

1999 Uniform Regional Scab Nursery for Spring Wheat Parents

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The Uniform Regional Scab Nursery for Spring Wheat Parents was grown for the 5th year in 1999 at 7 locations. These locations included St. Paul, Morris, and Crookston, MN; Langdon and Prosper, ND; Brookings, SD; and Glenlea, Manitoba. All nurseries were misted and inoculated with *Fusarium* to obtain infection in the entries. Langdon did not report data.

A total of 40 entries were tested including four check, (2375, Wheaton, BacUp, and Oslo) and 36 parental lines including 6 durums. Many entries have a Chinese source of resistant in their pedigree, usually derived from Sumai. Replications varied from two to four depending upon location. Methods of inoculation varied somewhat among locations, from macro-conidial spore suspension during anthesis (2×10^4 to 10×10^4) and/or by scattering infected kernels prior to anthesis (grain spawn) or both. Entries were planted in single rows or hill-planted.

Visual head symptoms of scab infection and post-harvested visual scabby kernel rating, based on a standard set, or counts (Tombstone) are reported in %. Minnesota does not read scabbed kernels beyond 50% so Minnesota locations will have lower % tombstone readings of the kernels. Each location's data are presented separately and entry means were used for the combined location analysis.

Level of disease varied by locations. Location means for Severity ranged from a low of 23% at Manitoba to a high of 65% at Brookings. Disease Index is computed by multiplying Severity x Incidence. Disease Index ranged from a low of 12% at Manitoba to a high of 65% at Brookings. Percent Tombstone (% scabby kernels) ranged from a low of 24% at Crookston to a high of 45% at Brookings. Yield of the plots were taken at four locations to attempt to determine entries ability to maintain yield under very severe scab conditions. Incidence levels approached 100% at several locations, therefore Disease correlated best over locations with % Severity ($r=0.83$) and moderately with incidence ($r=0.55$) over locations. High correlations would be expected because Disease is calculated by Severity and Incidence. Percent Tombstone of kernels was well related to Disease over locations ($r=0.62$) but related rather poorly to both Incidence and Severity ($r= \sim 0.35$). Yield did not relate well to any of the visual head data, but was related ($r=0.55$) to % Tombstone kernels.

Entry means over locations are presented in Table 8. Genotype x environment interaction was present for all traits evaluated, but better consistency among entries was observed in 1999 than in previous years. Possible the resistance expression is becoming more stable across environments as new germplasm is developed.

Collaborators for the 1999 Uniform Regional Scab Nursery for Spring Wheat Parents were:

Minnesota - R. Busch, J. Anderson, R. Dill-Macky, (St. Paul); J. Wiersma (Crookston); G. Nelson (Morris).

South Dakota - Yue Jin, Jackie Rudd (Brookings)

North Dakota - R. Stack, R. Frohberg (Fargo); J. Lukach (Langdon).

Manitoba - J. Gilbert, F. Townley-Smith (Winnipeg).

Entries were contributed by:

University of Minnesota; South Dakota State University; North Dakota State University; Agriculture and Agri-Food Canada; Trigen Seed Co.-Minneapolis, MN; AgriPro- Berthoud, Colorado; Western Plant Breeders, Bozeman Montana.

Table 1. Pedigree and Source of 1999 Uniform Regional Scab Nursery for Spring Wheat

| Entry no. | Entry name | Pedigree | Source |
|-----------|--|-----------------------------------|--------|
| 1 | 2375 | CHECK | ND |
| 2 | WHEATON | CHECK | MN |
| 3 | BACUP | CHECK | MN |
| 4 | OSLO | CHECK | AGRIP |
| 5 | SD3310 | SD8072/SD3067 | SD |
| 6 | SD3407 | COMPOSITE | SD |
| 7 | SD3414 | COMPOSITE | SD |
| 8 | SD3521 | SUMAI3/2375//SD0014 | SD |
| 9 | SD3523 | SD3116/2375//FAN1/SD3116 | SD |
| 10 | ND2710 | SUMAI3/WHEATON//GRANDIN | ND |
| 11 | ND2831 | ND2709/ND688 | ND |
| 12 | ND2891 | F0.2756//ND2710/ND674 | ND |
| 13 | ND2928 | NING7840/ND706 | ND |
| 14 | ND2941 | ND674//ND2710/ND688 | ND |
| 15 | 97NPY3209 | HAMER//SUMAI3/DALEN | AGRIP |
| 16 | 97NPY3263 | N92-0098//SUMAI3/DALEN | AGRIP |
| 17 | 97NPY3294 | N92-0176//SUMAI3/DALEN | AGRIP |
| 18 | 97NPY3445 | N92-0338//SUMAI3/DALEN | AGRIP |
| 19 | 97NPY3449 | N92-0338//SUMAI3/DALEN | AGRIP |
| 20 | FA997-703 | | WPB |
| 21 | 99T412 | PROBRAND822/NORM-2M | TRIGEN |
| 22 | 99T413 | PROBRAND822/NORM-12M | TRIGEN |
| 23 | 99TSP115 | PROBRAND822/NORM-15M | TRIGEN |
| 24 | 99TSP119 | SWM169KA/KLCBR'S//H1225B | TRIGEN |
| 25 | MN97518 | SBE0303-18/MN92320 | MN |
| 26 | MN97596 | 2375/SBG0590-83 | MN |
| 27 | MN97603 | GRANDIN/SBG0339-75 | MN |
| 28 | MN98068 | SBG0339-75/2370 | MN |
| 29 | MN98513 | BACUP/MCVEY | MN |
| 30 | AC BARRIE | NEEPAWA/COLUMBUS//BW90 | MANT |
| 31 | HY 644 | A16//A*4/BGBSR/3/SCEPTRE/NING8331 | MANT |
| 32 | 98EPWBFHB43 | PR2375/ACFOREMOST | MANT |
| 33 | 93B42-V2A | ACDOMAIN*2/SUMAI3 | MANT |
| 34 | 93B42-AW3C | ACDOMAIN*2/SUMAI3 | MANT |
| 35 | FA897-733 | DURUM | WPB |
| 36 | FA897-735 | DURUM | WPB |
| 37 | DH98031 | DURUM | ND |
| 38 | DH98052 | DURUM | ND |
| 39 | DH98053 | DURUM | ND |
| 40 | DH98069 | DURUM | ND |
| | AGRIP=AgriPro | WPB=Western Plant Breeders | |
| | MANT=Agriculture and Agrifood Canada, Manitoba | | |

Table 2. Uniform Regional Scab Nursery for Spring Wheat Parents, Manitoba, 1999

| Entry | Name | Severity | Incidence | Disease | Disease |
|-------|-------------|----------|-----------|---------|---------|
| | | | (%) | | rank |
| 1 | 2375 | 20 | 43 | 10 | 19 |
| 2 | Wheaton | 51 | 79 | 43.4 | 38 |
| 3 | BacUp | 19 | 42 | 8.53 | 17 |
| 4 | Oslo | 51 | 82 | 44.1 | 39 |
| 5 | SD3310 | 25 | 51 | 12.8 | 29 |
| 6 | SD3407 | 20 | 26 | 5.91 | 12 |
| 7 | SD3414 | 19 | 39 | 7.66 | 15 |
| 8 | SD3521 | 19 | 24 | 4.89 | 10 |
| 9 | SD3523 | 12 | 21 | 2.86 | 5 |
| 10 | ND2710 | 21 | 14 | 3.66 | 7 |
| 11 | ND2831 | 22 | 56 | 12.5 | 28 |
| 12 | ND2891 | 23 | 50 | 10.8 | 25 |
| 13 | ND2928 | 15 | 11 | 1.77 | 3 |
| 14 | ND2941 | 20 | 57 | 11.7 | 24 |
| 15 | 97NPY3209 | 17 | 49 | 8.77 | 18 |
| 16 | 97NPY3263 | 35 | 37 | 7.24 | 32 |
| 17 | 97NPY3294 | 54 | 90 | 49.7 | 40 |
| 18 | 97NPY3445 | 11 | 35 | 4.35 | 9 |
| 19 | 97NPY3449 | 30 | 66 | 19.8 | 36 |
| 20 | FA997-703 | 9 | 18 | 1.67 | 2 |
| 21 | 99T412 | 19 | 72 | 14 | 33 |
| 22 | 99T413 | 25 | 65 | 17.5 | 34 |
| 23 | 99TSP115 | 42 | 66 | 27.6 | 37 |
| 24 | 99TSP119 | 18 | 70 | 14.6 | 31 |
| 25 | MN97518 | 13 | 39 | 5.39 | 11 |
| 26 | MN97596 | 21 | 29 | 5.79 | 13 |
| 27 | MN97603 | 21 | 59 | 12.5 | 27 |
| 28 | MN98068 | 20 | 38 | 7.93 | 14 |
| 29 | MN98513 | 12 | 19 | 2.37 | 4 |
| 30 | AC Barrie | 19 | 43 | 9.25 | 16 |
| 31 | HY 644 | 13 | 24 | 3.08 | 6 |
| 32 | 98EPWAFHB43 | 19 | 8 | 1.56 | 1 |
| 33 | 93B42-V2A | 14 | 26 | 4.39 | 8 |
| 34 | 93B42-AW3C | 52 | 24 | 9.15 | 30 |
| 35 | FA897-733 | 16 | 61 | 10.6 | 22 |
| 36 | FA897-735 | 19 | 54 | 10.1 | 21 |
| 37 | DH98031 | 24 | 74 | 18.4 | 35 |
| 38 | DH98052 | 23 | 55 | 12.6 | 26 |
| 39 | DH98053 | 19 | 59 | 11.2 | 23 |
| 40 | DH98069 | 17 | 55 | 9.7 | 20 |
| | Mean | 23 | 46 | 12 | |
| | LSD 0.05 | 22 | 18 | 11 | |

One row plot, 2.4 m long. 3 reps. Mist-irrigated. Grain spawn inoculation.

Severity, Incidence, and Disease assessment from 20 spikes.

Weight (grain yield) and Scab (tombstone kernels) from entire row. 50% is maximum scab reading

Table 3. Uniform Regional Scab Nursery for Spring Wheat Parents, Brookings, SD, 1999

| Entry | Name | Yield | Tombstone | Severity | Incidence | Disease |
|-------|---|-------|-----------|----------|-----------|---------|
| | | g | | % | | |
| 1 | 2375 | 11.3 | 50 | 71 | 100 | 71 |
| 2 | Wheaton | 4.11 | 90 | 84 | 100 | 84 |
| 3 | BacUp | 17.3 | 38 | 56 | 100 | 56 |
| 4 | Oslo | 5.1 | 88 | 78 | 100 | 78 |
| 5 | SD3310 | 36.3 | 22 | 39 | 98 | 39 |
| 6 | SD3407 | 14.3 | 42 | 56 | 100 | 56 |
| 7 | SD3414 | 29 | 32 | 45 | 100 | 45 |
| 8 | SD3521 | 31.7 | 22 | 33 | 92 | 32 |
| 9 | SD3523 | 36.2 | 38 | 48 | 100 | 48 |
| 10 | ND2710 | 25.2 | 25 | 35 | 98 | 34 |
| 11 | ND2831 | 24.5 | 38 | 42 | 100 | 42 |
| 12 | ND2891 | 22.4 | 32 | 48 | 98 | 48 |
| 13 | ND2928 | 10.8 | 32 | 54 | 100 | 54 |
| 14 | ND2941 | 10.8 | 32 | 59 | 100 | 59 |
| 15 | 97NPY3209 | 19.2 | 43 | 51 | 100 | 51 |
| 16 | 97NPY3263 | 13.6 | 42 | 45 | 100 | 45 |
| 17 | 97NPY3294 | 7.9 | 62 | 80 | 100 | 80 |
| 18 | 97NPY3445 | 6.6 | 43 | 76 | 100 | 76 |
| 19 | 97NPY3449 | 8.4 | 38 | 72 | 100 | 72 |
| 20 | FA997-703 | 7.6 | 37 | 72 | 100 | 72 |
| 21 | 99T412 | 8.1 | 53 | 76 | 100 | 76 |
| 22 | 99T413 | 5.6 | 58 | 73 | 100 | 73 |
| 23 | 99TSP115 | 6.8 | 7 | 73 | 100 | 73 |
| 24 | 99TSP119 | 6.3 | 62 | 79 | 100 | 79 |
| 25 | MN97518 | 17.2 | 40 | 53 | 100 | 53 |
| 26 | MN97596 | 13.2 | 55 | 68 | 100 | 68 |
| 27 | MN97603 | 10.2 | 48 | 64 | 98 | 63 |
| 28 | MN98068 | 6.1 | 47 | 66 | 100 | 66 |
| 29 | MN98513 | 21.5 | 42 | 54 | 100 | 54 |
| 30 | AC Barrie | 2.8 | 50 | 87 | 100 | 87 |
| 31 | HY 644 | 7.1 | 72 | 73 | 100 | 73 |
| 32 | 98EPWAFHB43 | 6.2 | 42 | 75 | 100 | 75 |
| 33 | 93B42-V2A | 4.5 | 30 | 74 | 100 | 74 |
| 34 | 93B42-AW3C | 4.1 | 72 | 66 | 100 | 66 |
| 35 | FA897-733 | 5.7 | 42 | 68 | 100 | 68 |
| 36 | FA897-735 | 6.2 | 38 | 77 | 100 | 77 |
| 37 | DH98031 | 5.3 | 77 | 84 | 100 | 84 |
| 38 | DH98052 | 4.6 | 33 | 81 | 100 | 81 |
| 39 | DH98053 | 4 | 47 | 81 | 100 | 81 |
| 40 | DH98069 | 10.9 | 43 | 73 | 100 | 73 |
| | Mean | 12.5 | 45 | 65 | 99.6 | 65 |
| | LSD 0.05 | 7 | 19 | | | 19 |
| | Entries 21,2,35,36,39 were late maturing-data less reliable | | | | | |
| | I-meter rows, 3 reps. Mist-irrigated with spray and grain spawn inoculum. | | | | | |
| | Incidence, Severity and Disease assessment from 20 spikes/rep. | | | | | |
| | Grain yield and Scab (tombstone kernels) estimated from entire row | | | | | |

Table 4. Uniform Regional Scab Nursery for Spring Wheat Parents, Fargo, ND, 1999

| Entry | Name | Tombstone | Severity | Incidence | Disease |
|-------|---|-----------|----------|-----------|---------|
| | | | % | | |
| 1 | 2375 | 34 | 63 | 96 | 61 |
| 2 | WHEATON | 74 | 91 | 100 | 91 |
| 3 | BACUP | 24 | 44 | 96 | 42 |
| 4 | OSLO | 56 | 94 | 100 | 94 |
| 5 | SD3310 | 43 | 68 | 98 | 67 |
| 6 | SD3407 | 30 | 61 | 100 | 61 |
| 7 | SD3414 | 28 | 29 | 90 | 26 |
| 8 | SD3521 | 18 | 37 | 98 | 37 |
| 9 | SD3523 | 17 | 61 | 100 | 61 |
| 10 | ND2710 | 21 | 38 | 100 | 68 |
| 11 | ND2831 | 37 | 55 | 100 | 55 |
| 12 | ND2891 | 26 | 39 | 98 | 69 |
| 13 | ND2928 | 22 | 28 | 98 | 25 |
| 14 | ND2941 | 25 | 59 | 100 | 59 |
| 15 | 97NPY3209 | 26 | 67 | 100 | 67 |
| 16 | 97NPY3263 | 27 | 55 | 100 | 55 |
| 17 | 97NPY3294 | 33 | 81 | 100 | 81 |
| 18 | 97NPY3445 | 25 | 55 | 100 | 55 |
| 19 | 97NPY3449 | 24 | 47 | 98 | 46 |
| 20 | FA997-733 | 22 | 90 | 100 | 90 |
| 21 | 99T412 | 33 | 69 | 100 | 69 |
| 22 | 99T413 | 28 | 45 | 100 | 45 |
| 23 | 99TSP115 | 31 | 66 | 98 | 65 |
| 24 | 99TSP119 | 36 | 58 | 100 | 58 |
| 25 | MN97518 | 32 | 49 | 98 | 48 |
| 26 | MN97596 | 30 | 55 | 100 | 55 |
| 27 | MN97603 | 29 | 33 | 98 | 62 |
| 28 | MN98068 | 26 | 51 | 100 | 51 |
| 29 | MN98513 | 33 | 61 | 100 | 61 |
| 30 | AC BARRIE | 28 | 60 | 98 | 59 |
| 31 | HY644 | 29 | 38 | 100 | 38 |
| 32 | 98EPWBFHB4 | 43 | 79 | 100 | 79 |
| 33 | 93B42-V2A | 11 | 74 | 98 | 73 |
| 34 | 93B42-AW3C | 30 | 57 | 95 | 54 |
| 35 | FA897-735 | 36 | 92 | 100 | 92 |
| 36 | FA997-703 | 9 | 49 | 100 | 49 |
| 37 | DH98031 | 39 | 88 | 100 | 88 |
| 38 | DH98052 | 27 | 62 | 100 | 62 |
| 39 | DH98053 | 43 | 55 | 100 | 55 |
| 40 | DH98069 | 31 | 63 | 100 | 63 |
| | Mean | 30 | 59 | 99 | 59 |
| | FLSD(.05) | 14 | 26 | ns | |
| | Mist-irrigation. Two replicates. Spray and grain spawn inoculation. | | | | |
| | Incidence, Severity, and Disease estimated from two replicates | | | | |
| | Scab is count of tombstone kernels | | | | |

Table 5. Uniform Regional Scab Nursery for Spring Wheat Parents, St. Paul, MN, 1999

| Entry | Name | Weight (g) | Tombstone | Severity (%) | Incidence | Disease | Head date days 6-1 |
|-------|-------------|---------------|-----------|-----------------|-----------|---------|-----------------------|
| 1 | 2375 | 54 | 46 | 40 | 75 | 32 | 22 |
| 2 | Wheaton | 14 | 50 | 68 | 100 | 68 | 27 |
| 3 | BacUp | 42 | 15 | 39 | 90 | 35 | 19 |
| 4 | Oslo | 27 | 50 | 44 | 85 | 37 | 22 |
| 5 | SD3310 | 48 | 36 | 36 | 85 | 31 | 21 |
| 6 | SD3407 | 54 | 36 | 45 | 85 | 42 | 21 |
| 7 | SD3414 | 79 | 20 | 30 | 78 | 25 | 20 |
| 8 | SD3521 | 73 | 21 | 44 | 90 | 40 | 20 |
| 9 | SD3523 | 69 | 23 | 21 | 75 | 17 | 25 |
| 10 | ND2710 | 54 | 23 | 22 | 80 | 18 | 25 |
| 11 | ND2831 | 93 | 26 | 31 | 95 | 29 | 24 |
| 12 | ND2891 | 68 | 21 | 38 | 88 | 34 | 22 |
| 13 | ND2928 | 70 | 23 | 18 | 70 | 13 | 29 |
| 14 | ND2941 | 60 | 26 | 22 | 81 | 19 | 23 |
| 15 | 97NPY3209 | 79 | 26 | 42 | 91 | 39 | 23 |
| 16 | 97NPY3263 | 74 | 13 | 24 | 80 | 21 | 23 |
| 17 | 97NPY3294 | 38 | 48 | 37 | 96 | 35 | 24 |
| 18 | 97NPY3445 | 61 | 18 | 25 | 88 | 22 | 24 |
| 19 | 97NPY3449 | 50 | 21 | 28 | 86 | 24 | 24 |
| 20 | FA997-703 | 60 | 15 | 26 | 90 | 23 | 32 |
| 21 | 99T412 | 43 | 43 | 53 | 100 | 53 | 34 |
| 22 | 99T413 | 63 | 38 | 45 | 98 | 44 | 32 |
| 23 | 99TSP115 | 57 | 40 | 54 | 98 | 53 | 30 |
| 24 | 99TSP119 | 29 | 36 | 65 | 100 | 65 | 30 |
| 25 | MN97518 | 37 | 28 | 51 | 88 | 46 | 22 |
| 26 | MN97596 | 57 | 28 | 32 | 81 | 28 | 22 |
| 27 | MN97603 | 39 | 26 | 49 | 91 | 45 | 20 |
| 28 | MN98068 | 40 | 38 | 58 | 100 | 58 | 26 |
| 29 | MN98513 | 84 | 25 | 25 | 71 | 20 | 20 |
| 30 | AC Barrie | 32 | 31 | 35 | 93 | 33 | 28 |
| 31 | HY 644 | 33 | 25 | 39 | 100 | 39 | 31 |
| 32 | 98EPWAFHB43 | 31 | 36 | 45 | 96 | 43 | 33 |
| 33 | 93B42-V2A | 36 | 30 | 40 | 93 | 38 | 31 |
| 34 | 93B42-AW3C | 26 | 45 | 50 | 98 | 50 | 29 |
| 35 | FA897-733 | 45 | 46 | 30 | 88 | 27 | 29 |
| 36 | FA897-735 | 31 | 48 | 38 | 95 | 36 | 27 |
| 37 | DH98031 | 30 | 50 | 66 | 100 | 66 | 30 |
| 38 | DH98052 | 16 | 48 | 77 | 100 | 77 | 30 |
| 39 | DH98053 | 38 | 50 | 61 | 98 | 60 | 34 |
| 40 | DH98069 | 25 | 50 | 44 | 98 | 44 | 28 |
| | Mean | 49 | 33 | 41 | 90 | 39 | 26 |
| | LSD 0.05 | 20 | 12 | 18 | 19 | 20 | |

One row plot, 2.4 m long. 3 reps. Mist-irrigated. Spray inoculation.

Severity, Incidence, and Disease assessment from 20 spikes.

Weight (grain yield) and Scab (tombstone kernels) from entire row. 50% is maximum Scab reading.

Table 6. Uniform Regional Scab Nursery for Spring Wheat Parents, Morris, MN, 1999

| Entry | Name | Weight (g) | Tombstone | Severity (%) | Incidence | Disease | Head date days 6-1 |
|-------|-------------|---------------|-----------|-----------------|-----------|---------|-----------------------|
| 1 | 2375 | 88 | 35 | 31 | 90 | 28 | 21 |
| 2 | Wheaton | 11 | 50 | 62 | 98 | 61 | 25 |
| 3 | BacUp | 79 | 11 | 17 | 68 | 12 | 21 |
| 4 | Oslo | 30 | 50 | 49 | 98 | 48 | 23 |
| 5 | SD3310 | 96 | 18 | 32 | 86 | 28 | 21 |
| 6 | SD3407 | 66 | 20 | 35 | 93 | 32 | 21 |
| 7 | SD3414 | 89 | 11 | 27 | 88 | 23 | 21 |
| 8 | SD3521 | 74 | 10 | 29 | 75 | 25 | 22 |
| 9 | SD3523 | 84 | 21 | 22 | 68 | 15 | 23 |
| 10 | ND2710 | 69 | 16 | 12 | 43 | 5 | 23 |
| 11 | ND2831 | 62 | 18 | 19 | 68 | 12 | 23 |
| 12 | ND2891 | 77 | 10 | 19 | 71 | 14 | 21 |
| 13 | ND2928 | 48 | 21 | 9 | 38 | 3 | 25 |
| 14 | ND2941 | 62 | 13 | 29 | 88 | 26 | 23 |
| 15 | 97NPY3209 | 68 | 21 | 43 | 10 | 43 | 22 |
| 16 | 97NPY3263 | 71 | 11 | 25 | 83 | 22 | 23 |
| 17 | 97NPY3294 | 55 | 23 | 47 | 98 | 46 | 23 |
| 18 | 97NPY3445 | 51 | 13 | 20 | 65 | 13 | 24 |
| 19 | 97NPY3449 | 54 | 15 | 35 | 91 | 32 | 22 |
| 20 | FA997-703 | 96 | 11 | 6 | 30 | 2 | 25 |
| 21 | 99T412 | 39 | 30 | 39 | 93 | 36 | 26 |
| 22 | 99T413 | 43 | 28 | 37 | 95 | 35 | 25 |
| 23 | 99TSP115 | 28 | 35 | 57 | 10 | 57 | 25 |
| 24 | 99TSP119 | 34 | 28 | 42 | 96 | 41 | 25 |
| 25 | MN97518 | 45 | 16 | 29 | 86 | 25 | 23 |
| 26 | MN97596 | 73 | 25 | 24 | 71 | 18 | 23 |
| 27 | MN97603 | 66 | 18 | 19 | 66 | 15 | 21 |
| 28 | MN98068 | 31 | 16 | 53 | 10 | 53 | 25 |
| 29 | MN98513 | 78 | 35 | 29 | 93 | 27 | 22 |
| 30 | AC Barrie | 31 | 28 | 37 | 93 | 35 | 25 |
| 31 | HY 644 | 40 | 33 | 15 | 61 | 9 | 25 |
| 32 | 98EPWAFHB43 | 33 | 45 | 9 | 31 | 3 | 26 |
| 33 | 93B42-V2A | 34 | 11 | 26 | 66 | 19 | 26 |
| 34 | 93B42-AW3C | 29 | 28 | 38 | 86 | 35 | 26 |
| 35 | FA897-733 | 25 | 45 | 44 | 10 | 44 | 24 |
| 36 | FA897-735 | 30 | 45 | 50 | 10 | 50 | 23 |
| 37 | DH98031 | 17 | 46 | 49 | 98 | 48 | 25 |
| 38 | DH98052 | 20 | 45 | 34 | 85 | 30 | 25 |
| 39 | DH98053 | 19 | 45 | 35 | 81 | 29 | 25 |
| 40 | DH98069 | 30 | 50 | 44 | 98 | 43 | 24 |
| | Mean | 52 | 27 | 32 | 81 | 29 | 24 |
| | LSD 0.05 | 20 | 6 | 6 | 21 | 14 | |

One row plot, 2.4 m long. 3 reps. Mist-irrigated. Spray and grain spawn inoculation.

Severity, Incidence, and Disease assessment from 20 spikes

Weight (grain yield) and Scab (tombstone kernels) from entire row. 50% is maximum Scab reading.

Table 7. Uniform Regional Scab Nursery for Spring Wheat Parents, Crookston, MN, 1999

| Entry | Name | Weight (g) | Tombstone | Severity (%) | Incidence | Disease | Head date days 6-1 |
|-------|-------------|---------------|-----------|-----------------|-----------|---------|-----------------------|
| 1 | 2375 | 152 | 23 | 38 | 88 | 39 | 30 |
| 2 | Wheaton | 28 | 50 | 61 | 96 | 62 | 34 |
| 3 | BacUp | 115 | 11 | 44 | 93 | 43 | 27 |
| 4 | Oslo | 58 | 48 | 63 | 99 | 62 | 29 |
| 5 | SD3310 | 235 | 13 | 24 | 76 | 18 | 27 |
| 6 | SD3407 | 165 | 18 | 30 | 90 | 27 | 27 |
| 7 | SD3414 | 155 | 12 | 23 | 78 | 18 | 26 |
| 8 | SD3521 | 204 | 9 | 19 | 75 | 14 | 27 |
| 9 | SD3523 | 209 | 13 | 28 | 83 | 26 | 31 |
| 10 | ND2710 | 134 | 11 | 16 | 53 | 13 | 30 |
| 11 | ND2831 | 143 | 19 | 35 | 95 | 34 | 28 |
| 12 | ND2891 | 153 | 23 | 31 | 90 | 28 | 26 |
| 13 | ND2928 | 155 | 16 | 29 | 75 | 23 | 34 |
| 14 | ND2941 | 126 | 18 | 31 | 85 | 26 | 28 |
| 15 | 97NPY3209 | 101 | 28 | 34 | 90 | 31 | 28 |
| 16 | 97NPY3263 | 164 | 11 | 21 | 78 | 17 | 28 |
| 17 | 97NPY3294 | 106 | 33 | 52 | 98 | 51 | 28 |
| 18 | 97NPY3445 | 131 | 9 | 23 | 66 | 16 | 29 |
| 19 | 97NPY3449 | 85 | 18 | 19 | 66 | 12 | 29 |
| 20 | FA997-703 | 117 | 12 | 22 | 73 | 17 | 38 |
| 21 | 99T412 | 73 | 25 | 53 | 98 | 52 | 36 |
| 22 | 99T413 | 86 | 25 | 48 | 98 | 47 | 35 |
| 23 | 99TSP115 | 75 | 30 | 68 | 100 | 68 | 34 |
| 24 | 99TSP119 | 93 | 26 | 60 | 100 | 60 | 35 |
| 25 | MN97518 | 184 | 15 | 18 | 66 | 12 | 28 |
| 26 | MN97596 | 143 | 25 | 28 | 80 | 23 | 29 |
| 27 | MN97603 | 91 | 15 | 25 | 85 | 21 | 24 |
| 28 | MN98068 | 101 | 21 | 47 | 91 | 45 | 34 |
| 29 | MN98513 | 145 | 31 | 28 | 93 | 26 | 27 |
| 30 | AC Barrie | 99 | 26 | 47 | 95 | 45 | 32 |
| 31 | HY 644 | 122 | 30 | 47 | 100 | 47 | 34 |
| 32 | 98EPWAFHB43 | 101 | 33 | 29 | 80 | 24 | 35 |
| 33 | 93B42-V2A | 85 | 11 | 41 | 96 | 40 | 35 |
| 34 | 93B42-AW3C | 91 | 36 | 54 | 100 | 54 | 35 |
| 35 | FA897-733 | 110 | 36 | 67 | 98 | 66 | 30 |
| 36 | FA897-735 | 69 | 36 | 67 | 98 | 66 | 30 |
| 37 | DH98031 | 109 | 40 | 49 | 86 | 45 | 31 |
| 38 | DH98052 | 75 | 41 | 87 | 100 | 87 | 32 |
| 39 | DH98053 | 81 | 31 | 76 | 100 | 76 | 35 |
| 40 | DH98069 | 123 | 33 | 77 | 100 | 77 | 31 |
| | Mean | 120 | 24 | 42 | 88 | 39 | 31 |
| | LSD 0.05 | 42 | 10 | 19 | 18 | 10 | |

One row plot, 2.4 m long. 3 reps. Mist-irrigated. Grain spawn inoculation.

Severity, Incidence, and Disease assessment from 20 spikes.

Weight (grain yield) and Scab (tombstone kernels) from entire row. 50% is maximum scab reading

Table 8. Summary for 1999 Uniform Regional Scab Nursery for Spring Wheat Parents

| Entry | Name | Yield | Tombstone | Severity | Incidence | Disease | Days head |
|-------|---|-------|-----------|----------|-----------|---------|-----------|
| | | g | | | % | | 01-Jun |
| | | [4] | [5] | [6] | [6] | [6] | [3] |
| 1 | 2375 | 76 | 37.6 | 43 | 76 | 33 | 24 |
| 2 | Wheaton | 14 | 62.6 | 69 | 90 | 62 | 29 |
| 3 | BacUp | 63 | 19.6 | 36 | 73 | 26 | 22 |
| 4 | Oslo | 30 | 58.4 | 63 | 87 | 42 | 25 |
| 5 | SD3310 | 104 | 26.4 | 37 | 74 | 27 | 23 |
| 6 | SD3407 | 75 | 29.2 | 41 | 75 | 31 | 23 |
| 7 | SD3414 | 88 | 20.6 | 28 | 70 | 20 | 22 |
| 8 | SD3521 | 96 | 16 | 30 | 68 | 38 | 23 |
| 9 | SD3523 | 99 | 22.4 | 32 | 65 | 21 | 26 |
| 10 | ND2710 | 71 | 19.2 | 24 | 55 | 13 | 26 |
| 11 | ND2831 | 81 | 27.6 | 34 | 75 | 26 | 25 |
| 12 | ND2891 | 80 | 22.2 | 33 | 74 | 24 | 23 |
| 13 | ND2928 | 71 | 22.6 | 25 | 56 | 14 | 29 |
| 14 | ND2941 | 65 | 22.6 | 36 | 75 | 27 | 25 |
| 15 | 97NPY3209 | 67 | 28.8 | 42 | 65 | 27 | 24 |
| 16 | 97NPY3263 | 81 | 20.6 | 34 | 70 | 24 | 25 |
| 17 | 97NPY3294 | 52 | 39.8 | 58 | 87 | 30 | 25 |
| 18 | 97NPY3445 | 62 | 21.6 | 35 | 65 | 23 | 26 |
| 19 | 97NPY3449 | 49 | 23 | 38 | 74 | 28 | 25 |
| 20 | FA997-703 | 70 | 19.2 | 37 | 57 | 21 | 32 |
| 21 | 99T412 | 41 | 36.6 | 51 | 86 | 44 | 32 |
| 22 | 99T413 | 49 | 35.4 | 45 | 83 | 37 | 31 |
| 23 | 99TSP115 | 42 | 28.6 | 60 | 71 | 43 | 30 |
| 24 | 99TSP119 | 41 | 37.6 | 53 | 88 | 47 | 30 |
| 25 | MN97518 | 71 | 26.2 | 35 | 73 | 26 | 24 |
| 26 | MN97596 | 72 | 32.4 | 38 | 68 | 26 | 25 |
| 27 | MN97603 | 52 | 27.2 | 35 | 75 | 26 | 22 |
| 28 | MN98068 | 45 | 29.6 | 49 | 66 | 32 | 28 |
| 29 | MN98513 | 82 | 33 | 34 | 71 | 24 | 23 |
| 30 | AC Barrie | 41 | 32.4 | 47 | 77 | 36 | 28 |
| 31 | HY 644 | 51 | 37.8 | 37 | 70 | 26 | 30 |
| 32 | 98EPWAFHB43 | 43 | 39.8 | 42 | 60 | 25 | 31 |
| 33 | 93B42-V2A | 40 | 18.6 | 44 | 71 | 31 | 31 |
| 34 | 93B42-AW3C | 48 | 42.2 | 52 | 75 | 39 | 30 |
| 35 | FA897-733 | 46 | 41 | 52 | 66 | 34 | 28 |
| 36 | FA897-735 | 34 | 35.2 | 50 | 66 | 33 | 27 |
| 37 | DH98031 | 40 | 50.4 | 60 | 87 | 52 | 29 |
| 38 | DH98052 | 29 | 38.6 | 60 | 86 | 52 | 29 |
| 39 | DH98053 | 36 | 43.2 | 54 | 83 | 45 | 31 |
| 40 | DH98069 | 47 | 41.2 | 53 | 82 | 43 | 28 |
| | Mean | 58 | 31.7 | 44 | 74 | 33 | 27 |
| | LSD 0.05 | 27 | 10.4 | 13 | 17 | 11 | 3 |
| | [n]=no. of locations. Mist-irrigated, spray and/or grain spawn inoculation. | | | | | | |
| | Incidence, Severity, and Disease estimated Disease=Severity*Incidence. | | | | | | |
| | Scab is count of tombstone kernels as %. | | | | | | |