

PERFORMANCE OF ADVANCED LINES AND VARIETIES OF SPRING BARLEY SEEDED DIRECTLY INTO WHEAT OR BARLEY STUBBLE

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In addition to erosion control in all agronomic zones, direct-seeding offers the means to increase the diversity and intensity of cropping in areas traditionally dependent on a winter wheat/summer fallow rotation, thereby broadening the economic base of the farm and spreading risks over more crops. Intermediate-precipitation areas that currently use a winter wheat/spring cereal/summer fallow rotation have, with direct seeding, the potential to eliminate summer fallow all together. In the higher precipitation areas, such as the Palouse, where annual cropping is already a common practice, direct seeding offers one of the best means by which to reduce inputs because of fewer passes needed to grow crops.

Spring barley has proven particularly well-suited to direct seeding into cereal stubble. In fact, for those growers that are planning to experiment with direct seeding for the first time, planting spring barley directly into standing stubble of any cereal is probably the best way to start into one of these systems. Rhizoctonia root rot has been the most apparent hazard encountered with direct-seeded barley, but tools such as greenbridge management and fertilizer placement are helping greatly to reduce the risk of this disease. Research and grower experience have shown that virtually any drill equipped to 1) place seed through surface residues into good soil contact, 2) place fertilizer directly below or below and slightly to one side of the seed, 3) loosen soil beneath the seed for seminal root penetration, and 4) clear trash from within the seed row will be acceptable.

Further significant advancements towards achieving the high yields possible with direct-seeded spring barley will come with development of varieties with resistance or tolerance to the hazards encountered with this method of farming. Towards this end, research is underway on two fronts: evaluation of existing varieties to determine their suitability to direct seeding, and identification or development of barley germplasm with resistance or tolerance to Rhizoctonia root rot for use in the breeding program. In addition to greenhouse tests, a field test to screen both spring barley and spring wheat for resistance to Rhizoctonia root rot is under development on Spillman Farm (see article in this Field Day report, "A Development of a Field Screening Method for Resistance or Tolerance to Rhizoctonia Root Rot"). The development of Rhizoctonia-resistant varieties is a long-term effort.

The variety evaluation studies were begun about seven years ago and now include sites near Ritzville and Pullman, representing the low- and high-precipitation areas, respectively. Prior to 2000, we also had test plots at Bickleton and Dusty, but these were discontinued starting in 2001 as the WSU variety testing program has expanded its work into direct-seed systems in these areas. All tests are done with excellent greenbridge management and a one-pass system that seeds and places fertilizer and loosens the soil directly beneath the seed. All tests have been with spring barley seeded directly into cereal stubble. Yields of a select subset of varieties tested to date are presented in Table 1.

In general, the yields have been good to excellent. The low yields at the Ritzville site (Wellsandt Farms) in 2001 were due to a severe water shortage, and the even lower yields at Ritzville following spring wheat (2001b) were probably due to frost damage in addition to drought in this field. The

high average yields at Pullman (2001) were produced on the Cummington Agronomy Farm in a field that has been in continuous cereals for several years and direct-seeded cereals (spring wheat and spring barley) the past 2 years (1999 and 2000). As experienced with conventional seeding, Baronesse has been at or near the highest yielding spring barley in these tests.

Table 1. Yields of spring barley seeded directly into stubble of winter or spring wheat or spring barley.

| Variety | -----Pullman----- | | | -----Ritzville----- | | | | | | |
|-----------------|-------------------|-----------------|-----------------|---------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | 1999 (lbs/A) | 2000 (lbs/A) | 2001 (lbs/A) | 1998 (lbs/A) | 1999a (lbs/A) | 1999b (lbs/A) | 2000a (lbs/A) | 2000b (lbs/A) | 2001a (lbs/A) | 2001b (lbs/A) |
| Bob (WA8682-96) | | | 5255 | | | | | | | |
| Crest | 3500 | 5800 | | 2644 | | | | | | |
| Harrington | 3640 | 5060 | 5581 | 2549 | | 1960 | 2643 | 2560 | 465 | 788 |
| Bancroft | | | 4814 | | | | | | | |
| Baronesse | 4400 | 6360 | 5919 | 2899 | 2140 | 2100 | 2853 | 3046 | 448 | 724 |
| Meltan | 4620 | | | 2571 | | | 2524 | 2657 | 464 | 774 |
| Mentor | | 6020 | 5382 | | | | 2480 | 2663 | 442 | 943 |
| Tango | | | 3836 | | | | | | | |
| Valier | | | 4852 | | | | | | | |
| Xena | | | 5967 | | | | | | 401 | 937 |
| Camelot | 3680 | 6240 | | 2635 | | 2140 | | | | |
| Camas | | | 5641 | | | | | | | |
| Gallatin | 3360 | 5720 | 5045 | 2679 | 2120 | 2000 | 2567 | 2529 | | |
| WA9504-94 | | 6500 | | | | | 2654 | 2839 | | |
| Chinook | | | | 2635 | | 2140 | | | | |
| WA 7114-93 | | | | 2475 | 2240 | 2280 | | | | |
| WA 8772-93 | | | | 2514 | | | | | | |
| WA 8394-93 | | | | 2509 | 2020 | 2100 | | | | |
| Pongo | | | 5699 | | 1920 | 2100 | | | | |
| Farmington | | | 5248 | | | | | | 416 | 792 |
| Tofta | 4400 | 6060 | | | 2000 | 2100 | 2649 | 2780 | 464 | 931 |
| Tena | | 5680 | | | | | | 2516 | | |
| Moxex | | | 4368 | | | | | | | |
| Orca | | | 4800 | | | | | | | |
| 98NZ015 | | | 5235 | | | | | | | |
| 98NZ223 | | | 5629 | | | | | | | |
| Average | 3943 | 5938 | 5204 | 2611 | 2073 | 2102 | 2624 | 2699 | 443 | 841 |