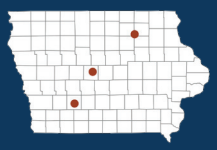
PRACTICAL FARMERS OF IOWA
COOPERATORS' PROGRAM Farmer-Led Research

EXPERIMENT



2025

Cereal Rye Variety Trial 2025

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In a Nutshell:

- 11 cereal rye varieties were trialed at three Iowa State University research farms.

Key Findings:

- Challenging wet weather in June and July delayed harvest, and there were significant lodging issues.
- Across all sites and varieties, hybrid cereal rye varieties averaged 62 bu/ac while open-pollinated varieties averaged 45 bu/ac.
- Most hybrid varieties outyielded most open-pollinated varieties at Boone and Greenfield, but Hazlet and Aroostook (both open-pollinated) were among the top performing varieties overall at Nashua.

Cooperators

ISU Northeast Research Farm (Ken Pecinovsky) – Nashua

ISU Ag Engineering and Agronomy Farm (Mike Fiscus) – Boone

ISU Southwest Research Farm (Matt Schnabel) – Greenfield

Funding

USDA-NIFA

Albert Lea Seed House

Green Cover Seed

North Dakota State University

KWS

FP Genetics

BACKGROUND

This was the seventh year that Practical Farmers of Iowa coordinated cereal rye variety trials at Iowa State University research farms at Nashua (northeast Iowa); it was the fifth year of trials at ISU research farms at Boone (central Iowa) and Greenfield (southwest Iowa). A fourth trial Kanawha (north-central Iowa) was not completed due to wet weather conditions around harvest.

In the previous seven years of rye variety trials on ISU farms, SU Cossani, SU Performer, SU Bebop, Tayo and Serafino have been the top yielding varieties across sites. Overall, yields in PFI's small-grains variety trials have varied quite a bit between years due to weather conditions and the retention and addition of higher performing varieties in the trials [1–7]. In 2024, the average cereal rye yield across the four participating Iowa research farms was 89 bu/ac [1]. In contrast, cereal rye variety trials conducted by the University of Minnesota reported an average yield of 118 bu/ac in 2024 [2]. In 2023, the average cereal rye yield across the four Iowa research farms was 42.6 bu/ac [3]. In 2022, the average cereal rye yield across the four research farms was 81.3 bu/ac [4].

METHODS

Variety trials were conducted at four locations in 2025: ISU Northern Research Farm in Kanawha; ISU Northeast Research Farm in Nashua; ISU Ag Engineering and Agronomy Farm in Boone; ISU Southwest Research Farm in Greenfield. Production characteristics and some breeding history about each of the trialed varieties can be found in **Table 1**. SU Bebop was trialed only at Nashua; Kanawha, Boone and Greenfield trialed ten varieties. Information on winter hardiness, days to heading, plant height and ergot susceptibility can be sourced from the University of Minnesota [8].

Rye test plots in Boone, IA just before harvest. Photo taken July 9, 2025.

TABLE 1. Origin, characteristics and seeding rate of cereal rye varieties trialed in 2025.

VARIETY	SPECIES	AGENT OR BREEDER	PVP [a]	TYPE	SEEDING RATE (lb/ac)[c]
Aroostook	Cereal rye	USDA-ARS	None	Open-pollinated	84.8
Elbon	Cereal rye	Oklahoma St. Univ.	None	Open-pollinated	59.0
Hazlet	Cereal rye	SeCan	None	Open-pollinated	80.9
ND Dylan	Cereal rye	North Dakota St. Univ.	PVP(94)	Open-pollinated	65.5
ND Gardner	Cereal rye	North Dakota St. Univ.	Pending	Open-pollinated	78.0
Receptor	Cereal rye	KWS	N/A[b]	Hybrid	54.1
Serafino	Cereal rye	KWS	N/A[b]	Hybrid	56.4
SU Bebop	Cereal rye	FP Genetics	None	Open-pollinated	90.7
SU Cossani	Cereal rye	FP Genetics	None	Hybrid	67.3
SU Performer	Cereal rye	FP Genetics	None	Hybrid	83.0
Tayo	Cereal rye	KWS	N/A[b]	Hybrid	46.7

[a] PVP = Plant Variety Protection. The PVP Act provides a certificate to the developer of a variety granting exclusive rights for reproducing and marketing the seed.

[b] Hybrids from KWS are protected from propagation by license agreements entered into with KWS upon seed purchase.

[c] Calculated from seed lot weights (no. seeds/lb) and germination rates (%) to achieve target populations of 25 seeds/ft^2 (open-pollinated) or 18.4 seeds/ft^2 (hybrid).

Rye management information is provided with the results from each location. No herbicide, insecticide or fungicide were applied at any location. Rye was planted at seeding rates (lb/ac) listed in **Table 1** to achieve seeding rates of 25 seeds/ft^2 for open-pollinated varieties and 18.4 seeds/ft^2 for hybrid varieties. All varieties were planted on 7.5 in. row spacing at 1.25 in. depth. Each location measured grain yield, grain test weight, plant height at harvest and % lodging. No sites were able to measure and report straw biomass this season. Reported yields are corrected to 14% moisture content. Cumulative monthly precipitation and average monthly temperature during the cereal rye growing season sourced from the NASA POWER dataset are provided for each location [7,8].

We analyze and report variety results separately for each trial location. At each location, the 3-year average yield is provided for individual varieties that have been trialed at the site in previous years. A "% of site average" is also included to aid in comparing yields of varieties within each location; this is the 2025 yield of a variety divided by the average yield across all varieties grown at the site in 2025. We used Analysis of Variance (ANOVA) followed by a Tukey's Significant Difference test to determine if there were statistically significant differences in yield, test weight, plant height and lodging across varieties at individual sites. Tukey's test calculates a statistic called the Minimum Significant Differences (MSD); if the difference in yield, etc. between two varieties is greater than the MSD, we consider the yields significantly different. Statistical significance is determined at the 90% confidence level, meaning that if the experiment were repeated, we would expect to see the same results nine times out of ten.

RESULTS AND DISCUSSION

After a dry winter, weather conditions during the 2025 growing season were marked by near-record April, June and July rainfalls, making weed management and cereal rye harvest difficult. As a result, field managers at Kanawha were unable to harvest their cereal rye variety trial, and harvests at other sites were somewhat delayed. Lodging was a major issue in all varieties at Greenfield and Boone this year, though most severely in open-pollinated varieties.

Across all sites and varieties, average 2025 rye variety trial yield was 53 bu/ac, down from 89 bu/ac in 2024 but up from 43 bu/ac in 2023. Hybrid cereal rye varieties averaged 62 bu/ac while open-pollinated varieties averaged 45 bu/ac across all sites and varieties. There were few statistically significant differences in yield between the five hybrid varieties at individual sites, and no consistent differences across sites; no single variety had consistently higher yields. At Boone and Greenfield, Serafino, Performer and Receptor were numerically the three top-yielding varieties. There were similarly few statistically significant differences between yields of open-pollinated varieties, though Aroostook yielded significantly higher than ND Dylan at Boone and ND Gardner at Greenfield.

At Greenfield and Boone, most of the individual hybrid varieties significantly outyielded the individual open-pollinated varieties. Notably, at Nashua Aroostook (55 bu/ac) and Hazlet (58 bu/ac), both open-pollinated varieties, were among the top performing varieties this year, yielding significantly higher than hybrids Receptor (41 bu/ac) and Tayo (38 bu/ac).

No cereal rye varieties made test weight (56 lb/bu) this year at any of the three sites. Hybrid varieties were, on average, about 10 in. shorter than open-pollinated varieties.

ISU SOUTHWEST RESEARCH FARM, GREENFIELD

Previous crop: Soybean
Replications: 3
Harvested plot size: 5 ft x 60 ft
Fertilizer applied: 124 lb/ac P, 273 lb/ac K and 28 lb/ac S on Mar. 17, 2025
36 lb/ac N as urea on Mar. 24, 2025
Planting date: Oct. 16, 2024
Harvest date: August 5, 2025

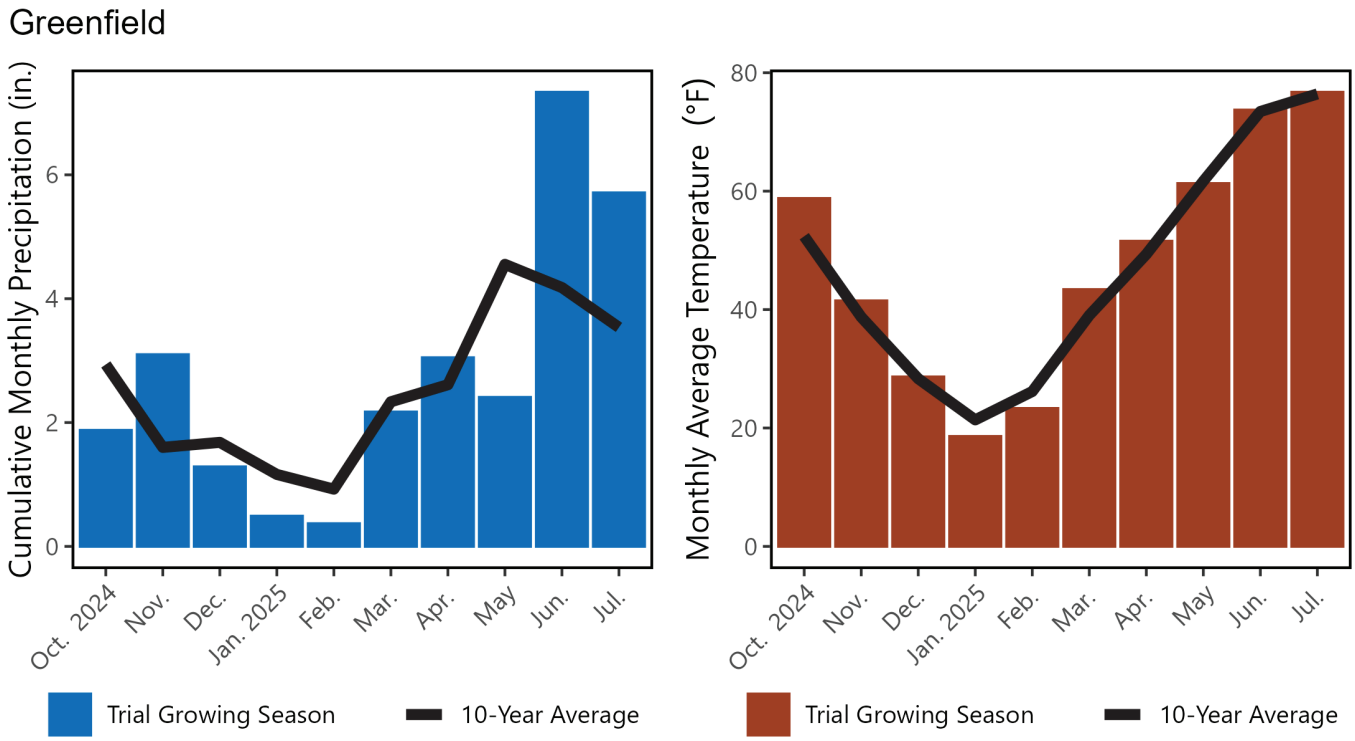

TABLE 2. 2025 Cereal Rye Variety Trial at Southwest Research Farm, Greenfield.

VARIETY	YIELD (bu/ac) 2025	YIELD (bu/ac) 3-Year Average[a]	YIELD (% of 2025 site mean)	TEST WEIGHT (lb/bu)	PLANT HT at HARVEST (in.)	LODGING (%)
Aroostook	32	40	86%	49	51	67%
Elbon	21	34	57%	52	52	65%
Hazlet	30	41	81%	50	55	92%
ND Dylan	23	33	62%	47	56	95%
ND Gardner	19	35	51%	49	52	92%
Receptor	49	63	132%	49	45	20%
Serafino	58	68	157%	49	41	32%
SU Cossani	44	--	119%	48	44	88%
SU Performer	51	--	138%	48	42	70%
Tayo	49	64	132%	48	44	68%
MSD (90%)	13	--	--	2	9	66%
MEAN	37	--	--	48	48	68%

By response variable, if the difference between any two entries is greater than the minimum significant difference (MSD) the entries are considered statistically different with 90% confidence.

[a] Average yield of each variety from the past three years at ISU Southwest Research Farm, including 2025. '--' indicates a variety with less than a three-year history.

ISU NORTHEAST RESEARCH FARM, NASHUA

Previous crop: Soybean
Replications: 3
Harvested plot size: 8.125 ft x 50 ft
Fertilizer applied: 31 lb P/ac and 200 lb K/ac on Oct. 25, 2024
31.8 lb S/ac as Supercal on Jan. 27, 2024
35 lb N/ac as urea on Mar. 27, 2025
Planting date: Oct. 11, 2024
Harvest date: Jul. 21, 2025

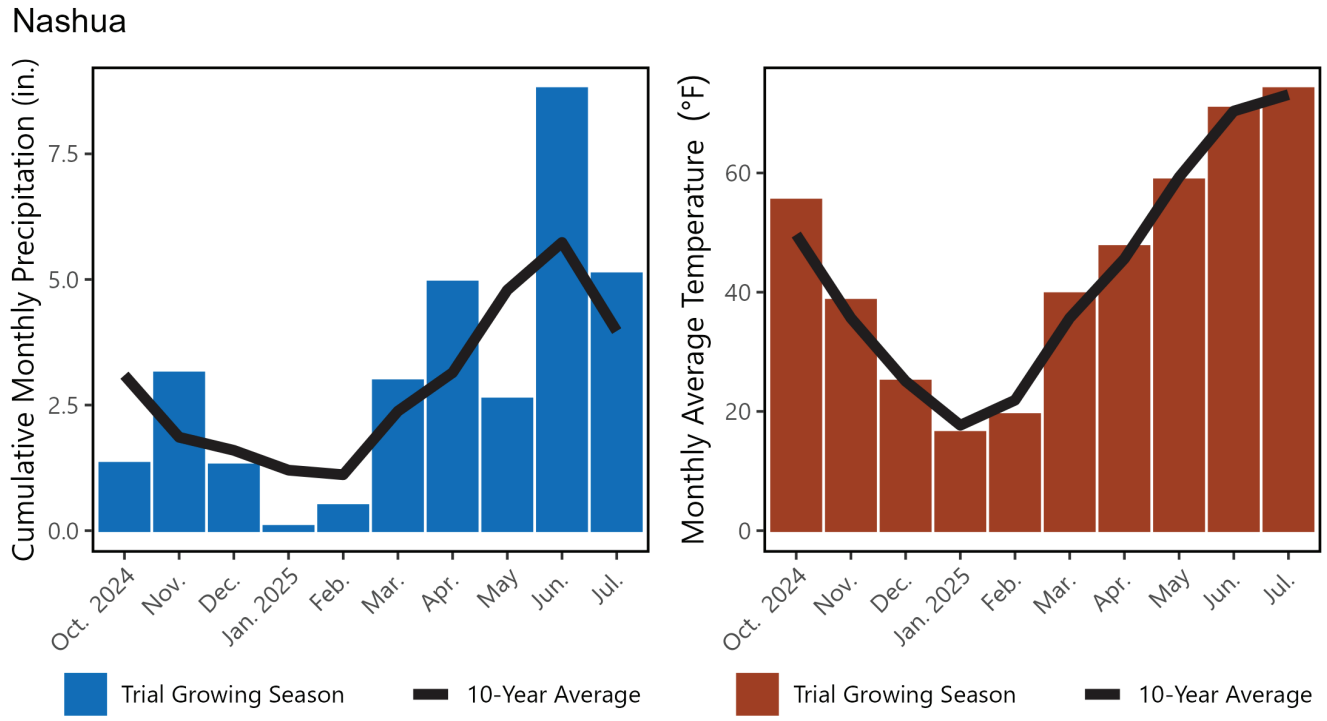

TABLE 3. 2025 Cereal Rye Variety Trial at Northeast Research Farm, Nashua.

VARIETY	YIELD (bu/ac) 2025	YIELD (bu/ac) 3-Year Average[a]	YIELD (% of 2025 site mean)	TEST WEIGHT (lb/bu)	PLANT HT at HARVEST (in.)	LODGING (%)
Aroostook	55	57	113%	49	51	2%
Elbon	36	44	74%	48	49	22%
Hazlet	58	60	118%	50	55	0%
ND Dylan	46	55	94%	48	55	3%
ND Gardener	51	53	103%	49	54	23%
Receptor	41	68	83%	45	43	0%
Serafino	56	77	115%	48	45	0%
SU Bebop	47	--	96%	47	48	0%
SU Cossani	56	--	114%	48	45	0%
SU Performer	57	--	116%	48	45	0%
Tayo	38	66	78%	45	43	2%
MSD (90%)	14	--	--	2	4	6%
MEAN	48	--	--	48	48	4%

By response variable, if the difference between any two entries is greater than the minimum significant difference (MSD) the entries are considered statistically different with 90% confidence.

[a] Average yield of each variety from the past three years at ISU Northeast Research Farm, including 2025. '--' indicates a variety with less than a three-year history.

ISU AG ENGINEERING AND AGRONOMY RESEARCH FARM, BOONE

Previous crop: Soybean
Replications: 3
Harvested plot size: 59 ft x 13.5 ft
Fertilizer applied: 39 lb N/ac, 100 lb P/ac, 40 lb K/ac and 37 lb S/ac applied on Apr. 8, 2025
Planting date: Oct. 16, 2024
Harvest date: Aug. 13, 2025

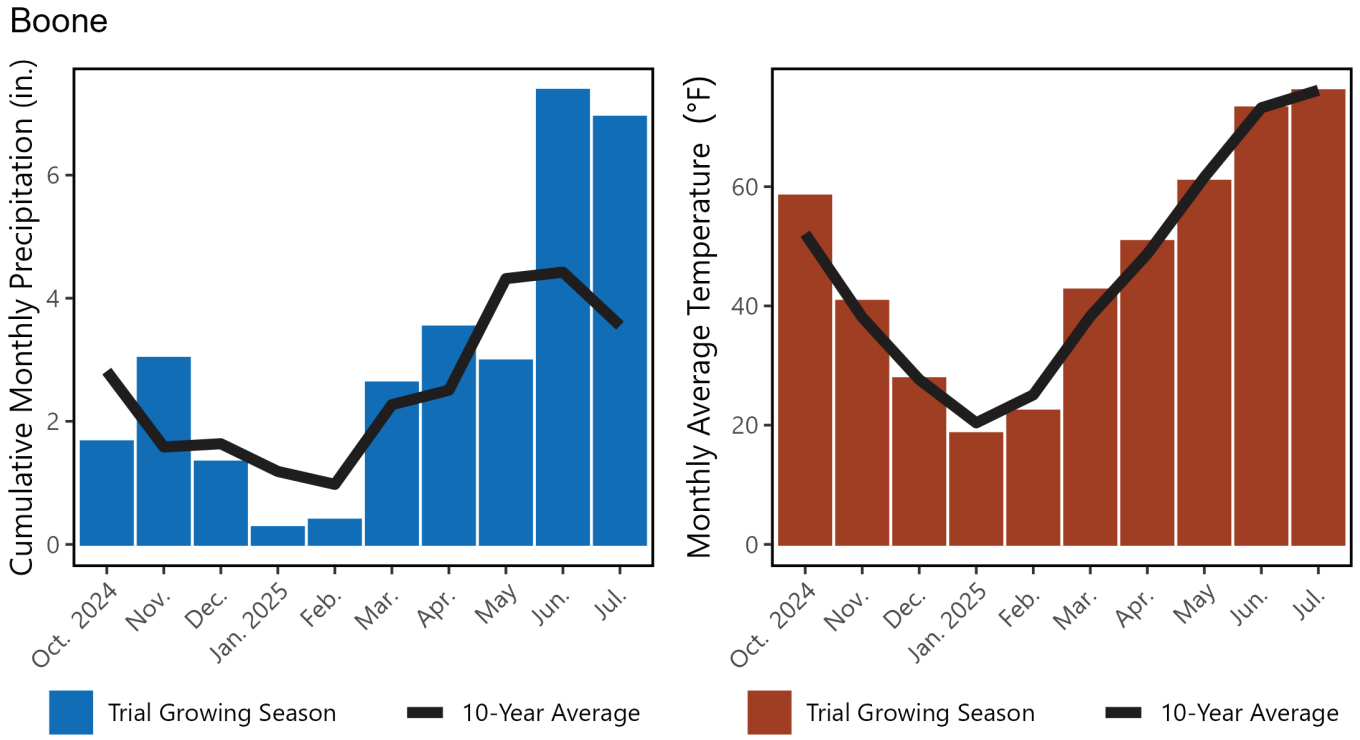

TABLE 4. 2025 Cereal Rye Variety Trial ISU Ag Engineering and Agronomy Research Farm, Boone.

VARIETY	YIELD (bu/ac) 2025	YIELD (bu/ac) 3-Year Average[a]	YIELD (% of 2025 site mean)	TEST WEIGHT (lb/bu)	PLANT HT at HARVEST (in.)	LODGING (%)
Aroostook	69	62	112%	51	53	98%
Elbon	60	46	130%	50	52	100%
Hazlet	60	58	103%	51	59	100%
ND Dylan	48	48	100%	52	58	85%
ND Gardner	66	53	125%	53	51	100%
Receptor	92	82	112%	51	45	30%
Serafino	92	92	100%	52	40	32%
SU Cossani	82	--	92%	52	46	40%
SU Performer	86	--	92%	52	43	37%
Tayo	71	71	100%	53	41	20%
MSD (90%)	15	--	--	4	9	36%
MEAN	72	--	--	52	49	64%

By response variable, if the difference between any two entries is greater than the minimum significant difference (MSD) the entries are considered statistically different with 90% confidence.

[a] Average yield of each variety from the past three years at ISU Ag Engineering and Agronomy Research Farm, including 2025. '--' indicates a variety with less than a three-year history.

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PRACTICAL FARMERS of Iowa

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