



Hard Red Spring Wheat

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Varietal Trials Results, January 2006



Spring wheat varieties are compared in trial plots at Waseca, Lamberton, Morris, Crookston, Stephen, Roseau and St. Paul. Wheat varieties are grown in replicated plots at each location. These plots are handled so that the factors affecting yield and other characteristics are as nearly the same for all varieties at each location as possible.

These hard red spring wheat trials are not designed for crop (species) comparisons, because the various crops are grown on different fields or with different management. The data should only be used to compare varieties within a table. Tested hard red spring wheat varieties are listed in the order of their flowering date in the tables.

Variety Selection Criteria

While grain yield is an important economic trait, return per acre also is affected by grain quality. Fusarium Head Blight (FHB), or scab, is an important consideration because it can dramatically reduce grain quality and yield.

The foliar disease rating, which represents the total complex of leaf diseases other than leaf rust, includes the Septoria complex and tan spot. Although varieties may differ for their response to each of those diseases, the rating does not differentiate among them. Consequently, the rating should be used as a general indication and only for varietal selection in areas where these diseases have been a problem or if the previous crop was wheat or barley.

Control of leaf diseases with fungicides may be warranted, even for varieties with an above-average rating.

The varietal response to FHB is presented as a severity rating, similar to the rating for leaf and stem rust. Resistance to spread in the head, the basis for this severity rating, is one of the resistance mechanisms to the disease. A second rating is provided to characterize ability to maintain sound, plump kernels despite visual disease symptoms on the head. This ability to maintain sound kernels, and thus test weight is another component to resistance.

Variety selection for 2006 continues to be a balance between yield potential, disease responses and grain quality. Leading varieties in Minnesota, based on acres planted, include Oxen, Knudson, Oklee, Granite, Briggs and Alsen. New releases for 2005 are Glenn (NDSU) and Ulen (MN). The variety Express was tested for the first time in the 2005 Minnesota variety trial.

Leaf rust continues to be a yearly problem on varieties with ratings of MS or worse. Varieties with ratings of MR or better should not experience economic levels of damage to this fungus in most years.

Stripe rust was a serious problem on susceptible varieties in some locations in 2004. This disease is not as widespread and does not occur as regularly as leaf rust, but can be very damaging when temperatures remain unseasonably cool into early July. Most varieties are resistant or moderately resistant. Trooper and Walworth are more susceptible, and sustained economic levels of damage in 2004.

Falling number data, an important end-use quality trait that can be determined at most local elevators, has been added to the grain-quality table. Falling number is measured in seconds, and values of 300 or higher are required for milling quality wheat. Falling number is related to preharvest sprouting because sprouted grain will always have low falling numbers. In the absence of visual sprouting, falling numbers are generally greater than 400, except in certain varieties.

Due to the increasing popularity of fungicide applications on wheat, we have been testing varietal response to application of fungicides at the time of herbicide application (Feekes 5), flag leaf emergence (Feekes 9), and at flowering (Feekes 10.51).

The practice of three fungicide applications during the growing season is not recommended. This fungicide regime was implemented to measure the varieties' yield potential when fungal diseases were controlled.

Growers' decisions regarding fungicide application should be based on the available decision support systems, and only if and when disease levels are forecasted to reach

economic damaging levels. These tests were carried out in the same field as the conventional (no-fungicide-applied) trials, so the results can be compared directly.

Three locations (Crookston, Morris and Roseau) and two locations (Crookston and Morris) were in-

cluded in the conventional vs. intensive comparison in 2004 and 2005, respectively. Over the two years, there was a 5- to 8-bushel/acre yield increase in response to fungicide treatment.

Varieties most susceptible to leaf and stripe rust diseases benefited

most from the fungicide applications.

Variety descriptions published in editions prior to 2005 have been discontinued because all of the information they contained is now included in the tables.

Origin, characteristics, and disease reactions of hard red spring wheat varieties.

| Variety | Origin ¹ | PVP Status ² | Days to Heading ³ | Height cm ³ | Straw Strength ⁴ | Leaf Rust ⁵ | Stripe Rust ⁵ | Other Leaf Diseases ⁵ | Scab | |
|-----------|---------------------|-------------------------|------------------------------|------------------------|-----------------------------|------------------------|--------------------------|----------------------------------|-------------------------------|------------------------------|
| | | | | | | | | | Disease Severity ⁵ | Grain Soundness ⁶ |
| Oklee | 2003 MN | PVP (94) | 64 | 80 | Medium | MR-MS | R | MR | MR-MS | 2.5 |
| Glenn | 2005 NDSU | PVP (pnd) | 64 | 87 | Strong | R | R | — | MR | 1.5 |
| Ulen | 2005 MN | PVP (pnd) | 64 | 81 | Medium | MR | R | MR-MS | MS | 3.5 |
| Trooper | 2004 Westbred | PVP (pnd) | 65 | 75 | V Strg | MR | MS-S | — | MR-MS | 2.5 |
| Briggs | 2002 SDSU | PVP (94) | 65 | 83 | Medium | R | R | MR | MR-MS | 3.0 |
| Walworth | 2001 SDSU | PVP (94) | 65 | 84 | Medium | MS | MS | MS-S | MR-MS | 2.5 |
| Banton | 2004 Trigen | PVP (pnd) | 65 | 83 | Strong | R-MR | R | — | MR-MS | 2.5 |
| Granger | 2004 SDSU | PVP (94) | 65 | 88 | Medium | MR | R | MR | MR-MS | 2.5 |
| Dapps | 2003 NDSU | PVP (94) | 66 | 92 | Medium | R | MR | MR-R | MS | 3.0 |
| Oxen | 1995 SDSU | PVP (94) | 66 | 79 | M Strg | MS-S | R | MS | MS-S | 3.0 |
| Express | 1992 Westbred | PVP (94) | 66 | 68 | V Strg | MR | R | — | — | — |
| Steele-ND | 2004 NDSU | PVP (94) | 66 | 81 | Medium | R | R | MR | MS | 2.5 |
| Reeder | 1999 NDSU | PVP (94) | 66 | 79 | Strong | MS-S | R | MR | MS | 3.5 |
| Mercury | 1999 N. Star G. | PVP (94) | 66 | 72 | Strong | MR | R | MR-R | S | 5.0 |
| Parshall | 1999 NDSU | PVP (94) | 67 | 90 | Strong | MS-S | R | MR-R | MR-MS | 2.0 |
| Alsen | 2000 NDSU | PVP (94) | 67 | 82 | Strong | MR | R | MR-MS | MR | 2.0 |
| Knudson | 2001 AgriPro | PVP (94) | 67 | 79 | M Strg | R | MR | MR-R | MR-MS | 2.5 |
| Freyr | 2004 AgriPro | PVP (94) | 67 | 82 | Medium | MR-MS | R | — | MR | 2.0 |
| Hanna | 2002 AgriPro | PVP (94) | 68 | 91 | M Strg | MS-S | R | MR-MS | MR | 2.0 |
| Norpro | 1999 AgriPro | PVP (94) | 69 | 75 | Strong | MR-MS | MR | MR-R | MS | 3.5 |
| Granite | 2002 Westbred | PVP (94) | 69 | 78 | V Strg | MS | MR | MR-MS | MR-MS | 2.5 |
| Marshall | 1982 MN | — | 71 | 77 | Strong | S | R | MS | MS | 3.5 |
| Saturn | 2004 N. Star G. | PVP (94) | 72 | 87 | V Strg | MR-MS | R | — | MS | 3.5 |
| Polaris | 2004 N. Star G. | PVP (94) | 73 | 85 | V Strg | MS | R | — | MS | 3.5 |
| Mean | | | 67 | 94 | | | | | | |

¹ Abbreviations: MN = Minnesota Agricultural Expt. Station and USDA-ARS, North Station; N. Star G. = North Star Genetics; NDSU = North Dakota State University Research foundation; SDSU = South Dakota Agricultural Expt. Stn.; Trigen = Trigen Seed Services LLC.

² PVP = plant variety protection. When the letters are followed by (94), seed of that variety may not be sold by a grower to anyone without express permission of the variety's developer/owner. If the PVP designation is followed by (pnd) consider that the variety has PVP (94) protection.

³ 2005 data. Days to heading is approximate because not all locations are included.

⁴ 2002-2005 data.

⁵ R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible.

⁶ Ability to maintain plump, sound kernels under scab epidemics; 1 = good, 5 = poor.

Grain quality of hard red spring wheat varieties.

| Variety | Test Weight (Lb/Bu) | | Protein (%) ¹ | | Baking | Falling | Pre-Harvest |
|-----------|---------------------|--------|--------------------------|--------|----------------------|---------------------|-------------|
| | 2005 | 2-Year | 2005 | 2-Year | Quality ² | Number ³ | Sprouting |
| Oklee | 59.8 | 60.4 | 15.2 | 15.0 | Low-Med. | 6,0,0,1 | R |
| Glenn | 61.5 | 62.0 | 15.9 | 15.5 | — | — | R |
| Ulen | 58.5 | 59.3 | 15.2 | 15.0 | Med. | 6,1,0,0 | MS |
| Trooper | 59.9 | 59.9 | 14.4 | 14.1 | — | — | R |
| Briggs | 59.5 | 60.1 | 14.9 | 14.8 | Med. | 5,1,1,0 | R |
| Walworth | 58.1 | 58.4 | 14.8 | 14.6 | Med.-High | 6,1,0,0 | R |
| Banton | 60.9 | 60.9 | 14.6 | 14.6 | — | 6,0,0,1 | — |
| Granger | 59.2 | 59.6 | 14.8 | 14.7 | — | 4,3,0,0 | MR |
| Dapps | 57.6 | 58.8 | 16.3 | 16.0 | High | 4,2,1,0 | R |
| Oxen | 55.6 | 56.7 | 14.6 | 14.5 | High-Med. | 5,2,0,0 | R |
| Express | 55.4 | — | 14.7 | — | — | — | — |
| Steele-ND | 59.8 | 60.6 | 15.4 | 15.3 | — | 7,0,0,0 | R |
| Reeder | 56.7 | 58.3 | 14.0 | 14.2 | Med.-High | 7,0,0,0 | R |
| Mercury | 57.5 | 58.6 | 14.7 | 14.2 | Med. | 4,2,1,0 | MS |
| Parshall | 60.2 | 60.7 | 14.9 | 14.7 | High-Med. | 7,0,0,0 | R |
| Alsen | 59.7 | 60.1 | 15.4 | 15.1 | High | 7,0,0,0 | R |
| Knudson | 59.1 | 59.5 | 14.5 | 14.3 | Med.-High | 5,2,0,0 | R |
| Freyr | 58.5 | 58.8 | 14.9 | 14.7 | — | — | R |
| Hanna | 58.8 | 59.5 | 14.9 | 14.7 | High | 5,2,0,0 | R |
| Norpro | 56.8 | 57.5 | 14.8 | 14.5 | Med. | 6,0,1,0 | R |
| Granite | 60.4 | 61.1 | 15.4 | 15.4 | Med.Low | 3,3,1,0 | R |
| Marshall | 54.8 | 55.9 | 14.1 | 13.9 | Low | 5,2,0,0 | R |
| Saturn | 55.5 | 56.2 | 15.4 | 15.2 | — | — | R |
| Polaris | 57.2 | 58.0 | 13.9 | 13.6 | — | — | R |
| Mean | 58.7 | 59.2 | 14.4 | 14.7 | | | |

¹ 12% moisture basis.

² 2001-2003 crop years.

³ Falling Number is the number of trials in which the variety had falling numbers greater than 400, 350-400, 300-350, and less than 250. Based on 7 environments in 2003 and 2004. A variety that had falling numbers of greater than 400 in all 7 environments (i.e., 7,0,0,0) is best.

Hard Red Spring Wheat Planting Rate and Date.

Calculating and seeding the appropriate amount of seed is an important first step towards maximizing yield. The seeding rate is a function of the number of kernels per pound of seed, the percent germination of the lot, the expected stand loss as a function of the quality of the seedbed, and the desired stand. In Minnesota, an average optimum stand for hard red spring wheat when planted early is between 28 to 30 plants per square foot or approximately 1.25 million plants per acre. This number should increase by 1 to 2 plants per square foot for every week planting is delayed past the early, optimum seeding date. Expected stand loss even under good seedbed conditions is between 10 to 20% and will increase with as poor seedbed or improper seed placement due to poor depth control.

The general formula for calculating a seeding rate is:

$$\text{Seeding Rate (Pounds/Acre)} = \frac{\text{Desired Stand (Plants/Acre)} \times (1 - \text{Expected Stand Loss})}{(\text{Seeds/Pound}) \times \text{Percentage Germination}}$$

Calculate the seeding rate for every single seed lot and calibrate the drill accordingly.

Example: Early variety.

| Desired Stand, (Plants/Acre) | Expected Stand Loss | Seeds per Pound | Percentage Germination | Seeding Rate, (Lb/Acre) |
|------------------------------|---------------------|-----------------|------------------------|-------------------------|
| 1.25 million | 0.20 | 14,000 | 0.95 | 113 |

Grain yield (percent of the mean) of hard red spring wheat varieties in Minnesota, northern locations.

| Variety | Crookston | | | Roseau ¹ | Stephen | | |
|----------------|-----------|--------|--------|---------------------|---------|--------|--------|
| | 2005 | 2-Year | 3-Year | 2-Year | 2005 | 2-Year | 3-Year |
| Oklee | 109 | 103 | 101 | 99 | 99 | 101 | 99 |
| Glenn | 103 | 101 | — | 104 | 109 | 102 | — |
| Ulen | 98 | 93 | 99 | 108 | 87 | 91 | 92 |
| Trooper | 95 | 100 | — | — | 101 | 106 | — |
| Briggs | 97 | 97 | 95 | 110 | 92 | 97 | 100 |
| Walworth | 98 | 100 | 98 | 101 | 115 | 108 | 103 |
| Banton | 95 | 100 | — | — | 100 | 101 | — |
| Granger | 117 | 99 | 95 | 97 | 116 | 110 | 106 |
| Dapps | 96 | 95 | 96 | 100 | 93 | 90 | 93 |
| Oxen | 100 | 92 | 92 | 103 | 106 | 100 | 99 |
| Express | 82 | — | — | — | 84 | — | — |
| Steele-ND | 100 | 95 | 97 | 99 | 95 | 99 | 103 |
| Reeder | 82 | 85 | 87 | 102 | 87 | 93 | 97 |
| Mercury | 96 | 97 | 99 | 109 | 111 | 110 | 105 |
| Parshall | 86 | 84 | 89 | 98 | 86 | 88 | 87 |
| Alsen | 98 | 101 | 98 | 96 | 91 | 92 | 94 |
| Knudson | 115 | 115 | 111 | 98 | 111 | 105 | 105 |
| Freyr | 111 | 106 | — | 94 | 119 | 101 | — |
| Hanna | 104 | 102 | 101 | 94 | 95 | 97 | 99 |
| Norpro | 101 | 101 | 98 | 96 | 96 | 98 | 101 |
| Granite | 109 | 110 | 105 | 98 | 101 | 96 | 98 |
| Marshall | 91 | 89 | 92 | 88 | 75 | 85 | 92 |
| Saturn | 112 | 104 | — | — | 94 | 100 | — |
| Polaris | 123 | 115 | — | — | 138 | 121 | — |
| Mean (Bu/Acre) | 62.3 | 74.5 | 77.3 | 91.3 | 83.3 | 77.4 | 76.5 |
| LSD | 11.7 | 15.5 | 13.2 | 17.2 | 17.7 | 25.9 | 14.8 |

¹Roseau was abandoned in 2005 due to flooding. The 2-year data are 2003 and 2004.

Grain yield (percent of the mean) of hard red spring wheat varieties in Minnesota, southern locations.

| Variety | Lamberton | | | Morris | | | St. Paul | | | Waseca | | |
|-----------|-----------|--------|--------|--------|--------|--------|----------|--------|--------|--------|--------|--------|
| | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year |
| Oklee | 117 | 106 | 103 | 99 | 103 | 97 | 95 | 99 | 94 | 126 | 114 | 110 |
| Glenn | 91 | 89 | — | 87 | 95 | — | 123 | 113 | — | 119 | 104 | — |
| Ulen | 115 | 109 | 104 | 101 | 102 | 101 | 114 | 121 | 112 | 131 | 127 | 120 |
| Trooper | 71 | 81 | — | 112 | 98 | — | 102 | 116 | — | 79 | 83 | — |
| Briggs | 118 | 108 | 104 | 118 | 113 | 105 | 105 | 101 | 99 | 109 | 105 | 102 |
| Walworth | 110 | 106 | 102 | 116 | 98 | 102 | 111 | 107 | 108 | 119 | 113 | 108 |
| Banton | 112 | 100 | — | 107 | 106 | — | 102 | 105 | — | 102 | 93 | — |
| Granger | 122 | 115 | 110 | 105 | 107 | 102 | 95 | 96 | 97 | 155 | 123 | 118 |
| Dapps | 127 | 117 | 107 | 93 | 99 | 94 | 109 | 104 | 101 | 104 | 106 | 102 |
| Oxen | 76 | 81 | 91 | 78 | 86 | 96 | 70 | 89 | 97 | 103 | 100 | 103 |
| Express | 117 | — | — | 104 | — | — | 119 | — | — | 74 | — | — |
| Steele-ND | 126 | 113 | 109 | 98 | 99 | 99 | 131 | 126 | 115 | 126 | 119 | 112 |
| Reeder | 59 | 75 | 85 | 78 | 92 | 98 | 108 | 111 | 110 | 84 | 91 | 93 |
| Mercury | 152 | 133 | 123 | 152 | 132 | 126 | 126 | 131 | 123 | 128 | 126 | 119 |
| Parshall | 84 | 74 | 75 | 90 | 87 | 88 | 95 | 105 | 106 | 97 | 86 | 90 |

**Grain yield (percent of the mean) of hard red spring wheat varieties in Minnesota, southern locations
(continued).**

| Variety | Lamberton | | | Morris | | | St. Paul | | | Waseca | | |
|-------------------|-----------|--------|--------|--------|--------|--------|----------|--------|--------|--------|--------|--------|
| | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year |
| Alsen | 84 | 89 | 91 | 104 | 101 | 97 | 100 | 93 | 94 | 92 | 91 | 89 |
| Knudson | 89 | 102 | 106 | 113 | 115 | 111 | 127 | 116 | 114 | 101 | 111 | 111 |
| Freyr | 122 | 115 | — | 109 | 108 | — | 89 | 96 | — | 101 | 101 | — |
| Hanna | 103 | 107 | 98 | 96 | 92 | 93 | 62 | 70 | 79 | 86 | 80 | 84 |
| Norpro | 82 | 95 | 101 | 100 | 97 | 98 | 66 | 70 | 82 | 92 | 98 | 99 |
| Granite | 120 | 116 | 118 | 101 | 99 | 103 | 93 | 95 | 96 | 90 | 94 | 97 |
| Marshall | 36 | 57 | 69 | 48 | 59 | 73 | 46 | 45 | 60 | 30 | 47 | 61 |
| Saturn | 112 | 102 | — | 101 | 101 | — | 121 | 125 | — | 98 | 102 | — |
| Polaris | 59 | 78 | — | 85 | 97 | — | 99 | 102 | — | 70 | 81 | — |
| Mean (Bu/Acre) | 35.8 | 45.4 | 47.2 | 43.6 | 63.3 | 68.2 | 51.0 | 58.9 | 67.8 | 39.8 | 52.9 | 65.0 |
| LSD | 31.0 | 25.9 | 22.5 | 23.7 | 21.8 | 20.4 | 18.7 | 22.1 | 20.6 | 23.9 | 25.9 | 16.8 |

Grain yield (percent of the mean) of hard red spring wheat varieties in Minnesota.

| Variety | State | | | North | | | South | | |
|------------------|-------|--------|--------|-------|--------|--------|-------|--------|--------|
| | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year |
| Oklee | 108 | 104 | 101 | 104 | 102 | 100 | 109 | 106 | 101 |
| Glenn | 105 | 101 | — | 106 | 102 | — | 105 | 100 | — |
| Ulen | 108 | 108 | 105 | 92 | 97 | 99 | 115 | 115 | 110 |
| Trooper | 94 | 96 | — | 98 | 98 | — | 91 | 95 | — |
| Briggs | 107 | 104 | 102 | 94 | 100 | 101 | 113 | 107 | 102 |
| Walworth | 111 | 105 | 103 | 107 | 103 | 101 | 114 | 106 | 105 |
| Banton | 103 | 100 | — | 97 | 99 | — | 105 | 101 | — |
| Granger | 118 | 108 | 104 | 116 | 103 | 100 | 119 | 111 | 107 |
| Dapps | 103 | 102 | 99 | 94 | 95 | 96 | 108 | 106 | 101 |
| Oxen | 89 | 92 | 97 | 103 | 98 | 98 | 82 | 89 | 96 |
| Express | 97 | — | — | 83 | — | — | 104 | — | — |
| Steele-ND | 112 | 108 | 105 | 97 | 97 | 100 | 120 | 114 | 109 |
| Reeder | 83 | 92 | 96 | 84 | 92 | 95 | 82 | 92 | 97 |
| Mercury | 127 | 121 | 115 | 104 | 106 | 104 | 139 | 131 | 123 |
| Parshall | 90 | 88 | 90 | 86 | 89 | 90 | 92 | 88 | 90 |
| Alsen | 95 | 95 | 94 | 94 | 97 | 96 | 95 | 93 | 93 |
| Knudson | 109 | 109 | 109 | 113 | 106 | 106 | 107 | 111 | 110 |
| Freyr | 108 | 104 | — | 115 | 101 | — | 105 | 105 | — |
| Hanna | 91 | 92 | 92 | 100 | 98 | 98 | 87 | 87 | 88 |
| Norpro | 90 | 93 | 96 | 99 | 99 | 99 | 85 | 90 | 95 |
| Granite | 102 | 102 | 102 | 105 | 105 | 101 | 101 | 101 | 103 |
| Marshall | 54 | 65 | 76 | 83 | 85 | 91 | 40 | 52 | 66 |
| Saturn | 106 | 105 | — | 103 | 102 | — | 108 | 107 | — |
| Polaris | 96 | 99 | — | 131 | 114 | — | 78 | 89 | — |
| Mean (Bu/Acre) | 51.9 | 64.2 | 67.8 | 72.8 | 78.6 | 76.3 | 42.5 | 55.1 | 62.1 |
| LSD | 17.0 | 9.3 | 6.6 | 19.0 | 12.6 | 8.2 | 20.7 | 12.5 | 9.7 |
| No. Environments | 6 | 13 | 20 | 2 | 5 | 8 | 4 | 8 | 12 |

Grain yield (percent of the mean) of hard red spring wheat varieties grown under conventional (Con) and intensive (Int) management.¹

| Variety | Grain Yield (Bu/Acre) | | | | Test Weight (Lb/Bu) | | | | Protein (%) | | | |
|-----------|-----------------------|------------------|------|------|---------------------|------|------|------|-------------|------|------|------|
| | 2004 | | 2005 | | 2004 | | 2005 | | 2004 | | 2005 | |
| | Con ¹ | Int ¹ | Con | Int | Con | Int | Con | Int | Con | Int | Con | Int |
| Alsen | 88 | 90 | 53 | 56 | 61.2 | 61.9 | 59.9 | 59.2 | 14.5 | 14.6 | 15.3 | 15.3 |
| Banton | 92 | 92 | 53 | 57 | 61.4 | 61.2 | 60.6 | 59.7 | 14.3 | 14.6 | 14.6 | 14.8 |
| Briggs | 94 | 94 | 56 | 59 | 61.7 | 61.5 | 59.3 | 58.4 | 14.2 | 14.5 | 14.8 | 14.8 |
| Dapps | 91 | 86 | 50 | 51 | 60.9 | 60.0 | 57.5 | 57.1 | 14.8 | 15.5 | 16.0 | 15.5 |
| Express | — | — | 48 | 43 | — | — | 55.2 | 54.4 | — | — | 14.4 | 14.8 |
| Freyr | 87 | 92 | 58 | 58 | 60.3 | 60.7 | 58.9 | 58.6 | 14.0 | 14.5 | 14.6 | 15.2 |
| Glenn | — | — | 51 | 57 | — | — | 60.9 | 60.7 | — | — | 15.6 | 15.7 |
| Granger | 90 | 89 | 59 | 65 | 61.0 | 61.2 | 56.9 | 58.2 | 14.4 | 14.4 | 14.6 | 14.8 |
| Granite | 87 | 100 | 56 | 62 | 62.5 | 62.9 | 60.7 | 60.9 | 14.8 | 15.1 | 14.7 | 15.2 |
| Hanna | 81 | 94 | 53 | 59 | 61.5 | 61.2 | 59.5 | 59.3 | 14.2 | 14.5 | 14.6 | 15.0 |
| HJ98 | 87 | 100 | — | — | 59.3 | 60.4 | — | — | 13.4 | 13.7 | — | — |
| Ingot | 81 | 88 | — | — | 62.7 | 62.7 | — | — | 14.0 | 14.9 | — | — |
| Knudson | 93 | 96 | 61 | 64 | 60.1 | 60.3 | 59.3 | 58.8 | 13.9 | 14.0 | 14.3 | 14.4 |
| Marshall | 71 | 96 | 39 | 64 | 58.2 | 60.8 | 55.6 | 58.3 | 13.5 | 13.6 | 13.4 | 14.1 |
| Mercury | 94 | 108 | 63 | 65 | 60.5 | 60.8 | 57.2 | 56.7 | 13.5 | 13.7 | 14.2 | 14.2 |
| Norpro | 83 | 100 | 53 | 60 | 58.9 | 59.9 | 57.4 | 56.2 | 13.6 | 13.7 | 14.5 | 14.5 |
| Oklee | 88 | 94 | 55 | 58 | 61.9 | 62.5 | 59.9 | 59.5 | 14.7 | 14.8 | 15.2 | 15.0 |
| Oxen | 89 | 94 | 48 | 58 | 59.0 | 60.3 | 55.6 | 56.4 | 14.0 | 13.9 | 14.3 | 14.8 |
| P 2375 | 89 | 93 | — | — | 61.5 | 61.9 | — | — | 14.5 | 14.2 | — | — |
| Parshall | 80 | 93 | 46 | 52 | 61.5 | 62.2 | 60.1 | 59.6 | 14.3 | 14.9 | 14.1 | 15.0 |
| Polaris | 90 | 96 | 57 | 72 | 60.2 | 60.5 | 58.3 | 59.6 | 13.7 | 13.4 | 13.4 | 14.2 |
| Reeder | 88 | 98 | 43 | 52 | 60.6 | 61.5 | 56.4 | 57.4 | 14.3 | 14.6 | 13.6 | 14.2 |
| Saturn | 88 | 92 | 57 | 70 | 57.9 | 59.5 | 56.7 | 57.6 | 14.6 | 14.4 | 15.1 | 15.5 |
| Steele-ND | 88 | 87 | 52 | 52 | 61.8 | 62.0 | 59.6 | 58.7 | 14.7 | 14.6 | 14.9 | 15.1 |
| Trooper | 77 | 105 | 54 | 57 | 59.7 | 62.4 | 59.4 | 59.7 | 13.3 | 14.0 | 14.2 | 14.5 |
| Ulen | — | — | 52 | 58 | — | — | 57.9 | 57.9 | — | — | 15.3 | 15.2 |
| Verde | 90 | 93 | — | — | 59.6 | 60.3 | — | — | 13.9 | 13.9 | — | — |
| Walworth | 80 | 96 | 56 | 61 | 59.7 | 60.7 | 58.1 | 57.8 | 14.2 | 14.7 | 14.5 | 14.9 |
| Mean | 86.6 | 94.6 | 53.1 | 58.7 | 60.5 | 61.2 | 58.4 | 58.4 | 14.1 | 14.4 | 14.6 | 14.9 |
| LSD | 6.2 | 6.2 | 7.1 | 7.1 | 1.9 | 1.9 | 0.7 | 0.7 | 1.0 | 1.0 | 0.3 | 0.3 |

¹ Intensive trials received fungicide treatments at Feekes 5 (Stratego @ 5 fl.oz/acre), Feekes 9 (Tilt @ 4 fl.oz/acre), and Feekes10.51 (Folicur @ 4 fl.oz./acre). Conventional trials received no fungicide.