

2016 Hard Red Spring Wheat Field Crop Trials Results



Minnesota Agricultural Experiment Station and the College of Food, Agricultural and Natural Resource Sciences

Spring wheat varieties were sown in trial plots at Crookston, Lamberton, Morris, Roseau, St. Paul and Waseca and on-farm sites near Benson, Fergus Falls, Hallock, Le Center, Kimball, Oklee, Perley, Stephen and Strathcona. 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 alphabetical order in the tables.

Variety Selection Criteria

While grain yield is an important economic trait, return per acre is also affected by grain quality. Because Fusarium Head Blight (FHB), or scab, can reduce grain quality and yield dramatically, it is an important consideration. Disease ratings are on a 1-9 scale where 1 = most resistant and 9 = most susceptible. Rating differences of 2 or more should be considered significant.

During the past few years, leaf rust infections throughout Minnesota have been low. Stripe rust was observed at several locations in 2015 and to a lesser extent, 2016. The majority of varieties are resistant or moderately resistant, but WB9507 is susceptible.

Table 1. Origin and agronomic characteristics of hard red spring wheat varieties in Minnesota in single-year (2016) and multiple-year comparisons.

| Entry | Origin ¹ | PVP Status | Days to Heading ² | Height Inches ² | Straw Strength ³ |
|-----------------|-----------------------------|---------------|------------------------------|----------------------------|-----------------------------|
| Bolles | 2015 MN | PVP (pending) | 62.1 | 32.3 | 4 |
| Boost | 2016 SDSU | PVP (pending) | 62.7 | 29.6 | 5 |
| Chevelle | 2014 Meridian Seeds | PVP (94) | 58.9 | 30.6 | 4 |
| Dyna-Gro Ambush | 2016 Dyna-Gro | PVP (pending) | 58.4 | 31.8 | 5 |
| Elgin-ND | 2013 NDSU | PVP (94) | 59.8 | 35.9 | 6 |
| Faller | 2007 NDSU | PVP (94) | 61.6 | 32.9 | 5 |
| Focus | 2015 SDSU | PVP (pending) | 55.6 | 36.4 | 7 |
| Forefront | 2012 SDSU | PVP (94) | 57.6 | 37.2 | 6 |
| Glenn | 2005 NDSU | PVP (94) | 57.7 | 35.3 | 5 |
| HRS 3361 | 2013 CROPLAN by WinField | PVP (94) | 60.3 | 31.3 | 3 |
| HRS 3419 | 2014 CROPLAN by WinField | PVP (pending) | 63.8 | 31.7 | 3 |
| HRS 3504 | 2015 CROPLAN by WinField | PVP (pending) | 62.4 | 28.7 | 3 |
| HRS 3530 | 2015 CROPLAN by WinField | PVP (pending) | 61.8 | 35.0 | 5 |
| HRS 3616 | 2016 CROPLAN by WinField | PVP (pending) | 60.2 | 31.4 | 4 |
| LCS Albany | 2009 Limagrain Cereal Seeds | PVP (94) | 63.4 | 30.3 | 5 |
| LCS Anchor | 2016 Limagrain Cereal Seeds | PVP (pending) | 58.0 | 28.9 | 5 |
| LCS Breakaway | 2012 Limagrain Cereal Seeds | PVP (94) | 59.8 | 30.2 | 4 |
| LCS Iguacu | 2014 Limagrain Cereal Seeds | PVP (94) | 62.3 | 31.0 | 4 |
| LCS Nitro | 2015 Limagrain Cereal Seeds | PVP (94) | 62.3 | 31.1 | 5 |
| LCS Prime | 2016 Limagrain Cereal Seeds | PVP (pending) | 58.1 | 32.5 | 5 |
| Linkert | 2013 MN | PVP (94) | 59.9 | 29.3 | 2 |
| Norden | 2012 MN | PVP (94) | 60.3 | 30.5 | 3 |
| Prevail | 2014 SDSU | PVP (94) | 57.9 | 32.8 | 4 |
| Prosper | 2011 NDSU | PVP (94) | 61.6 | 33.5 | 6 |
| RB07 | 2007 MN | PVP (94) | 59.0 | 31.7 | 5 |
| Rollag | 2011 MN | PVP (94) | 59.2 | 29.9 | 3 |
| Shelly | 2016 MN | PVP (pending) | 62.0 | 30.6 | 5 |
| Surpass | 2016 SDSU | PVP (pending) | 57.0 | 33.7 | 7 |
| SY Ingmar | 2014 AgriPro/Syngenta | PVP (94) | 60.5 | 31.0 | 4 |
| SY Rowyn | 2013 AgriPro/Syngenta | PVP (94) | 59.3 | 30.5 | 5 |
| SY Soren | 2011 AgriPro/Syngenta | PVP (94) | 59.6 | 29.7 | 4 |
| SY Valda | 2015 AgriPro/Syngenta | PVP (94) | 60.1 | 30.7 | 4 |
| TCG-Cornerstone | 2016 21st Century Genetics | PVP (pending) | 60.5 | 29.1 | 3 |
| TCG-Spittfire | 2016 21st Century Genetics | PVP (pending) | 63.5 | 30.1 | 3 |
| TCG-Wildfire | 2016 21st Century Genetics | PVP (pending) | 60.7 | 33.6 | 4 |
| WB-Mayville | 2011 WestBred | PVP (94) | 58.8 | 28.8 | 3 |
| WB9507 | 2013 Westbred | PVP (94) | 59.8 | 33.3 | 5 |
| WB9653 | 2015 Westbred | PVP (94) | 61.8 | 29.1 | 4 |
| Mean | | | 60.2 | 31.6 | |

¹Abbreviations: MN = Minnesota Agricultural Experiment Station; NDSU = North Dakota State University Research Foundation; SDSU = South Dakota Agricultural Experiment Station

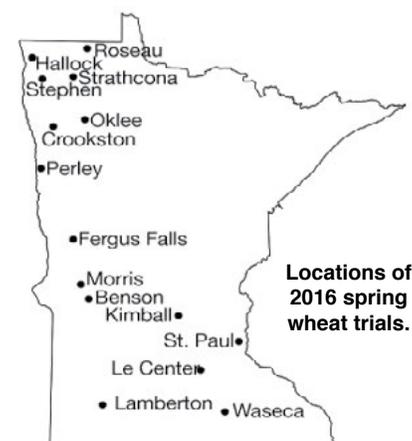
²2016 data.

³1-9 scale in which 1 is the strongest straw and 9 is the weakest. Based on 2014-2016 data. The rating of newer entries may change by as much as one rating point as more data are collected.

Stripe rust can be very damaging when temperatures remain unseasonably cool into early July. Carefully consider a variety's rating for leaf and stripe rust and plan to use a fungicide if a variety is rated 5 or higher and disease levels warrant treatment. Varieties with ratings of 4 or better should not experience economic levels of damage in most years. Stem rust ratings are included in the disease tables

because there are differences in variety reaction. However, the levels of this disease have been very low in production fields in recent years, even on susceptible varieties.

Bacterial leaf streak ratings of all varieties that have been evaluated for at least two years are presented in the disease table. This disease cannot be controlled with fungicides. Selection



Locations of 2016 spring wheat trials.

Table 2. Grain quality of hard red spring wheat varieties in Minnesota in single-year (2016) and multiple-year comparisons.

| Entry | Test Weight (Lb/Bu) | | Protein (%) ¹ | | Baking Quality ² | Pre-Harvest Sprouting ³ |
|-------------------------|---------------------|-------------|--------------------------|-------------|-----------------------------|------------------------------------|
| | 2016 | 2 yr | 2016 | 2 yr | | |
| Bolles | 58.3 | 59.4 | 15.8 | 15.9 | 1 | 1 |
| Boost | 58.7 | 59.0 | 14.6 | 14.8 | 3 | 4 |
| Chevelle | 59.1 | 60.2 | 12.9 | 13.2 | — | 3 |
| Dyna-Gro Ambush | 60.2 | — | 14.7 | — | — | — |
| Elgin-ND | 58.9 | 59.6 | 14.4 | 14.6 | 3 | 2 |
| Faller | 58.6 | 59.6 | 13.2 | 13.4 | 5 | 1 |
| Focus | 60.1 | 61.3 | 15.1 | 15.0 | 3 | 4 |
| Forefront | 59.8 | 60.6 | 14.7 | 14.6 | 5 | 3 |
| Glenn | 61.0 | 62.0 | 14.8 | 15.0 | 1 | 1 |
| HRS 3361 | 58.6 | 59.4 | 13.8 | 13.9 | 3 | 2 |
| HRS 3419 | 58.5 | 58.8 | 12.9 | 13.2 | 6 | 4 |
| HRS 3504 | 58.9 | 58.9 | 13.3 | 13.7 | — | 1 |
| HRS 3530 | 59.5 | 60.2 | 14.4 | 14.4 | — | 2 |
| HRS 3616 | 58.8 | — | 15.0 | — | — | — |
| LCS Albany | 59.3 | 59.9 | 13.3 | 13.3 | 6 | 4 |
| LCS Anchor | 58.5 | — | 14.9 | — | — | — |
| LCS Breakaway | 59.5 | 60.6 | 14.9 | 14.8 | 5 | 2 |
| LCS Iguacu | 60.1 | 60.7 | 12.5 | 12.9 | 7 | 2 |
| LCS Nitro | 58.7 | 59.6 | 13.1 | 13.2 | 4 | 4 |
| LCS Prime | 58.0 | 59.4 | 12.9 | 13.2 | — | 2 |
| Linkert | 59.6 | 60.4 | 14.9 | 15.0 | 1 | 2 |
| Norden | 60.2 | 61.3 | 13.9 | 14.0 | 4 | 1 |
| Prevail | 59.5 | 60.3 | 14.1 | 14.1 | 4 | 4 |
| Prosper | 58.9 | 59.9 | 13.4 | 13.6 | 5 | 2 |
| RB07 | 58.6 | 59.8 | 14.5 | 14.5 | 3 | 2 |
| Rollag | 59.9 | 60.8 | 14.7 | 14.8 | 6 | 1 |
| Shelly | 59.4 | 60.1 | 13.4 | 13.8 | 5 | 1 |
| Surpass | 58.8 | 59.6 | 14.5 | 14.6 | — | 2 |
| SY Ingmar | 59.9 | 60.7 | 14.3 | 14.7 | 2 | 2 |
| SY Rowyn | 59.7 | 60.3 | 13.7 | 13.8 | 3 | 3 |
| SY Soren | 59.1 | 59.5 | 14.6 | 14.7 | 4 | 2 |
| SY Valda | 59.6 | 60.2 | 13.7 | 13.8 | — | 3 |
| TCG-Cornerstone | 58.9 | — | 14.6 | — | — | — |
| TCG-Spitfire | 57.7 | — | 13.5 | — | — | — |
| TCG-Wildfire | 58.9 | — | 14.3 | — | — | — |
| WB-Mayville | 58.9 | 59.7 | 14.7 | 14.6 | 3 | 3 |
| WB9507 | 58.1 | 58.8 | 13.4 | 13.5 | 3 | 4 |
| WB9653 | 59.0 | 59.6 | 13.3 | 13.5 | — | 1 |
| Mean | 59.3 | 60.7 | 14.1 | 14.2 | | |
| No. Environments | 9 | 11 | 9 | 11 | | |

¹12% moisture basis.

²2014-2015 crop years.

³1-9 scale in which 1 is best and 9 is worst. Values of 1-3 should be considered as resistant.

of more resistant varieties is the only recommended practice at this time to reduce losses due to this disease. The rating of newer varieties may change by as much as one rating point as more data is collected.

The “Other Leaf Diseases” rating represents a combined reaction to septoria 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 fungal leaf diseases with fungicides may be warranted, even for varieties with an above-average rating.

Linkert was the no. 1 variety in Minnesota in 2016, sown on 27.8% of the state's wheat acres. WB-Mayville was the 2nd most popular variety at 13.1%, followed by Prosper (10.2%), Bolles (8.8%) and Faller (6.0%). The 2016 releases Shelly (U of MN); Boost and Surpass (SDSU); Dyna-Gro Ambush (Dyna-Gro); HRS 3616 (CROPLAN by WinField); LCS Anchor and LCS Prime (Limagrain Cereal Seeds); and TCG-Cornerstone, TCG-Spitfire, and TCG-Wildfire (21st Century Genetics) were included in the 2016 trials and their data (multi-year for Boost, LCS Prime, Shelly, and Surpass) is presented for the first time this year. Testing

of Barlow, MS Stingray and Samson was discontinued.

Due to the increased use of fungicides on wheat in Minnesota, we initiated an additional variety trial in 2004 in which fungicides are applied at the time of herbicide application (Feekes 5), flag leaf emergence (Feekes 9) and at the onset of 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' performance when fungal diseases were controlled to the maximum extent possible. Decisions regarding fungicide applications should be based on the available decision support systems, and used only if and when disease levels are forecasted to reach economically damaging levels. The additional performance evaluations were carried out adjacent to the conventional (no fungicides applied) trials, so results can be compared directly. Data from

trials conducted in Lamberton, Morris, Crookston, and Roseau are included in the 2016 and multi-year summaries. In the two northern locations, the fungicide regime as applied in these trials increased grain yield on average by 5.2 bu/acre in 2016 and by 11.2 bu/acre over the past three years. The two southern locations, Lamberton and Morris, averaged 7.2 and 5.7 bu/acre higher grain yield when fungicide protected in 2016 and over the 3-year average, respectively. Rather than

Table 3. Disease reactions¹ of hard red spring wheat varieties in Minnesota in multiple-year comparisons.

| Entry | Leaf Rust | Stripe Rust ² | Stem Rust ³ | Bacterial Leaf Streak ⁴ | Other Leaf Diseases ⁵ | Scab |
|-----------------|-----------|--------------------------|------------------------|------------------------------------|----------------------------------|------|
| Bolles | 1 | 1 | 2 | 4 | 4 | 4 |
| Boost | 2 | 2 | 3 | 2 | 7 | 4 |
| Chevelle | — | 1 | 1 | — | 6 | 5 |
| Dyna-Gro Ambush | — | — | — | — | 4 | — |
| Elgin-ND | 2 | 2 | 2 | 5 | 5 | 5 |
| Faller | 5 | 5 | 2 | 4 | 4 | 4 |
| Focus | 3 | 3 | 3 | 3 | 7 | 4 |
| Forefront | 2 | 2 | 4 | 3 | 4 | 3 |
| Glenn | 5 | 1 | 1 | 4 | 5 | 3 |
| HRS 3361 | 3 | 3 | 3 | 4 | 4 | 5 |
| HRS 3419 | 4 | 1 | 1 | 6 | 3 | 5 |
| HRS 3504 | — | 2 | 2 | — | 4 | 6 |
| HRS 3530 | — | 3 | 1 | — | 4 | 4 |
| HRS 3616 | — | — | — | — | 5 | — |
| LCS Albany | 2 | 3 | 3 | 6 | 5 | 4 |
| LCS Anchor | — | — | — | — | 6 | — |
| LCS Breakaway | 3 | 2 | 2 | 3 | 5 | 5 |
| LCS Iguacu | 4 | 5 | 2 | 4 | 4 | 4 |
| LCS Nitro | 4 | 2 | 2 | 6 | 6 | 5 |
| LCS Prime | — | 4 | 2 | — | 6 | 4 |
| Linkert | 4 | 1 | 1 | 4 | 4 | 5 |
| Norden | 2 | 1 | 1 | 4 | 4 | 4 |
| Prevail | 2 | 1 | 5 | 2 | 6 | 4 |
| Prosper | 5 | 5 | 2 | 4 | 4 | 5 |
| RB07 | 2 | 2 | 2 | 6 | 6 | 4 |
| Rollag | 4 | 1 | 2 | 4 | 5 | 3 |
| Shelly | 4 | 1 | 2 | 4 | 4 | 4 |
| Surpass | — | 2 | 5 | — | 5 | 4 |
| SY Ingmar | 3 | 2 | 1 | 3 | 5 | 4 |
| SY Rowyn | 3 | 1 | 1 | 2 | 6 | 4 |
| SY Soren | 2 | 2 | 1 | 4 | 4 | 5 |
| SY Valda | — | 2 | 1 | — | 4 | 4 |
| TCG-Cornerstone | — | — | — | — | 5 | — |
| TCG-Spittfire | — | — | — | — | 4 | — |
| TCG-Wildfire | — | — | — | — | 4 | — |
| WB-Mayville | 3 | 3 | 2 | 6 | 7 | 7 |
| WB9507 | 8 | 8 | 3 | 6 | 3 | 4 |
| WB9653 | — | 2 | 2 | — | 4 | 5 |

¹1-9 scale where 1=most resistant, 9=most susceptible.

²Based on natural infections in 2015 at Kimball, Lamberton and Waseca.

³Stem rust levels have been very low in production fields in recent years, even on susceptible varieties.

⁴Bacterial leaf streak symptoms are highly variable from one environment to the next. The rating of newer entries may change by as much as one rating point as more data is collected.

⁵Combined rating of tan spot and septoria.

the average increases in grain yield, the responses of individual varieties provide the most useful information; varieties rated susceptible to leaf rust, stripe rust, and other fungal leaf diseases usually benefited most from fungicide applications.

Project Leaders

James Anderson, Jochum Wiersma, Susan Reynolds, Lance Miller, Chris Olson, Ruth Dill-Macky, James Kolmer, Matt Rouse, Yue Jin, Madeleine Smith and Linda Dykes.

Test Plot Managers

Matt Bickell, Robert Bouvette, Dave Grafstrom, Mark Hanson, Tom Hoverstad, Lance Miller, Chris Olson, Steve Quiring, Curt Reese, Susan Reynolds, Galen Thompson and Donn Vellekson.

Table 4. Relative grain yield of hard red spring wheat varieties in northern Minnesota locations in single-year (2016) and multiple-year comparisons (2014-2016).

| Entry | Crookston | | | Fergus Falls | | | Hallock | | | Oklee | | | Perley ¹ | Roseau | | | Stephen ¹ | Strathcona ¹ |
|-----------------------|--------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|---------------------|-------------|-------------|-------------|----------------------|-------------------------|
| | 2016 | 2-Yr | 3-Yr | 2016 | 2-Yr | 3-Yr | 2016 | 2-Yr | 3-Yr | 2016 | 2-Yr | 3-Yr | 2-Yr | 2016 | 2-Yr | 3-Yr | 2-Yr | 2-Yr |
| Bolles | 95 | 94 | 96 | 98 | 97 | 99 | 89 | 92 | 92 | 97 | 98 | 100 | 97 | 99 | 100 | 101 | 95 | 103 |
| Boost | 97 | 92 | 92 | 98 | 94 | 97 | 86 | 93 | 93 | 93 | 98 | 96 | 94 | 83 | 94 | 95 | 94 | 84 |
| Chevelle | 103 | 103 | — | 106 | 102 | — | 99 | 96 | — | 103 | 104 | — | — | 85 | 84 | — | — | — |
| Dyna-Gro Ambush | 105 | — | — | 100 | — | — | 106 | — | — | 103 | — | — | — | 104 | — | — | — | — |
| Elgin-ND | 89 | 94 | 95 | 95 | 96 | 97 | 89 | 87 | 93 | 106 | 104 | 101 | 93 | 104 | 92 | 93 | 95 | 94 |
| Faller | 97 | 95 | 104 | 95 | 105 | 108 | 102 | 106 | 109 | 103 | 101 | 104 | 104 | 110 | 107 | 105 | 107 | 105 |
| Focus | 89 | 94 | 94 | 100 | 96 | 95 | 105 | 100 | 100 | 96 | 99 | 96 | 97 | 97 | 104 | 105 | 95 | 94 |
| Forefront | 94 | 98 | 99 | 89 | 91 | 97 | 97 | 100 | 101 | 94 | 93 | 95 | 103 | 105 | 99 | 100 | 98 | 101 |
| Glenn | 88 | 89 | 87 | 97 | 94 | 90 | 99 | 94 | 95 | 93 | 96 | 97 | 92 | 103 | 105 | 102 | 98 | 100 |
| HRS 3361 | 106 | 103 | 101 | 101 | 103 | 104 | 97 | 96 | 97 | 101 | 100 | 101 | 97 | 105 | 97 | 100 | 93 | 99 |
| HRS 3419 | 108 | 111 | 109 | 95 | 101 | 109 | 109 | 112 | 110 | 108 | 109 | 110 | 106 | 131 | 120 | 116 | 108 | 111 |
| HRS 3504 | 102 | 102 | — | 111 | 108 | — | 108 | 102 | — | 100 | 100 | — | — | 93 | 94 | — | — | — |
| HRS 3530 | 100 | 104 | — | 95 | 103 | — | 110 | 112 | — | 105 | 103 | — | — | 114 | 107 | — | — | — |
| HRS 3616 | 100 | — | — | 105 | — | — | 97 | — | — | 96 | — | — | — | 83 | — | — | — | — |
| LCS Albany | 111 | 107 | 110 | 105 | 108 | 110 | 103 | 106 | 106 | 110 | 107 | 110 | 104 | 120 | 110 | 108 | 106 | 105 |
| LCS Anchor | 96 | — | — | 95 | — | — | 94 | — | — | 95 | — | — | — | 74 | — | — | — | — |
| LCS Breakaway | 105 | 104 | 98 | 99 | 100 | 93 | 101 | 96 | 96 | 94 | 95 | 98 | 103 | 92 | 98 | 97 | 101 | 100 |
| LCS Iguacu | 107 | 105 | 106 | 94 | 93 | 101 | 111 | 107 | 104 | 101 | 100 | 105 | 107 | 111 | 111 | 110 | 109 | 106 |
| LCS Nitro | 104 | 104 | 103 | 102 | 103 | 109 | 104 | 101 | 100 | 102 | 102 | 103 | 101 | 114 | 105 | 105 | 100 | 106 |
| LCS Prime | 96 | 92 | — | 104 | 111 | — | 93 | 101 | — | 109 | 107 | — | — | 105 | 107 | — | — | — |
| Linkert | 97 | 102 | 99 | 96 | 95 | 91 | 97 | 99 | 98 | 96 | 96 | 96 | 95 | 85 | 94 | 97 | 101 | 103 |
| Norden | 103 | 101 | 99 | 100 | 99 | 98 | 98 | 97 | 98 | 99 | 101 | 101 | 97 | 84 | 101 | 97 | 99 | 93 |
| Prevail | 96 | 99 | 98 | 97 | 98 | 104 | 105 | 103 | 102 | 98 | 97 | 98 | 101 | 105 | 106 | 105 | 99 | 101 |
| Prosper | 100 | 100 | 105 | 99 | 104 | 107 | 102 | 106 | 108 | 103 | 100 | 104 | 106 | 119 | 111 | 109 | 105 | 106 |
| RB07 | 104 | 102 | 102 | 98 | 97 | 97 | 91 | 92 | 93 | 98 | 99 | 99 | 98 | 83 | 88 | 92 | 99 | 97 |
| Rollag | 102 | 105 | 103 | 98 | 99 | 98 | 106 | 103 | 102 | 95 | 94 | 95 | 100 | 81 | 84 | 88 | 92 | 97 |
| Shelly | 103 | 105 | 106 | 106 | 100 | 105 | 102 | 103 | 103 | 107 | 107 | 107 | 108 | 119 | 111 | 107 | 98 | 107 |
| Surpass | 101 | 102 | — | 98 | 100 | — | 102 | 99 | — | 103 | 101 | — | — | 102 | 104 | — | — | — |
| SY Ingmar | 99 | 97 | 99 | 106 | 102 | 101 | 106 | 102 | 100 | 102 | 99 | 98 | 100 | 99 | 101 | 98 | 101 | 100 |
| SY Rowyn | 100 | 101 | 104 | 101 | 104 | 106 | 101 | 102 | 102 | 100 | 101 | 102 | 98 | 103 | 96 | 97 | 100 | 102 |
| SY Soren | 102 | 103 | 102 | 107 | 97 | 99 | 102 | 96 | 97 | 100 | 99 | 99 | 95 | 86 | 100 | 102 | 99 | 102 |
| SY Valda | 108 | 108 | — | 107 | 108 | — | 119 | 118 | — | 110 | 109 | — | — | 121 | 108 | — | — | — |
| TCG-Cornerstone | 96 | — | — | 99 | — | — | 89 | — | — | 92 | — | — | — | 91 | — | — | — | — |
| TCG-Spitfire | 102 | — | — | 111 | — | — | 101 | — | — | 103 | — | — | — | 109 | — | — | — | — |
| TCG-Wildfire | 101 | — | — | 97 | — | — | 91 | — | — | 105 | — | — | — | 100 | — | — | — | — |
| WB-Mayville | 96 | 97 | 93 | 107 | 101 | 95 | 92 | 95 | 96 | 98 | 97 | 99 | 97 | 86 | 91 | 96 | 94 | 95 |
| WB9507 | 104 | 99 | 103 | 97 | 104 | 107 | 112 | 111 | 111 | 90 | 93 | 98 | 106 | 108 | 99 | 100 | 104 | 103 |
| WB9653 | 103 | 100 | — | 110 | 109 | — | 106 | 96 | — | 97 | 99 | — | — | 96 | 95 | — | — | — |
| Mean (Bu/Acre) | 102.1 | 92.2 | 93.5 | 87.6 | 98.7 | 92.1 | 79.6 | 85.4 | 86.3 | 99.4 | 101.2 | 98.4 | 95.4 | 63.0 | 73.8 | 78.7 | 72.8 | 77.6 |
| LSD (0.10) | 3.4 | 3.7 | 3.7 | 3.9 | 3.5 | 3.7 | 4.3 | 4.0 | 4.0 | 3.5 | 3.4 | 3.5 | 3.6 | 5.5 | 4.7 | 4.4 | 4.7 | 4.4 |

¹Data from 2016 sites at Perley (hail), Stephen and Strathcona (excessive water) were excluded from analyses. 2-year data for these locations is from 2014 and 2015.

Table 5. Relative grain yield of hard red spring wheat varieties in southern Minnesota locations in single-year (2016) and multiple-year comparisons (2014-2016).

| Entry | Benson | | | Kimball | | | Le Center | | | Lamberton | | | Morris | | | St. Paul | | | Waseca | | |
|-----------------------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 2016 | 2-Yr | 3-Yr | 2016 | 2-Yr | 3-Yr | 2016 | 2-Yr | 3-Yr | 2016 | 2-Yr | 3-Yr | 2016 | 2-Yr | 3-Yr | 2016 | 2-Yr | 3-Yr | 2016 | 2-Yr | 3-Yr |
| Bolles | 92 | 95 | 95 | 98 | 98 | 98 | 104 | 95 | 89 | 101 | 95 | 97 | 97 | 97 | 99 | 102 | 103 | 104 | 99 | 99 | 104 |
| Boest | 93 | 94 | 96 | 89 | 93 | 94 | 96 | 93 | 98 | 106 | 97 | 99 | 101 | 97 | 103 | 103 | 98 | 99 | 102 | 106 | 106 |
| Chevelle | 108 | 111 | — | 88 | 104 | — | 96 | 100 | — | 99 | 101 | — | 109 | 109 | — | 106 | 105 | — | 107 | 101 | — |
| Dyna-Gro Ambush | 94 | — | — | 100 | — | — | 100 | — | — | 102 | — | — | 107 | — | — | 97 | — | — | 93 | — | — |
| Elgin-ND | 93 | 97 | 95 | 81 | 86 | 88 | 80 | 86 | 82 | 84 | 90 | 94 | 99 | 100 | 100 | 99 | 100 | 99 | 99 | 91 | 87 |
| Faller | 101 | 101 | 104 | 95 | 90 | 96 | 99 | 102 | 105 | 109 | 109 | 108 | 88 | 92 | 97 | 76 | 89 | 95 | 92 | 98 | 98 |
| Focus | 94 | 94 | 97 | 90 | 88 | 87 | 81 | 87 | 90 | 96 | 103 | 103 | 95 | 94 | 101 | 77 | 88 | 91 | 100 | 98 | 96 |
| Forefront | 88 | 90 | 92 | 106 | 104 | 103 | 94 | 101 | 101 | 98 | 102 | 101 | 91 | 98 | 102 | 95 | 90 | 95 | 96 | 98 | 101 |
| Glenn | 82 | 83 | 88 | 94 | 91 | 89 | 71 | 77 | 79 | 85 | 93 | 93 | 81 | 84 | 90 | 81 | 78 | 78 | 89 | 93 | 90 |
| HRS 3361 | 101 | 94 | 96 | 94 | 96 | 99 | 108 | 106 | 104 | 107 | 102 | 101 | 97 | 100 | 99 | 95 | 98 | 99 | 111 | 112 | 111 |
| HRS 3419 | 110 | 104 | 103 | 130 | 128 | 122 | 136 | 126 | 127 | 116 | 113 | 114 | 115 | 115 | 111 | 114 | 116 | 113 | 115 | 115 | 115 |
| HRS 3504 | 114 | 110 | — | 101 | 102 | — | 100 | 105 | — | 107 | 108 | — | 115 | 115 | — | 101 | 102 | — | 112 | 107 | — |
| HRS 3530 | 115 | 114 | — | 108 | 101 | — | 106 | 107 | — | 105 | 104 | — | 104 | 97 | — | 108 | 107 | — | 119 | 126 | — |
| HRS 3616 | 99 | — | — | 101 | — | — | 113 | — | — | 93 | — | — | 104 | — | — | 104 | — | — | 96 | — | — |
| LCS Albany | 107 | 108 | 109 | 113 | 116 | 114 | 120 | 112 | 107 | 114 | 107 | 111 | 105 | 103 | 106 | 107 | 112 | 114 | 102 | 104 | 111 |
| LCS Anchor | 93 | — | — | 108 | — | — | 77 | — | — | 75 | — | — | 86 | — | — | 91 | — | — | 83 | — | — |
| LCS Breakaway | 92 | 94 | 96 | 110 | 99 | 98 | 89 | 93 | 93 | 89 | 90 | 91 | 99 | 93 | 94 | 105 | 102 | 96 | 91 | 94 | 91 |
| LCS Iguacu | 98 | 99 | 101 | 117 | 109 | 108 | 120 | 108 | 110 | 103 | 101 | 102 | 98 | 98 | 99 | 112 | 116 | 116 | 103 | 92 | 95 |
| LCS Nitro | 106 | 105 | 108 | 118 | 116 | 115 | 129 | 118 | 120 | 110 | 106 | 107 | 107 | 110 | 108 | 126 | 123 | 119 | 110 | 105 | 109 |
| LCS Prime | 110 | 108 | — | 94 | 102 | — | 95 | 98 | — | 97 | 103 | — | 100 | 95 | — | 86 | 86 | — | 86 | 82 | — |
| Linkert | 93 | 92 | 92 | 114 | 103 | 101 | 87 | 96 | 94 | 85 | 88 | 89 | 94 | 96 | 93 | 109 | 105 | 99 | 92 | 95 | 97 |
| Norden | 97 | 95 | 98 | 102 | 98 | 96 | 95 | 95 | 92 | 96 | 97 | 98 | 99 | 100 | 97 | 105 | 103 | 101 | 88 | 93 | 98 |
| Prevail | 101 | 96 | 100 | 115 | 114 | 110 | 101 | 103 | 105 | 105 | 103 | 101 | 89 | 95 | 102 | 99 | 103 | 105 | 117 | 118 | 120 |
| Prosper | 104 | 109 | 110 | 90 | 93 | 96 | 98 | 99 | 100 | 109 | 105 | 105 | 95 | 92 | 100 | 86 | 94 | 98 | 96 | 99 | 104 |
| RB07 | 99 | 99 | 98 | 96 | 99 | 98 | 88 | 88 | 89 | 89 | 93 | 97 | 95 | 95 | 94 | 96 | 98 | 94 | 81 | 89 | 87 |
| Rollag | 95 | 96 | 98 | 97 | 98 | 98 | 91 | 91 | 88 | 84 | 89 | 91 | 98 | 101 | 98 | 94 | 94 | 94 | 75 | 79 | 80 |
| Shelly | 105 | 107 | 107 | 92 | 103 | 104 | 109 | 99 | 93 | 112 | 109 | 109 | 118 | 115 | 107 | 115 | 115 | 113 | 114 | 112 | 112 |
| Surpass | 97 | 99 | — | 79 | 85 | — | 76 | 88 | — | 101 | 100 | — | 104 | 102 | — | 79 | 78 | — | 112 | 108 | — |
| SY Ingmar | 109 | 105 | 108 | 125 | 115 | 111 | 115 | 111 | 114 | 110 | 105 | 104 | 106 | 100 | 103 | 113 | 100 | 100 | 105 | 94 | 94 |
| SY Rowyn | 108 | 104 | 106 | 106 | 106 | 106 | 112 | 104 | 106 | 109 | 107 | 106 | 108 | 110 | 113 | 111 | 106 | 104 | 113 | 107 | 110 |
| SY Soren | 101 | 97 | 98 | 110 | 103 | 101 | 109 | 97 | 95 | 89 | 90 | 96 | 102 | 93 | 97 | 113 | 106 | 103 | 112 | 98 | 97 |
| SY Valda | 113 | 110 | — | 98 | 101 | — | 114 | 114 | — | 111 | 110 | — | 113 | 112 | — | 103 | 106 | — | 105 | 102 | — |
| TCG-Cornerstone | 96 | — | — | 98 | — | — | 104 | — | — | 93 | — | — | 94 | — | — | 105 | — | — | 93 | — | — |
| TCG-Spittfire | 95 | — | — | 103 | — | — | 100 | — | — | 99 | — | — | 102 | — | — | 103 | — | — | 89 | — | — |
| TCG-Wildfire | 100 | — | — | 104 | — | — | 110 | — | — | 103 | — | — | 103 | — | — | 99 | — | — | 98 | — | — |
| WB-Mayville | 100 | 95 | 97 | 108 | 99 | 95 | 104 | 105 | 104 | 100 | 96 | 93 | 98 | 105 | 97 | 105 | 106 | 103 | 94 | 99 | 95 |
| WB9507 | 100 | 104 | 104 | 97 | 94 | 99 | 118 | 115 | 115 | 107 | 100 | 102 | 76 | 80 | 89 | 87 | 103 | 106 | 112 | 101 | 106 |
| WB9653 | 108 | 109 | — | 91 | 103 | — | 101 | 105 | — | 106 | 106 | — | 109 | 115 | — | 102 | 106 | — | 110 | 110 | — |
| Mean (Bu/Acre) | 113.0 | 109.2 | 109.9 | 64.6 | 81.1 | 84.1 | 78.4 | 82.9 | 74.3 | 72.0 | 84.4 | 83.3 | 78.3 | 71.6 | 74.7 | 65.7 | 76.7 | 74.1 | 74.2 | 61.5 | 53.6 |
| LSD (0.10) | 3.6 | 8.0 | 6.5 | 19.9 | 12.5 | 9.3 | 14.6 | 14.6 | 12.0 | 9.2 | 8.6 | 7.1 | 10.1 | 10.2 | 11.4 | 12.3 | 11.6 | 11.6 | 11.1 | 15.9 | 14.2 |

Hard red spring wheat seeding rate calculator.

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 a poor seedbed or improper seed placement due to poor depth control.

The general formula for calculating a seeding rate is:

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

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 | 117 |

Table 6. Relative grain yield of hard red spring wheat varieties in Minnesota in single-year (2016) and multiple-year comparisons (2014-2016).

| Entry | State | | | North | | | South | | |
|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 2016 | 2-Year | 3-Year | 2016 | 2-Year | 3-Year | 2016 | 2-Year | 3-Year |
| Bolles | 97 | 97 | 98 | 95 | 97 | 98 | 99 | 97 | 98 |
| Boost | 96 | 94 | 96 | 92 | 92 | 94 | 98 | 96 | 99 |
| Chevelle | 102 | 101 | — | 100 | 98 | — | 103 | 105 | — |
| Dyna-Gro Ambush | 101 | — | — | 104 | — | — | 99 | — | — |
| Elgin-ND | 93 | 93 | 94 | 96 | 94 | 96 | 91 | 93 | 93 |
| Faller | 98 | 100 | 103 | 101 | 103 | 106 | 95 | 98 | 101 |
| Focus | 94 | 96 | 96 | 97 | 98 | 97 | 91 | 93 | 95 |
| Forefront | 95 | 97 | 99 | 95 | 96 | 99 | 95 | 97 | 99 |
| Glenn | 88 | 91 | 91 | 95 | 95 | 95 | 83 | 86 | 87 |
| HRS 3361 | 102 | 100 | 100 | 102 | 99 | 100 | 102 | 101 | 101 |
| HRS 3419 | 115 | 113 | 112 | 109 | 110 | 110 | 119 | 116 | 115 |
| HRS 3504 | 106 | 104 | — | 103 | 102 | — | 108 | 107 | — |
| HRS 3530 | 107 | 108 | — | 104 | 107 | — | 110 | 108 | — |
| HRS 3616 | 99 | — | — | 97 | — | — | 102 | — | — |
| LCS Albany | 109 | 108 | 109 | 109 | 106 | 108 | 109 | 109 | 110 |
| LCS Anchor | 90 | — | — | 92 | — | — | 88 | — | — |
| LCS Breakaway | 97 | 98 | 96 | 99 | 100 | 98 | 96 | 95 | 95 |
| LCS Iguacu | 106 | 104 | 105 | 104 | 104 | 106 | 107 | 104 | 105 |
| LCS Nitro | 110 | 107 | 108 | 105 | 103 | 104 | 114 | 112 | 112 |
| LCS Prime | 99 | 101 | — | 101 | 104 | — | 96 | 98 | — |
| Linkert | 95 | 97 | 96 | 95 | 98 | 97 | 95 | 96 | 95 |
| Norden | 98 | 98 | 98 | 98 | 98 | 98 | 97 | 97 | 97 |
| Prevail | 102 | 102 | 103 | 100 | 100 | 101 | 103 | 104 | 105 |
| Prosper | 100 | 102 | 104 | 104 | 104 | 106 | 98 | 99 | 102 |
| RB07 | 94 | 95 | 96 | 96 | 96 | 97 | 92 | 95 | 95 |
| Rollag | 94 | 95 | 95 | 97 | 97 | 97 | 91 | 93 | 93 |
| Shelly | 108 | 106 | 106 | 107 | 105 | 105 | 110 | 108 | 107 |
| Surpass | 97 | 98 | — | 101 | 103 | — | 93 | 94 | — |
| SY Ingmar | 107 | 103 | 103 | 102 | 100 | 100 | 111 | 105 | 106 |
| SY Rowyn | 106 | 104 | 104 | 101 | 101 | 102 | 110 | 106 | 107 |
| SY Soren | 103 | 98 | 99 | 100 | 99 | 99 | 105 | 98 | 99 |
| SY Valda | 110 | 109 | — | 112 | 110 | — | 109 | 108 | — |
| TCG-Cornerstone | 96 | — | — | 93 | — | — | 97 | — | — |
| TCG-Spitfire | 101 | — | — | 105 | — | — | 98 | — | — |
| TCG-Wildfire | 101 | — | — | 99 | — | — | 103 | — | — |
| WB-Mayville | 99 | 98 | 97 | 97 | 96 | 96 | 101 | 101 | 98 |
| WB9507 | 100 | 101 | 104 | 102 | 102 | 104 | 100 | 100 | 103 |
| WB9653 | 104 | 104 | — | 103 | 101 | — | 104 | 107 | — |
| Mean (Bu/Acre) | 81.5 | 85.0 | 83.3 | 86.2 | 89.4 | 87.5 | 78.0 | 81.0 | 79.0 |
| LSD (0.10) | 4.8 | 3.4 | 2.5 | 6.0 | 4.4 | 2.9 | 6.8 | 4.9 | 3.9 |
| No. Environments | 12 | 27 | 42 | 5 | 13 | 21 | 7 | 14 | 21 |

Table 7. Grain yield (bushels per acre) of hard red spring wheat varieties grown under conventional and intensive management.

| Entry | North | | | | | | South | | | | | | State | | | | | |
|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 2016 | | 2-Year | | 3-Year | | 2016 | | 2-Year | | 3-Year | | 2016 | | 2-Year | | 3-Year | |
| | Conv | Int |
| Bolles | 79.6 | 86.4 | 80.3 | 89.4 | 84.8 | 93.5 | 74.4 | 82.5 | 74.9 | 81.1 | 77.6 | 83.1 | 77.0 | 84.4 | 77.6 | 85.2 | 81.2 | 88.3 |
| Boost | 75.8 | 78.0 | 76.9 | 86.8 | 80.5 | 92.8 | 77.6 | 79.2 | 75.5 | 80.1 | 79.8 | 83.1 | 76.7 | 78.6 | 76.2 | 83.4 | 80.2 | 87.9 |
| Chevelle | 79.3 | 87.7 | 78.4 | 94.1 | — | — | 78.3 | 84.7 | 81.7 | 87.0 | — | — | 78.8 | 86.2 | 80.1 | 90.5 | — | — |
| Dyna-Gro Ambush | 86.4 | 91.2 | — | — | — | — | 78.5 | 76.9 | — | — | — | — | 82.5 | 84.1 | — | — | — | — |
| Elgin-ND | 78.2 | 83.4 | 77.2 | 86.9 | 81.3 | 92.1 | 69.2 | 75.0 | 73.8 | 78.6 | 76.7 | 81.2 | 73.7 | 79.2 | 75.5 | 82.8 | 79.0 | 86.7 |
| Faller | 84.1 | 93.0 | 83.3 | 99.1 | 89.9 | 105.1 | 73.7 | 87.6 | 78.7 | 90.1 | 81.2 | 90.2 | 78.9 | 90.3 | 81.0 | 94.6 | 85.6 | 97.6 |
| Focus | 76.0 | 80.5 | 81.8 | 88.5 | 85.1 | 93.6 | 71.7 | 82.9 | 76.9 | 82.5 | 80.4 | 84.1 | 73.9 | 81.7 | 79.4 | 85.5 | 82.8 | 88.9 |
| Forefront | 80.8 | 87.7 | 81.4 | 85.4 | 85.5 | 92.3 | 70.6 | 74.4 | 77.9 | 80.1 | 80.0 | 81.6 | 75.7 | 81.1 | 79.7 | 82.8 | 82.8 | 87.0 |
| Glenn | 77.2 | 80.8 | 79.5 | 84.9 | 80.7 | 89.8 | 62.1 | 68.7 | 69.4 | 72.1 | 72.4 | 76.6 | 69.7 | 74.8 | 74.4 | 78.5 | 76.6 | 83.2 |
| HRS 3361 | 87.1 | 91.3 | 83.5 | 91.6 | 86.7 | 97.7 | 76.6 | 86.6 | 79.2 | 83.0 | 79.2 | 83.3 | 81.8 | 89.0 | 81.4 | 87.3 | 83.0 | 90.5 |
| HRS 3419 | 96.5 | 100.7 | 95.6 | 99.5 | 96.8 | 105.7 | 86.9 | 88.7 | 89.0 | 92.7 | 88.9 | 93.1 | 91.7 | 94.7 | 92.3 | 96.1 | 92.9 | 99.4 |
| HRS 3504 | 81.5 | 82.9 | 81.5 | 92.7 | — | — | 83.3 | 90.1 | 86.9 | 90.5 | — | — | 82.4 | 86.5 | 84.2 | 91.6 | — | — |
| HRS 3530 | 87.3 | 89.7 | 87.4 | 94.5 | — | — | 78.5 | 90.4 | 78.6 | 89.2 | — | — | 82.9 | 90.1 | 83.0 | 91.9 | — | — |
| HRS 3616 | 77.1 | 83.9 | — | — | — | — | 74.2 | 81.4 | — | — | — | — | 75.6 | 82.6 | — | — | — | — |
| LCS Albany | 94.4 | 98.9 | 90.1 | 100.0 | 93.7 | 103.7 | 82.3 | 86.7 | 82.1 | 91.1 | 85.6 | 89.7 | 88.3 | 92.8 | 86.1 | 95.6 | 89.7 | 96.7 |
| LCS Anchor | 72.3 | 75.4 | — | — | — | — | 60.7 | 69.7 | — | — | — | — | 66.5 | 72.6 | — | — | — | — |
| LCS Breakaway | 82.4 | 86.3 | 84.3 | 93.4 | 83.9 | 97.1 | 71.2 | 75.6 | 71.4 | 79.6 | 73.2 | 82.3 | 76.8 | 80.9 | 77.9 | 86.5 | 78.6 | 89.7 |
| LCS Iguacu | 89.8 | 92.4 | 89.3 | 92.6 | 92.8 | 99.1 | 75.6 | 87.2 | 78.0 | 88.7 | 79.4 | 88.6 | 82.7 | 89.8 | 83.7 | 90.7 | 86.1 | 93.9 |
| LCS Nitro | 89.0 | 97.7 | 86.8 | 94.4 | 89.8 | 100.5 | 81.4 | 82.0 | 84.0 | 83.8 | 84.9 | 87.9 | 85.2 | 89.8 | 85.4 | 89.1 | 87.4 | 94.2 |
| LCS Prime | 82.1 | 89.7 | 82.0 | 97.0 | — | — | 73.8 | 85.1 | 77.2 | 90.8 | — | — | 78.0 | 87.4 | 79.6 | 93.9 | — | — |
| Linkert | 76.2 | 80.0 | 81.5 | 89.0 | 84.5 | 93.9 | 67.2 | 78.5 | 71.5 | 79.9 | 72.0 | 79.4 | 71.7 | 79.3 | 76.5 | 84.4 | 78.3 | 86.7 |
| Norden | 79.1 | 80.2 | 83.8 | 87.2 | 84.4 | 92.5 | 73.3 | 76.3 | 76.8 | 79.6 | 76.9 | 81.1 | 76.2 | 78.3 | 80.3 | 83.4 | 80.7 | 86.8 |
| Prevail | 82.0 | 86.2 | 84.9 | 93.9 | 87.3 | 97.0 | 72.8 | 84.4 | 77.6 | 86.0 | 80.0 | 84.9 | 77.4 | 85.3 | 81.2 | 89.9 | 83.6 | 90.9 |
| Prosper | 88.6 | 89.3 | 86.9 | 93.7 | 91.9 | 101.0 | 76.5 | 87.4 | 77.3 | 89.4 | 81.1 | 89.6 | 82.6 | 88.4 | 82.1 | 91.5 | 86.5 | 95.3 |
| RB07 | 79.0 | 84.5 | 79.4 | 92.5 | 83.7 | 97.9 | 69.2 | 67.8 | 73.3 | 77.6 | 75.6 | 79.7 | 74.1 | 76.1 | 76.4 | 85.0 | 79.7 | 88.8 |
| Rollag | 77.6 | 86.9 | 79.4 | 92.8 | 82.7 | 96.4 | 68.6 | 73.3 | 73.5 | 77.0 | 74.4 | 77.9 | 73.1 | 80.1 | 76.5 | 84.9 | 78.6 | 87.2 |
| Shelly | 90.2 | 97.0 | 89.3 | 100.7 | 91.8 | 104.4 | 86.8 | 94.0 | 87.2 | 91.8 | 85.6 | 89.8 | 88.5 | 95.5 | 88.2 | 96.2 | 88.7 | 97.1 |
| Surpass | 83.6 | 83.9 | 85.4 | 90.2 | — | — | 77.0 | 80.7 | 78.7 | 83.7 | — | — | 80.3 | 82.3 | 82.1 | 86.9 | — | — |
| SY Ingmar | 81.7 | 90.7 | 81.9 | 95.4 | 84.8 | 98.0 | 81.2 | 87.3 | 80.1 | 85.4 | 81.6 | 86.5 | 81.4 | 89.0 | 81.0 | 90.4 | 83.2 | 92.2 |
| SY Rowyn | 83.6 | 89.1 | 81.9 | 94.6 | 86.6 | 98.7 | 81.6 | 90.4 | 84.7 | 88.7 | 86.3 | 89.7 | 82.6 | 89.8 | 83.3 | 91.6 | 86.5 | 94.2 |
| SY Soren | 79.1 | 88.7 | 84.3 | 92.9 | 87.6 | 97.7 | 71.8 | 81.2 | 71.4 | 82.5 | 76.3 | 83.7 | 75.5 | 85.0 | 77.8 | 87.7 | 82.0 | 90.7 |
| SY Valda | 93.5 | 94.6 | 89.5 | 97.0 | — | — | 84.1 | 90.1 | 86.8 | 91.6 | — | — | 88.8 | 92.3 | 88.2 | 94.3 | — | — |
| TCG-Cornerstone | 77.5 | 83.9 | — | — | — | — | 70.3 | 76.7 | — | — | — | — | 73.9 | 80.3 | — | — | — | — |
| TCG-Spitfire | 86.2 | 91.0 | — | — | — | — | 75.7 | 80.6 | — | — | — | — | 80.9 | 85.8 | — | — | — | — |
| TCG-Wildfire | 82.9 | 85.9 | — | — | — | — | 77.7 | 78.2 | — | — | — | — | 80.3 | 82.1 | — | — | — | — |
| WB-Mayville | 76.2 | 89.5 | 78.3 | 95.6 | 81.3 | 98.7 | 74.6 | 83.8 | 78.3 | 82.1 | 75.0 | 81.6 | 75.4 | 86.7 | 78.3 | 88.8 | 78.1 | 90.2 |
| WB9507 | 87.0 | 96.7 | 82.4 | 99.6 | 87.5 | 103.2 | 68.2 | 92.6 | 70.8 | 91.5 | 75.9 | 92.0 | 77.6 | 94.6 | 76.6 | 95.5 | 81.7 | 97.6 |
| WB9653 | 82.7 | 84.6 | — | — | — | — | 80.7 | 94.1 | — | — | — | — | 81.7 | 89.3 | — | — | — | — |
| Mean (Bu/Acre) | 82.5 | 87.7 | 83.0 | 92.5 | 86.0 | 97.2 | 75.2 | 82.4 | 77.8 | 84.5 | 78.9 | 84.6 | 78.8 | 85.0 | 80.4 | 88.5 | 82.5 | 90.9 |
| LSD (0.10) | 9.9 | 12.5 | 7.1 | 7.9 | 5.5 | 5.8 | 8.1 | 6.8 | 7.3 | 7.0 | 5.1 | 5.0 | 6.1 | 6.9 | 5.1 | 5.2 | 3.7 | 3.8 |
| No. Environments | 2 | 2 | 4 | 4 | 6 | 6 | 2 | 2 | 4 | 4 | 6 | 6 | 4 | 4 | 8 | 8 | 12 | 12 |