

# **IRRIGATED WINTER AND SPRING WHEAT VARIETY DRILL STRIP DEMONSTRATION**

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## **Introduction**

Soft white winter wheat is an important crop for central Oregon. Proximity to the Portland market makes it a good choice for growing plus it has added benefits as a rotational crop. Drill Strip demonstration tests are run to see how the varieties perform in side-by-side comparisons under commercial farm conditions. Some of the varieties have been grown for years, while other varieties have been released more recently. It has been many years since a drill strip demonstration was run. Two on-farm locations in central Oregon were planted for drill strip comparison of soft white winter wheat cultivars to determine yield and other agronomic characteristics.

## **Materials and Methods**

Twelve cultivars were planted on October 19, 1999 at the Macy Farms at Culver, Oregon, and 11 cultivars were planted on October 20, 1999 at the Dean Davis Farm in Prineville. Farm Drills were used to plant the strips. The Davis field had been previously cropped with sugar beets, while the Macy field had previously been cropped to potatoes. The fields were fertilized, irrigated, and weed control applied by the producers.

The soil test (top 1 ft.) at the Davis Farm results was: 30 lb/acre NO<sub>3</sub>, 20 lb/acre NH<sub>4</sub>, 428 ppm K, and 62 ppm P. The field was fertilized with 410 lbs. of 30-0-0-7 plus zinc on December 8, 1999. No soil test data or fertilizer program information was available for the Macy Farm field. The Macy Farms and Davis Farm fields were irrigated by center pivot and wheel line irrigation system, respectively. The Macy Farm and Dean Davis plots were harvested on August 14, and on August 21, respectively. One drill width of 12 ft. x 1162 ft. in length was harvested at Macy's, while 18 feet out of 24 ft. (two drill widths planted) x 594 ft. long was harvested at the Davis Farm.

The wheat was harvested with the producers' combines and the grain was weighed in a weigh wagon in the field. Samples for protein and test weight were taken and sent to Oregon State University Crop and Soil Science Department, Corvallis, for processing. Protein was predicted by near infrared spectroscopy (NIRS). Plant heights were measured and a lodging score was given for the strip. Test weight was reported at 12 percent moisture and protein at 10 percent moisture. Yield is reported at "as is" field harvest moisture. The data represents single replications. Many thanks to these two farms for providing the land, time, labor, and harvest.

## Results and Discussion

The yield, test weight, protein, height, lodging, and grain N uptake data are reported in Tables 1 and 2 for the two winter wheat drill strip locations. Tables 1 and 2 are sorted and ranked by highest to lowest yielding cultivar at each site. Davis Farm estimated that their field (Basin) maybe averaged 120 bu/acre, and Macy Farms estimated their field (Stephens) yielded 180 bu/acre.

Table 1. Grain yield, test weight, protein, height, lodging, and grain N uptake results for the 2000 soft white winter wheat variety drill strip demonstration planted on October 20,1999, at the Dean Davis Farm, Prineville, Oregon.

| Variety      | Grain yield<br>(bu/acre) | Test weight<br>(lb/bu) | Protein<br>(%) | Height<br>(in.) | Lodging<br>(%) | Grain N Uptake<br>(lb/acre) |
|--------------|--------------------------|------------------------|----------------|-----------------|----------------|-----------------------------|
| Hiller Club  | 133.6                    | 56.7                   | 8.5            | 37              | 0              | 119.5                       |
| Brundage     | 131.2                    | 60.9                   | 10.1           | 36              | 0              | 139.5                       |
| Weatherford  | 124.3                    | 59.0                   | 8.7            | 37              | 0              | 113.8                       |
| Stephens     | 122.2                    | 59.0                   | 9.5            | 34              | 0              | 123.4                       |
| Basin (M)    | 122.6                    | 59.4                   | 7.9            | 30              | 0              | 102.0                       |
| 7817         | 121.6                    | 59.3                   | 9.9            | 46              | 0              | 126.7                       |
| Basin (W)    | 116.4                    | 59.7                   | 9.1            | 33              | 0              | 115.2                       |
| MacVicar     | 116.2                    | 61.0                   | 9.3            | 34              | 0              | 113.8                       |
| Basin (E)    | 113.7                    | 60.6                   | 8.5            | 34              | 0              | 101.7                       |
| Madsen       | 112.8                    | 59.8                   | 9.2            | 31              | 0              | 109.2                       |
| Rodsen (mix) | 106.1                    | 59.8                   | 9.7            | 35              | 0              | 108.3                       |
| Rod          | 105.9                    | 58.5                   | 10.2           | 30              | 0              | 113.7                       |
| WPB 470      | 105.9                    | 59.6                   | 10.5           | 33              | 0              | 117.0                       |
| Mean         | 117.7                    | 59.5                   | 9.3            | 35              | 0              | 115.4                       |

E = east side of strips, W = west side of strips, M = middle of strips

Table 2. Grain yield, test weight, height, lodging, and grain N uptake results for the 2000 soft white winter wheat variety drill strip demonstration planted on October 19, 1999 at Macy Farms, Culver, Oregon.

| Variety       | Grain yield<br>(bu/acre) | Test weight<br>(lb/acre) | Protein<br>(%) | Height'<br>(in.) | Lodging | Grain N uptake<br>(lb/acre) |
|---------------|--------------------------|--------------------------|----------------|------------------|---------|-----------------------------|
| Brundage      | 208.1                    | 62.6                     | 10.1           | 38               | 0       | 221.2                       |
| Stephens      | 202.1                    | 59.5                     | 10.4           | 38               | 2       | 221.2                       |
| WB 470        | 199.2                    | 62.8                     | 10.6           | 39               | 1       | 222.3                       |
| MacVicar      | 199.2                    | 58.7                     | 10.1           | 38               | 2       | 211.8                       |
| Weatherford   | 196.4                    | 60.6                     | 10.2           | 44               | 0       | 210.9                       |
| Basin         | 196.0                    | 60.9                     | 9.6            | 35               | 3       | 198.1                       |
| Rodsen (mix)  | 191.0                    | 59.9                     | 9.9            | 41               | 0       | 199.0                       |
| Rod           | 190.9                    | 58.7                     | 9.9            | 45               | 5       | 198.9                       |
| 7817          | 189.7                    | 59.2                     | 10.4           | 45               | 1       | 207.7                       |
| Gene          | 186.0                    | 57.4                     | 10.9           | 36               | 0       | 213.4                       |
| Madsen        | 185.5                    | 60.6                     | 9.9            | 40               | 0       | 193.3                       |
| Hiller (club) | 171.9                    | 56.5                     | 10.3           | 41               | 30      | 186.4                       |
| Mean          | 193.0                    | 59.8                     | 10.2           | 39               | 4       | 207.0                       |

'Height is an average of three measurements taken across the field

The following spring wheat variety drill strip comparisons in Tables 3-5, were conducted by Tom Shibley, Round Butte Seed Growers, Culver, Oregon. No planting dates, fertilizer programs are available. The producers managed and harvested the strips in their fields. The field weights were made with the OSU Extension weigh wagon. Test weight and protein percent were processed with the same procedures as previously stated, by the Oregon State University State-wide campus team in Corvallis, Oregon. The drill strips were not replicated.

Table 3. 2000 soft white spring wheat variety drill strip comparison for yield, test weight, protein, and grain N uptake at the Big Falls Ranch, Terrebonne, Oregon.

| Variety   | Yield<br>(bu/acre) | Test weight<br>(lb/bu) | Protein<br>(%) | Height<br>(in.) | Grain N<br>uptake<br>(lb/acre) |
|-----------|--------------------|------------------------|----------------|-----------------|--------------------------------|
| Alpowa    | 114                | 61.5                   | 11.0           |                 | 132.2                          |
| Pennawawa | 111                | 61.4                   | 10.2           |                 | 119.5                          |
| Vanna     | 103                | 59.7                   | 11.0           |                 | 118.9                          |
| Mean      | 109                | 60.9                   | 10.7           |                 | 123.5                          |

Table 4. 2000 hard red spring wheat variety drill strip comparison for yield, test weight, protein, height, and grain N uptake at the Curt Locke farm, Culver, Oregon.

| Variety     | Yield<br>(bu/acre) | Test weight<br>(lb/bu) | Protein<br>(%) | Height<br>(in.) | Grain N<br>uptake<br>(lb/acre) |
|-------------|--------------------|------------------------|----------------|-----------------|--------------------------------|
| Brooks      | 112                | 60.9                   | 14.3           | 28              | 169.0                          |
| Bonus       | 106                | 59.9                   | 13.9           | 24              | 154.8                          |
| Yecora Roja | 104                | 61.0                   | 14.9           | 26              | 163.1                          |
| Standard    | 102                | 59.0                   | 13.6           | 27              | 145.6                          |
| Mean        | 106                | 60.2                   | 14.2           | 26              | 158.1                          |

Table 5. 2000 hard red spring wheat variety drill strip comparison for yield, test weight, protein, height, and grain N uptake at the Jim Carlson farm, Culver, Oregon.

| Variety     | Yield<br>(bu/acre) | Test Weight<br>(lb/bu) | Protein<br>(%) | Height<br>(in.) | Grain N<br>Uptake<br>(lb/acre) |
|-------------|--------------------|------------------------|----------------|-----------------|--------------------------------|
| Brooks      | 142                | 62.5                   | 12.3           | 33              | 194.7                          |
| Bonus       | 141                | 62.0                   | 11.8           | 32              | 175.7                          |
| Standard    | 129                | 63.3                   | 12.5           | 31              | 153.5                          |
| Yecora Roja | 117                | 60.3                   | 13.4           | 29              | 181.4                          |
| Mean        | 132                | 62.0                   | 12.5           | 31              | 176.3                          |