Table S1. Entry information for Nordic germplasm evaluation in WWA and the AK Interior. Entry information is derived from the seed source except where notated. \* Accession is derived from Genetic Resources Information System for Wheat and Triticale; \*\* accession is derived from Hagenblad et al. 2012 except where “na.”

| Entry name | Study ID | Pedigree | Country of origin | Year released | Species | Source | Accession ID | Confirmed wt *NAM-B1* \*\* |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ruskea | NAM001 | Selection from Swedish landrace | Finland | 1919 | *T. aestivum* ssp. *aestivum* | US National Plant Germplasm System | PI 192331 | *wt* |
| Svalöf | NAM002 | Landrace | Sweden | Collected, 1924 | *T. aestivum* ssp. *aestivum* | US National Plant Germplasm System | PI 58560 | “Svalöf 0201”and “Svalöf 0880” are *wt* |
| Svalöf 60407 | NAM003 | Unknown | Sweden | Donated, 1969 | *T. aestivum* ssp. *aestivum* | US National Plant Germplasm System | PI 352134 | “Svalöf 0201” and “Svalöf 0880” are *wt* |
| Stanley | NAM004 | Ladoga/Red Fife; sister selection to Preston | Canada | 1893 | *T. aestivum* ssp. *aestivum* | US National Plant Germplasm System | CItr 4796 | *wt* |
| Tähti | NAM007 | Karn//Aurore/Pika | Finland | 1972 | *T. aestivum* ssp. *aestivum* | US National Plant Germplasm System | PI 525191 | *wt* |
| Fram I | NAM008 | Jo3/MO07 | Norway | 1920 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB2126.1 | *wt* |
| Fram II | NAM009 | Jo3/MO07 | Norway | 1940 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB2127.1 | *wt* |
| Kr Finset, Eikesdal | NAM010 | Landrace | Norway | na | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB2128.1 | *wt* |
| Landvårkveite | NAM011 | Landrace | Norway | na | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB2129.1 | *wt* |
| Lanor | NAM012 | Norrøna/Lade | Norway | 1970 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB2130.1 | *wt* |
| Nora | NAM013 | Fram II/Sopu; Norrona/Karn II \* | Norway | 1959\* | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB2132.1 | *wt* |
| Norrøna | NAM014 | Fram II/Sopu | Norway | 1958 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB2133.1 | *wt* |
| Skirne | NAM015 | Gelchsheimer/Särimner | Norway | 1937\* | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB2138.1 | *wt* |
| Snøgg I | NAM016 | 0843/Ås | Norway | 1939\* | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB2139.1 | *wt* |
| Snøgg II | NAM017 | 0834/As; Jookinen/Russian-wheat; Jo3/Sibirian/Ås \* | Norway | 1940\* | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB2140.1 | *wt* |
| Tautra | NAM018 | Unknown | Norway | 1950\* | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB2141.1 | *wt* |
| Trym | NAM019 | Huron/Fylgia I | Norway | 1948 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB2142.1 | *wt* |
| Ås | NAM020 | Landrace selection | Norway | 1926 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB2143.1 | *wt* |
| Halland | NAM021 | Landrace | Sweden | na | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB6409.1 | *wt* |
| Dalarna | NAM022 | Landrace | Sweden | na | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB6410.1 | *wt* |
| Lantvete från Dalarna | NAM023 | Landrace | Sweden | na | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB6673.3 | *wt* |
| Rubin | NAM024 | Kolben/Dala | Sweden | 1921 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB6678.1 | *wt* |
| Diamant | NAM025 | Kolben/Hallands | Sweden | 1928 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB6679.1 | *wt* |
| Diamant II | NAM026 | Diamant/Extra Kolben II | Sweden | 1938 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB6681.3 | *wt* |
| Rival | NAM027 | Diamant/Extra Kolben II | Sweden | 1952 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB6684.1 | *wt* |
| Amy | NAM028 | SV01281/SV55460//Prins | Sweden | 1971 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB6689.2 | *wt* |
| KVL 8063 | NAM029 | Landrace | Denmark | na | *T. aestivum* ssp. *sphaerococcum* | Nordic Genetic Resource Center | NGB7210 | *wt* |
| Østby | NAM030 | Landrace | Norway | na | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB8922.1 | *wt* |
| Ås II | NAM031 | Ås x Diamant\*\* | Norway | 1945 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB9710.1 | *wt* |
| Manu | NAM032 | Ruso/Runar | Finland | 1993 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB11709.2 | *wt* |
| Sopu | NAM033 | Marquis/Ruskea | Finland | 1935\* | *T. aestivum ssp. aestivum* | Nordic Genetic Resource Center | NGB13346.1 | “Sopu 7” is *wt* |
| Västergötland | NAM034 | Landrace | Sweden | na | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB13441.2 | *wt* |
| Horsmanaho ME0201; Timantti | NAM035 | Landrace | Finland | Collected in E. Finland, 1980 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB42.1 | *wt* |
| Haarajärvi ME0102; Apu | NAM037 | Landrace | Finland | Collected in E. Finland, 1980 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB121.2 | *wt* |
| ME8008070302B, Timantti, Paavo | NAM038 | Landrace | Finland | Collected in E. Finland, 1980 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB130.2 | *wt* |
| Järvenkylä ME0302 SEP A; Timantti | NAM039 | Landrace | Finland | Collected in E. Finland, 1980 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB131.2 | *wt* |
| Ruso | NAM040 | Reward/Pika//unknown | Finland | 1967 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB349.3 | *wt* |
| Hankkijan Ulla | NAM041 | Tammi/TA C4431 | Finland | 1975 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB351.1 | *wt* |
| Hankkijan Taava | NAM042 | Radiated line | Finland | 1978 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB353.2 | *wt* |
| Luja | NAM043 | Svenno//Hopea/Tammi | Finland | 1981 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB357.3 | *wt* |
| Touko | NAM044 | Timantii/Hopea | Finland | 1950 | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB359.5 | *wt* |
| Børsum | NAM045 | Landrace | Norway | na | *T. aestivum* ssp. *aestivum* | Nordic Genetic Resource Center | NGB2125.1 | *wt* |
| HRS 3419 | NAMC002 | Unknown, breeding line | United States | na | *T. aestivum* ssp. *aestivum* | WSU Variety Testing | Private, Croplan-Winfield | na |
| SAS 13-69 | NAMC003 | Unknown, breeding line | United Kingdom | na | *T. aestivum* ssp. *aestivum* | WSU Variety Testing | Private, Schaffer Ag Seeds | na |
| Expresso | NAMC004 | Express\*6/(Source\_of\_Yr15\_and\_Yr17)Avocet//Express\*6/Madsen \* | United States | 2007\* | *T. aestivum* ssp. *aestivum* | WSU Variety Testing | PI 651616 | na |
| SAS 4B | NAMC006 | Unknown, breeding line | United Kingdom | na | *T. aestivum* ssp. *aestivum* | WSU Variety Testing | Private, Schaffer Ag Seeds | na |
| SAS W4 | NAMC009 | Unknown, breeding line | United Kingdom | na | *T. aestivum* ssp. *aestivum* | WSU Variety Testing | Private, Schaffer Ag Seeds | na |
| Kelse | NAMC011 | Westbred 906R/PI520542//Scholar \* | United States | 2008\* | *T. aestivum* ssp. *aestivum* | WSU Mount Vernon | PI 653842 | na |
| Canus | NAMC013 | Marquis/Kanred \* | Canada | 1934\* | *T. aestivum* ssp. *aestivum* | WSU Mount Vernon | CItr 11637 | na |
| Edison | NAMC014 | Yafen/Holdfast/6/ Kavko/5/Kavkaz/Tobari 66// Candealfen/Bluebird/3/Bolillo/4/Nacozari 76 | United States | 2014, donated USDA 2016 | *T. aestivum* ssp. *aestivum* | WSU Mount Vernon | PI 542711 | na |
| Dayn | NAMC015 | ID-597//WA-7931\*2/P-9347-A-1-2; UI-Lochsall-Otis\*2/P-934-7-A-1-2 \* | United States | 2013\* | *T. aestivum* ssp. *aestivum* | WSU Variety Testing | PI 666941 | na |
| JD | NAMC016 | Eden/Coda/PI 574537 \* | United States | 2008\* | *T. aestivum* ssp. *compactum* | WSU Mount Vernon | PI 656790 | na |

Table S2A. Summary of trait means by accession and location evaluated over two years at Mount Vernon, WA and Fairbanks, AK. The minimum significant difference (MSD) is Fisher’s least significant difference at α = 0.05 under a Bonferroni adjustment. Agronomic traits presented include growing degree days (GDDs) to senescence, grain yield, test weight, and lodging.

| Accession | GDDs to senescence  (days) | | Yield  (kg ha-1) | | Test weight  (kg/hL) | | Lodging  (%) | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | AK | WA | AK | WA | AK | WA | AK | WA |
| NAM001 | 1375.62 | 1425.82 | 3095.24 | 2177.51 | 78.04 | 77.19 | 91.67 | 51.67 |
| NAM002 | 1452.62 | 1560.50 | 3551.59 | 2018.62 | 77.82 | 76.72 | 94.17 | 33.33 |
| NAM003 | 1450.57 | 1530.32 | 4297.62 | 2032.47 | 78.25 | 76.03 | 18.33 | 0.00 |
| NAM004 | 1449.37 | 1418.32 | 2230.15 | 1740.12 | 77.39 | 76.86 | 94.17 | 77.50 |
| NAM007 | 1401.43 | 1467.65 | 3734.13 | 2219.34 | 78.47 | 75.45 | 4.17 | 0.00 |
| NAM008 | 1368.98 | 1391.23 | 3142.86 | 3074.08 | 77.82 | 77.08 | 75.00 | 35.83 |
| NAM009 | 1364.97 | 1369.73 | 3000.00 | 3354.34 | 77.82 | 77.99 | 95.00 | 33.33 |
| NAM010 | 1349.63 | 1403.07 | 3460.32 | 3275.93 | 78.04 | 78.64 | 18.33 | 4.17 |
| NAM011 | 1389.65 | 1471.07 | 2908.73 | 1995.43 | 76.96 | 75.88 | 95.00 | 15.83 |
| NAM012 | 1371.33 | 1412.07 | 3392.86 | 2058.50 | 77.82 | 76.86 | 64.17 | 20.00 |
| NAM013 | 1381.02 | 1439.65 | 3626.98 | 3686.67 | 78.04 | 77.76 | 61.67 | 22.50 |
| NAM014 | 1365.98 | 1429.82 | 2916.67 | 3355.17 | 77.82 | 77.71 | 84.17 | 24.17 |
| NAM015 | 1391.05 | 1456.07 | 2992.06 | 2168.96 | 77.82 | 76.98 | 90.00 | 36.67 |
| NAM016 | 1368.67 | 1407.48 | 2821.43 | 2231.56 | 77.82 | 76.86 | 81.67 | 24.17 |
| NAM017 | 1354.70 | 1373.57 | 2888.89 | 2598.99 | 77.82 | 78.54 | 80.83 | 19.17 |
| NAM018 | 1360.78 | 1427.32 | 3432.54 | 1820.18 | 77.82 | 76.97 | 64.17 | 14.17 |
| NAM019 | 1384.40 | 1434.48 | 3210.32 | 2644.35 | 77.82 | 76.36 | 95.00 | 20.00 |
| NAM020 | 1378.15 | 1455.65 | 2960.32 | 2191.19 | 77.82 | 76.28 | 94.17 | 24.17 |
| NAM021 | 1389.70 | 1438.98 | 3083.33 | 2501.30 | 77.17 | 78.46 | 91.67 | 36.67 |
| NAM022 | 1368.63 | 1421.82 | 3170.64 | 2104.60 | 77.82 | 77.38 | 86.67 | 85.00 |
| NAM023 | 1392.80 | 1419.57 | 3424.60 | 2347.39 | 77.82 | 78.62 | 89.17 | 42.50 |
| NAM024 | 1379.15 | 1462.23 | 3373.02 | 2657.81 | 77.82 | 76.54 | 90.00 | 46.67 |
| NAM025 | 1387.40 | 1458.82 | 3408.73 | 2207.07 | 77.82 | 77.70 | 87.50 | 25.83 |
| NAM026 | 1381.22 | 1474.40 | 3438.49 | 2423.90 | 77.82 | 77.97 | 70.83 | 25.00 |
| NAM027 | 1422.48 | 1488.40 | 3573.41 | 2125.24 | 78.04 | 77.11 | 68.33 | 20.00 |
| NAM028 | 1438.57 | 1524.15 | 4035.71 | 1975.67 | 78.04 | 78.32 | 32.50 | 0.00 |
| NAM029 | 1476.28 | 1488.23 | 3003.97 | 1192.46 | 77.82 | 75.16 | 11.67 | 0.00 |
| NAM030 | 1376.77 | 1411.98 | 2916.67 | 2293.01 | 78.04 | 77.65 | 93.33 | 50.00 |
| NAM031 | 1374.22 | 1447.15 | 3353.18 | 2976.95 | 78.04 | 78.25 | 86.67 | 8.33 |
| NAM032 | 1354.82 | 1387.73 | 3587.30 | 2675.18 | 78.25 | 77.37 | 5.00 | 0.00 |
| NAM033 | 1381.10 | 1413.40 | 3373.02 | 1941.58 | 77.82 | 76.53 | 75.00 | 44.17 |
| NAM034 | 1415.28 | 1465.40 | 3515.87 | 1795.04 | 78.04 | 76.35 | 92.50 | 34.17 |
| NAM035 | 1395.73 | 1448.32 | 3218.25 | 2012.63 | 78.04 | 78.55 | 79.17 | 25.83 |
| NAM037 | 1364.37 | 1426.90 | 3400.79 | 2563.57 | 77.82 | 76.60 | 30.83 | 5.83 |
| NAM038 | 1391.93 | 1441.40 | 3214.29 | 2154.58 | 78.04 | 77.97 | 86.67 | 32.50 |
| NAM039 | 1381.70 | 1454.57 | 3011.91 | 2072.14 | 77.82 | 78.88 | 85.00 | 29.17 |
| NAM040 | 1374.02 | 1445.65 | 3797.62 | 3029.16 | 78.25 | 77.71 | 10.83 | 4.17 |
| NAM041 | 1352.17 | 1370.32 | 3652.78 | 2549.27 | 77.82 | 76.98 | 10.83 | 4.17 |
| NAM042 | 1392.88 | 1449.32 | 4146.83 | 2830.33 | 77.82 | 76.84 | 0.83 | 0.00 |
| NAM043 | 1379.22 | 1452.57 | 3670.64 | 3270.76 | 78.04 | 76.24 | 0.83 | 0.00 |
| NAM044 | 1380.32 | 1488.98 | 3603.18 | 2531.55 | 78.25 | 77.56 | 71.67 | 20.83 |
| NAM045 | 1397.52 | 1458.98 | 3503.97 | 2299.14 | 77.82 | 76.19 | 88.33 | 15.83 |
| NAMC002 | 1475.43 | 1447.40 | 4003.97 | 3301.17 | 77.82 | 78.89 | 4.17 | 0.00 |
| NAMC003 | 1506.33 | 1605.85 | 4436.51 | 4171.48 | 75.66 | 72.54 | 0.00 | 0.00 |
| NAMC004 | 1436.85 | 1442.32 | 3083.33 | 2505.22 | 77.82 | 77.26 | 1.67 | 0.00 |
| NAMC006 | 1479.27 | 1612.03 | 4428.57 | 4517.68 | 76.09 | 74.13 | 0.00 | 0.00 |
| NAMC009 | 1424.67 | 1579.42 | 4500.00 | 3814.60 | 75.23 | 72.86 | 0.00 | 0.00 |
| NAMC011 | 1439.30 | 1451.40 | 3162.70 | 2465.08 | 77.39 | 79.74 | 1.67 | 0.00 |
| NAMC013 | 1412.60 | 1509.90 | 3281.75 | 1857.99 | 77.82 | 78.54 | 81.67 | 10.00 |
| NAMC014 | 1445.95 | 1460.48 | 3678.57 | 3560.78 | 77.82 | 74.65 | 14.17 | 0.00 |
| NAMC015 | 1434.15 | 1457.07 | 4331.35 | 3343.42 | 78.47 | 80.73 | 15.00 | 0.00 |
| NAMC016 | 1450.88 | 1474.90 | 3162.70 | 3708.05 | 78.04 | 79.67 | 27.50 | 0.00 |
| Location mean | 1400.24 | 1454.88 | 3427.12 | 2584.98 | 77.76 | 77.12 | 55.64 | 19.68 |
| Min mean | 1349.63 | 1369.73 | 2230.15 | 1192.46 | 75.23 | 72.54 | 0.00 | 0.00 |
| Max mean | 1506.33 | 1612.03 | 4500.00 | 4517.68 | 78.47 | 80.73 | 95.00 | 85.00 |
| MSD | 82.86 | 68.85 | 1597.72 | 1570.68 | 1.31 | NA | 38.28 | 34.90 |
| df | 208 | 208 | 208 | 208 | 208 | 163 | 208 | 208 |

Table S2B. Summary of trait means by accession and location evaluated over two years at Mount Vernon, WA and Fairbanks, AK. The minimum significant difference (MSD) is Fisher’s least significant difference at α = 0.05 under a Bonferroni adjustment. Grain protein content (GPC), and grain Fe, Zn, and Mn content are presented.

| Accession | GPC (%) | | Fe (mg g-1) | | Mn (mg g-1) | | Zn (mg g-1) | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | AK | WA | AK | WA | AK | WA | AK | WA |
| NAM001 | 15.58 | 13.90 | 37.01 | 35.03 | 31.56 | 15.37 | 20.86 | 36.25 |
| NAM002 | 13.95 | 13.74 | 33.67 | 27.32 | 28.22 | 13.32 | 18.22 | 32.70 |
| NAM003 | 14.61 | 14.10 | 29.59 | 28.48 | 28.87 | 12.96 | 16.17 | 31.32 |
| NAM004 | 14.59 | 13.91 | 37.29 | 31.36 | 33.28 | 12.65 | 24.60 | 37.34 |
| NAM007 | 16.01 | 14.82 | 32.54 | 27.44 | 26.62 | 12.99 | 18.07 | 28.28 |
| NAM008 | 13.77 | 14.00 | 38.26 | 35.85 | 32.86 | 15.39 | 19.08 | 33.83 |
| NAM009 | 14.18 | 13.42 | 42.15 | 28.16 | 32.28 | 16.84 | 18.30 | 31.07 |
| NAM010 | 14.80 | 13.74 | 39.96 | 31.68 | 31.76 | 14.31 | 18.46 | 31.43 |
| NAM011 | 15.65 | 15.13 | 43.04 | 37.14 | 29.80 | 17.75 | 21.99 | 41.99 |
| NAM012 | 13.39 | 12.38 | 41.04 | 27.91 | 28.90 | 12.71 | 17.95 | 32.89 |
| NAM013 | 13.59 | 12.65 | 32.94 | 27.67 | 26.95 | 12.81 | 16.12 | 28.84 |
| NAM014 | 12.66 | 12.12 | 33.85 | 30.64 | 26.15 | 12.09 | 16.80 | 29.33 |
| NAM015 | 14.96 | 14.31 | 40.42 | 32.82 | 32.22 | 14.18 | 20.46 | 34.44 |
| NAM016 | 13.45 | 13.33 | 33.91 | 30.63 | 28.90 | 10.94 | 18.64 | 30.47 |
| NAM017 | 14.51 | 13.84 | 37.47 | 30.68 | 28.84 | 10.48 | 18.75 | 33.81 |
| NAM018 | 13.25 | 12.05 | 34.13 | 26.34 | 29.86 | 13.68 | 17.52 | 30.91 |
| NAM019 | 14.16 | 13.83 | 37.03 | 30.42 | 29.95 | 14.39 | 18.61 | 31.72 |
| NAM020 | 13.75 | 13.79 | 35.74 | 30.83 | 28.93 | 13.74 | 17.49 | 30.73 |
| NAM021 | 15.64 | 14.45 | 38.28 | 36.51 | 36.27 | 15.12 | 20.22 | 36.29 |
| NAM022 | 14.47 | 13.97 | 40.74 | 37.28 | 32.58 | 15.22 | 19.74 | 37.37 |
| NAM023 | 15.19 | 13.56 | 34.10 | 33.15 | 31.85 | 14.49 | 18.87 | 34.69 |
| NAM024 | 13.87 | 13.66 | 33.02 | 30.77 | 28.16 | 14.90 | 17.10 | 30.83 |
| NAM025 | 15.85 | 14.13 | 42.04 | 33.71 | 36.72 | 15.58 | 19.76 | 34.49 |
| NAM026 | 14.59 | 14.20 | 41.45 | 32.11 | 32.76 | 11.60 | 19.71 | 34.09 |
| NAM027 | 14.29 | 13.86 | 40.27 | 28.14 | 32.18 | 12.06 | 17.31 | 33.08 |
| NAM028 | 14.96 | 14.06 | 34.08 | 28.51 | 28.40 | 10.66 | 17.27 | 30.05 |
| NAM029 | 14.81 | 14.69 | 42.77 | 31.03 | 36.64 | 14.27 | 22.93 | 39.43 |
| NAM030 | 15.46 | 14.39 | 43.52 | 34.87 | 33.51 | 14.31 | 21.58 | 36.22 |
| NAM031 | 14.99 | 13.83 | 39.40 | 31.86 | 34.46 | 15.46 | 17.88 | 32.88 |
| NAM032 | 15.59 | 14.36 | 41.10 | 28.61 | 34.28 | 12.03 | 18.69 | 31.57 |
| NAM033 | 14.23 | 13.05 | 30.50 | 25.54 | 28.19 | 10.85 | 18.60 | 33.22 |
| NAM034 | 14.99 | 13.76 | 27.86 | 22.61 | 29.85 | 11.11 | 18.87 | 28.55 |
| NAM035 | 15.78 | 14.06 | 37.50 | 33.22 | 37.48 | 15.04 | 21.76 | 35.79 |
| NAM037 | 13.86 | 12.86 | 35.14 | 27.50 | 33.17 | 10.81 | 18.75 | 28.27 |
| NAM038 | 15.76 | 14.06 | 38.71 | 33.16 | 36.67 | 13.19 | 18.81 | 32.71 |
| NAM039 | 15.84 | 13.89 | 35.15 | 31.75 | 36.29 | 13.08 | 20.09 | 33.99 |
| NAM040 | 14.74 | 12.88 | 35.41 | 28.07 | 31.54 | 11.43 | 14.80 | 29.43 |
| NAM041 | 15.96 | 14.10 | 37.38 | 28.47 | 29.43 | 12.84 | 18.31 | 31.97 |
| NAM042 | 13.87 | 12.92 | 37.11 | 28.04 | 30.17 | 12.10 | 15.68 | 29.67 |
| NAM043 | 13.66 | 13.50 | 36.24 | 30.20 | 31.61 | 9.68 | 13.83 | 25.97 |
| NAM044 | 15.05 | 13.30 | 45.29 | 27.60 | 37.21 | 13.84 | 17.39 | 33.43 |
| NAM045 | 14.23 | 14.23 | 41.94 | 32.78 | 32.40 | 13.04 | 18.62 | 32.95 |
| NAMC002 | 13.74 | 13.44 | 33.28 | 27.83 | 25.36 | 11.99 | 13.76 | 29.05 |
| NAMC003 | 11.91 | 12.10 | 29.65 | 20.46 | 24.53 | 11.26 | 13.59 | 25.38 |
| NAMC004 | 16.15 | 14.54 | 41.70 | 29.17 | 36.49 | 13.11 | 16.01 | 30.43 |
| NAMC006 | 12.55 | 13.17 | 31.68 | 26.21 | 28.83 | 13.75 | 14.84 | 28.01 |
| NAMC009 | 13.49 | 13.08 | 31.38 | 25.51 | 29.26 | 13.51 | 14.47 | 25.91 |
| NAMC011 | 16.39 | 14.70 | 40.46 | 26.58 | 32.82 | 9.35 | 17.18 | 30.90 |
| NAMC013 | 15.75 | 13.94 | 45.08 | 24.63 | 38.59 | 13.08 | 22.33 | 38.41 |
| NAMC014 | 11.63 | 12.19 | 33.52 | 24.44 | 25.17 | 12.65 | 11.63 | 26.40 |
| NAMC015 | 14.31 | 13.24 | 31.85 | 24.49 | 30.57 | 14.57 | 13.04 | 31.36 |
| NAMC016 | 12.19 | 11.85 | 37.74 | 23.32 | 29.35 | 10.95 | 15.41 | 28.94 |
| Location mean | 14.47 | 13.64 | 37.03 | 29.59 | 31.32 | 13.15 | 18.02 | 32.10 |
| Min mean | 11.63 | 11.85 | 27.86 | 20.46 | 24.53 | 9.35 | 11.63 | 25.38 |
| Max mean | 16.39 | 15.13 | 45.29 | 37.28 | 38.59 | 16.84 | 24.60 | 41.99 |
| MSD | 2.27 | 1.40 | 11.31 | 8.90 | 9.52 | 7.98 | 8.05 | 7.86 |
| df | 208 | 208 | 208 | 208 | 208 | 208 | 208 | 208 |

Table S3. Results of the stripe rust nursery of the Nordic germplasm evaluation trials. Evaluation occurred at two locations, Palouse Conservation Field Station (PCFS), WSU, Pullman and Northwest Washington Research and Extension Center (NWREC), WSU, Mount Vernon over one year.

|  |  | PCFS Farm, Pullman, WA | | | | NWREC, Mount Vernon, WA | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 21 June 2016 | | 7 July 2016 | | 2 June 2016 | | 27 June 2016 | |
|  |  | Flowering stage | | Soft dough stage | | Stem elongation | | Milk stage | |
| Study ID | Entry name | Infection type | Severity (%) | Infection type | Severity (%) | Infection type | Severity (%) | Infection type | Severity (%) |
| NAM001 | Ruskea | 5 | 30 | 5 | 35 | 8 | 80 | 8 | 80 |
| NAM002 | Svalöf | 3 | 15 | 3 | 2 | 8 | 70 | 5 | 20 |
| NAM003 | Svalöf 60407 | 5 | 15 | 5 | 20 | 8 | 60 | 8 | 30 |
| NAM004 | Stanley | 2 | 15 | 5 | 15 | 8 | 30 | 3 | 5 |
| NAM007 | Tähti | 2 | 15 | 3 | 1 | 5 | 20 | 3 | 5 |
| NAM008 | Fram I | 2 | 15 | 5 | 10 | 8 | 30 | 5 | 10 |
| NAM009 | Fram II | 2 | 15 | 5 | 10 | 8 | 30 | 3 | 15 |
| NAM010 | Kr Finset, Eikesdal | 5 | 25 | 5 | 5 | 8 | 20 | 8 | 60 |
| NAM011 | Landvårkveite | 3 | 15 | 5 | 15 | 8 | 50 | 8 | 50 |
| NAM012 | Lanor | 6 | 30 | 5 | 10 | 8 | 60 | 8 | 90 |
| NAM013 | Nora | 2 | 15 | 5 | 5 | 8 | 40 | 5 | 30 |
| NAM014 | Norrøna | 2 | 20 | 5 | 10 | 8 | 30 | 8 | 50 |
| NAM015 | Skirne | 5 | 25 | 5 | 25 | 8 | 30 | 8 | 60 |
| NAM016 | Snøgg I | 5 | 25 | 5 | 25 | 8 | 40 | 8 | 70 |
| NAM017 | Snøgg II | 6 | 20 | 5 | 25 | 8 | 30 | 8 | 40 |
| NAM018 | Tautra | 5 | 25 | 5 | 5 | 8 | 60 | 8 | 90 |
| NAM019 | Trym | 2 | 10 | 5 | 25 | 6 | 20 | 2 | 1 |
| NAM020 | Ås | 2 | 15 | 2 | 2 | 8 | 40 | 8 | 80 |
| NAM021 | Halland | 2 | 15 | 5 | 15 | 8 | 60 | 8 | 40 |
| NAM022 | Dalarna | 5 | 30 | 5 | 5 | 8 | 50 | 8 | 30 |
| CHECK | AVS - susceptible | 8 | 30 | 8 | 100 | 8 | 80 | 8 | 100 |
| NAM023 | Lantvete från Dalarna | 5 | 25 | 8 | 95 | 8 | 60 | 8 | 50 |
| NAM024 | Rubin | 5 | 15 | 5 | 15 | 8 | 50 | 8 | 20 |
| NAM025 | Diamant | 5 | 15 | 5 | 15 | 8 | 40 | 8 | 50 |
| NAM026 | Diamant II | 2 | 15 | 5 | 25 | 8 | 50 | 8 | 40 |
| NAM027 | Rival | 6 | 30 | 5 | 20 | 8 | 70 | 8 | 50 |
| NAM028 | Amy | 6 | 20 | 5 | 30 | 8 | 50 | 8 | 50 |
| NAM029 | KVL 8063 | 6 | 30 | 5 | 5 | 8 | 50 | 8 | 50 |
| NAM030 | Østby | 5 | 25 | 5 | 25 | 8 | 40 | 8 | 40 |
| NAM031 | Ås II | 2 | 10 | 5 | 25 | 8 | 50 | 8 | 30 |
| NAM032 | Manu | 2 | 15 | 5 | 15 | 8 | 20 | 5 | 20 |
| NAM033 | Sopu | 6 | 30 | 5 | 35 | 8 | 40 | 8 | 80 |
| NAM034 | Västergötland | 5 | 25 | 5 | 20 | 8 | 70 | 8 | 80 |
| NAM035 | Horsmanaho ME0201; Timantti | 5 | 20 | 5 | 25 | 8 | 60 | 8 | 80 |
| NAM037 | Haarajärvi ME0102; Apu | 5 | 20 | 5 | 10 | 8 | 70 | 8 | 80 |
| NAM038 | ME8008070302B, Timantti, Paavo | 5 | 30 | 5 | 20 | 8 | 70 | 8 | 80 |
| NAM039 | Järvenkylä ME0302 SEP A; Timantti | 5 | 25 | 5 | 20 | 8 | 70 | 8 | 80 |
| NAM040 | Ruso | 5 | 25 | 5 | 25 | 8 | 50 | 8 | 70 |
| NAM041 | Hankkijan Ulla | 5 | 25 | 5 | 25 | 8 | 50 | 8 | 50 |
| NAM042 | Hankkijan Taava | 5 | 25 | 5 | 20 | 8 | 40 | 8 | 70 |
| CHECK | AVS - susceptible | 8 | 40 | 8 | 95 | 8 | 80 | 8 | 90 |
| NAM043 | Luja | 5 | 20 | 5 | 10 | 2 | 5 | 2 | 5 |
| NAM044 | Touko | 5 | 20 | 5 | 20 | 8 | 60 | 8 | 80 |
| NAM045 | Børsum | 5 | 15 | 5 | 10 | 8 | 40 | 8 | 30 |
| NAMC002 | HRS 3419 | 2 | 10 | 2 | 1 | 8 | 20 | 3 | 5 |
| NAMC003 | SAS 13-69 | 2 | 5 | 3 | 1 | 8 | 20 | 3 | 5 |
| NAMC004 | Expresso | 2 | 5 | 2 | 2 | 2 | 1 | 3 | 5 |
| NAMC006 | SAS 4B | 2 | 15 | 5 | 10 | 5 | 20 | 5 | 10 |
| NAMC009 | SAS W4 | 2 | 15 | 5 | 5 | 5 | 30 | 3 | 5 |
| NAMC011 | Kelse | 2 | 15 | 5 | 25 | 7 | 30 | 8 | 60 |
| NAMC013 | Canus | 5 | 25 | 5 | 20 | 8 | 60 | 5 | 60 |
| NAMC014 | Edison | 2 | 15 | 2 | 10 | 2 | 5 | 2 | 1 |
| NAMC015 | Dayn | 2 | 15 | 2 | 1 | 2 | 10 | 2 | 5 |
| NAMC016 | JD | 2 | 15 | 3 | 2 | 8 | 20 | 2 | 5 |
| CHECK | AVS - susceptible | 8 | 40 | 8 | 95 | 8 | 80 | 8 | 90 |
| CHECK | AVS - susceptible | 8 | 40 | 8 | 100 | 8 | 80 | 8 | 90 |
| CHECK | AVS - susceptible | 8 | 40 | 8 | 100 | 8 | 80 | 8 | 90 |
| CHECK | AVS - susceptible | 8 | 40 | 8 | 100 | 8 | 80 | 8 | 90 |
| CHECK | AVS - susceptible | 8 | 40 | 8 | 100 | 8 | 80 | 8 | 90 |
| CHECK | AVS - susceptible | 8 | 40 | 8 | 100 | 8 | 80 | 8 | 90 |
| CHECK | AVS - susceptible | 8 | 40 | 8 | 100 | 8 | 80 | 8 | 90 |

Figure S1. Weather summaries for each location by year environment from 31 March to 31 August. Top: Daily precipitation (cm) for Mount Vernon (left) and Fairbanks (right). Bottom: Daily minimum (left) and maximum (right) temperature (°C) for Mount Vernon and Fairbanks. Planting and harvest dates are described in the text.



