

Spring Barley Variety Screening

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Abstract

The Klamath Basin is the leading production area for spring barley in Oregon. The Klamath Experiment Station (KES) plays an important role in screening new spring barley varieties to enhance production. Screening efforts are made on feed, malting, and hooded lines. The initial screening for the Oregon State University (OSU) spring barley-breeding program occurs at KES. In 2000, 128 varieties were evaluated in this program. Much of this work emphasizes increasing barley stripe rust (BSR) tolerance. In addition to these initial-screening trials, advanced selections from the OSU Statewide Trials and the Western Regional Nurseries are evaluated locally. The Statewide Trials include evaluations at branches of the Oregon Agricultural Experiment Station throughout the state. This year, 25 lines were evaluated in a mineral soil at KES and on an organic soil at a Lower Klamath Lake (LKL) site. Bancroft (malting) and Nebula (feed) were the highest yielding lines at the KES site. At the LKL site, B1202 (malting) and Jersey (feed) were the highest yielding lines. In the Western Regional Spring Barley Nursery, BA2B96-5038 (malting) and ID 93Ab688 (feed) were the highest yielding lines.

Introduction

More than one-quarter of the barley grown in Oregon is produced in the Klamath Basin. In 2000, close to 38,000 acres of

barley was produced within the Klamath Irrigation Project, out of a total grain production base of about 55,000 acres. All grain accounted for about 30 percent of total irrigated acreage, while barley represented about 20 percent of acreage in the Klamath Irrigation Project. Barley was second to alfalfa, which accounted for 27 percent of crop acreage in the project.

Local production includes both feed and malting types, with feed types accounting for about two-thirds of the acreage. Klamath Basin data from the Bureau of Reclamation indicated that 10 and 54 percent of the barley grown in Oregon and California, respectively, was intended for malt. Popular feed varieties include Baronesse, Steptoe, Gus, Gustoe, and Nebula. Morex and B1202 are the main malting varieties grown. Newly released varieties Orca, Tango, and UC 960 warrant further consideration due to BSR tolerance.

With the importance of barley to this growing area, plant breeders use the Klamath Basin for initial screening trials. In 2000, Dr. Patrick Hayes and Dr. Lynn Gallagher, OSU and UC Davis barley breeders, respectively, had nurseries of early breeding lines at KES and at the Intermountain Research and Extension Center (IREC) at Tulelake, CA. With the potential for BSR to cause economic ruin to local barley production, much of this work emphasizes incorporation of BSR resistance. In addition to the initial screening

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investigations, barley varieties nearer to release status are screened at KES and IREC. In 2000, the OSU Statewide Spring Barley Variety Trials were evaluated at KES and at a LKL site. The Western Regional Spring Barley Nursery, which is coordinated by the USDA, Agricultural Research Service Small Grains Research Unit at Aberdeen, Idaho, was also grown at KES.

The 2000 barley crop was injured by a severe frost at the end of May. Temperatures dipped to 23⁰F at KES, with even colder temperatures experienced at other sites including the LKL area. Barley in experimental plots at KES made it through this frost with little or no visible injury. However, plants at the LKL site, which were from 2 to 4 in high, were frozen back to the ground. These plants appeared to recover, but in general the barley at this site yielded less than in other years. This early frost, along with cool temperatures later, drastically reduced yields in some production fields in the LKL area.

Infections of BSR increase water loss and decrease the amount of photosynthate available for grain filling, resulting in reductions in the number and weight of kernels. This reduction is more severe with early infections. In 2000, BSR breakouts followed a cool, wet period around July 4. The barley in research plots at KES, which was planted April 25, was past the labeled treatment stage (prior to 50 percent heading) for Folicur® (tebuconazole, Bayer) by the time infection was observed. However, later planted barley, as was the case with LKL sites, was treatable after this BSR outbreak. Many producers applied Folicur with fairly good results. In some untreated fields, secondary fungal diseases attacked BSR weakened plants, resulting in further yield reductions.

Procedures

KES

The OSU Statewide and Western Regional trials were conducted on a Poe fine sandy loam soil in a 3-year rotation immediately following potatoes. All trials were arranged in a randomized block design. The OSU Statewide Trial included three replications while the Western Regional Trial included four replications. Seed was planted at a 1-in depth at 30 seeds/ft² with a Kincaid (Kincaid Equipment Manufacturing) plot planter on April 25. Plots were 4.5 ft wide (9 rows at 6-in spacing) and 20 ft long. Along ends of plots, 5.5-ft-wide borders were 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 and 57 lb S/acre broadcast preplant (21-0-0-24 at 240 lb/acre). Weeds were controlled with Buctril® (Bromoxynil, Aventis) at 0.5 lb ai/acre (1.5 pt/acre) and Rhomene® (MCPA, Aventis) at 0.5 lb ai/acre (1 pt/acre) applied with a conventional ground sprayer at the 4-leaf stage. Irrigation was applied with solid-set sprinklers arranged in a 40- by 40-ft pattern in accordance with crop needs.

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 with a Hege (Hans-Ulrich Hege) plot harvester with a 4.5-ft-wide header and yields recorded on August 24 for the Statewide Trial and on August 25 for the Western Regional Trial.

At KES, test weights and plumps and thins were determined for only one replication in the Western Regional Trial. Grain from the Oregon Statewide Trial was

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sent to Corvallis for determination of test weight, percent protein, and kernel weight. Yield, 50 percent heading date, plant height, and lodging percent data were analyzed statistically with SAS software.

Lower Klamath Lake

The Oregon Statewide Spring Wheat Variety Trial was conducted on an Algoma silt loam soil in a continuous grain rotation. Grain was planted with a Kincaid plot planter on May 19. Seed was placed at a 1-in depth 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). Weeds were controlled with a tank mix of 2,4-D (Agrilience, LLC) and Express® (tribenuron-methyl, E.I. duPont de Nemours & Co.) applied at recommended rates. Folicur® (tebuconazole, Bayer) was applied aerially in July to control rust associated with barley in the surrounding field area.

The field was flooded during the winter to restore moisture to the soil profile and received two irrigations during the growing season with an overhead linear move system. 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. Samples were evaluated at Corvallis for test weight, percent protein, and kernel weight. All data were analyzed statistically using SAS software.

Results and Discussion

Oregon Statewide Trial: KES

In spite of 23 percent lodging, Bancroft was the highest yielding malt line tested (Table 1). Chinook did not significantly differ from Bancroft in yield. Both of these lines yielded over 2 ton/acre. However, Chinook exhibited a significantly higher protein level than the 13 percent desired by the malting industry. Nebula, WA9504-94, Xena, H3860224, and Baronesse were the highest yielding feed types. Yields for the two hooded lines in the test were considerably less than the top-yielding malt or feed entries. Yields of BSR-resistant lines were mixed. Orca was similar in yield to all of the highest yielding lines except for Nebula. Tango was similar in yield to Orca, but like UC960 had lower test weights.

For lines evaluated in 2000, 1999, and 1998, Xena, Baronesse, and Bancroft were among the highest producers (Table 2). WA9504-94, Steptoe, and Othello joined the above lines in the highest yielding group for average yields over the last 2 years.

Oregon Statewide Trial: LKL

In general, yields at this organic soil site have been greater than yields at the mineral KES site. However, this was not the case in 2000 trials. A 20, 6, and 26 percent yield reduction was noted at the LKL site compared to the KES site for averages across the malting, feed, and hooded lines (Table 3). The yield reduction for the LKL site trial was due to a combination of increased lodging, frost injury, and serious weed competition. Differences between sites were also noted in the top-yielding lines. B1202 was the highest yielding malting entry at the LKL site. This line produced a higher yield on the organic soil than at the

mineral soil site. However, protein content of B1202 was higher than the malt standard of 13 percent. As at KES, WA9504-94, Nebula, and Baronesse were among the highest yielding feed-type selections. Jersey, Sprinter, Steptoe, Statehood, and DA587-124 were among the highest yielding entries at LKL, but not at KES. Xena and H3860224 yielded well at KES but performed less favorably at the LKL site. The yield ranking of the hooded lines varied at the two sites.

Averaged over 3 years, Baronesse, B1202, Gus, and Steptoe were grouped together as the top producers (Table 4). WA9504-94 and Baronesse produced the highest average yields for the past 2 years.

Western Regional Nursery: KES

Nineteen of the selections in this nursery were grouped together as top producers (Table 5). Nine malting, nine feed, and one hooded line were included among top- yielding selections. The highest yielding malting lines were BA2B96-5038 and ND 15422. Both of these barley varieties yielded significantly more than the malting standard, Morex. The top-yielding feed varieties, ID 93Ab688 and MTLB-30, both produced over 3.2 ton/acre. The multipurpose hooded line WPB-DA587-124 also yielded over 3.2 ton/acre.

Five of the lines evaluated in each of the last 3 years yielded an average of over 2.5 ton/acre (Table 6). These included UT 5724, Harrington, Steptoe, MT 910189, and WA 9504-94. Among lines tested the last 2 years, the highest yielding group did not include any of the top 3-year average lines. The top 2-year average yielding lines were ID 93Ab688, Baronesse, UT 4467, and WA 11825-95.

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Table 1. Oregon Statewide Spring Barley Variety Trial; mineral soil site: agronomic and quality data of spring barley varieties and lines established April 25, 2000 at KES, Klamath Falls, OR.

| Variety or line | Row | Use ¹ | Yield | Test weight | Protein | Height | 50% heading | Lodging |
|-------------------|-----|------------------|---------|-------------|---------|--------|-------------|---------|
| | | | lb/acre | lb/bu | % | in | Julian | % |
| Bancroft | 2 | M | 7340 | 53.8 | 13.4 | 35 | 177 | 23 |
| Chinook | 2 | M | 6400 | 51.9 | 15.3 | 34 | 177 | 0 |
| Harrington | 2 | M | 5960 | 53.9 | 13.5 | 31 | 177 | 0 |
| B-1202 | 2 | M | 5850 | 51.7 | 15.2 | 31 | 177 | 0 |
| Garnet | 2 | M | 5740 | 53.0 | 14.4 | 29 | 177 | 0 |
| Galena | 2 | M | 5670 | 52.1 | 14.9 | 28 | 179 | 0 |
| Morex | 6 | M | 5580 | 52.3 | 15.0 | 40 | 175 | 0 |
| Mean | | | 6080 | 52.7 | 14.5 | 33 | 177 | 3 |
| Nebula | 6 | F | 7630 | 51.1 | 13.2 | 30 | 177 | 0 |
| WA9504-94 | 2 | F | 7080 | 53.5 | 14.1 | 30 | 179 | 0 |
| Xena | 2 | F | 6950 | 53.4 | 13.5 | 32 | 176 | 0 |
| H3860224 | 2 | F | 6840 | 54.4 | 14.2 | 32 | 177 | 0 |
| Baronesse | 2 | F | 6710 | 53.3 | 13.5 | 27 | 177 | 0 |
| Othello | 2 | F | 6550 | 54.4 | 14.5 | 24 | 177 | 0 |
| Orca | 2 | F | 6400 | 53.8 | 14.6 | 33 | 172 | 0 |
| DA587-124 | 2 | F | 6150 | 51.8 | 13.2 | 22 | 174 | 0 |
| Jersey | 6 | F | 6010 | 52.6 | 14.4 | 28 | 178 | 0 |
| Steptoe | 6 | F | 5890 | 49.8 | 12.5 | 30 | 172 | 0 |
| Statehood | 6 | F | 5760 | 49.4 | 12.9 | 31 | 174 | 0 |
| Tango | 6 | F | 5720 | 49.8 | 12.8 | 33 | 174 | 0 |
| Valier | 6 | F | 5480 | 53.9 | 13.5 | 31 | 177 | 0 |
| UC 960 | 6 | F | 5280 | 47.4 | 13.7 | 25 | 173 | 0 |
| Gus | 6 | F | 4720 | 49.6 | 13.8 | 24 | 175 | 0 |
| Sprinter | 6 | F | 4550 | 49.7 | 14.5 | 27 | 181 | 0 |
| Mean | | | 6110 | 51.7 | 13.7 | 29 | 176 | 0 |
| Sara-I | 2 | H | 4920 | 49.2 | 14.6 | 38 | 173 | 0 |
| Belford | 2 | H | 4490 | 45.5 | 13.6 | 39 | 175 | 0 |
| Mean | | | 4710 | 47.4 | 14.1 | 39 | 174 | 0 |
| Grand Mean | | | 5940 | 51.7 | 14.1 | 31 | 176 | 1 |
| CV (%) | | | 10 | 1 | 4 | 6 | 1 | 480 |
| LSD (.05) | | | 980 | 1.1 | 0.9 | 3 | 1 | 6 |

¹F denotes a feed barley variety, M denotes a malting line, and H a hooded variety.

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Table 2. Three-year summary of Oregon Statewide Spring Barley Variety Trial; mineral soil site: grain yield of spring barley established at KES, Klamath Falls, OR, 1998-2000.

| Variety or line | Row | Use ¹ | Yield | | | 2-year average | | 3-year average | |
|-----------------|-----|------------------|---------|------|------|----------------|------|----------------|------|
| | | | 2000 | 1999 | 1998 | yield | rank | yield | rank |
| | | | lb/acre | | | lb/acre | | lb/acre | |
| Xena | 2 | F | 6950 | 5440 | 6640 | 6190 | 2 | 6340 | 1 |
| Baronesse | 2 | F | 6710 | 5950 | 5510 | 6330 | 1 | 6060 | 2 |
| Bancroft | 2 | M | 7340 | 4980 | 5460 | 6160 | 3 | 5930 | 3 |
| Step toe | 6 | F | 5890 | 5530 | 5470 | 5710 | 6 | 5630 | 4 |
| Chinook | 2 | M | 6400 | 4740 | 5700 | 5570 | 7 | 5610 | 5 |
| Othello | 2 | F | 6550 | 4890 | 4820 | 5720 | 5 | 5420 | 6 |
| Tango | 6 | F | 5720 | 5060 | 5500 | 5390 | 8 | 5420 | 7 |
| Orca | 2 | F | 6400 | 4070 | 5770 | 5240 | 10 | 5410 | 8 |
| B1202 | 2 | M | 5850 | 4700 | 5180 | 5280 | 9 | 5240 | 9 |
| Galena | 2 | M | 5670 | 4740 | 5160 | 5210 | 11 | 5190 | 10 |
| Gus | 6 | F | 4720 | 3810 | 4000 | 4270 | 12 | 4180 | 11 |
| WA9504-94 | 2 | F | 7080 | 4800 | | 5940 | 4 | | |
| Nebula | 6 | F | 7630 | | | | | | |
| H3860224 | 2 | F | 6840 | | | | | | |
| DA587-124 | 2 | F | 6150 | | | | | | |
| Jersey | 6 | F | 6010 | | | | | | |
| Harrington | 2 | M | 5960 | | | | | | |
| Statehood | 6 | F | 5760 | | | | | | |
| Garnet | 2 | M | 5740 | | | | | | |
| Morex | 6 | M | 5580 | | | | | | |
| Valier | 6 | F | 5480 | | | | | | |
| UC 960 | 6 | F | 5280 | | | | | | |
| Sara I | 2 | H | 4920 | | | | | | |
| Sprinter | 6 | F | 4550 | | | | | | |
| Belford | 2 | H | 4490 | | | | | | |
| Mean | | | 5990 | 4890 | 5380 | 5580 | | 5490 | |
| CV (%) | | | 10 | 11 | 10 | 8 | | 7 | |
| LSD (.05) | | | 980 | 940 | 920 | 740 | | 620 | |

¹F denotes a feed barley variety, M denotes a malting line, and H a hooded variety.

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Table 3. Oregon Statewide Spring Barley Variety Trial; organic soil site: agronomic and quality data of spring barley established May 19, 2000, at Klamath County, OR.

| Variety or line | Row | Use ¹ | Yield | Test weight | Protein | Height | 50% heading | Lodging |
|-------------------|-----|------------------|---------|-------------|---------|--------|-------------|---------|
| | | | lb/acre | lb/bu | % | in | Julian | % |
| B1202 | 2 | M | 6280 | 52.0 | 15.3 | 30 | 204 | 25 |
| Bancroft | 2 | M | 5090 | 54.3 | 13.9 | 30 | 201 | 10 |
| Galena | 2 | M | 4960 | 54.5 | 15.4 | 33 | 201 | 12 |
| Harrington | 2 | M | 4750 | 52.7 | 15.4 | 33 | 199 | 22 |
| Chinook | 2 | M | 4290 | 52.2 | 15.3 | 32 | 203 | 30 |
| Garnet | 2 | M | 3830 | 52.1 | 14.9 | 30 | 203 | 17 |
| Mean | | | 4870 | 53.0 | 15.0 | 31 | 202 | 19 |
| Jersey | 6 | F | 6980 | 49.1 | 14.4 | 41 | 200 | 13 |
| WA9504-94 | 2 | F | 6950 | 53.3 | 14.2 | 30 | 204 | 12 |
| Sprinter | 6 | F | 6880 | 52.9 | 14.2 | 32 | 201 | 3 |
| Steptoe | 6 | F | 6460 | 50.4 | 12.2 | 35 | 196 | 38 |
| Nebula | 6 | F | 6420 | 53.1 | 12.8 | 31 | 199 | 0 |
| Statehood | 6 | F | 6310 | 49.7 | 11.5 | 30 | 196 | 22 |
| Baronesse | 2 | F | 6280 | 54.0 | 15.0 | 29 | 203 | 8 |
| DA587-124 | 2 | F | 6250 | 50.9 | 12.7 | 26 | 199 | 13 |
| Othello | 2 | F | 5700 | 45.8 | 13.8 | 41 | 199 | 80 |
| Tango | 6 | F | 5540 | 49.0 | 13.6 | 28 | 197 | 12 |
| Xena | 2 | F | 5460 | 53.9 | 13.6 | 32 | 200 | 23 |
| Orca | 2 | F | 4850 | 51.9 | 12.8 | 28 | 201 | 7 |
| UC960 | 6 | F | 4720 | 50.3 | 14.0 | 27 | 202 | 18 |
| H3860224 | 2 | F | 4570 | 51.0 | 13.1 | 30 | 199 | 2 |
| Valier | 6 | F | 4390 | 54.0 | 15.7 | 32 | 203 | 7 |
| Gus | 6 | F | 4300 | 54.2 | 12.8 | 30 | 203 | 12 |
| Mean | | | 5750 | 51.5 | 13.5 | 31 | 200 | 17 |
| Belford | 2 | H | 4530 | 51.2 | 15.8 | 33 | 203 | 35 |
| SaraI | 2 | H | 2410 | 51.4 | 13.8 | 34 | 199 | 8 |
| Mean | | | 3470 | 51.3 | 14.8 | 33 | 201 | 22 |
| Grand Mean | | | 5340 | 51.8 | 14.0 | 31 | 201 | 18 |
| CV (%) | | | 13 | 3 | 3 | 7 | 1 | 65 |
| LSD (.05) | | | 1120 | 2.4 | 0.6 | 9 | 2 | 19 |

¹F denotes a feed barley variety, M denotes a malting line, and H a hooded variety.

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Table 4. Three-year summary of Oregon Statewide Spring Barley Variety Trial; organic soil site: grain yield of spring barley established at Klamath County, OR, 1997, 1999, and 2000

| Variety or line | Row | Use ¹ | Yield | | | 2-year average | | 3-year average | |
|-----------------|-----|------------------|---------|---------|---------|----------------|---------|----------------|------|
| | | | 2000 | 1999 | 1997 | yield | rank | yield | rank |
| | | | lb/acre | lb/acre | lb/acre | lb/acre | lb/acre | lb/acre | |
| Baronesse | 2 | F | 6280 | 6280 | 6270 | 6280 | 2 | 6280 | 1 |
| B1202 | 2 | M | 6280 | 5750 | 6370 | 6020 | 3 | 6130 | 2 |
| Gus | 6 | F | 4300 | 6640 | 7310 | 5470 | 8 | 6080 | 3 |
| Steptoe | 6 | F | 6460 | 5320 | 5500 | 5890 | 5 | 5760 | 4 |
| Bancroft | 2 | M | 5090 | 4760 | 5810 | 4920 | 11 | 5220 | 5 |
| Chinook | 2 | M | 4290 | 4890 | 5710 | 4590 | 12 | 4960 | 6 |
| WA9504-94 | 2 | F | 6950 | 6750 | | 6850 | 1 | | |
| Othello | 2 | F | 5700 | 6290 | | 6000 | 4 | | |
| Galena | 2 | M | 4960 | 6480 | | 5720 | 6 | | |
| Xena | 2 | F | 5460 | 5700 | | 5580 | 7 | | |
| Orca | 2 | F | 4850 | 6000 | | 5420 | 9 | | |
| Tango | 6 | F | 5540 | 4330 | | 4930 | 10 | | |
| Jersey | 6 | F | 6980 | | | | | | |
| Sprinter | 6 | F | 6880 | | | | | | |
| Nebula | 6 | F | 6420 | | | | | | |
| Statehood | 6 | F | 6310 | | | | | | |
| DA587-124 | 2 | F | 6250 | | | | | | |
| Harrington | 2 | M | 4750 | | | | | | |
| UC960 | 6 | F | 4720 | | | | | | |
| H3860224 | 2 | F | 4570 | | | | | | |
| Belford | 2 | H | 4530 | | | | | | |
| Valier | 6 | F | 4390 | | | | | | |
| Garnet | 2 | M | 3830 | | | | | | |
| SaraI | 2 | H | 2410 | | | | | | |
| Mean | | | 5340 | 5770 | 6160 | 5640 | | 5740 | |
| CV (%) | | | 13 | 9 | 9 | 6 | | 5 | |
| LSD (.05) | | | 1120 | 910 | 980 | 590 | | 520 | |

¹F denotes a feed barley variety, M denotes a malting line, and H a hooded variety.

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Table 5. Western Regional Spring Barley Nursery: agronomic data for spring barley lines established April 24, 2000, at KES, Klamath Falls, OR.

| Variety or line | Use ¹ | Row | Yield lb/acre | Test weight lb/bu | % above sieve | | | 50% | | Lodging % |
|-------------------|------------------|-----|------------------|-------------------------|---------------|--------|-----|--------------|-------------------|--------------|
| | | | | | 6/64 | 5.5/64 | pan | Height in | heading Julian | |
| BA2B96-5038 | M | 2 | 6450 | 55.5 | 98 | 1 | 0 | 31 | 178 | 0 |
| ND 15422 | M | 6 | 6340 | 54.0 | 96 | 3 | 1 | 34 | 175 | 0 |
| SK-CDC Bold | M | 2 | 6320 | 54.0 | 92 | 5 | 3 | 31 | 177 | 0 |
| WA 11832-95 | M | 2 | 6310 | 55.0 | 96 | 3 | 1 | 31 | 177 | 0 |
| ID 93Ab859 | M | 2 | 6140 | 56.5 | 98 | 1 | 1 | 34 | 179 | 0 |
| WA 11825-95 | M | 2 | 6060 | 55.0 | 97 | 2 | 1 | 30 | 177 | 0 |
| Harrington | M | 2 | 6020 | 54.5 | 92 | 5 | 3 | 33 | 179 | 0 |
| BA6B95-2482 | M | 6 | 5780 | 53.0 | 92 | 5 | 3 | 37 | 174 | 0 |
| MT 910189 | M | 2 | 5720 | 55.5 | 96 | 3 | 1 | 30 | 177 | 0 |
| SK TR150 | M | 2 | 5690 | 54.0 | 97 | 2 | 1 | 35 | 179 | 0 |
| Stander | M | 6 | 5610 | 54.1 | 96 | 3 | 1 | 37 | 175 | 0 |
| 2ND 17274 | M | 2 | 5490 | 55.0 | 98 | 2 | 1 | 34 | 173 | 0 |
| OR 2967102 | M | 2 | 5440 | 56.5 | 98 | 2 | 0 | 25 | 179 | 0 |
| BA6B93-2978 | M | 6 | 5410 | 53.0 | 96 | 3 | 1 | 39 | 176 | 0 |
| Morex | M | 6 | 5350 | 53.5 | 95 | 4 | 2 | 40 | 175 | 0 |
| WA 11801-95 | M | 2 | 5330 | 55.0 | 97 | 2 | 1 | 33 | 179 | 0 |
| BA6B94-8253 | M | 6 | 5210 | 54.0 | 96 | 3 | 1 | 36 | 177 | 0 |
| BA2B96-5119 | M | 2 | 5170 | 56.8 | 98 | 2 | 1 | 33 | 177 | 0 |
| SK-TR346 | M | 2 | 4870 | 54.5 | 95 | 4 | 2 | 31 | 178 | 0 |
| Mean | | | 5730 | 54.7 | 96 | 3 | 1 | 34 | 177 | 0 |
| ID 93Ab688 | F | 6 | 6670 | 54.0 | 92 | 5 | 4 | 38 | 174 | 0 |
| MTLB-30 | F | 6 | 6660 | 56.0 | 98 | 2 | 0 | 34 | 177 | 0 |
| Baronesse | F | 2 | 6350 | 56.0 | 94 | 4 | 2 | 30 | 177 | 0 |
| UT 4467 | F | 2 | 6320 | 53.0 | 89 | 7 | 4 | 32 | 172 | 0 |
| MTLB-05 | F | 6 | 6240 | 55.0 | 97 | 2 | 1 | 33 | 177 | 0 |
| Steptoe | F | 6 | 6000 | 53.0 | 95 | 3 | 1 | 32 | 174 | 0 |
| WA 9504-94 | F | 6 | 5810 | 54.5 | 93 | 5 | 2 | 29 | 181 | 0 |
| Tango | F | 6 | 5790 | 52.0 | 97 | 2 | 1 | 33 | 174 | 0 |
| UT 3757 | F | 6 | 5730 | 51.8 | 91 | 6 | 3 | 31 | 173 | 0 |
| UT 5724 | F | 6 | 5690 | 52.0 | 92 | 5 | 3 | 30 | 172 | 0 |
| ND 15477 | F | 6 | 5560 | 55.0 | 96 | 3 | 1 | 33 | 175 | 0 |
| PB1-95-2R-517 | F | 2 | 5530 | 56.0 | 97 | 2 | 1 | 31 | 177 | 0 |
| UT 5742 | F | 6 | 5260 | 52.0 | 94 | 4 | 2 | 29 | 171 | 0 |
| PB1-97-2R-7090 | F | 2 | 4890 | 55.0 | 95 | 4 | 2 | 33 | 180 | 0 |
| PB1-95-2R-A629 | F | 2 | 4770 | 54.0 | 97 | 2 | 1 | 29 | 177 | 0 |
| Mean | | | 5820 | 54.0 | 94 | 4 | 2 | 32 | 175 | 0 |
| WPB-DA587-124 | H | 6 | 6430 | 54.4 | 95 | 3 | 1 | 23 | 175 | 0 |
| WPB-BZ594-35 | H | 2 | 3750 | 56.0 | 76 | 16 | 8 | 27 | 177 | 0 |
| Mean | | | 5090 | 55.2 | 86 | 10 | 5 | 25 | 176 | 0 |
| Grand Mean | | | 5730 | 54.4 | 95 | 4 | 2 | 32 | 176 | 0 |
| CV (%) | | | 12 | -- | -- | -- | -- | 8 | 1 | 0 |
| LSD (.05) | | | 970 | -- | -- | -- | -- | 4 | 1 | 0 |

¹F denotes a feed barley variety, M denotes a malting line, and H a hooded variety.

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Table 6. Western Regional Spring Barley Nursery: grain yield of spring barley lines planted at KES, Klamath Falls, OR, 1998-2000.

| Variety or line | Use ¹ | Row | Yield | | | 2-year average | | 3-year average | |
|-----------------|------------------|-----|---------|---------|---------|----------------|---------|----------------|------|
| | | | 2000 | 1999 | 1998 | yield | rank | yield | rank |
| | | | lb/acre | lb/acre | lb/acre | lb/acre | lb/acre | lb/acre | |
| UT 5724 | F | 6 | 5690 | 5490 | 5430 | 5590 | 8 | 5530 | 1 |
| Harrington | M | 2 | 6020 | 4690 | 5550 | 5360 | 10 | 5420 | 2 |
| Stephoe | F | 6 | 6000 | 5270 | 4240 | 5640 | 7 | 5170 | 3 |
| MT 910189 | M | 2 | 5720 | 4690 | 5040 | 5200 | 13 | 5150 | 4 |
| WA 9504-94 | F | 6 | 5810 | 4380 | 5190 | 5100 | 14 | 5130 | 5 |
| Stander | M | 6 | 5610 | 4450 | 4540 | 5030 | 18 | 4870 | 6 |
| Morex | M | 6 | 5350 | 4470 | 4530 | 4910 | 20 | 4780 | 7 |
| BA6B93-2978 | M | 6 | 5410 | 4680 | 4220 | 5040 | 17 | 4770 | 8 |
| ID 93Ab688 | F | 6 | 6670 | 5660 | | 6170 | 1 | | |
| Baronesse | F | 2 | 6350 | 5430 | | 5890 | 2 | | |
| UT 4467 | F | 2 | 6320 | 5230 | | 5770 | 3 | | |
| WA 11825-95 | M | 2 | 6060 | 5460 | | 5760 | 4 | | |
| MTLB-05 | F | 6 | 6240 | 5070 | | 5650 | 5 | | |
| MTLB-30 | F | 6 | 6660 | 4650 | | 5650 | 6 | | |
| ID 93Ab859 | M | 2 | 6140 | 4590 | | 5370 | 9 | | |
| PB1-95-2R-517 | F | 2 | 5530 | 5030 | | 5280 | 11 | | |
| UT 3757 | F | 6 | 5730 | 4830 | | 5280 | 12 | | |
| SK TR150 | M | 2 | 5690 | 4420 | | 5060 | 15 | | |
| ND 15477 | F | 6 | 5560 | 4550 | | 5050 | 16 | | |
| UT 5742 | F | 6 | 5260 | 4620 | | 4940 | 19 | | |
| BA6B94-8253 | M | 6 | 5210 | 4310 | | 4760 | 21 | | |
| PB1-95-2R-A629 | F | 2 | 4770 | 4660 | | 4720 | 22 | | |
| OR 2967102 | M | 2 | 5440 | 3960 | | 4700 | 23 | | |
| WPB-BZ594-35 | H | 2 | 3750 | 3820 | | 3780 | 24 | | |
| BA2B96-5038 | M | 2 | 6450 | | | | | | |
| WPB-DA587-124 | H | 6 | 6430 | | | | | | |
| ND 15422 | M | 6 | 6340 | | | | | | |
| SK-CDC Bold | M | 2 | 6320 | | | | | | |
| WA 11832-95 | M | 2 | 6310 | | | | | | |
| Tango | F | 6 | 5790 | | | | | | |
| BA6B95-2482 | M | 6 | 5780 | | | | | | |
| 2ND 17274 | M | 2 | 5490 | | | | | | |
| WA 11801-95 | M | 2 | 5330 | | | | | | |
| BA2B96-5119 | M | 2 | 5170 | | | | | | |
| PB1-97-2R-7090 | F | 2 | 4890 | | | | | | |
| SK-TR346 | M | 2 | 4870 | | | | | | |
| Mean | | | 5730 | 4770 | 4840 | 5240 | | 5100 | |
| CV (%) | | | 12 | 8 | 14 | 7 | | 7 | |
| LSD (.05) | | | 970 | 560 | 1030 | 480 | | 520 | |

¹F denotes a feed barley variety, M denotes a malting line, and H a hooded variety.