

Small Grain Variety Trials

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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, cereal rye and oats can be marketed for cover crop seed, grain, straw, forage, hay, or haylage. Their 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, cereal rye and oats were trialed at the Armstrong and Neely-Kinyon Research and Demonstration Farms. This was the second-year cereal rye was trialed, and the third-year oat was trialed in this location.

Materials and Methods

Ten varieties of cereal rye (and one triticale variety) and 17 varieties of oats were trialed this year. Management information for each trial can be found in Table 1. No herbicides or insecticides were applied. Seed samples of non-hybrid varieties of rye and triticale 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). 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

Table 1. Management information for small grain variety trials.

	Cereal rye and triticale trial	Oat trial
Previous crop	Soybean	Soybean
Replications	3	3
Harvested plot size	5 ft × 50 ft.	5 ft × 50 ft.
Fertilizer applied	30 lb. N/acre as Urea, March 28	30 lb. N/acre as Urea, March 28
Tillage	None	Disked on March 28
Planting date	Oct. 8, 2021	April 6 followed by cultipacker
Row spacing	7.5 in.	7.5 in.
Seeding rate	Variable to achieve target planting population of 23 seeds/ft. ²	4 bushels/acre
Seeding depth	1.25 in.	1 in.
Harvest date	July 22	July 22

Rye yields ranged from 55 to 113 bushels/acre with an average of 85. The three hybrid rye varieties (Bono, Serafino, Tayo) had the highest yield. Rye and triticale seed germination ranged from 89% to 96% with an average of 94% (Table 2).

Oat yields ranged from 104 to 149 bushels/acre with an average of 124. Test weight ranged from 33.6 to 39.8 lb./bushel. Three varieties had a test weight above the milling threshold: 38 lb./bushel. The highest yielding variety was Reins. Antigo had 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 the Practical Farmers of Iowa website:

[Cereal Rye and Triticale Variety Trial 2022](https://practicalfarmers.org/research/cereal-rye-and-triticale-variety-trial-2022)

practicalfarmers.org/research/cereal-rye-and-triticale-variety-trial-2022

[Oat Variety Trial 2022](https://practicalfarmers.org/research/oat-variety-trial-2022)

practicalfarmers.org/research/oat-variety-trial-2022

Acknowledgements

This work is supported by the Agriculture and Food Research Initiative, grant number F9000315202081 from the USDA National Institute of Food and Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the U.S. Department of Agriculture. Seed donated by Albert Lea Seed House, KWS, Welter Seed and Honey Company., Meridian Seeds, South Dakota State University Seed Foundation, and Zabel Seed.

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

Variety	Yield		Test weight, lb./bu.	Plant height at harvest, in.	Lodging at harvest (%) ^b	Seed germination (%)
	bu./ac.	% site av.				
Aroostook	79	92	56	52	5	94
Bono	111	129	57	45	0	0
Danko	83	97	57	48	0	94
Elbon	55	65	55	54	7	96
Hazlet	87	101	58	48	2	95
ND Dylan	67	78	56	52	8	94
ND Gardner	63	74	55	54	10	94
Serafino	113	132	57	47	0	0
Spooner	65	76	56	54	0	94
Tayo	116	135	56	45	0	0
Tulus (trit.)	102	119	49	37	0	89
LSD(90%)	12	0	3	6	4	0
MEAN	85	0	56	50	3	94

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.

Table 3. Yield, test weight, plant height, and percent lodging of oat varieties.

Variety	Yield		3-year average, bu./ac.	Test weight lb./bu.	Harvest plant height, in.	Lodging at harvest, %
	bu./ac.	% of site average				
Antigo	120	97	112	39.8	38	12
CS Camden	116	93	106	33.6	38	2
Deon	118	95	115	36.0	39	0
Esker 2020	114	92	124	33.6	40	7
Goliath	107	86	91	37.9	43	5
Hayden	136	109	125	37.6	41	0
Jerry	117	94	92	37.3	40	0
MN Pearl	119	96	130	36.5	38	2
Morton	104	84	101	35.5	45	0
Natty	132	106	125	37.8	37	3
Reins	149	120	144	38.5	34	0
Rushmore	129	103	134	37.6	39	0
Saddle	133	107	136	36.8	36	0
SD Buffalo	136	110	0	36.4	41	0
Shelby 427	134	108	128	37.7	39	0
Sumo	105	85	113	38.7	37	0
Warrior	144	116	124	36.8	40	0
MEAN	124	0	0	34.7	39	0
LSD(90%)	31	0	0	2.1	6	0

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. three-year average yields are listed for varieties trialed in the past two years at this location.