

Spring Wheat Performance in 2001

WSU Statewide Extension Uniform Variety Testing Program Trial Results*

Spring wheat acreage in Washington State totaled 640,000 acres in 2001 that accounted for 25.7 percent of the combined winter and spring wheat (2,490,000 acres) planted. ⁽¹⁾ Alpowa continued as the most popular spring wheat variety and was planted on 44.9 percent (287,400 acres) of all spring wheat acres. Three hard red common spring wheat varieties (WPB 926, Express and Scarlet) combined to account for nearly 25 percent of all spring wheat acreage. Hard white spring wheat witnessed an 83 percent reduction in planted acreage in 2001 (4,100 acres) compared to the previous year (24,400 acres).



Yield and Quality Results – Soft White Common/Club Spring (Table 1): Soft white common/club spring wheat yields from the 2001 WSU Statewide Extension Uniform Variety Testing Program nurseries averaged 14.2 percent less than historical 3-year average yields at 10 testing locations throughout eastern Washington. Unseasonably dry growing conditions coupled with frost during grain fill over Memorial Day weekend 2001 were the most significant contributors to reduced yields. Two locations (Bickleton, Ritzville (annual crop)) were not harvested due to severe drought conditions. Yields in higher precipitation areas were not as adversely affected as yields in lower precipitation areas.

Across all locations, average yields for soft white common spring wheat varieties were comparable. Alpowa, Challis, Wawawai and Zak were the highest yielding soft white common wheat varieties and average yields were not statistically different across all locations (Table 1). Acreage planted to Wawawai dropped 37 percent in 2001. ⁽¹⁾ This reduction was undoubtedly due to high dockage associated with difficulty in thrashing during harvest. Zak soft white common spring wheat is expected to replace Wawawai acres based on Hessian fly resistance, high quality and ease of thrashing at harvest. Two new lines from the WSU Spring Wheat Breeding Program, (K. Kidwell), which performed well in the 2001 trials were WA7905 (soft white common) and WA7902 (soft white club). WA7905 is currently being evaluated for quality and will be recommended for pre-release to the WSU Agricultural Research Center. WA7902 was approved for pre-release by the WSU Agriculture Research Center in February 2001 and should be available as registered seed to producers in spring 2003. WA7902, proposed name EDEN, has yields that have equaled or exceeded soft white common variety yields at many testing locations. Yields of WA7902 greatly exceed yields of CALORWA, the only commercially available soft white club currently available.

Test weight averages for all varieties across all locations were 60.2 pounds per bushel. Percent protein averaged 11.8%. Stress conditions caused by low soil moisture levels and high temperatures during grain contributed to high grain protein in 2001.

Yield and Quality Results – Hard Red and Hard White Spring (Table 2 and Table 3): Hard red and hard white common spring yields were more severely impacted by 2001 growing conditions averaging 19.3 percent lower yields than historical 3-year average yields at 10 testing locations. As with soft white common nurseries, two locations (Bickleton, Ritzville (annual crop)) were not harvested due to severe drought conditions and yields in higher precipitation areas were not as adversely affected as yields in lower precipitation areas.

Scarlet, Jefferson and Hank generally out yielded WPB926, the historical hard red common, at each testing location. Scarlet, adapted to low precipitation areas, was available for commercial production for the first time in 2001 and was planted on 44,400 acres. ⁽¹⁾ Scarlet had the highest average yield across 14 testing locations with 53.9 bushels per acre. The WSU Spring Wheat Breeding Program as a replacement is currently evaluating WA7893 for Scarlet. In addition, WA7859 is undergoing extensive milling tests as part of a program conducted by the PNW Wheat Quality Council. Hard white spring wheat varieties continued a trend of exceeding hard red common yields for commercially available varieties by four to five bushels per acre. Lolo (Univ of Idaho), Winsome (Oregon State Univ) and ID377S (Univ of Idaho) had the highest averaged yields across all locations and were statistically greater. Test weight averages for all varieties across all locations were 60.0 pounds per bushel. Percent protein averaged 14.7 percent, 13.4 percent and 15.1 percent for hard red, hard white and durum varieties, respectively.

Summary tables for yield, test weight and percent protein are listed on the WSU Statewide Extension Uniform Cereal Variety Testing Program web page: <http://variety.wsu.edu>. Additional information can be obtained by contacting local WSU Cooperative Extension offices or WSU Cooperative Extension, Dept. of Crop and Soil Sciences (509)-335-2915 for hard copies.

Acknowledgements: The WSU Statewide Extension Uniform Cereal Variety Testing Program trials are made possible by the contribution of land and time from cooperators on whose farms the trials are located as well as cooperators at the WSU research units at Pullman and Lind. Partnerships with research scientists from both the public and private sectors are a key element in making this program successful. Funding was provided by: Washington Wheat Commission, WSU Cooperative Extension, WSU Agricultural Research Center, WSU Dept of Crop & Soil Sciences, Washington State Crop Improvement Association, and private companies that had varieties included in the trials.

⁽¹⁾ *USDA National Agricultural Statistics Service report, Washington Wheat Varieties 2001 Crop, July 13 2001*

* John W. Burns, et al., WSU Extension Agronomy Specialist, in collaboration with Kim K. Kidwell, et al., WSU Spring Wheat Breeder.

Table 1: GRAIN YIELD (Soft White Spring Wheat) summaries for entries in the 2001 WSU Statewide Extension Uniform Cereal Variety Testing Program Trials. PRELIMINARY DATA ⁽¹⁾

VARIETY NAME	LIND FALLOW	HORSE HEAVEN	LAMONT	WALLA WALLA	DAYTON	ST. JOHN	DUSTY	MAYVIEW	ALMIRA	FARMINGTON	REARDAN	FAIRFIELD	PULLMAN	ROYAL SLOPE (irrigated)	VARIETY MEAN
YIELD (BU/A) - high variety at each location underlined															
Soft White Common															
ML037,(C6-2)	Irrigated (Royal Slope) Nursery only													126	125.7
WA7890	24	21	29	28	<u>48</u>	45	<u>63</u>	<u>63</u>	63	70	85	83	93	124	<u>59.8</u>
WA7905	<u>25</u>	22	28	34	45	48	53	43	59	75	<u>89</u>	87	95	128	<u>59.4</u>
ALPOWA	20	20	30	34	40	48	62	53	64	74	80	84	86	132	<u>59.2</u>
WA7884	23	21	32	34	39	52	61	56	60	71	66	82	94	135	58.9
WA7887	21	22	<u>36</u>	36	44	<u>57</u>	45	62	62	69	77	78	95	120	58.7
WA7877	23	21	27	29	43	<u>57</u>	<u>63</u>	56	57	71	64	79	89	<u>138</u>	58.4
BZ698-31	21	21	29	<u>40</u>	45	46	49	<u>63</u>	65	73	78	79	90	112	57.9
ID526	20	21	30	33	44	42	54	56	54	<u>77</u>	76	82	<u>97</u>	116	57.3
CHALLIS	20	21	22	31	42	46	56	61	<u>69</u>	71	80	75	86	115	56.7
WAWAWAI	23	20	26	31	38	46	58	57	59	72	72	79	91	119	56.6
ZAK	21	21	28	35	39	44	53	54	57	65	75	78	90	133	56.6
WA7883	17	<u>23</u>	23	33	43	50	52	56	53	73	74	82	95	115	56.3
JUBILEE	17	21	28	33	41	44	55	59	57	67	72	75	85	110	54.6
EDWALL	19	19	24	34	43	52	46	48	64	72	72	76	84	105	54.0
FIELDER	18	21	23	28	39	55	47	60	59	72	71	75	78	109	54.0
WA7886	21	21	23	31	40	44	41	47	57	72	73	77	89	117	53.8
PENAWAWA	19	20	22	26	38	47	45	58	55	63	72	71	80	108	51.8
Soft White Club															
WA7902	22	22	24	38	44	52	51	58	57	69	83	<u>89</u>	91	114	58.1
WA7904	19	16	33	37	40	52	57	53	52	70	74	79	82	106	54.9
CALORWA	18	20	20	35	39	47	39	49	54	67	73	76	83	96	51.0
NURSERY STATS															
NURSERY MEAN	21	21	27	33	42	49	52	56	59	71	75	79	89	118	56.6
CV %	8.1	7.6	16.8	16.2	10.6	15.3	19.5	10.0	9.0	8.2	10.0	4.2	4.2	7.6	10.4
LSD @ .10 (bu/ac)	2.3	2.2	6.2	7.3	6.0	10.2	14.0	7.6	7.3	7.9	10.4	1.6	5.1	12.3	2.7

⁽¹⁾ J. Burns, WSU Extension Agronomist et al., WSU Extension Variety Testing Program in collaboration with K. Kidwell, WSU Spring Wheat Breeder et al., WSU Spring Wheat Breeding Program, Pullman, WA, 2001

Table 2: GRAIN YIELD (Hard Spring Wheat) summaries for entries in the 2001 WSU Statewide Extension Uniform Cereal Variety Testing Program Trials. PRELIMINARY DATA ⁽¹⁾

VARIETY NAME	HORSE HEAVEN	LIND FALLOW	LAMONT	WALLA WALLA	DAYTON	ST. JOHN	DUSTY	ALMIRA	MAYVIEW	REARDAN	FARMINGTON	FAIRFIELD	PULLMAN	ROYAL SLOPE (irrigated)	VARIETY MEAN
YIELD (BU/A) - high variety at each location underlined															
Hard Red Common															
EXPRESS	Irrigated (Royal Slope) Nursery only													87	87.4
PRONTO	Irrigated (Royal Slope) Nursery only													76	76.4
SCARLET	17	<u>21</u>	<u>27</u>	<u>35</u>	41	<u>51</u>	<u>60</u>	<u>56</u>	59	64	72	82	87	98	<u>53.9</u>
SEEDER HR	<u>23</u>	20	<u>27</u>	23	<u>50</u>	38	46	52	<u>69</u>	64	57	77	84	<u>112</u>	<u>53.0</u>
JEFFERSON	18	17	20	34	44	45	44	52	60	67	66	83	86	93	<u>52.0</u>
GENMILLS BR2306	20	19	22	34	44	38	55	52	34	<u>70</u>	68	<u>85</u>	83	96	51.5
WA7859	19	19	20	33	43	40	<u>60</u>	55	49	60	<u>75</u>	79	81	87	51.4
HANK	10	12	13	34	45	49	48	54	60	65	65	81	<u>89</u>	97	50.5
WA7875	19	19	18	30	45	44	48	51	55	60	66	76	84	89	50.1
WA7839	14	12	16	30	45	48	55	52	55	67	70	79	79	81	49.4
WA7893	18	15	22	31	40	49	43	48	46	67	66	80	83	82	49.3
TARA	11	12	14	32	43	46	52	54	49	67	72	84	88	72	49.0
WA7892	12	17	18	27	43	37	41	53	55	61	68	78	82	88	48.4
WA7860	15	17	21	30	40	44	48	<u>56</u>	37	69	65	77	81	78	48.4
WESTBRED 926	12	9	16	31	45	41	42	52	54	65	64	81	80	77	47.7
BZ9M99-1019	16	10	11	31	43	47	46	49	52	69	66	77	79	86	47.6
BUTTE 86	15	18	14	27	40	47	54	51	47	58	64	72	76	62	45.6
Hard White Common															
ID560	Irrigated (Royal Slope) Nursery only													115	114.5
LOLO	16	20	25	33	<u>50</u>	45	<u>72</u>	<u>65</u>	77	65	<u>71</u>	<u>89</u>	<u>92</u>	115	<u>58.3</u>
WINSOME	<u>20</u>	<u>21</u>	<u>31</u>	32	47	39	64	59	75	63	69	86	<u>92</u>	105	<u>57.3</u>
ID377S	18	20	28	30	45	41	63	62	<u>77</u>	65	70	80	87	113	<u>57.1</u>
WA7914	16	<u>20</u>	12	27	47	42	50	53	66	65	68	88	86	<u>127</u>	54.8
WA7901	14	20	18	31	42	47	47	47	58	66	64	83	88	106	52.1
455	14	15	18	28	44	34	61	54	63	58	69	84	83	93	51.4
WA7900	12	17	17	<u>35</u>	42	42	51	56	46	<u>69</u>	69	81	84	98	51.3
MACON	14	16	17	31	43	40	47	54	46	66	67	83	87	101	50.7
GENMILLS 40019	15	15	12	32	41	50	48	47	58	60	66	86	88	87	50.5
GENMILLS 40020	17	13	13	34	44	44	48	56	62	<u>69</u>	68	86	85	77	50.3
GENMILLS 40002	15	13	9	<u>35</u>	37	<u>51</u>	44	52	50	64	63	80	82	86	48.6
GENMILLS 40016	12	12	10	31	40	47	46	50	56	63	68	78	76	78	47.6
Spring Durum															
GENMILLS 90009	Irrigated (Royal Slope) Nursery only													70.2	70.2
UTOPIA	17	9	6	30	34	35	46	38	47	61	65	80	87	78	45.1
NURSERY STATS															
NURSERY MEAN	16	16	18	31	43	44	51	53	56	65	67	81	84	91	51.2
CV %	14.4	11.9	24.3	12.2	8.6	15.3	34.5	11.7	6.6	7.8	8.6	5.3	5.7	7.8	12.9
LSD @ .10 (bu/ac)	3.1	2.6	5.9	5.2	5.1	9.1	24.0	8.4	5.1	1.5	7.9	5.8	6.6	10.4	3.9

⁽¹⁾ J. Burns, WSU Extension Agronomist et al., WSU Extension Variety Testing Program in collaboration with K. Kidwell, WSU Spring Wheat Breeder et al., WSU Spring Wheat Breeding Program, Pullman, WA, 2001

Table 3: GRAIN PROTEIN PERCENT (Hard Spring Wheat) summaries for entries in the 2001 WSU Statewide Extension Uniform Cereal Variety Testing Program Trials. PRELIMINARY DATA ⁽¹⁾

VARIETY NAME	HORSE HEAVEN	LIND FALLOW	LAMONT	WALLA WALLA	DAYTON	ST. JOHN	DUSTY	ALMIRA	MAYVIEW	REARDAN	FARMINGTON	FAIRFIELD	PULLMAN	ROYAL SLOPE (irrigated)	VARIETY MEAN ⁽²⁾
PERCENT (%) GRAIN PROTEIN - high variety at each location underlined															
Hard Red Common															
EXPRESS	Irrigated (Royal Slope) Nursery only													15.9	15.9
PRONTO	Irrigated (Royal Slope) Nursery only													16.7	16.7
BZ9M99-1019	16.8	17.9	18.7	15.6	12.8	15.2	16.2	15.6	15.4	12.6	15.5	11.2	14.9	15.9	15.2
WESTBRED 926	17.1	17.9	18.4	15.3	12.8	16.5	16.3	15.0	14.4	12.7	15.2	11.2	13.9	16.1	15.1
WA7859	15.6	16.7	17.8	14.5	12.8	17.6	15.8	14.4	14.8	12.4	15.0	11.4	14.9	15.3	14.9
WA7839	17.1	17.2	18.4	15.8	12.1	15.2	15.7	14.7	14.4	12.8	14.3	11.2	13.6	15.5	14.7
WA7892	17.4	17.6	18.6	15.7	13.6	15.4	15.3	14.5	14.2	11.7	14.2	11.2	13.4	14.9	14.7
BUTTE 86	15.4	16.5	18.0	14.7	12.2	14.8	14.6	14.9	14.4	12.7	14.5	11.3	15.1	17.0	14.6
TARA	17.4	17.7	18.8	14.7	12.3	14.8	15.4	14.4	14.3	11.9	13.4	10.2	13.9	16.4	14.5
HANK	17.7	18.0	18.7	15.1	12.2	13.4	15.5	14.4	14.0	11.5	15.4	10.4	13.4	15.7	14.5
WA7875	15.3	16.7	17.3	14.6	11.7	15.1	15.3	14.3	14.1	12.4	14.6	11.4	14.0	15.8	14.4
SCARLET	15.7	16.8	17.7	14.5	12.7	14.0	15.3	14.2	13.7	12.3	14.0	10.9	13.8	15.3	14.3
JEFFERSON	15.8	17.0	17.7	14.9	12.5	15.2	14.6	14.8	14.0	11.9	14.5	10.1	13.6	14.8	14.3
WA7860	16.1	17.1	17.7	15.1	11.5	15.4	15.1	13.4	13.9	11.5	14.3	9.8	13.5	16.0	14.2
WA7893	16.4	17.2	17.5	14.9	12.3	14.2	15.2	14.3	14.2	11.9	14.2	10.3	13.2	14.9	14.2
GENMILLS BR2306	14.1	16.0	16.0	14.1	11.2	16.2	14.2	13.5	13.9	11.3	14.3	10.4	12.7	14.6	13.7
SEDEX HR	14.3	14.9	15.0	15.3	11.3	15.6	15.4	12.5	11.9	11.3	14.8	10.2	12.2	12.9	13.3
Hard White Common															
ID560	Irrigated (Royal Slope) Nursery only													12.6	12.6
GENMILLS 40002	16.2	16.7	17.6	14.6	11.5	14.3	15.6	14.1	13.2	12.0	14.4	9.9	13.4	15.0	14.1
GENMILLS 40016	16.0	16.1	17.3	13.9	11.4	13.5	15.1	13.7	14.0	12.2	13.3	11.1	13.6	15.2	13.9
GENMILLS 40020	15.0	16.1	16.5	14.2	11.6	14.6	14.6	13.2	12.8	11.9	13.5	11.0	13.2	15.7	13.7
GENMILLS 40019	15.9	15.7	16.5	14.7	12.5	13.0	14.9	14.7	13.4	11.8	13.8	10.2	12.9	13.7	13.7
455	15.7	15.7	16.1	14.0	12.3	15.6	14.5	13.4	13.2	12.2	13.3	10.8	12.6	13.3	13.7
ID377S	15.7	15.9	16.3	14.3	12.2	15.9	14.5	12.6	13.0	12.1	13.7	11.0	13.2	13.1	13.7
LOLO	15.8	15.2	16.2	13.8	12.3	14.9	14.1	12.6	13.0	12.0	13.3	10.1	12.8	13.1	13.4
MACON	15.6	15.7	15.8	14.0	11.1	15.1	14.0	12.6	12.4	11.1	13.7	9.8	12.2	13.8	13.2
WA7914	14.9	15.1	16.4	12.8	11.8	13.8	14.7	13.4	12.3	11.5	13.6	9.5	12.4	13.4	13.2
WA7901	16.0	15.0	16.1	14.0	11.3	14.2	14.1	12.9	12.4	11.4	13.3	9.7	12.5	13.3	13.2
WA7900	16.2	15.6	16.4	13.1	10.9	15.5	13.6	12.4	12.1	10.8	12.6	9.8	12.6	14.1	13.1
WINSOME	14.1	14.5	14.5	14.1	11.9	15.4	12.9	12.5	12.0	11.4	12.8	10.3	12.1	12.5	12.9
Spring Durum															
GENMILLS 90009	Irrigated (Royal Slope) Nursery only													16.2	16.2
UTOPIA	14.4	14.4	15.5	13.9	12.1	16.3	15.6	13.8	14.1	11.5	14.3	11.0	13.4	15.1	13.9
NURSERY STATS															
NURSERY MEAN	15.8	16.3	17.1	14.5	12.0	15.0	14.9	13.8	13.6	11.9	14.1	10.5	13.3	14.7	14.0
CV %	^{Note (2)}	1.0	1.6	4.4	3.9	10.9	5.4	2.9	2.2	5.7	5.1	6.0	4.0	2.5	4.9
LSD @ .10 (% protein)	^{Note (2)}	0.2	0.4	0.9	0.6	2.2	1.1	0.6	0.4	0.9	1.0	0.9	0.7	0.5	0.4

⁽¹⁾ J. Burns, WSU Extension Agronomist et al., WSU Extension Variety Testing Program in collaboration with K. Kidwell, WSU Spring Wheat Breeder et al., WSU Spring Wheat Breeding Program, Pullman, WA, 2001

^{Note (2)} Insufficient sample size for analysis