

PROJECT TITLE: Winter Wheat Variety Evaluations

YEAR/PROJECT: 1988/756 Small Grain Production

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OBJECTIVES:

To determine the adaptability of new and introduced winter wheat varieties for western Montana.

SUMMARY:

The Western Regional Winter Wheat nurseries are grown at the Kalispell and Stillwater locations. The outstanding varieties from these nurseries are tested in western Montana in off-station nursery evaluations. These data are used in making recommendations to the Montana producer.

Continuous snow cover began on December 15, 1987 and continued until February 13, 1988 ( 60 days ) which was 34 days less than last year and 45 days shorter than the 1985/86 season. Dwarf smut infection levels were low at the Stillwater and Kalispell locations sites this year. Although disease occurrence was light in most experiments there was a severe incidence of stripe rust in susceptible varieties in the Intrastate winter wheat nursery. Although fall, winter and early spring precipitation amounts were 60-70% of normal the rainfall recieved in April and May greatly aided the sustaining of winter wheat through to harvest. Yields were very good considering the lack of moisture experienced State-wide.

RESULTS:

Western Regional Hard Red Winter Wheat - Kalispell

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The Kalispell site had a mean yield of 81.57 bu/A. The highest yielding entry was UT 157140 at 97.75 bu/A. UT 156751, UT 156516, ID 326, and DRDR 8608 all had yields greater than 90 bu/A. No variety had a test weight of 60 lbs/bu and only five entries had test weights of 59.0 lbs/bu. Winter survival of all varieties were good, averaging 95.82%. TCK smut was generally light with seven lines being smut free. Table 1.

Western Regional Hard Red Winter Wheat - Stillwater

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The Stillwater trial had a mean yield of 85.97 bu/A. Nine lines had yields in excess of 90/bu/A. All lines but two had test weights above the 60 lb/bu. Winter survival for all entries averaged 97%. TCK smut levels were very low in the test. Table 2.

72

### Western Regional Soft White Winter Wheat - Kalispell

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The Kalispell nursery had a mean yield of 94.74 bu/A. OR 855 was the highest yielding entry at 112.93 bu/A. Test weights were low and averaging 55.56 lbs/bu. TCK smut levels were low, with only WA 7621 and WA 7527 smut free. Table 3.

### Western Regional Soft White Winter Wheat - Stillwater

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The mean yield for the Stillwater site was 86.51 bu/A. ORF 75336 had the high yield ( 103.94 bu/A ). No other varieties had yields above 100 bu/A but eight entries had yields of 90 bu/A or greater. Yield data was found nonsignificant when analyzed statistically. Test weights were average ( 59.44 lbs/bu ). TCK smut was light with fourteen entries having a range of .5 to 8 percent. Table 4.

### Intrastate Winter Wheat - Kalispell

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The Kalispell location had a mean yield of 91.51 bu/A. The high yielding entry was Winridge at 121.57 bu/A. Ten lines were equal to Winridge, and above 100 bushel per acre. Test weights were good with an average of 61.38 lbs/bu. Fourteen entries had test weights above 62 lbs/bu. TCK smut was light yet was observed in all but eight entries. Stripe rust was prevalent throughout the trial and severe in twelve varieties. MT 86009 and MT 86029 were the only two varieties showing good resistance to strip rust. Table 5.

### Offstation Winter Wheat Trials

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The offstation winter wheat trials were grown in Ravalli County ( McIntyre farm, Stevensville, MT ), Lake County ( Haake farm, Polson, MT. ) and in Flathead County ( Stillwater location, Oscar Buller farm Kalispell, MT. ). The mean yields were 35.94 bu/A for Ravalli Co., 28.65 bu/A for Lake Co., and 79.86 bu/A for Flathead Co. Heights, test weights, % TCK smut and % survival observations are given in tables 7-9.



Table 5. Agronomic data from the Intrastate Winter Wheat Nursery grown on the Northwestern Agricultural Research Center, Kalispell, MT in 1988.

Date planted: September 17, 1987

Harvested: August 29, 1988

| VARIETY                       | YIELD<br>BU/A | TEST WT<br>LB/BU | HEIGHT<br>INCHES | HEADING<br>DATE | % TCK<br>Smut | STRIPE<br>INF TYP | RUST<br>% SEVER |
|-------------------------------|---------------|------------------|------------------|-----------------|---------------|-------------------|-----------------|
| CI 17902 WINRIDGE 1/          | 121.57        | 61.98            | 47.44            | 158.50          | .00           | .20               | 6.25            |
| CI 17860 NEELEY               | 117.11        | 62.88            | 44.49b           | 157.50          | .00           | .20               | 3.75            |
| MT 86021 ID745101/LCO         | 114.86        | 61.80            | 41.24b           | 157.00          | .00           | .15               | 8.75            |
| MT 86009 CRT//FRD1655/OLESEN( | 110.46        | 59.53b           | 39.67b           | 155.00b         | .63a          | .00               | .00             |
| MT 79125 UT755079/CST56//TX65 | 107.82        | 60.10b           | 36.61b           | 156.50b         | .00           | .10               | 5.00            |
| QT 542 HYBRITECH (87-1359)    | 107.58        | 62.78            | 44.19b           | 154.00b         | .25           | .35               | 20.00           |
| MT 84458 CST//FRD1655/OLESEN( | 106.51        | 61.85            | 39.57b           | 153.00b         | .00           | .15               | 5.00            |
| MT 8039 LCO/FRD//NE69559/WNK  | 103.88        | 61.15            | 43.11b           | 156.00b         | .25           | .30               | 17.50           |
| NA 1316 ROCKY                 | 103.84        | 63.38a           | 45.47            | 156.00b         | .37           | .20               | 18.75           |
| ND 8002 SEWARD                | 102.29b       | 62.13            | 50.00a           | 157.75          | .37           | .35               | 13.75           |
| MT 86020 ID745101/LCO         | 98.75b        | 61.60            | 37.70b           | 156.75b         | .37           | .22               | 8.75            |
| MT 86007 FRD SD1287//D.P. (WH | 96.98b        | 59.90b           | 37.30b           | 155.50b         | .12           | .50a              | 55.00a          |
| MT 86029 CST/MT 6928//MT 6927 | 96.84b        | 59.68b           | 38.58b           | 156.75b         | .63a          | .00               | .00             |
| MT 86022 ID745101/LCO         | 95.45b        | 59.68b           | 41.34b           | 156.00b         | .25           | .20               | 31.25a          |
| MT 7810 FRD/WNK//MT 6928/TR   | 94.55b        | 60.05b           | 38.29b           | 157.00b         | .25           | .40               | 13.75           |
| CI 15075 CENTURK              | 93.66b        | 62.50            | 45.77            | 156.25b         | .50a          | .25               | 15.00           |
| MT 86031 ID745101/LCO         | 93.64b        | 61.20            | 36.81b           | 157.00          | .00           | .27               | 18.75           |
| PI491533 NORWIN               | 92.61b        | 60.95            | 29.72b           | 158.50          | .50a          | .15               | 8.75            |
| MT 7811 FRD/WNK//MT 6928/TR   | 92.50b        | 60.90            | 40.75b           | 157.25          | .12           | .30               | 11.25           |
| MT 87009 MSC/CTK A+//IUL      | 91.63b        | 61.15            | 34.35b           | 157.25          | .00           | .25               | 13.75           |
| CI 17735 NORSTAR              | 91.60b        | 62.55            | 53.54a           | 160.00          | .37           | .30               | 6.25            |
| NA 0001 THUNDERBIRD           | 91.57b        | 62.98            | 39.67b           | 152.75b         | .50a          | .17               | 20.00           |
| MT 86032 ID745101/LCO         | 88.62b        | 61.05            | 36.71b           | 157.00          | .25           | .20               | 10.00           |
| MT 85202 FRD/WNK//MT 6928/TR  | 87.05b        | 61.78            | 46.36            | 158.25          | .25           | .50a              | 26.25a          |
| MT 86003 CRT//FRD1655/OLESEN( | 86.40b        | 58.83b           | 34.55b           | 156.75b         | .25           | .40               | 35.00a          |
| MT 84268 CST//FRD1650/OLESEN( | 85.62b        | 61.25            | 39.86b           | 156.50b         | .12           | .30               | 10.00           |
| MT 85203 FRD/WNK//MT 6928/TR  | 85.44b        | 61.45            | 26.57b           | 160.00          | .00           | .12               | 7.50            |
| MT 86036 CST//FRD1628/OLESEN( | 85.23b        | 61.45            | 46.46            | 157.00          | .12           | .70a              | 58.75a          |
| CI 13670 WINALTA              | 85.18b        | 62.40            | 51.57a           | 158.25          | .25           | .30               | 10.00           |
| MT 8003 TIBER                 | 84.98b        | 62.08            | 46.26            | 157.75          | .25           | .80a              | 68.75a          |
| MT 85200 FRD/WNK//MT 6928/TR  | 84.31b        | 59.05b           | 35.73b           | 155.75b         | .25           | .20               | 22.50           |
| CI 17439 ROUGHRIDER           | 83.15b        | 62.45            | 51.57a           | 156.75b         | .25           | .25               | 20.00           |
| QT X1348 HYBRITECH            | 82.48b        | 59.03b           | 38.68b           | 156.50b         | .37           | .55a              | 35.00a          |
| CI 13872 FROID                | 81.76b        | 61.55            | 55.51a           | 157.75          | .37           | .30               | 13.75           |
| NA 362-5 ABILENE              | 79.28b        | 63.45a           | 31.40b           | 155.00b         | .37           | .20               | 23.75a          |
| CI 17844 REDWIN               | 76.75b        | 60.80b           | 45.77            | 157.50          | .12           | .80a              | 62.50a          |
| PI478771 AGASSIZ              | 74.06b        | 62.38            | 53.15a           | 158.25          | .25           | .70a              | 40.00a          |
| PI491532 CREE                 | 71.81b        | 62.23            | 51.38a           | 157.00          | .12           | .45a              | 46.25a          |
| MT 86042 MARIAS/MT 6930//LCO  | 70.06b        | 62.17            | 48.62            | 156.75b         | .37           | .30               | 33.75a          |
| MT 86038 CST//FRD1628/OLESEN( | 68.55b        | 60.40b           | 45.28            | 157.00          | .25           | .85a              | 81.00a          |
| CI 8885 CHEYENNE              | 65.29b        | 61.93            | 50.79a           | 158.50          | .12           | .45a              | 40.00a          |

Table 5. Cont'd

| VARIETY                      | YIELD<br>BU/A | TEST WT<br>LB/BU | HEIGHT<br>INCHES | HEADING<br>DATE | % TCK<br>Smut | STRIPE RUST<br>INF TYF % SEVER |
|------------------------------|---------------|------------------|------------------|-----------------|---------------|--------------------------------|
| EXPERIMENTAL MEANS           | 91.51         | 61.38            | 42.48            | 156.84          | .24           | .33 23.07                      |
| F TEST FOR VAR. 2/           | 3.80**        | 9.34**           | 67.58**          | 7.62**          | 1.00          | 6.57** 10.94**                 |
| C.V. 2: (S OF MEAN/MEAN)*100 | 7.45          | .65              | 1.96             | .35             | 71.90         | 24.77 25.83                    |
| LSD (0.05)                   | 19.09         | 1.11             | 2.33             | 1.52            | .48           | .23 16.69                      |

1/ Check variety

2/ F value for variety comparison

\*\* Indicates statistical significance at the .05 probability level.

a/ Values significantly greater than the check at the .01 level.

b/ Values significantly less than the check at the .01 level.

Table 6. Agronomic data from the three offstation winter wheat trials of 1988. Yield ( BU/A )

| CI or<br>State # | Variety              | ---- YIELD Bushels/Acre ---- |        |          |       |
|------------------|----------------------|------------------------------|--------|----------|-------|
|                  |                      | Ravalli                      | Lake   | Flathead |       |
| MT 8003          | TIBER                | 36.35                        | 29.17b | 84.07    |       |
| MT 8039          | LC0/FRD//NE69559/WNK | 28.22                        | 23.78b | 78.80    |       |
| CI 15075         | CENTURK              | 38.58                        | 16.07b | 79.20    |       |
| MT 79125         | UT755079/CST56//TX65 | 31.85                        | 47.90  | 84.47    |       |
| CI 13190         | WARRIOR              | 36.08                        | 27.07b | 81.82    |       |
| NA 201           | ARCHER               | 36.74                        | 25.27b | 74.62    |       |
| CI 17419         | DAWS                 | 42.02                        | 44.17  | 88.30    |       |
| CI 17441         | VONA                 | 47.65                        | 15.02b | 91.33    |       |
| PI491532         | CREE                 | 46.29                        | 26.30b | 78.97    |       |
| PI491533         | NORWIN               | 34.29                        | 24.02b | 63.80b   |       |
| CI 13670         | WINALTA              | 32.90                        | 16.38b | 66.20b   |       |
| CI 17727         | WESTON               | 29.83                        | 54.58  | 71.03    |       |
| CI 17735         | NORSTAR              | 37.65                        | 20.15b | 77.80    |       |
| CI 17844         | REDWIN               | 27.92                        | 25.72b | 79.05    |       |
| CI 17860         | NEELEY               | 30.94                        | 33.48b | 86.38    |       |
| CI 17879         | ROCKY                | 35.23                        | 15.27b | 79.12    |       |
| CI 17880         | WINGS                | 43.69                        | 11.18b | 77.85    |       |
| CI 8885          | CHEYENNE             | 31.24                        | 31.73b | 73.88    |       |
| CI 17902         | WINRIDGE 1/          | 26.75                        | 50.33  | 82.75    |       |
| CI 17909         | LEWJAIN              | 31.70                        | 36.85b | 89.45    |       |
| CI 17954         | HILL                 | 48.93                        | 27.22b | 88.15    |       |
|                  |                      | $\bar{X}$                    | 35.94  | 28.65    | 79.86 |
|                  |                      | F value 2/                   | .77    | 13.00**  | 1.99* |
|                  |                      | C.V.                         | 20.86  | 11.82    | 6.45  |
|                  |                      | L.S.D.                       | 21.43  | 9.68     | 14.72 |

1/ Check variety

2/ F value for variety comparison

\* or \*\* Indicates statistical significance at the .05 or .01 level

a/ Values significantly greater than the check at the .05 level

b/ Values significantly less than the check at the .05 level



Table 7. Agronomic data from the three offstation winter wheat trials of 1988. Test Weights ( lbs/Bu )

| CI or<br>State # | Variety              | TEST WEIGHTS Pounds/Bushels |         |          |
|------------------|----------------------|-----------------------------|---------|----------|
|                  |                      | Lake                        | Ravalli | Flathead |
| MT 8003          | TIBER                | 60.17                       | 65.00   | 63.47    |
| MT 8039          | LCD/FRD//NE69559/WNK | 59.60                       | 62.07b  | 60.80b   |
| CI 15075         | CENTURK              | 57.90                       | 63.83   | 62.77    |
| MT 79125         | UT755079/CST56//TX65 | 60.93                       | 64.53   | 62.13    |
| CI 13190         | WARRIOR              | 60.50                       | 64.07   | 63.47    |
| NA 201           | ARCHER               | 56.43b                      | 63.33   | 61.63    |
| CI 17419         | DAWS                 | 60.00                       | 62.63b  | 61.70    |
| CI 17441         | VONA                 | 56.40b                      | 64.17   | 63.33    |
| PI491532         | CREE                 | 61.47                       | 65.33   | 63.60a   |
| PI491533         | NORWIN               | 61.27                       | 64.33   | 63.23    |
| CI 13670         | WINALTA              | 58.90                       | 65.27   | 64.07a   |
| CI 17727         | WESTON               | 64.53a                      | 66.30a  | 64.07a   |
| CI 17735         | NORSTAR              | 59.87                       | 63.80   | 63.97a   |
| CI 17844         | REDWIN               | 62.03                       | 64.63   | 62.70    |
| CI 17860         | NEELEY               | 61.93                       | 61.90b  | 63.03    |
| CI 17879         | ROCKY                | 56.50b                      | 64.77   | 63.37    |
| CI 17880         | WINGS                | 60.00                       | 65.60a  | 63.30    |
| CI 8885          | CHEYENNE             | 59.97                       | 65.80a  | 63.67a   |
| CI 17902         | WINRIDGE 1/          | 61.03                       | 64.23   | 62.47    |
| CI 17909         | LEWJAIN              | 60.90                       | 60.17b  | 60.57b   |
| CI 17954         | HILL                 | 59.10                       | 60.97b  | 61.03b   |

|            |        |         |        |
|------------|--------|---------|--------|
| $\bar{X}$  | 59.97  | 63.94   | 62.78  |
| F value 2/ | 7.13** | 12.78** | 8.62** |
| C.V.       | 1.25   | .70     | .58    |
| L.S.D.     | 2.14   | 1.28    | 1.05   |

1/ Check variety

2/ F value for variety comparison

\* or \*\* Indicates statistical significance at the .05 or .01 level

a/ Values significantly greater than the check at the .05 level

b/ Values significantly less than the check at the .05 level

Table 8. Agronomic data from the three offstation winter wheat trials of 1988. Height (Inches)

| CI or<br>State # | Variety              | HEIGHT Inches |         |          |         |
|------------------|----------------------|---------------|---------|----------|---------|
|                  |                      | Lake          | Ravalli | Flathead |         |
| MT 8003          | TIBER                | 40.29         | 30.71   | 40.29a   |         |
| MT 8039          | LDD/FRD//NE69559/WNK | 36.48         | 26.64   | 30.05b   |         |
| CI 15075         | CENTURK              | 39.89         | 26.12   | 31.76b   |         |
| MT 79125         | UT755079/CST56//TX65 | 34.78         | 28.48   | 31.36b   |         |
| CI 13190         | WARRIOR              | 39.50         | 31.63   | 35.30    |         |
| NA 201           | ARCHER               | 30.58b        | 28.61   | 28.35b   |         |
| CI 17419         | DAWS                 | 28.35b        | 27.95   | 28.87b   |         |
| CI 17441         | VONA                 | 33.07b        | 28.35   | 23.88b   |         |
| PI491532         | CREE                 | 41.47         | 33.20   | 36.09    |         |
| PI491533         | NORWIN               | 23.88b        | 24.80   | 25.59b   |         |
| CI 13670         | WINALTA              | 41.73         | 29.92   | 39.11a   |         |
| CI 17727         | WESTON               | 40.94         | 32.28   | 40.16a   |         |
| CI 17735         | NORSTAR              | 40.94         | 31.23   | 39.11a   |         |
| CI 17844         | REDWIN               | 40.29         | 26.77   | 37.27    |         |
| CI 17860         | NEELEY               | 36.22         | 26.64   | 34.12    |         |
| CI 17879         | ROCKY                | 38.58         | 26.51   | 33.20b   |         |
| CI 17880         | WINGS                | 36.09         | 28.87   | 27.95b   |         |
| CI 8885          | CHEYENNE             | 39.50         | 27.56   | 38.19    |         |
| CI 17902         | WINRIDGE             | 37.80         | 28.48   | 35.96    |         |
| CI 17909         | LEWJAIN              | 28.08b        | 24.15   | 25.72b   |         |
| CI 17954         | HILL                 | 28.48b        | 29.40   | 26.38b   |         |
|                  |                      | $\bar{X}$     | 32.80   | 28.49    | 36.05   |
|                  |                      | F value 2/    | 11.49** | 1.38     | 27.32** |
|                  |                      | C.V.          | 4.76    | 7.16     | 2.81    |
|                  |                      | L.S.D.        | 4.46    | 5.83     | 2.90    |

1/ Check variety

2/ F value for variety comparison

\* or \*\* Indicates statistical significance at the .05 or .01 level

a/ Values significantly greater than the check at the .05 level

b/ Values significantly less than the check at the .05 level

Table 9. Agronomic data from the three offstation winter wheat trials of 1988. Percent smut ( Lake and Flathead Co. ) and Percent winter survival ( Flathead Co. only ).

| CI or State # | Variety              | % TCK SMUT |          | Stand Loss Flathead Co. |
|---------------|----------------------|------------|----------|-------------------------|
|               |                      | Lake       | Flathead |                         |
| MT 8003       | TIBER                | 40.00a     | .17      | 1.67                    |
| MT 8039       | LCO/FRD//NE69559/WNK | 41.67a     | 3.50a    | 1.67                    |
| CI 15075      | CENTURK              | 60.00a     | 1.67     | .67                     |
| MT 79125      | UT755079/CST56//TX65 | 11.67      | .00      | 1.00                    |
| CI 13190      | WARRIOR              | 38.33a     | .00      | .67                     |
| NA 201        | ARCHER               | 46.67a     | .33      | .00                     |
| CI 17419      | DAWS                 | 21.67a     | .67      | .67                     |
| CI 17441      | VONA                 | 75.00a     | 2.00a    | .00                     |
| PI491532      | CREE                 | 36.67a     | .00      | .67                     |
| PI491533      | NORWIN               | 55.00a     | .33      | .00                     |
| CI 13670      | WINALTA              | 43.33a     | .33      | .00                     |
| CI 17727      | WESTON               | 18.17      | .17      | .67                     |
| CI 17735      | NORSTAR              | 46.67a     | .00      | 1.00                    |
| CI 17844      | REDWIN               | 35.00a     | 1.00     | 3.33a                   |
| CI 17860      | NEELEY               | 31.67a     | .83      | 1.67                    |
| CI 17879      | ROCKY                | 65.00a     | 2.67a    | .67                     |
| CI 17880      | WINGS                | 75.00a     | 2.67a    | .00                     |
| CI 8885       | CHEYENNE             | 33.33a     | .17      | 1.67                    |
| CI 17902      | WINRIDGE             | 1/         | .00      | 1.00                    |
| CI 17909      | LEWJAIN              | 10.67      | .00      | .33                     |
| CI 17954      | HILL                 | 50.00a     | .17      | 1.00                    |
|               | $\bar{X}$            | 38.93      | .80      | .87                     |
|               | F 2/                 | 13.33**    | 3.23**   | 1.00                    |
|               | C.V.                 | 15.11      | 73.46    | 92.33                   |
|               | L.S.D.               | 16.81      | 1.68     | 2.30                    |

1/ Check variety

2/ F value for variety comparison

\* or \*\* Indicates statistical significance at the .05 or .01 level

a/ Values significantly greater than the check at the .05 level

b/ Values significantly less than the check at the .05 level