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# For yield test weight disease resistance:

## Settler Oat

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'Settler,' a new spring oat, was released by the South Dakota Agricultural Experiment Station in 1989 during South Dakota's Centennial celebration and named in honor of the pioneers that settled in South Dakota.

Settler exhibits a significant improvement over other varieties released by Reeves in its tolerance to barley yellow dwarf (BYD) virus. This disease is caused by a virus transmitted by insects and is commonly called "red leaf."

Settler has also shown good yield and test weight in South Dakota and other regional trials (Table 1).

**Origin.** Settler was selected from a single F<sub>3</sub> panicle from the cross (Benson//W12221-2/Noble) made in 1978 and was first tested as the experimental line SD820045 in 1982. Settler was entered in the Uniform Midseason Regional Oat Performance Nursery coordinated by USDA from 1986 to 1988 and has been in the South Dakota Crop Performance Testing Program since 1986.

### Agronomic characteristics.

Settler is a white-kernel oat with medium-high groat protein content and medium-high test weight. It is medium-late in

maturity, averaging about 3 days later than 'Kelly' and 'Don.' It is similar to 'Hyttest' (Table 2).

Settler is medium-tall, averaging about one inch shorter than 'Burnett' and 2 inches taller than Don (Table 2). Despite its height Settler still exhibits good straw strength.

Disease resistance is its strong suit (Table 2). Only Don has better smut resistance. Only Don and Valley have better crown rust resistance. A major advantage of Settler is that it combines these resistances with a high level of tolerance to BYD virus.

Settler has a medium-high groat protein content. It is higher in protein than Don and Burnett but lower than Kelly and Hytest.

Limited test results indicate Settler is an above-average milling yield oat. (Milling yield is equal to the pounds of raw oats needed to produce 100 lb of oat groats. An excellent rating is 155 lb or less; a very poor rating is 185 lb or more.) Milling tests on oat samples from Watertown in 1986 resulted in the following variety ratings and milling yields: Burnett, very poor, 198 lb. Settler and Don, good, 162 and 165 lb, respectively. Kelly and Hytest, very good, 156 and 157 lb, respectively.

Table 1. Average yield (bu) and test weight (TW) comparisons for eight eastern South Dakota locations, 1987-89.

| Variety | Location  |      |         |      |           |      |           |      |          |      |           |      |        |      |       |      |      |      |
|---------|-----------|------|---------|------|-----------|------|-----------|------|----------|------|-----------|------|--------|------|-------|------|------|------|
|         | Beresford |      | Freeman |      | Aurora Co |      | Brookings |      | Highmore |      | Watertown |      | Groton |      | Selby |      | Avg. |      |
|         | bu        | TW   | bu      | TW   | bu        | TW   | bu        | TW   | bu       | TW   | bu        | TW   | bu     | TW   | bu    | TW   | bu   | TW   |
| Kelly   | 36        | 31.3 | 43      | 32.3 | 39        | 31.7 | 80        | 34.7 | 43       | 36.3 | 64        | 34.3 | 67     | 32.3 | 51    | 36.0 | 53   | 33.7 |
| Don     | 69        | 31.0 | 51      | 31.3 | 53        | 31.7 | 97        | 33.7 | 60       | 33.7 | 92        | 34.0 | 91     | 32.0 | 58    | 33.7 | 71   | 32.7 |
| Burnett | 40        | 29.7 | 42      | 30.3 | 48        | 30.3 | 83        | 31.3 | 50       | 34.3 | 73        | 32.0 | 76     | 29.3 | 56    | 34.7 | 59   | 31.7 |
| Hyttest | 42        | 32.7 | 46      | 33.3 | 42        | 30.3 | 77        | 34.0 | 48       | 36.0 | 74        | 35.7 | 77     | 34.7 | 51    | 37.3 | 57   | 34.3 |
| Valley  | 61        | 29.0 | 51      | 33.0 | 53        | 29.3 | 92        | 32.0 | 54       | 31.0 | 69        | 32.7 | 97     | 31.0 | 58    | 34.0 | 67   | 31.0 |
| Settler | 66        | 31.0 | 52      | 32.3 | 59        | 31.7 | 99        | 33.3 | 59       | 34.7 | 84        | 33.7 | 91     | 29.7 | 57    | 37.0 | 71   | 33.0 |

**Table 2. Agronomic characteristics of 'Settler' compared to other varieties.**

| Variety | 1989, days          |                 | Straw strength | 1986-88, groat protein | Disease resistance |      |           |            |
|---------|---------------------|-----------------|----------------|------------------------|--------------------|------|-----------|------------|
|         | planting to heading | 1987-89, height |                |                        | Red leaf           | Smut | Stem rust | Crown rust |
| Kelly   | 60                  | 29*             | Fair           | 21.9%                  | MS*                | MR*  | S*        | MR*        |
| Don     | 60                  | 27*             | Good           | 18.8%                  | MR                 | R    | S         | R          |
| Burnett | 61                  | 30*             | Poor           | 19.5%                  | S                  | MR   | S         | S          |
| Hyttest | 63                  | 32*             | Good           | 21.0%                  | MS                 | MR   | S         | MS         |
| Valley  | 65                  | 27*             | Good           | 20.5%                  | MR                 | MS   | R         | R          |
| Settler | 63                  | 29"             | Good           | 20.3%                  | MR                 | MR   | S         | MR         |

\* S=susceptible, MS=moderately susceptible, MR=moderately resistant, R=resistant

**Table 3. Average yield (bu) and test weight (TW) comparisons for four western South Dakota locations, 1987-89.**

| Variety | Location |      |      |      |            |      |       |      |         |      |
|---------|----------|------|------|------|------------|------|-------|------|---------|------|
|         | Martin   |      | Wall |      | Bear Butte |      | Bison |      | Average |      |
|         | bu       | TW   | bu   | TW   | bu         | TW   | bu    | TW   | bu      | TW   |
| Kelly   | 61       | 33.9 | 44   | 32.1 | 45         | 32.0 | 61    | 33.4 | 52      | 32.9 |
| Don     | 72       | 33.1 | 51   | 31.7 | 53         | 32.1 | 67    | 31.6 | 61      | 32.1 |
| Burnett | 64       | 31.9 | 53   | 29.4 | 40         | 29.9 | 66    | 33.7 | 56      | 31.2 |
| Hyttest | 61       | 34.4 | 48   | 31.7 | 39         | 31.3 | 63    | 36.3 | 53      | 33.4 |
| Valley  | 76       | 31.5 | 48   | 29.7 | 46         | 26.1 | 77    | 31.5 | 62      | 29.7 |
| Settler | 70       | 33.2 | 49   | 29.9 | 45         | 30.5 | 70    | 32.9 | 59      | 31.6 |

**Performance data.** Settler has an excellent yield and test weight performance record in both eastern and western South Dakota (Tables 1 and 3).

Some varieties are higher in either yield or test weight at particular locations, but on the average Settler has exhibited the best

**combination of yield and test weight.**

Although not shown in Tables 1 and 3, Settler has been in the top-yielding group at 92% of the test locations based on 3-yr averages (1987-89). In comparison, Don has been in the top-yielding group at 75% of the locations. Burnett,

Kelly, Hyttest, and Valley were top yielders at 25%, 8%, 17%, and 67% of the test locations, respectively.

This means Settler is well adapted to South Dakota and has excellent yield potential.

Test weight results from both eastern and western South Dakota indicate Settler is lower than Kelly and Hyttest, similar to Don, and higher than Valley and Burnett (Tables 1 and 3).

**Summary.** Settler, when compared to other popular varieties, appears to exhibit the best combination of yield and test weight. These factors, along with Settler's moderately high resistance to BYD virus, give it a competitive advantage in South Dakota oat production.

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**Settler  
Oat**

