



2023 Klamath Falls Small Grain Variety Trial Report

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2022-2023 Small Grain Introduction

Grain production is vital to Oregon's Agriculture industry where over 700,000 acres of winter wheat have been planted over the last growing season. While the majority of wheat production is in the North-central and Northeast regions of the state, about 100,000 acres were produced in the Klamath Basin. Irrigated winter wheat typically yields about double that of non-irrigated winter wheat, and irrigated spring wheat typically yields almost three times non-irrigated wheat. The Klamath Basin Research & Extension Center (KBREC) in collaboration with the Oregon State University Cereal Variety Testing program and Oregon Wheat Commission have been conducting variety trials for several years with the focus on both spring and winter cereal varieties. Selecting for cereal grain quality is a circular and complex process that starts with plant breeders identifying genotypes with the desired qualities to the field performances that meet or exceed field traits such as yield, disease resistance and drought tolerance. Variety performance and subsequent selection by breeders, producers and buyers is therefore one of the most important decision in variety testing. Wheat variety selection decisions are usually made from multiple years of data as the performance of particular variety will vary between years due to different environmental conditions or climatic factors. For this reason, trials have been conducted on-site at KBREC on mineral soil and at Lower Lake on silty clay loam muck soil. A variety by environmental interaction plays a major role in grain performance. Listed at the bottom of the results tables are two important statistics that merit attention. Coefficient of variation (CV) and least significant difference (LSD). The LSD statistics tells us if varieties are truly different from each other. For varieties to be considered different from each other their averages (lb/bu) must differ by at least the LSD value. That is, as we say in statistics, we are confident (>90%) that treatment x (or variety) performed better than treatment y . The CV, on the other hand, is often expressed as a percentage and is a measure of the level of variation in the trial. Generally, 15% or less is considered acceptable and indicates good quality data. Higher CVs can be caused by several environment factors such as stand loss due to drought or bird predation and reduces the ability to detect true varietal differences. Data therefore with CVs over 15% should be used with caution. A stable (or high) yield and seed quality over a number of years with diverse weather and environmental conditions is an indication of its overall grain quality. Choosing the right wheat variety can therefore have a huge impact on profits. Small grain variety evaluation at KBREC has been on-going since 2012. Beginning in the present growing season, we included an organic spring wheat varietal trial. We are committed to, and will continue organic spring grain variety trials going forward.

Table 1: General information for all trials

	Winter Wheat	Spring Wheat (Conventional)	Spring Wheat (Organic)
Location	Wilson Rd, Merrill, OR	KBREC	Lower Klamath Lake
Soil type	Fordney loamy fine sand	Poe fine sandy loam	Silty clay loam
Row Spacing (in)	6	6	6
Plot Length (ft)	~18	~18	~18
Plot Width (ft)	5	5	5
Irrigation (inches)	17	17.8	4
Fertilizer	50 lbs N in addition to the 225 lbs/acre of total N that was already available	Hard red :300 lbs N/acre on wheat, Soft white: 200 lbs N/acre on wheat, barley: 125 lbs N/acre	Nature Safe® (11-1-0 & 7-12-0) organic poultry manure. Wheat plots 755, barley plots 470 lbs/acre
Weed Control	Curtail® at 8 oz/ac, WETCIT® at 6.4 oz/ac, Rhomene® at 29 oz/acre) as well as WeedMaster® (Dicamba + 2,4-D) at 4 oz/acre	Huskie (Pyrasulfotole and bromoxynil) at 2pt/acre (0.25 lb a.i./acre) and WeedMaster (Dicamba + 2,4-D) at 14/oz/acre	N/A

⇔ KBREC small grain trial results summary can be accessed online at:

<https://agsci.oregonstate.edu/kbrec/newsletter-publications/small-grains-publications>

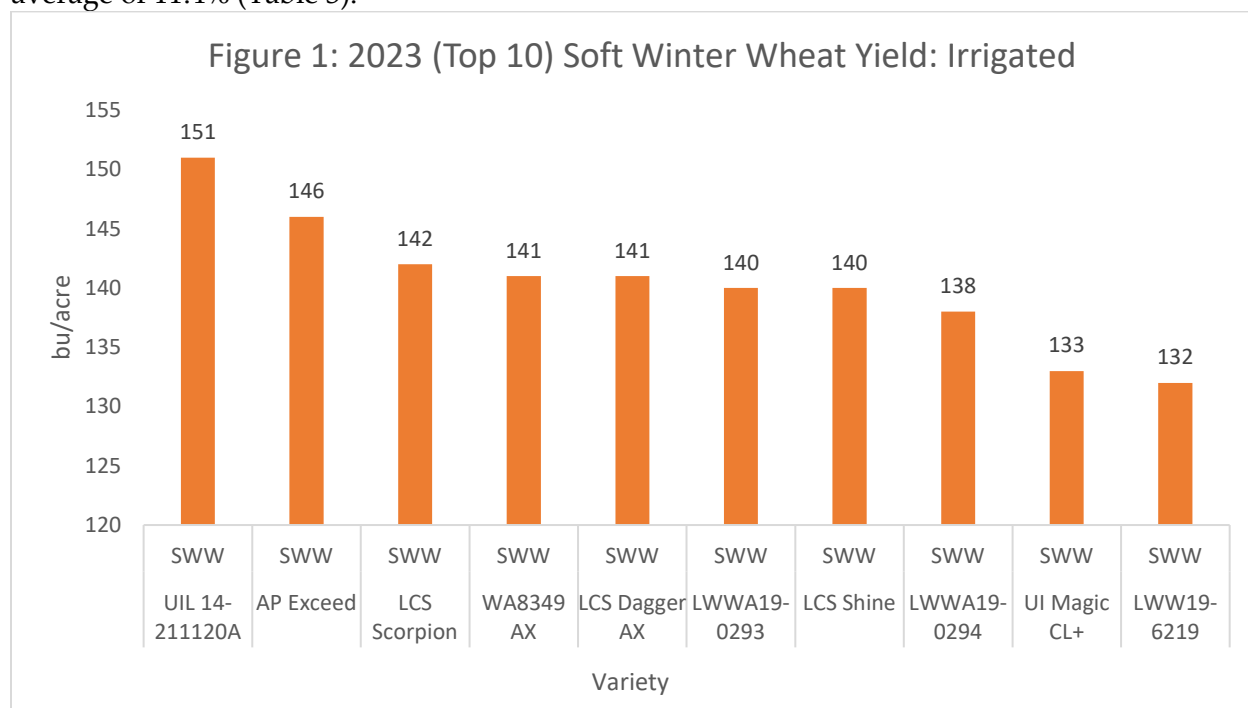
⇔ Oregon statewide small grain variety trials for multiple locations and years can be accessed

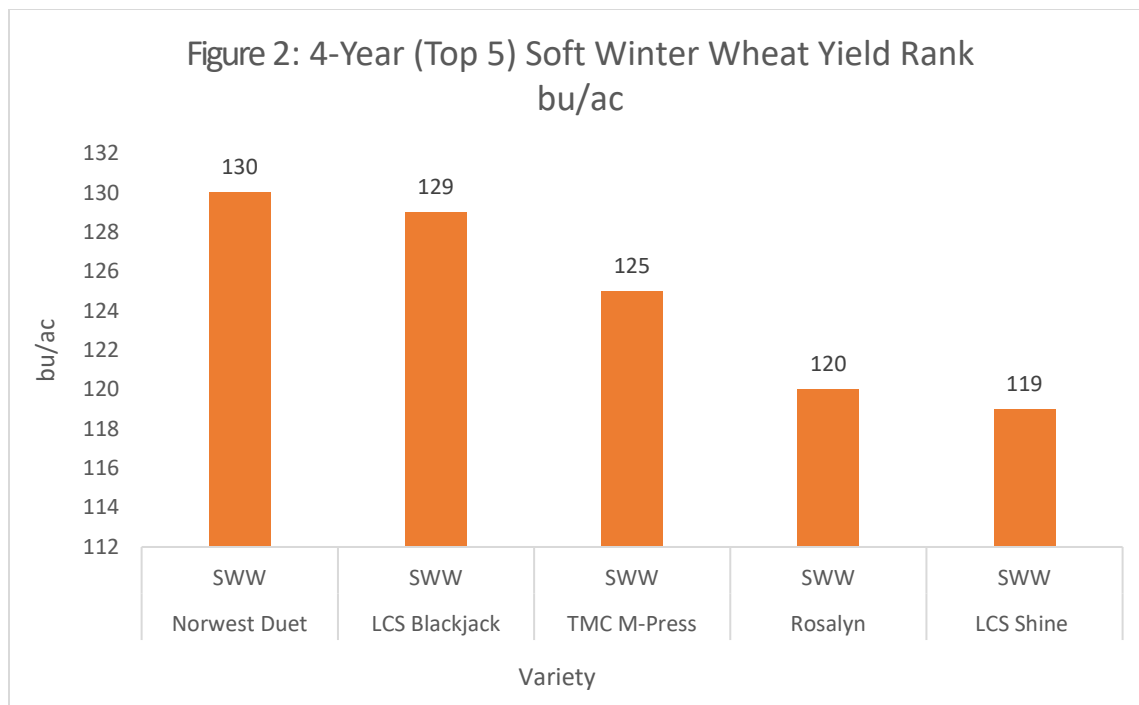
online at: <https://cropandsoil.oregonstate.edu/wheat/osu-wheat-variety-trials>

Winter wheat

Procedures and trial conditions: The winter wheat trial was planted October 25, 2022 using a Seed Research Equipment Solutions (SRES) cone drill. The full trial included 54 entries split into 50 Soft Winter Wheat (SWW) and 4 club classes. Plots were seeded at a depth of ¼ inch, measured 20 by 4.5 ft, and consisted of 9 rows spaced 6-inches apart which were later trimmed to an average length of approximately 18 ft before harvest. The trial was conducted at an off-site location on Fordney loamy fine sand soil following garlic. Trail design was a 3-replicate alpha-lattice design. Plots were fertilized with 50 lbs N in addition to the 225 lbs/acre of total N that was available based on soil test results. Weeds were controlled with the broadleaf herbicide Curtail® at 8 oz/ac, WETCIT® at 6.4 oz/ac, Rhomene® at 29 oz/acre) as well as WeedMaster® (Dicamba + 2,4-D) at 4 oz/acre on April 23 2023. Plots were harvested on August 23 2023. Irrigation was applied based on evapotranspiration rates and crop needs with solid-set sprinklers arranged in a 30-by 48-ft pattern. Winter grain received a total of 17 inches of surface irrigation.

Results and discussion: Compared to the most recent years trial results were good. All measured parameters (plant height, yield, test weight and protein percentage) showed significant differences (Tables 2 and 3). Yields averaged 123 bu/acre ranging from 151 to 105 bu/acre. Figure 1 shows the top 10 performing varieties and includes UIL 14-211120A, AP Exceed, LCD Scorpion AX, WA8349 AX and LCS Dagger AX as the top five. In terms of a 4-year average yield rank, figure 2 shows that Norwest Duet, LCS blackjack, Rosalyn, and LSC shine were the top performing varieties. The protein content ranged from 9.8 to 13.2 % with an average of 11.4% (Table 3).

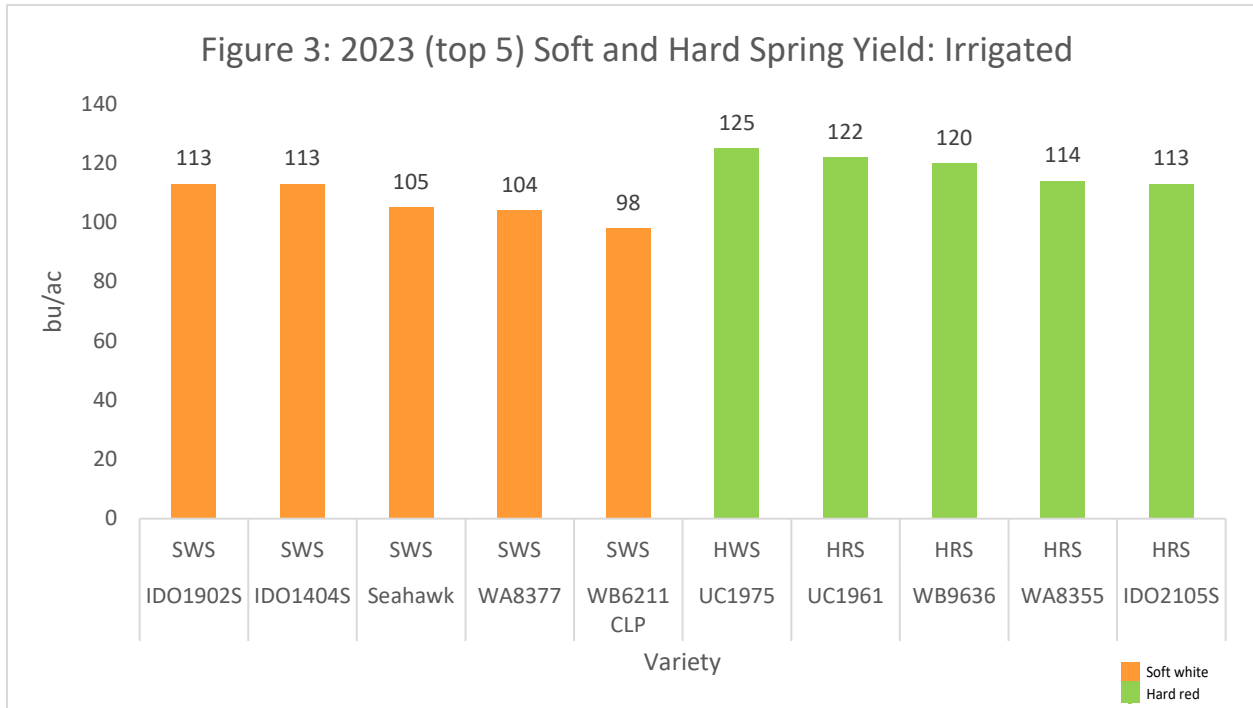




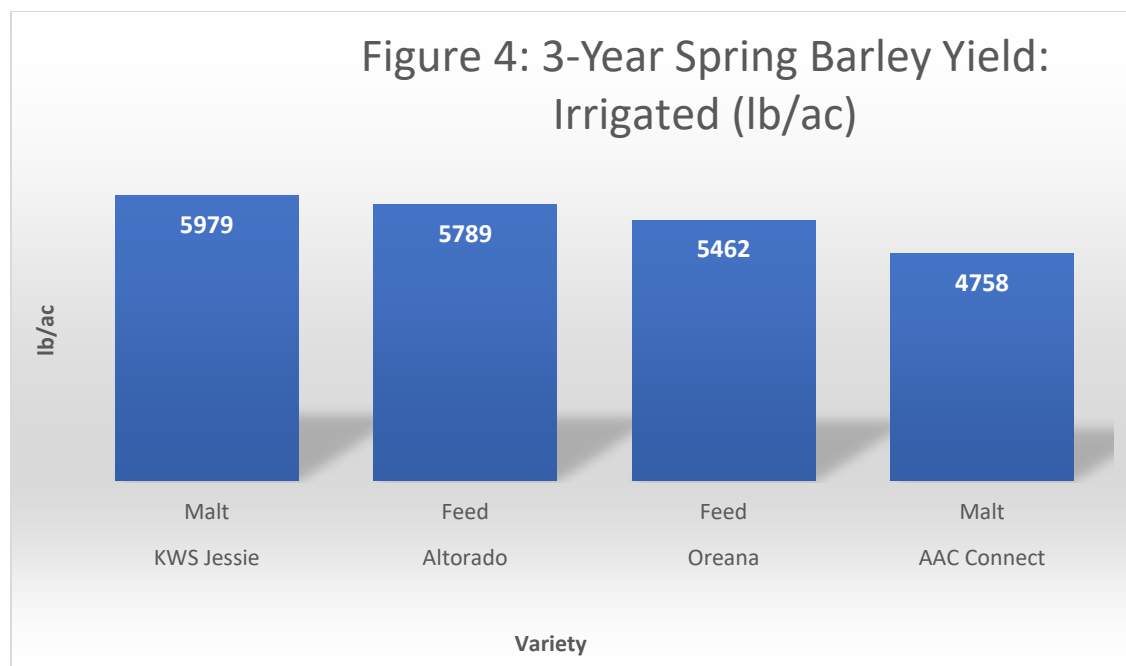
Spring grain (Conventional)

Procedures and trial conditions: The spring grain trial was planted at two separate locations. At KBREC, a conventionally managed trial evaluated varieties from three spring grain classes, hard white spring (HWS), hard red spring (HRS) and soft white spring (SWS). Additionally, 13, (9 malt and 4 feed) barley varieties were evaluated. A second trial with the same varieties evaluated on-site at KBREC was conducted at Lower Klamath Lake under organic agronomic practices. The trial at KBREC was conducted on Poe fine sandy loam soil following a period of fallow. The field was disked, spring tooth harrowed and rolled along with multiple chisel plow passes at different angles prior to planting. Plots were planted on June 2, 2023 where wheat and barley cultivars were drilled seeded to a depth of 0.75 inches using a Seed Research Equipment Solutions (SRES) cone drill. Soil moisture was good during seedbed preparation and germination and stand density were good. Average precipitation in the 2022-2023 growing season was above that of the 2021-2022 growing season (Figure 5). Plots were fertilized with 300 lbs N/acre hard red, 200 lbs N/acre soft white and 125 lbs N/acre for barley. The trial was arranged in a randomized complete block design with three replications. Plots measured 20 by 4.5 ft, and consisted of 9 rows spaced 6-inches apart which were later trimmed to an average length of approximately 18 ft before harvest. Plots were harvested on October 05, 2023 with a small-plot combine. Broadleaf herbicides mixtures of Huskie (Pyrasulfotole and bromoxynil) at 2pt/acre (0.25 lb a.i./acre) and WeedMaster (Dicamba + 2,4-D) at 14/oz/acre were applied to plots on July 3, 2023 with a conventional ground sprayer tank mix. Irrigation was applied based on evapotranspiration rates and crop needs with solid-set sprinklers arranged in a 30-by 48-ft pattern. Spring wheat grain received a total of 17.8 inches of surface irrigation.

Results and discussion: Similar to the winter wheat trial, yield performances were good (Table 4). Bird damage however, affected crop yields and was a major management problem during the trial. SWS yields ranged from 113 to 79 bu/acre with an average of 98 bu/acre. Top SWS performing entries were IDO1902S, IDO1404S, Seahawk, WA8321 and WB6211 CLP. The varieties with the highest 4-year yield average were Ryan, Tekoa, and UI Cookie. Not all varieties from the 2023 growing season were evaluated over four years. In this regard, the highest 3-year yield average where most varieties were evaluated in order of performance were, IDO1902S, Seahawk, Tekoa, Ryan and WA8321. Hard red yields ranged from 125 to 78 bu/acre with an average of 101 bu/acre (Table 6). Two HWS (UC1975 & UC Central White) varieties were among the top 10 yielding varieties. Other top ten yielding entries were UC1961, WB9636, WA8355, IDO2105S, WA8358 CL+, IDO2202CL2, WB9623 and Glee. Two year ranked data is only available for five entries where the top-yielding varieties were Hale, UI Gold (IDO1804S), AP Renegade, WB9668 and WB9303. The top 5 performing soft and hard spring varieties are shown in figure 3.



Barley yields averaged 7741 lb/acre and yielded between 8818 and 6480 lb/acre (Table 8). All but one (Altorado) of the top five yielding varieties were malting varieties. KWS Jessie, Altorado, and Oreana had the highest 3-year average which ranged from 5979 to 4758 lb/acre and averaging 5497 lb/acre (Table 8). Altorado was the only variety with a four-year yield rank of 6025 lb/acre.



Spring grain (Organic)

Procedures and trial conditions: Wet soil conditions delayed ground preparation and an earlier planting date at Lower Lake (LKL). Plots were planted ¼ inch deep with a SRES cone drill planter on May 25, 2023. Pre harvest, plots measured 20 ft by 4.5 ft wide (9 rows with 6 inches spacing) with a harvested area of roughly 18 ft by 4.5 ft wide. All plots received Nature Safe® (11-1-0 & 7-12-0) organic poultry manure. Wheat plots were fertilized at 755 lbs to the acre while barley plots received 470 lbs to the acre. Results from the trial indicate that with adequate irrigation (trial was effectively a deficient irrigation trial) yield potentials could have been even greater. Weeds infestation was generally significant, but also variable in some instances as not all plots were affected. Weeds infestation included Witchgrass (*Panicum capillare* L.), Kochia (*Kochia scoparia* L.), Lambsquarters (*Chenopodium album*), Pigweeds (*Amaranthus spp.*) and Prickly lettuce (*Lactuca serriola*).

Results and discussion: Problems encountered with irrigation set-up and implementation resulted in only three irrigation events after tillering for a total of only 4 inches of surface irrigation. The resulting drought stress along with weed infestation affected crop performance. Notwithstanding, yields could be considered respectable given the agronomic challenges. Soft spring yields ranged from 78 to 39 bu/acre with an average of 57 bu/acre (Table 10). Top SWS performing entries were WA832, WA8408, IDO1404S, WA8377 and AP Mondovi. Protein levels ranged from 11.5 to 9.4 % with a mean of 10.8% (Table 11). Hard red yields ranged from 56 to 16 bu/acre and averaged 31 bu/acre (Table 12). Top ranked hard spring varieties included IDO210S, IDO2202CL2, WB9303 UC Central Red and UI Gold (IDO1804S). Barley yields ranged from 3977 to 1761 lb/acre with an average of 2767 lb/acre (Table 14).

**Table 2: 2023 OREGON SOFT WINTER WHEAT YIELD TRIALS
Klamath Falls (Irrigated)**

Site Description: Trial was relatively uniform.
Multi-year averages include data from 2023, 2021, 2020, and 2019

Variety	Herbicide Resistance	Class	2023 Yield		2-Year		3-Year		4-Year		Best Estimate* Yield bu/ac
			Yield bu/ac	Rank	Yield bu/ac	Rank	Yield bu/ac	Rank	Yield bu/ac	Rank	
UIL 14-211120A		SWW	151	1							148 ± 28
AP Exceed		SWW	146	2	145	1					146 ± 20
LCS Scorpion AX	AX	SWW	142	3							139 ± 28
WA8349 AX	AX	SWW	141	4							138 ± 28
LCS Dagger AX	AX	SWW	141	5							138 ± 28
LWWA19-0293	AX	SWW	140	6							137 ± 28
LWWA19-0294	AX	SWW	138	8							134 ± 28
Norwest Duet		SWW	123	27	118	10	131	1	130	1	130 ± 14
LCS Kamiak (LWW17-5877)		SWW	131	11	128	2					130 ± 20
LWW19-6219		SWW	132	10							129 ± 28
LCS Blackjack		SWW	124	24	117	13	124	3	129	2	129 ± 14
AP Iliad		SWW	127	18	126	3					128 ± 20
WB1621		SWW	131	12							127 ± 28
LCS Hydra AX	AX	SWW	129	16							125 ± 28
TMC M-Press		SWW	111	48	115	15	122	4	125	3	125 ± 14
CPX69217		SWW	127	19							124 ± 28
LWW20-3371		SWW	126	20							123 ± 28
Nimbus (OR2130755)		SWW	131	13	120	7					123 ± 16
OR2160243		SWW	119	36	120	6					122 ± 20
Sockeye CL+ (WA8306 CL+)	CL+	SWW	124	22							121 ± 28
Rosalyn		SWW	114	44	111	18	121	5	120	4	120 ± 14
Piranha CL+ (WA8305 CL+)	CL+	SWW	123	25							120 ± 28
VI Voodoo CL+	CL+	SWW	123	26							120 ± 28
UI Magic CL+	CL+	SWW	133	9							120 ± 20
LCS Shine		SWW	140	7	124	4	125	2	119	5	119 ± 14
09PN118-02 CL2	CL+	SWW	122	28	118	11					119 ± 20
Nixon		SWW	109	50	106	21	115	6	119	6	119 ± 14
LCS Kraken AX	AX	SWW	122	30							118 ± 28
WB1720		SWW	121	31							118 ± 28
Norwest Tandem		SWW	118	37	117	12					118 ± 16
LCS Jefe		SWW	130	14	116	14					118 ± 20
ARS09500-17CBW		Club	121	32							118 ± 28
UIL 17-7706 CL+	CL+	SWW	120	33							117 ± 28
LCS Artdeco		SWW	128	17	123	5					117 ± 16
TMC M-Pire		SWW	120	34							116 ± 28
ORI2190027 CL+	CL+	SWW	119	35							116 ± 28
OR2170559		SWW	129	15	114	16					116 ± 20
Cameo		Club	116	39	114	17					116 ± 20
VI Presto CL+	CL+	SWW	116	38							113 ± 28
WA8345 AX	AX	SWW	115	40							112 ± 28
OR2200083 CL+	CL+	SWW	115	41							112 ± 28
WA8348 AX	AX	SWW	115	43							112 ± 28
OR2160264		SWW	122	29	110	19					112 ± 20
OR2180377		SWW	113	46							110 ± 28
OR5180071		Club	106	52	108	20					109 ± 20
SY Assure		SWW	124	23	119	9					109 ± 16
VI Shock		SWW	112	47							109 ± 28
LCS Drive		SWW	126	21	120	8					108 ± 16
WB1922		SWW	110	49							107 ± 28
Appleby CL+	CL+	SWW	114	45							106 ± 20
WA8346 AX	AX	SWW	108	51							105 ± 28
Stephens		SWW	115	42							103 ± 16
ORI2190025 CL+	CL+	SWW	106	53							103 ± 28
OR5180072		Club	105	54							102 ± 28
		Average	123		119		123		124		120
		LSD (0.05)	13								
		CV (%)	7.8								

*Best linear unbiased estimators (BLUEs) are best estimators of variety performance relative to other varieties, based on up to four years of data.

**Table 3: 2023 OREGON SOFT WINTER WHEAT YIELD TRIALS Klamath Falls
(Irrigated)**

Site Description: Trial was relatively uniform.

Variety	Class	Quality*	Height in	Test Weight lbs/bu	Protein %
UIL 14-211120A	SWW		34.2	57.9	11.6
AP Exceed	SWW	MD	33.3	60.6	10.0
LCS Scorpion AX	SWW		34.1	58.2	10.4
WA8349 AX	SWW		35.9	60.4	11.5
LCS Dagger AX	SWW		30.7	62.8	11.3
LWWA19-0293	SWW		29.7	63.2	10.3
LWWA19-0294	SWW		31.2	62.6	10.3
Norwest Duet	SWW	D	38.3	57.4	11.4
LCS Kamiak (LWW17-5877)	SWW		33.0	60.3	10.9
LWW19-6219	SWW		32.2	59.7	10.8
LCS Blackjack	SWW	D	32.4	55.9	11.5
AP Iliad	SWW	A	31.2	57.0	12.0
WB1621	SWW		33.5	60.6	11.6
LCS Hydra AX	SWW		34.8	60.4	10.2
TMC M-Press	SWW	D	33.5	56.4	11.2
CPX69217	SWW		31.7	58.2	11.5
LWW20-3371	SWW		25.5	60.9	11.3
Nimbus (OR2130755)	SWW	MD	34.8	58.7	11.0
OR2160243	SWW		32.4	55.6	12.1
Sockeye CL+ (WA8306 CL+)	SWW	MD	37.9	56.5	10.7
Rosalyn	SWW	A	33.7	55.1	11.1
Piranha CL+ (WA8305 CL+)	SWW	D	38.6	58.6	10.4
VI Voodoo CL+	SWW	D	30.6	57.8	10.7
UI Magic CL+	SWW	D	32.4	60.2	11.2
LCS Shine	SWW	MD	29.0	59.1	10.4
09PN118-02 CL2	SWW		34.8	55.8	11.6
Nixon	SWW	MD	35.1	55.4	11.2
LCS Kraken AX	SWW		37.8	58.9	10.9
WB1720	SWW		30.7	58.8	11.9
Norwest Tandem	SWW	A	28.4	57.1	11.7
LCS Jefe	SWW	D	34.7	58.9	10.9
ARS09500-17CBW	Club		36.9	58.7	12.3
UIL 17-7706 CL+	SWW		33.4	57.8	11.6
LCS Artdeco	SWW	A	30.9	59.4	9.8
TMC M-Pire	SWW		30.8	58.8	11.2
ORI2190027 CL+	SWW		31.6	60.2	11.0
OR2170559	SWW		32.2	58.4	12.3
Cameo	Club	MD	36.6	54.2	13.2
VI Presto CL+	SWW	D	35.1	58.7	11.8
WA8345 AX	SWW		36.7	57.7	11.3
OR2200083 CL+	SWW		33.4	56.3	11.7
WA8348 AX	SWW		37.4	57.8	12.3
OR2160264	SWW		31.8	58.2	11.9
OR2180377	SWW		33.4	54.4	11.1
OR5180071	Club		34.6	56.1	12.6
SY Assure	SWW	D	28.1	61.0	10.8
VI Shock	SWW		36.1	54.5	11.1
LCS Drive	SWW	D	28.3	54.5	11.7
WB1922	SWW		35.1	56.5	12.6
Appleby CL+	SWW	D	33.5	59.4	12.0
WA8346 AX	SWW		35.3	55.9	11.2
Stephens	SWW	D	34.0	55.3	11.5
ORI2190025 CL+	SWW		31.0	54.5	13.0
OR5180072	Club		34.8	54.7	12.4
Average			33.3	58.0	11.4
LSD (0.05)			1.6	1.9	1.0
CV (%)			3.5	2.2	6.1

*Quality ratings assigned by the USDA Western Wheat Quality Laboratory.

Quality Ratings: MD = Most Desirable; D = Desirable; A = Acceptable; LD = Least Desirable; UCS = Unacceptable Except Customer-Specific Uses



Table 4: 2023 OREGON SOFT SPRING WHEAT YIELD TRIALS Klamath Falls (Irrigated)



Site Description: Trial was relatively uniform.

The third replicate of this trial was dropped due to bird damage.

Variety	Herbicide Resistance	Class	2023 Yield		2-Year		3-Year		4-Year		Best Estimate* Yield bu/ac
			Yield bu/ac	Rank	Yield bu/ac	Rank	Yield bu/ac	Rank	Yield bu/ac	Rank	
IDO1902S		SWS	113	1	98	1	89	1			92 ± 10
IDO1404S		SWS	113	2	98	2					90 ± 10
Seahawk		SWS	105	3	90	3	87	2			90 ± 10
WA8377		SWS	104	4	88	5					84 ± 12
Ryan		SWS	96	7	85	6	78	4	83	1	83 ± 9
Tekoa		SWS	94	8	89	4	82	3	82	2	82 ± 9
WA8408		SWS	96	6							81 ± 18
WA8321		SWS	94	9	85	7	76	5			79 ± 10
AP Mondovi CL2	CL+	SWS	94	10							79 ± 18
WB6211 CLP	CL+	SWS	98	5	84	8	74	6			77 ± 10
UI Cookie		SWS	79	12	80	9	73	7	75	3	75 ± 9
Roger		Club	82	11	78	10	67	8			70 ± 10
		Average	98		88		78		80		82
		LSD (0.05)	14								
		CV (%)	10.4								

*Best linear unbiased estimators (BLUEs) are best estimators of variety performance relative to other varieties, based on up to four years of data.



Table 5: 2023 OREGON SOFT SPRING WHEAT YIELD TRIALS Klamath Falls (Irrigated)



Site Description: Trial was relatively uniform.

Variety	Class	Quality*	Height in	Test Weight lbs/bu	Protein %
IDO1902S	SWS		32.8	62.8	12.8
IDO1404S	SWS		33.0	60.8	13.2
Seahawk	SWS	MD	32.3	62.1	13.6
WA8377	SWS		32.0	62.0	13.6
Ryan	SWS	MD	33.0	60.0	14.0
Tekoa	SWS	MD	33.0	61.1	13.6
WA8408	SWS		33.8	61.2	13.4
WA8321	SWS		32.8	60.2	13.0
AP Mondovi CL2	SWS	MD	36.5	59.7	14.7
WB6211 CLP	SWS		34.0	59.1	13.9
UI Cookie	SWS	MD	32.0	58.9	14.0
Roger	Club	MD	31.0	60.4	13.0
	Average		33.0	60.7	13.6
	LSD (0.05)		2.2	0.6	0.6
	CV (%)		4.7	0.6	3.0

*Quality ratings assigned by the USDA Western Wheat Quality Laboratory.

Quality Ratings: MD = Most Desirable; D = Desirable; A = Acceptable; LD = Least Desirable; UCS = Unacceptable Except Customer-Specific Uses



**Table 6: 2023 OREGON HARD SPRING WHEAT
YIELD TRIALS Klamath Falls (Irrigated)**



Site Description: Trial was relatively uniform.

The third replicate of this trial was dropped due to bird damage. 2-year averages include data from 2023 and 2020.

Variety	Herbicide Resistance	Class	2023 Yield		2-Year		3-Year		4-Year		Best Estimate* Yield bu/ac
			Yield bu/ac	Rank	Yield bu/ac	Rank	Yield bu/ac	Rank	Yield bu/ac	Rank	
UC1975		HWS	125	1							120 ± 13
UC1961		HRS	122	2							117 ± 13
WB9636		HRS	120	3							115 ± 13
WA8355		HRS	114	4							109 ± 13
IDO2105S		HRS	113	5							108 ± 13
WA8358 CL+	CL+	HRS	111	6							106 ± 13
IDO2202CL2	CL+	HRS	108	7							104 ± 13
WB9623		HRS	108	8							103 ± 13
UC-Central White (UC1932)		HWS	108	9							103 ± 13
Glee		HRS	107	10							102 ± 13
Lanning		HRS	106	11							101 ± 13
Hale		HRS	104	12	94	1					94 ± 9
WA8387 CL+	CL+	HRS	98	13							93 ± 13
UI Gold (IDO1804S)		HWS	92	16	92	2					92 ± 9
IDO2002S		HWS	94	14							89 ± 13
IDO2104HF		HWS	94	15							89 ± 13
Net CL+	CL+	HRS	91	17							86 ± 13
AP Renegade		HRS	87	20	85	3					85 ± 9
WB9668		HRS	88	18	81	4					81 ± 9
Kelse		HRS	86	21							81 ± 13
WB9303		HRS	88	19	79	5					79 ± 9
UC Central Red		HRS	84	22							79 ± 13
WB9662		HRS	78	23							73 ± 13
		Average	101		86						96
		LSD (0.05)	17								
		CV (%)	12.0								

*Best linear unbiased estimators (BLUEs) are best estimators of variety performance relative to other varieties, based on up to four years of data.



**Table 7:2023 OREGON HARD SPRING WHEAT
YIELD TRIALS Klamath Falls (Irrigated)**



Site Description: Trial was relatively uniform.

Variety	Class	Quality*	Height in	Test Weight lbs/bu	Protein %
UC1975	HWS		31.8	61.6	14.4
UC1961	HRS		27.8	59.2	15.1
WB9636	HRS		30.5	62.8	15.7
WA8355	HRS		33.8	62.8	15.6
IDO2105S	HRS		37.0	62.3	15.4
WA8358 CL+	HRS		35.0	63.9	16.3
IDO2202CL2	HRS		35.0	61.6	15.5
WB9623	HRS		33.8	61.6	16.6
UC-Central White (UC1932)	HWS		29.8	61.8	15.4
Glee	HRS	MD	37.0	63.4	15.5
Lanning	HRS		35.5	61.8	16.5
Hale	HRS	MD	34.8	63.0	16.0
WA8387 CL+	HRS		34.8	64.2	15.3
UI Gold (IDO1804S)	HWS		32.3	61.9	15.3
IDO2002S	HWS		28.5	60.7	15.2
IDO2104HF	HWS		33.5	63.0	14.9
Net CL+	HRS	MD	33.8	63.9	15.8
AP Renegade	HRS	D	32.3	63.3	16.2
WB9668	HRS	D	28.8	62.9	17.2
Kelse	HRS	D	32.5	62.3	16.6
WB9303	HRS		34.0	62.6	17.1
UC Central Red	HRS		29.0	61.1	15.9
WB9662	HRS	LD	30.8	62.3	16.3
	Average		32.7	62.3	15.8
	LSD (0.05)		2.1	1.1	0.4
	CV (%)		4.6	1.3	1.9

*Quality ratings assigned by the USDA Western Wheat Quality Laboratory.

Quality Ratings: MD = Most Desirable; D = Desirable; A = Acceptable; LD = Least Desirable; UCS = Unacceptable Except Customer-Specific Uses

**Table 8: 2023 OREGON SPRING BARLEY YIELD TRIALS
Klamath Falls (Irrigated)**

Site Description: Trial was relatively uniform.

Data for several varieties was discarded due to bird damaged plots.

Variety	Class	2023 Yield		2-Year		3-Year		4-Year		Best Estimate* Yield lb/ac
		Yield lb/ac	Rank	Yield lb/ac	Rank	Yield lb/ac	Rank	Yield lb/ac	Rank	
KWS Fantex	Malt	8818	1							7051 ± 1243
KWS Thalix	Malt	8348	3	6639	1					6635 ± 869
DH160733	Malt	8056	5							6289 ± 1243
LGBU16-1320-A	Malt	8044	6							6277 ± 1243
KWS Jessie	Malt	7805	7	6347	2	5979	1			6179 ± 712
Altorado	Feed	8232	4	6072	3	5789	2	6025	1	6025 ± 606
LCS Diablo	Malt	8388	2							5904 ± 882
BC Leandra	Malt	7170	11	5849	4					5844 ± 869
Oreana	Feed	6524	12	5475	5	5462	3			5662 ± 712
S14230-41513	Malt	7184	10							5417 ± 1243
Lenetah	Feed	7478	8	5379	6					5247 ± 696
Survivor	Feed	7262	9	4855	8					5055 ± 696
AAC Connect	Malt	6480	13	4943	7	4758	4			4958 ± 712
	Average	7741		5695		5497		6025		5888
	LSD (0.05)	778								
	CV (%)	7.2								

*Best linear unbiased estimators (BLUEs) are best estimators of variety performance relative to other varieties, based on up to four years of data.

**Table 9: 2023 OREGON SPRING
BARLEY YIELD TRIALS Klamath Falls
(Irrigated)**

Site Description: Trial was relatively uniform.

Variety	Class	Quality*	Height in	Test Weight lbs/bu	Protein %
KWS Fantex	Malt		26.5	53.2	13.4
KWS Thalix	Malt		23.8	53.0	12.4
DH160733	Malt		28.5	53.5	13.3
LGBU16-1320-A	Malt		25.3	50.7	12.2
KWS Jessie	Malt		23.3	52.3	12.4
Altorado	Feed		29.5	53.5	13.2
LCS Diablo	Malt		29.3	52.2	12.8
BC Leandra	Malt		24.5	51.8	12.5
Oreana	Feed		27.3	53.3	13.3
S14230-41513	Malt		26.8	52.8	13.0
Lenetah	Feed		33.0	52.7	13.7
Survivor	Feed		31.5	54.1	13.8
AAC Connect	Malt		33.5	53.5	13.8
	Average		27.6	52.8	13.0
	LSD (0.05)		1.4	0.5	0.6
	CV (%)		3.6	0.6	3.2



**Table 10: 2023 OREGON SOFT SPRING WHEAT YIELD TRIALS
Klamath Falls Organic (Irrigated)**



Site Description: Trial was grown under Organic conditions.

Variety	Herbicide Resistance	Class	2023 Yield		2-Year		3-Year		4-Year		Best Estimate* Yield bu/ac
			Yield bu/ac	Rank	Yield bu/ac	Rank	Yield bu/ac	Rank	Yield bu/ac	Rank	
WA8321		SWS	78	1							
WA8408		SWS	75	2							
IDO1404S		SWS	70	3							
WA8377		SWS	64	4							
AP Mondovi CL2	CL+	SWS	56	5							
Tekoa		SWS	53	6							
Seahawk		SWS	53	7							
Roger		Club	53	8							
IDO1902S		SWS	52	9							
Ryan		SWS	49	10							
UI Cookie		SWS	47	11							
WB6211 CLP	CL+	SWS	39	12							
		Average	57								
		LSD (0.05)	7								
		CV (%)	8.6								

*Best linear unbiased estimators (BLUEs) are not calculated when only one year of data is available.



**Table 11: 2023 OREGON SOFT SPRING WHEAT YIELD TRIALS
Klamath Falls Organic (Irrigated)**



Site Description: Trial was grown under Organic conditions.

Variety	Class	Quality*	Height in	Test Weight lb/bu	Protein %
WA8321	SWS		29.1	63.2	9.4
WA8408	SWS		30.2	64.3	10.4
IDO1404S	SWS		27.7	64.0	10.0
WA8377	SWS		30.5	63.9	11.2
AP Mondovi CL2	SWS	MD	31.5	63.3	11.8
Tekoa	SWS	MD	29.8	64.1	10.8
Seahawk	SWS	MD	27.2	63.4	10.7
Roger	Club	MD	23.9	63.8	9.8
IDO1902S	SWS		27.7	64.6	11.1
Ryan	SWS	MD	26.7	62.7	11.4
UI Cookie	SWS	MD	26.3	62.8	11.5
WB6211 CLP	SWS		24.7	61.3	11.4
		Average	27.9	63.4	10.8
		LSD (0.05)	2.4	0.5	0.3
		CV (%)	6.1	0.6	2.1

*Quality ratings assigned by the USDA Western Wheat Quality Laboratory.

Quality Ratings: MD = Most Desirable; D = Desirable; A = Acceptable; LD = Least Desirable; UCS = Unacceptable Except Customer-Specific Uses



**Table 12: 2023 OREGON HARD SPRING WHEAT YIELD TRIALS
Klamath Falls Organic (Irrigated)**



Site Description: Trial was grown under Organic conditions.

Variability was relatively high for this trial.

Variety	Herbicide Resistance	Class	2023 Yield		2-Year		3-Year		4-Year		Best Estimate* Yield bu/ac
			Yield bu/ac	Rank	Yield bu/ac	Rank	Yield bu/ac	Rank	Yield bu/ac	Rank	
IDO2105S		HRS	56	1							
IDO2202CL2	CL+	HRS	50	2							
WB9303		HRS	42	3							
UC Central Red		HRS	41	4							
UI Gold (IDO1804S)		HWS	40	5							
WA8358 CL+	CL+	HRS	37	6							
Lanning		HRS	37	7							
UC1975		HWS	36	8							
WB9662		HRS	34	9							
IDO2002S		HWS	34	10							
WB9636		HRS	33	11							
Net CL+	CL+	HRS	32	12							
WA8387 CL+	CL+	HRS	29	13							
WB9668		HRS	29	14							
AP Renegade		HRS	28	15							
Glee		HRS	27	16							
UC-Central White (UC1932)		HWS	24	17							
IDO2104HF		HWS	23	18							
UC1961		HRS	23	19							
WB9623		HRS	23	20							
Kelse		HRS	23	21							
WA8355		HRS	17	22							
Hale		HRS	16	23							
		Average	31								
		LSD (0.05)	8								
		CV (%)	18.6								

*Best linear unbiased estimators (BLUEs) are only calculated when more than one year of data is available.



**Table 13: 2023 OREGON HARD SPRING WHEAT YIELD TRIALS
Klamath Falls Organic (Irrigated)**



Site Description: Trial was grown under Organic conditions.

Variety	Class	Quality*	Height in	Test Weight lb/bu	Protein %
IDO2105S	HRS		26.8	63.9	12.4
IDO2202CL2	HRS		26.6	63.8	12.2
WB9303	HRS		24.7	63.8	14.5
UC Central Red	HRS		23.7	62.8	13.2
UI Gold (IDO1804S)	HWS		26.7	63.3	12.3
WA8358 CL+	HRS		27.5	65.1	13.8
Lanning	HRS		25.0	62.7	13.8
UC1975	HWS		20.9	61.2	12.2
WB9662	HRS	LD	23.9	63.3	13.4
IDO2002S	HWS		23.7	63.1	12.6
WB9636	HRS		22.2	62.4	13.8
Net CL+	HRS	MD	24.7	65.2	12.9
WA8387 CL+	HRS		25.0	65.0	13.0
WB9668	HRS	D	20.9	62.2	14.7
AP Renegade	HRS	D	24.5	63.3	13.7
Glee	HRS	MD	23.1	64.9	13.7
UC-Central White (UC1932)	HWS		19.6	61.8	12.8
IDO2104HF	HWS		23.5	63.8	12.5
UC1961	HRS		20.3	58.6	13.5
WB9623	HRS		25.4	64.1	13.6
Kelse	HRS	D	24.5	63.3	14.0
WA8355	HRS		24.5	62.7	13.0
Hale	HRS	MD	21.5	63.0	14.0
	Average		23.9	63.2	13.3
	LSD (0.05)		2.6	0.5	0.3
	CV (%)		7.7	0.6	1.9

*Quality ratings assigned by the USDA Western Wheat Quality Laboratory.

Quality Ratings: MD = Most Desirable; D = Desirable; A = Acceptable; LD = Least Desirable; UCS = Unacceptable Except Customer-Specific Uses



**Table 14: 2023 OREGON SPRING BARLEY YIELD TRIALS
Klamath Falls Organic (Irrigated)**



Site Description: Trial was grown under Organic conditions.

Variety	Class	2023 Yield		2-Year		3-Year		4-Year		Best Estimate* Yield lb/ac
		Yield lb/ac	Rank	Yield lb/ac	Rank	Yield lb/ac	Rank	Yield lb/ac	Rank	
Carleton	Feed	3977	1							
YU518-415	Feed	3516	2							
AAC Connect	Malt	3393	3							
BC Leandra	Malt	3355	4							
Altorado	Feed	3206	5							
Oreana	Feed	3043	6							
DH160733	Malt	2992	7							
LCS Odyssey	Malt	2959	8							
KWS Jessie	Malt	2903	9							
KWS Thalix	Malt	2678	10							
DH160754	Malt	2671	11							
Successor (DH190481)	Feed	2411	12							
Lenetah	Feed	2366	13							
LCS Diablo	Malt	2330	14							
S14230-41513	Malt	2214	15							
KWS Fantex	Malt	2168	16							
LGBU16-1320-A	Malt	1862	17							
Survivor	Feed	1761	18							
	Average	2767								
	LSD (0.05)	428								
	CV (%)	11.0								

*Best linear unbiased estimators (BLUEs) are not calculated when only one year of data is available.



**Table 15: 2023 OREGON SPRING BARLEY YIELD TRIALS
Klamath Falls Organic (Irrigated)**

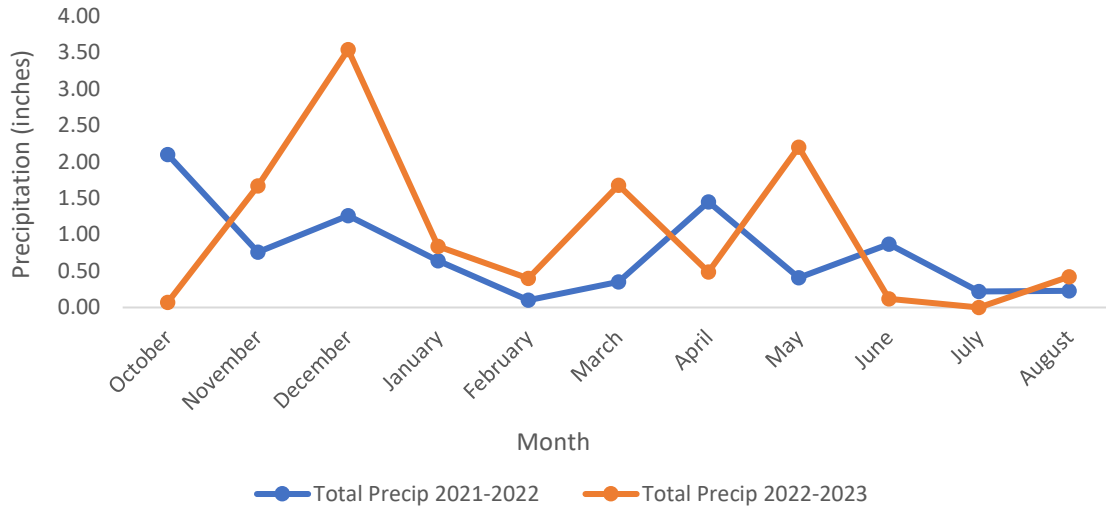


Site Description: Trial was grown under Organic conditions.

Variety	Class	Height in	Test Weight lbs/bu	Protein %
Carleton	Feed	23.9	52.8	11.2
YU518-415	Feed	25.8	53.7	11.4
AAC Connect	Malt	27.7	53.8	11.3
BC Leandra	Malt	20.7	52.2	11.3
Altorado	Feed	27.2	53.8	11.2
Oreana	Feed	23.9	53.6	11.4
DH160733	Malt	23.1	53.9	11.3
LCS Odyssey	Malt	25.2	53.1	11.4
KWS Jessie	Malt	21.5	52.5	11.2
KWS Thalís	Malt	21.6	52.4	11.3
DH160754	Malt	21.7	53.2	11.2
Successor (DH190481)	Feed	22.4	56.1	11.3
Lenetah	Feed	27.2	55.0	11.3
LCS Diablo	Malt	22.0	52.7	11.4
S14230-41513	Malt	24.9	52.6	11.4
KWS Fantex	Malt	20.4	54.5	11.4
LGBU16-1320-A	Malt	22.8	50.9	11.5
Survivor	Feed	27.1	55.2	11.4
	Average	23.9	53.5	11.3
	LSD (0.05)	2.3	1.2	0.1
	CV (%)	6.9	1.6	0.9

2021-2023 Weather Data

**Figure 5: Monthly (October - August) Total Precipitation
2021-2022 and 2022-2023**



**Figure 6: Average monthly (a) maximum, (b) minimum (c) and
mean temperature (October - August) 2021-2022 and 2022-2023**

