

Spring Small Grain (Barley, Wheat, and Oats) Variety Screening in the Klamath Basin

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Abstract As in the past, small grain variety trials were conducted by the Klamath Experiment Station (KES) during 2001 on mineral and muck soils. However, the mineral soil trials were moved to Dairy, Oregon to the U.S. Timberland's tree nursery and the muck soil trials received irrigation prior to seeding but did not receive in-season irrigation. At the mineral soil site, the Oregon State University (OSU) elite nurseries for soft white (SW), hard white (HW), and hard red (HR) wheat were evaluated. Also at this site, the Western Regional Trials for barley and wheat were conducted and the OSU Statewide Barley and Wheat Trials were evaluated. These Statewide Trials were also conducted at a site on Lower Klamath Lake (LKL) on muck soil. The LKL site also served as the site for the Western Regional Uniform Oat Trial and a screening site for non-replicated early generation material from the OSU barley breeding program. At both sites, yields tended to be lower than those noted in earlier years. The highlight for both sites was the yield potential shown by selected SW wheat lines, especially with no in-season irrigation at the LKL site.

Introduction

Grain production was changed in the 2001 growing season with limited water deliveries to the Klamath

Irrigation Project. As would be expected, the most adversely affected fields were those with mineral soils with low water holding capacities. Many of these fields had insufficient soil water to produce grain. Much of the planted small grain acreage was harvested as hay or used for pasture. With the assistance of the Natural Resource Conservation Service (NRCS), which provided cost sharing incentives, over 29,000 acres were seeded to small grains as cover crops to prevent wind erosion. Barley, wheat, and oats were all used in these plantings, but beardless varieties of barley and wheat were more prominent than in the past. Some of the muck soil cover-cropped fields were harvested for grain but most produced hay or were used for pasture.

In the project land serviced by the Tulelake Irrigation District, considerable grain acreage was planted that did receive supplemental irrigation from private and state-funded irrigation wells. Many of the fields that had grown sugarbeets or potatoes during the 2000 growing season were planted to small grains, and these contained residual nitrogen and soil moisture from those previous crops. According to J. W. Cope of Winema Elevators, yields for these fields were just slightly less than expected in a normal year.

Many of the fields at LKL serviced by the Klamath Drainage District received winter pre-irrigation.

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Most of these fields did not receive in-season irrigation, but with the residual moisture in these high water-holding muck soils, grain was produced. Barley yields were less than in some years, but with less weed pressure and no barley stripe rust, pesticide costs were reduced. Some yields of white wheat from this area were similar to or increased over previous years. These results indicate definite advantages for the winter flooding practice.

In previous years, small grain variety trials were conducted on-site at KES on a mineral soil and at a LKL site on a silty clay loam muck soil. These trials received in-season irrigation either from solid-set or linear sprinklers. With the lack of water at KES, the mineral soil trials were moved to the U.S. Timberland's nursery site west of Dairy, Oregon. These trials were conducted under solid-set sprinkler irrigation. The trials at the LKL site received winter flooding but no in-season irrigation.

On the mineral soil site, OSU Elite Nurseries for HR, SW, and HW wheat types were conducted. Western Regional Trials with barley and hard and soft wheat, and OSU Statewide Trials with barley and hard and soft wheat were also conducted. At the muck soil site a non-replicated OSU barley breeding trial, Western Regional Uniform Oat Trial, and OSU Statewide Trials with barley and hard and soft wheat were conducted.

Procedures

Mineral Soil Trials

The spring grain variety trials were conducted on a Fordney loamy fine sand. For the previous 2 years, this field was used to grow a conifer crop and received methyl- bromide fumigation prior to seeding of the conifers. All trials

were arranged in a randomized block design. The Western Regional Trials included four replicates, while OSU Elite Wheat Nurseries and Statewide Trials included three replicates. Seed was planted at a 1-in depth at 30 seeds/ft² with a Kincaid (Kincaid Equipment Manufacturing) plot planter on May 7 and 8. Plots were 4.5 ft wide (9 rows at 6-in spacing) and 20 ft long. Before harvest, a 5.5-ft border between the plots was shredded, resulting in 14.5-by 4.5-ft harvest areas.

All plots were fertilized with 50 lb N, 63 lb P₂O₅, and 41 lb S/acre banded at planting (16-20-0-13 at 310 lb/acre) and 50 lb N applied as URAN (32 percent N) solution in the irrigation water on June 19. Due to reduced weed pressure from the fumigation and long-term weed control efforts at the nursery site, no herbicide treatments were necessary. Irrigation was applied with solid-set sprinklers arranged in a 30-by 40-ft pattern. From establishment to head filling, 12.6 in of irrigation and 1.9 in of rainfall was received on the plots. This was about 75 percent of the calculated AgriMet evapotranspiration for grain for this period.

During the growing season, the date to achieve 50 percent heading was noted and just prior to harvest, plant height and lodging percentages were recorded. Between August 27 and 31 grain was harvested with a Hege (Hans-Ulrich Hege) plot harvester with a 4.5-ft-wide header.

Test weights were determined for one replication in the OSU Elite Wheat Nurseries and the Western Regional wheat and barley trials. Percent plumps and thins were determined for one replication of the Western Regional Spring Barley Nursery. Percent protein was determined in Corvallis for the OSU

Statewide soft wheat trial. Data were analyzed with SAS software.

Muck Soil Trials

The trials were conducted on an Algoma silt loam soil that received winter flood pre-irrigation in a continuous grain rotation. Grain was planted with a Kincaid plot planter on May 28. Seed was placed at 2-in depth into moisture at a seeding rate of 30 seeds/ft². Fertilizer included 70 lb N/acre shanked in before planting as anhydrous ammonia and 50 lb N, 63 lb P₂O₅, and 41 lb S/acre banded at planting (16-20-0-13 at 310 lb/acre). With no in-season irrigation to wet the soil surface, weed emergence after planting was minimal resulting in no herbicide application being necessary. Also with dry growing conditions throughout the summer, no barley stripe rust was present and no foliar fungicide treatments were applied.

During the growing season, the date to achieve 50 percent heading was noted and just prior to harvest, plant height and lodging percentages were recorded. Grain was harvested and yield recorded on September 20 with a Hege (Hans-Ulrich Hege) plot combine with a 4.5-ft-wide header. Test weights were determined for one replication in the Uniform Northwest Oat Trial. Percent protein was determined in Corvallis for the OSU Statewide Trials. Data were analyzed with SAS software.

Results and Discussion

For a grain variety to be considered superior for the Klamath Basin, it must show improvements over standard varieties over time. This ensures producers that it has the potential to produce favorably in seasons with variable climatic conditions. In the past, with a continuing history of trials

on-site at KES or LKL, average tables were produced over time to show this multiple year potential. However, with the new mineral soil site and the lack of customary in-season irrigation for the muck soil site, the validity of making multiple year averages was questioned. Thus the data presented in this report are those produced only during the 2001 growing season.

Barley

Western Regional Spring Barley Nursery (Mineral Soil)

Fourteen standard varieties and 26 numbered selections were included in the 2001 nursery. Yields in this trial ranged from 3,450 to 5,500 lb/acre and averaged 4,430 lb/acre (Table 1). These yields were less than those in the 2000 trial, where an average yield of 5,730 lb/acre was observed. Seventeen of these lines yielded over 4,600 lb/acre and did not significantly differ from the highest yielding line, WA8682-96 (5,500 lb/acre), which is being evaluated for malting. The highest yielding feed barley was WA8709-96 (5,450 lb/acre). Other feed-type numbered selections in the top-yielding group included WA10147-96 (5,070 lb/acre), BZ594-20 (4,860 lb/acre), UT004087 (4,740 lb/acre), and MT960228 (4,700 lb/acre). The potential experimental malting barleys included in the highest yield group were MT960099 (5,140 lb/acre), WA10138-96 (5,070 lb/acre), 2B97-4299 (4,900 lb/acre), 95SR316A (4,840 lb/acre), 95SR149C (4,730 lb/acre), and 2B96-5057 (4,620 lb/acre). Named varieties in this top-yielding group included Baronesse (5,170 lb/acre), CDC Helgason (4,980 lb/acre), CDC Bold (4,710 lb/acre), Legacy (4,690 lb/acre), and Harrington (4,640 lb/acre). The top three of these named varieties are feed types and

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Legacy and Harrington are malting barleys.

Test weights for this trial ranged from 50.0 to 57.0 lb/bu with an average across all entries at 53.9 lb/bu. This was similar to the 2000 trial where the average test weight was 54.4 lb/bu. Percent plumps, those grains remaining above the 6/64-in screen, averaged 90.9 percent. This was slightly less than the 95.0 percent average observed in 2000. One entry in the 2001 test, 95Ab5180, contained only 46.7 percent plumps.

OSU Statewide Spring Barley Trial (Mineral Soil)

Twelve standard varieties and seven numbered selections were included in this trial. Yields ranged from 3,410 to 5,700 lb/acre and averaged 4,760 lb/acre (Table 2). The average yield across entries in 2001 was less than the average yield (5,940 lb/acre) obtained in the 2000 trial. Fourteen of these lines yielded at least 4,690 lb/acre and did not significantly differ from the highest yielding variety, Bancroft (5,700 lb/acre), a malt barley. Top-yielding numbered lines were YU597-399 and WA8682-96 (5,350 lb/acre). Both of these lines are being evaluated for use in malting. WA8682-96 was also the highest yielding line in the Western Regional Trial reported above. The highest feed-type numbered line was H3860224 (5,240 lb/acre). High-yielding standards included the malting types Valier (5,390 lb/acre), Chinook (5,190 lb/acre), Harrington (4,860 lb/acre), Garnet (4,830 lb/acre), and Othello (4,810 lb/acre). Standard feed-types in the top yielding group included Xena (5,260 lb/acre), Farmington (5,050 lb/acre), and Steptoe (4,690 lb/acre).

OSU Statewide Spring Barley Trial (Muck Soil)

This trial included the same entries as the mineral soil site trial. Yields in this trial ranged from 1,330 to 4,250 lb/acre and averaged 3,100 lb/acre (Table 3), less than the 2000 trial average of 5,340 lb/acre. Also, the average yield for this muck soil site with no in-season irrigation was less than for the mineral soil site (4,760 lb/acre). At this site, five lines yielded at least 3,480 lb/acre and did not significantly differ from the highest yielding variety, Valier (4,250 lb/acre), a feed type barley. This group of five included three lines being evaluated for malting quality: WA8682-96 (4,140 lb/acre), YU597-390 (3,830 lb/acre), and Othello (3,820 lb/acre), and the feed-type Farmington (3,480 lb/acre). Of these five, all except YU597-390 were in the mineral soil top-yielding group.

One line in the test, Stab-7, was very slow in tillering and head formation, as was evident in the low yield (1,330 lb/acre) for this line. This variety, which has been tested as a winter barley, possibly did not receive a proper vernalization period to stimulate heading. However, heading inhibition did not occur with the line on the mineral soil.

Test weights for this trial ranged from 50.4 to 54.8 lb/bu with an average of 53.2 lb/bu. This was similar to the test weight average of 53.9 lb/bu in the Western Regional Barley Trial conducted on mineral soils. It was speculated that the lack of in-season irrigation water might lower test weights, but this did not appear to happen. Protein content for the trial entries ranged from 12.6 to 15.4 percent. This resulted in all entries having higher protein concentrations than the accepted

maximum level of 12.5 percent for malting varieties. This was expected considering that standard N rates were applied and yields were about 60 percent of normal.

Wheat

OSU Elite Soft White Spring Wheat Nursery (Mineral Soil)

Six named varieties and 24 numbered lines were included in the trial. Yields ranged from 3,770 to 5,720 lb/acre with an average of 4,650 lb/acre (Table 4), less than the average yield (6,420 lb/acre) that was achieved in the 2000 trial at KES. Fourteen top-yielding lines produced at least 4,690 lb/acre. WS-1 (5,720 lb/acre), Alpowa (4,980 lb/acre), Dirkwin (4,890 lb/acre), and Penewawa (4,700 lb/acre) were the standard varieties in this top-yielding group. High-yielding numbered lines in the group included OR9640085 (5,390 lb/acre), OR4970062, (5,340 lb/acre), and OR4200010 (5,310 lb/acre). Test weights for the trial ranged from 59.0 to 65.5 lb/bu with an average of 63.3 lb/bu.

OSU Elite Hard White Spring Wheat Nursery (Mineral Soil)

One named variety and 35 numbered lines were included in the trial. Yields ranged from 3,180 to 5,110 lb/acre with an average of 4,220 lb/acre (Table 5), less than the average yield (5,130 lb/acre) achieved in the 2000 trial at KES. Eleven top-yielding lines produced at least 4,490 lb/acre. Lolo (5,100 lb/acre), a newly released line from the Idaho program, was in this group of high-yield producers. High-yielding numbered lines included OR4910006 (5,110 lb/acre), OR4990092 (4,760 lb/acre), and OR942834 (4,750 lb/acre). OR4910006 and OR942834 were both in the highest yielding group

in the 2000 trial as well. Test weights ranged from 60.0 to 69.0 lb/bu and averaged 65.1 lb/bu.

OSU Elite Hard Red Spring Wheat Nursery (Mineral Soil)

One named variety and 22 numbered lines were included in the trial. Yields ranged from 3,270 to 4,420 lb/acre with an average of 3,940 lb/acre (Table 6), less than the average yield (5,210 lb/acre) achieved in this trial in 2000. Thirteen high-yielding lines yielded at least 3,960 lb/acre. Tara (3,960 lb/acre), a newly released line from the Washington State program, was among the high-yield producers. High-yielding numbered lines included OR4870148 (4,420 lb/acre), OR3900362 (4,400 lb/acre), and OR4870410 (4,340 lb/acre). OR4870410 was also in the highest yielding group in 2000. Test weights ranged from 62.5 to 67.5 lb/bu and averaged 64.5 lb/bu.

Western Regional Soft White Spring Wheat Nursery (Mineral Soil)

Four standard varieties and 11 numbered selections were included in the 2001 nursery. Yields ranged from 5,000 to 2,800 lb/acre and averaged 4,140 lb/acre (Table 7). Yields averaged 65 percent of those observed in the 2000 trial, where average yield was 6,410 lb/acre. Seven lines yielding at least 4,480 lb/acre did not significantly differ from the highest yielding line, Alpowa (5,000 lb/acre). Penawawa (4,660 lb/acre), another standard, also was among the highest yielding lines. Numbered lines in this top-yielding group included IDO564 (4,740 lb/acre), WA007877 (4,560 lb/acre), ML037C-6-2 (4,540 lb/acre), OR942889 (4,480 lb/acre), and WA007884 (4,480 lb/acre). OR942889 was also a top-yielding line

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in the OSU Elite Soft White Spring Nursery this year. Test weights for this trial ranged from 61.0 to 66.0 lb/bu with an average across all entries of 64.6 lb/bu.

Western Regional Hard Spring Wheat Nursery (Mineral Soil)

This trial evaluated both HW and HR lines. Two standard HW varieties and 8 numbered HW selections and 2 standard HR varieties and 16 numbered HR lines were evaluated (Table 8). Yields for the HW lines in this trial ranged from 3,380 to 5,280 lb/acre and averaged 4,450 lb/acre. HR yields ranged from 3,610 to 4,540 lb/acre and averaged 4,090 lb/acre. Across all of the HW and HR lines, yields averaged 4,220 lb/acre. In the 2000 trial, average yields were higher for both types of wheat with HW types averaging 6,450 lb/acre and HR types averaging 5,730 lb/acre.

For the HW types in 2001, three lines yielded at least 5,100 lb/acre and were not significantly different from each other. These were the numbered lines OR4920311 (5,280 lb/acre) and WA007901 (5,100 lb/acre) and the standard IDO 377S (5,170 lb/acre). OR4920311 yielded significantly more than did any of the HR selections.

For the HR lines, 12 entries yielded at least 3,920 lb/acre and did not differ in yield. The standard, Westbred 926 (3,960 lb/acre) was in this group, but was second lowest in yield among these lines. Numbered lines in the group included N96-0060 (4,540 lb/acre), IDO545 (4,470 lb/acre), and IDO557 (4,370 lb/acre). N96-0060 produced the highest yield among HR entries in the 2000 trial at KES.

Test weights for both types ranged from 62.5 to 68.0 lb/bu. The grand mean for both types was 64.6

lb/bu. A trend was seen for the average test weight across the HW lines (65.7 lb/bu) to be greater than for HR lines (64.0 lb/bu).

OSU Statewide Soft Spring Wheat Nursery (Mineral Soil)

This trial was conducted at both the mineral and muck soil sites. It evaluated eight standard SW lines and three numbered selections. In addition, Alpowa was tested with no seed treatment, with fungicide seed treatment only, and with both fungicide and insecticide seed treatments. Jefferson, a HR type, Winsome, a HW type, and three oat varieties were included in the trials for comparison.

Not considering the untreated Alpowa, there were no significant yield differences among the SW lines. The yield range from 4,190 to 5,420 lb/acre was within the least significant difference of 1,260 lb/acre for the trial (Table 9). Average yield of the SW lines (4,820 lb/acre) was less than the average in the 2000 trial (5,900 lb/acre). Treasure (5,420 lb/acre) and Challis (5,400 lb/acre) were numerically the highest yielding standard varieties. Treasure was also the highest yielding entry in the 2000 Statewide Spring Wheat Trial. WA7902 (5,010 lb/acre) and WA7884 (4,960 lb/acre) were numerically the highest yielding experimental lines. WA7884 also yielded well in the Western Regional Soft White Nursery. There were yield advantages for fungicide (5,120 lb/acre) and fungicide/insecticide (4,420 lb/acre) seed treatments over untreated (3,360 lb/acre) Alpowa. Ten SW lines exhibited increased yields over the HR line, Jefferson (3,610 lb/acre). The HW line, Winsome (4,330 lb/acre), was equivalent in yield to the SW lines. Two of the SW

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lines, Treasure and Challis, had higher yields than the highest yielding oat selection, Cayuse (4,030 lb/acre).

For the SW lines, test weights ranged from 61.1 to 63.3 lb/bu and averaged 62.5 lb/bu. Test weights for the fungicide-treated Alpowa, WA7884, and Wawawai were greater than that for Challis.

Protein contents within the SW lines were similar to Winsome, the HW line. Jefferson, a HR type, and all oat selections exhibited higher protein content than all SW wheat selections.

The oat selections included Cayuse, a hulled variety, and hull-less varieties Lamont and Provena. As harvested, yields for Cayuse (4,030 lb/acre) and Lamont (3,390 lb/acre) were not different, with both of them yielding more than Provena (2,780 lb/acre). Test weights for the two hull-less lines were over 10 lb/bu more than the hulled line. Most of this difference was due to the lack of the low-density hull. Considering protein content, Provena (16.1 percent) was greater than Lamont (13.9 percent) and both hull-less lines were greater than Cayuse (10.7 percent). From the literature, oat grain will account for about 75 percent of the weight in a hulled variety. Using this value and calculating yield and protein content for Cayuse (3,020 lb/acre calculated) resulted in no yield differences for the three lines. Protein content for Cayuse (14.3 percent calculated) is between the two hull-less lines.

OSU Statewide Soft Spring Wheat Nursery (Muck Soil)

Unlike the mineral site, differences in yields were present within the SW types. Yields ranged from 3,180 to 5,700 lb/acre and averaged 4,250 lb/acre (Table 10). The average for the

muck soil site was less than in the mineral soil (4,820 lb/acre) and the 2000 trial (5,690 lb/acre). WA7884 (5,700 lb/acre) and Alpowa (5,100 lb/acre, fungicide/insecticide; 4,920 lb/acre, untreated; 4,740 lb/acre, fungicide) were the top-yielding selections. These selections yielded more than the HR and oat entries. Winsome, a HW type, produced similar yield to these highest yielding SW types.

For the SW lines, test weights ranged from 59.8 to 63.2 lb/bu and averaged 62.0 lb/bu. WA7902 and Wawawai had slightly lower test weights compared to the other SW types. With the lack of in-season irrigation, especially during grain filling, speculation that test weights might be lower for these wheat lines proved false. Grand means across all entries in the trials were 59.6 for the muck soil and 60.0 for the mineral soil.

Numerically, the lowest yielding SW lines, Wawawai and WA7902, exhibited the highest protein contents. As at the mineral soil site, overall SW protein contents were similar to the HW selection and lower than in the HR line and oat selections. In the muck soil, wheat entries exhibited 0.7 to 3.2 percent more protein than on the mineral soil. Protein content of oats was higher by 5.1 to 7.9 percent. Lower yields on the muck soil, a slightly increased N fertilizer rate, and mineralized nitrogen from organic matter all would account for an increase in available N and thus higher protein levels.

As with oat selections in the mineral soil, calculating values to account for the hulls of Cayuse (2,840 lb/acre calculated) results in no observed grain yield differences. Protein content rankings were also the same with Provena (24.0 percent) being greater

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than Cayuse (21.1 percent calculated), which was greater than Lamont (19.7percent).

OSU Statewide Hard Spring Wheat Nursery (Mineral Soil)

This trial was conducted on both mineral and muck soils. It evaluated four standard HW lines, four numbered HW selections, seven standard HR varieties, and three numbered HR lines. In addition, the HW variety, Winsome, was tested at seeding rates of 20, 30, and 40 seeds/ft². Penawawa and Alpowa, SW lines, were included for comparisons in the trial.

For the HW entries, 9 of the 10 selections were shown to be similar to each other. For the HW types, yield ranged from 4,340 to 5,490 lb/acre with an average yield of 4,810 lb/acre (Table 11). IDO 377S (5,490 lb/acre), Lolo (5,380 lb/acre), Winsome (5,180 lb/acre), and WA7901 (5,120 lb/acre) numerically were the highest yielding lines. All three seeding rates for Winsome produced statistically equivalent yields. Winsome and IDO 377S were the highest yielding HW lines in the 2000 trial at KES.

Yields for the HR selections ranged from 3,780 to 4,890 lb/acre and averaged 4,370 lb/acre (Table 11). Five of the HR entries were in the highest yielding group. These included the standard varieties Jefferson (4,890 lb/acre) and Scarlet (4,540 lb/acre). Also in this highest yielding group were the numbered lines WA7839 (4,630 lb/acre), OR4910028 (4,570 lb/acre), and IDO557 (4,520 lb/acre). IDO557 was also in the highest yielding group in the Western Regional Hard Spring Wheat Nursery.

The two SW entries, Penawawa (4,910 lb/acre) and Alpowa (4,730 lb/acre), produced yields similar to the

highest producing HW and HR lines. Unfortunately, samples from this trial were inadvertently discarded at Corvallis before test weight and protein contents were determined.

OSU Statewide Hard Spring Wheat Nursery (Muck Soil)

In the muck soil, the two highest yielding selections were the SW variety, Alpowa (5,940 lb/acre), and the HW variety Winsome (5,040 lb/acre) (Table 12). Other HW selections that were equivalent to Winsome were IDO560 (4,200 lb/acre) and Lolo (4,080 lb/acre). HR line yields were slightly reduced from those of the top-yielding group of the other types. Eight of the HR selections were similar and included Jefferson (4,200 lb/acre), Scarlet (4,140 lb/acre), Hank (4,080 lb/acre), and OR4910028 (3,780 lb/acre). Numerically, Hank and Alpowa produced more grain on the muck soil than on the mineral soil. This was not the case with any of the other trial entries.

Means for the test weights were slightly higher than 60 lb/bu. None of the selections were below the 58 lb/bu minimum for Grade 1 wheat. Protein contents for both the HW and the HR entries tended to increase with decreasing yields. All of the HR lines produced grain with at least 14 percent protein, which would result in a premium payment. HR line protein was greater than for either HW or SW lines.

Oats

Western Regional Uniform Northwestern Spring Oat Nursery (Muck Soil)

Twelve standard varieties and 18 numbered selections were included in the 2001 nursery. Yields in this trial ranged from 2,890 to 5,570 lb/acre and

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averaged 4,260 lb/acre (Table 13). These yields were 71 percent of the 2000 trial average yield of 5,960 lb/acre. Ten lines yielded at least 4,530 lb/acre and did not significantly differ from the highest yielding lines, OT382 and 95Ab10854 (5,570 lb/acre). Other numbered lines included in this top-yielding group included 95Ab12584 (4,800 lb/acre), AbSP9-2 (4,550 lb/acre), and 90Ab1322 (4,530 lb/acre). Standard varieties in this highest yielding group included CDC Pacer (5,200 lb/acre), Celsia (5,010 lb/acre), Derby (4,870 lb/acre), and Killdeer (4,810 lb/acre).

Test weights ranged from 39.0 to 43.0 lb/bu and averaged 40.6 lb/bu. This was similar to the average (40.4 lb/bu) noted in 2000 when the trial was conducted at KES on a mineral soil with solid-set irrigation.

Summary

Promising new lines of grain were noted in all types and classes in these trials. Selections of barley to be used for malting include WA8682-96, YU597-399, and YU597-390. Yields and percent plumps were favorable for these lines. However, differing nitrogen management strategies need to be considered because protein levels were excessive for use in malting. Promising feed barley lines include WA8709-96 and H3860224. All of these lines should be evaluated for susceptibility to barley stripe rust. Although not a problem this year, under the right environmental conditions this disease has the potential to adversely affect Klamath Basin barley production.

Overall, the high yield for SW wheat in the muck soil with winter pre-irrigation was the highlight of these trials. As always there is the concern that late spring frosts will injure wheat more

than barley, but the production levels achieved by SW varieties without in-season irrigation are promising.

New wheat lines exhibited good potential. For SW types, OR9640085, OR4970062, OR4200010, WA7902, WA7884, IDO564, WA7877, ML037C-6-2, and OR942889 produced high yield. HW types yielded as well as SW lines in certain trials. Potential was shown for some of these types, including OR4910006, OR4990092, OR942834, OR4920311, WA007901, IDO560, and WA7899. HR types did not reach the 14 percent protein content necessary for the premium grade except in tests on the muck soil. New HR lines that indicated good potential were OR4870148, OR3900362, OR4870410, N96-0060, IDO545, IDO557, WA7839, and OR4910028.

For oats, the hull-less lines tested yielded less than the hulled types. However, adjusting for the weight of the hull resulted in these entries being similar in yield to the hulled comparison. Provena, with its higher protein content, was the most interesting hull-less oat. Promising new oat lines from the regional test included OT382, 95Ab10854, 95Ab12584, AbSP9-2, and 90Ab1322.

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Table 1. Western Regional Spring Barley Nursery: agronomic and grain quality data for spring barley varieties and lines established on May 7, 2001, at U.S. Timberland's tree nursery, Dairy, OR.

Variety or line	Row use ¹		Yield	Test weight	% Above screen			Height	50% head
					6/64	5.5/64	Pan		
			lb/acre	lb/bu	-----percent-----			in	Julian
WA8682-96	2	f/m	5500 a ²	56.0	94.6	3.8	1.5	25	183
WA8709-96	2	f	5450 a	56.5	96.7	2.5	0.8	25	183
Baronesse	2	f	5170 ab	54.0	91.3	6.1	2.6	26	184
MT960099	2	f/m	5140 ab	55.5	85.1	10.6	4.4	23	183
WA10147-96	2	f	5070 ab	53.5	93.3	5.1	1.6	25	184
WA10138-96	2	m	5070 ab	54.5	92.1	5.5	2.4	25	181
CDC Helgason (TR346)	2	f	4980 abc	54.5	91.5	6.6	1.9	27	185
2B97-4299	2	m	4900 abcd	54.0	90.8	6.6	2.6	28	184
BZ594-20	2	f	4860 abcd	55.0	90.5	6.3	3.2	25	183
95SR316A	2	m	4840 abcd	56.0	87.8	8.4	3.8	27	185
UT004087	6	f	4740 abcde	55.0	94.0	4.5	1.6	28	180
95SR149C	2	m	4730 abcde	53.5	94.0	4.6	1.4	27	185
CDC Bold	2	f	4710 abcde	53.5	86.9	9.9	3.2	25	184
MT960228	2	f	4700 abcde	56.0	92.3	5.6	2.0	25	184
Legacy (6B93-2978)	6	m	4690 abcde	52.0	96.7	2.5	0.8	33	183
Harrington	2	m	4640 abcdef	55.0	90.7	7.3	2.0	27	185
2B96-5057	2	m	4620 abcdef	54.1	93.9	4.5	1.6	27	185
UT004467	6	f	4520 bcdefg	52.0	83.1	12.0	4.9	27	178
CDC Select	2	m	4510 bcdefg	54.0	95.6	3.4	0.9	26	183
UT001632	6	f	4480 bcdefgh	55.0	97.4	1.8	0.8	29	179
BZ596-117	2	f	4410 bcdefgh	55.0	88.6	8.2	3.2	23	183
Steptoe	6	f	4400 bcdefgh	52.5	95.4	3.3	1.4	24	180
2B97-4077	2	m	4350 bcdefghi	53.0	87.8	9.5	2.7	28	185
93Ab688	6	f	4330 bcdefghi	52.0	90.9	6.5	2.6	25	179
CDC Copeland (TR150)	2	m	4320 bcdefghi	53.0	95.2	3.5	1.3	28	185
PB1-97-2R-7090	2	f	4310 bcdefghi	57.0	92.2	5.5	2.3	25	183
PB1-95-2R-517	2	f	4310 bcdefghi	56.5	90.4	7.1	2.5	23	183
MT970116	2	f/m	4280 bcdefghi	55.0	92.8	5.2	2.1	27	183
UT003757	6	f	4150 cdefghi	50.0	82.6	12.5	4.8	25	179
6B95-2482	6	m	4120 cdefghi	53.5	92.5	5.9	1.6	29	180
TR 167	2	m	4030 defghi	54.5	96.3	2.6	1.1	25	183
Drummond (ND15477)	6	m	3920 efghi	52.0	95.5	3.4	1.1	27	180
Stander	6	m	3750 fghi	54.0	93.9	4.5	1.6	27	183
PB1-95-2R-A629	2	f	3680 ghi	54.0	94.5	4.1	1.4	24	181
95Ab5180	6	m	3680 ghi	50.0	46.7	36.5	16.7	25	180
6B95-2089	6	m	3650 ghi	54.0	92.6	6.0	1.4	30	181
ND15422	6	m	3650 ghi	50.5	95.2	3.7	1.1	27	182
BCD 47 (OR2967102)	2	m	3590 hi	53.0	89.1	8.8	2.1	22	183
Morex	6	m	3490 i	52.0	92.0	5.8	2.2	28	180
Sprinter	2	f	3450 i	53.0	92.8	5.6	1.6	21	185
Mean			4430	53.9	90.9	6.6	2.5	26	182
CV (%)			15	--	--	--	--	7	1
LSD (0.05)			910	--	--	--	--	3	1

¹Use: f = feed, m = malt, f/m = being evaluated for malting.

²Values within a column followed by the same letter are not significantly different (p = 0.05).

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Table 2. OSU Statewide Spring Barley Trial: mineral soil, agronomic and grain quality data for spring barley varieties and lines established on May 7, 2001, at U.S. Timberland's tree nursery, Dairy, OR.

Variety or line ¹	Row	Use ²	Yield	Height	50% head
			lb/acre	in	Julian
Bancroft	2	m	5700 a ³	26	185
Valier	2	f	5390 ab	26	184
YU597-399	2	f/m	5350 ab	20	183
WA8682-96	6	f/m	5350 ab	25	183
Xena	2	f	5260 abc	24	184
H3860224	2	f	5240 abcd	26	183
Chinook	2	m	5190 abcde	26	185
Farmington (WA 9504-94)	2	f	5050 abcde	23	185
DA587-124	6	f/m	4910 abcde	20	179
Harrington	2	m	4860 abcdef	23	183
Garnet	2	m	4830 abcdef	24	184
Othello (BCD-47)	2	f/m	4810 abcdef	20	183
Stab-7	6	f/m	4760 abcdef	30	187
Steptoe	6	f	4690 abcdef	23	178
YU597-390	2	f/m	4320 bcdefg	20	183
Stab-113	6	f/m	4130 cdefg	26	183
Morex	6	m	4110 defg	30	180
Orca	2	f	4090 efg	28	181
Stab-47	6	f/m	3750 fg	26	177
Tango	6	f	3410 g	24	178
Mean			4760	25	182
CV (%)			14	7	1
LSD (0.05)			1140	3	1

¹All seed was treated with fungicide and insecticide (Gaucho) unless otherwise noted.

²Use: f = feed, m = malt, f/m = being evaluated for malting.

³Values within a column followed by the same letter are not significantly different ($p = 0.05$).

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Table 3. OSU Statewide Spring Barley Trial: muck soil, agronomic and grain quality data for spring barley varieties and lines established on May 28, 2001, at Lower Klamath Lake, Klamath County, OR.

Variety or line ¹	Row	Use ²	Yield ³	Test weight	Protein	Height	50% head
			lb/acre	lb/bu	%	in	Julian
Valier	2	f	4250 a ⁴	54.6	14.4	23	199
WA8682-96	6	f/m	4140 ab	54.7	13.4	25	195
YU597-390	2	f/m	3830 abc	53.6	14.6	20	193
Othello (BCD-47)	2	f/m	3820 abc	54.0	15.3	20	194
Farmington (WA 9504-94)	2	f	3480 abcd	53.0	14.5	24	200
TR167	2	f/m	3440 bcde	54.5	14.4	26	199
Orca	2	f	3420 bcde	54.5	14.8	24	192
DA587-124	6	f/m	3340 cdef	53.6	13.3	20	193
H3860224	2	f	3320 cdef	54.4	15.1	24	197
Xena	2	f	3310 cdef	53.1	13.4	23	197
Harrington	2	m	3310 cdef	53.7	14.4	23	200
Bancroft	2	m	3240 cdef	53.9	14.5	25	201
YU597-399	2	f/m	3190 cdef	54.4	14.8	20	197
Morex	6	m	3120 cdefg	52.9	14.3	31	196
Stab-47	6	f/m	2930 defg	51.4	15.0	28	193
CDC Select	2	m	2860 defgh	54.8	14.9	25	200
Stab-113	6	f/m	2800 defgh	51.7	15.1	27	201
Samish-23	2	f/m	2760 defgh	53.2	14.7	24	200
Steptoe	6	f	2730 defgh	50.9	13.2	22	193
Chinook	2	m	2660 efgh	53.4	15.4	23	200
Jersey	2	f	2630 fgh	52.1	15.1	24	201
Tango	6	f	2390 gh	50.4	12.6	24	193
Garnet	2	m	2090 hi	52.6	15.4	22	203
Stab-7	6	f/m	1330 i	51.4	15.3	27	NA
Mean			3100	53.2	14.4	24	197
CV (%)			15	1	4	7	1
LSD (0.05)			780	1.0	0.9	3	2

¹All seed was treated with fungicide and insecticide (Gaucho) unless otherwise noted.

²Use: f = feed, m = malt, f/m = being evaluated for malting.

³Yield normalized to 10 percent moisture.

⁴Values within a column followed by the same letter are not significantly different ($p = 0.05$).

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Table 4. OSU Elite Soft White Spring Wheat Nursery: agronomic and grain quality data for spring wheat varieties and lines established on May 7, 2001, at U.S. Timberland's tree nursery, Dairy, OR.

Variety or line	Yield	Test weight	Height	50% head
	lb/acre	lb/bu	in	Julian
WS-1	5720 a ¹	63.0	31	185
OR9640085	5390 ab	63.0	32	184
OR4970062	5340 abc	64.0	31	182
OR4200010	5310 abc	63.5	35	188
OR942845	5230 abcd	63.5	31	184
OR4200018	5200 abcde	63.0	31	189
Alpowa	4980 abcdef	64.5	30	183
OR4850001	4910 abcdef	62.0	29	186
Dirkwin	4890 abcdef	63.0	29	184
WA007831	4890 abcdef	63.5	29	184
OR942838	4870 abcdef	64.5	30	186
ID000488	4810 abcdefg	63.0	33	186
Penewawa	4700 abcdefgh	65.0	29	183
OR942889	4690 abcdefgh	64.0	31	184
OR4970039	4590 bcdefgh	64.5	28	183
OR4200012	4590 bcdefgh	62.0	36	186
Pomerelle	4580 bcdefgh	63.0	25	184
Whitebird	4580 bcdefgh	64.0	28	184
OR4880013	4450 bcdefgh	61.5	31	189
OR4990007	4410 bcdefgh	65.5	30	182
OR4200014	4410 bcdefgh	63.0	33	189
OR4200008	4360 cdefgh	64.5	28	188
OR4200017	4290 defgh	63.0	31	188
OR4970063	4260 defgh	64.0	27	180
OR4200009	4240 defgh	59.0	32	187
OR4200024	4230 efg	63.5	29	186
OR4200019	4080 fgh	64.0	32	188
OR4200035	4010 fgh	61.5	28	183
OR4200032	3820 gh	63.5	27	184
OR4200033	3770 h	64.0	29	185
Mean	4650	63.3	30	185
CV (%)	13	--	7	1
LSD (0.05)	1010	--	3	2

¹Values within a column followed by the same letter are not significantly different (p = 0.05).

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Table 5. OSU Elite Hard White Spring Wheat Nursery: agronomic and grain quality data for spring wheat varieties and lines established on May 7, 2001, at U.S. Timberland's tree nursery, Dairy, OR.

Variety or line	Yield	Test weight	Height	50% head
	lb/acre	lb/bu	in	Julian
OR4910006	5110 a ¹	66.0	28	182
Lolo (IDO533)	5100 a	66.0	28	183
OR4990092	4760 ab	61.0	30	189
OR942834	4750 ab	66.0	31	182
OR4200037	4690 abc	65.5	25	184
OR4870255	4570 abcd	65.5	28	180
OR4990061	4560 abcde	64.5	28	185
OR4970018	4530 abcde	69.0	28	182
OR4990065	4520 abcde	64.0	28	183
OR4990028	4500 abcde	66.5	27	189
OR4990056	4490 abcde	63.0	26	189
OR4990037	4420 bcdef	64.0	26	183
OR4870453	4410 bcdef	64.5	26	186
OR4920307	4390 bcdefg	63.5	28	186
OR4990062	4360 bcdefg	62.0	25	184
OR4990040	4220 bcdefgh	66.5	26	183
OR4970025	4210 bcdefgh	66.0	27	182
OR4200002	4160 bcdefgh	65.0	29	184
OR4920311	4150 bcdefgh	65.5	29	185
OR3940124	4120 bcdefgh	67.5	25	186
OR4200004	4120 bcdefgh	65.5	29	183
OR4200003	4110 bcdefgh	65.5	30	183
OR4990041	4090 cdefgh	64.5	25	183
OR4990073	4060 cdefgh	65.0	23	184
OR4990009	4010 defgh	64.0	25	183
OR4990088	3960 defgh	65.5	28	182
OR4990080	3930 defgh	65.5	28	181
OR4990014	3930 defgh	67.0	26	184
OR4930230	3930 defgh	64.5	30	188
OR4200001	3910 efgh	63.5	28	189
OR4990089	3820 fghi	65.5	27	185
OR4990032	3780 fghi	65.5	26	185
OR4200034	3770 fghi	66.5	31	183
OR9640151	3760 ghi	67.0	26	180
OR4200021	3680 hi	60.0	30	186
OR4200005	3180 i	66.0	27	180
Mean	4220	65.1	27	184
CV (%)	9	--	6	1
LSD (0.05)	650	--	2	2

¹Values within a column followed by the same letter are not significantly different (p = 0.05).

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Table 6. OSU Elite Hard Red Spring Wheat Nursery: agronomic and grain quality data for spring wheat varieties and lines established on May 7, 2001, at U.S. Timberland's tree nursery, Dairy, OR.

Variety or line	Yield	Test weight	Height	50% head
	lb/acre	lb/bu	in	Julian
OR4870148	4420 a ¹	63.5	28	183
OR3900362	4400 ab	65.0	26	183
OR4870410	4340 abc	63.0	28	182
OR4920002	4280 abcd	65.0	25	185
OR4200036	4190 abcd	63.5	25	185
OR4990118	4180 abcd	64.0	26	184
OR4990119	4130 abcde	62.5	21	182
OR4990126	4120 abcdef	62.5	26	183
OR4990110	4100 abcdef	66.5	25	183
OR4895011	4050 abcdef	64.5	27	182
OR4990111	4030 abcdef	67.0	26	184
OR4990114	4020 abcdef	67.0	25	183
Tara (WA007824)	3960 abcdefg	65.0	29	180
OR4990094	3940 bcdefgh	64.0	23	184
OR4990117	3880 cdefgh	67.5	26	184
OR4890001	3840 defgh	66.0	19	178
OR4990095	3680 efghi	63.5	26	183
OR4990115	3680 efghi	65.0	27	183
OR4930003	3650 fghi	64.0	24	178
OR4910028	3490 ghi	64.0	25	179
OR4870581	3480 ghi	64.0	22	179
OR4880189	3480 hi	63.0	26	183
OR4990123	3270 i	64.5	19	179
Mean	3940	64.5	25	182
CV (%)	7	--	9	1
LSD (0.05)	480	--	4	1

¹Values within a column followed by the same letter are not significantly different ($p = 0.05$).

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Table 7. Western Regional Soft White Spring Wheat Nursery: agronomic and grain quality data for spring wheat varieties and lines established on May 7, 2001, at U.S. Timberland's tree nursery, Dairy, OR.

Variety or line	Yield	Test weight	Height	50% head
	lb/acre	lb/bu	in	Julian
Alpowa	5000 a ¹	66.0	29	187
IDO564	4740 ab	65.5	29	183
Penawawa	4660 ab	65.0	28	185
WA007877	4560 abc	64.0	28	185
ML037C-6-2	4540 abcd	64.0	26	188
OR942889	4480 abcd	65.0	29	182
WA007884	4480 abcd	65.0	29	187
Rene98	4160 bcde	61.0	32	189
IDO569	4150 bcde	65.5	25	182
WA007902	4020 cde	65.5	24	185
OR9640085	3920 de	65.0	27	181
IDO563	3770 ef	65.5	27	178
WA007883	3590 ef	65.5	27	183
IDO556	3220 fg	65.0	24	185
Federation	2800 g	61.0	37	189
Mean	4140	64.6	28	184
CV (%)	11	--	7	1
LSD (0.05)	620	--	3	1

¹Values within a column followed by the same letter are not significantly different (p = 0.05).

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Table 8. Western Regional Hard Spring Wheat Nursery: agronomic and grain quality data for spring wheat varieties and lines established on May 7, 2001, at U.S. Timberland's tree nursery, Dairy, OR.

Variety or line	Yield		Test weight	Height	50% head
	lb/acre		lb/bu	in	Julian
<u>Hard White Spring</u>					
OR4920311	5280	a ¹	65.0	28	185
IDO 377S	5170	ab	66.5	26	180
WA007901	5100	abc	64.0	28	183
UC1107	4420	def	66.5	25	185
OR4920307	4420	def	63.5	28	186
WA007899	4320	defg	67.0	28	180
IDO560	4260	defgh	65.0	28	184
WA007900	4190	defgh	66.0	28	180
OR4970025	3970	defghi	65.0	27	183
UC 896	3380	i	68.0	23	180
Mean	4450		65.7	27	183
<u>Hard Red Spring</u>					
N96-0060	4540	bcd	65.0	27	182
IDO545	4470	cde	63.0	28	182
IDO557	4370	def	63.5	26	182
IDO558	4290	defg	64.0	25	179
UC1037	4290	defg	64.0	24	180
XKW940W01	4250	defgh	65.0	28	182
WA007875	4210	defgh	64.5	30	180
WA007859	4190	defgh	62.5	31	182
Klasic	4170	defgh	63.0	25	179
98S0191-60-8	4160	defgh	65.0	27	184
KW960175	4110	defgh	63.0	32	183
Westbred 926	3960	defghi	64.0	26	179
MLCB20-123	3920	defghi	63.0	28	180
UC1036	3890	efghi	65.0	22	184
OR4990095	3820	fghi	65.0	27	183
IDO566	3680	ghi	65.0	23	183
N96-2444	3670	ghi	65.0	23	185
N97-0090	3610	hi	63.0	29	183
Mean	4090		64.0	27	182
Grand mean	4220		64.6	27	182
CV (%)	11		--	9	1
LSD (0.05)	650		--	3	2

¹Values within a column followed by the same letter are not significantly different (p = 0.05).

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Table 9. OSU Statewide Soft Spring Wheat Nursery: mineral soil, agronomic and grain quality data for varieties and lines established on May 7, 2001, at U.S. Timberland's tree nursery, Dairy, OR.

Variety or line ¹	Yield ²	Test weight	Protein	Height	50% head
	lb/acre	lb/bu	%	in	Julian
<u>Soft White Spring</u>					
Treasure	5420 a ³	62.3	8.4	27	183
Challis	5400 a	61.1	8.5	29	184
Penawawa	5230 ab	62.5	8.8	26	183
Alpowa (fungicide only)	5120 ab	63.3	9.3	30	185
WA7902	5010 ab	62.9	9.5	24	184
Zak	5000 ab	62.6	9.0	29	184
Whitebird	4980 ab	62.6	8.5	27	185
WA7884	4960 ab	63.1	9.5	30	185
Wawawai	4900 ab	63.0	9.7	31	181
IDO526	4680 ab	62.0	8.6	26	183
Alpowa	4420 abc	62.5	9.4	29	186
Jubilee (IDO525)	4190 abc	62.4	9.2	27	185
Alpowa (untreated)	3360 cd	62.4	9.2	30	187
Mean	4820	62.5	9.1	28	184
<u>Hard Red Spring</u>					
Jefferson	3610 cd	63.0	11.1	27	179
<u>Hard White Spring</u>					
Winsome	4330 abc	61.3	9.7	26	186
<u>Oats</u>					
Cayuse	4030 bc	39.5	10.7	28	185
Lamont (hull-less)	3390 c	51.7	13.9	34	191
Provena (hull-less)	2780 d	52.9	16.1	33	191
Mean	3400	48.0	13.5	32	189
Grand mean	4500	60.0	9.9	29	182
CV (%)	17	2	8	9	1
LSD (0.05)	1260	1.8	1.2	3	2

¹All seed was treated with fungicide and insecticide (Gaucho) unless otherwise noted.

²Yield normalized to 10 percent moisture.

³Values within a column followed by the same letter are not significantly different ($p = 0.05$).

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Table 10. OSU Statewide Soft Spring Wheat Trial: muck soil, agronomic and grain quality data for varieties and lines established on May 28, 2001, at Lower Klamath Lake, Klamath County, OR.

Variety or line ¹	Yield ²	Test weight	Protein	Height	50% head
	lb/acre	lb/bu	%	in	Julian
<u>Soft White Wheat</u>					
WA7884	5700 a ³	61.8	10.2	30	185
Alpowa	5100 ab	63.2	10.8	29	186
Alpowa (untreated)	4920 abc	62.7	10.7	30	187
Alpowa (fungicide only)	4740 abcd	63.1	10.7	30	185
Jubilee (IDO 525)	4620 bcde	61.8	11.6	27	185
Treasure	4320 bcdef	62.1	10.5	27	183
Challis	3960 cdefg	61.9	11.1	29	184
IDO526	3960 cdefg	62.8	11.0	26	183
Zak	3840 defgh	62.4	11.0	29	184
Whitebird	3720 efgh	62.2	11.4	27	185
Penawawa	3600 fghi	61.8	11.4	26	183
WA7902	3600 fghi	60.3	11.9	24	184
Wawawai	3180 ghi	59.8	12.0	32	181
Mean	4250	62.0	11.1	28	184
<u>Hard Red Spring</u>					
Jefferson	3900 defg	63.1	14.3	27	179
<u>Hard White Spring</u>					
Winsome	4740 abcd	62.1	11.4	26	186
<u>Oats</u>					
Cayuse	3780 defgh	40.1	15.8	28	185
Lamont (hull-less)	2880 hi	49.2	19.7	34	191
Provena (hull-less)	2700 i	52.0	24.0	33	191
Mean	3120	47.1	19.8	32	189
Grand mean	4080	59.6	12.7	28	185
CV (%)	15	3	4	6	1
LSD (0.05)	960	2.7	0.6	3	2

¹All seed was treated with fungicide and insecticide (Gaucho) unless otherwise noted.

²Yield normalized to 10 percent moisture.

³Values within a column followed by the same letter are not significantly different (p = 0.05).

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Table 11. Statewide Hard Spring Wheat Trial: mineral soil, agronomic and grain quality data for varieties and lines established on May 7, 2001, at U.S. Timberland's tree nursery, Dairy, OR.

Variety or line	Yield	Height	50% head
	lb/acre	in	Julian
<u>Hard White Spring</u>			
IDO 377S	5490 a ¹	26	180
Lolo (IDO533)	5380 ab	26	180
Winsome (30 seeds/ft ²)	5180 abc	27	186
WA7901	5120 abcd	29	181
IDO560	4980 abcde	28	184
Winsome (40 seeds/ft ²)	4930 abcde	27	187
WA7899	4760 abcdef	29	180
Winsome (20 seeds/ft ²)	4670 abcdef	27	188
Sunco	4650 abcdef	25	184
WA7900	4340 cdef	28	179
Mean	4810	27	184
<u>Hard Red Spring</u>			
Jefferson	4890 abcde	27	180
WA7839	4630 abcdef	29	179
OR4910028	4570 abcdef	26	179
Scarlet	4540 abcdef	30	181
IDO557	4520 abcdef	29	179
Tara (WA7824)	4360 bcdef	30	179
Iona	4220 cdef	29	182
Westbred 936	4110 def	23	180
Hank	4030 ef	25	178
Yecora Rojo	3780 f	19	178
Mean	4370	27	180
<u>Soft White Spring</u>			
Penawawa	4910 abcde	27	182
Alpowa	4730 abcdef	29	184
Mean	4820	28	183
Grand mean	4670	27	181
CV (%)	13	6	1
LSD (0.05)	1030	3	2

¹Values within a column followed by the same letter are not significantly different (p = 0.05).

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Table 12. Statewide Hard Spring Wheat Trial: organic soil, agronomic and grain quality data for varieties and lines established on May 28, 2001, at Lower Klamath Lake, Klamath County, OR.

Variety or line	Yield ¹	Test weight	Protein	Height	50% head
	lb/acre	lb/bu	%	in	Julian
<u>Hard White Spring</u>					
Winsome (30 seeds/ft ²)	5040 ab ²	59.7	11.7	26	200
IDO560	4200 bc	60.5	11.3	28	198
Lolo (IDO533)	4080 bcd	60.8	12.4	28	193
WA 7900	3780 cdef	61.0	13.2	26	193
IDO 377S	3720 cdef	61.6	12.4	25	193
WA7899	3660 cdef	61.3	12.1	26	193
Winsome (40 seeds/ft ²)	3480 cdef	59.1	11.6	26	200
Sunco	3360 cdef	60.9	13.1	22	194
Winsome (20 seeds/ft ²)	3180 cdef	58.9	12.2	27	200
WA7901	2640 f	59.5	13.8	28	196
Mean	3740	60.2	12.4	26	196
<u>Hard Red Spring</u>					
Jefferson	4200 bc	60.6	14.6	24	192
Scarlet	4140 bcd	60.2	14.5	29	193
Hank	4080 bcd	60.2	14.8	26	193
OR4910028	3780 cdef	59.1	14.0	24	192
Westbred 936	3180 cdef	60.5	15.3	22	193
Yecora Rojo	3120 cdef	60.2	14.6	18	192
IDO557	3120 cdef	60.6	14.1	25	192
WA7839	3060 cdef	60.4	15.2	27	194
Iona	3000 def	59.9	14.8	30	196
Tara (WA7824)	2880 ef	60.7	15.4	27	192
Mean	3460	60.2	14.7	25	193
<u>Soft White Spring</u>					
Alpowa	5940 a	61.2	11.5	27	194
Penawawa	4140 bcd	60.0	11.6	25	194
Mean	5040	60.6	11.6	26	194
Grand mean	3720	60.2	13.3	26	195
CV (%)	19	1	4	6	1
LSD (0.05)	1140	1.0	0.8	3	2

¹Yield normalized to 10 percent moisture.

²Values within a column followed by the same letter are not significantly different (p = 0.05).

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Table 13. Uniform Northwestern Spring Oat Nursery: agronomic and grain quality data for spring oats varieties and lines established on May 28, 2001, at Lower Klamath Lake, Klamath County, OR.

Variety or line	Yield	Test weight	Height	50% head
	lb/acre	lb/bu	in	Julian
OT382	5570 a ¹	41.5	35	200
95Ab10854	5570 a	42.0	31	204
CDC Pacer	5200 ab	41.0	36	199
94Ab5543	5020 abc	40.5	32	200
Celsia	5010 abc	39.0	34	201
Derby	4870 abcd	41.5	37	201
Killdeer (ND 930122)	4810 abcde	41.5	31	193
95Ab12584	4800 abcde	39.5	31	193
AbSP9-2	4550 abcdef	42.5	30	199
90Ab1322	4530 abcdef	41.0	27	200
AbSP19-9	4440 bcdef	42.5	28	200
Otana	4410 bcdef	40.5	37	199
90Ab1620	4260 bcdef	41.5	30	202
87Ab5632	4230 bcdef	41.5	31	200
87Ab4983	4170 bcdef	41.0	24	192
Ajay	4100 cdef	39.5	22	200
UC125	4080 cdef	43.0	25	200
91Ab406	4080 cdef	39.0	25	198
Cayuse	3970 cdefg	40.5	31	197
UC129	3900 defg	39.0	29	192
96Ab8796	3840 defg	39.0	26	199
CDC Dancer	3790 defg	42.0	34	200
87Ab5125	3780 defg	41.0	27	199
UC128	3770 defg	38.0	31	193
Whitestone	3750 efg	41.0	32	201
91Ab502	3720 efg	40.0	25	193
AbSP14-6	3620 fg	39.0	27	197
Rio Grande	3600 fg	40.0	25	193
Monida	3560 fg	41.0	31	201
Powell	2890 g	40.0	25	198
Mean	4260	40.6	30	198
CV (%)	18	--	8	1
LSD (0.05)	1100	--	3	2

¹Values within a column followed by the same letter are not significantly different (p = 0.05).