

# Oat and Cereal Rye Variety Trial

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Careful management and proper variety selection can make small grains profitable in crop rotations due to their low input requirements and beneficial effects on succeeding crops. When grown as a cash crop, oats and cereal rye can be marketed for cover crop seed, grain, straw, forage, hay, or haylage. The mid-summer harvest allows for a myriad of field management options for the remainder of the season, such as mid-season manure application or the establishment of a perennial forage crop.

Practical Farmers of Iowa has been collaborating with Iowa State University Research Farms to trial small grain varieties since 2015. This past year, oats and cereal rye were trialed at the Northeast Research and Demonstration Farm.

## Materials and Methods

Nine varieties of cereal rye and 18 varieties of oats were trialed in 2021. Management information for each trial can be found in Table 1. No herbicides or insecticides were applied. Due to low rainfall, oats were not screened for diseases in 2021. Rye seed samples from each location were sent to the ISU Seed Testing Laboratory for germination testing. Germination seed samples were pooled across replicates at each site, therefore, germination data are not analyzed statistically. Data were analyzed using JMP Pro 15 (SAS Institute Inc.). Statistical significance is determined at  $P \leq 0.10$  level (unless otherwise noted) and means separations are reported using Tukey's least significant difference (LSD).

## Results and Discussion

Rye yields ranged from 56 to 117 bushels per acre with an average of 83. The three hybrid rye varieties (Bono Serafino, Brasetto) had the highest yield. Rye straw yields ranged from 1.9 to 2.8 tons per acre with an average of 2.5. Rye seed germination ranged from 87 to 90% (Table 2).

**Table 1. Management information for small grain variety trials**

	Oat trial	Cereal Rye trial
Previous crop	Soybean	Soybean
Replications	3	3
Harvested plot size	8 ft × 127 ft	8 ft × 50 ft
Fertilizer applied	14 lb N 66 lb P per ac. as MAP: Nov. 13 2020 30 lb N per ac as Urea: March 22, 2021	60 lb P/ac and 267 lb K/ac: Oct. 21, 2020
Tillage	Field cultivator: March 30, 31	
Planting date	March 30, followed by cultipacker	Oct. 9, 2020 no-till drill followed by cultipacker
Row spacing	7.5 in.	7.5 in.
Seeding rate	4 bu/ac	Variable to achieve target planting population of 23 seeds/ft <sup>2</sup>
Seeding depth	1 in.	1.25 in.
Harvest date	July 13	July 13

Oat yields ranged from 87 to 131 bushels per acre with an average of 121. Test weight

**Table 2. Yield (grain and straw), test weight, plant height, and germination of cereal rye varieties.**

VARIETY	YIELD			Test weight (lb./bu.)	Straw yield (ton/ac.)	Plant height at harvest (in.)	Seed germination (%)
	bu./ac.	(% of site average)	3-year average (bu./ac.)				
Bono	111	133	78	54	2.3	43	
Brasetto	115	138	75	53	2.6	45	
Danko	86	103		54	1.9	48	89
Elbon	60	71	41	54	2.3	50	90
Hazlet	79	95	56	54	2.6	50	87 <sup>c</sup>
ND Dylan	58	70	48	53	2.8	51	89
ND Gardner	68	82		53	2.7	51	88
Serafino	117	140	88	54	3.0	45	
Spooner	56	67	49	53	2.5	52	88
LSD (90%) <sup>a</sup>	36			1	0.2	6	
MEAN	83			54	2.5	48	89

<sup>a</sup> By response variable, if the difference between any two entries is greater than the least significant difference (LSD) the entries are considered statistically different with 90% confidence.

<sup>b</sup> Lodging data are visual estimates and were not statistically analyzed.

<sup>c</sup> Fungal abnormalities present in the sample.

ranged from 30.3 to 44.1 lbs. per bushel with an average of 34.2. The two highest yielding varieties were Saddle and Warrior. Streaker, a hullless variety, had the lowest yield, but was the only variety at the site to have a test weight meet food grade specifications (Table 3). Oat straw yields ranged from 1.2 to 1.6 tons per acre with an average of 1.4.

**Table 3. Yield, test weight, plant height, and straw yield of oat varieties. Varieties with a test weight that meets food grade specification ( $\geq 38$  lb./bu.) are highlighted.**

VARIETY	YIELD			Test weight (lb./bu.)	Plant height at harvest (in.)	Straw yield germination (%)
	bu./ac.	(% of site average)	7-year average (bu./ac.) <sup>b</sup>			
Saddle	131	108	127	33.4	31	1.46
Warrior	129	106	123	32.8	30	1.58
Shelby 427	129	106	115	36.3	33	1.60
Natty	127	105	124	34.8	34	1.36
Reins	127	105	118	34.8	26	1.16
Goliath	127	105	127	33.3	36	1.57
Saber	126	104	124	33.2	30	1.27
Hayden	125	103	129	34.6	31	1.57
Deon	124	102	124	34.2	32	1.57
Esker2020	123	102	131	30.3	31	1.36
Rushmore	121	100	132	33.7	32	1.44
CS Camden	121	100	109	30.8	29	1.44
Antigo	120	99	109	36.3	32	1.26
Morton	117	96	112	31.5	34	1.56
Jerry	117	96	109	34.4	33	1.43
MN Pearl	116	96	132	31.1	30	1.53
Sumo	114	94	110	36.1	32	1.16
Streaker	87	72	84	44.1	34	1.51
MEAN	121	--	--	34.2	32	1.43
LSD(90%) <sup>a</sup>	12	--	--	00.4	2	0.03

<sup>a</sup> By response variable, if the difference between any two entries is greater than the least significant difference (LSD) the entries are considered statistically different with 90% confidence.

<sup>b</sup> 7-year average yields are listed only for those varieties trialed at least twice in the past seven years at this location

Further information about the trials, such as the characteristic of each variety and their source, can be found on the Practical Farmers of Iowa website

[Oat Variety Trial 2021](https://practicalfarmers.org/research/oat-variety-trial-2021) practicalfarmers.org/research/oat-variety-trial-2021

[Cereal Rye Variety Trial](https://practicalfarmers.org/research/cereal-rye-variety-trial-2021) (practicalfarmers.org/research/cereal-rye-variety-trial-2021)

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