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For Yield, Test Weight, Disease Resistance: Settler Oat

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For yield
test weight
disease resistance:

Settler Oat



Agricultural Experiment Station
South Dakota State University
U.S. Department of Agriculture

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 F₃ 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 'Hytest' (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
Hytest	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 planting to		Straw strength	1986-88, groat protein	Disease resistance			
	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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