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## 2008 Winter Wheat Variety Yield Results and Planting Tips

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2008 turned out to be an excellent year for winter wheat production in most of South Dakota. Though conditions were very dry for planting last fall, most of the central and eastern part of the state had good rains in Oct. to get the wheat off to a good start. There were areas in the west central and northwest part of the state that did not get rain in the fall, and in those areas the wheat did not make it through the winter. From May on through the summer most of the state had plentiful rainfall and cool conditions, which led to excellent wheat yields — with reports of some fields exceeding 100 bushels per acre. The main problems in 2008 were tan spot early in the season, rust that came in later in the season in the central part of the state, and the difficulty getting the crop harvested with the rainy humid conditions in July and early Aug.

Yields from the Crop Performance Testing Program averaged 71 bu/A statewide, with all locations making it to harvest.

- The top-performing varieties East River in 2008 were Smoky Hill, Overland, NuDakota, Wendy, Expedition,

and Fuller.

- The top-performing varieties West River in 2008 were Overland, NuDakota, Smoky Hill, Wendy, Expedition, and Hawken.
- The varieties with the best three-year statewide average yields were Overland, NuDakota, Wendy, Expedition, Wesley, and Arapahoe.

Tables 1, 2, and 3 give the characteristics and performance of winter wheat varieties tested in South Dakota. Use them to select a variety with the agronomic characteristics suitable for your area and production system. When considering yield, look for varieties that have performed well at locations near your farm over the past three years. The intensive managed sites (IMS) at Brookings and Winner had fungicides applied to them, whereas the regular CPTs at those locations did not. Brookings had 4 oz/acre of Folicur applied at heading. At Winner, 5 oz/acre (half rate) of Stratego plus 1 gal/acre 6-16-6 was applied with the herbicide in the spring.

### Recommended Varieties for 2009

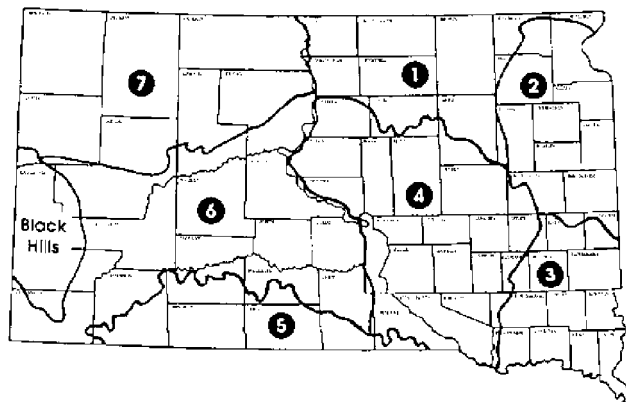
#### Recommended:

| Variety                         | Crop Adaptation Area   |
|---------------------------------|--|
| Alice (white) <sup>PVP</sup>    | 1 <sup>pc</sup> , 4 <sup>pc</sup> , 5, 6, 7 <sup>pc</sup>    |
| Expedition <sup>PVP</sup>       | 1 <sup>pc</sup> , 4 <sup>pc</sup> , 5, 6, 7 <sup>pc</sup>    |
| Harding <sup>PVP</sup>          | 1 <sup>pc</sup> , 2 <sup>pc</sup> , 4, 7                     |
| Millenium <sup>PVP</sup>        | 1 <sup>pc</sup> , 4 <sup>pc</sup> , 5, 6, 7 <sup>pc</sup>    |
| Overland <sup>PVP</sup>         | 1 <sup>pc</sup> , 3, 4 <sup>pc</sup> , 5, 6, 7 <sup>pc</sup> |
| NuDakota (white) <sup>PVP</sup> | 5, 6, 7 <sup>pc</sup>  |
| Wendy (white) <sup>PVP</sup>    | 5, 6, 7 <sup>pc</sup>  |
| Wesley                          | 5, 6, 7 <sup>pc</sup>  |

#### Acceptable/Promising

| Variety                 | Crop Adaptation Area   |
|-------------------------|--|
| Arapahoe <sup>PVP</sup> | 1 <sup>pc</sup> , 3, 4 <sup>pc</sup> , 5, 6, 7 <sup>pc</sup> |
| Darrell <sup>PVP</sup>  | 1 <sup>pc</sup> , 4 <sup>pc</sup> , 5, 6, 7 <sup>pc</sup>    |
| Hatcher <sup>PVP</sup>  | 5, 6, 7 <sup>pc</sup>  |
| Hawken <sup>PVP</sup>   | 3, 4 <sup>pc</sup> , 5, 6                                    |

Crop adaptation areas for South Dakota (revised 1992)



<sup>PVP</sup> U.S. Plant Variety Protection applied for and/or issued; seed sales of these varieties are restricted to classes of certified seed.  
<sup>pc</sup> Plant into protective cover.

## Winter Wheat Production Tips

Winter wheat planting season is around the corner. Here are some tips that will set the crop for success in 2009:

1. Choose a variety with good agronomic characteristics that is both recommended for your area and, on average, performed well in locations near your farm in the last few years.
2. Direct seed into standing stubble. The standing stubble traps snow and the trapped snow insulates wheat seedlings against cold temperatures, reducing risk of winterkill. Seeding winter wheat into broadleaf crops stubble is recommended to reduce the risk of insect, disease, and weed problems in the rotation. Seeding into wheat stubble should be avoided as this can increase the risk of disease carryover to the following season. If planting winter wheat into a fallow field, it is important to minimize the number of tillage operations just before planting. Plowing and other deep-tillage operations can reduce seedbed firmness, dry the topsoil, and bury protective residues increasing the risk of winter kill.
3. Control weeds now. Controlling grassy weeds and volunteer wheat crop two weeks prior to planting winter wheat will provide a break in the life cycle of wheat curl mite and help to control wheat streak mosaic and other diseases.
4. Plant on time. In South Dakota the recommended time to plant winter wheat is Sept. 15 through Oct. 10. Wheat plants should be well established before freezing to attain maximum cold tolerance and to accumulate enough energy reserves for the following spring. Planting wheat too early may produce excessive fall growth, reducing

**Table 1.** Hard winter wheat yield results - West River Locations, 2006 – 2008 (bu/A)

| Variety (Hdg.)* -<br>by 3-yr then 2008<br>state yield avg. | Location Yield Avg. (Bu/a at 13% moist.) |      |          |       |        |      |                |         |        |      | West Yield Avg.<br>(bu/a) |      | State Yield Avg.<br>(bu/a) |      |
|--|--|------|----------|-------|--------|------|----------------|---------|--------|------|---------------------------|------|----------------------------|------|
|  | Wall                                     |      | Kennebec | Hayes | Winner |      | Winner-<br>IMS | Sturgis | Martin |      | 2008                      | 3-Yr | 2008                       | 3-Yr |
|  | 2008                                     | 3-Yr | 2008     | 2008  | 2008   | 3-Yr | 2008           | 2008    | 2008   | 3-Yr |                           |      |                            |      |
| Overland (4)   | 85+                                      | 61+  | 91+      | 78    | 75+    | 57+  | 84+            | 45+     | 59     | 47+  | 74                        | 55   | 78                         | 60   |
| NuDakota~W (3)   | 78                                       | 62+  | 84       | 75    | 83+    | 58+  | 84+            | 38+     | 58     | 47+  | 71                        | 56   | 77                         | 60   |
| Wendy~W (-)  | 84+                                      | 64+  | 79       | 83+   | 68     | 52+  | 81+            | 30      | 60     | 48+  | 69                        | 55   | 75                         | 58   |
| Expedition (0)   | 80+                                      | 61+  | 77       | 81+   | 70     | 51+  | 76+            | 40+     | 68+    | 48+  | 70                        | 53   | 75                         | 57   |
| Wesley (2)   | 79+                                      | 61+  | 76       | 77    | 65     | 49   | 82+            | 39+     | 64+    | 52+  | 69                        | 54   | 72                         | 57   |
| Arapahoe (3)   | 71                                       | 56   | 86       | 73    | 61     | 50+  | 68             | 28      | 61     | 49+  | 64                        | 52   | 68                         | 57   |
| Millennium (4)   | 76                                       | 56   | 89       | 77    | 68     | 52+  | 71             | 40+     | 63     | 47+  | 69                        | 52   | 72                         | 56   |
| Alice~W (-)  | 77                                       | 60+  | 77       | 74    | 71     | 52+  | 78+            | 40+     | 63     | 48+  | 69                        | 53   | 72                         | 56   |
| Hatcher (2)  | 65                                       | 56   | 73       | 71    | 72     | 49   | 77+            | 45+     | 71+    | 52+  | 68                        | 52   | 70                         | 56   |
| Wahoo (3)  | 75                                       | 58+  | 82       | 75    | 58     | 47   | 58             | 39+     | 69+    | 50+  | 65                        | 52   | 67                         | 56   |
| Darrell (5)  | 73                                       | 55   | 81       | 79+   | 67     | 47   | 73             | 41+     | 68+    | 49+  | 69                        | 50   | 72                         | 55   |
| Harding (5)  | 67                                       | 52   | 86       | 71    | 61     | 49   | 60             | 34      | 59     | 44   | 63                        | 48   | 66                         | 53   |
| Tandem (4)   | 68                                       | 55   | 82       | 82+   | 56     | 46   | 66             | 37+     | 62     | 46   | 65                        | 49   | 65                         | 52   |
| Jerry (5)  | 62                                       | 49   | 76       | 66    | 56     | 42   | 69             | 33      | 55     | 43   | 60                        | 45   | 62                         | 50   |
| Jagalene (3)   | 77                                       | 58+  | 62       | 70    | 57     | 42   | 82+            | 38+     | 54     | 39   | 63                        | 46   | 67                         | 49   |
| Smoky Hill (4)   | 81+                                      | .    | 84       | 85+   | 69     | .    | 84+            | 41+     | 58     | .    | 72                        | .    | 78                         | .    |
| Hawken (3)   | 79+                                      | .    | 78       | 73    | 79+    | .    | 83             | 34      | 63     | .    | 70                        | .    | 73                         | .    |
| InfinityCL (3)   | 72                                       | .    | 82       | 78    | 75+    | .    | 70             | 33      | 69+    | .    | 68                        | .    | 72                         | .    |
| RonL (2)   | 71                                       | .    | 79       | 75    | 73     | .    | 81             | 37+     | 60     | .    | 68                        | .    | 72                         | .    |
| Fuller (2)   | 78                                       | .    | 75       | 76    | 77+    | .    | 70             | 38+     | 62     | .    | 68                        | .    | 72                         | .    |
| Settler CL (3)   | 75                                       | .    | 74       | 79+   | 70     | .    | 74             | 33      | 67+    | .    | 67                        | .    | 68                         | .    |
| Test avg. :  | 74                                       | 57   | 81       | 76    | 69     | 50   | 74             | 37      | 63     | 47   | 68                        | 52   | 71                         | 56   |
| High avg. :  | 85                                       | 64   | 95       | 85    | 83     | 58   | 86             | 45      | 71     | 52   | 74                        | 56   | 78                         | 60   |
| Low avg. :   | 62                                       | 49   | 62       | 66    | 56     | 42   | 58             | 28      | 54     | 39   | 63                        | 45   | 62                         | 49   |
| # LSD (0.05):  | 7  | 7    | 6        | 7     | 9      | 9    | 11             | 9       | 8      | 6    |                           |      |                            |      |
| ## TPG-value :   | 79                                       | 58   | 90       | 79    | 75     | 50   | 76             | 36      | 64     | 47   |                           |      |                            |      |
| ### C.V. :   | 6  | 10   | 5        | 6     | 10     | 10   | 11             | 14      | 8      | 9    |                           |      |                            |      |

\* Heading, the relative difference in days to heading, compared to Expedition.

# If the difference between two varieties within a column equals or exceeds the LSD value, the difference is significant; if not, the difference is nonsignificant (NS) at the 0.05 level of probability.

## Minimum value required for variety to qualify for the top performance group (TPG).

+ Indicates values within a column that qualify for the TPG.

### A measure of experimental error, 15% or less is best for yield.

amounts of soil moisture and nutrients. Early planted wheat may act as a host for leaf curl mites that transmit wheat streak mosaic virus and also increase the risk of root and crown rot diseases. Research from western South Dakota has shown that grain yield is decreased and that the crop suffers substantial winter injury when planting is later than Oct. 15.

5. Don't plant too deep or too shallow. Plant winter wheat at a depth of 1.5 to 2 inches in a firm seedbed. Planting deeper than 2 inches reduces emergence and can result in weak spindly seedlings with a poor ability to survive the winter. For those direct seeding, a uniform depth of 1 to 1.5 inches under optimum moisture conditions will give a good stand. If it is necessary to plant deeper to get to moisture, growers should choose a variety with a longer coleoptile (table 3). Make sure there is good soil-to-seed

contact, especially under drier conditions. If soil cover over the seed is poor there is risk of exposing the crown and adversely affecting winter survival.

6. Plant the right amount of seed. The recommended seeding rates are 22 pure live seeds per square foot (approximately 960,000 seeds/acre). If you have a poor seedbed or are planting later than the recommended dates, increase seeding rate to 28 pure live seeds per square foot. However, properly managed winter wheat has a tremendous ability to tiller and can compensate for thin stands.
7. Test soils and apply fertilizer based on soil test results and yield expectations. Research has shown that phosphorus helps winter survival by stimulating root growth and tillering in the fall. Therefore, if soil test results indicate low phosphorus, application of the required rate is recommended.

**Table 2.** Hard winter wheat yield results - East River Locations, 2006 – 2008 (bu/A)

| Variety (Hdg.)* -<br>by 3-yr then 2008<br>state yield avg. | Location Yield Avg. (Bu/a at 13% moist.) |      |                   |                |       |       |        |        | East Yield Avg.<br>(bu/a) |      | State Yield Avg.<br>(bu/a) |      |
|--|--|------|-------------------|----------------|-------|-------|--------|--------|---------------------------|------|----------------------------|------|
|  | Brookings                                |      | Brookings-<br>IMS | South<br>Shore | Selby | Onida | Pierre | Platte | 2008                      | 3-Yr | 2008                       | 3-Yr |
|  | 2008                                     | 3-Yr | 2008              | 2008           | 2008  | 2008  | 2008   | 2008   |                           |      |                            |      |
| Overland (4)   | 79                                       | 74+  | 90+               | 65             | 84+   | 85+   | 57+    | 85+    | 77                        | .    | 78                         | 60   |
| NuDakota~W (3)   | 91+                                      | 73+  | 95+               | 44             | 83+   | 79+   | 55+    | 88+    | 75                        | .    | 77                         | 60   |
| Wendy~W (-)  | 83                                       | 69+  | 89                | 56             | 84+   | 81+   | 42     | 81+    | 73                        | .    | 75                         | 58   |
| Expedition (0)   | 80                                       | 69+  | 96+               | 60             | 76    | 81+   | 45     | 85+    | 73                        | .    | 75                         | 57   |
| Wesley (2)   | 77                                       | 66+  | 92+               | 57             | 73    | 80+   | 49     | 71     | 71                        | .    | 72                         | 57   |
| Arapahoe (3)   | 75                                       | 71+  | 72                | 53             | 74    | 73    | 44     | 67     | 65                        | .    | 68                         | 57   |
| Millennium (4)   | 74                                       | 69+  | 78                | 60             | 78    | 76    | 49     | 77     | 69                        | .    | 72                         | 56   |
| Alice~W (-)  | 79                                       | 62   | 88                | 63             | 71    | 79+   | 48     | 69     | 71                        | .    | 72                         | 56   |
| Hatcher (2)  | 81                                       | 66+  | 87                | 50             | 75    | 66    | 48     | 73     | 68                        | .    | 70                         | 56   |
| Wahoo (3)  | 78                                       | 67+  | 79                | 53             | 67    | 69    | 45     | 66     | 65                        | .    | 67                         | 56   |
| Darrell (5)  | 84                                       | 67+  | 90+               | 54             | 76    | 74    | 49     | 72     | 71                        | .    | 72                         | 55   |
| Harding (5)  | 75                                       | 65+  | 73                | 52             | 71    | 69    | 52     | 64     | 65                        | .    | 66                         | 53   |
| Tandem (4)   | 70                                       | 60   | 75                | 51             | 70    | 69    | 36     | 63     | 62                        | .    | 65                         | 52   |
| Jerry (5)  | 68                                       | 65+  | 70                | 48             | 74    | 65    | 28     | 66     | 59                        | .    | 62                         | 50   |
| Jagalene (3)   | 70                                       | 55   | 82                | 43             | 65    | 80+   | 60+    | 72     | 67                        | .    | 67                         | 49   |
| Smoky Hill (4)   | 94+                                      | .    | 97+               | 58             | 78    | 80+   | 58+    | 84+    | 78                        | .    | 78                         | .    |
| Hawken (3)   | 88                                       | .    | 89                | 62             | 73    | 71    | 37     | 72     | 70                        | .    | 73                         | .    |
| InfinityCL (3)   | 82                                       | .    | 85                | 55             | 78    | 71    | 47     | 71     | 70                        | .    | 72                         | .    |
| RonL (2)   | 74                                       | .    | 89                | 59             | 72    | 75    | 53     | 70     | 70                        | .    | 72                         | .    |
| Fuller (2)   | 84                                       | .    | 92+               | 49             | 77    | 79+   | 51     | 69     | 72                        | .    | 72                         | .    |
| Settler CL (3)   | 75                                       | .    | 87                | 41             | 61    | 70    | 37     | 66     | 62                        | .    | 68                         | .    |
| Test avg. :  | 81                                       | 67   | 86                | 53             | 75    | 75    | 46     | 74     | 69                        | .    | 71                         | 56   |
| High avg. :  | 97                                       | 74   | 97                | 65             | 84    | 86    | 60     | 88     | 78                        | .    | 78                         | 60   |
| Low avg. :   | 68                                       | 55   | 70                | 36             | 61    | 65    | 25     | 63     | 59                        | .    | 62                         | 49   |
| # LSD (0.05):  | 7  | 65   | 8                 | -              | 6     | 9     | 8      | 9      |                           |      |                            |      |
| ## TPG-value :   | 91                                       | 10   | 90                | -              | 79    | 78    | 53     | 80     |                           |      |                            |      |
| ### C.V. :   | 6  | 8    | 6                 | 21             | 6     | 9     | 12     | 9      |                           |      |                            |      |

\* Heading, the relative difference in days to heading, compared to Expedition.

# If the difference between two varieties within a column equals or exceeds the LSD value, the difference is significant; if not, the difference is nonsignificant (NS) at the 0.05 level of probability.

## Minimum value required for variety to qualify for the top performance group (TPG).

+ Indicates values within a column that qualify for the TPG.

### A measure of experimental error, 15% or less is best for yield.

**Table 3.** Origin, variety traits, and disease reactions for winter wheat entries for 2008

| Variety    | (Hdg.)* | Lodging Resis.# | End-Use Qty# | Winter Hardy Rtg# | Cole-optile Pct## | Wheat Steak Mosaic+ | Tan-spot+ | Rust    |       |       | PVP**  |
|------------|---------|-----------------|--------------|-------------------|-------------------|---------------------|-----------|---------|-------|-------|--------|
|            |         |                 |              |                   |                   |                     |           | Stripe+ | Leaf+ | Stem+ |        |
| Alice~W    | -1      | G               | EB           | G                 | 78                | MR                  | MS        | -       | 4     | MR    | Pdg*** |
| Wendy~W    | -1      | E               | GN           | E                 | 67                | MS                  | R         | MR      | 6     | MR    | Yes    |
| Expedition | 0       | F               | GB           | G-E               | 88                | S                   | MS        | MS      | 7     | R     | Yes    |
| Fuller     | 2       | F-G             | AB           | G                 |                   | MS                  | MR        | -       | 2     | MR    | Pdg    |
| Hatcher    | 2       | G               | GB           | F-G               | 89                | S                   | -         | MS      | 6     | MR    | Yes    |
| RonL       | 2       | G-E             | GB           | G                 |                   | MR                  | -         | R       | 9     | MR    | Yes    |
| Wesley     | 2       | E               | GB           | G-E               | 79                | S                   | MR        | MR      | 4     | R     | No     |
| Arapahoe   | 3       | F               | GB           | G-E               | 83                | S                   | S         | MS      | 2     | MR    | Yes    |
| Hawken     | 3       | E               | AB           | G                 | -                 | MS                  | MR        | MR      | 3     | MR    | Yes    |
| InfinityCL | 3       | G               | AB           | G                 |                   | S                   | -         | MR      | 3     | MR    | Yes    |
| Jagalene   | 3       | E               | AB           | G                 | 92                | MS                  | MR        | MR      | 9     | MR    | Yes    |
| NuDakota~W | 3       | E               | AB           | G-E               | -                 | MR                  | -         | MR      | 4     | MR    | Yes    |
| Wahoo      | 3       | G               | AB           | G                 | 91                | S                   | -         | MR      | 5     | R     | Yes    |
| SettlerCL  | 3       | G               | AB           | G                 | -                 | S                   | -         | MS      | 4     | MR    | Yes    |
| Millennium | 4       | G               | AB           | F-G               | 78                | S                   | MS        | MR      | 2     | MR    | Yes    |
| Overland   | 4       | G               | AB           | E                 | 89                | -                   | -         | R       | 1     | R     | Yes    |
| Smoky Hill | 4       | G               | EB           | G                 |                   | MS                  | MR        | MR      | 1     | R     | Yes    |
| Tandem     | 4       | F-G             | EB           | G                 | 12                | S                   | S         | MR      | 7     | MR    | Yes    |
| Darrell    | 5       | G               | EB           | G                 | 89                | MR                  | MS        | -       | 6     | R     | Yes    |
| Harding    | 5       | F-G             | AB           | E                 | 0                 | MR                  | MR        | MS      | 2     | MR    | Yes    |
| Jerry      | 5       | F               | GB           | E                 | 92                | MS                  | -         | MR      | 3     | R     | No     |

\* Heading, the relative difference in days to heading, compared to Expedition.

~ W, Hard white wheat variety.

# E= exc., A= accept., F= fair, G= good, P= poor, B= baking, N=noodles.

##Percent of Harding (3-1/4" long).

+ R= resistant, MR= moderately resist., MS= mod. susceptible, S= susc., VS= very susc.

\*\* Plant variety protection (PVP), title V certification option- sold by variety name only as a class of certified seed.

\*\*\* PVP application pending.



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