberdeen	Rupert	Ririe	Rockland	Soda Springs	Average	Kimberly	Aberdeen	Rupert	Ririe	Rockland	Soda Springs	Average
SY Touchstone (W)	11.0	14.3	16.1	11.3	---	---	13.2	76	80	65	72	---	---	73.3
Colter	11.7	13.6	15.4	11.3	11.9	10.8	12.5	71	75	49	62	63	64	64.0
Garland	11.8	13.6	15.3	11.5	11.5	11.3	12.5	71	71	55	56	66	64	63.8
Greenville	11.2	13.3	14.7	11.5	10.7	10.7	12.0	70	71	48	68	59	67	63.8
IDO1101 (W)	11.7	13.3	14.6	11.1	11.2	10.6	12.1	77	84	63	73	73	79	74.8
Judee	11.5	14.7	14.2	11.4	12.9	11.6	12.7	76	83	61	60	67	73	70.0
Keldin	11.3	13.0	12.6	11.3	12.0	9.8	11.7	76	76	63	62	69	66	68.7
LCI 13DH04-16 (W)	11.5	14.0	13.5	11.7	13.0	10.3	12.3	80	86	76	70	79	71	77.0
LCI 13DH14-53 (W)	10.4	12.3	13.4	11.9	15.0	10.5	12.3	77	72	72	71	76	71	73.2
LCS Yeti (W)	11.6	14.4	13.8	11.6	12.1	10.8	12.4	74	76	76	63	68	71	71.3
LCI13DH14-83 (W)	11.1	13.5	14.2	11.7	15.8	10.3	12.8	81	82	69	72	83	72	76.5
LCS Colonia	11.2	13.4	13.7	9.8	12.3	10.4	11.8	62	68	52	53	56	56	57.8
LCS Jet	10.8	12.8	13.0	10.8	11.5	---	11.8	76	83	64	58	69	---	70.0
Manning	11.3	12.9	13.9	10.8	11.9	10.2	11.8	72	85	63	63	69	68	70.0
MTS1224	11.4	14.3	13.5	11.7	12.0	11.3	12.4	77	87	70	72	75	76	76.2
Northern	11.3	13.9	13.6	12.9	11.7	12.3	12.6	78	90	70	75	79	83	79.2
Norwest 553	11.3	13.1	13.0	11.4	10.9	10.7	11.7	70	82	68	66	68	69	70.5
OR2110664 (W)	11.3	13.5	13.9	11.7	11.4	11.0	12.1	71	81	68	65	73	69	71.2
OR2110679 (W)	11.4	13.8	14.0	11.1	11.4	10.8	12.1	79	86	68	6	69	76	64.0
OR2111025 (W)	11.0	13.5	14.1	11.5	11.2	11.2	12.1	71	84	66	62	67	72	70.3
OR2120012R	11.2	13.4	13.2	11.8	12.9	---	12.5	64	73	64	59	62	---	64.4
OR2120276H (W)	11.0	13.2	13.7	11.5	11.5	10.5	11.9	71	84	74	65	70	70	72.3
SY Clearstone 2CL	11.2	13.7	13.9	11.3	11.8	10.4	12.1	72	79	70	63	67	68	69.8
UI Silver (W)	10.8	14.0	13.9	10.8	10.1	11.1	11.8	76	93	73	73	71	74	76.7
Utah 100	10.9	12.9	14.3	10.8	11.7	11.2	12.0	78	88	70	77	79	79	78.5
WA8252	10.7	13.4	13.9	10.5	11.4	---	12.0	71	87	66	65	70	---	71.8
Warhorse	12.4	15.0	14.4	11.9	13.0	10.6	12.9	81	87	74	74	78	70	77.3
WB3768 (W)	11.5	12.8	14.4	11.0	12.2	10.5	12.1	71	88	78	68	70	77	75.3
Whetstone	11.7	13.6	13.4	11.7	---	---	12.6	76	74	69	64	---	---	70.8
Yellowstone	11.1	13.2	13.8	12.0	11.9	10.3	12.1	73	81	70	64	71	71	71.7
Bearpaw	---	---	---	12.6	11.2	---	11.9	---	---	---	77	74	---	75.5
Curlew	---	---	---	10.8	12.4	---	11.6	---	---	---	68	76	---	72.0
Deloris	---	---	---	10.8	12.0	---	11.4	---	---	---	67	67	---	67.0
Eltan (SWW)	---	---	---	11.7	10.5	---	11.1	---	---	---	25	15	---	20.0
Golden Spike (W)	---	---	---	10.4	11.3	---	10.9	---	---	---	60	62	---	61.0
Juniper	---	---	---	11.6	12.4	---	12.0	---	---	---	76	78	---	77.0
Lucin-CL	---	---	---	12.3	11.7	---	12.0	---	---	---	70	70	---	70.0
Judee/Garland	---	---	---	11.2	12.4	---	11.8	---	---	---	65	70	---	67.5
Promontory	---	---	---	10.9	11.9	---	11.4	---	---	---	70	71	---	70.5
UI SRG	---	---	---	10.9	11.9	---	11.4	---	---	---	69	77	---	73.0
UICF Grace (W)	---	---	---	11.0	11.8	---	11.4	---	---	---	73	80	---	76.5
WB1376CLP (SWW)	---	---	---	---	14.0	---	14.0	---	---	---	---	26	---	26.0
Location Average	11.3	13.5	14.0	11.4	12.0	10.8	12.1	73.9	81.2	66.5	64.4	68.3	71.0	68.8

(W) = White

(SWW) = Soft White Winter

Table 69. Soft White Winter Wheat Grain Protein & Kernel Hardness, 2016.

Variety	-----Grain Protein %-----						-----Kernel Hardness 0-100-----					
	Kimberly	Aberdeen	Rupert	Ririe	Soda Springs	Average	Kimberly	Aberdeen	Rupert	Ririe	Soda Springs	Average
SY Assure	8.9	12.1	10.9	---	---	10.6	18	22	29	---	---	23.0
Bobtail	8.1	12.4	10.1	10.6	10.6	10.4	13	26	20	23	13	19.0
Brundage	8.5	12.7	10.6	10.7	---	10.6	19	17	25	23	---	21.0
Bruneau	8.2	12.9	10.5	10.8	10.6	10.6	16	26	21	21	12	19.2
WB1783	8.8	12.0	10.1	11.5	---	10.6	24	32	31	30	---	29.3
BZ6W09-489	9.1	12.8	10.9	11.3	---	11.0	23	30	27	21	---	25.3
IDN-01-10704A	8.3	11.3	10.6	11.4	11.5	10.6	24	28	27	28	18	25.0
IDN-02-29001A	8.6	13.0	10.0	10.7	10.8	10.6	19	24	26	16	16	20.2
IDN06-03303B	8.4	12.3	9.7	---	---	10.1	15	16	12	---	---	14.3
IDN06-18102A	8.5	12.7	10.3	---	---	10.5	26	26	29	---	---	27.0
IDN07-28017B	8.6	11.9	10.5	---	---	10.3	14	23	22	---	---	19.7
UI Sparrow	8.3	12.7	11.1	9.9	10.4	10.5	18	31	25	21	17	22.4
Jasper	8.7	12.8	10.3	11.6	10.5	10.8	19	22	22	24	14	20.2
LCS Artdeco	8.5	11.8	9.2	---	---	9.8	16	13	21	---	---	16.7
LCS Biancor	8.6	11.6	9.9	---	---	10.0	16	20	24	---	---	20.0
Norwest Duet	8.1	12.8	10.0	11.1	---	10.5	22	32	25	28.0	---	26.8
Norwest Tandem	9.9	12.3	10.0	10.7	10.8	10.7	29	28	26	27.0	13	24.6
LOR-833	8.9	12.7	10.2	12.2	10.5	10.9	17	25	23	27	12	20.8
LOR-913	9.5	12.6	10.5	---	---	10.9	27	26	27	---	---	26.7
LCS Drive	9.3	11.7	9.7	---	---	10.2	25	21	27	---	---	24.3
LCS Hulk	9.1	12.8	10.7	10.2	11.2	10.8	27	23	24	15	16	21.0
Madsen	9.4	12.9	10.2	10.9	10.6	10.8	24	25	24	20	14	21.4
OR2110526	9.2	12.3	10.6	11.4	10.6	10.8	25	23	25	19.0	16	21.6
Stephens	9.7	13.7	10.5	11.2	10.9	11.2	23	26	25	16	16	21.2
SY Ovation	9.4	12.0	10.0	11.3	---	10.7	29	23	25	20	---	24.3
UI Castle	8.9	12.9	10.8	11.1	11.0	10.9	23	20	26	16	15	20.0
UI Magic	9.5	13.1	10.4	10.7	11.1	11.0	26	24	28	18	20	23.2
UI Palouse	9.4	11.6	11.2	10.5	12.1	11.0	21	21	20	16	14	18.4
UI-WSU Huffman	9.5	13.0	10.7	11.1	11.5	11.2	26	33	24	18	15	23.2
WA8206	9.2	13.9	10.6	11.6	11	11.3	23	35	26	22	15	24.2
WA8232	9	13	10.7	12	10.4	11.0	26	32	25	24	16	24.6
WA8234	9	13.5	9.5	10.0	12	10.8	27	34	28	22.0	17	25.6
WB 456	10.1	13.3	10.3	---	---	11.2	34	36	30	---	---	33.3
WB-528	9.1	12.9	10.1	---	---	10.7	25	33	27	---	---	28.3
WB1376CLP	10.8	13.5	10.4	12.2	11.5	11.7	31	30	25	28	18	26.4
WB1529	9.5	13	9.6	---	---	10.7	22	30	26	---	---	26.0
LWW10-1073	---	---	---	12.1	---	12.1	---	---	---	23	---	23.0
Otto	---	---	---	11.4	---	11.4	---	---	---	23.0	---	23.0
SY 107	---	---	---	11.1	---	11.1	---	---	---	27.0	---	27.0
Eltan	---	---	---	9.8	---	9.8	---	---	---	14	---	14.0
Average	9.0	12.6	10.3	11.1	11.0	10.8	22.6	26.0	24.9	21.7	15.4	22.9

Table 70. Hard Spring Wheat Grain Protein & Kernel Hardness, 2016.

Variety	-----Grain Protein %-----						-----Kernel Hardness 0-100-----					
	Rupert	Aberdeen	Idaho Falls	Ashton	Soda Springs	Average	Rupert	Aberdeen	Idaho Falls	Ashton	Soda Springs	Average
Hard Red Spring												
10SB0087-B	12.1	10.7	12.8	13.8	11.8	12.2	78	74	85	77	71	77.0
Alum	12.7	13.8	13.4	13.6	11.2	12.9	81	77	79	71	66	74.8
Bullseye	13.6	13.4	12.7	13.3	---	13.3	80	75	85	80	---	80.0
Cabernet	12.6	13.0	12.7	13.7	---	13.0	76	70	70	71	---	71.8
HRS 3419	11.7	12.4	11.0	13.6	---	12.2	75	77	73	76	---	75.3
HRS 3504	12.6	13.1	12.7	13.1	---	12.9	90	87	93	88	---	89.5
HRS 3530	12.0	13.6	12.6	13.7	---	13.0	83	76	81	79	---	79.8
HRS 3616	13.1	13.9	14.2	14.4	---	13.9	89	82	92	88	---	87.8
Jefferson	12.1	13.2	12.3	13.3	11.1	12.4	81	73	82	73	71	76.0
Kelse	13.5	13.7	13.6	14.2	12.4	13.5	75	70	78	72	70	73.0
LCS Iron	12.4	12.7	11.9	13.0	11.2	12.2	80	79	82	75	70	77.2
SY Basalt	11.8	12.7	11.4	---	---	12.0	74	64	74	---	---	70.7
SY Coho	12.9	13.6	12.0	---	---	12.8	84	80	80	---	---	81.3
SY Selway	---	---	---	---	10.6	10.6	---	---	---	---	72	72.0
SY3015-8	12.3	13.1	12.9	---	---	12.8	79	70	75	---	---	74.7
WB9200	13.9	14.0	13.1	15.2	12.3	13.7	89	81	85	86	74	83.0
WB9377	12.4	12.7	13.1	13.3	12.3	12.8	85	80	88	82	80	83.0
WB9411	12.3	13.3	13.1	13.4	10.9	12.6	77	72	78	73	65	73.0
WB9518	13.7	14.5	12.9	15.0	12.3	13.7	81	82	83	87	73	81.2
WB9668	13.4	14.4	13.4	15.1	12.0	13.7	84	82	78	81	68	78.6
Hard White Spring												
Dayn (W)	12.3	13.0	12.2	13.7	11.1	12.5	87	79	83	84	75	81.6
IDO1202S (W)	12.2	12.2	11.7	12.9	10.8	12.0	76	70	77	68	70	72.2
IDO1203-A (W)	12.4	12.4	11.5	12.8	10.1	11.8	89	76	81	74	71	78.2
IDO1602S (W)	11.9	12.0	11.4	13.7	11.1	12.0	71	59	63	58	57	61.6
Klasic (W)	12.0	12.2	11.7	13.7	10.3	12.0	67	54	52	51	48	54.4
LCS Atomo (W)	12.4	12.3	11.8	13.2	10.5	12.0	86	80	86	90	78	84.0
LCS Star (W)	12.2	12.4	11.6	13.2	10.1	11.9	86	74	71	71	65	73.4
Snow Crest (W)	12.8	12.5	11.7	14.2	---	12.8	61	49	51	49	---	52.5
SY-Teton (W)	11.9	12.4	11.2	---	10.4	11.5	73	56	63	---	59	62.8
UI Platinum (W)	12.0	12.3	11.3	13.7	10.1	11.9	75	64	64	62	57	64.4
WA8240 (W)	12.1	12.8	12.0	13.3	---	12.6	88	77	80	81	---	81.5
WA8262 (W)	12.5	13.2	13.0	13.7	---	13.1	82	79	80	84	---	81.3
WB-Paloma (W)	12.4	13.1	11.9	13.3	---	12.7	82	70	69	71	---	73.0
WB7328 (W)	13.3	12.8	12.3	14.3	11.0	12.7	71	62	57	54	50	58.8
WB7589 (W)	13.1	13.5	11.7	13.9	10.9	12.6	80	73	72	67	66	71.6
Location Average	12.5	13.0	12.3	13.7	11.1	12.6	79.9	72.7	76.2	74.1	67.1	74.6

(W) = White

Table 71. Soft White Spring Wheat Grain Protein & Kernel Hardness, 2016.

Variety	-----Grain Protein %-----						-----Kernel Hardness 0-100-----					
	Rupert	Idaho			Soda		Rupert	Idaho			Soda	
		Aberdeen	Falls	Ashton	Springs	Average		Aberdeen	Falls	Ashton	Springs	Average
12-SW-068	10.5	10.8	11.5	11.2	13.2	11.4	31	35	25	27	22	28.0
Alturas	9.2	10.7	10.3	10.8	12.8	10.8	16	32	19	24	21	22.4
Babe	8.9	11.9	10.4	10.9	13.2	11.1	19	29	20	25	18	22.2
Diva	9.5	11.9	10.8	10.6	13.0	11.2	27	40	26	30	25	29.6
IDO1403S	10.1	11.4	11.1	11.2	13.7	11.5	22	39	25	27	27	28.0
IDO1405S	9.6	10.7	10.4	11.3	13.5	11.1	21	33	17	25	21	23.4
Louise	10.2	11.6	11.2	11.1	13.3	11.5	28	38	28	29	21	28.8
Melba*	9.0	10.6	9.5	10.1	14.1	10.7	28	41	23	30	28	30.0
Seahawk	9.8	11.8	9.6	10.4	13.2	11.0	29	39	16	33	30	29.4
SY Saltese	9.8	11.6	10.6	---	---	10.7	28	35	19	---	---	27.3
UI Pettit	9.6	10.8	9.5	10.6	12.8	10.7	25	36	13	28	28	26.0
UI Stone	8.9	10.8	10.3	9.6	12.1	10.3	16	30	16	12	22	19.2
Tekoa	10.1	11.7	10.7	10.1	13.4	11.2	30	35	25	27	25	28.4
WB 1035 CL	11.4	12.4	12.2	11.6	14.9	12.5	31	37	26	27	30	30.2
WB6121	10.8	11.6	12.0	12.1	13.2	11.9	27	37	24	26	28	28.4
WB6430	9.3	10.8	10.8	10.3	12.6	10.8	26	39	24	24	24	27.4
Location Average	9.8	11.3	10.7	10.8	13.3	11.1	25.3	35.9	21.6	26.3	24.7	26.8

*= indicates club wheat

Table 72. Percent Flour Protein and Flour Yield for Soft White Winter Wheat at Kimberly, Ririe, and Aberdeen, 2016.

Variety	Flour Protein (%)						Flour Yield (%)					
	Kimberly	Aberdeen	Rupert	Ririe	Soda Springs	Average	Kimberly	Aberdeen	Rupert	Ririe	Soda Springs	Average
SY Assure	7.8	9.5	9.4	---	---	8.9	63.9	66.2	63.5	---	---	64.5
Bobtail	6.8	11.3	8.7	9.4	9.8	9.2	68.7	68.9	66.9	65.9	67.2	67.5
Brundage	7.5	11.2	9.5	9.3	---	9.4	64.7	61.3	65.2	65.7	---	64.2
Bruneau	6.8	11.5	8.9	9.9	9.6	9.3	65.7	65.6	64.1	64.0	65.0	64.9
WB1783	7.3	10.6	8.4	9.9	---	9.1	64.3	66.6	64.7	62.8	---	64.6
BZ6W09-489	8.2	11.8	9.4	10.8	---	10.1	68.3	66.5	64.2	63.8	---	65.7
IDN-01-10704A	7.3	10.5	9.3	10.1	10.2	9.5	68.2	65.9	64.3	64.7	64.2	65.4
IDN-02-29001A	8.2	11.7	8.6	9.9	9.8	9.6	69.7	66.6	67.4	66.0	66.8	67.3
IDN06-03303B	7.9	11.3	9.4	---	---	9.5	65.5	65.6	64.5	---	---	65.2
IDN06-18102A	7.4	11.6	8.8	---	---	9.3	65.4	64.3	64.1	---	---	64.6
IDN07-28017B	8.0	11.1	8.9	---	---	9.3	67.9	66.6	65.2	---	---	66.5
UI Sparrow	7.6	11.4	9.7	8.6	9.1	9.3	64.7	63.8	62.4	63.4	64.9	63.9
Jasper	7.8	11.7	8.8	10.2	9.5	9.6	68.5	65.6	65.3	65.0	65.7	66.0
LCS Artdeco	7.5	10.9	8.1	---	---	8.8	62.6	61.0	61.6	---	---	61.7
LCS Biancor	7.3	10.9	8.0	---	---	8.7	64.0	62.9	62.9	---	---	63.3
Norwest Duet	7.2	11.2	8.2	9.5	---	9.0	66.7	63.5	65.2	64.2	---	64.9
Norwest Tandem	7.8	11.4	8.5	9.5	9.3	9.3	65.3	63.1	62.8	62.4	64.0	63.5
LOR-833	7.7	11.8	9.2	11.0	9.6	9.9	67.2	65.2	63.8	63.1	66.3	65.1
LOR-913	8.3	11.6	9.1	---	---	9.7	66.3	63.6	63.8	---	---	64.6
LCS Drive	7.5	11.5	8.0	---	---	9.0	62.6	62.7	60.1	---	---	61.8
LCS Hulk	7.5	11.9	9.3	9.6	9.8	9.6	66.9	62.4	61.4	63.4	63.4	63.5
Madsen	7.8	11.7	8.9	10.9	9.5	9.8	67.0	64.1	63.1	62.7	65.5	64.5
OR2110526	7.8	11.2	9.1	10.5	9.7	9.7	63.3	63.2	61.8	61.7	64.0	62.8
Stephens	7.9	12.1	8.9	10.6	10.3	10.0	65.3	59.2	63.1	64.6	63.5	63.1
SY Ovation	7.6	10.9	8.5	11.0	---	9.5	66.2	64.8	62.9	63.3	---	64.3
UI Castle	7.6	12.2	9.2	10.8	9.9	9.9	70.3	62.2	65.5	65.9	68.0	66.4
UI Magic	7.7	12.5	8.8	10.4	9.9	9.9	65.6	68.3	63.0	62.9	63.6	64.7
UI Palouse	7.9	10.6	9.5	10.1	10.9	9.8	65.7	64.3	63.9	64.1	61.6	63.9
UI-WSU Huffman	7.9	11.5	9.3	10.6	10.3	9.9	67.1	65.0	62.4	64.0	64.0	64.5
WA8206	7.6	12.8	8.7	10.6	9.9	9.9	67.1	65.4	65.2	65.8	65.6	65.8
WA8232	7.5	11.2	8.9	10.3	9.5	9.5	65.0	61.1	61.9	62.1	60.9	62.2
WA8234	7.6	12.0	7.5	8.5	11.0	9.3	64.5	64.0	64.7	65.4	62.2	64.2
WB 456	8.6	12.0	8.5	---	---	9.7	67.2	65.0	65.2	---	---	65.8
WB-528	7.8	11.6	8.3	---	---	9.2	64.7	63.6	64.7	---	---	64.4
WB1376CLP	9.0	11.9	8.6	10.7	10.2	10.1	63.9	62.3	64.1	63.4	63.1	63.4
WB1529	8.1	11.4	7.9	---	---	9.1	62.3	60.2	63.5	---	---	62.0
LWW10-1073	---	---	---	10.8	---	10.8	---	---	---	61.2	---	61.2
Otto	---	---	---	9.6	---	9.6	---	---	---	64.8	---	64.8
SY 107	---	---	---	9.1	---	9.1	---	---	---	62.8	---	62.8
Eltan	---	---	---	9.2	---	9.2	---	---	---	64.8	---	64.8
Location average	7.7	11.4	8.8	10.0	9.9	9.5	65.9	64.2	63.8	63.9	64.5	64.4

Table 73. Percent Break Flour Yield and Cookie Diameter for Soft White Winter Wheat at Kimberly, Ririe, and Aberdeen, 2016.

Variety	Break Flour Yield (%)						Cookie Diameter (cm)					
	Kimberly	Aberdeen	Rupert	Ririe	Soda Springs	Average	Kimberly	Aberdeen	Rupert	Ririe	Soda Springs	Average
SY Assure	37.8	34.2	36.0	---	---	36.0	8.4	8.3	8.4	---	---	8.4
Bobtail	44.1	38.3	43.8	43.6	43.0	42.6	8.9	8.8	8.8	8.8	8.8	8.8
Brundage	40.0	39.0	40.1	42.7	---	40.5	9.0	8.7	8.8	8.9	---	8.9
Bruneau	39.8	36.7	39.3	39.8	40.1	39.2	8.8	8.6	8.6	9.0	9.0	8.8
WB1783	35.5	33.3	35.9	35.4	---	35.0	8.3	8.1	8.3	8.4	---	8.3
BZ6W09-489	37.1	33.9	34.9	36.3	---	35.5	8.3	8.4	8.4	8.6	---	8.4
IDN-01-10704A	41.8	38.5	42.0	41.4	42.3	41.2	8.8	9.0	8.7	8.9	9.0	8.9
IDN-02-29001A	42.8	39.5	41.7	41.7	42.0	41.5	8.8	8.8	8.7	8.8	8.8	8.8
IDN06-03303B	42.6	40.0	42.3	---	---	41.6	8.8	8.6	8.5	---	---	8.6
IDN06-18102A	42.1	40.3	41.3	---	---	41.2	9.0	8.8	8.9	---	---	8.9
IDN07-28017B	40.3	36.1	38.6	---	---	38.3	8.8	8.8	8.7	---	---	8.8
UI Sparrow	38.5	33.3	38.6	39.4	39.9	37.9	8.7	8.4	8.7	8.9	8.7	8.7
Jasper	42.5	38.0	42.8	43.1	43.8	42.1	8.8	8.5	8.6	8.8	9.1	8.7
LCS Artdeco	37.3	36.0	34.4	---	---	35.9	8.5	8.4	8.4	---	---	8.5
LCS Biancor	41.4	36.7	38.1	---	---	38.7	8.8	8.7	8.8	---	---	8.8
Norwest Duet	38.2	34.7	39.6	38.9	---	37.9	8.6	8.3	8.5	8.7	---	8.5
Norwest Tandem	37.7	32.3	37.2	37.8	37.7	36.5	8.6	8.4	8.6	8.7	8.7	8.6
LOR-833	41.4	35.3	36.7	36.6	40.3	38.1	8.6	8.5	8.5	8.5	8.7	8.5
LOR-913	39.3	35.6	35.8	---	---	36.9	8.7	8.8	8.6	---	---	8.7
LCS Drive	38.4	34.1	33.7	---	---	35.4	8.8	8.7	8.6	---	---	8.7
LCS Hulk	38.6	34.6	36.2	39.6	38.2	37.4	8.7	8.3	8.4	8.8	8.7	8.6
Madsen	39.6	33.9	38.0	37.3	39.0	37.6	8.7	8.5	8.6	8.7	8.6	8.6
OR2110526	39.3	36.2	36.7	39.6	38.3	38.0	8.6	8.6	8.6	8.8	8.9	8.7
Stephens	36.7	32.0	34.3	37.8	36.8	35.5	8.5	8.3	8.6	8.7	8.6	8.5
SY Ovation	38.2	35.0	35.4	33.0	---	35.4	8.6	8.5	8.4	8.6	---	8.5
UI Castle	42.6	36.8	38.3	38.8	39.7	39.2	8.8	8.7	8.6	8.7	8.3	8.6
UI Magic	38.5	36.0	34.4	37.7	36.7	36.7	8.6	8.4	8.5	8.7	8.5	8.6
UI Palouse	40.7	36.6	40.4	40.4	40.2	39.6	8.9	8.4	8.6	8.7	8.8	8.7
UI-WSU Huffman	38.7	34.8	36.4	37.5	38.0	37.1	8.9	8.6	8.5	8.8	8.7	8.7
WA8206	38.4	34.1	37.4	36.3	36.2	36.5	8.6	8.4	8.4	8.4	8.4	8.4
WA8232	37.2	31.7	36.8	37.0	36.8	35.9	8.4	8.4	8.4	8.6	8.6	8.5
WA8234	37.4	32.9	36.4	37.6	36.6	36.2	8.5	8.4	8.3	8.6	8.5	8.5
WB 456	35.4	35.2	35.5	---	---	35.4	8.6	8.4	8.3	---	---	8.4
WB-528	38.4	34.8	37.3	---	---	36.8	8.4	8.6	8.4	---	---	8.4
WB1376CLP	34.0	34.9	35.2	35.7	34.8	34.9	8.8	8.8	8.6	8.3	8.6	8.6
WB1529	37.7	33.4	38.1	---	---	36.4	8.7	8.7	8.7	---	---	8.7
LWW10-1073	---	---	---	35.9	---	35.9	---	---	---	8.5	---	8.5
Otto	---	---	---	42.0	---	42.0	---	---	---	8.9	---	8.9
SY 107	---	---	---	38.9	---	38.9	---	---	---	8.8	---	8.8
Eltan	---	---	---	42.4	---	42.4	---	---	---	8.8	---	8.8
Location average	39.2	35.5	37.8	38.8	39.0	38.0	8.7	8.5	8.5	8.7	8.7	8.6

Table 74. Percent Flour Protein and Flour Yield for Soft White Spring Wheat at Rupert, Aberdeen, Idaho Falls, Ashton, and Soda Springs, 2016.

Variety	Flour Protein (14% mb)						Flour Yield (%)					
	Rupert	Aberdeen	Idaho Falls	Ashton	Soda Springs	Average	Rupert	Aberdeen	Idaho Falls	Ashton	Soda Springs	Average
12-SW-068	8.6	10.6	9.9	9.8	11.9	10.2	61.5	61.3	58.8	59.0	57.0	59.5
Alturas	8.5	10.7	8.9	9.5	11.6	9.8	65.1	65.1	64.2	65.7	61.5	64.3
Babe	8.0	11.6	9.0	9.7	12.0	10.1	64.7	56.9	61.8	63.0	58.3	60.9
Diva	8.3	11.6	9.0	9.3	11.7	10.0	65.4	65.2	63.6	64.6	61.5	64.1
IDO1403S	8.9	11.2	9.5	10.0	12.5	10.4	64.3	64.8	63.8	61.6	57.9	62.5
IDO1405S	8.2	10.2	8.7	10.0	12.3	9.9	62.7	63.5	63.4	61.5	58.4	61.9
Louise	8.4	11.4	9.2	9.7	12.0	10.1	64.9	63.9	65.3	63.2	58.7	63.2
Melba*	7.3	9.9	7.9	8.8	12.7	9.3	68.6	67.8	68.3	67.3	60.1	66.4
Seahawk	7.8	11.3	8.3	9.1	12.0	9.7	66.0	64.1	65.3	64.0	59.9	63.9
SY Saltese	7.9	11.3	9.2	---	---	9.5	64.6	63.6	63.9	---	---	64.1
UI Pettit	8.4	10.3	8.7	9.1	11.6	9.6	66.5	63.1	66.1	64.1	61.7	64.3
UI Stone	7.5	10.3	9.1	9.4	11.1	9.5	67.6	66.4	67.5	66.1	62.9	66.1
Tekoa	8.2	11.6	9.1	9.0	12.1	10.0	66.2	65.5	66.7	66.8	62.1	65.5
WB 1035 CL	9.9	12.6	10.6	10.6	13.7	11.5	59.6	58.4	60.0	57.8	56.8	58.5
WB6121	9.6	11.5	10.4	10.9	11.8	10.8	63.5	62.1	62.0	59.8	59.9	61.4
WB6430	8.2	10.4	8.8	9.2	11.6	9.6	65.9	65.5	65.7	64.0	61.5	64.5
Location Average	8.4	11.0	9.1	9.6	12.0	10.0	64.8	63.6	64.1	63.2	59.9	63.2

mb = moisture basis

*= indicates club wheat

Table 75. Percent Break Flour and Cookie Diameter for Soft White Spring Wheat at Rupert, Aberdeen, Idaho Falls, Ashton, and Soda Springs, 2016.

Variety	Break Flour (%)						Cookie Diameter (cm)					
	Rupert	Aberdeen	Idaho Falls	Ashton	Soda Springs	Average	Rupert	Aberdeen	Idaho Falls	Ashton	Soda Springs	Average
12-SW-068	31.9	34.6	32.7	32.6	36.3	33.6	8.5	8.7	8.8	8.5	8.4	8.6
Alturas	37.4	36.2	36.8	38.4	37.6	37.3	8.7	9.0	8.7	8.7	8.7	8.8
Babe	35.7	35.9	34.4	36.4	36.9	35.9	8.8	8.7	8.6	8.6	8.6	8.7
Diva	38.0	39.4	37.0	37.4	38.9	38.2	8.7	8.9	9.0	8.7	8.7	8.8
IDO1403S	37.7	38.9	37.8	35.8	36.3	37.3	8.9	8.9	8.9	8.8	8.5	8.8
IDO1405S	37.4	38.6	38.1	36.8	36.8	37.6	8.9	8.9	8.9	8.9	8.5	8.8
Louise	36.3	38.2	37.3	36.8	37.0	37.1	9.0	9.0	8.8	9.0	8.6	8.9
Melba*	41.3	41.2	42.6	40.3	38.4	40.7	8.9	9.0	9.1	9.1	8.9	9.0
Seahawk	38.8	38.6	38.4	36.8	35.4	37.6	8.7	8.8	9.1	8.8	8.5	8.8
SY Saltese	37.2	38.8	37.6	---	---	37.9	8.9	8.8	8.9	---	---	8.9
UI Pettit	38.8	38.8	40.4	36.3	35.2	37.9	9.1	9.1	9.1	8.8	8.6	8.9
UI Stone	42.4	41.1	41.7	39.6	40.0	41.0	9.0	8.9	9.0	8.9	8.8	8.9
Tekoa	37.9	41.2	39.6	39.5	39.8	39.6	8.8	8.9	9.2	8.8	8.6	8.9
WB 1035 CL	31.4	34.2	32.4	30.9	32.6	32.3	8.4	8.5	8.5	8.3	8.2	8.4
WB6121	33.4	34.8	34.5	32.6	33.9	33.8	8.9	9.0	8.7	8.6	8.5	8.7
WB6430	39.8	39.4	40.3	38.2	36.9	38.9	8.8	8.8	9.0	8.9	8.8	8.9
Location Average	37.2	38.1	37.6	36.6	36.8	37.3	8.8	8.9	8.9	8.8	8.6	8.8

*= indicates club wheat

Table 76. Percent Flour Protein and Flour Yield for Hard Winter Wheat at Aberdeen, Kimberly, Ririe, Rockland, and Soda Springs, 2016.

Variety	Flour Protein (14% mb)							Flour Yield (%)						
	Kimberly	Aberdeen	Rupert	Ririe	Rockland	Soda Springs	Average	Kimberly	Aberdeen	Rupert	Ririe	Rockland	Soda Springs	Average
Hard Red Winter Wheat														
SY Touchstone (W)	10.3	13.1	13.8	10.1	---	---	11.8	60.9	58.5	52.1	56.4	---	---	57.0
Colter	11.1	12.4	13.8	11.1	11.4	10.0	11.6	61.7	59.4	55.0	58.8	60.3	55.9	58.5
Garland	10.7	12.4	13.4	10.4	10.4	10.2	11.3	58.9	51.9	46.6	55.9	54.1	54.0	53.6
Greenville	10.1	11.7	12.4	10.0	9.8	9.7	10.6	53.8	51.4	45.4	52.9	53.5	49.2	51.1
Judee	10.5	14.4	14.1	11.2	12.6	11.2	12.3	59.5	58.3	49.9	55.9	57.1	55.7	56.1
Keldin	10.4	11.7	12.3	10.3	11.1	8.5	10.7	59.9	58.0	53.9	56.7	57.6	58.8	57.5
LCS Colonia	10.6	12.3	13.5	9.2	12.0	10.1	11.3	60.3	62.1	55.7	59.4	60.8	61.7	60.0
LCS Jet	10.0	11.3	12.4	9.7	10.5	---	10.8	57.9	60.9	54.5	55.5	57.2	---	57.2
Manning	10.5	11.4	13.4	10.4	11.1	9.1	11.0	59.4	57.2	51.4	57.5	58.7	60.4	57.4
Loma	10.9	13.0	14.9	11.0	11.7	10.3	12.0	59.8	56.2	55.4	59.2	60.3	59.5	58.4
Northern	10.8	13.5	11.9	12.1	11.6	11.8	12.0	56.3	55.2	50.8	54.8	55.3	56.8	54.9
Norwest 553	10.1	12.6	13.0	10.7	10.6	9.5	11.1	58.5	58.9	55.6	57.5	58.8	62.9	58.7
OR2120012R	10.7	12.6	14.7	11.2	14.2	---	12.7	59.3	59.8	54.0	57.3	58.0	---	57.7
SY Clearstone CL2 (W)	10.2	13.2	13.6	10.6	11.4	9.6	11.4	56.9	56.9	52.9	55.6	56.1	58.2	56.1
Utah 100	9.6	12.0	13.8	9.6	10.9	10.0	11.0	57.5	57.6	48.2	55.0	57.7	59.3	55.9
Warhorse	11.5	15.0	14.6	11.2	13.4	9.1	12.5	56.1	55.0	48.9	55.6	52.5	59.8	54.6
Whetstone	10.9	13.9	12.4	11.2	---	---	12.1	57.9	58.9	53.2	59.0	---	---	57.2
Yellowstone	10.6	12.8	13.4	10.5	12.9	9.6	11.6	59.8	58.6	54.0	58.7	58.0	60.6	58.3
Bearpaw	---	---	---	11.8	11.2	---	11.5	---	---	---	58.8	57.0	---	57.9
Curlew	---	---	---	9.7	11.6	---	10.7	---	---	---	60.2	59.2	---	59.7
Deloris	---	---	---	9.9	12.3	---	11.1	---	---	---	60.0	62.4	---	61.2
Juniper	---	---	---	10.5	11.5	---	11.0	---	---	---	58.4	57.9	---	58.2
Lucin-CL	---	---	---	11.9	11.9	---	11.9	---	---	---	60.5	61.4	---	60.9
Judee/Garland	---	---	---	9.9	12.8	---	11.4	---	---	---	56.1	56.6	---	56.4
Promontory	---	---	---	9.8	12.2	---	11.0	---	---	---	60.2	59.6	---	59.9
UI SRG	---	---	---	9.6	11.7	---	10.7	---	---	---	56.7	59.2	---	57.9
Location Average	10.5	12.7	13.4	10.5	11.7	9.9	11.4	58.6	57.5	52.1	57.4	57.9	58.0	57.4
Hard White Winter Wheat														
IDO1101 (W)	10.1	12.1	12.6	10.1	10.1	9.2	10.7	57.8	56.2	53.7	56.6	55.7	54.7	55.8
LCI 13DH04-16 (W)	10.4	12.6	12.4	10.1	12.4	9.1	11.2	60.2	58.8	54.4	57.0	54.6	58.8	57.3
LCI 13DH14-53 (W)	9.0	10.7	12.7	11.2	14.6	9.7	11.3	57.8	55.9	51.9	55.3	53.8	55.4	55.0
LCS Yeti (W)	10.8	13.5	13.3	11.6	11.7	9.5	11.7	59.0	58.5	54.7	58.1	56.4	59.0	57.6
LCI13DH14-83 (W)	10.1	12.3	14.4	11.6	16.1	9.1	12.3	59.0	56.5	50.0	56.1	56.0	54.9	55.4
OR2110664 (W)	10.2	11.5	13.5	10.8	12.0	10.0	11.3	59.0	59.8	51.9	58.2	58.7	61.1	58.1
OR2110679 (W)	11.2	12.4	13.4	10.0	11.7	9.7	11.4	58.3	59.8	51.3	58.4	58.2	61.0	57.8
OR2111025 (W)	9.4	11.8	13.6	10.8	10.8	10.2	11.1	58.6	58.3	50.8	57.7	58.1	59.8	57.2
OR2120276H (W)	9.6	12.4	11.7	10.7	11.6	9.5	10.9	58.5	59.2	52.3	56.2	55.5	59.3	56.8
UI Silver (W)	9.9	13.6	13.5	9.5	10.0	10.1	11.1	58.5	57.4	52.7	57.3	59.6	60.0	57.6
WA8252 (W)	9.9	12.4	13.3	9.0	11.3	---	11.2	59.3	55.7	47.1	57.4	55.1	---	54.9
WB3768 (W)	10.8	12.0	14.5	10.0	11.3	9.7	11.4	58.3	57.7	54.1	57.8	56.9	59.4	57.4
Golden Spike (W)	---	---	---	9.0	11.6	---	10.3	---	---	---	59.4	59.2	---	59.3
UICF Grace (W)	---	---	---	9.6	11.4	---	10.5	---	---	---	53.6	51.5	---	52.6
Location Average	10.1	12.3	13.2	10.3	11.9	9.6	11.2	58.7	57.8	52.1	57.1	56.4	58.5	56.6

mb = moisture basis

Table 77. Bake Volume for Hard Winter Wheat at Aberdeen, Kimberly, Rupert, Rockland, and Soda Springs, 2016.

Variety	Bake Volume (cc)						Average
	Aberdeen	Kimberly	Rupert	Ririe	Rockland	Soda Springs	
Hard Red Winter Wheat							
SY Touchstone (W)	1300	1025	975	850	---	---	1038
Colter	1225	1125	1175	1050	1025	975	1096
Garland	1100	950	875	950	875	900	942
Greenville	1200	825	875	925	950	800	929
Judee	1300	975	1100	1025	1200	1025	1104
Keldin	1100	925	950	925	1025	850	963
LCS Colonia	1100	1000	1075	850	1125	950	1017
LCS Jet	1100	900	975	925	975	---	975
Manning	1075	975	1100	1025	1025	950	1025
Loma	1300	1050	1225	1125	1125	1050	1146
Northern	1200	975	1000	1175	1100	1125	1096
Norwest 553	1175	950	1025	1025	975	925	1013
OR2120012R	1150	1000	1150	1050	1150	---	1100
SY Clearstone CL2	1200	900	1075	975	1025	1025	1033
Utah 100	1125	975	1125	925	1025	1000	1029
Warhorse	1300	1050	1075	1025	1100	825	1063
Whetstone	1200	1100	1050	1100	---	---	1113
Yellowstone	1150	950	1100	1050	1100	900	1042
Bearpaw	---	---	---	1050	875	---	963
Curlew	---	---	---	975	1000	---	988
Deloris	---	---	---	1025	1125	---	1075
Juniper	---	---	---	1075	1025	---	1050
Lucin-CL	---	---	---	1100	1100	---	1100
Judee/Garland	---	---	---	1000	1125	---	1063
Promontory	---	---	---	975	975	---	975
UI SRG	---	---	---	900	1050	---	975
Location Average	1183	981	1051	1003	1045	950	1035
Hard White Winter Wheat							
IDO1101 (W)	1025	925	1025	950	950	875	958
LCI 13DH04-16 (W)	1100	1000	900	900	1050	800	958
LCI 13DH14-53 (W)	1000	850	925	1050	1200	875	983
LCS Yeti (W)	1225	1025	1025	1050	1100	900	1054
LCI13DH14-83 (W)	1125	925	1025	1150	1300	875	1067
OR2110664 (W)	1100	875	1100	1000	975	950	1000
OR2110679 (W)	1075	925	1075	1050	1000	950	1013
OR2111025 (W)	1200	875	1125	1100	1000	950	1042
OR2120276H (W)	1125	950	925	1050	1050	1000	1017
UI Silver (W)	1300	975	1150	1000	1000	1075	1083
WA8252 (W)	1025	825	1000	850	925	---	925
WB3768 (W)	1125	775	1175	975	1000	925	996
Golden Spike (W)	---	---	---	950	1050	---	1000
UICF Grace (W)	---	---	---	900	950	---	925
Location Average	1119	910	1038	998	1039	925	1001

Table 78. Percent Flour Protein and Flour Yield for Hard Spring Wheat at Rupert, Aberdeen, Idaho Falls, Ashton, and Soda Springs, 2016.

Variety	Flour Protein (14% mb)						Flour Yield (%)					
	Rupert	Aberdeen	Falls	Ashton	Soda Springs	Average	Rupert	Aberdeen	Falls	Ashton	Soda Springs	Average
Hard Red Spring												
10SB0087-B	11.1	12.3	12.0	12.5	10.5	11.7	62.5	66.7	61.5	63.7	57.4	62.4
Alum	11.7	14.2	13.5	12.9	10.3	12.5	60.3	64.3	58.2	61.8	58.1	60.6
Bullseye	11.7	13.0	12.3	13.4	---	12.6	59.9	62.1	58.4	63.7	---	61.0
Cabernet	12.4	12.5	12.1	14.7	---	12.9	62.3	67.5	60.6	65.9	---	64.1
HRS 3419	10.6	12.1	9.9	13.7	---	11.6	59.0	63.7	55.4	61.2	---	59.8
HRS 3504	11.8	13.0	12.2	13.2	---	12.6	59.6	62.0	57.8	62.7	---	60.5
HRS 3530	10.7	14.2	12.8	14.2	---	13.0	58.1	62.3	55.9	61.2	---	59.4
HRS 3616	12.2	13.7	13.3	14.2	---	13.4	55.6	59.0	53.7	57.0	---	56.3
Jefferson	11.0	12.5	12.3	13.1	10.3	11.8	62.2	62.4	60.0	64.1	56.8	61.1
Kelse	13.0	13.0	13.0	14.8	10.8	12.9	57.7	60.5	56.9	60.6	55.6	58.3
LCS Iron	11.8	12.3	11.3	13.1	9.9	11.7	56.9	63.2	56.5	59.7	53.3	58.0
SY Basalt	10.4	13.5	11.0	---	---	11.6	61.0	64.6	59.7	---	---	61.8
SY Coho	11.2	13.7	11.5	---	---	12.1	60.0	62.1	57.1	---	---	59.7
SY Selway	---	---	---	---	9.3	9.3	---	---	---	---	58.0	58.0
SY3015-8	11.4	12.8	12.4	---	---	12.2	63.1	64.8	59.6	---	---	62.5
WB9200	12.5	13.4	12.7	15.7	11.9	13.2	57.6	61.7	54.8	60.1	54.4	57.7
WB9377	11.4	11.7	12.7	13.0	10.8	11.9	55.0	57.8	51.8	55.9	53.1	54.7
WB9411	11.5	12.9	12.9	14.3	9.3	12.2	57.7	60.8	56.5	59.1	54.7	57.8
WB9518	12.4	14.2	12.3	15.0	10.8	12.9	55.0	59.8	50.6	56.2	52.0	54.7
WB9668	13.3	13.5	13.0	15.5	11.4	13.3	58.4	61.0	53.5	57.6	53.3	56.8
Location Average	11.7	13.1	12.3	14.0	10.5	12.3	59.1	62.4	56.8	60.7	55.2	59.3
Hard White Spring												
Dayn (W)	10.6	12.2	11.8	14.0	10.3	11.8	60.3	64.4	57.9	60.8	53.5	59.4
IDO1202S (W)	10.8	11.5	11.3	13.4	10.1	11.4	61.5	63.1	58.0	61.4	54.8	59.8
IDO1203-A (W)	10.8	11.8	10.8	13.1	9.1	11.1	60.6	62.0	57.9	61.2	58.4	60.0
IDO1602S (W)	10.8	11.4	10.8	14.3	10.5	11.6	60.9	65.2	61.4	62.3	59.5	61.9
Klasic (W)	11.2	11.6	10.7	14.5	9.4	11.5	62.6	61.5	60.2	61.6	58.4	60.9
LCS Atomo (W)	10.8	11.1	10.4	12.5	8.9	10.7	55.0	58.1	53.6	52.8	51.7	54.2
LCS Star (W)	10.7	11.5	10.5	13.6	8.6	11.0	56.9	63.0	59.5	60.7	56.1	59.3
Snow Crest (W)	12.4	12.8	11.9	15.6	---	13.2	59.0	59.9	58.0	58.3	---	58.8
SY-Teton (W)	10.4	11.3	9.9	---	9.3	10.2	58.7	61.8	58.3	---	56.2	58.7
UI Platinum (W)	10.9	11.7	9.8	14.0	9.1	11.1	59.8	64.5	61.0	63.0	59.4	61.5
WA8240 (W)	10.9	11.9	11.4	13.2	---	11.9	54.9	60.7	57.9	57.7	---	57.8
WA8262 (W)	11.6	12.4	12.1	13.5	---	12.4	58.5	63.7	61.1	59.7	---	60.8
WB-Paloma (W)	11.1	12.5	10.8	13.4	---	12.0	58.2	59.9	58.6	59.1	---	59.0
WB7328 (W)	12.9	12.2	11.7	15.0	10.4	12.4	57.0	61.7	57.4	57.5	56.4	58.0
WB7589 (W)	12.0	12.7	10.7	14.3	9.5	11.8	55.7	60.7	56.4	59.0	54.5	57.3
Location Average	11.2	11.9	11.0	13.9	9.6	11.6	58.6	62.0	58.5	59.7	56.3	59.2

(W) = White

mb = moisture basis

Table 79. Bake Volume for Hard Spring Wheat, 2016.

Variety	Bake Volume (cc)					Average
	Aberdeen	Ashton	Idaho Falls	Rupert	Soda Springs	
Hard Red Spring Wheat						
10SB0087-B	1100	1175	1150	1050	1025	1100
Alum	1225	1300	1200	1100	1000	1165
Bullseye	1175	1200	1200	1000	---	1144
Cabernet	1400	1300	1225	1225	---	1288
HRS 3419	1200	1200	925	950	---	1069
HRS 3504	1400	1150	1100	1050	---	1175
HRS 3530	1400	1300	1200	1050	---	1238
HRS 3616	1200	1200	1300	1050	---	1188
Jefferson	1225	1300	1175	1050	900	1130
Kelse	1225	1300	1225	1200	1025	1195
LCS Iron	1125	1125	1025	875	900	1010
SY Basalt	1050	---	1100	1050	---	1067
SY Coho	1300	---	1100	1100	---	1167
SY Selway	---	---	---	---	775	775
SY3015-8	1175	---	1150	1025	---	1117
WB9200	1300	1300	1175	1100	1100	1195
WB9377	1100	1125	1100	1000	950	1055
WB9411	1175	1300	1200	1050	900	1125
WB9518	1300	1200	1100	1050	1000	1130
WB9668	1300	1250	1200	1200	1050	1200
Location Average	1230	1233	1150	1062	966	1127
Hard White Spring Wheat						
Dayn (W)	1200	1300	1125	1025	950	1120
IDO1202S (W)	1050	1125	1050	1025	975	1045
IDO1203-A (W)	1150	1200	1075	1050	900	1075
IDO1602S (W)	1150	1200	1150	1125	1000	1125
Klasic (W)	1200	1175	1075	1150	950	1110
LCS Atomo (W)	1050	1050	1000	1000	850	990
LCS Star (W)	1300	1200	1075	1150	800	1105
Snow Crest (W)	1300	1300	1125	1150	---	1219
SY-Teton (W)	1175	---	1000	1100	925	1050
UI Platinum (W)	1125	1225	1025	1050	950	1075
WA8240 (CLP)	1075	1225	975	975	---	1063
WA8262 (W)	1275	1300	1175	1125	---	1219
WB-Paloma (W)	1250	1300	1150	1125	---	1206
WB7328 (W)	1200	1300	1225	1175	1050	1190
WB7589 (W)	1225	1300	1050	1125	975	1135
Location Average	1182	1229	1085	1090	939	1115

(W) = White

Addendum 1. Resistance reaction of hard winter wheat varieties in a heavily inoculated dwarf bunt (*Tilletia controversa*) nursery, Logan, UT. 2017 data and 2014-2017 averages.

Thanks to our Cooperator Dr. David Hole, Utah State University.

Winter Wheat Variety	Overall Disease Rating	Percent Bunted Heads (%)	No. of Years of Testing
04PN028B-3 (W)	S	45	1
Bearpaw	S	46	4
Colter*	MS	7	2
Curlew	VR	0	4
DAS001	S	35	2
Deloris	VR	0	4
Earl	S	18	2
Eltan (SWW)	R	1	3
Garland	R	1	2
Golden Spike (W)	VR	0	4
Greenville	R	2	4
IDO1101 (W)	VR	0	4
IDO1103	VR	0	2
IDO1209DH (W)	R	2	1
IDO1506 (W)	R	3	1
Judee	S	23	3
Juniper	VR	0	4
Keldin	S	27	4
LCI 13DH04-16 (W)	S	74	2
LCI 13DH14-53 (W)	S	85	2
LCS Yeti (W)	S	56	2
LCI13DH14-83 (W)	S	64	2
LCS Azimut	S	41	2
LCS Colonia	S	17	3
LCS Jet	S	40	4
Loma	S	59	2
Lucin-CL	S	19	4
Mandala	S	33	1
Manning	R	1	3
Metropolis	S	38	1
Moreland	S	23	2
MT1332	R	2	1
MT1348	R	2	1
Northern	S	54	3
Norwest 553	S	52	4
LCS Rocket	S	48	1

(W) = White
(SWW) = Soft White Winter

Winter Wheat Variety	Overall Disease Rating	Percent Bunted Heads (%)	No. of Years of Testing
OR2100081H	S	23	2
OR2110019H	MR	4	1
OR2110664 (W)	S	85	1
OR2110679 (W)	S	66	2
OR2111025 (W)	S	49	2
OR2120012R	S	53	1
OR2120070R	S	58	1
OR2120276H (W)	S	33	2
OR2130021R	S	63	1
OR2130118H (W)	S	80	1
Promontory	R	1	4
Rebalde	S	78	1
SY Clearstone 2CL (W)	MR	4	4
SY Touchstone (W)	S	53	1
UI Silver	VR	0	4
UI SRG	VR	0	4
UICF Grace (W)	R	1	4
Utah 100	VR	0	4
WA 8267 (W)	S	38	1
WA8252 (W)	S	55	2
Wanser	S	74	2
Warhorse	S	63	3
WB-Rimrock	S	20	1
WB3768 (W)	MR	5	4
WB4303	S	25	1
WB4623CLP	S	60	1
Weston	MR	4	2
Whetstone	S	57	4
XA3101 (W)	S	40	1
XA4103	S	28	1
XA4104	S	30	1
XA4601	MS	15	1
Yellowstone	MS	8	4

0 VR = very resistant
 1 - 3 R = resistant
 4 - 6 MR = moderately resistant
 7 - 15 MS = moderately susceptible
 > 15 S = susceptible

Addendum 2. Resistance reaction of soft white winter wheat varieties in a heavily inoculated dwarf bunt (*Tilletia controversa*) nursery, Logan, UT. 2017 data and 2014-2017 averages.

Thanks to our Cooperator Dr. David Hole, Utah State University.

Winter Wheat Variety	Overall Disease Rating	Percent Bunted Heads (%)	No. of Years of Testing
Bobtail	S	37	4
Brundage	S	30	4
Bruneau	MS	11	4
BZ6W09-489	VR	0	1
DAS003	R	2	1
DAS004	MS	8	1
Eltan	R	3	4
IDN-01-10704A	MS	12	4
IDN-02-29001A	MS	7	4
IDN06-03303B	MS	7	2
IDN06-18102A	S	30	1
IDN07-28017B	MS	7	2
IDN09-08357A	S	65	1
IDO1004	MS	8	1
IDO1005	MS	10	1
Jasper	S	43	3
Kaseberg	S	47	2
LCS Artdeco	S	34	4
LCS Biancor	S	35	3
LCS Drive	S	43	4
LOR-833	S	19	2
LOR-913	S	16	2
LOR-978	MS	7	1
LWW10-1073	MR	4	3
LCS Shark	S	50	1
LWW14-73161	S	28	1
LCS Hulk	MS	11	2
Madsen	MS	7	3
Mary	MS	14	2
Norwest Duet	MS	9	3
Norwest Tandem	S	43	3
OR2080637	MS	9	2
OR2080641	MS	9	2
OR2090473	S	50	2
OR2100940	S	35	1
OR2101043	MS	13	1

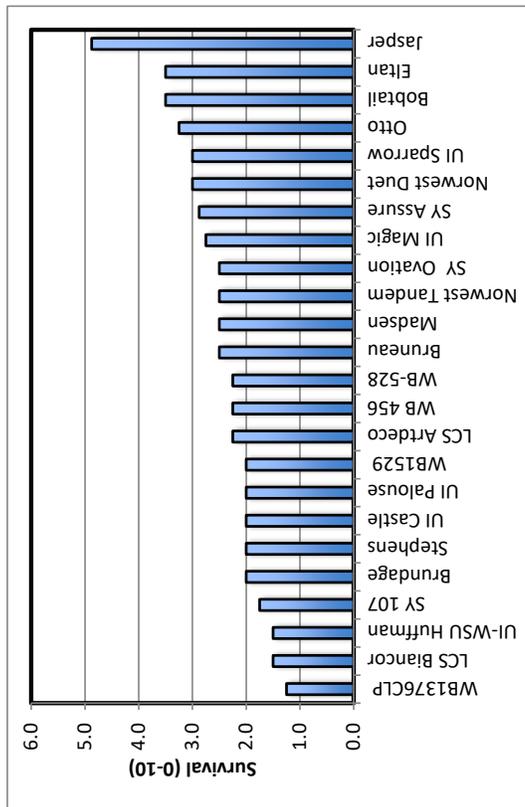
Winter Wheat Variety	Overall Disease Rating	Percent Bunted Heads (%)	No. of Years of Testing
OR2110526	S	43	1
OR2121086	MR	4	1
ORI2150031CF+	S	16	1
ORI2150033CF+	S	20	1
Otto	R	2	4
Rosalyn	R	3	2
Stephens	MS	8	4
SY Ovation	S	29	4
SY 107	MR	5	2
SY Assure	R	3	3
SY Banks	MS	15	1
SY Command	S	25	1
SY Dayton	S	33	1
UI Castle	MS	14	3
UI Magic	MS	15	3
UI Palouse	S	52	3
UI Sparrow	VR	0	4
UI-WSU Huffman	S	21	4
UICF Brundage	MS	8	1
WA8206	MS	13	1
WA8232	S	34	2
WA8234	MS	10	2
WB 456	S	33	4
WB-528	MS	6	4
WB-Junction	MS	8	2
WB1070CL	MS	9	1
WB1376CLP	S	20	4
WB1529	MR	4	4
WB1604	MS	9	2
WB1783	S	23	2
WB523	VR	0	1
XA1101	S	60	1
XA1401	S	65	1

0 VR = very resistant
 1 - 3 R = resistant
 4 - 6 MR = moderately resistant
 7 - 15 MS = moderately susceptible
 > 15 S = susceptible

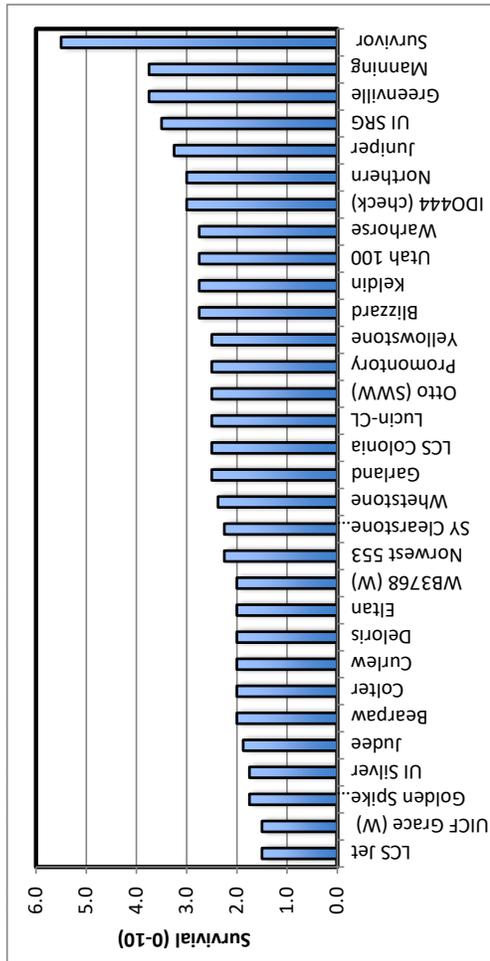
Addendum 3. Snow mold survival of winter wheat on a scale of 0 - 9, where 0 is no stand and 9 is full stand. Under severe snow mold conditions in 2016, stands were very poor. Snow mold did not develop in 2017.

Soft White Winter Variety	2015 - 2016 average
WB1376CLP	1.3
LCS Biancor	1.5
UI-WSU Huffman	1.5
SY 107	1.8
Brundage	2.0
Stephens	2.0
UI Castle	2.0
UI Palouse	2.0
WB1529	2.0
LCS Artdeco	2.3
WB 456	2.3
WB-528	2.3
Bruneau	2.5
Madsen	2.5
Norwest Tandem	2.5
SY Ovation	2.5
UI Magic	2.8
SY Assure	2.9
Norwest Duet	3.0
UI Sparrow	3.0
Otto	3.3
Bobtail	3.5
Eltan	3.5
Jasper	4.9

Soft White Winter Wheat



Hard Red and White Winter Wheat



Hard Winter Variety	2015 - 2016 average
LCS Jet	1.5
UICF Grace (W)	1.5
Golden Spike (W)	1.8
UI Silver	1.8
Judee	1.9
Bearpaw	2.0
Colter	2.0
Curlew	2.0
Deloris	2.0
Eltan	2.0
WB3768 (W)	2.0
Norwest 553	2.3
SY Clearstone CL2	2.3
Whetstone	2.4
Garland	2.5
LCS Colonia	2.5
Lucin-CL	2.5
Otto (SWW)	2.5
Promontory	2.5
Yellowstone	2.5
Blizzard	2.8
Keldin	2.8
Utah 100	2.8
Warhorse	2.8
IDO444 (check)	3.0
Northern	3.0
Juniper	3.3
UI SRG	3.5
Greenville	3.8
Manning	3.8
Survivor	5.5

Addendum 4a. Stripe rust ratings for 2016 winter wheat. Stripe rust was not severe in 2017 in the southeastern portions of Idaho. Ratings were based on an index of percent tissue affected by stripe rust multiplied by infection type.

2016 Disease Ratings in Aberdeen

Hard Winter Wheat Under Extremely High Disease Pressure

Variety	Stripe Rust Infection Type (IT)	Percent Leaf Area Infected (PLAI)	IT x PLAI %	Stripe Rust Rating
Colter	7.0	24	1.66	S
Garland	7.0	58	4.03	VS
Greenville	7.3	15	1.09	S
IDO1101 (W)	7.0	24	1.66	S
Judee	6.0	8	0.50	MR
Keldin	7.0	26	1.84	S
LCI 13DH04-16 (W)	7.5	10	0.75	MS
LCI 13DH14-53 (W)	7.0	43	2.98	VS
LCS Yeti (W)	8.0	8	0.62	MR
LCI13DH14-83 (W)	7.0	40	2.80	VS
LCS Colonia	6.3	2	0.13	R
LCS Jet	7.0	3	0.21	MR
Loma (MT1224)	6.0	15	0.87	MS
Manning	7.0	16	1.14	S
Northern	6.0	15	0.90	MS
Norwest 553	6.5	2	0.10	R
OR2110664 (W)	7.5	6	0.43	MR
OR2110679 (W)	7.0	2	0.14	R
OR2111025 (W)	7.0	4	0.28	MR
OR2120012R	7.0	7	0.51	MR
OR2120276H (W)	7.0	5	0.33	MR
SY Clearstone CL2	7.0	15	1.05	S
SY Touchstone (W)	7.0	3	0.21	MR
UI Silver	7.0	14	0.96	S
Utah 100	7.0	14	0.96	S
WA8252 (W)	6.8	14	0.93	MS
Warhorse	7.0	10	0.67	MS
WB3768 (W)	7.0	24	1.66	S
Whetstone	7.0	16	1.14	S
Yellowstone	7.0	24	1.66	S

Average 6.9 15
 LSD (0.05) 5.0 4
 CV 4.6 17
 P>F <0.0001 <0.0001

(W) = White

Infection Type: on a scale from 0 to 9, where 0 is immune,

1 is resistant, and 8 to 9 is very susceptible.

TIPS:

R to MR - should not need fungicides

R to MR - should not need fungicides unless disease pressure becomes high

MR to MS - consider spraying with protective fungicides under medium to high disease pressure

S = will need protective fungicide application when stripe rust is present

VS = will need fungicides in the presence of stripe rust, at times up to three applications in severe years

2016 Disease Ratings in Aberdeen

Soft White Winter Wheat Under Extremely High Disease Pressure

Variety	Stripe Rust Infection Type (IT)	Percent Leaf Area Infected (PLAI)	IT x PLAI %	Stripe Rust Rating
Bobtail	3.8	1	0.04	R
Brundage	8.1	76	6.20	VS
Bruneau	7.1	7	0.48	MR
BZ6W09-489	7.0	7	0.51	MR
IDN-01-10704A	6.5	6	0.41	MR
IDN-02-29001A	5.3	1	0.07	R
IDN06-03303B	7.0	9	0.63	MS
IDN06-18102A	7.1	6	0.45	MR
IDN07-28017B	6.0	1	0.06	R
Jasper	7.0	5	0.32	MR
LCS Artdeco	6.3	17	1.06	MS
LCS Biancor	2.6	1	0.01	R
LCS Drive	1.3	0	0.00	R
LOR-833	3.5	1	0.03	R
LOR-913	0.0	0	0.00	R
LCS Hulk	3.5	1	0.03	R
Madsen	7.0	18	1.24	S
Norwest Duet	4.3	1	0.03	R
Norwest Tandem	5.5	2	0.11	R
OR2110526	5.8	4	0.23	MR
Stephens	5.8	24	1.37	S
SY Ovation	6.3	4	0.22	MR
SY Assure	3.5	1	0.04	R
UI Castle	3.5	1	0.02	R
UI Magic	7.1	21	1.51	S
UI Palouse	7.4	6	0.46	MR
UI Sparrow	7.0	5	0.32	MR
UI-WSU Huffman	6.8	5	0.34	MR
WA8206	1.5	1	0.01	R
WA8232	1.3	1	0.01	R
WA8234	5.9	1	0.07	R
WB 456	7.0	6	0.42	MR
WB-528	6.6	9	0.56	MR
WB1376CLP	7.3	7	0.53	MR
WB1529	5.9	2	0.12	R
WB1783	5.3	1	0.05	R

Average 5.3 7
 LSD (0.05) 2.2 2
 CV 29.7 21
 P>F <0.0001 <0.0001

Addendum 4b. Stripe rust ratings for 2016 winter wheat. Stripe rust was not severe in 2017 in the southeastern portions of Idaho. Ratings were based on an index of percent tissue affected by stripe rust multiplied by infection type.

2016 Disease Ratings in Rockland

Hard Winter Wheat

Variety	Stripe Rust Infection Type (IT)	Percent Leaf Area Infected (PLAI)	IT x PLAI %	Stripe Rust Rating
Bearpaw	7.5	48	3.56	VS
Colter	6.0	9	0.54	MS
Curlew	6.0	5	0.30	MR
Deloris	8.5	55	4.68	VS
Eltan (SWW)*	8.0	43	3.40	VS
Garland	8.0	50	4.00	VS
Golden Spike (W)	8.0	25	2.00	S
Greenville	5.5	4	0.19	R
IDO1101 (W)	6.0	8	0.45	MS
Judee	4.5	9	0.38	MR
Juniper	6.5	7	0.42	MS
Keldin	8.0	18	1.40	S
LCI 13DH04-16 (W)	5.5	6	0.30	MR
LCI 13DH14-53 (W)	8.0	15	1.20	S
LCS Yeti (W)	8.0	15	1.20	S
LCH13DH14-83 (W)	6.5	10	0.65	MS
LCS Colonia	2.5	1	0.01	R
LCS Jet	5.0	7	0.33	MR
Loma (MTS1224)	7.5	10	0.75	MS
Lucin-CL	8.5	55	4.68	VS
Manning	5.5	4	0.22	MR
Northern	6.0	3	0.18	R
Norwest 553	0.0	0	0.00	R
OR2110664 (W)	5.5	2	0.11	R
OR2110679 (W)	6.0	2	0.12	R
OR2111025 (W)	2.5	2	0.04	R
OR2120012R	5.5	5	0.25	MR
OR2120276H (W)	5.5	2	0.11	R
Promontory	7.0	9	0.63	MS
SY Clearstone CL2	5.5	3	0.17	R
UI Silver	5.0	6	0.30	MR
UI SRG	4.0	2	0.06	R
UICF Grace (W)	8.0	23	1.80	S
Utah 100	7.0	2	0.14	R
WA8252	6.0	15	0.90	MS
Warhorse	7.0	7	0.46	MS
WB1376CLP (SWW)	0.0	0	0.00	R
WB3768 (W)	6.0	5	0.30	MR
Yellowstone	6.0	8	0.48	MS

Average	5.9	13
LSD (0.05)	2.4	12
CV	20	44
P>F	<0.0001	<0.0001

*Soft white winter check

(SWW) = Soft White Winter Wheat

(W) = Hard White Winter Wheat

Addendum 5. Stripe rust ratings for 2016 spring wheat. Stripe rust was severe in the southeastern portions of Idaho, from Arbon Valley area to Aberdeen.

Ratings were based on an index of percent tissue affected by stripe rust multiplied by infection type.

Hard Spring Wheat	Stripe Rust Infection Type	Percent Leaf Area Infected	IT x PLAI %	Relative RATING
WB9518	1.5	0.3	0.0038	R
SY3015-8	3.0	0.5	0.0150	R
WB9668	3.0	0.5	0.0150	R
Dayn (W)	6.0	1.5	0.0900	R
WB9200	5.3	1.8	0.0919	R
WB9411	4.3	3.8	0.1594	R
LCS Iron	1.3	15.0	0.1875	R
LCS Luna	6.5	3.0	0.1950	R
HRS 3419	6.5	3.3	0.2113	MR
Cabernet	6.5	3.5	0.2275	MR
LCS Star (W)	4.3	5.8	0.2444	MR
SY Basalt	6.6	7.0	0.4638	MR
WB7589 (W)	7.0	6.8	0.4725	MR
WA8240 (CLP)	7.0	9.0	0.6300	MR
SY Coho	7.0	11.3	0.7875	MS
Alum	5.8	15.0	0.8625	MS
LCS Atomo (W)	7.5	11.5	0.8625	MS
Alzada (D)	7.0	13.8	0.9625	MS
SY-Teton (W)	7.0	16.3	1.1375	MS
IDO1602S	7.1	16.3	1.1578	MS
WA8262	6.3	20.0	1.2500	MS
WB9377	7.3	20.0	1.4500	S
HRS 3616	6.9	21.3	1.4609	S
WB7328 (W)	7.0	23.8	1.6625	S
UI Platinum (W)	6.1	32.5	1.9906	S
Kelse	7.0	31.3	2.1875	S
Bullseye	6.5	35.0	2.2750	S
IDO1202S (W)	7.0	38.8	2.7125	S
Jefferson	7.0	41.3	2.8875	S
HRS 3504	7.8	42.5	3.2938	VS
IDO1203-A (W)	7.0	47.5	3.3250	VS
WB-Paloma (W)	7.1	47.5	3.3844	VS
Snow Crest (W)	7.0	50.8	3.5525	VS
HRS 3530	7.1	57.5	4.0969	VS
Klasic (W)	7.0	70.0	4.9000	VS

Average	6.1	21.0
LSD (0.05)	0.8	12.0
CV	9.4	38.0
P>F	<0.0001	<0.0001

(W) = White
(D) = Durum
(CLP) = 2-gene Clearfield

Soft White Spring Wheat	Stripe Rust Infection Type	Percent Leaf Area Infected	IT x PLAI %	Relative G
Seahawk	0.5	0.0	0.0000	R
Melba (club)	3.6	3.0	0.1088	R
WB6121	6.8	2.0	0.1350	R
Tekoa	4.5	3.3	0.1463	R
Diva	6.3	5.8	0.3594	MR
WB6430	7.0	5.5	0.3850	MR
SY Saltese	6.8	8.0	0.5400	MR
IDO1403S	8.1	10.0	0.8125	MS
Louise	7.0	14.3	0.9975	MS
12-SW-068	6.5	22.5	1.4625	S
IDO1405S	6.6	28.8	1.9047	S
Alturas	7.0	41.3	2.8875	S
UI Stone	7.0	41.3	2.8875	S
WB-1035CL+	8.8	33.8	2.9531	VS
UI Pettit	8.0	57.5	4.6000	VS
Babe	8.0	75.0	6.0000	VS

Average	6.4	22.0
LSD (0.05)	0.9	4.0
CV	10.3	11.0
P>F	<0.0001	<0.0001

Infection Type: on a scale from 0 to 9, where 0 is immune, 1 is resistant, and 8 to 9 is very susceptible.

TIPS:

R to MR - should not need fungicides

MR - should not need fungicides unless disease pressure becomes high

MR to MS - consider spraying with protective fungicides under medium to high disease pressure

S = will need protective fungicide application when stripe rust is present

VS = will need fungicides in the presence of stripe rust, at times up to three applications in severe years consider spraying at herbicide timing to prevent infection in S and VS varieties.

Addendum 6a. Results from the 2017 FHB Screening nursery, Aberdeen, ID, where plots were inoculated with corn spawn colonized with *Fusarium graminearum*. Results are based on one year's data. Rankings may change from year to year and with high disease pressure. Lines with the same letter behind the rating are not significantly different.

Table A. Screening (29) Hard Red Spring Wheat Varieties for FHB

Variety	Resistance rating	FHB Index* (%)	FDK ^z (%)	Yield (bu/A)	Test Weight (lb/bu)	DON (ppm)
Rollag	R	2.0 J	0.7 IJ	78.9 A-G	62.0 A	1.1
HRS3419	R	3.8 IJ	0.3 J	87.1 A-D	58.5 A-D	0.6
SY Selway	MS ^x	13.6 HIJ	5.8 D-I	70.9 A-H	54.0 C-E	21.2
SY Gunsight	MR	14.9 HIJ	3.6 E-J	79.4 A-G	59.0 ABC	8.8
WB9668	MS	15.6 HIJ	7.4 B-F	59.8 E-I	56.5 B-E	24.5
LCS Iron	MS	19.9 G-J	3.0 G-J	93.2 A	59.5 ABC	9.8
12SB0197	MS	21.5 GHI	3.2 F-J	90.1 ABC	57.5 A-E	7.9
WB9350	MS	21.5 GHI	7.0 C-G	65.1 C-I	54.5 C-E	31.2
WB9578	MS	22.9 GH	4.0 E-J	67.6 B-H	59.0 ABC	11.2
XA9660	S	26.3 FGH	7.4 B-F	64.2 D-I	56.5 B-E	19.5
WB9433	S	26.4 FGH	11.2 ABC	55.9 GHI	53.5 EF	29.2
06PN3017-09	S	26.6 FGH	2.6 HIJ	92.7 AB	59.5 ABC	9.1
IDO1603S	S	28.4 E-H	8.5 BCD	67.3 C-H	55.5 C-E	17.1
12SB0224	S	29.2 D-H	6.0 D-H	79.6 A-G	57.5 A-E	16.9
WB9411	S	29.2 D-H	4.0 E-J	67.3 C-H	59.5 ABC	9.1
IDO1602S	S	29.7 D-H	3.8 E-J	81.6 A-F	59.5 ABC	13.4
HSG 500,709	S	31.3 C-H	10.7 A-D	65.8 C-I	53.5 EF	37.3
Alum	S	35.9 C-G	3.2 F-J	79.4 A-G	61.0 AB	7.2
SY Coho	VS	42.1 B-F	8.5 BCD	74.3 A-H	55.0 C-E	21.3
SY Basalt	VS	42.3 B-F	6.4 D-H	82.3 A-E	57.5 A-E	11.1
WB936	VS	43.5 B-F	13.2 A	41.6 I	46.5 G	55.3
XA9760	VS	44.0 B-F	7.9 B-E	69.5 A-H	57.0 B-E	21.5
HSG 501,089	VS	45.7 B-E	11.4 AB	49.4 HI	51.5 F	30.3
Jefferson	VS	46.9 A-D	6.5 D-H	63.2 D-I	57.5 A-E	19.4
Cabernet	VS	47.9 ABC	8.5 BCD	56.9 F-I	55.0 C-E	30.2
Kelse	VS	47.9 ABC	5.8 D-H	71.6 A-H	58.5 A-D	8.9
WB9518	VS	48.0 ABC	10.7 A-D	50.6 HI	54.0 DEF	33.2
XA9301	VS	58.1 AB	9.4 A-D	65.4 C-I	54.5 C-E	29.5
XA9502	VS	64.5 A	10.7 A-D	55.9 GHI	51.0 FG	40.6
<i>P</i> ($\alpha=0.05$)		<.0001	<.0001	0.0156	0.0003	

^xHigh DON accumulation

*FHB index = (% Severity x % Incidence)/100

^zFusarium Damaged Kernels

- 0 VR = very resistant
- 1 - 3 R = resistant
- 4 - 17 MR = moderately resistant
- 18 - 25 MS = moderately susceptible
- 26 - 40 S = susceptible
- 41 - 100 VS = very susceptible

Data analyzed using PROC GLYMMIX in SAS

This material is based upon work supported by the U.S. Department of Agriculture, under Agreement No. 59-0206-4-042. This is a cooperative project with the U.S. Wheat & Barley Scab Initiative. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

Addendum 6b. Results from the 2017 FHB Screening nursery, Aberdeen, ID, where plots were inoculated with corn spawn colonized with *Fusarium graminearum*. Results are based on one year's data. Rankings may change from year to year and with high disease pressure. Lines with the same letter behind the rating are not significantly different.

Table B. Screening (14) Hard White Spring Wheat Varieties and (2) Durum for FHB

Variety	Resistance rating	FHB Index (%)	FDK ^z (%)	Yield (bu/A)	Test Weight (lb/bu)	DON (ppm)
Rollag	R	2.0 J	0.7 II	78.9 A-G	62.0 A	1.1
XA7523	MR	9.6 B	1.8 H	70.5 BC	58.5 AB	5.6
Dayn	MR	11.9 B	2.0 GH	106.0 A	60.0 A	6.0
LCS Star	MS	19.2 B	4.4 E-H	76.5 AB	56.5 ABC	13.9
Snow Crest	S ^x	8.5 B	4.6 D-H	76.2 AB	56.5 ABC	17.0
WB7328	S ^x	11.1 B	7.2 A-F	52.8 BCD	54.0 BCD	31.3
SY-Teton	S ^x	14.2 B	5.2 C-H	70.0 BC	55.5 A-D	16.8
WB7202CLP	S ^x	18.2 B	11.0 A	55.5 BCD	52.5 CD	30.2
XA7524	S ^x	19.6 B	8.5 A-E	55.9 BCD	54.5 BCD	34.1
IDO1203	S	40.2 A	6.2 B-G	78.0 AB	57.0 ABC	16.2
IDO1202S	S	40.4 A	3.4 FGH	82.3 AB	60.0 A	10.5
WB-Paloma	VS	40.8 A	8.9 A-D	58.3 BCD	54.0 BCD	40.2
Imperial (D)	VS	48.9 A	9.8 AB	35.4 D	47.0 E	37.3
Alzada (D)	VS	49.1 A	7.9 A-E	60.0 BCD	55.5 A-D	23.8
UI Platinum	VS	49.2 A	5.4 C-H	53.7 BCD	55.0 BCD	22.9
Klasic	VS	50.1 A	10.2 A	44.3 CD	51.0 DE	28.3
WB7589	VS	55.8 A	9.2 ABC	67.6 BC	55.5 A-D	25.1
<i>P</i> ($\alpha=0.05$)		<.0001	0.0045	0.0262	0.0033	

(D) = Durum

Table C. Screening (16) Soft White Spring Wheat Varieties for FHB

Variety	Resistance rating	FHB Index (%)	FDK ^z (%)	Yield (bu/A)	Test weight (lb/bu)	DON (ppm)
Rollag	R	2.0 J	0.7 II	78.9 A-G	62.0 A	1.1
WB6121	MR	6.6 E	1.0 C	74.1 EF	59.5 C-F	9.6
WA 8277	MR	12.9 DE	0.8 C	91.5 A-F	62.0 A	6.0
Tekoa	MR	13.3 DE	1.0 C	117.2 A	61.0 ABC	5.5
14-SSW-1059	MR	17.9 CDE	1.6 BC	112.3 ABC	58.5 E-G	4.9
Alturas	MS	18.6 CDE	1.0 C	100.0 A-E	60.5 A-D	4.4
UI Pettit	MS	20.4 B-E	1.4 BC	88.8 B-F	57.5 GH	13.9
IDO1403S	MS	21.6 B-E	1.4 BC	89.8 A-F	59.5 C-F	7.3
WB6430	MS	21.8 B-E	2.6 B	80.9 DEF	57.0 H	21.7
Melba	MS	24.3 B-E	0.7 C	92.9 A-F	60.0 B-E	3.7
UI Stone	MS ^y	39.5 AB	0.7 C	116.4 AB	60.5 A-D	3.7
WB6341	S	26.9 BCD	1.4 BC	96.6 A-E	58.0 FGH	10.7
IDO1405S	S	28.1 BCD	1.2 BC	88.1 C-F	59.0 D-G	9.3
SY Saltese	S	32.0 A-D	2.0 BC	91.3 A-F	59.0 D-G	9.2
Seahawk	S	32.3 A-D	1.3 BC	107.5 A-D	61.5 AB	5.4
WA 8278	S	34.8 ABC	1.4 BC	100.0 A-E	60.0 B-E	5.3
Louise	VS	52.1 A	5.8 A	66.1 F	57.5 GH	13.7
<i>P</i> ($\alpha=0.05$)		0.0256	0.0006	0.0455	0.0002	

³High DON accumulation

^yLow DON

^zFusarium Damaged Kernels

Addendum 7a. Results from the 2017 FHB Screening nursery, Aberdeen, ID, where plots were inoculated with corn spawn colonized with *Fusarium graminearum*. Results are based on one year's data. Rankings may change from year to year and with high disease pressure. Lines with the same letter behind the rating are not significantly different.

Table D. Screening Two-Rowed Malt Barley Varieties for FHB

Variety	Rating	FHB Index (%)	Yield (bu/A)	Test Weight (lb/bu)	DON (ppm)
Clho 4196	R	0.3 H	69.0 KLM	48.7 BCD	1.2
Merem	R	0.7 GH	121.0 A-D	48.7 BCD	2.5
ICB 111809	R	0.9 GH	64.5 LM	48.1 B-E	3.7
Harrington	MR	1.1 GH	89.0 G-L	47.6 C-F	3.3
ABI Balster	MR	1.2 GH	123.7 AB	48.2 B-E	6.0
ABI Growler	MR	1.5 GH	109.5 A-G	47.1 D-G	4.5
Conlon	MR	1.5 GH	92.3 E-K	47.4 C-G	3.7
ACC Synergy	MR	1.6 GH	131.6 A	49.8 AB	7.4
Hockett	MR	1.8 GH	113.8 A-G	48.7 BCD	7.7
CDC Meredith	MR	1.9 GH	105.3 B-H	48.0 B-E	4.9
ABI Voyager	MR	2.3 FGH	103.5 B-I	48.5 BCD	6.3
AC Metcalfe	MR	2.3 FGH	106.2 A-G	48.7 BCD	5.5
Far15-52A	MR	2.3 FGH	55.4 M	46.7 D-H	7.7
Conrad	MR	2.4 FGH	122.3 ABC	49.2 BC	11.8
CDC Copeland	MS	2.7 FGH	115.0 A-G	47.9 B-E	6.1
ND Genesis	MS	3.2 E-H	109.5 A-G	47.4 C-G	5.9
2B11-5166	MS	3.3 E-H	117.7 A-E	46.2 E-I	5.8
2B11-4949	MS	3.4 E-H	119.8 A-D	47.2 C-G	4.9
Golden Promise	MS	3.9 E-H	101.0 B-I	44.1 JK	11.2
Pinnacle	MS	3.9 E-H	115.3 A-F	49.2 BC	9.6
2Ab08-X05M010-82	MS	4.0 E-H	113.8 A-G	46.8 D-G	7.3
2Ab08-X05M010-65	MS	4.5 D-H	122.8 AB	46.7 D-H	13.1
Moravian 169	S	5.0 D-H	89.9 F-L	45.7 F-J	10.9
Moravian 69	S	5.6 D-H	79.3 H-M	44.7 H-K	9.0
Explorer	S	6.0 D-H	98.6 B-I	45.5 G-I	15.9
2Ab07-X031098-31	S	8.3 D-G	70.8 J-M	51.3 A	6.0
LCS Sienna	S	9.7 C-F	96.5 C-J	45.4 G-K	12.2
SY Sirish	S	10.6 B-E	99.9 B-I	44.1 JK	23.6
Bill Coors 100	S	12.1 BCD	78.1 I-M	44.2 IJK	15.2
LCS Odyssey	VS	17.2 ABC	101.4 B-I	41.9 LM	26.6
LCS Opera	VS	18.0 AB	95.9 D-J	40.8 M	20.0
LCS Genie	VS	21.0 A	104.1 B-I	43.4 KL	21.5
<i>P</i> ($\alpha=0.05$)		0.0001	<.0001	<.0001	

0 R = resistant

*Resistant check 1 - 2 MR = moderately resistant

*Susceptible check 3 - 5 MS = moderately susceptible

6 - 15 S = susceptible

15 - 40 VS = very susceptible

*FHB index = (% Severity x % Incidence)/100

Data analyzed using PROC GLYMMIX in SAS

This material is based upon work supported by the U.S. Department of Agriculture, under Agreement No. 59-0206-4-042. This is a cooperative project with the U.S. Wheat & Barley Scab Initiative. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

Addendum 7b. Results from the 2017 FHB Screening nursery, Aberdeen, ID, where plots were inoculated with corn spawn colonized with *Fusarium graminearum*. Results are based on one year's data. Rankings may change from year to year and with high disease pressure. Lines with the same letter behind the rating are not significantly different.

Table E. Screening Two-Rowed Feed Barley Varieties for FHB

Variety	Rating	FHB Index (%)	Yield (bu/A)	Test Weight (lb/bu)	DON (ppm)
Clho 4196	R	0.3 G	69.0 GH	48.7 B-F	1.2
ICB 111809	R	0.9 G	64.5 H	48.1 C-F	3.7
Xena	R	0.9 G	124.4 AB	47.9 C-F	4.9
Clearwater	MR	1.4 FG	84.1 E-H	53.2 A	7.1
Champion	MR	1.7 FG	134.6 A	48.9 B-F	6.7
Lenetah	MR	1.8 EFG	123.1 AB	49.6 BCD	4.9
Sawtooth	MR	1.8 EFG	76.0 FGH	49.4 B-E	6.2
Altorado	MR	2.2 D-G	115.6 ABC	48.8 B-F	16.4
Transit	MS	2.8 C-G	80.2 FGH	50.9 AB	3.2
Idagold II	MS	3.0 B-G	119.2 ABC	47.1 DEF	10.7
Vespa	MS	3.9 A-G	98.6 C-F	46.6 EF	7.4
CDC Fibar	MS	4.1 A-G	79.9 FGH	50.5 ABC	9.7
Claymore	MS	4.2 A-G	112.0 A-D	48.0 C-F	9.3
Kardia	S	5.2 A-F	85.9 E-H	49.4 B-E	4.8
RWA 1758	S	5.8 A-E	106.2 B-E	47.3 DEF	7.6
Harriman	S	6.0 A-D	123.7 AB	48.3 B-F	7.8
2Ab09-X06F058HL-31	S	6.7 ABC	83.5 E-H	52.6 A	6.9
Oreana	S	6.9 AB	91.1 D-G	46.3 F	17.5
Julie	S	7.6 A	80.2 FGH	51.1 AB	3.3
<i>P</i> ($\alpha=0.05$)		0.0152	<.0001	0.0025	

Table F. Screening Six-Rowed Barley Varieties for FHB

Variety	Rating	FHB Index (%)	Yield (bu/A)	Test Weight (lb/bu)	DON (ppm)
Chevron	R	0.3 C	69.3 FG	46.3 AB	0.9
Quest	R	0.6 C	92.9 EF	46.1 ABC	7.0
Lacey	MR	1.1 C	113.2 A-E	47.0 A	8.9
Stander	MR	1.5 C	120.7 ABC	48.1 A	10.3
Celebration	MR	1.9 C	94.1 C-E	48.8 A	7.0
01Ab9663	MS	2.9 C	123.4 AB	46.4 A	18.3
Tradition	MS	3.4 BC	127.4 A	46.4 A	11.3
UTSB10905-72	MS	5.3 BC	119.8 A-D	40.5 D	16.8
UTSB10902-91	S	6.9 BC	107.7 A-E	41.6 BCD	11.6
Millennium	S	7.4 BC	100.2 B-E	39.8 D	47.1
Goldeneye	S	8.3 BC	93.8 DEF	40.5 D	35.1
Herald	S	8.5 BC	88.7 EF	41.5 CD	14.8
PI 383933	VS	16.0 B	10.9 I	28.0 E	20.5
YU510-559	VS	36.2 A	41.2 H	28.9 E	79.4
YU510-510	VS	45.8 A	58.1 GH	32.5 E	92.2
<i>P</i> ($\alpha=0.05$)		<.0001	<.0001	<.0001	

Addendum 8. Summary of spring wheat tolerance and resistance traits to *Heterodera avenae* (Cereal Cyst Nematode, CCN) for data grouped over two years.

Market Class and Cultivar	White Females/Plant ^v	Resistance Rating ^w	Yield Increase ^x (%)	Tolerance Rating ^y	MR + MT ^z
<u>Soft white</u>					
LCS Star	2.6	R	15.5	MI	
LCS Iron	16.1	S	24.1	MI	
Alpowa	8.9	MS	7.1	T	
Alturas	25	S	16.1	MI	
Babe	15.7	S	20.4	MI	
Cataldo	5.2	MR	39.1	I	
Penawawa	21.7	S	17	MI	
UI Petit	19.7	S	17.7	MI	
UI Stone	11.1	MS	18.7	MI	
Seahawk	26.6	VS	17.2	MI	
WB6121	20.5	S	11.6	MT	
WB6430	28.9	VS	14.5	MT	
<u>Hard red and hard white</u>					
Alzada	21.4	S	12.5	MT	
Blanca Grande (W)	20.8	S	10.4	MT	
Bullseye	24.2	S	16.6	MI	
WB9576	7.8	MS	5.8	T	
Cabernet	15.2	S	21.7	MI	
Choteau	11.9	MS	18.3	MI	
Dayn (W)	7.5	MS	14.3	MT	
Glee	12.4	S	16.9	MI	
UI Platinum	8.9	MS	20.7	MI	
Jefferson	7.7	MS	38.7	I	
Kelse	13	S	18.3	MI	
Klasic (W)	4.4	MR	15	MT	X
Snow Crest (W)	26	VS	23.7	MI	
SY Basalt	24.7	S	23.8	MI	
UI Winchester	19.3	S	19.7	MI	
Volt	31.2	VS	35.4	I	
WB-Rockland	1.5	R	14.5	MT	X
WB9229	10.4	MS	26.6	MI	
WB-Idamax (W)	16.2	S	22.4	MI	
WB-Paloma (W)	26.2	VS	25.8	MI	
Westbred 936	60.8	VS	41.9	I	

^v Number of *H. avenae* white females produced/plant for the control (no-nematicide) treatment.

^w Cultivars were rated as very resistant (VR; ≤ 1 swollen female/plant), resistant (R; 1.1 to 3), moderately resistant (MR; 3.1 to 6), moderately susceptible (MS; 6.1 to 12), susceptible (S; 12.1 to 25), or very susceptible (VS; >25).

^x Percentage increase in grain yield due to application of nematicide.

^y Tolerance ratings were very tolerant (VT; $<5\%$ yield response to nematicide), tolerant (T; 5 to 10%), moderately tolerant (MT; 10 to 15%), moderately intolerant (MI; 15 to 30%), intolerant (I; 30 to 50%), or very intolerant (VI; $>50\%$).

^z Cultivars that were neither resistant nor tolerant but which met a balanced criteria of being at least both moderately resistant ($\leq 6\%$ swollen females/plant) and moderately tolerant ($\leq 15\%$ yield increase with nematicide).

(W) = White

Addendum 9. Spring barley tolerance and resistance to *Heterodera avenae* (Cereal Cyst Nematode, CCN) ; data are means of trials conducted during two successive years.

Market Class and Cultivar	White Females ^v	Resistance Rating ^w	Yield Increase ^x	Tolerance Rating ^y	MR + MT ^z
<u>2-row feed barley</u>					
Julie	6.2	MS	1.5	VT	
RWA 1758	6.3	MS	4.7	VT	
Tetonia	13.1	S	4.6	VT	
Vespa	10.1	MS	3	VT	
Baronesse	6.2	MS	8.7	T	
Champion	5.9	MR	7.2	T	X
Lenetah	2.6	R	9.8	T	X
Xena	3.4	MR	5.4	T	X
CDC McGwire	8.6	MS	11.8	MT	
Idagold II	4.5	MR	10.6	MT	X
Spaulding	14.5	S	12.1	MT	
Transit	4.5	MR	10.5	MT	X
CDC Fibar (hull-less)	4.4	MR	18.2	MI	
Clearwater	7.3	MS	23.1	MI	
<u>2-row malt barley</u>					
ABI Balster	12.2	S	1.5	VT	
Copeland	19.4	S	4.4	VT	
Merit	15.3	S	3.8	VT	
Merem	11.8	MS	5.6	T	
Merit 57	26.4	VS	6.5	T	
Overture	17.1	S	9.1	T	
Pinnacle	19.1	S	6.9	T	
Genie	33.6	VS	10.7	MT	
Harrington	20.8	S	10.3	MT	
Meredith	13.8	S	13.6	MT	
ABI Voyager	38.6	VS	19	MI	
Conrad	9.8	MS	16.8	MI	
Hockett	24.1	S	16.6	MI	
Metcalf	16.5	S	16.8	MI	
Odyssey	0.9	VR	15.5	MI	
<u>6-row feed barley</u>					
Millenium	5	MR	2.6	VT	X
Herald	10.5	MS	5.6	T	
Goldeneye	5.5	MR	13.8	MT	X
Steptoe	5.3	MR	17.2	MI	
<u>6-row malt barley</u>					
Menan	7.8	MS	0.8	VT	
Quest	6.4	MS	3	VT	
Legacy	3.8	MR	27.2	MI	
Morex	10.2	MS	17.6	MI	
Tradition	5.6	MR	20.8	MI	
Celebration	6.4	MS	30.5	I	

^v Number of *H. avenae* white females produced/plant for the control (no-nematicide) treatment.

^w Cultivars were rated as very resistant (VR; ≤ 1 swollen female/plant), resistant (R; 1.1 to 3), moderately resistant (MR; 3.1 to 6), moderately susceptible (MS; 6.1 to 12), susceptible (S; 12.1 to 25), or very susceptible (VS; >25).

^x Percentage increase in grain yield due to application of nematicide.

^y Tolerance ratings were very tolerant (VT; $<5\%$ yield response to nematicide), tolerant (T; 5 to 10%), moderately tolerant (MT; 10 to 15%), moderately intolerant (MI; 15 to 30%), intolerant (I; 30 to 50%), or very intolerant (VI; $>50\%$).

^z Cultivars that were neither resistant nor tolerant but which met a balanced criteria of being at least both moderately resistant ($\leq 6\%$ swollen females/plant) and moderately tolerant ($\leq 15\%$ yield increase with nematicide).

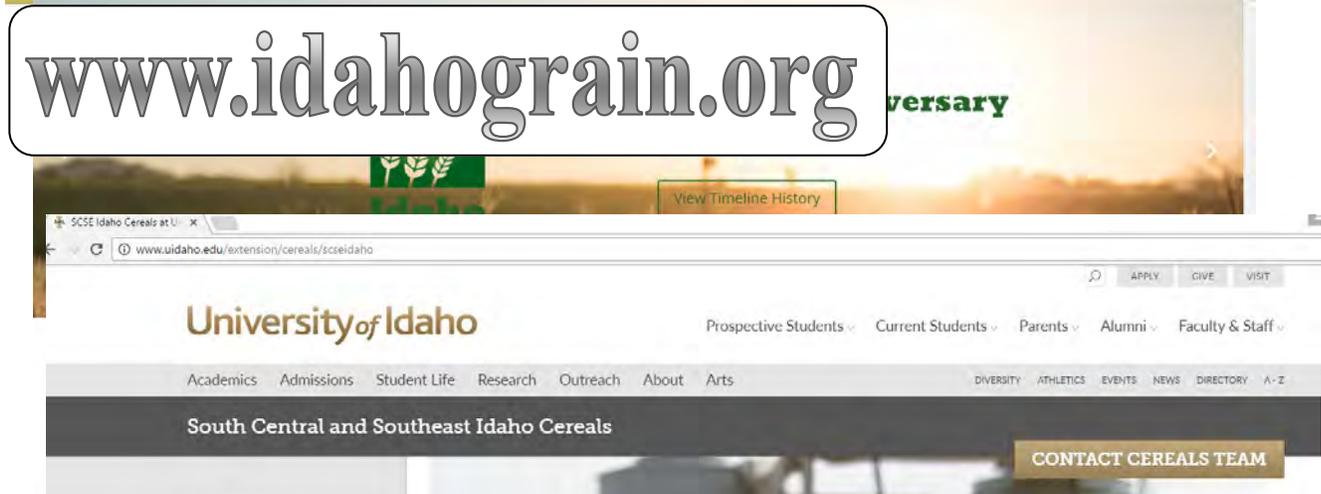
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