

Oat and Cereal Rye Variety Trials in Northern Iowa

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Introduction

Careful management and proper variety selection can make small grains profitable in crop rotations due to 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 Research Farms to trial small grain varieties since 2015. This past year, oats and cereal rye were trialed at the Northern Research Demonstration Farm, Kanawha, Iowa.

Materials and Methods

Nine varieties of cereal rye and 18 varieties of oats were trialed in 2020. Management information for each trial can be found in Table 1. No herbicides or insecticides were applied. Rye seed samples from each location were sent to the Iowa State Seed Testing Laboratory for germination testing. Germination seed samples were pooled across replicates at each site and therefore germination data are not analyzed statistically.

Data were analyzed using JMP Pro 15 (SAS Institute, Inc., Cary, NC). 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 18 to 67 bushels/acre. The three hybrid rye varieties (Bono, Brassetto, Serafino) had the highest yield. Rye seed germination ranged from 91 to 97 percent (Table 2).

Oat yields ranged from 87 to 141 bushels/acre. Test weight ranged from 32.1 to 44.8 lb/bushel. Five varieties had a test weight above the milling threshold: 38 lb/bushel. The two highest yielding varieties were Saddle and Antigo. Streaker, a hullless variety, had the lowest yield but the highest test weight (Table 3).

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

<https://practicalfarmers.org/research/oat-variety-trial-2020/>

<https://practicalfarmers.org/research/cereal-rye-variety-trial-2020/>

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Table 1. Management information for small grain variety trials in the Northern Research and Demonstration Farm in 2020.

	Oat trial	Cereal rye trial
Previous crop	Soybeans	Soybeans
Replications	3	3
Harvested plot size	5 ft x 47 ft	5 ft x 57 ft
Fertilizer applied	65 lb N/ac as urea Apr. 2	720 lb K/ac as potash Nov. 22, 2019 102 lb N/ac and 480 lb P/ac as MAP Nov. 25, 2019
Tillage	Soil finisher Apr. 2 and Apr. 7	
Planting date	Apr. 7, followed by cultipacker	Oct. 19, 2019 with no-till drill
Row spacing	7.5 in.	7.5 in
Seeding rate	4 bu/ac	Variable to achieve target planting population of 23 seeds/ft ²
Seeding depth	1 in.	1.25 in.
Harvest date	July 24	July 22

Table 2. Yield, test weight, plant height, percent lodging, and germination of cereal rye varieties.

	Yield		Test weight (lb/bu)	Plant height at harvest (in.)	Lodging at harvest (%) ^b	Seed germination (%)	
	(bu/ac)	(% of site avg.)					2-yr avg. (bu/ac)
Bono	67	153	72	56	37	2	--
Brasetto	65	147	68	55	36	2	--
Serafino	64	147	64	55	37	0	--
Hazlet	47	108	46	56	44	7	96
ND Dylan	39	88	40	55	45	3	96
Spooner	38	88	38	55	45	5	94
Elbon	32	74	29	56	44	3	95
Aroostook	24	54	24	55	47	0	97
Wheeler	18	52	18	52	53	5	91
Mean	44	--	--	55	43	3	95
LSD(0.10) ^a	7	--	--	1	4	--	--

^aBy 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.

^bLodging data are visual estimates and were not statistically analyzed.

Table 3. Yield, test weight, plant height, and percent lodging of oat varieties. Varieties with a test weight that meets food grade specification (≥ 38 lb/bu) are highlighted.

Variety	Yield		6-yr avg. (bu/ac) ^b	Test weight (lb/bu)	Plant height at harvest (in.)	Lodging at harvest (%)
	(bu/ac)	(% of site avg.)				
Saddle	141	118	99	36.0	31	0
Antigo	135	112	74	39.1	34	78
Reins	133	111	83	37.5	26	2
Saber	132	110	102	35.5	32	2
Warrior	132	110	99	34.9	33	0
Rushmore	130	108	--	38.7	35	2
MN Pearl	125	104	95	35.0	37	2
Natty	124	103	92	37.0	36	3
Hayden	123	103	88	35.7	34	7
Esker 2020	123	102	95	32.8	32	22
Shelby 427	123	102	81	38.1	36	2
Sumo	119	100	75	38.6	32	3
Ogle	117	98	--	32.1	33	2
Goliath	111	92	80	36.7	41	13
Deon	109	90	88	34.5	35	2
Morton	103	86	--	35.1	41	7
Jerry	102	85	65	37.8	35	22
Streaker	87	73	--	44.8	36	37
Mean	120	--	--	36.7	34	11
LSD ^a	32	--	--	1.4	4	24

^aBy 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.

^b6-yr average yields are listed only for those varieties trialed at least twice in the past six years at this location. This was the first year that Morton, Ogle, Rushmore, and Streaker were trialed.