ID91-34302A
Soft White Winter Wheat
Proposed name: 'Simon'

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'Simon' soft white winter wheat (*Triticum aestivum* L.) is proposed for release by the Idaho Agricultural Experiment Station in 2003. Simon is a white chaffed, awned, strawbreaker footrot resistant semi-dwarf soft white common winter wheat with good to excellent yield potential in the intermediate to high rainfall areas of the Pacific Northwest. It is blue-green in color with a semi-erect flag leaf. The kernels of Simon are an intermediate size, white, and soft.

Pedigree and History

Simon has the pedigree 'Haven'/'Lambert'//'Madsen'. Haven is a soft red biscuit wheat from Nickerson Seed Inc. (formerly PBI), UK. Lambert is a soft white common winter wheat released jointly by the Idaho Agricultural Experiment Station, the Oregon Agricultural Experiment Station and Washington Agricultural Experiment Station (Zemetra et al. 1995). Madsen is a soft white common winter wheat developed by the USDA-ARS, Pullman, WA (Allan et al. 1989) and carries the *Pch1* gene for resistance to strawbreaker footrot (caused by *Pseudocercosporella herpotrichoides* (Fron) Deighton). The original cross for Simon was made in 1991. The F_1 population was designated as ID91-343 and grown in bulk for three generations with minimal selection. Heads were collected from the F_3 bulk population and planted as F_4 headrows. One row was selected from the F_4 headrows based on agronomic performance, disease resistance, seed appearance and quality (percent protein and SDS sedimentation). This headrow was designated ID91-34302A. The line was evaluated in the F_6 generation for resistance to strawbreaker footrot and was determined to carry the same level of resistance to the disease as Madsen wheat by T. Murray, Washington State University. ID91-34302A was then evaluated for 6 years in replicated yield trials. In 1999, ID91-34302A was entered in the Western Regional White Winter Wheat Nursery and evaluated for three years. ID91-34302A was entered for evaluation in the Tri-State Extension cereal testing nursery in 2001 and evaluated for two years. In 2003, ID91-34302A was evaluated by the Pacific Northwest Wheat Quality Council for its end-use quality. Heads were collected in 1999 and were grown during the 1999-2000 growing season at Moscow, Idaho to produce the pre-breeder seed generation. The breeder seed generation was grown in 2000-2001 and the initial foundation seed generation was grown in 2002-2003 at Moscow, Idaho.

Area of Adaptation

Simon is a soft white common winter wheat with good to excellent straw strength that is adapted to intermediate to high rainfall dryland areas of the Pacific Northwest. It also has potential as a foot rot resistant wheat for the irrigated regions of the Pacific Northwest.

Agronomic Characteristics

Simon is a semi-dwarf wheat that is similar in height to Madsen (Tables 2 and 3). Simon is blue-green in color (4/4 chroma GY hue based on Munsell Book of Color) with semi-erect flag leaves. Heading date for Simon is 2-3 days earlier than that observed with Madsen (Table 1) under rainfed conditions in northern Idaho and about one day earlier than Madsen under irrigated conditions. Simon has good to excellent straw strength showing a similar lodging response as Madsen under rainfed and irrigated conditions. Glumes of Simon are awned and seed is intermediate in size, white and soft.

Agronomic Performance

Simon is high yielding under both rainfed and irrigated conditions (Table 1). It equals or exceeds the yield of Madsen, Lambert and Weatherford in 4 to 5 years of advanced yield testing with a 5 year (29 site/years) average of 102 bu/acre rainfed and a 5 year (14 site/year) average of 149 bu/acre irrigated. In the Western Regional Uniform White Winter Wheat Nursery, Simon had a slightly greater yield than either Madsen or Stephens over 3 years of testing (36 site/years) (Table 2). In extension testing in northern Idaho in 2002 (Table 3), Simon had an average yield equal to or greater than Madsen or Lambert (5 site/years). In extension testing in southern Idaho under irrigation in 2002 (Table 3), Simon performed well, exceeding the yield of Madsen and Weatherford in both the southwestern extension trials and the southeastern extension trials (4 and 3 site/years, respectively). In the 2002 Washington State extension trials, Simon had a slightly lower yield than Madsen (Table 4) over 19 sites. In the 2002 Oregon State extension trials, Simon had a similar yield to the other foot rot resistant cultivars Madsen and Weatherford (Table 5).

Simon had an equal to slightly higher test weight under both rainfed and irrigated conditions than Madsen or Lambert (Table 1). In 5 years of advanced testing, Simon had an average test weight of 59.0 lbs/bu rainfed and 59.4 lbs/bu irrigated. In the Western Regional Uniform White Winter Wheat Nursery (Table 2), Simon's test weight (59.5 lbs/bu) was similar to that of both Madsen (59.7 lbs/bu) and Stephens (59.3 lbs/bu). In extension testing in 2002 (Tables 3, 4, 5), Simon's test weight was equal to or greater than the other foot rot resistant cultivars (Madsen, Tubbs and Weatherford).

End-use Quality

Simon has good end-use quality for a soft white winter wheat. Percent flour protein is similar to that found for other soft white winter wheats being, on average, less than that found in Madsen and slightly higher than that found in Lambert (Tables 6 and 7). For kernel hardness, Simon is most similar to Madsen and slightly lower than Lambert in the advanced yield trials (Table 6). Break flour yield for Simon is favorable, being similar to or greater than Madsen in regional (Table 7) and advanced yield trials (Table 6). Percent flour ash was also similar for the two cultivars (Tables 6 and 7). For end-use quality, Simon had a similar cookie diameter to Madsen, being slightly greater than Madsen over 5 years of testing in Idaho (Table 6) and equal to Madsen in 3 years of

regional testing (Table 7). For sponge cake volume, Simon was better than Stephens and similar to Madsen over three years of regional testing (Table 7). In Pacific Northwest Wheat Quality Council testing, Simon was found to have acceptable end-use quality for a soft white winter wheat.

Disease Reactions

Simon has moderate resistance to stripe rust (caused by *Puccinia striiformis* Westend.) based on regional testing (Table 8). Simon has temperature sensitive adult resistance based on the Mt. Vernon, WA results (Table 8). Simon has moderate resistance to strawbreaker footrot (caused by *Pseudocercosporella herpotrichoides* (Fron) Deighton) similar to that found in Madsen. In two inoculated field trials (Table 9), Simon showed little reduction in yield and had a similar number of white heads and lodging as Madsen. Simon appears to have an intermediate level of tolerance to Cephalosporium stripe (caused by *Hymenula cerealis* Ellis & Everh.) based on inoculated field results (Table 10). Simon had a similar percentage of height reduction to Madsen but a greater number of white heads. For both traits, Simon was superior to the susceptible check Stephens (Kronstad et al. 1978). It is moderately susceptible to dwarf bunt (caused by *Tilletia controversa* Kühn in Rabenh.) and would require the use of a seed fungicide treatment if grown in a region where dwarf bunt can occur.

Breeder and Foundation seed of Simon will be maintained by the Idaho Foundation Seed Program under the direction of the Idaho Agricultural Experiment Station, University of Idaho, Moscow, ID 83844.

References

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