Williston Research Extension Center

NDSU NORTH DAKOTA STATE UNIVERSITY

Eastern Agricultural Research Center

MONTANA STATE UNIVERSITY

Annual Research Report No. 31 | December 2025

North Dakota State University – Williston Research Extension Center

2025 Faculty and Staff

WREC Staff		Seasonal Staff
Tyler Tjelde	Director	Caleb Boothe
Tami Telck	Office Coordinator	Eric Eriksmoen
Kyle Dragseth	Farm Manager/Foundation Seedstocks Manager	Gabe Hobbs
James Staricka	Ph.D., Soil Scientist	Connor Lofgren
Gautam Pradhan	Ph.D., Dryland Research Agronomist	Isabella Lofgren
Edson Ncube	Ph.D., Plant Pathology Research Specialist Supervisor	Scott Roseth
Rojee Chipalu-Pradhan	Horticulture Research Specialist	Samantha Turnquist
Kuldip Gevariya	Research Specialist	
Destiney Haug	Ag Research Technician	
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David Weltikol	Ag Technician/Mechanic	
Kaleb Cornell	Ag Technician	
Samuel Ortiz	Research Technician	

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Montana State University - Eastern Agricultural Research Center

2025 Faculty and Staff

Agronomy		Pathology	
Chengci Chen	Ph.D., Professor &Superintendent	Frankie Crutcher	Ph.D., Associate Professor
Cherie Gatzke	Administrative Assistant	Caitlin Gross	Research Assistant
William Franck	Ph. D., Research Scientist	Vishal Monga	Graduate Student
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Sooyoung Franck	Research Associate	Debra Kunda	Research Assistant
Tapiwanashe Magwaba	Research Associate	Harrison Aubrey	Research Assistant
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Thomas Gross	Research Assistant	Rowan Bushell	Seasonal Student Employee
Chrisanne Kuester	Research Assistant		
Karyna Herhalo	Research Assistant		
Edi Wiraguna	Graduate Student		
Tehmina Arshad	Graduate Student		
Lily Wick	Seasonal Student Employee		
Bryan Allen	Seasonal Student Employee		
Quentin Waters	Seasonal Student Employee		

MONTANA STATE UNIVERSITY
MONTANA AGRICULTURAL EXPERIMENT STATION

Table of Contents

Weather Information

WREC Dryland Site — Williston, ND

Month	Precipitation 2025	Precipitation Avg	Temperature 2025	Temperature Avg	*
	- inches -		- degrees F -		
Oct-Dec 2024	1.68	1.84			
Jan-Mar 2025	0.72	1.24			
April	2.18	1.09	44	44	0
May	3.20	2.14	57	56	2
June	0.82	2.83	64	64	0
July	5.27	2.52	69	71	4
August	1.84	1.74	69	70	2
September	0.23	1.37	64	60	0
April-July	11.47				
April-Sept	13.54				
Total Oct 24-Sept 25	15.94				

*Number of Days over 89° F

Last Spring Frost: April 29, 2025 (31.4° F)

First Fall Frost: October 5, 2025 (29.1° F)

EARC Irrigated Site — Sidney, MT

Month	Precipitation 2025	Precipitation Avg	Temperature 2025	Temperature Avg	*
	- inches -		- degrees F -		
Oct-Dec 2024	1.26	1.84			
Jan-March 2025	0.53	1.24			
April	2.15	1.12	44.3	44.3	0
May	3.35	2.24	56.8	56.0	4
June	1.16	2.65	64.8	64.6	1
July	3.04	2.03	69.9	70.2	9
August	1.69	1.44	68.8	68.8	3
September	0.39	1.33	62.6	58.3	2
April-July	9.70	8.04			
April-Sept	11.78	10.81			
Total Oct 24-Sept 25	13.57	13.89			

*Number of Days over 89° F

Last Spring Frost: May 2, 2025 (30.5° F)

First Fall Frost: September 6, 2025 (30.9° F)

WREC Irrigated Site — Nesson Valley, ND

Month	Precipitation 2025	Precipitation Avg	Temperature 2025	Temperature Avg	*
	- inches -		- degrees F -		
Oct-Dec 2024	1.92	2.35			
Jan-Mar 2025	0.69	1.65			
April	1.36	1.01	42	42	0
May	3.79	2.31	55	54	3
June	0.59	3.26	64	64	0
July	3.99	2.80	69	70	5
August	1.75	1.51	68	69	1
September	1.15	1.32	62	58	0
April-July	9.73				
April-Sept	12.63				
Total Oct 24-Sept 25	15.24				

*Number of Days over 89° F

Hofflund Last Spring Frost: May 17, 2025 (31.8° F)

Hofflund First Fall Frost: September 6, 2025 (31.0° F)

Off-Station Precipitation* — Montana

Site	April	May	June	July	Aug	Total
Nashua	0.25	0.88	1.76	3.46	1.10	7.45
Poplar	1.62	0.92	1.21	3.30	0.78	7.83
Richland	0.64	0.89	1.23	4.18	2.15	9.09
Vida	0.64	0.97	1.08	3.77	1.15	7.61
Wibaux	1.02	2.72	3.35	4.27	1.01	12.37

*Actual rainfall received at plot location may have been more or less.

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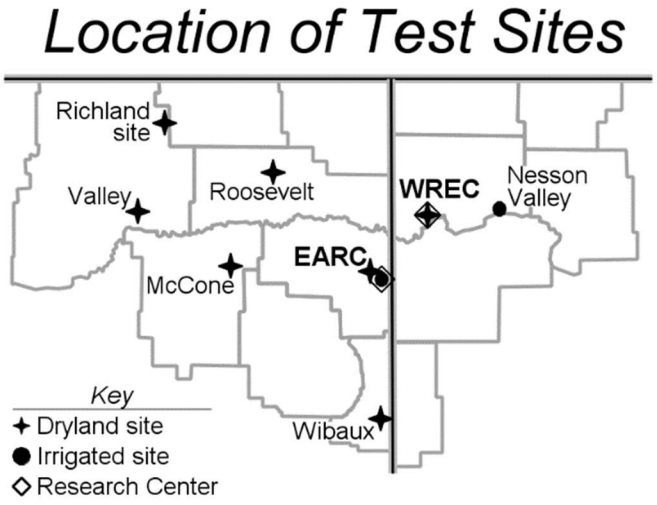
MONTANA STATE UNIVERSITY — MONTANA AGRICULTURAL EXPERIMENT STATION

Off-Station Trial Cooperating Producers and CES Agents

COUNTIES FOR MONTANA

McCone County - Leonard Schock - Agent Tandi Kassner
Richland Pulse Trial Site - Richard Fulton - Agent Shelley Mills
Roosevelt County - Mark Swank - Agent Wendy Becker
Valley County - Bill Laukner - Agent Shelley Mills
Wibaux County – Rick Miske – Agent Kelli Bacon



We would like to take this opportunity to thank the County Agents, the County Ag Improvement Associations and especially the farm operators who permit the location of off-station plots on their land. **All are to be commended for their cooperative efforts in helping determine crops and variety performance in the MonDak region.**

Results from tillage, chemical fallow, and field scale no-till trials, as well as other management trials on dryland and irrigated crops can be obtained by visiting with Center personnel.

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2026 NDSU WREC Seed Varieties Available

Kyle Dragseth, WREC Foundation Seedstocks Manager

701-770-1652

Spring Wheat

- ND Stampede
  - 2025 release high yield, early maturity, high protein and excellent quality.

- ND Roughrider
  - 2026 release high yielder developed for western parts of North Dakota, particularly in dry conditions. Highest yielding spring wheat in multiple variety trials.

- MT Dagmar
  - Semi-solid stem, good yielding, semi-dwarf variety.

Durum

- ND Riveland
  - High yield potential, low cadmium uptake, large kernels, resistant to both leaf and stem rust, exhibits the lowest Fusarium head blight diseases severity among all varieties tested in the field and greenhouse screening nurseries.

- AAC Stronghold
  - Solid stem, high yield and test weight.

Winter Wheat

- ND Allison
  - High yield potential, tolerant of acidic soil and aluminum, winter hardy crop adapted across North Dakota.

Barley

- ND Treasure
  - High yielding, strong straw semi-dwarf variety intended for the pet food market.

- MT Cowgirl
  - Tall high yielding awn-less forage barley

- MT Lavina
  - Excellent yielding, two row hooded spring barley.

2026 NDSU WREC Seed Varieties Available (continued)

Kyle Dragseth, WREC Foundation Seedstocks Manager

701-770-1652

Oats

- CDC Haymaker
  - Yields high producing large plump seed with high seed weight. Forage oat with tall strong straw. Feed advantage over other oats with thinner stems, more easily digestible compared to other oats.

- CDC Douglas
  - High yielding grain variety. Good test weight and excellent fit for straight cutting.

Chickpeas

- ND Crown
  - High yielding, large seeded, tall chickpea variety. Resistance to lodging. Moderate resistance to disease pressures.

Flax

- CDC Rowland
  - Large brown seeded late maturing, high yield variety with good lodging resistance, that is well adapted for all ND regions. Resistant to Flax rust and moderately resistant to Fusarium Wilt and Powdery Mildew.

Please call for seed availability and prices

ND Stampede

Spring Wheat

Characteristics

- Similar to Faller with higher protein
- Short, early maturing variety
- Strong straw strength

TO ORDER:

Contact Kyle Dragseth at 701-770-1652

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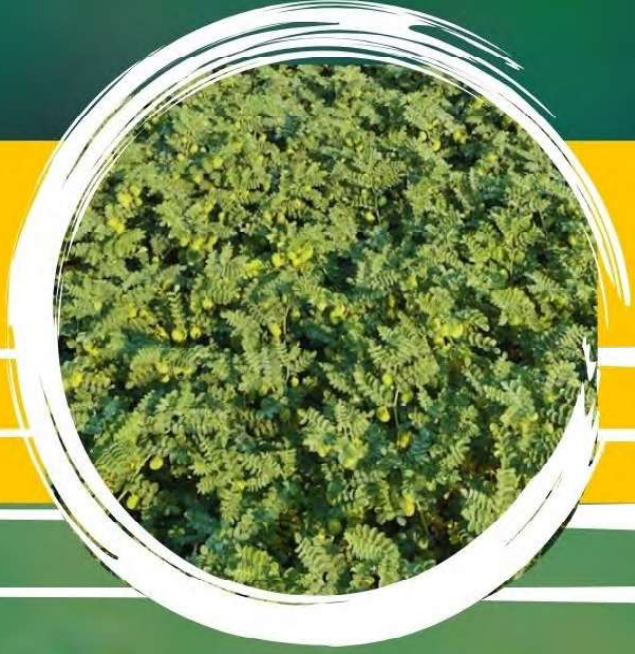

ND Crown

Chickpea

Characteristics

- High Yield
- Large Seeded
- Tall variety with resistance to lodging
- Moderate resistance to disease pressures

To Order:

Contact Kyle Dragseth at 701-770-1652

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Spring Wheat Variety Descriptions

Variety	Origin[1]	Year Released	DTH[2] (DAP)	Height[2] (in)	Resistance To[3]						Quality Factors[2]	
					Lodging	Stem Rust	Leaf Rust	Foliar Disease	Bac. Leaf Streak	Head Scab	Test Weight	Grain Protein
AAC Starbuck VB*	Canada	2020	50	23	4	1	6	NA	6	5	59.5	16.2
AP Gunsmoke CL2	Syngenta/Agripro	2021	50	22	6	2	3	4	8	5	57.9	16.7
AP Murdock	Syngenta/Agripro	2019	50	22	4	2	5	4	6	6	58.1	16.3
AP Smith	Syngenta/Agripro	2021	52	19	2	1	3	3	5	6	58.4	16.1
AR3530	Armor Brand/Croplan	2015	49	26	7	2	5	NA	5	6	59.1	14.7
AR3915	Armor Brand/Croplan	2019	48	23	4	NA	2	NA	5	4	59.9	15.8
Ascend-SD	SD	2022	49	26	5	2	4	NA	5	4	58.4	14.3
Bolles	MN	2015	56	26	4	2	2	4	6	6	57.8	17.1
Brawn-SD	SD	2022	48	22	4	NA	2	NA	4	4	60.7	13.9
CAG-justify	Champions Alliance Grp	2021	52	22	6	2	2	5	6	5	56.7	15.5
CAG-reckless	Champions Alliance Grp	2021	51	23	5	2	2	6	6	5	58.3	15.1
CDC Landmark VB	Canada	2018	49	25	4	NA	5	NA	6	6	60.3	15.5
CP3099a	Croplan	2020	55	22	5	6	3	4	7	6	56.0	13.8
CP3119a	Croplan	2020	57	22	3	NA	NA	6	5	3	54.2	13.8
CP3188	Croplan	2020	51	23	8	6	2	6	7	5	57.5	14.0
CP3322	Croplan	2023	54	25	3	NA	3	NA	4	6	60.1	12.7
Driver	SD	2020	53	24	4	2	1	7	7	4	60.1	15.6
Elgin-ND	NDSU	2012	53	26	5	2	6	NA	7	5	57.7	16.2
Glenn	NDSU	2005	51	26	4	2	6	6	5	4	60.7	15.8
Lang-MN	MN	2017	54	24	4	2	2	NA	5	3	58.1	16.6
Lanning	MT	2017	53	23	3	2	7	4	5	6	59.6	15.4
LCS Ascent	Limagrain	2022	46	24	4	2	6	NA	7	4	59.9	13.7
LCS Boom	Limagrain	2023	47	23	4	NA	6	NA	6	7	60.6	14.6
LCS Buster	Limagrain	2020	55	22	4	1	4	4	4	4	57.2	14.2
LCS Cannon	Limagrain	2018	48	22	4	1	7	5	7	6	61.4	15.9
LCS Dual	Limagrain	2020	48	25	4	2	6	NA	7	6	59.3	13.4
LCS Hammer AX	Limagrain	2022	47	24	4	2	6	NA	7	6	58.8	13.7
LCS Trigger	Limagrain	2016	58	23	5	6	1	4	4	3	57.8	15.0
MN-Rothsay	MN	2022	51	22	3	2	6	NA	5	5	58.8	13.8
MN-Torgy	MN	2020	52	23	4	2	3	3	5	4	59.6	15.9
MS Charger	Meridian Seeds	2022	47	24	7	2	2	NA	7	5	59.3	12.4
MS Cobra	Meridian Seeds	2022	50	21	4	1	2	4	7	5	59.2	16.1
MS Ranchero	Meridian Seeds	2020	53	23	5	2	4	5	5	6	58.6	15.5
ND Frohberg	NDSU	2020	51	23	4	2	5	8	5	5	59.2	16.7
ND Heron	NDSU	2022	50	23	6	1	7	NA	7	4	60.2	16.6
ND Thresher	NDSU	2023	50	21	4	2	4	NA	4	4	58.7	15.0
ND VitPro	NDSU	2017	53	25	4	2	4	6	6	4	59.2	16.6
PFS Buns	Peterson Farm Seeds	2021	59	20	4	1	2	NA	4	6	56.5	15.0
Shelly	MN	2016	54	23	4	2	6	3	7	5	58.9	14.8
SY 611 CL2	Syngenta/Agripro	2019	52	21	3	2	6	4	6	5	60.0	16.1
SY Ingmar	Syngenta/Agripro	2014	53	23	2	2	3	6	6	6	58.8	16.0
SY Longmire	Syngenta/Agripro	2019	52	23	5	2	6	4	6	6	60.1	16.4

SY Mccloud	Syngenta/Agripro	2019	52	23	4	2	5	7	7	6	61.0	16.6
SY Valda	Syngenta/Agripro	2015	53	23	4	2	2	7	6	5	58.3	15.4
TCG-Heartland	21st Century Genetics	2019	51	22	3	2	3	4	7	6	60.6	16.6
TCG-Spitfire	21st Century Genetics	2015	55	22	3	2	5	6	5	6	58.4	15.6
TCG-Teddy	21st Century Genetics	2023	49	19	3	NA	4	NA	5	6	59.2	15.1
TCG-Wildcat	21st Century Genetics	2020	53	21	3	2	5	6	7	6	59.4	15.5
WB9590	Westbred	2017	48	22	3	2	3	8	8	7	59.7	14.2
WB9606	Westbred	2020	50	24	4	NA	4	NA	6	6	60.9	14.3
WB9719	Westbred	2018	55	23	4	NA	5	NA	5	6	60.1	16.2

[1]Refers to developer: Canada represents developer from that country; MN = University of Minnesota; MT = Montana State University; NDSU = North Dakota State University; SD = South Dakota State University.

[2]DTH - Days to head recorded as days after planting, plant height, and quality data are averaged over a period ranging from a single year to nine years. The duration depends on the number of years a specific variety is included into the WREC trial from 2015 onward.

[3]Resistance scores from 1-9, with 1 = resistant and 9 very susceptible, NA = not available. *VB = Variety Blend.

WREC Spring Wheat Variety Trial - Dryland **Williston, ND 2025**

Variety	Days to Heading (d)	Plant Height (in)	Protein (%)	Test Weight (lb/bu)	Grain Yield		
					2025 (bu/a)	2-Year Average (bu/a)	3-Year Average (bu/a)
AAC Concord	62.4	33.9	16.7	53.6	37.1	-	-
AC Hockley	60.0	28.9	17.8	55.2	42.0	-	-
AC Hodge	58.9	30.9	17.3	55.0	43.5	-	-
AP Dager	61.4	27.0	16.6	53.1	38.4	-	-
AP Elevate	61.4	28.0	16.8	54.6	32.5	54.8	-
AP Gunsmoke CL2	60.4	30.5	17.3	54.5	42.2	58.4	51.4
AP Iconic	61.3	28.0	16.2	54.8	39.3	-	-
AP Murdock	60.5	29.2	16.3	54.0	32.1	54.2	43.2
AP Smith	61.9	25.3	16.1	54.7	34.9	52.7	41.6
Ascend SD	61.9	31.2	16.3	54.5	38.8	57.4	45.3
Brawn-SD	60.1	29.7	15.2	56.8	41.9	58.3	45.5
CP 3055	66.6	26.9	14.8	53.1	41.9	55.6	-
CP 3551	61.8	28.9	15.9	54.9	35.1	-	-
CP 3678	63.2	29.4	16.4	55.9	45.0	-	-
Dagmar	57.4	29.9	16.7	54.8	46.0	-	-
Driver	63.5	29.5	15.2	56.6	44.6	57.5	51.3
Enhance-SD	58.2	31.3	16.4	55.1	36.2	-	-
Faller	63.6	31.7	14.7	54.3	38.8	48.6	-
Lang-MN	61.3	28.7	15.7	55.2	35.3	-	-
LCS Ascent	58.3	28.8	15.9	55.8	39.1	62.4	52.1
LCS Cannon	57.5	29.7	15.8	56.4	42.6	55.4	46.9
LCS Hammer AX	60.5	29.9	14.4	55.9	38.3	-	-
LCS Rimfire	58.2	27.0	15.1	55.1	43.8	-	-
MN-Rothsay	62.8	27.0	16.2	56.2	38.5	53.9	43.8
MN-Torgy	61.5	28.0	16.4	55.6	43.3	58.1	49.0
MS Charger	59.7	27.2	14.3	56.2	43.2	58.5	51.3
MS Cobra	60.7	28.7	15.7	56.7	35.9	56.0	44.6
MS Nova	59.0	28.4	16.2	54.8	47.1	59.5	-
MS Ranchero	61.8	30.2	15.6	54.8	44.4	55.9	47.6
MT Carlson	61.2	28.4	15.0	54.8	37.2	58.0	-
ND Frohberg	60.8	31.8	16.1	55.6	34.2	52.6	42.7
ND Heron	57.4	31.4	17.0	55.7	43.8	56.9	48.9
ND Horizon	60.5	27.7	16.5	55.2	43.5	-	-
ND Nighthawk	62.0	30.9	15.1	56.5	45.2	-	-
ND Rourghrider	61.8	28.6	16.9	52.2	41.6	-	-
ND Stampede	60.4	31.3	17.2	54.0	35.6	55.8	-
ND Thresher	62.4	28.7	16.0	53.3	36.9	50.1	39.2
PFS Muffins	60.8	26.8	15.8	54.7	38.7	-	-
PFS Rolls	61.8	30.3	15.7	55.0	33.8	53.7	-
PG Predator	61.0	27.7	16.3	55.7	33.8	57.1	-

WREC Spring Wheat Variety Trial - Dryland (cont.) **Williston, ND 2025**

Variety	Days to Heading (d)	Plant Height (in)	Protein (%)	Test Weight (lb/bu)	Grain Yield		
					2025 (bu/a)	2-Year Average (bu/a)	3-Year Average (bu/a)
SY Ingmar	61.8	28.8	16.7	56.0	38.0	53.2	-
SY Valda	61.0	29.1	15.9	55.6	42.7	57.5	-
TCG Badlands	61.1	29.4	16.2	55.1	30.1	53.4	-
TCG Wildcat	61.7	26.1	17.0	55.4	33.9	54.7	45.1
TCG Zelda	58.0	28.0	16.4	55.4	43.6	59.8	-
TW OLYMPIC	60.6	28.7	16.0	56.2	36.6	-	-
TW TRAILFIRE	58.4	28.7	16.1	54.9	45.3	-	-
WB9590	57.9	25.5	17.1	53.8	35.8	54.4	-
Mean	60.8	29.0	16.1	55.1	39.5		
CV %	1.4	5.7	3.1	1.2	6.7		
LSD 5 %	2.3	4.6	1.4	1.8	7.4		
LSD 10%	2.0	3.9	1.2	1.5	6.2		

Location: Williston, ND; Latitude: 48.12447 W; Longitude: -103.73869 N. Altitude: 2054 ft.

Planted: 4/22/2025 Soil type: Williams-Bowbells Loam

Harvested: 8/13/2025 Previous Crop: Chickpea

Soil test (0-6 in): P = 20 ppm; K = 308 ppm; pH = 6.1; OM = 2.4%.

Soil test (0-24 in): NO_3-N = 9 lb/a; S = 36 lb/a

Applied fertilizers: N = 126 lb/a; P_2O_5 = 14 lb/a; S = 3 lb/a; Zn = 0.3 lb/a

**Hail storm on July 25, 2025 impacted yields.

Data includes only released varieties. Experimental lines are not included. Statistics reflect the entire trial.

WREC Spring Wheat Variety Trial - Irrigated **Nesson Valley, ND 2025**

Variety	Plant Height (in)	Days to Heading (d)	Protein (%)	Test Weight (lb/bu)	Grain Yield	
					2025 (bu/a)	2-Year Average (bu/a)
AAC CONCORD	31.3	62.7	17.1	60.9	75.4	-
AC HOCKLEY	28.5	49.5	16.6	63.3	88.2	-
AC HODGE	31.8	49.8	17.4	62.8	97.6	-
AP DAGER	24.7	51.2	15.7	61.8	80.9	-
AP ELEVATE	27.3	50.6	16.7	62.6	94.7	102.6
AP GUNSMOKE CL2	26.8	50.4	18.4	62.4	83.9	86.4
AP ICONIC	27.9	49.8	16.2	62.3	97.7	-
AP MURDOCK	28.9	51.9	16.8	62.3	102.5	97.3
AP SMITH	26.5	51.9	16.2	63.0	93.9	88.9
ASCEND-SD	30.8	52.8	16.8	62.5	104.0	86.9
BRAWN-SD	30.0	52.1	15.9	63.5	113.0	109.5
CP3055	29.3	55.6	14.3	59.8	104.5	87.5
CP3555	28.8	51.4	15.9	62.2	111.7	-
CP3678	26.1	51.0	17.7	62.2	89.4	-
DAGMAR	26.4	47.8	17.6	62.0	88.9	-
DRIVER	30.0	50.8	15.5	63.8	103.1	97.8
ENHANCE-SD	29.6	48.7	17.5	61.8	100.3	-
LANG-MN	26.7	52.3	17.7	61.0	68.4	-
LCS ASCENT	28.3	47.9	15.8	63.0	105.5	91.8
LCS BOOM	25.1	47.3	17.6	63.9	81.2	84.2
LCS BUSTER	30.9	53.3	14.3	61.3	121.3	113.4
LCS CANNON	26.8	47.0	17.5	63.8	92.2	94.4
LCS HAMMER AX	25.1	49.8	17.0	62.1	79.1	-
LCS RIMFIRE	26.2	48.4	16.7	62.1	89.1	-
MN ROTHSAY	26.8	51.7	16.6	62.5	113.4	98.1
MN TORGY	26.1	51.2	17.2	62.1	80.0	78.2
MS CHARGER	27.7	50.6	14.8	62.5	103.8	103
MS COBRA	28.0	50.0	17.3	62.6	92.2	88.2
MS NOVA	27.9	48.8	16.9	63.4	108.0	103.6
MS RANCHERO	29.9	53.6	15.7	61.8	113.9	94.5
MT CARLSON	25.6	50.8	16.6	60.8	82.5	87.9
ND FROHBERG	32.5	50.2	17.2	62.5	95.5	85.8
ND HERON	29.2	48.5	17.6	63.6	78.2	74.9
ND HORIZON	27.7	50.7	16.4	62.9	102.6	-
ND NIGHTHAWK	29.0	53.0	17.0	60.7	100.0	-
ND ROUGHRIDER	28.8	52.9	16.1	61.8	122.2	-
ND STAMPEDE	27.6	50.7	17.6	61.9	97.4	97.9
ND THRESHER	27.0	53.0	17.8	61.5	79.5	79.9
PFS MUFFINS	24.6	50.4	16.8	62.3	105.7	-

WREC Spring Wheat Variety Trial - Irrigated (cont.) **Nesson Valley, ND 2025**

Variety	Plant Height (in)	Days to Heading (d)	Protein (%)	Test Weight (lb/bu)	Grain Yield	
					2025 (bu/a)	2-Year Average (bu/a)
PFS ROLLS	25.9	51.6	16.9	62.2	89.7	93
PG PREDATOR	25.7	49.7	16.8	61.7	98.1	105
SHELLY	28.8	53.1	16.9	62.7	97.9	95.7
SY 611 CL2	27.0	49.6	16.9	63.5	88.2	-
SY INGMAR	28.4	50.1	17.0	62.6	95.8	94.8
SY VALDA	27.0	51.4	16.4	63.1	89.8	90.5
TCG ARSENAL	27.8	53.5	15.4	62.5	107.5	-
TCG BADLANDS	27.0	51.6	15.6	62.3	103.7	98.8
TCG WILDCAT	28.9	51.7	17.3	62.4	88.1	-
TCG ZELDA	25.9	48.8	17.3	62.8	91.9	-
TW OLYMPIC	28.2	50.9	17.3	63.2	100.1	-
TW TRAILFIRE	30.4	48.6	17.0	62.3	96.6	-
WB9590	24.4	49.1	17.7	62.1	91.3	-
Mean	27.8	51.0	16.7	62.4	95.8	-
CV %	6.3	5.2	2.7	0.6	12.2	-
LSD 5%	2.9	4.3	0.7	0.6	18.9	-
LSD 10%	2.4	3.6	0.6	0.5	15.8	-

Location: Ray, ND; Latitude 48.16609°N; Longitude 103.10813°W Elevation: 1900 ft

Planted: 5/2/2025 Previous Crop: Soybean

Harvested: 8/22/2025 Soil Type: Lihen Loamy Fine Sand

Fertilizer Applied: N:P:K = 150:50:50 lb/a

Dryland Spring Wheat Advance Yield Trial - MSU **EARC, Sidney, MT 2025**

Variety	Plant Height (inch)	Days to Heading (Julian*)	Lodging (%)	Test Weight (lb/bu)	Protein (%)	Grain Yield† (bu/ac)
AAC Concord	34.3	172.3	5.0	61.8	13.7	56.0
AP Elevate	28.7	170.0	11.7	63.5	13.4	65.0
AP Gunsmoke CL1	29.7	168.3	13.3	63.1	13.6	58.6
AP Smith	28.6	171.0	6.7	64.2	13.7	64.8
CP3055	29.8	175.3	5.0	59.3	12.8	63.4
CP3119A	31.4	175.7	5.0	58.4	12.3	65.3
DAGMAR	31.2	167.0	3.3	63.2	14.0	65.0
DUCLAIR	31.8	168.7	3.3	61.9	13.4	57.8
LANNING	29.1	167.3	10.0	64.0	13.1	66.1
LCS ASCENT	30.6	168.0	10.0	64.6	13.1	67.4
LCS BOOM	28.5	168.0	11.7	63.5	13.5	54.8
LCS Sentry	31.4	169.0	11.7	63.7	12.9	63.0
MS Charger	29.9	168.0	15.0	63.8	12.1	62.6
MS Nova	28.3	168.0	13.3	63.7	12.9	57.9
MS Ranchero	30.3	168.0	11.7	62.6	12.9	66.5
MT 21074	29.8	172.3	15.0	63.8	13.4	63.3
MT 21174	30.7	169.0	5.0	63.5	13.6	62.3
MT 21484	30.6	168.3	8.3	63.4	13.9	65.4
MT 21487	31.2	168.3	3.3	64.1	13.8	69.2
MT 22073	28.7	168.0	8.3	62.0	13.7	63.0
MT 22083	28.7	167.3	15.0	63.7	14.0	61.9
MT 22182	29.0	167.3	5.0	62.0	13.4	60.9
MT 22205	29.5	167.7	16.7	62.7	13.5	67.3
MT 22345	29.8	168.7	8.3	62.8	13.2	65.7
MT 23039	27.8	168.3	6.7	61.7	13.4	64.5
MT 23052	28.2	169.3	8.3	63.7	13.3	62.8
MT 23067	28.5	167.7	3.3	64.6	13.5	68.3
MT 23085	30.1	168.7	11.7	62.3	13.3	65.7
MT 23098	31.4	168.3	5.0	63.3	13.8	66.7
MT 23110	31.0	167.0	3.3	64.3	13.1	66.5
MT 23113	31.4	169.0	6.7	63.3	13.2	67.0
MT 23116	29.8	168.0	3.3	62.2	13.2	63.7
MT 23127	30.1	171.3	11.7	61.8	12.9	69.8
MT 23133	28.3	166.3	11.7	62.9	13.4	72.1
MT 23184	29.4	168.7	5.0	63.6	13.5	70.1
MT 23190	27.8	168.3	10.0	63.6	13.5	60.8
MT 23204	29.5	167.7	10.0	62.5	13.5	69.0
MT 23205	30.3	172.0	15.0	64.1	13.1	65.2
MT 23206	27.4	166.7	15.0	62.3	13.0	68.4
MT 23241	31.5	170.3	10.0	62.4	12.7	67.4
MT 23265	31.4	169.7	10.0	62.7	13.2	65.0
MT 23294	28.2	172.7	6.7	64.1	13.3	65.8

Dryland Spring Wheat Advance Yield Trial - MSU (cont.) **EARC, Sidney, MT 2025**

Variety	Plant Height (inch)	Days to Heading (Julian*)	Lodging (%)	Test Weight (lb/bu)	Protein (%)	Grain Yield† (bu/ac)
MT 23297	29.1	171.0	5.0	62.4	13.7	64.4
MT 23339	31.2	171.0	5.0	63.3	12.7	64.5
MT 23365	30.3	168.3	1.7	63.3	13.0	70.2
MT 23385	31.8	171.3	11.7	62.2	12.8	64.5
MT Carlson	30.4	169.0	5.0	62.2	12.7	67.3
MT Dutton	30.4	169.7	6.7	62.6	13.2	69.1
MT Ubet	29.4	168.0	6.7	63.0	13.4	68.6
McNEAL	31.1	171.7	20.0	61.4	13.4	60.8
ND Stampede	30.4	168.3	13.3	61.8	14.1	61.3
NS PRESSER CLP	32.9	171.7	18.3	62.1	12.9	63.3
PG Predator	28.7	170.3	8.3	63.5	13.9	66.3
REEDER	32.3	169.7	10.0	63.4	13.9	63.1
ROCKER	31.1	171.3	15.0	64.3	13.1	66.3
SY Longmire	30.2	170.7	5.0	63.3	13.2	62.0
SY ROCKFORD	31.5	171.3	11.7	62.9	12.7	64.2
SYN 251	28.0	171.0	10.0	62.2	12.9	66.4
SYN 252	29.9	169.0	13.3	62.9	13.3	62.9
THATCHER	41.2	173.0	16.7	60.1	13.9	51.4
VIDA	31.4	170.7	15.0	63.2	12.7	67.8
WB 222	24.8	167.7	11.7	62.2	14.5	58.0
WB 9879 CLP	29.8	171.3	3.3	62.1	13.7	63.7
WB GUNNISON	29.3	168.3	10.0	63.5	12.9	57.8
Mean	30.1	169.5	9.3	62.9	13.3	77.2
P-Value	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
CV (%)	4.3	0.43	6.9	1.0	2.6	7.4
LSD (0.05)	2.1	1.2	1.0	1.0	0.56	9.3

(Julian*) is a continuous count of days since January 1 Planted: 4/8/2025

† Grain yield adjusted to 12.0% moisture Harvested: 8/1/2025

N Available: 57 lb/ac Previous crop: Fallow

N added: 40 lb/ac Soil Type: Williams Clay Loam

P2O5 Available: 33 ppm Precipitation (Planting to Harvest): 11.2 inch

P2O5 added: 15 lb/ac Plot Width: 5 ft

Herbicide Application: Opensky @ 16 oz/ac on 5/27/2025

Irrigated Spring Wheat Advance Yield Trial - MSU **EARC, Sidney, MT 2025**

Variety	Plant Height (inch)	Days to Heading (Julian*)	Lodging (%)	Test Weight (lb/bu)	Protein (%)	Grain Yield† (bu/ac)
AAC Concord	38.6	172.0	7.7	62.3	14.2	91.9
AP Elevate	31.0	169.7	1.0	64.3	13.8	110.9
AP Gunsmoke CL1	33.9	169.7	2.3	63.3	14.0	111.2
AP Smith	30.8	170.7	0.0	64.3	14.1	106.5
CP3055	34.6	175.7	0.3	63.0	12.6	109.4
CP3119A	35.1	176.0	0.0	61.6	13.1	102.0
DAGMAR	35.7	168.0	2.3	63.3	14.3	107.4
DUCLAIR	33.2	167.7	3.7	62.5	13.8	109.3
LANNING	32.8	167.3	2.0	63.5	14.7	111.5
LCS ASCENT	33.9	167.0	4.0	64.3	13.2	109.5
LCS BOOM	33.5	166.3	1.3	64.8	13.8	102.4
LCS Sentry	36.3	168.3	1.7	64.4	13.0	111.6
MS Charger	30.8	168.3	5.0	63.8	12.4	109.0
MS Nova	34.4	167.7	2.7	64.1	14.3	109.2
MS Ranchero	36.3	169.3	1.3	63.5	13.4	107.4
MT 21074	33.9	172.0	0.0	64.8	13.6	110.4
MT 21174	36.4	168.3	2.0	63.0	14.7	109.1
MT 21484	36.4	168.0	2.7	63.8	14.4	107.1
MT 21487	34.6	168.3	4.0	64.0	14.2	110.3
MT 22073	33.2	168.0	4.0	62.2	15.0	106.3
MT 22083	33.5	166.3	1.3	64.3	14.5	103.0
MT 22182	35.1	166.7	3.0	61.0	13.6	102.1
MT 22205	32.9	167.3	1.0	62.5	14.1	113.2
MT 22345	33.6	169.0	3.7	62.8	13.6	112.2
MT 23039	33.2	168.7	2.0	62.7	13.8	114.0
MT 23052	31.5	168.7	2.7	64.4	13.8	107.3
MT 23067	31.7	167.3	0.0	63.1	14.6	109.0
MT 23085	34.9	168.3	2.7	62.8	14.3	117.6
MT 23098	34.3	168.7	3.7	63.6	13.7	108.8
MT 23110	34.0	166.0	3.7	63.2	14.5	108.0
MT 23113	33.8	168.3	1.3	63.1	14.2	104.8
MT 23116	33.3	167.3	1.0	62.1	13.6	108.2
MT 23127	32.8	171.3	2.3	62.7	14.1	112.0
MT 23133	31.8	167.0	1.3	63.4	14.3	107.4
MT 23184	31.5	168.3	3.0	64.4	14.2	106.0
MT 23190	33.3	167.7	0.7	63.2	14.6	109.4
MT 23204	34.2	169.0	1.0	63.2	13.8	110.8
MT 23205	34.7	172.0	6.3	63.9	13.8	108.7
MT 23206	31.5	166.7	4.7	62.3	14.2	100.7
MT 23241	34.0	170.0	2.0	63.3	13.7	110.3
MT 23265	36.9	169.0	1.7	63.0	13.2	111.6
MT 23294	34.4	172.3	6.3	64.2	14.8	106.7

Irrigated Spring Wheat Advance Yield Trial - MSU (cont.) **EARC, Sidney, MT 2025**

Variety	Plant Height (inch)	Days to Heading (Julian*)	Lodging (%)	Test Weight (lb/bu)	Protein (%)	Grain Yield† (bu/ac)
MT 23297	34.6	171.3	0.0	62.9	14.0	109.7
MT 23339	34.7	170.0	4.7	63.3	14.5	106.5
MT 23365	34.4	168.0	5.0	63.6	13.6	106.9
MT 23385	35.1	171.7	1.7	62.6	14.4	101.9
MT Carlson	32.9	169.0	3.0	62.5	13.3	115.7
MT Dutton	33.9	170.0	2.7	62.8	14.7	106.1
MT Ubet	32.6	168.7	3.7	63.1	14.1	108.6
McNEAL	36.1	172.3	4.0	62.3	14.1	90.0
ND Stampede	33.8	168.0	1.7	64.0	14.1	109.1
NS PRESSER CLP	37.6	172.7	4.0	62.2	13.8	106.6
PG Predator	31.7	170.7	2.0	63.9	13.9	109.6
REEDER	36.9	168.7	0.3	63.9	13.8	104.7
ROCKER	33.5	171.7	1.3	64.3	14.1	106.6
SY Longmire	32.4	169.3	1.0	64.0	13.8	104.9
SY ROCKFORD	34.3	171.3	2.3	63.2	13.3	111.1
SYN 251	30.3	170.7	2.3	63.4	12.7	107.3
SYN 252	33.8	168.7	1.7	64.0	13.2	116.2
THATCHER	41.7	173.3	8.7	61.5	14.0	82.1
VIDA	34.2	170.7	5.3	63.0	14.2	105.9
WB 222	27.9	168.0	0.3	62.8	15.1	91.3
WB 9879 CLP	33.3	170.3	1.7	63.2	13.9	111.5
WB GUNNISON	31.4	168.3	1.3	63.2	12.9	100.4
Mean	33.9	169.3	2.5	63.3	13.9	107.1
P Value	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
CV	3.4	0.39	52.3	0.51	3.4	6.5
LSD	1.8	1.1	3.7	0.52	0.75	11.2

(Julian*) is a continuous count of days since January 1
† Grain yield adjusted to 12.0% moisture
N Available: 35 lb/ac
N added: 70 lb/ac
P2O5 Available: 15 ppm
P2O5 added: 26 lb/ac
Herbicide Application: Opensky @ 16 oz/ac on 5/27/2025

Planted: 4/16/2025
Harvested: 8/13/2025
Previous crop: Peas
Soil Type: Savage Silty Clay
Precipitation (Planting to Harvest): 10.5 inch
Irrigation (Sprinkler): 2.02 inch
Plot Width: 5 ft

McCone County Dryland Spring Wheat - MSU **Vida, MT 2025**

Variety	Plant Height (inch)	Sawfly Damage (0-10)	Test Weight (lb/bu)	Protein (%)	Grain Yield (bu/ac)
AP SMITH	27.3	2.3	60.4	15.7	60.8
CP3055	32.8	1.3	61.5	14.8	67.6
CP3119A	32.4	1.0	61.5	14.2	66.1
DAGMAR	32.7	1.7	61.7	16.3	71.2
LANNING	31.1	2.7	61.8	16.5	70.4
LCS ASCENT	32.2	4.0	60.4	14.9	69.5
MT 21074	30.6	1.3	63.9	17.0	65.7
MT 21174	32.2	2.3	61.4	16.8	63.6
MT 21484	30.4	3.3	60.6	16.5	65.8
MT 21487	32.5	3.7	60.6	16.3	63.6
MT 22073	31.4	3.3	59.4	16.8	66.2
MT 22083	31.5	1.7	62.9	15.3	66.6
MT 22182	31.9	3.0	57.9	15.6	61.7
MT 22205	31.1	3.0	59.0	16.3	65.6
MT 22345	31.1	2.0	61.0	15.6	72.1
MT CARLSON	31.0	3.7	60.6	15.3	66.3
MT DUTTON	31.6	3.3	59.7	16.3	68.0
MT UBET	31.2	3.3	61.7	15.7	73.6
ND STAMPEDE	30.2	5.0	59.0	16.1	59.8
REEDER	31.9	3.7	61.4	16.3	59.0
ROCKER	31.8	2.3	63.3	16.1	66.2
SY LONGMIRE	30.4	4.3	62.2	15.7	64.5
SY ROCKFORD	31.0	2.7	62.0	15.1	75.6
VIDA	33.7	2.0	61.7	15.5	68.8
WB 9879CLP	30.6	3.0	60.7	15.7	63.2
WB GUNNISON	30.2	2.3	60.2	15.4	59.2
Mean	31.3	2.8	61.0	15.8	66.2
P Value	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.2
CV	3.9	11.6	1.6	2.0	10.0
LSD	2.0	0.5	1.6	0.5	10.8

† Grain yield adjusted to 12.0% moisture

N Available: 50 lb/ac

N added: 70 lb/ac

P2O5 Available: 11 ppm

P2O5 added: 26 lb/ac

S added: 10 lb/ac

Herbicide Application: Tolvera @11 oz/ac on 5/27/2025

Planted: 5/5/2025

Harvested: 8/18/2025

Previous crop: Fallow

Precipitation (Planting to Harvest): 6.2 inch

Plot Width: 5 ft

Roosevelt County Dryland Spring Wheat - MSU **Poplar, MT 2025**

Variety	Plant Height (inch)	Sawfly Damage (0-10)	Test Weight (lb/bu)	Protein (%)	Grain Yield (bu/ac)
AP SMITH	21.0	4.0	63.9	16.8	25.8
CP3055	18.6	1.0	60.0	15.5	31.2
CP3119A	21.1	2.3	59.9	14.4	33.1
DAGMAR	21.9	1.7	62.9	16.7	32.2
LANNING	22.7	4.0	61.7	16.9	28.2
LCS ASCENT	22.7	3.3	63.6	16.1	26.1
MT 21074	23.6	2.0	64.2	16.7	32.6
MT 21174	24.1	2.0	62.6	16.9	35.8
MT 21484	22.8	2.7	62.4	16.5	32.0
MT 21487	22.7	3.0	63.0	16.6	28.6
MT 22073	23.0	2.3	59.5	17.4	36.3
MT 22083	21.7	3.0	62.6	16.7	31.4
MT 22182	20.7	2.0	59.0	16.4	31.6
MT 22205	22.3	3.7	62.4	17.0	30.8
MT 22345	19.8	3.0	61.3	16.3	31.2
MT CARLSON	23.5	2.0	61.5	16.2	36.7
MT DUTTON	22.6	3.7	60.8	17.6	28.2
MT UBET	22.2	3.7	62.6	16.5	31.9
ND STAMPEDE	23.4	3.3	62.4	17.4	27.3
REEDER	23.6	3.0	63.4	16.4	27.1
ROCKER	21.8	2.0	64.6	16.0	30.8
SY LONGMIRE	22.7	2.0	63.8	17.1	29.2
SY ROCKFORD	24.3	3.3	61.9	16.8	27.4
VIDA	22.8	2.3	62.6	16.3	29.8
WB 9879CLP	21.0	1.0	61.7	17.3	25.6
WB GUNNISON	22.3	2.3	62.0	16.0	24.9
Mean	22.3	2.6	62.2	16.6	30.2
P Value	0.4248	0.003353	<0.0001	<0.0001	0.1731
CV	9.9	11.3	1.4	2.2	16
LSD	3.6	0.49	1.5	0.61	7.9

† Grain yield adjusted to 12.0% moisture

N added: 70 lb/ac

P2O5 added: 26 lb/ac

Herbicide Application: Huskie FX @ 13.6 oz/Ac on 5/22/25

Precipitation (Planting to Harvest): 6.1 inch

Planted: 4/18/2025

Harvested: 8/4/2025

Previous crop: Peas

Plot Width: 5 ft

Wibaux County Dryland Spring Wheat - MSU **Wibaux, MT 2025**

Variety	Plant Height (inch)	Sawfly Damage (0-10)	Test Weight (lb/bu)	Protein (%)	Grain Yield (bu/ac)
AP SMITH	27.3	2.3	60.4	15.7	60.8
CP3055	32.8	1.3	61.5	14.8	67.6
CP3119A	32.4	1.0	61.5	14.2	66.1
DAGMAR	32.7	1.7	61.7	16.3	71.2
LANNING	31.1	2.7	61.8	16.5	70.4
LCS ASCENT	32.2	4.0	60.4	14.9	69.5
MT 21074	30.6	1.3	63.9	17.0	65.7
MT 21174	32.2	2.3	61.4	16.8	63.6
MT 21484	30.4	3.3	60.6	16.5	65.8
MT 21487	32.5	3.7	60.6	16.3	63.6
MT 22073	31.4	3.3	59.4	16.8	66.2
MT 22083	31.5	1.7	62.9	15.3	66.6
MT 22182	31.9	3.0	57.9	15.6	61.7
MT 22205	31.1	3.0	59.0	16.3	65.6
MT 22345	31.1	2.0	61.0	15.6	72.1
MT CARLSON	31.0	3.7	60.6	15.3	66.3
MT DUTTON	31.6	3.3	59.7	16.3	68.0
MT UBET	31.2	3.3	61.7	15.7	73.6
ND STAMPEDE	30.2	5.0	59.0	16.1	59.8
REEDER	31.9	3.7	61.4	16.3	59.0
ROCKER	31.8	2.3	63.3	16.1	66.2
SY LONGMIRE	30.4	4.3	62.2	15.7	64.5
SY ROCKFORD	31.0	2.7	62.0	15.1	75.6
VIDA	33.7	2.0	61.7	15.5	68.8
WB 9879CLP	30.6	3.0	60.7	15.7	63.2
WB GUNNISON	30.2	2.3	60.2	15.4	59.2
Mean	32.2	2.3	63.6	14.8	72.2
P Value	< 0.0001	0.2636	0.0002	< 0.0001	0.0118
CV	5.6	55.6	2.1	3.3	12.8
LSD	3.0	2.1	2.2	0.8	15.1

† Grain yield adjusted to 12.0% moisture

N added: 70 lb/ac

P2O5 added: 26 lb/ac

Precipitation (Planting to Harvest): 11.41 inch

Herbicide Application: Everest 3.0 @ 1.5oz/ac, Wide AR Match @ 14 oz/ac and LVG @ 8oz/ac on 4/4/2025 and RT3 @ 28 oz/ac and Aim @ 0.5 oz/ac on 5/5/2025

Planted: 4/29/2025

Harvested: 8/26/2025

Previous crop: Corn

Plot Width: 5 ft

Dryland Intrastate Winter Wheat Evaluation - MSU **EARC, Sidney, MT 2025**

Variety	Winter Survival (%)	Plant Height (inch)	Days to Heading (Julian*)	Test Weight (lb/bu)	Protein (%)	Grain Yield† (bu/ac)
AAC Coldfront	76.7	29.8	163.0	63.5	11.7	80.2
AAC Vortex	88.3	29.5	165.3	61.7	11.7	71.6
AAC Wildfire	80.0	30.6	167.7	61.7	12.0	78.1
AP Solid	26.7	24.7	161.0	62.8	13.2	35.4
AP Sunbird	60.0	22.3	158.0	63.1	10.9	44.9
AP24AX	41.7	25.9	161.3	61.5	10.7	60.3
Bobcat	51.7	25.3	168.0	63.6	11.8	59.8
Brawl CL Plus	60.0	25.1	155.3	62.7	12.4	45.0
CO21SF191RA	58.3	27.8	165.3	62.5	12.4	56.4
CO21SF263RA	60.0	27.8	167.0	62.2	12.6	50.4
CP7017AX	46.7	21.7	158.7	61.2	11.4	42.6
CP7462	58.3	22.6	158.7	59.9	11.1	52.5
CP7869	46.7	24.1	156.0	62.6	11.6	53.9
CS Bridger CLP	76.7	26.1	161.3	62.2	12.2	74.7
Flathead	40.0	25.6	158.0	62.8	11.9	53.7
FourOsix	45.0	25.2	166.3	63.0	12.0	54.8
Judee	28.3	23.9	168.0	62.2	14.3	19.6
Keldin	36.7	27.2	167.7	63.2	11.8	51.8
LCS Atomic AX	63.3	24.9	160.0	62.7	11.2	51.9
LCS Missile	10.0	23.6	166.0		12.5	16.5
LCS Radar	71.7	23.9	159.7	62.3	12.2	49.3
LCS Steel AX	46.7	26.6	164.3	62.5	10.2	55.9
Loma	55.0	25.6	167.3	61.4	12.4	69.5
MT Meadowlark	50.0	26.5	168.7	62.0	11.9	55.8
MT WarCat	40.0	27.6	169.7	62.1	12.0	52.9
MT2142	60.0	26.5	164.0	62.9	11.4	67.6
MT2230	45.0	25.3	161.0	63.4	12.8	42.4
MT2270	46.7	26.4	165.3	63.5	10.4	69.8
MT2327	35.0	25.3	161.7	62.2	12.5	49.5
MT2335	21.7	24.5	165.0	59.2	15.2	30.1
MTAX21203	41.7	25.6	161.0	63.4	12.3	36.8
MTAX22120	30.0	23.1	161.3	62.7	11.5	44.1
MTCS22127	60.0	26.8	163.7	62.0	12.1	59.8
MTCS22128	53.3	28.0	168.3	63.1	11.3	74.2
MTCS2264	18.3	23.1	166.3	61.2	13.8	27.4
MTFHS23316	31.7	26.5	169.3	62.7	13.4	44.4
MTS21103	46.7	25.6	168.0	61.6	11.9	60.5
MTS2286	60.0	28.0	168.3	62.7	11.5	64.2
MTS2294	28.3	24.1	164.3	63.8	11.8	57.3
MTS23103	38.3	24.8	163.3	62.5	53.5	38.9
MTV2164	55.0	29.8	162.0	61.3	11.3	72.0
NAS-25MT-01	68.3	29.4	167.3	62.6	10.8	67.7
NAS-25MT-02	18.3	25.7	166.3	62.9	12.6	36.5
Northern	55.0	27.4	167.3	62.3	12.6	67.5
Ramsay	25.0	26.8	168.7	63.3	11.7	53.9
SY Clearstone 2CL	66.7	30.6	165.7	62.2	12.4	60.2
StandClear CLP	83.3	27.8	166.0	63.4	11.9	67.8
Warhorse	56.7	24.7	167.0	61.6	12.5	61.0
Yellowstone	68.3	28.7	164.7	62.3	11.7	71.2
Mean	49.6	26.1	164.3	62.4	12.9	54.3
P Value	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.3	< 0.0001
CV	36.8	6.1	1.0	1.4	76.5	18.4
LSD	29.6	2.6	2.8		16.0	16.2

(Julian*) is a continuous count of days since January 1

† Grain yield adjusted to 12.0% moisture

N Available: 31 lb/ac

N added: 35 in furrow, 46 broadcast

P2O5 Available: 0 lb/ac

P2O5 added: 13 lb/ac

Herbicide Application: Opensky @ 16 oz/ac on 5/27/2025

Planted: 10/1/2024

Harvested: 7/30/2025

Previous crop: Fallow

Soil Type: Williams Clay Loam

Precipitation (Planting to Harvest): 12.8 inch

Plot Width: 5 ft

WREC Durum Variety Trial - Dryland **Williston, ND 2025**

Variety	Plant Height (in)	Days to Heading (d)	Protein (%)	Test Weight (lb/bu)	Grain Yield		
					2025 (bu/a)	2-Year Average (bu/a)	3-Year Average (bu/a)
AAC Stronghold	29.6	65.5	18.0	57.1	34.0	-	-
Alberto	20.5	60.0	16.8	53.2	33.7	-	-
Alkabo	31.7	62.1	16.4	55.7	35.3	51.0	44.9
Carpio	29.9	66.6	16.9	55.0	28.0	45.2	39.3
Divide	32.3	64.6	17.6	56.0	29.4	44.4	37.4
Dorato	23.1	59.4	16.9	54.2	33.0	-	-
Joppa	31.8	65.5	16.8	56.2	31.3	51.2	43.1
Maier	31.3	63.9	18.2	55.3	32.0	45.5	38.6
Mountrail	30.6	65.0	17.4	54.9	32.2	45.5	39.6
MT Raska	26.6	59.5	17.5	57.0	36.2	47.3	39.9
ND Grano	31.0	65.3	17.6	55.5	31.5	47.6	41.1
ND Riveland	33.2	63.2	17.6	56.0	30.8	48.8	41.4
ND Stanley	31.1	65.0	17.3	56.8	32.9	48.1	41.6
Strongfield	31.6	65.0	18.4	55.6	30.8	45.6	40.8
Tiburon	22.1	62.1	17.7	52.2	30.5	-	-
Mean	30.9	64.3	17.5	55.9	31.9	-	-
CV %	4.9	1.6	1.8	1.0	6.0	-	-
LSD 5 %	4.3	2.9	0.9	1.6	5.4	-	-
LSD 10%	3.6	2.5	0.7	1.3	4.5	-	-

Location: Williston, ND; Lattitude: 48.12463°W; Longitude: 103.73869°N Elevation: 2054 ft

Planted: 4/22/2025 Previous Crop: Chickpea

Harvested: 8/12/2025 Soil Type: Williams-Bowbells Loam

Fertilizer Applied: N:P:K =126:14:0 lb/a

Soil test (0-6 in): P = 20 ppm; K = 308 ppm; pH = 6.1; OM = 2.4%

Soil test (0-24 in): NO_3-N = 9 lb/a; S = 36 lb/a

** Hail storm on July 25, 2025 impacted yields.

Data includes only released varieties. Experimental lines are not included. Statistics reflect the entire trial.

WREC Durum Variety Trial - Irrigated **Nesson Valley, ND 2025**

Variety	Plant Height (in)	Days to Heading (d)	Protein (%)	Test Weight (lb/bu)	Grain Yield	
					2025 (bu/a)	2-Year Average (bu/a)
AAC Shrader	30.7	57.5	19.1	60.9	79.0	-
AAC Stronghold	29.8	58.0	18.6	61.0	71.3	-
Alberto	18.3	55.5	17.7	58.6	55.9	-
Alkabo	30.0	58.5	17.7	61.1	75.9	-
Carpio	26.3	59.0	18.3	60.9	69.8	-
CDC Defy	33.3	56.5	17.5	62.0	92.2	83.8
Divide	27.6	59.0	18.3	59.7	69.6	71.9
Dorato	23.8	56.0	16.3	61.3	69.3	-
Joppa	30.8	57.5	17.8	61.5	77.0	80.9
Maier	28.9	57.0	19.1	60.7	73.3	75.8
Mountrail	30.8	59.5	17.6	61.2	85.0	81.4
MT Blackbeard	31.0	61.0	18.0	60.7	76.7	76.4
MT Raska	25.4	54.0	17.3	62.4	84.6	70.3
ND Grano	30.5	60.5	17.5	62.1	86.1	87.3
ND Riveland	34.3	60.0	17.5	61.3	89.1	87.0
ND Stanley	29.6	59.5	18.4	62.4	77.5	78.3
Strongfield	28.1	58.0	19.1	59.9	59.0	59.7
TCG Ranger	28.8	56.0	16.9	62.1	80.3	-
Tiburon	24.7	57.5	19.0	57.9	58.9	-
Mean	29.0	58.3	18.0	61.0	76.3	-
CV %	8.1	2.2	2.1	0.8	10.1	-
LSD 5%	5.1	2.8	0.8	1.1	16.0	-
LSD 10%	4.2	2.3	0.6	0.9	13.2	-

Location: Ray, ND; Latitude 48.16609°N; Longitude 103.10813°W Elevation: 1900 ft

Planted: 5/2/2025 Previous Crop: Soybean

Harvested: 8/21/2025 Soil Type: Lihen Loamy Fine Sand

Fertilizer Applied: N:P:K = 150:50:50 lb/a

Data includes only released varieties. Experimental lines are not included. Statistics reflect the entire trial.

2025 Dryland Statewide Durum - MSU **EARC, Sidney, MT 2025**

Variety	Plant Height (inch)	Days to Heading (Julian*)	Test Weight (lb/bu)	Protein (%)	Grain Yield† (bu/ac)
Alzada	27.0	170.3	60.4	14.1	47.2
CDC Defy	34.9	171.7	64.2	12.8	53.2
Divide	34.5	174.0	63.8	13.9	48.3
Joppa	32.9	174.0	62.6	14.5	43.3
Lustre	33.1	174.3	61.7	14.0	33.3
MT Blackbeard	37.8	175.3	63.1	14.0	55.3
MT Raska	24.7	170.0	63.0	14.0	46.4
MTD19011	31.9	173.0	63.0	12.9	57.2
MTD19241	32.0	173.0	63.4	13.9	57.7
MTD22011	32.8	175.0	63.9	14.0	47.2
MTD22013	29.9	174.0	61.6	15.0	45.3
MTD22016	32.5	174.3	62.6	14.6	46.7
MTD22030	33.7	173.3	63.7	12.6	56.1
MTD22045	32.9	172.0	63.2	13.2	52.1
MTD22075	31.9	172.3	62.9	14.4	49.8
MTD22090	33.7	174.7	62.5	15.3	43.9
MTD22175	30.2	171.0	59.8	15.0	45.6
MTD22206	32.0	174.3	63.6	15.2	46.5
MTD22417	38.2	174.7	64.5	13.8	56.2
MTD22419	33.7	174.3	63.4	14.8	49.7
MTD22431	33.9	174.3	64.0	12.6	52.1
MTD22447	33.1	173.3	63.3	14.9	43.7
MTD22473	33.7	174.3	62.6	13.5	51.7
MTD22627	33.1	175.0	64.0	14.3	43.6
MTD22999	22.7	168.7	63.5	13.6	51.9
MTD23067	26.8	171.7	61.1	14.4	57.2
MTD23103	29.9	171.0	61.8	15.1	50.6
Mountrail	32.9	174.0	62.6	13.5	49.9
ND Riveland	33.7	174.3	62.8	14.3	49.2
ND Stanley	32.4	174.3	64.1	14.9	41.2
Mean	32.1	173.2	62.9	14.1	49.1
P Value	<0.0001	<0.0001	<0.0001	0.005632	0.5399
CV	5.9	0.46	1.2	6.5	19.9
LSD	3.1	1.3	1.3	1.5	16.0

(Julian*) is a continuous count of days since January 1

† Grain yield adjusted to 12.0% moisture

N Available: 57 lb/a

N added: 40 lb/ac

P2O5 Available: 33 lb/ac

P2O5 added: 15 lb/ac

Herbicide Application: Opensky @ 16 oz/ac on 5/27/2025

Planted: 4/10/2025

Harvested: 8/4/2025

Previous crop: Fallow

Soil Type: Williams Clay Loam

Precipitation (Planting to Harvest): 11.2 inch

Plot Width: 5 ft

McCone County Dryland Durum - MSU **Vida, MT 2025**

Variety	Plant Height (inch)	Sawfly Damage (0-10)	Lodging (%)	Test Weight (lb/bu)	Protein (%)	Grain Yield† (bu/ac)
AAC Stronghold	35.7	1.3	0.0	64.6	15.9	64.8
Alzada	30.4	2.7	16.7	62.9	14.7	68.2
CDC Defy	38.2	4.0	0.0	64.4	15.6	63.1
Divide	38.1	2.3	0.0	64.4	15.8	65.1
Joppa	38.5	5.7	63.3	64.3	14.6	62.1
Lustre	37.1	2.7	50.0	63.4	16.1	60.8
MT Blackbeard	38.3	3.3	0.0	64.8	15.6	65.4
MT Raska	28.9	1.3	0.0	63.9	15.6	63.3
MTD19011	38.2	3.0	0.0	63.8	15.2	71.4
MTD19241	34.1	1.7	0.0	63.8	15.9	62.4
ND Riveland	38.7	2.3	0.0	64.7	15.0	67.3
ND Stanley	36.1	3.0	0.0	65.1	15.2	64.8
Mean	36	2.8	10.8	64.2	15.4	64.9
P Value	<0.0001	0.007138	<0.0001	0.01875	0.01833	0.9713
CV	3.0	41.6	102	1.0	3.2	13.8
LSD	1.8	1.9	18.6	1.1	0.85	15.1

† Grain yield adjusted to 12.0% moisture
N Available: 50 lb/ac
N added: 150 lb/ac
P2O5 Available: 11 ppm
P2O5 added: 26 lb/ac
S added: 10 lb/ac
Planted: 5/5/2025
Harvested: 8/18/2025
Previous crop: Fallow
Precipitation (Planting to Harvest): 6.2 inch
Plot Width: 5 ft
Herbicide Application: Tolvera @11 oz/ac on 5/27/2025

Roosevelt County Dryland Durum - MSU **Poplar, MT 2025**

Variety	Plant Height (inch)	Sawfly Damage (0-10)	Test Weight (lb/bu)	Protein (%)	Grain Yield† (bu/ac)
AAC Stronghold	22.6	1.0	63.5	17.6	26.6
Alzada	21.1	4.3	62.2	16.5	25.9
CDC Defy	24.4	4.7	63.0	17.3	22.0
Divide	25.7	3.7	62.8	16.7	23.5
Joppa	23.8	5.0	63.1	17.0	19.9
Lustre	24.8	3.0	61.2	17.4	24.2
MT Blackbeard	26.2	4.3	63.0	16.6	25.8
MT Raska	20.6	3.3	63.8	17.2	25.2
MTD19011	23.4	5.0	62.3	17.4	22.0
MTD19241	25.9	1.3	62.8	17.4	28.0
ND Riveland	26.0	3.7	62.8	17.1	24.8
ND Stanley	22.7	5.0	63.5	17.2	18.2
Mean	23.9	3.7	62.8	17.11	23.8
P Value	0.03367	<0.0001	0.003269	0.354	0.09188
CV	8.9	19.7	1.0	3.2	15.0
LSD	3.6	1.2	1.1	0.92	6.0

† Grain yield adjusted to 12.0% moisture
N added: 70 lb/ac
P2O5 added: 26 lb/ac
Hebicide Application: Huskie FX @ 13.6 oz/ac on 5/22/25
Precipitation (Planting to Harvest): 6.1 inch
Planted: 4/18/2025
Harvested: 8/4/2025
Previous crop: peas
Plot Width: 5 ft

Wibaux County Dryland Durum - MSU **Wibaux, MT 2025**

Variety	Plant Height (inch)	Sawfly Damage (0-10)	Test Weight (lb/bu)	Protein (%)	Grain Yield† (bu/ac)
AAC Stronghold	35.3	1.7	63.3	15.4	56.4
Alzada	30.6	5.7	61.9	14.0	62.4
CDC Defy	40.3	4.0	64.5	15.0	61.9
Divide	38.5	3.3	64.1	14.8	64.2
Joppa	37.7	4.0	63.8	14.6	59.1
Lustre	38.6	3.3	63.1	15.1	59.0
MT Blackbeard	39.8	4.0	63.5	14.7	58.8
MT Raska	29.3	1.3	64.4	14.7	65.9
MTD19011	37.1	4.0	63.5	15.8	60.8
MTD19241	35.2	2.0	63.3	15.3	63.8
ND Riveland	38.6	4.0	64.6	15.3	60.0
ND Stanley	36.2	3.3	64.2	15.2	59.3
Mean	36.4	3.4	63.7	15.0	61.0
P Value	<0.0001	<0.0001	<0.0001	0.3913	0.9757
CV	3.5	28.3	0.76	5.1	14.0
LSD	2.1	1.6	0.82	1.3	14.4

† Grain yield adjusted to 12.0% moisture
N added: 70 lb/ac
P2O5 added: 26 lb/ac
Precipitation (Planting to Harvest): 11.41 inch
Herbicide Application: Everest 3.0 @ 1.5oz/ac, Wide AR Match @ 14 oz/ac
and LVG @ 8oz/ac on 4/4/2025 and RT3 @ 28 oz/ac and Aim @ 0.5 oz/ac on 5/5/2025
Planted: 4/29/2025
Harvested: 8/26/2025
Previous crop: Corn
Plot Width: 5 ft

Irrigated Statewide Durum - MSU **EARC, Sidney, MT 2025**

Variety	Plant Height (inch)	Days to Heading (Julian*)	Lodging (%)	Test Weight (lb/bu)	Protein (%)	Grain Yield† (bu/ac)
Alzada	30.1	168.0	90.0	62.8	13.4	104.5
CDC Defy	39.0	170.7	51.7	64.1	12.1	118.6
Divide	39.1	172.0	60.0	63.9	13.0	111.2
Joppa	36.6	171.7	46.7	64.1	12.5	115.0
Lustre	37.7	172.7	81.7	63.3	12.6	112.5
MT Blackbeard	38.6	173.7	78.3	63.1	13.4	107.9
MT Raska	28.9	168.3	0.0	63.7	13.0	108.3
MTD19011	36.6	171.7	46.7	62.9	12.5	120.0
MTD19241	35.4	171.3	88.3	63.3	13.0	118.7
MTD22011	35.3	173.3	11.7	62.9	12.8	109.2
MTD22013	32.8	172.0	26.7	63.0	12.6	119.3
MTD22016	37.7	172.7	10.0	64.2	12.2	114.4
MTD22030	36.4	172.7	45.0	63.8	11.8	123.8
MTD22045	35.4	170.7	36.7	64.1	12.2	116.2
MTD22075	36.0	172.0	60.0	63.7	12.9	114.1
MTD22090	37.9	172.0	70.0	63.4	13.2	107.5
MTD22175	36.5	172.0	80.0	63.2	12.9	111.1
MTD22206	36.6	172.3	11.7	64.6	13.4	108.7
MTD22417	41.7	174.7	56.7	64.8	13.1	110.6
MTD22419	37.9	172.7	10.0	64.3	12.2	120.0
MTD22431	39.0	174.3	53.3	63.5	12.2	104.6
MTD22447	36.5	172.3	20.0	64.3	13.5	106.3
MTD22473	37.1	173.0	46.7	63.2	12.3	117.1
MTD22627	39.0	173.7	53.3	63.8	13.0	111.8
MTD22999	26.8	167.0	3.3	63.5	13.2	105.4
MTD23067	30.6	170.7	11.7	61.7	13.4	125.9
MTD23103	32.4	168.3	20.0	62.9	14.4	103.4
Mountrail	35.6	171.0	51.7	64.1	12.4	117.5
ND Riveland	39.5	171.7	16.7	64.2	12.7	112.5
ND Stanley	34.4	173.3	8.3	64.9	13.1	116.7
Mean	35.9	171.7	41.6	63.6	12.8	113.1
P Value	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	< 0.0001
CV	5.4	0.6	39.7	0.88	4.3	4.8
LSD	3.2	1.7	27.0	0.92	0.91	8.9

(Julian*) is a continuous count of days since January 1

† Grain yield adjusted to 12.0% moisture

N Available: 35 lb/ac

N added: 70 lb/ac

P2O5 Available: 15 lb/ac

P2O5 added: 26 lb/ac

Herbicide Application: Opensky @ 16 oz/ac on 5/27/2025

Planted: 4/11/2025

Harvested: 8/13/2025

Previous crop: Peas

Soil Type: Savage Silty Clay

Precipitation (Planting to Harvest): 11.0 inch

Irrigation (Sprinkler): 2.02 inch

Plot Width: 5 ft

WREC Barley Variety Trial - Dryland **Williston, ND 2025**

Variety	Days to Heading (d)	Plant Height (in)	Plump (%)	Protein (%)	Test Weight (lb/bu)	Grain Yield 2025 (bu/a)	Grain Yield 2-Year Average (bu/a)	Grain Yield 3-Year Average (bu/a)
Two-row								
AAC Prairie	62.4	26.4	73.0	-	-	41.3	-	-
AAC Synergy	66.8	25.7	57.5	15.4	46.9	31.4	56.7	-
ABI Cardinal	64.2	26.0	53.2	16.3	44.6	36.9	64.6	-
CDC Churchill	65.0	23.4	27.3	15.3	47.9	37.4	-	-
CDC Fraser	65.4	24.1	42.3	16.0	43.4	40.6	60.3	46.9
Conlon	61.0	25.4	91.2	14.8	49.6	36.3	56.0	44.6
Explorer	64.7	22.5	37.9	14.6	45.3	39.2	58.2	49.4
Firefoxx	64.7	24.6	31.3	14.1	43.7	41.7	-	-
MT Cowgirl	64.4	29.3	23.5	15.5	42.2	37.2	-	-
ND Genesis	64.2	29.3	75.3	13.8	50.1	33.5	43.1	-
Pinnacle	63.4	26.4	73.8	14.1	45.4	42.4	69.4	-
Six-row								
ND Treasure	62.7	26.0	19.2	15.0	43.9	40.6	51.6	43.3
Tradition	64.3	28.7	47.9	15.6	47.3	41.0	63.7	49.8
Mean	63.5	25.7	56.0	14.2	45.9	41.4		
CV %	1.2	6.7	15.2	3.8	3.9	12.3		
LSD 5%	2.1	4.8	24.1	1.5	5.1	14.3		
LSD 10%	1.8	4.0	20.1	1.3	4.3	12.0		

Location: Williston, ND; Lattitude: 48.12396 W; Longitude: -103.73869 N. Altitude: 2054 ft.

Planted 4/21/2025 Soil Type: Williams-Bowbells Loam

Harvested: 8/4/2025 Previous Crop: Chickpea

Soil test (0-6 in): P = 20 ppm; K = 308 ppm; pH = 6.1; OM = 2.4%.

Soil test (0-24 in): NO_3-N = 9 lb/a; S = 36 lb/a.

Applied fertilizers: N = 71 lb/a; P_2O_5 = 14 lb/a; S = 3 lb/a; Zn = 0.3 lb/a.

**Hail storm on July 25, 2025 impacted yields

Data includes only released varieties. Experimental lines are not included. Statistics reflect the entire trial.

Dryland Offstation Barley - MSU **EARC, Sidney, MT 2025**

Variety	Plant Height (in)	Days to Heading (Julian*)	Plump (6/64 seive %)	Regular (5/64 seive %)	Test Weight (lb/bu)	Protein (%)	Grain Yield† (bu/ac)
AAC Synergy	28.7	170.7	94.5	5.2	51.2	12.6	85.8
ABI Eagle	27.7	172.0	82.3	16.3	50.4	13.4	88.3
ABI Montana	26.9	170.3	87.7	11.7	51.2	12.4	82.5
ABI Voyager	28.3	169.0	94.2	5.4	50.8	12.7	84.6
AC Metcalfe	31.1	170.0	87.1	13.7	51.9	13.7	87.5
BC Lexy	24.9	174.0	92.7	7.0	49.9	12.0	84.0
Bill Coors 100	25.9	173.3	91.6	7.7	49.5	13.4	87.3
Buzz	26.5	168.3	96.9	2.9	52.6	11.7	85.7
Havener	28.3	173.3	30.5	61.2	58.5	13.9	74.0
Hockett	28.7	169.3	94.2	5.5	53.6	12.2	89.1
KWS Enduris	27.4	172.7	96.7	3.1	49.2	11.9	86.7
KWS Kayis	26.2	172.7	94.7	5.0	48.9	12.0	94.4
LCS Genie	26.9	170.7	77.2	21.7	51.5	12.5	95.1
LCS Odyssey	25.9	173.7	90.2	9.3	49.7	12.2	89.5
LG Diablo	26.8	175.3	95.1	4.5	48.8	13.0	86.8
ME031	24.4	172.0	89.7	10.1	49.7	12.3	87.1
MT Boy Howdy	29.9	172.0	96.8	2.9	53.4	11.6	86.7
MT Endurance	29.4	168.3	97.1	2.8	51.0	12.0	87.0
MT17M01908	32.0	168.3	98.5	1.4	52.6	11.3	92.4
MT19_M064_04	30.6	171.0	84.1	15.2	50.1	12.0	88.4
MT19_M067_02	26.9	168.3	96.6	3.3	51.6	12.0	85.6
MT19_M080_13	27.3	167.0	97.0	2.9	50.8	11.6	95.9
MT20_H092_13	31.5	170.7	40.4	56.8	59.3	16.2	64.5
MT20_M047_16	28.1	168.0	97.3	2.6	52.5	11.1	91.3
Merit 57	28.0	171.7	80.0	18.4	50.0	12.8	89.4
Mean	27.9	170.9	87.3	11.9	51.5	12.5	86.8
P Value	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
CV	4.6	0.63	3.1	20.1	1.1	3.0	6.8
LSD	2.1	1.8	4.4	3.9	0.91	0.62	9.6

(Julian*) is a continuous count of days since January 1

† Grain yield adjusted to 12.0% moisture

N Available: 57 lb/ac

N added: 40 lb/ac

P2O5 Available: 33 ppm

P2O5 added: 15 lb/ac

Herbicide Application: Axial XL @ 16 oz/ac & LV-4 @ 22 oz/ac on 5/24/2025

Planted: 4/8/2025

Harvested: 7/31/2025

Previous crop: Fallow

Soil Type: Williams Clay Loam

Precipitation (Planting to Harvest): 11.2 inch

Plot Width: 5 ft

Forage Barley - MSU **EARC, Sidney, MT 2025**

Variety	Plant Height (inch)	Days to Heading (Julian*)	Test Weight (lb/bu)	Protein (%)	Forage Yield (ton/ac)	Grain Yield (bu/ac)
Cowgirl	31.6	168.7	49.0	12.5	4.0	90.0
Haymaker	31.2	169.0	50.2	13.3	4.0	85.9
Lavina	29.4	169.0	48.4	12.1	3.8	87.3
MT Double Barrel	28.6	171.7	48.6	13.0	3.7	90.9
MT20_F097_01	31.0	171.0	47.7	12.8	3.6	79.5
MT20_F099_05	31.1	169.0	50.6	13.3	3.7	83.9
MT20_F108_13	29.4	171.7	50.4	13.0	3.7	87.1
MT20_F109_08	30.6	169.3	49.2	12.6	4.1	90.7
MT20_F109_22	30.1	168.3	48.8	12.7	4.0	90.3
MT20_F110_19	32.2	170.0	49.9	12.8	4.6	88.6
MT21_F003_05	31.4	169.0	48.6	12.8	3.6	86.5
MT21_F004_01	31.2	170.3	48.8	12.7	3.7	92.8
MT21_F005_10	27.4	172.7	46.9	13.2	3.3	81.1
MT22_F001_09	31.4	172.3	51.2	12.6	3.8	84.6
MT22_F001_15	30.3	170.0	50.1	12.6	3.9	88.1
MT22_F002_08	31.9	171.7	50.3	13.4	3.8	80.8
MT22_F003_09	30.7	172.0	49.5	12.2	3.2	84.2
MT22_F004_04	32.2	167.7	49.8	13.5	3.7	78.8
MT22_F005_03	32.5	168.7	48.8	13.4	4.3	88.4
MT22_F005_14	31.9	167.3	48.7	12.3	4.2	88.8
MT22_F007_02	32.9	170.0	48.2	11.6	4.4	90.3
MT22_F007_27	31.5	169.0	47.9	11.7	4.0	96.0
MT22_F007_29	30.6	169.3	48.7	11.2	3.5	95.6
MT22_F008_05	33.1	169.0	49.0	12.0	4.2	79.6
MT22_F009_15	29.7	168.3	50.0	12.5	3.7	90.0
Mean	31.0	169.8	49.2	12.6	3.9	87.2
P Value	<0.0001	<0.0001	<0.0001	<0.0001	0.201	0.0208
CV	3.8	0.7	0.9	3.0	12.6	6.7
LSD	1.9	2.0	0.7	0.6	0.8	9.6

(Julian*) is a continuous count of days since January 1

† Grain yield adjusted to 12.0% moisture

N Available: 57 lb/ac

N added: 40 lb/ac

P2O5 Available: 33 ppm

P2O5 added: 15 lb/ac

Herbicide Application: Axial XL @ 16 oz/ac & LV-4 @ 22 oz/ac on 5/24/2025

Planted: 4/8/2025

Harvested: 7/31/2025

Previous crop: Fallow

Soil Type: Williams Clay Loam

Precipitation (Planting to Harvest): 11.2 inch

Plot Width: 5 ft

Irrigated Intrastate Barley Evaluation - MSU **EARC, Sidney, MT 2025**

Variety	Plant Height (in)	Days to Heading (Julian*)	Lodging (1-10)	Plump (6/64 seive %)	Regular (5/64 seive %)	Test Weight (lb/bu)	Protein (%)	Grain Yield† (bu/ac)
AAC Synergy	35.7	173.7	8.3	98.0	1.9	53.5	12.0	147.4
Buzz	32.8	170.7	2.0	98.4	1.4	53.7	11.5	121.4
FHB-2017-59-2	35.0	168.7	8.7	98.3	1.5	55.9	13.3	130.4
Havener	33.9	175.0	8.0	86.2	12.6	63.9	13.2	120.7
Hockett	33.7	171.0	9.3	97.8	2.0	55.2	12.7	138.2
MT Boy Howdy	32.2	174.0	1.3	98.5	1.4	53.3	11.2	130.3
MT Endurance	34.1	172.0	2.7	98.6	1.2	52.6	13.2	100.6
MT17M01908	34.3	169.3	2.0	99.2	0.8	53.9	11.5	122.7
MT17M05808	33.7	170.3	8.3	96.5	3.2	53.7	12.7	127.7
MT18H02702	37.0	172.7	9.3	92.3	7.1	61.8	13.6	130.2
MT18M11004	34.0	173.0	4.7	96.9	2.9	54.4	12.4	143.2
MT19_H09_09	36.4	174.3	9.7	82.2	16.5	63.4	14.6	112.5
MT19_H11_04	36.9	176.0	8.3	80.9	18.3	63.1	14.6	111.8
MT19_M061_19	34.0	172.7	4.7	97.9	1.8	52.6	11.9	135.0
MT19_M064_04	34.8	174.0	6.3	98.2	1.7	53.4	11.8	136.6
MT19_M067_02	31.1	169.3	4.0	98.8	1.2	51.8	11.8	125.6
MT19_M080_13	31.8	168.0	3.7	98.9	1.1	53.4	12.2	136.7
MT19_M095_04	32.7	169.0	3.7	98.1	1.6	53.7	12.1	135.0
MT20_H092_13	39.1	174.7	3.3	90.8	8.9	63.2	16.6	107.5
MT20_M008_04	35.0	170.7	5.7	97.8	2.0	53.7	12.3	128.6
MT20_M047_16	32.7	171.0	1.3	98.8	1.1	53.6	11.6	125.8
MT20_M053_02	35.6	169.7	8.7	96.2	3.2	53.3	12.0	135.1
MT20_M120_05	31.9	167.3	3.3	99.1	0.8	53.6	11.9	122.9
MT21_069_02	29.1	175.3	7.0	98.7	1.2	54.0	11.9	148.3
MT21_129_01	30.1	175.0	8.7	98.1	1.8	53.5	12.2	143.9
MT21_M021_05	35.8	172.3	7.7	97.9	1.9	53.5	12.2	140.0
MT21_M053_06	36.9	171.0	8.3	97.7	2.0	51.4	10.8	142.8
MT21_M064_01	31.5	171.7	8.3	96.3	3.4	53.7	11.1	144.9
MT21_M070_01	32.8	173.3	5.7	98.4	1.5	52.0	11.2	137.7
MT21_M072_02	32.8	171.7	8.3	96.9	2.6	53.2	11.5	138.5
MT21_M089_01	30.6	174.0	8.0	97.1	2.6	53.5	11.8	146.5
MT21_M098_01	34.1	174.3	9.3	98.7	1.2	52.6	12.7	127.0
MT21_M115_01	34.1	171.7	6.0	97.6	2.1	52.8	11.8	135.8
MT21_M126_03	37.4	171.0	8.3	97.6	2.2	53.8	11.6	129.6
MT22_M022_07	35.0	172.7	3.0	97.9	1.9	53.8	11.8	140.2
MT22_M025_02	32.5	168.7	5.3	96.6	3.0	53.9	11.3	130.8
MT22_M028_01	35.2	172.0	4.7	96.0	3.6	52.6	11.7	128.6
MT22_M029_01	35.2	171.0	4.7	98.2	1.7	53.3	12.0	137.8
MT22_M033_14	31.6	170.7	4.3	97.7	1.9	52.5	12.4	112.0
MT22_M034_01	34.1	170.3	1.7	97.2	2.5	53.1	11.7	126.5
MT22_M035_04	35.0	172.3	5.0	90.3	8.7	53.2	11.9	118.4
MT22_M039_09	34.0	168.3	4.7	99.0	0.9	53.2	13.5	118.7
MT22_M040_01	33.2	168.0	1.0	98.9	1.0	54.1	12.7	123.1
MT22_M051_10	28.9	175.0	6.3	93.6	5.7	52.8	12.3	134.6

Irrigated Intrastate Barley Evaluation - MSU (cont.) **EARC, Sidney, MT 2025**

Variety	Plant Height (in)	Days to Heading (Julian*)	Lodging (1-10)	Plump (6/64 seive %)	Regular (5/64 seive %)	Test Weight (lb/bu)	Protein (%)	Grain Yield† (bu/ac)
MT22_M054_01	32.5	169.3	0.3	98.5	1.3	53.6	11.6	123.6
MT22_M055_01	32.3	170.7	2.7	98.5	1.3	54.7	12.3	127.9
MT22_M056_08	36.4	169.7	6.3	98.9	1.0	53.9	12.1	124.1
MT22_M056_12	33.1	168.7	1.7	98.8	1.1	54.2	12.3	125.4
MT22_M057_09	36.6	169.7	0.3	98.5	1.4	53.9	12.1	100.6
MT22_M058_03	35.4	171.3	7.7	96.4	3.3	52.3	13.3	139.3
MT22_M059_12	31.0	168.0	0.7	98.8	1.2	54.6	12.1	119.1
MT22_M066_01	32.5	169.0	1.3	97.8	1.9	54.6	11.3	130.8
MT22_M078_10	29.8	169.3	2.7	97.8	1.9	54.4	11.6	128.1
MT22_M096_03	31.4	169.0	2.3	96.5	3.3	52.2	12.9	118.7
MT22_M097_01	31.6	166.3	5.7	97.5	2.2	53.5	11.1	125.7
MT22_Y023_07	30.8	175.0	4.7	97.3	2.5	54.1	13.8	136.8
MT22_Y024_09	29.7	174.0	9.3	92.0	7.5	54.6	13.0	141.3
MT22_Y038_04	36.7	171.0	1.7	98.1	1.6	54.6	13.7	119.2
MT22_Y042_15	31.0	170.7	0.3	99.1	0.9	53.3	12.1	115.5
MT22_Y044_14	30.7	170.7	0.3	98.8	1.0	53.4	11.5	125.8
MT22_Y048_13	31.8	166.7	9.3	94.1	5.4	54.2	12.3	117.3
MT22_Y065_06	32.4	171.0	8.3	97.8	2.0	55.5	13.3	135.2
MT22_Y077_15	32.3	172.3	5.3	96.2	3.4	54.6	14.1	132.1
Merit 57	32.3	174.7	8.3	93.9	5.6	53.0	12.2	150.7
Mean	33.4	171.3	5.2	96.6	3.1	54.3	12.3	129.2
P Value	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
CV	6.2	0.56	29.4	1.3	37.5	0.78	2.7	5.6
LSD	3.3	1.6	2.5	2.0	1.9	0.69	0.54	11.6

(Julian*) is a continuous count of days since January 1

† Grain yield adjusted to 12.0% moisture

N Available: 35 lb/ac

N added: 70 lb/ac

P2O5 Available: 15 ppm

P2O5 added: 26 lbs/ac

Herbicide Application: Axial XL @ 16 oz/ac & LV-4 @ 22 oz/ac on 5/24/2025

Planted: 4/16/2025

Harvested: 8/14/2025

Previous crop: Peas

Soil Type: Savage Silty Clay

Precipitation (Planting to Harvest): 10.5 inch

Irrigation (Sprinkler): 2.02 inch

Plot Width: 5 ft

WREC Oat Variety Trial - Irrigated **Nesson Valley, ND 2025**

Variety	Days to Heading (d)	Plant Height (in)	Lodging (1-9)	Test Weight (lb/bu)	Grain Yield (bu/a)
AAC Douglas	55.3	35.3	6.8	34.3	141.5
Beach	55.7	35.3	1.0	34.3	83.8
CDC Endure	59.3	36.1	3.2	33.9	147.9
Crema (hull-less)	61.0	35.6	1.8	44.9	120.6
Deon	59.0	31.2	1.5	34.6	110.6
HiFi	58.0	36.4	2.1	35.6	130.8
Jury	57.7	36.3	4.9	35.2	160.7
Leggett	57.7	33.3	1.2	33.6	105.1
MN Pearl	47.7	37.5	1.0	34.5	115.5
ND Carson	58.7	33.6	1.0	34.6	157.7
ND Heart	55.7	36.2	1.7	34.0	106.3
ND Miller	58.3	33.3	2.2	37.9	144.2
ND Spilde	56.7	33.3	1.2	30.1	100.9
ND Williams	58.7	40.9	1.0	37.1	114.2
Newburg	56.3	38.3	5.3	35.3	156.3
Otana	58.0	36.8	6.0	37.6	141.1
Paul (hull-less)	61.0	37.0	5.1	42.7	130.7
Rockford	57.7	34.8	1.9	35.8	87.6
SD Buffalo	52.0	34.1	1.0	35.6	100.1
SD Momentum	58.3	39.4	1.5	36.8	148.2
SD Titan	56.3	42.7	1.9	36.4	119.1
CDC Haymaker	63.0	40.4	3.7	30.5	136.6
CS Camden	56.7	31.2	5.2	33.9	147.1
Kildeer	55.7	30.2	2.7	35.0	117.9
Mean	57.7	35.8	2.7	36.1	128.5
CV %	7.2	7.0	44.7	2.5	14.4
LSD 5%	11.6	7.0	3.4	2.6	51.7
LSD 10%	9.7	5.9	2.9	2.2	43.3

Location: Ray, ND; Latitude 48.16611°N; Longitude 103.1068994°W Elevation: 1900 ft.

Planted: 5/6/2025 Previous Crop: Soybean

Harvested: 9/12/2025 Soil Type: Lihen Loamy Fine Sand

Fertilizer Applied: N:P:K = 150:50:50 lb/a

Data includes only released varieties. Experimental lines are not included. Statistics reflect the entire trial.

WREC Corn Variety Trial - Irrigated **Nesson Valley, ND 2025**

Variety	Brand	Test Weight (lb/bu)	Harvest Moisture (%)	Grain Yield (bu/a)
G80Q01-V	Golden Harvest	57.0	16.8	169.5
G82B12-AA	Golden Harvest	55.4	16.1	184.0
G85B04-AA	Golden Harvest	54.5	16.8	133.1
G87U44-V	Golden Harvest	55.4	16.3	179.6
183-13VT2	Bayer	54.6	16.2	170.0
169-09VT2	Bayer	58.8	15.1	162.8
177-54VT2	Bayer	54.3	15.2	186.4
180-24VT2	Bayer	55.5	15.9	188.6
3114 VT2P RIB	Wilbur Ellis - Integra	57.1	15.8	229.2
3431 VT2P RIB	Wilbur Ellis - Integra	56.4	16.7	212.7
T6181 VT2P	Thunder Seed	54.7	16.0	165.1
T6983 VT2P	Thunder Seed	56.0	16.0	168.8
T6685 PC	Thunder Seed	54.0	15.5	208.6
Mean		55.8	16.1	178.1
CV %		1.2	3.4	13.0
LSD 5%		1.0	0.8	33.0
LSD 10%		0.8	0.6	27.5

Location: Ray, ND; Latitude: 48.16564°N; Longitude: 103.10024°W Elevation: 1900 ft.

Planted: 5/13/2025 Previous Crop: Spring Wheat

Harvested: 11/12/2025 Soil Type: Lihen Loamy Fine Sand

Fertilizer Applied: 325 lbs Urea

WREC Flax Uniform Regional Nursery - Irrigated **Nesson Valley, ND 2025**

Variety	Plant Height (in)	Days to Flowering (d)	Oil (%)	Test Weight (lb/bu)	Grain Yield (bu/a)
AAC Bright	23.5	56.4	47.7	49.2	30.8
AAC Marvelous	26.1	55.2	47.5	51.3	35.9
Carter	22.7	53.2	44.5	52.5	33.9
CDC Durado	22.0	53.8	44.1	50.4	26.3
CDC Glas	27.0	55.2	44.4	49.4	36.8
CDC Kernen	22.7	55.1	45.3	50.6	27.5
CDC Neela	23.8	55.6	45.5	52.6	36.9
CDC Rowland	25.6	55.0	45.0	50.2	29.5
Gold ND	25.5	55.0	45.7	50.9	26.9
ND Hammond	25.8	55.7	44.7	50.6	32.8
Omega	25.3	54.9	44.9	52.7	29.3
Webster	24.7	55.0	45.7	52.1	31.6
York	23.9	53.9	43.8	50.5	33.4
Mean	24.3	54.9	45.4	51.8	32.1
CV %	6.7	1.5	1.3	1.1	12.1
LSD at 5%	4.6	2.4	1.7	1.5	10.9
LSD at 10%	3.8	2.0	1.4	1.3	9.1

Location: Ray, ND; Latitude: 48.16591°N; Longitude: 103.10294°W Altitude: 1900 ft

Planted: 5/6/2025 Previous Crop: Spring Wheat

Harvested: 9/24/2025 Soil Type: Lihen Loamy Fine Sand

Fertilizer Applied: N:P:K:S:Zn = 40:11:0:3:0.3 lb/a

Data includes only released varieties. Experimental lines are not included.
Statistics reflect the entire trial.

WREC Canola TruFlex™ Variety Trial - Dryland

Nesson Valley, ND 2025

Variety	Seed Source	Hybrid Trait	Days to Flowering* (d)	Plant Height (in)	Oil (%)	Test Weight (lb/bu)	Grain Yield (lb/a)
LR344PC	BASF	TFLL	49.8	38.1	40.6	49.9	1719.2
LR354PC	BASF	TFLL	51.3	39.1	40.3	50.4	1641.4
CP9978TF	Winfield-Croplan	TF	48.0	33.0	42.9	48.7	1965.8
CP9221TF	Winfield-Croplan	TF	48.5	31.1	42.0	49.4	2048.5
CP9551TF	Winfield-Croplan	TF	48.0	33.3	45.2	48.6	2328.7
DG 781 TCM	Dyna Gro	TF	48.3	36.4	41.2	48.5	1741.7
Mean			49.0	35.1	42.0	49.3	1907.5
CV %			2.3	8.6	1.8	1.2	15.8
LSD 5%			3.4	8.8	2.3	0.9	453.1
LSD 10%			2.8	7.3	1.9	0.7	372.7

Location: Ray, ND; Latitude: 48.1617824°N; Longitude: 103.1073663°W — Altitude: 1900 ft.

Planted: 5/6/2025 — Previous Crop: Spring Wheat

Harvested: 8/27/2025 — Soil Type: Lihen Loamy Fine Sand

Fertilizer Applied: N:P:K:S:Zn = 191:63:50:3:0.3 lb/a

*Days to 10% flowering

WREC Canola TruFlex™ Variety Trial - Irrigated

Nesson Valley, ND 2025

Variety	Seed Source	Hybrid Trait	Days to Flowering* (d)	Plant Height (in)	Oil (%)	Test Weight (lb/bu)	Grain Yield (lb/a)
LR344PC	BASF	TFLL	49.8	38.1	45.8	50.2	2325.3
LR354PC	BASF	TFLL	51.3	39.1	46.9	50.9	2232.3
CP9978TF	Winfield-Croplan	TF	48.0	33.0	47.7	50.4	2175.0
CP9221TF	Winfield-Croplan	TF	48.5	31.1	45.4	50.0	2160.3
CP9551TF	Winfield-Croplan	TF	48.0	33.3	49.4	50.3	2523.1
DG 781 TCM	Dyna Gro	TF	48.3	36.4	46.8	49.5	1948.3
Mean			49.0	35.1	47.0	50.2	2227.4
CV %			2.3	8.6	1.4	0.6	9.7
LSD 5%			1.7	4.5	1.0	0.4	326.0
LSD 10%			1.4	3.7	0.8	0.3	268.1

Location: Ray, ND; Latitude: 48.16598°N; Longitude: 103.10294°W — Altitude: 1899 ft.

Planted: 5/6/2025 — Previous Crop: Spring Wheat

Harvested: 8/28/2025 — Soil Type: Lihen Loamy Fine Sand

Fertilizer Applied: N:P:K:S:Zn=108:13:0:3:0.3 lb/a — *Days to 10% flowering.

Statewide Canola Variety Trial - MSU **EARC, Sidney, MT 2025**

Variety	Plant Height (in)	Days to Flowering (Julian*)	Oil (%)	Grain Yield (lb/ac)
BY7204LL	42.5	168.0	52.1	2642.5
BY7206LL	40.6	169.0	51.9	2738.7
DG661LCM	42.7	169.3	50.6	2596.8
DG783TCN	38.9	167.8	51.7	2526.6
DK401TL	42.7	166.0	51.5	2738.4
L333PC	43.3	169.8	50.0	2507.0
L340PC	40.5	168.8	48.3	2525.4
L345PC	44.6	170.8	49.2	2514.9
LR344PC	44.3	170.0	50.3	2814.9
LR354PC	42.8	170.5	50.9	2771.2
NCC101S	38.2	163.0	44.2	2215.3
NCC2504B	38.3	166.5	49.5	2521.8
RUBCL0225	39.0	167.5	50.5	2391.0
RUBCL0924	39.8	166.5	48.6	2425.5
Mean	41.3	168.1	49.9	2566.43
P Value	< 0.0001	< 0.0001	< 0.0001	< 0.0001
CV	4.5	0.47	1.8	6.8
LSD	2.7	1.1	1.3	250.6

(Julian*) is a continuous count of days since January 1
† Grain yield adjusted to 12.0% moisture
N Available: 22 lb/ac
N added: 70 lb/ac
P2O5 Available: 15 ppm
P2O5 added: 26 lb/ac

Planted: 4/26/2025
Harvested: 8/7/2025
Previous crop: wheat
Soil Type: Savage Silty Clay
Crop Year Precipitation: 10.5 inch
Irrigation (sprinkler): 2.2 inch
Plot Width: 5 ft

Herbicide Applied: Sonalan 10G @ 9.5lb/ac on 10/25/2024
Section 3 @ 5 oz/ac on 5/28/2025
Pesticide Applied: Mustang Maxx @ 4 oz/ac on 5/12/2025, 5/27/2025, and 6/6/2025

Irrigated Soybean Variety Evaluation - MSU **Sidney, MT 2025**

Variety	Days to Flower (DAP)[1]	Days to Maturity (DAP)[1]	Plant Height (in)	Test Weight (lb/bu)	Oil (%)	Protein (%)	Adjusted Grain Yield (lb/a)
CP00926X	59	126	40.5	60.2	18.3	29.7	3519
CP0337x	59	131	37.1	59.5	19.4	28.0	3675
R0422XF	67	133	36.9	58.9	19.5	28.9	3778
RX0228	57	126	40.8	59.7	19.5	29.8	3541
TX8307N	67	137	37.5	59.7	19.0	28.2	3721
TX8603N	65	133	36.6	59.0	19.5	30.1	4096
TX8605N	59	134	39.9	58.7	19.6	28.9	4111
Mean	62	131	38.5	59.4	19.2	29.1	3777
P-Value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.02
LSD (0.05)	1.0	0.5	2.2	0.4	0.4	1.0	361
CV (%)	1.1	0.3	3.9	0.5	1.3	2.3	6.5

Location: EARC; Sidney, MT — Previous crop: Spring Wheat

Planted: 5-13-2025 — Harvested: 9-24-25, 9-26-25, 9-30-25

Applied fertilizers: None — Soil type: Savage Silty Clay Loam

Rainfall (Planting to Harvest): 9.5 inches — Irrigation: 3.25 inches

Yield, Protein and Oil adjusted to 13% moisture content — DAP[1] = Days after planting

Herbicide: Panther at 2 oz/a on 10-14-24

Cornerstone at 24 oz/a on 5-14, 6-11 and 7-4; Dual II Magnum at 16 oz/a on 6-11

WREC Soybean NDSU Advanced Yield Trial - Dryland **Nesson Valley, ND 2025**

Variety	RM	Plant Height (in)	Protein (%)	Test Weight (lb/bu)	Grain Yield (bu)
AG005X8	00.5	28.2	36.2	51.1	38.9
AG0333	0.3	33.1	39.3	51.7	38.4
ND Benson	0.4	31.3	40.0	52.1	34.1
ND Dickey	0.7	32.5	40.2	52.7	37.3
ND Rolette	00.9	31.7	38.4	52.5	34.7
ND21008GT20	00.8	35.2	38.6	51.6	29.1
ND2108GT73	0.8	34.4	38.3	52.5	35.2
ND17009GT	00.9	37.8	39.3	52.7	40.0
ND18-20092(GT SCN)	0.1	31.4	39.3	52.0	29.8
Mean		32.0	38.8	52.1	33.4
CV %		8.2	2.0	0.8	14.0
LSD at 5%		3.7	1.1	0.6	6.7
LSD at 10%		3.1	0.9	0.5	5.6

Location: Ray, ND; Latitude: 48.1619520°N; Longtitude: 103.1061638°W Altitude: 1899 ft.

Planted: 5/22/2025 Previous Crop: Spring Wheat

Harvested: 10/10/2025 Soil Type: Lihen Loamy Fine Sand

WREC Soybean NDSU Advanced Yield Trial - Irrigated **Nesson Valley, ND 2025**

Variety	Status	RM	Plant Height (in)	Protein (%)	Test Weight (lb/bu)	Grain Yield* (bu/a)
AG005X8		00.5	25.8	35.5	51.2	31.1
AG0333		0.3	29.2	38.5	52.2	32.0
ND Benson		0.4	27.3	39.6	53.1	30.2
ND Dickey		0.7	28.0	39.4	53.0	29.1
ND Rolette		00.9	25.1	36.8	52.3	32.2
ND21008GT20		00.8	27.2	37.7	52.3	33.6
ND2108GT73		0.8	29.3	38.3	53.7	31.2
ND17009GT		00.9	27.8	38.7	52.0	32.5
ND18-20092(GT SCN)		0.1	26.2	38.4	52.2	33.0
Mean			27.0	38.1	52.5	29.3
CV %			7.7	2.3	0.7	14.6
LSD 5%			2.9	1.3	0.5	6.1
LSD 10%			2.5	1.0	0.4	5.1

*Stand issues were the reason for yield reduction.

Location: Ray, ND; Latitude 48.16606°N; Longitude 103.10173°W Elevation: 1900 ft

Planted: 5/22/2025 Previous Crop: Spring Wheat

Harvested: 10/10/2025 Soil Type: Lihen Loamy Fine Sand

Data includes only released varieties. Experimental lines are not included. Statistics reflect the entire trial.

WREC Soybean Variety Trial - Irrigated **Nesson Valley, ND 2025**

Variety	Company	Herbicide Trait	Maturity Group	Plant Height (in)	Protein (%)	Test Weight (lb/bu)	Grain Yield (bu/a)
0325RXF	Bayer	RR2XF	0.3	32.6	37.4	51.3	50.3
0525RXF	Bayer	RR2XF	0.5	33.6	36.3	51.3	53.0
0823RXF	Bayer	RR2XF	0.8	33.2	38.9	52.6	51.2
XF0493	Wilbur Ellis - Integra	RR2XF	0.2	31.7	37.6	52.1	49.1
XF0212	Wilbur Ellis - Integra	RR2XF	0.4	37.2	37.5	51.9	46.1
0324E	Wilbur Ellis - Fortus	Enlist E3	0.3	28.0	37.5	51.9	51.1
TX8402N	Thunder Seed	RR2XF	0.2	32.7	34.9	51.6	50.5
TE7603N	Thunder Seed	Enlist E3	0.3	26.5	38.3	52.0	49.9
TX8603N	Thunder Seed	RR2XF	0.3	32.9	37.5	51.5	51.0
XO 0094E	BASF	Enlist E3	00.9	27.2	38.4	52.7	46.1
XO 0234E	BASF	Enlist E3	0.2	27.7	37.7	52.3	45.2
XO 0436E	BASF	Enlist E3	0.4	30.2	38.2	52.3	47.2
XF0674	Wilbur Ellis - Integra	RR2XF	0.6	29.9	37.2	51.8	51.2
XO 0554E	BASF	Enlist E3	0.5	26.8	36.9	51.5	39.7
Mean				30.7	37.5	51.9	48.7
CV %				6.3	1.1	0.7	9.0
LSD 5%				2.8	0.6	0.5	6.3
LSD 10%				2.3	0.5	0.4	5.2

Location: Ray, ND; Latitude 48.16544°N; Longitude 103.10025°W Elevation: 1900 ft

Planted: 5/23/2025 Previous Crop: Spring Wheat

Harvested: 10/10/2025 Soil Type: Lihen Loamy Fine Sand

Dryland Green Dry Pea Variety Evaluation - MSU **Richland, MT 2025**

Variety	Plant Height	Test Weight	1000 Seed Weight	Protein	Adjusted Grain Yield
	(in)	(lb/bu)	(g)	(%)	(lb/a)
Aragorn	17.4	62.6	202	23.2	1355
Banner	17.8	64.8	210	21.2	1466
Fairway	15.6	63.2	186	22.4	1746
Ginny 2	18.0	64.9	231	23.1	1864
Hampton	15.4	64.0	233	25.4	1736
NDP150412G	16.6	65.3	200	24.7	1651
NDP170101G	20.8	65.9	249	24.3	1899
NDP170328G	19.4	65.3	240	24.1	1687
Passion	17.3	64.0	215	22.3	1725
PG Greenback	21.2	67.7	277	21.4	2212
Pro 171-7665	16.2	64.4	232	22.0	1527
Ultra	18.4	64.8	211	21.2	1414
Vail	18.9	67.2	194	23.0	1804
Mean	17.9	64.9	221	22.9	1699
P-Value	0.02	<0.001	<0.001	<0.001	0.01
LSD (0.05)	3.4	0.7	10.3	1.0	401.5
CV (%)	13.2	0.8	3.3	2.9	16.5

Dryland Yellow Dry Pea Variety Evaluation - MSU **Richland, MT 2025**

Variety	Plant Height	Test Weight	1000 Seed Weight	Protein	Adjusted Grain Yield
	(in)	(lb/bu)	(g)	(%)	(lb/a)
AAC Beyond	18.9	66.1	234	21.7	1878
AAC Carver	21.2	65.2	245	21.3	1949
AAC IronHorse	19.5	65.9	264	23.7	1927
AAC Profit	18.5	65.5	258	22.8	1932
CDC Inca	18.2	66.3	251	23.4	2047
CDC Meadow	20.2	66.1	208	21.8	1823
CP5222Y	18.4	66.1	277	23.6	1839
DS-Admiral	18.9	65.5	240	23.2	1719
MS GrowPro	18.3	65.8	306	24.7	1885
MS ProStar	19.7	65.9	263	23.7	2073
ND Dawn	18.0	64.4	236	22.3	1662
NDP170110Y	20.1	65.6	234	24.5	1861
NDP170181Y	22.8	65.9	233	22.9	1933
NDP170322Y	20.8	66.1	251	24.0	1928
Orchestra	17.5	66.0	281	25.2	2186
PG Bank	17.5	66.1	271	25.4	1743
PG Prairie	20.3	66.8	275	23.5	2063
Pizzazz	17.6	66.0	299	24.2	1832
Pro 173-7406	18.9	64.4	241	22.8	1625
PS16NZ0003	20.6	66.6	284	22.7	2027
PS17100008	17.4	65.1	240	22.5	1663
Mean	19.1	65.8	256	23.3	1888
P-Value	0.4	<0.001	<0.001	<0.001	0.007
LSD (0.05)	NS	0.5	12	0.7	274
CV (%)	14.4	0.6	3.3	2.2	10.3

Location: Richland, MT
Previous crop: Spring Wheat
Planted: 5-1-2025
Harvested: 8-6-2025
Applied fertilizers in lb/a: None
Soil type: Farnuf Loam
Rainfall: 6.5 inches
DAP[1] = Days after planting
Yield adjusted to 13% moisture content
Protein presented on a dry matter basis
Herbicide: Fall-Valor, Preplant-RoundUp & Sharpen

Irrigated Green Dry Pea Variety Evaluation - MSU **Sidney, MT 2025**

Variety	Days to Flower	Plant Height	Test Weight	1000 Seed Weight	Protein	Adjusted Grain Yield
	(DAP)[1]	(in)	(lb/bu)	(g)	(%)	(lb/a)
Aragorn	60					
Hampton	64					
PG Greenback	66	26.6	64.5	215	23.5	4183
Mean	63		LSD (0.05)	0.5		
P-Value	<0.001		CV (%)	0.5		

Note: Cultivars Aragorn and Hampton lodged and were lost to pigeons prior to harvest.

Irrigated Yellow Dry Pea Variety Evaluation - MSU **Sidney, MT 2025**

Variety	Days to Flower	Plant Height	Test Weight	1000 Seed Weight	Protein	Adjusted Grain Yield
	(DAP)[1]	(in)	(lb/bu)	(g)	(%)	(lb/a)
21162	66	25.7	64.6	223	27.4	3807
21163	67	24.1	64.0	202	27.0	3946
AAC Beyond	66	24.9	65.5	199	26.1	3872
AAC Carver	64	24.8	64.8	225	22.4	4258
AAC Profit	66	25.1	64.0	217	25.0	4069
CDC Inca	66	27.5	65.3	221	24.8	4202
CDC Meadow	63	23.1	65.5	195	22.8	3708
CP5222Y	60	21.0	64.8	256	25.7	3857
DS-Admiral	62	23.3	63.1	226	23.3	3751
MS GrowPro	63	22.3	64.6	294	27.2	3921
MS ProStar	65	24.4	64.8	222	25.1	4144
ND Dawn	62	25.7	64.9	240	24.0	4235
Orchestra	61	22.9	64.6	264	26.6	3817
PG Bank	65	26.4	64.8	244	25.2	3967
PG Cash	64	23.9	65.5	247	26.6	4032
PG Prairie	63	23.0	65.1	239	24.4	3841
PS16NZ0003	65	20.9	65.4	264	26.7	4131
Mean	64	24.1	64.8	234	25.3	3974
P-Value	<0.001	0.006	<0.001	<0.001	<0.001	0.06
LSD (0.05)	0.6	3.1	0.9	10	0.8	NS
CV (%)	0.7	9.3	1.0	3.0	2.2	6.6

Location: EARC; Sidney, MT
Previous crop: Spring Wheat
Planted: 4-16-2025
Harvested: 7-25-2025
Applied fertilizers in lb/a: None
Soil type: Savage Silty Clay Loam
Rainfall: 8.4 inches
Irrigation: 3.1 inches
Yield adjusted to 13% moisture content
DAP[1] = Days after planting
Protein presented on a dry matter basis
Herbicide: Panther at 2 oz/a on 10-14-24; Varisto at 20 oz/a and Section III @ 5 oz/a on 5-31-25

WREC Dry Bean Variety Trial - Irrigated **Nesson Valley, ND 2025**

Variety	Type	100 Kernel weight (g)	Test Weight (lb/bu)	Yield (lb/a)
Black Tails	Black	15.0	66.5	2451.5
Eclipse	Black	15.7	65.9	2526.0
ND Galaxy	Black	15.2	65.1	2488.5
ND Twighlight	Black	16.6	66.9	2454.6
Eiger	Great Northern	21.9	64.7	2542.9
ND Pegasus	Great Northern	26.0	64.5	2786.1
Blizzard	Navy	14.4	64.9	2003.4
HMS Metalist	Navy	13.2	66.5	2037.3
ND Polar	Navy	12.9	65.5	1971.3
T9905	Navy	15.0	66.7	2587.7
Coral	Pink	26.5	64.4	2648.7
Magnolia	Pink	32.4	65.8	2543.5
ND Rosaland	Pink	24.3	65.9	2537.5
Cowboy	Pinto	26.6	64.7	2748.6
LA PEZ	Pinto	23.4	64.6	2850.1
Monterrey	Pinto	24.9	65.9	2596.2
ND Falcon	Pinto	25.4	60.6	1934.4
Torreon	Pinto	28.4	65.1	2533.5
Windbreaker	Pinto	30.8	62.9	2463.0
Gleam	SD Pinto	25.6	66.0	3013.7
ND 181664	SD Pinto	27.5	60.4	2613.3
ND palomino	SD Pinto	27.0	60.7	2159.7
ND Rodeo	SD Pinto	30.6	65.4	2931.9
ND200832	SD Pinto	25.1	63.8	2331.7
Vibrant	SD Pinto	24.7	62.6	2634.1
WMM-750	SD Pinto	23.1	63.2	2955.3
NOF 151006-2	Small Red	28.2	65.6	2558.4
Viper	Small Red	19.3	64.5	2882.8
WMM-556	Small Red	25.4	65.8	2815.6
Mean		22.9	64.7	2538.0
CV %		5.6	1.0	13.3
LSD 5%		1.8	0.9	473.6
LSD 10%		1.5	0.8	396.1

Location: Ray, ND; Latitude: 48.16594°N; Longitude: 103.10173°W Altitude: 1899 ft.

Planted: 6/3/2025 Previous Crop: Spring Wheat

Harvested: 10/22/2025 Soil Type: Lihen Loamy Fine Sand

Irrigated Dry Bean Variety Evaluation - MSU **Sidney, MT 2025**

Variety	Type	Days to Flower (DAP)[1]	Days to Maturity (DAP)[1]	Plant Height (in)	Adjusted Grain Yield (lb/a)
Adzuki (Common)	Adzuki	64	105	17.1	857
MT-AZ01	Adzuki	63	105	15.5	677
PI 656664 02 SD	Adzuki	63	105	12.3	438
PI 656670 02 SD	Adzuki	63	105	14.8	477
MT-MU01	Mung	65	112		1104
Cowboy	Pinto	49	99	24.2	3973
Othello	Pinto	43	100	22.5	3517
USDA Rattler	Pinto	51	105	27.0	4251
Viper	Red	50	103	26.1	3898
Mean		57	104	19.9	2132
P-Value		<0.001	<0.001	<0.001	<0.001
LSD (0.05)		1.2	0.5	4.2	402
CV (%)		1.4	0.3	14.6	13.0

Location: EARC; Sidney, MT
Previous crop: Spring Wheat
Planted: 5-27-2025
Applied fertilizers: None
Harvested: 9-9, 9-11, 9-12 and 9-26-25
Soil type: Savage Silty Clay Loam
Rainfall (Planting to Harvest): 6.3 inches
Irrigation: 2.6 inches
Yield adjusted to 13% moisture content
DAP[1] = Days after planting
Herbicide: Panther at 2 oz/a on 10-14-24; Cornerstone at 24 oz/a on 5-28-25

Dryland Lentil Variety Evaluation - MSU **Richland, MT 2025**

Variety	Plant Height (in)	Test Weight (lb/bu)	1000 Seed Weight (g)	Adjusted Grain Yield (lb/a)
Avondale	15.3	62.5	57.3	1862
CDC 6964-4	14.8	64.2	40.1	2049
CDC 7731-9Y	15.3	62.0	80.0	2092
CDC Greenstar	16.1	61.2	76.6	2115
CDC Impala CL	13.6	66.0	34.7	2222
CDC Maxim CL	14.7	64.6	44.1	2024
CDC Richlea	15.6	62.5	58.9	2064
CDC Viceroy	15.6	65.7	38.3	2150
LC14600088R	14.5	62.4	66.0	2175
MS-LSR-1	15.9	63.9	54.6	2322
MS-LXSR-2	14.5	65.2	43.8	2113
Mean	15.1	63.6	54.0	2108
P-Value	0.08	<0.001	<0.001	0.6
LSD (0.05)	NS	0.4	1.9	NS
CV (%)	8.0	0.4	2.5	12.0

Location: Richland, MT — Previous crop: Spring Wheat
Planted: 5-1-2025 — Harvested: 8-22-2025
Applied fertilizers in lb/a: None — Soil type: Farnuf Loam
Yield adjusted to 13% moisture content — Rainfall: 8.1 inches
Herbicide: Fall-Valor, Preplant-RoundUp & Sharpen

Irrigated Lentil Variety Evaluation - MSU **Sidney, MT 2025**

Variety	Days to Flower (DAP)[1]	Plant Height (in)	Test Weight (lb/bu)	1000 Seed Weight (g)	Adjusted Grain Yield (lb/a)
Avondale	65	12.4	60.8	53.3	1544
CDC 6964-4	67	14.0	62.7	38.0	2952
CDC 7731-9Y	66	10.1	59.1	79.8	2956
CDC Greenstar	67	11.0	58.3	74.8	2584
CDC Impala CL	68	11.6	64.1	32.8	1569
CDC Maxim CL	64	14.2	62.8	44.0	3069
CDC Richlea	66	11.4	59.6	57.5	2907
CDC Viceroy	68	13.3	63.4	35.5	2387
MS-LSR-1	65	15.4	62.4	54.3	3539
MS-LXSR-2	68	13.6	62.4	43.0	2993
Mean	66	12.7	61.6	51.3	2650
P-Value	<0.001	<0.001	<0.001	<0.001	<0.001
LSD (0.05)	0.6	2.2	0.8	1.8	809
CV (%)	0.6	11.8	0.9	2.5	21.1

Location: EARC; Sidney, MT — Previous crop: Spring Wheat
Planted: 4-15-2025 — Harvested: 8-7-2025
Applied fertilizers in lb/a: None — Soil type: Savage Silty Clay Loam
Rainfall: 10.8 inches — Irrigation: 2.0 inches
Yield adjusted to 13% moisture content — DAP[1] = Days after planting
Herbicide:Outlook at 18 oz/a on 4-16-2025

Note: Pigeon damage was extensive in this trial with cultivars Avondale and CDC Impala sustaining the most damage.

Dryland Chickpea Variety Evaluation - MSU **Richland, MT 2025**

Variety	Plant Height	Test Weight	Seed sizes greater than 22/64 inches	Adjusted Grain Yield
	(in)	(lb/bu)	(%)	(lb/a)
CDC 3789-7	16.4	62.5	72.1	1810
CDC Anna	16.6	63.4	0.0	2462
CDC Frontier	15.6	63.6	30.1	2312
CDC Leader	15.6	62.9	39.7	1935
CDC Orion	14.7	61.8	53.5	1733
CDC Palmer	13.5	61.9	64.2	1828
MT Bridger	15.6	63.8	48.1	2165
Myles	15.7	61.1	0.0	2240
Nash	16.1	61.4	67.5	807
ND Crown	15.6	63.8	54.4	1955
New Hope	19.0	63.4	36.0	1335
Royal	17.3	59.5	56.8	563
Sawyer	15.8	62.6	43.7	1070
Sierra	16.7	62.0	71.2	1063
Mean	16.0	62.4	45.5	1663
P-Value	<0.001	0.004	<0.001	<0.001
LSD (0.05)	1.7	2.1	10.7	493
CV (%)	7.6	2.3	16.4	20.8

Location: Richland, MT
Previous crop: Spring Wheat
Planted: 5-2-2025
Harvested: 9-18-2025
Applied fertilizers in lb/a: None
Soil type: Farnuf Loam
Yield adjusted to 13% moisture content
Rainfall: 8.2 inches

Note: Damage from Ascochyta was evident throughout the trial especially for cultivars Nash, Royal, Sawyer and Sierra.

Irrigated Chickpea Variety Evaluation - MSU **Sidney, MT 2025**

Variety	Days to Flower	Plant Height	Test Weight	Seed size greater than 22/64 inches	Adjusted Grain Yield
	(DAP)[1]	(in)	(lb/bu)	(%)	(lb/a)
CDC Anna	62	19.0	62.9	0.0	4366
CDC Frontier	65	17.6	61.8	63.9	4812
CDC Leader	66	16.3	61.6	70.4	4411
CDC Orion	61	18.1	61.4	88.0	4737
CDC Palmer	63	17.2	61.8	87.1	4365
MT Bridger	64	19.5	63.4	72.0	4938
Myles	62	16.6	60.2	0.0	3710
Nash	66	18.8	60.4	96.3	3505
ND Crown	64	21.3	62.7	80.4	4357
New Hope	65	22.0	62.3	67.9	3648
Royal	67	19.3	61.6	93.3	3523
Sawyer	63	17.1	61.6	78.3	4016
Sierra	65	18.0	60.0	94.1	3295
Mean	64	18.5	61.7	68.6	4129
P-Value	<0.001	<0.001	<0.001	<0.001	<0.001
LSD (0.05)	1.3	1.9	0.6	7.3	736
CV (%)	1.4	7.3	0.7	7.5	12.5

Location: EARC; Sidney, MT
Previous crop: Spring Wheat
Planted: 4-16-2025
Harvested: 8-27-2025
Applied fertilizers in lb/a: None
Soil type: Savage Silty Clay Loam
Rainfall: 10.9 inches
Irrigation: 3.1 inches

DAP[1] = Days after planting
Yield adjusted to 13% moisture content

Herbicide: Panther at 2 oz/a on 10-14-24;
Section III at 8 oz/a on 5-31;
Tough at 24 oz/a on 6-10

Fungicide: Miravis Top at 14 oz/a on 6-17 and 7-13; Proline at 5.7 oz/a & BravoWeatherstik at 2 pt/a on 6-29 and 7-27

2024-2025 Northeast Montana Alfalfa Variety Dryland Trials Comparing Conventional and Roundup Ready Technologies

Wendy Becker[1], Dr. Hayes Goosey[2], Felixe Becker[3]

Alfalfa has been an important forage crop in Montana for over a century. It was brought to the Yellowstone Valley area in 1889 by Spanish missionaries, and its importance was quickly recognized by becoming the foundation of the first seed association in Montana. It has excellent protein and energy qualities that make it an attractive forage crop to grow and for animals to use in their diet. It is widely adapted to Montana's variable climate in Montana making it an excellent production choice.

For many years there were trials that grew alfalfa alongside the MSU Foundation Seed, however, the costs of keeping up with variety trials has proven expensive with little return. Industry advances and the advent of roundup ready technology pushed trials to private industry with no new trials at MSU since 2004. Since alfalfa is a perennial crop, many ranchers only look for information about new varieties when they are planning to seed a new crop or renovate an old stand. The technology has changed three -fold or more since they last researched information, in addition, not all businesses that sell seed, have immediate access to varieties at all times. This has led to many questions on "what kind" of seed a rancher needs to purchase to local extension offices.

In 2023, a field variety trial was conducted at the Froid Research Site using seeds available locally, MSU Foundation seed (Cooper and Shaw), and the standard Ladak alfalfa seed. The region was in a drought status for most of the timeframe. Rainfall in 2023 was 15.55 in. and was not evenly dispersed in the summer months, 2024 was 11.37 in. and rainfall was mostly in June, 2025 rainfall was 19.52 in. but the largest amount fell in July.

Seed was obtained through five sources. The research site was prepared by applying two label rates of foliar glyphosate on June 1st 2022 and May 20th 2023, prior to seeding on June 8th 2023. Plot sizes were flagged in a 10 x 5 ft. randomized complete block design with three replicates and 2 ft. borders around each plot. Alfalfa was inoculated and seeded at 5 lbs. PLS/acre rate, then broadcast and harrowed in with a hand rake. Year one-1st cutting was taken on June 28, 2024, clipped in a one-square ft. frame. Year two-2nd cutting was taken after the first plant killing frost on Oct. 18th, 2024, and sent to the MSU lab for analysis. Year 2-1st cutting was obtained on June 20, 2025, and Year 2-2nd cutting on Oct 8, 2025, after the first plant killing frost.

MSU Forage Lab tested each forage sample for quality using a FOSS NIRS DS2500 forage analyzer. Data were analyzed to determine varietal differences using the PROC GLIMMIX procedures of SAS (v. 9.4) with replicate as the random variable.

Depending on end goal of a new or renovated alfalfa seeding, it has been determined there are available choices right in our area. Forage buyers and sellers may be searching for varieties that will be greater in yield, protein, energy, or nutrient quality measurements. It's always important to get a hay sample to check for quality as well as nitrates. Factors affecting the northeast Montana area over the last few years have been drought and grasshopper pressure. This cultivar trial will continue to be collected with a 3rd year data set.

2024 1st Year 1st Cutting Alfalfa																				
	Yield (g)		DM		CP		NDF		TDN		ADF		CA		K		P		Tons/acre	
DG4210	39.69	b	89.98	a	22.29	a	29.16	c	71.47	ab	22.37	bc	1.71	ab	2.08	a	0.31	a	1.91	b
ALFAFOUR RANCHER	100.17	a	89.73	b	20.68	b	32.62	ab	69.8	bc	24.52	ab	1.74	a	1.98	a	0.3	ab	4.81	a
COOPER	71.82	ab	89.97	a	21.14	ab	31.21	bc	70.86	ab	23.16	bc	1.69	ab	2.08	a	0.3	ab	3.45	ab
DG417RR	38.75	b	89.91	ab	21.66	ab	29.55	bc	71.89	a	21.84	c	1.75	a	2.07	a	0.21	a	1.86	b
SHAW	62.37	b	89.87	ab	22.21	ab	30.66	bc	70.99	ab	22.99	bc	1.7	ab	2.17	a	0.21	a	2.99	b
GRAZE-N-HAY 3.10RR	59.54	b	89.83	ab	21.91	ab	29.79	bc	71.37	ab	22.51	bc	1.75	a	2.12	a	0.21	a	2.86	b
LADAK	51.98	b	90.02	a	20.86	ab	34.55	ab	68.36	c	26.37	a	1.57	b	2.15	a	0.29	b	2.50	b
Mean	**60.62**		**89.90**		**21.54**		**31.08**		**70.68**		**23.39**		**1.70**		**2.09**		**0.26**		**2.91**	
p=Value <0.05																				

2024 1st Year 2nd Cutting Alfalfa																				
	Yield (g)			DM	CP		NDF		TDN		ADF		CA		K		P		Tons/acre	
DG4210	11.67	ab	91.72	ab	19.10	ab	39.15	ab	67.03	a	28.08	a	1.64	a	1.44	a	0.22	a	0.56	ab
ALFAFOUR RANCHER	17.67	a	91.33	b	19.79	a	35.98	ab	69.06	a	25.46	a	1.85	a	1.30	a	0.22	a	0.85	a
COOPER	16.33	ab	91.81	a	18.79	ab	39.85	ab	66.70	a	28.49	a	1.74	a	1.51	a	0.23	a	0.78	ab
DG417RR	16.00	ab	91.77	ab	19.13	ab	40.76	ab	66.26	a	29.06	a	1.69	a	1.62	a	0.22	a	0.77	ab
SHAW	6.33	b	91.47	ab	19.98	a	34.42	b	69.31	a	25.14	a	1.87	a	1.36	a	0.22	a	0.30	b
GRAZE-N-HAY 3.10RR	9.33	ab	91.59	ab	19.28	ab	36.86	ab	68.80	a	25.80	a	1.76	a	1.47	a	0.22	a	0.45	ab
LADAK	13.00	ab	91.74	ab	17.24	b	41.95	a	65.38	a	30.19	a	1.69	a	1.50	a	0.19	a	0.62	ab
Mean	**12.90**		**91.63**		**19.04**		**38.42**		**67.51**		**27.46**		**1.75**		**1.46**		**0.22**		**0.62**	
p=Value <0.05																				

2025 2nd Year 1st Cutting Alfalfa																				
	Yield (g)		DM		CP		NDF		TDN		ADF		CA		K		P		Tons/acre	
DG4210	32.00	abc	89.05	a	21.67	a	34.53	a	67.78	a	27.11	a	1.76	a	1.82	a	0.31	a	1.54	abc
ALFAFOUR RANCHER	47.67	a	88.93	a	22.37	a	34.80	a	67.48	a	27.50	a	1.84	a	1.85	a	0.34	a	2.29	a
COOPER	37.00	abc	89.07	a	21.61	a	35.08	a	67.59	a	27.36	a	1.82	a	1.66	ab	0.31	a	1.78	abc
DG417RR	21.00	c	88.92	a	22.73	a	34.63	a	68.11	a	26.69	a	1.78	a	1.80	a	0.33	a	1.01	c
SHAW	31.33	bc	89.38	a	22.08	a	37.28	a	65.79	a	29.67	a	1.68	a	1.92	a	0.33	a	1.50	bc
GRAZE-N-HAY 3.10RR	27.00	bc	88.92	a	21.73	a	34.75	a	66.70	a	28.50	a	1.89	a	1.51	b	0.32	a	1.30	bc
LADAK	39.33	ab	89.08	a	21.93	a	34.04	a	68.25	a	36.51	a	1.93	a	1.75	ab	0.31	a	1.89	ab
Mean	**33.62**		**89.05**		**22.02**		**35.02**		**67.39**		**29.05**		**1.81**		**1.76**		**0.32**		**1.61**	
p=Value <0.05																				

2025 2nd Year 2nd Cutting Alfalfa																				
	Yield (g)		DM		CP		NDF		TDN		ADF		CA		K		P		Tons/acre	
DG4210	27.6	b	90.87	a	14.72	a	50.04	a	57.91	a	39.79	a	1.2	a	1.45	a	0.13	a	1.33	b
ALFAFOUR RANCHER	103.83	a	90.84	a	14.75	a	50.21	a	58.53	a	38.98	a	1.13	a	1.55	a	0.15	a	4.99	a
COOPER	38.11	b	91	a	13.71	a	50.75	a	57.58	a	40.21	a	1.08	a	1.44	a	0.11	a	1.83	b
DG417RR	28.59	b	91.16	a	13.48	a	53.14	a	55.25	a	43.2	a	1	a	1.68	a	0.11	a	1.37	b
SHAW	33.19	b	91.02	a	13.73	a	51.3	a	57.01	a	40.93	a	1.12	a	1.65	a	0.12	a	1.59	b
GRAZE-N-HAY 3.10RR	40.08	b	91.13	a	13.76	a	52.23	a	56.56	a	41.52	a	1.08	a	1.46	a	0.13	a	1.92	b
LADAK	64.07	ab	90.88	a	14.04	a	48.93	a	58.98	a	38.41	a	1.16	a	1.79	a	0.15	a	3.08	ab
Mean	**47.92**		**90.99**		**14.03**		**50.94**		**57.40**		**40.43**		**1.11**		**1.57**		**0.13**		**2.30**	
p=Value <0.05																				

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Canola Seeding Rate Evaluation Under Dryland and Irrigated Conditions at Nesson Valley, ND

Gautam Prasad Pradhan, Tyler Tjelde, Kuldipkumar Gevariya
NDSU Williston Research Extension Center

Background

Canola is an important oilseed crop in northwestern North Dakota, where both dryland and irrigated production systems contribute to regional yield stability and profitability. Despite its adaptability, canola stand establishment is highly sensitive to seeding rate, particularly under variable moisture conditions common in the Northern Great Plains. Suboptimal seeding rates can result in poor emergence, reduced stand uniformity, and lower yield potential, whereas excessively high rates may increase seed costs without providing agronomic benefits.

Previous seeding rate research in the northern Great Plains and Canadian Prairies has shown mixed responses, with some studies reporting yield advantages from higher plant densities while others show little to no benefit once a minimum stand is achieved. However, relatively few studies have evaluated canola seeding rate performance in western North Dakota, particularly under side-by-side dryland and irrigated conditions. Growers and crop advisers frequently request region-specific guidance that balances seed cost with yield potential under the distinct management systems of the region.

To address this knowledge gap, a canola seeding rate experiment was conducted under both rainfed and irrigated conditions at the Nesson Valley Irrigation Research Site of the Williston Research Extension Center (WREC). The study evaluated a range of seeding rates under both dryland and irrigated conditions to determine whether increasing plant population improves crop development, oil content, or yield. The results provide updated, locally relevant information to support seeding rate recommendations for canola growers in the region.

Objectives

The specific objectives of this study were to:

1. Evaluate the effects of six seeding rates (6, 8, 10, 12, 14, and 16 PLS ft^{-2}) on canola growth, development, seed quality, and yield under rainfed and irrigated conditions.
2. Determine whether optimal seeding rate recommendations differ between dryland and irrigated management in western North Dakota.
3. Provide regionally relevant guidance to growers and extension personnel on economically and agronomically appropriate canola seeding rates for contrasting moisture environments.

Materials and Methods

Field studies were conducted during the 2025 growing season at the Nesson Valley Irrigation Research Site of the Williston Research Extension Center (WREC), located near Ray, North Dakota. The site is characterized by Lihen Loamy Fine Sand soils typical of the Missouri River terrace system and a semiarid climate with highly variable seasonal precipitation. The irrigated trial used a fully automated linear irrigation system; the rainfed trial received no supplemental irrigation.

Two independent experiments were established: (a) Dryland (Latitude: 48.1617824°N; Longitude: 103.1073663°W) and (b) Irrigated (Latitude: 48.16598°N; Longitude: 103.10294°W). Both experiments

were conducted under randomized complete block design with four replications. Six seeding rates were evaluated: 6, 8, 10, 12, 14, and 16 pure live seeds (PLS) / sq. ft. A TruFlex™ commercial spring canola hybrid, DG 781 TCM was direct-seeded using a six rows small-plot drill with row-to-row distance of 7". Weed, disease, and insect management followed standard WREC practices to minimize non-treatment stress. Plots were harvested using a small plot combine.

The following measurements were recorded: Plant height (in.) at physiological maturity, Days to flowering (d) from emergence to 10% bloom, Seed oil concentration (%) via NMR, Test weight (lb bu^{-1}), and Grain yield, expressed as lb a^{-1}. Data from the rainfed and irrigated experiments were analyzed independently due to differences in moisture environment and experimental error structures. Analysis of variance (ANOVA) was conducted using SAS PROC MIXED procedure considering seeding rate as a fixed effect and replication as a random effect. Treatment means were compared using the F-test at $\alpha = 0.05$. Because the experiments were not combined statistically, results are presented separately for each environment.

Results

Rainfed conditions (2025)

Seeding rate had no significant effects on any measured canola agronomic traits under rainfed management (Table 1). Plant height ranged narrowly from 40.5 to 42.7 in, and days to flowering varied only slightly among treatments (46.0–47.5 d). Grain oil concentration was consistent across seeding rates (41.2–42.3%, P = 0.4), and test weight remained stable at approximately 50.3–51.0 lb bu^{-1}. Grain yield showed numerical variation (1613–2037 lb a^{-1}), but differences were not statistically significant (P = 0.3). Overall, treatment means were highly similar, indicating that increasing seeding rate did not improve stand development, oil content, or yield under rainfed conditions during 2025.

Table 1. Effects of seeding rate on canola agronomic traits under rainfed conditions, 2025.

Seeding Rate (PLS/sq. ft.)	Plant Height (in)	Days to Flowering (d)	Grain Oil (%)	Test Weight (lb/a)	Grain Yield (lb/bu)
6	40.6	47.0	41.3	50.5	1683.1
8	40.5	47.0	41.2	50.5	1623.6
10	42.7	47.5	41.9	50.3	1932.2
12	42.4	47.0	42.3	51.0	1613.4
14	40.6	47.0	41.6	50.6	1879.4
16	42.4	46.0	41.6	50.6	2036.6
Mean	41.5	46.9	41.6	50.6	1794.7
P-Value	0.8	0.2	0.4	0.7	0.3

Irrigated conditions (2025)

Likewise, seeding rate had no significant influence on canola growth, phenology, or yield under irrigation (Table 2). Plant height ranged from 35.6 to 38.8 in, and days to flowering showed minimal variation (47.0–48.3 d, P = 0.5). Grain oil concentration was consistent across treatments (44.2–45.0%, P = 1.0). Grain yield varied numerically from 2039 to 2381 lb a^{-1}, but the differences were not statistically significant (P = 1.0). Test weight also remained uniform across seeding rates (48.6–48.9 lb bu^{-1}, P = 0.6). These results indicate that, under irrigation, increasing seeding rate provided no measurable agronomic or yield advantage.

Summary

Across both environments, canola performance was **insensitive to seeding rate**, with no significant treatment effects detected for plant height, flowering time, oil concentration, test weight, or yield. Because the rainfed and irrigated trials were conducted independently, results are presented separately, but the conclusions were consistent: **higher seeding rates did not improve canola productivity in 2025**.

Table 2. Effects of seeding rate on canola agronomic traits under irrigated conditions, 2025.

Seeding Rate (PLS/sq. ft.)	Plant Height (in)	Days to Flowering (d)	Grain Oil (%)	Test Weight (lb/a)	Grain Yield (lb/bu)
6	37.6	48.0	44.9	48.9	2377.2
8	35.6	48.3	44.4	48.8	2176.4
10	37.5	47.8	45.0	48.9	2161.0
12	36.2	47.3	44.2	48.6	2039.3
14	38.8	47.0	45.0	48.7	2330.4
16	36.6	47.3	45.0	48.9	2380.5
Mean	37.1	47.6	44.7	48.8	2244.1
P-Value	0.8	0.5	1.0	1.0	0.6

Canola Variety Evaluation & Seeding Rate Trials (Left). Flax Uniform Regional Trial (Right)
Nesson, Ray, ND (Aerial Image: Gautam Pradhan, July 18, 2025)

Evaluation of Grain Sorghum Lines Under Dryland and Irrigated Conditions in Northwestern North Dakota, 2025

Gautam Prasad Pradhan, Tyler Tjelde, Kuldipkumar Gevariya
NDSU Williston Research Extension Center

Background

Northwestern North Dakota is traditionally characterized by short growing seasons, cool temperatures, and limited rainfall, which together make crop diversification challenging. Grain sorghum, a highly drought-tolerant crop, has potential as an alternative for semiarid production systems in this region. This trial was initiated in response to a request from a producer and member of our Joint Advisory Board Committee, who expressed interest in evaluating sorghum as a possible option to help diversify local agricultural systems.

Objectives

The main objective of this trial was to determine the potential for growing grain sorghum under semiarid, cool conditions with limited rainfall and a short growing period.

Materials and Methods

A total of 360 sorghum lines from the Sorghum Association Panel (Table 1), sourced globally and obtained through the USDA National Plant Germplasm System – GRIN-Global, were evaluated under both dryland and irrigated conditions. The trial was conducted as a non-replicated single-row experiment using an Augmented Block Design, with 408 plots in each environment. One commercial grain sorghum variety and one sorghum sudan grass variety were included as controls. Three plants per plot were hand-harvested to record phenology, grain yield, and yield components.

Preliminary Observations:

The sorghum lines showed wide variation in growth and development, reflecting their diverse geographic origins. Grain yield and other yield components are currently under analysis, but early observations indicate that several lines completed their growth cycle successfully under both dryland and irrigated conditions.

Significance for Producers:

This trial provides valuable information on sorghum adaptability in northwestern North Dakota. Results will help producers evaluate whether sorghum could be a viable option for diversifying cropping systems under semiarid conditions.

Table 1: List of sorghum germplasm evaluated (Scan QR code or visit the link to view full table).

List of Sorghum Germplasm and Planting Layout 2025.xlsx

Sorghum Germplasm in Different Growth Stages
(Aerial Image: Gautam Pradhan, August 21, 2025)

2025 Resistance of Barley Varieties to Fusarium Head Blight — Sidney, MT

Frankie Crutcher, Jamie Sherman, Caitlin Gross, Marie Dorval, Myra Rudolph, Amlan Arman

OBJECTIVE: Test the resistance of different Barley varieties to Fusarium head blight caused by *F. graminearum*.

MATERIALS AND METHODS:

Irrigated	Previous Crops: Soybean
Variety: Misc.	Residual Soil N to 3 ft: NTot 19.7 lbs/A
Location: Sidney, MT	Residual Soil P to 6 in: 16 ppm
Planted: May 7	Applied Fertilizer: 70-26-0 190 lbs/A
Harvested: Sep 5	Irrigated (sprinkler) on: May 14 - Jun 27 (2.92 in total)
Plot Size: 2.5’ x 10’	Herbicide Applications: 2-4,D,PanoFlex, Wolverine Advanced, Axial Bold
Seeding Rate: 90 lbs/A	Precipitation April – September: 11.4 in
Soil Type: Savage silty clay loam	Disease assessment: July 18 - July 28

COMMENTS:

Corn spawn inoculated with six isolates of *F. graminearum* was applied to the field May 28. Misting to increase humidity was applied from Jun 19 – Jul 21.

RESULTS:

Table 1: Barley Variety Reponses to Fusarium Head Blight

Variety	Severity (%)	Incidence (%)	Index	Yield (lbs/A)
2017-40-10	2.6 b-d	33.3 a-e	0.9 b-d	3481.4 a-i
2017-40-17	2.1 b-d	33.3 a-e	0.7 cd	3751.8 a-f
2017-41-16	0.9 cd	16.7 c-e	0.2 d	3052.5 a-j
2017-41-6	1.9 b-d	21.1 b-e	0.6 d	3098.2 a-j
2017-42-18	2.1 b-d	34.4 a-e	0.7 cd	4188.6 a-d
2017-42-2	1.6 cd	23.3 b-e	0.4 d	3252.1 a-j
2017-42-3	1.5 cd	21.1 b-e	0.6 d	4138.4 a-d
2017-43-18	1.3 cd	22.2 b-e	0.3 d	3386.2 a-i
2017-43-19	3.6 b-d	46.7 a-e	1.7 b-d	3574.2 a-i
2017-43-20	2.9 b-d	41.1 a-e	1.4 b-d	2993.2 a-j
2017-43-22	1.2 cd	18.9 c-e	0.2 d	3723.9 a-f
2017-44-18	1.6 cd	27.8 a-e	0.5 d	4199.4 a-d
2017-44-23	1.2 cd	18.9 c-e	0.2 d	3807.9 a-f
2017-46-10	1.0 cd	20.0 b-d	0.25 cd	3883.9 a-h
2017-46-19	1.4 cd	23.3 b-e	0.3 d	3162.8 a-j
2017-47-6	0.6 d	11.1 e	0.1 d	4720.3 a
2017-69-13	1.2 cd	20.0 b-e	0.3 d	3784.4 a-f
2019-23-22	1.1 cd	21.1 b-e	0.4 d	2819.5 b-j
2019-27-46	1.6 cd	22.2 b-e	0.5 d	3866.3 a-f
2021-45-11	2.5 b-d	35.6 a-e	1.0 b-d	3319.8 a-i
2021-45-7	2.7 b-d	43.3 a-e	1.2 b-d	3701.9 a-f
Bearpaw	4.0 b-d	40 a-d	2.2 b-d	3976.5 a-h
Chevron	2.3 b-d	32.2 a-e	0.8 cd	2387.3 e-j
Conlon	0.9 cd	17.8 c-e	0.2 d	3914.3 a-f
Hockett	2.4 b-d	31.1 a-e	0.9 b-d	3242.9 a-j
MT Boy Howdy	3.8 b-d	47.8 a-e	1.8 b-d	3904.8 a-f
MT17M01908	1.4 cd	20.0 b-e	0.3 d	3612.2 a-g
MT18F00607	5.0 b-d	53.3 a-e	2.7 b-d	3180.9 a-j
MT19_H011_13	6.8 bc	67.8 a	4.7 bc	2842.3 b-j

MT19_M034_16	3.6 b-d	44.4 a-e	1.9 b-d	4320.2 a-c
MT19_M061_19	2.9 b-d	40.0 a-e	1.2 b-d	3808.6 a-f
MT19_M064_04	3.0 b-d	36.7 a-e	1.3 b-d	3752.1 a-f
MT19_M080_13	1.6 cd	25.6 a-e	0.5 d	4010.9 a-e
MT20_H092_03	5.6 b-d	56.7 a-d	3.4 b-d	2923.6 b-j
MT20_H092_13	4.9 b-d	50.0 a-e	2.5 b-d	2793.0 b-j
MT20_M033_14	4.2 b-d	51.1 a-e	2.2 b-d	4020.1 a-e
MT20_M047_16	2.1 b-d	31.1 a-e	0.6 d	3515.5 a-i
MT20_M120_05	1.3 cd	21.1 b-e	0.4 d	3772.6 a-f
MT21_M089_01	1.8 b-d	28.9 a-e	0.6 d	4304.6 a-c
MT22_Y075_02	2.6 b-d	33.3 a-e	1.1 b-d	3194.7 a-j
MT22_Y075_03	2.3 b-d	36.7 a-e	1.0 b-d	2716.7 b-j
MT22_Y075_09	2.0 b-d	31.1 a-e	0.7 cd	3862.8 a-f
MT22_Y075_14	2.7 b-d	35.6 a-e	1.0 b-d	3590.0 a-h
MT22_Y076_04	2.1 b-d	23.3 b-e	0.7 cd	3070.2 a-j
MT22_Y076_11	3.9 b-d	44.4 a-e	2.1 b-d	3426.2 a-i
MT22_Y079_10	1.6 cd	25.6 a-e	0.4 d	3829.0 a-f
MT22_Y080_09	2.7 b-d	32.2 a-e	0.9 b-d	3273.9 a-i
MT23_006_02	6.2 b-d	54.4 a-d	3.4 b-d	2520.3 d-j
MT23_006_06	20.7 a	46.7 a-e	9.9 a	1524.2 j
MT23_042_03	2.5 b-d	35.6 a-e	1.0 b-d	1926.8 g-j
MT23_042_05	5.6 b-d	53.3 a-e	3.0 b-d	2660.3 c-j
MT23_042_07	2.7 b-d	36.7 a-e	1.1 b-d	1853.1 ij
MT23_042_08	2.2 b-d	27.8 a-e	0.8 cd	1869.5 h-j
MT23_051_01	7.8 b	58.9 a-c	4.8 b	3467.7 a-i
MT23_055_01	6.2 b-d	62.2 ab	3.9 b-d	2968.5 b-j
MT23_055_07	1.4 cd	17.8 c-e	0.3 d	4135.1 a-d
MT23_063_08	3.1 b-d	35.6 a-e	1.2 b-d	2225.1 f-j
MT23_M064_15	3.3 b-d	46.7 a-e	1.5 bd	3779.4 a-f
MT23_M066_18	2.7 b-d	36.7 a-e	1.1 b-d	3727.9 a-f
MT23_M067_02	3.2 b-d	40.0 a-e	1.3 b-d	3397.9 a-i
MT23_M079_04	3.8 b-d	47.8 a-e	1.9 b-d	3199.8 a-j
MT23_M086_03	3.6 b-d	42.2 a-e	1.6 b-d	3627.7 a-g
MT23_M090_10	2.4 b-d	34.4 a-e	0.9 b-d	4139.3 a-d
MT23_M096_03	2.4 b-d	34.4 a-e	1.3 b-d	3575.8 a-i
MT23_M096_04	3.1 b-d	34.4 a-e	1.6 b-d	3783.9 a-f
MT23_M097_06	4.7 b-d	52.2 a-e	2.6 b-d	3290.4 a-i
MT23_M098_05	1.3 cd	21.1 b-e	0.3 d	3942.9 a-f
MT23_M102_24	1.2 cd	21.1 b-e	0.3 d	3814.6 a-f
MT23_M103_04	1.4 cd	22.2 b-e	0.3 d	4140.3 a-d
Pinnacle	5.3 b-d	44.4 a-e	2.6 b-d	2657.0 c-j
Stander	3.4 b-d	37.8 a-e	1.3 b-d	3940.1 a-f
Synergy	1.7 cd	30.0 a-e	0.6 d	4394.5 ab
Mean	3.0	34.5	1.3	3435.9
%CV	98.5	46.0	129.5	21.7
HSD (0.05)	11.8	12.2	4.6	608.1
P-value	<0.0001	<0.0001	<0.0001	<0.0001

Letters in common did not differ significantly according to a Tukey's HSD test at a significance level of 5%.

[a]Pest Severity: Average percent area of head covered by disease. Thirty heads were evaluated for each plot.

[b]Pest Incidence: Percent of thirty plants per plot that had visible FHB symptoms.

[c]Index: Severity X Incidence / 100

[d]Grain yield adjusted to 12.0% moisture.

DON (vomitoxin) Levels in Durum Wheat Across North Dakota Variety Trials (2023 - 2024)

Edson Ncube and Destiney Haug
NDSU Williston Research Extension Center

Background

Scab disease and the mycotoxin vomitoxin (DON) are major grain quality concerns in durum wheat. The episodic nature of infections and variable environmental conditions further complicate scab occurrence and DON accumulation. This study evaluated DON levels in 21 durum varieties (Figures 1 & 2) from variety trials conducted during the 2023 and 2024 growing seasons at nine locations in North Dakota: Carrington, Garrison, Hettinger, Langdon, Minot, Mohall, Nesson, Rugby, and Williston.

Objective

This project monitors DON levels in durum varieties grown at trial sites across North Dakota. It generates grain quality data that support growers in making informed decisions when selecting durum varieties.

Materials and Methods

Grain samples from Variety Trials were milled with a coffee grinder, and DON concentrations were quantified using DON test strips (Neogen Corporation). Results were read on a Lateral Flow Strip Reader, and data analyzed using JMP® version 18.2.2 software program.

Results and Discussion

Results showed a significant Variety × Location × Year interaction ($P < 0.0001$), (Figure 1). However, varietal differences in DON levels were not statistically significant ($P = 0.1084$). Location had a strong influence ($P = 0.0040$), with DON levels notably higher in Rugby and Mohall in 2024, while Langdon remained stable across both years (Figure 2).

These results suggest that inconsistent disease pressure and environmental variability impact DON accumulation. Therefore, continued statewide monitoring of DON is important as DON contamination is a market risk for growers. Furthermore, locations like Rugby and Mohall may require more aggressive scab management strategies such as keeping an eye on the Scab Risk Tool (https://www.wheatscab.psu.edu/) and timely fungicide applications at flowering.

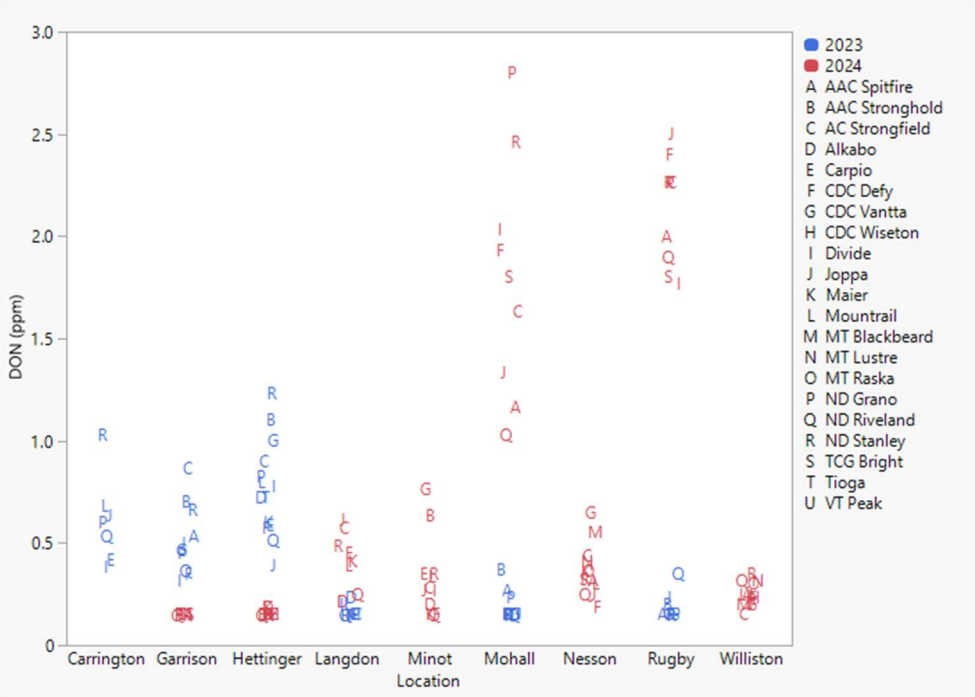


Figure 1. Variety × Location × Year interaction on DON accumulation ($P < 0.0001$)

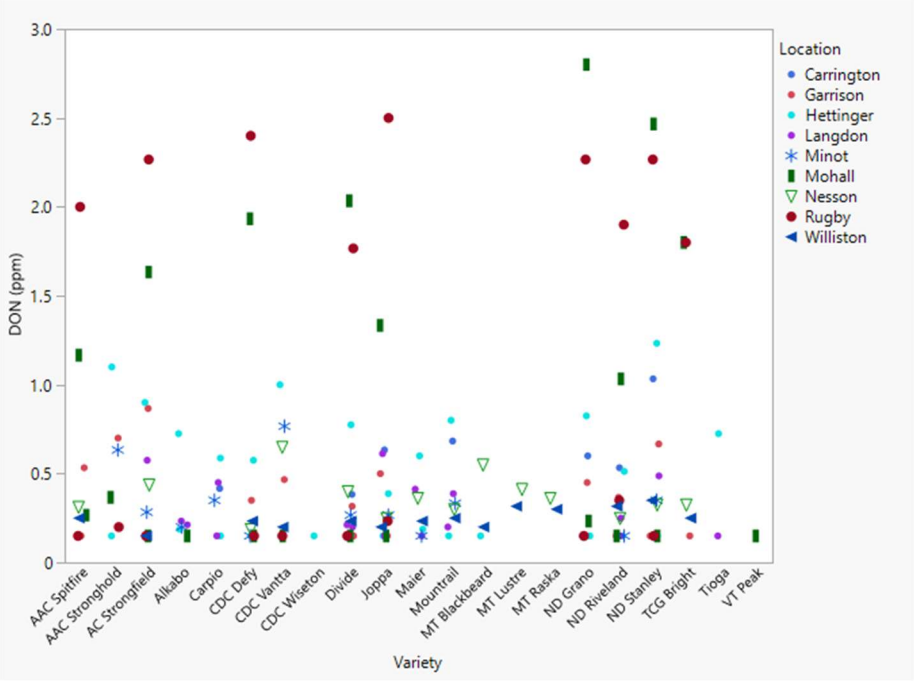


Figure 2. Variety × Location interaction on DON accumulation ($P = 0.0040$)

Acknowledgements

This work was sponsored by the North Dakota Wheat Commission. Special thanks to Agronomists from various NDSU RECs (John Rickertsen, Leandro Bortolon, Bryan Hanson, Kristin Simons, and Justin Jacobs) for providing durum samples.

2025 Resistance of Durum Varieties to Fusarium Head Blight **Sidney, MT**

Frankie Crutcher, Mike Giroux, Caitlin Gross, Marie Dorval, Myra Rudolph, Amlan Arman

OBJECTIVE: Test the resistance of different Durum varieties to Fusarium head blight caused by F. graminearum.

MATERIALS AND METHODS:

Irrigated
Variety: Misc.
Location: Sidney, MT
Planted: May 7
Harvested: Sep 9
Plot Size: 2.5' x 10'
Seeding Rate: 90 lbs/A
Soil Type: Savage silty clay loam

Previous Crops: Soybean
Residual Soil N to 3 ft: NTot 19.7 lbs/A
Residual Soil P to 6 in: 16 ppm
Applied Fertilizer: 70-26-0 190 lbs/A
Irrigated (sprinkler) on: May 14 and Jun 27 (2.92 in total)
Herbicide Applications: 2-4,D,PanoFlex, Wolverine Advanced
Precipitation April – September: 11.4 in
Disease assessment: July

COMMENTS:
Corn spawn inoculated with six isolates of *F. graminearum* was applied to the field May 28. Misting to increase humidity was applied from Jun 19 – Jul 21.

RESULTS:

Table 1: Durum Variety Reponses to Fusarium Head Blight

Variety	Severity (%)[a]	Incidence (%)[b]	Index[c]	Yield (lbs/A)[d]
Alzada	11.5a	65.5a-c	7.6a-d	1130.3d
CDC Defy	5.2ab	60a-c	3.1c-e	2212.3a-d
Divide	6.1ab	72.2a-c	4.4a-e	2504.8a-d
Joppa	7ab	75.5ab	5.3a-e	1777.8a-d
Lustre	9.5ab	74.4ab	7.1a-e	2002.2a-d
Mountrail	10.8a	86.6a	9.5ab	1605.5cd
MT Blackbear	5.3ab	58.8a-c	3.1c-e	1918.8a-d
MT Raska	7.1ab	61.1a-c	4.7a-e	1866.6a-d
MtD22473	6.3ab	63.3a-c	4.1a-e	2387.5a-d
MTD19011	6.5ab	66.6a-c	4.4a-e	1482cd
MTD19241	5.1ab	63.3a-c	3.2c-e	2839.7a-c
MTD22011	7.3ab	80ab	5.8a-e	1733.7a-d
MTD22013	8.3ab	75.5ab	6.3a-e	1363.2d
MTD22016	6.2ab	70a-c	4.4a-e	1687.9a-d
MTD22030	5.5ab	71.1a-c	3.9b-e	2526.5a-d
MTD22045	6.6ab	73.3a-c	4.9a-e	1882.8a-d
MTD22075	6.1ab	67.7a-c	4.1a-e	1694.9a-d
MTD22090	5.8ab	65.5a-c	3.8b-e	2044.2a-d
MTD22175	9.0ab	72.2a-c	6.5a-e	2379a-d
MTD22206	6.8ab	74.4ab	5.1a-e	1461.6cd
MTD22417	3.8b	56.6a-c	2.3c-e	3088.6ab

MTD22419	5.3ab	65.5a-c	3.6b-e	1634.3b-d
MTD22431	3.5b	50bc	1.9de	2922a-c
MTD22447	6.1ab	63.3a-c	3.9b-e	2503.4a-d
MTD22627	5.0ab	48.8bc	2.4c-e	2601.5a-d
MTD22999	8.5ab	53.3a-c	4.5a-e	1593.6cd
MTD23067	9.5ab	87.7a	8.3a-c	1323.6d
MTD23103	11.6a	86.6a	10.2a	1863.8a-d
ND Riveland	3.2b	38.8c	1.2e	3150.2a
ND Stanley	7.3ab	71.1a-c	5.1a-e	1980.6a-d
Mean	6.9	67.3	4.8	2036.8
%CV	39.5	21.2	54.2	32.1
HSD (0.05)	2.1	16.0	1.6	488.3
P-value	<0.0001	<0.0001	<0.0001	<0.0001

Letters in common did not differ significantly according to a Tukey's HSD test at a significance level of 5%.

[a]Pest Severity: Average percent area of head covered by disease. Thirty heads were evaluated for each plot.

[b]Pest Incidence: Percent of thirty plants per plot that had visible FHB symptoms.

[c]Index: Severity X Incidence / 100

[d]Grain yield adjusted to 12.0% moisture.

2025 Resistance of Spring Wheat Varieties to Fusarium Head Blight — Sidney, MT

Frankie Crutcher, Jason Cook, Caitlin Gross, Marie Dorval, Myra Rudolph, Amlan Arman

OBJECTIVE: Test the resistance of different spring wheat varieties to Fusarium head blight caused by *F. graminearum*.

MATERIALS AND METHODS:

Irrigated
Variety: Misc.
Location: Sidney, MT
Planted: May 7
Harvested: Sep 5
Plot Size: 2.5' x 10'
Seeding Rate: 90 lbs/A
Soil Type: Savage silty clay loam

Previous Crops: Soybean
Residual Soil N to 3 ft: NTot 19.7 lbs/A
Residual Soil P to 6 in: 16 ppm
Applied Fertilizer: 70-26-0 190 lbs/A
Irrigated (sprinkler) on: May 14 - Jun 27 (2.92 in total)
Herbicide Applications: 2-4,D,PanoFlex, Wolverine Advanced
Precipitation April – September: 11.4 in
Disease assessment: July 30

COMMENTS:

Corn spawn inoculated with six isolates of *F. graminearum* was applied to the field May 28. Misting to increase humidity was applied from Jun 19 – Jul 21.

RESULTS:

Table 1: Spring Wheat Variety Reponses to Fusarium Head Blight

Variety	Severity (%)[a]	Incidence (%)[b]	Index[c]	Yield (lbs/A)[d]
AAC Concord	7.7 ab	76.7 a-d	6.0 ab	2005.9 f-h
AP Dagr	8.7 ab	73.3 a-d	6.5 ab	3268.2 a-h
AP Elevate	5.1 ab	58.9 a-d	3.1 ab	3277.8 a-h
AP Gunsmoke CL2	5.8 ab	71.1 a-d	4.2 ab	3488.4 a-f
AP Iconic	4.6 ab	60.0 a-d	2.7 ab	3845.2 ab
AP Smith	5.3 ab	67.8 a-d	3.6 ab	2840.1 a-h
CP3188	5.7 ab	56.7 a-d	3.4 ab	2598.4 a-h
CP3322	5.3 ab	56.7 a-d	3.0 ab	2158.7 e-h
DAGMAR	9.1 ab	87.8 a-c	7.9 ab	2831.5 a-h
DUCLAIR	5.5 ab	56.7 a-d	3.2 ab	3395.0 a-g
LANNING	8.0 ab	74.4 a-d	6.1 ab	3038.4 a-h
LCS ASCENT	3.7 b	54.4 b-d	2.0 ab	3769.7 ab
LCS BOOM	4.6 ab	54.4 b-d	2.9 ab	3835.9 ab
LCS Sentry	5.1 ab	58.9 a-d	3.2 ab	3655.2 a-d
MS Charger	4.3 b	57.8 a-d	2.6 ab	4032.2 a
MS Nova	5.7 ab	66.7 a-d	3.9 ab	3762.3 ab
MS Ranchero	3.3 b	46.7 d	1.6 b	3650.4 a-e
MT 21074	14.4 a	67.8 a-d	12.4 a	2174.8 d-h
MT 21174	7.8 ab	77.8 a-d	6.1 ab	2603.1 a-h
MT 21484	7.4 ab	81.1 a-d	6.1 ab	2875.0 a-h
MT 21487	7.7 ab	83.3 a-d	6.5 ab	2789.7 a-h
MT 22073	7.1 ab	76.7 a-d	5.8 ab	3118.0 a-h
MT 22083	6.8 ab	68.9 a-d	4.7 ab	2520.7 b-h
MT 22182	8.9 ab	86.7 a-c	7.9 ab	2196.1 d-h
MT 22205	8.9 ab	84.4 a-d	7.6 ab	3080.1 a-h
MT 22345	10.3 ab	90.0 ab	9.3 ab	2716.4 a-h
MT 23039	8.9 ab	82.2 a-d	7.4 ab	2704.8 a-h
MT 23052	7.9 ab	72.2 a-d	5.7 ab	3023.9 a-h
MT 23067	7.4 ab	75.6 a-d	5.7 ab	3137.6 a-h
MT 23084	10.0 ab	87.8 a-c	8.8 ab	2521.6 b-h

MT 23085	9.4 ab	74.4 a-d	7.0 ab	2487.5 b-h
MT 23098	7.6 ab	70.0 a-d	5.3 ab	2752.8 a-h
MT 23110	11.6 ab	90.0 ab	10.5 ab	2443.4 b-h
MT 23113	10.5 ab	88.9 ab	9.3 ab	2641.7 a-h
MT 23116	10.1 ab	78.9 a-d	8.5 ab	2380.9 b-h
MT 23127	7.9 ab	75.6 a-d	5.9 ab	1787.1 h
MT 23130	9.9 ab	77.8 a-d	7.9 ab	2993.4 a-h
MT 23133	8.4 ab	80.0 a-d	6.7 ab	2632.4 a-h
MT 23184	11.0 ab	80.0 a-d	9.2 ab	2199.6 d-h
MT 23204	8.3 ab	70.0 a-d	6.0 ab	2681.2 a-h
MT 23205	9.9 ab	74.4 a-d	7.3 ab	1833.3 h
MT 23241	7.2 ab	68.9 a-d	4.9 ab	2505.2 b-h
MT 23265	11.5 ab	82.2 a-d	9.7 ab	2711.7 a-h
MT 23275	5.6 ab	63.3 a-d	3.5 ab	3238.5 a-h
MT 23294	5.3 ab	60.0 a-d	3.2 ab	2799.5 a-h
MT 23297	7.8 ab	71.1 a-d	5.6 ab	2633.1 a-h
MT 23339	9.1 ab	81.1 a-d	7.4 ab	2904.9 a-h
MT 23385	6.6 ab	68.9 a-d	4.7 ab	2852.3 a-h
MT Carlson	8.2 ab	87.8 a-c	7.2 ab	2894.3 a-h
MT Dutton	7.7 ab	78.9 a-d	6.1 ab	3210.6 a-h
MT Sidney	3.7 b	46.7 d	1.8 b	3459.8 a-f
MT Ubet	7.8 ab	81.1 a-d	6.3 ab	2821.9 a-h
MT24017	6.8 ab	77.8 a-d	5.4 ab	3030.6 a-h
MT24019	8.3 ab	63.3 a-d	5.9 ab	3828.7 ab
MT24028	6.7 ab	72.2 a-d	4.9 ab	3245.0 a-h
MT24069	6.7 ab	74.4 a-d	5.0 ab	1954.6 gh
MT24097	10.3 ab	77.8 a-d	8.3 ab	3246.9 a-h
MT24112	8.1 ab	84.4 a-d	6.9 ab	2553.7 a-h
MT24120	8.0 ab	72.2 a-d	5.9 ab	2739.7 a-h
MT24128	4.1 b	48.9 cd	2.0 ab	3599.3 a-e
MT24175	10.6 ab	94.4 a	10.1 ab	1952.1 gh
MT24213	5.5 ab	67.8 a-d	3.8 ab	2892.9 a-h
MT24225	4.9 ab	52.2 b-d	2.7 ab	3590.7 a-e
MT24319	6.3 ab	74.4 a-d	4.7 ab	3226.9 a-h
MT24320	7.7 ab	78.9 a-d	6.1 ab	3094.3 a-h
MT24365	5.3 ab	60.0 a-d	3.3 ab	3198.1 a-h
MT24366	8.7 ab	85.6 a-d	7.4 ab	2942.9 a-h
MT24388	9.1 ab	87.8 a-c	8.2 ab	2379.0 b-h
McNEAL	9.3 ab	81.1 a-d	7.5 ab	2193.5 d-h
ND Stampede	4.5 ab	61.1 a-d	2.9 ab	3714.0 a-c
PG Predator	7.6 ab	74.4 a-d	6.0 ab	3158.6 a-h
REEDER	8.7 ab	84.4 a-d	7.3 ab	2555.0 a-h
ROCKER	8.6 ab	71.1 a-d	6.6 ab	2690.3 a-h
SY Ingmar	7.3 ab	71.1 a-d	5.2 ab	2979.2 a-h
SY Longmire	9.2 ab	81.1 a-d	8.0 ab	2658.8 a-h
SY ROCKFORD	4.9 ab	62.2 a-d	3.1 ab	3710.9 a-c
VIDA	7.3 ab	68.9 a-d	5.2 ab	2504.4 b-h
WB GUNNISON	6.7 ab	80.0 a-d	5.4 ab	2223.7 c-h
Mean	7.5	72.7	5.7	2892.8
% CV	41.9	19.7	57.3	21.8
HSD (0.05)	3.1	18.1	3.8	503.0
P-value	<0.0001	<0.0001	<0.0001	<0.0001

Letters in common did not differ significantly according to a Tukey's HSD test at a significance level of 5%.

[a]Pest Severity: Average percent area of head covered by disease. Thirty heads were evaluated for each plot.

[b]Pest Incidence: Percent of thirty plants per plot that had visible FHB symptoms.

[c]Index: Severity X Incidence / 100

[d]Grain yield adjusted to 12.0% moisture.

2025 Pea Foliar Trial **Sidney, MT**

Frankie Crutcher, Marie Dorval, Caitlin Gross, Amlan Arman

OBJECTIVE: Test the efficacy of different fungicide combinations for control of *Ascochyta* and/or *Septoria* on peas under dryland conditions.

MATERIALS AND METHODS:

Dryland	Previous Crops: Spring wheat
Cultivar: 'AAC Carver'	Residual Soil N to 3 ft: 12 lbs/A
Location: Sidney, MT	Residual Soil P to 6 in: 24 ppm
Planted: Apr 18	Applied Fertilizer: None
Harvested: Jul 24	Herbicide Applications: Glystar Plus (glyphosate) 64 fl oz/A
Plot Size: 5' x 20'	Precipitation April – August: 12.93 in
Seeding Rate: 8 LS/ft^2	Date of treatment application: Jun 6
Soil Type: Clay loam	Disease assessments: Jun 20 and Jul 3

COMMENTS:

Seeds were inoculated with peat-based commercial Exceed® (Visjon Biologics, Henrietta, TX) and treated with Evergol and Cruiser at the recommended rates. Fungicides were applied at early bloom using a Teejet 80015VS Even Flat Spray nozzle tips at 14 GPA. Both pathogens were observed in the field, however *Septoria* was the predominant pathogen present.

RESULTS:

Table 1: Effect of Fungicide Treatments on Peas to control *Ascochyta* and *Septoria*

Trt #	% Sev[a] Jun 20	% Inc Jun 20	% Sev Jul 3	% Inc Jul 3	Adj. Yield (lbs/A)[c]	%Protein	Test Wt (lbs/bu)	TSW (g)[d]
1	4.3	70.0	20.5 a	100	1879.8	22.1	64.3	214.6
2	3.5	57.5	8.4 b	100	2132.1	21.9	64.4	210.3
3	4.3	70.0	10.3 b	100	2123.5	21.9	65.0	214.6
4	3.8	65.0	12.5 b	100	2033.3	21.7	64.6	213.3
5	4.1	67.5	14.0 ab	100	2036.6	21.9	64.5	213.1
6	2.6	50.0	12.5 b	100	1996.5	21.5	64.7	213.4
Mean	3.8	63.3	13.0	100	2033.6	21.8	64.6	213.2
P-value	0.2682	0.1758	0.0013	1.00	0.1919	0.3937	0.5863	0.3265
CV (%)	29.4	20.6	37.2	0	7.5	1.6	0.9	1.3
HSD(0.05)	-	-	7.3	-	-	-	-	-

Letters in common did not differ significantly according to a Tukey's HSD test at a significance level of 5%.

[a]Severity: Average percent area of foliar area covered by disease. Ten plants were evaluated for each plot.

[b]Incidence: Percent of ten plants per plot that had visible leaf blight symptoms.

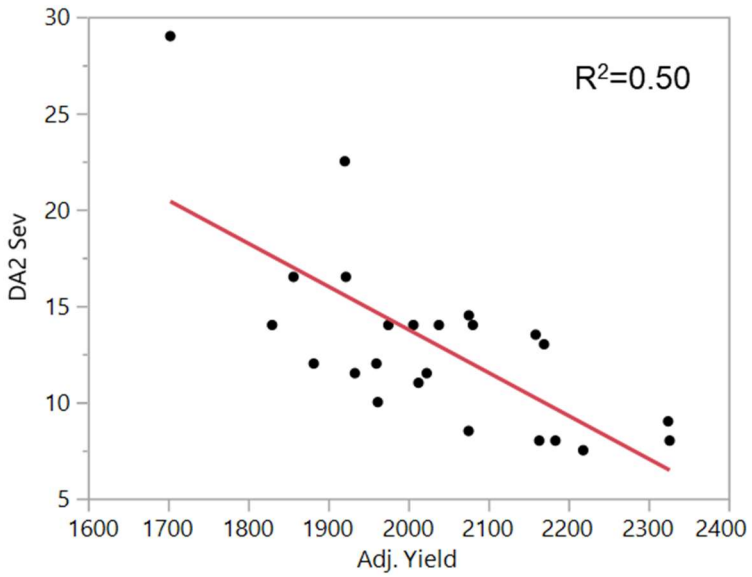
[c]Yield was adjusted to 13% moisture.

[d]TSW indicates thousand seed weight in grams.

Table 2: Fungicide Treatments for Dryland Peas

Trt #	Fungicide*	Rate
1	Untreated Check	N/A
2	UPL Experimental	7 fl oz/a
3	UPL Experimental	7 fl oz/a
	Vacciplant	7 fl oz/a
4	Zolera FX	5 fl oz/a
5	Zolera FX	5 fl oz/a
	Vacciplant	7 fl oz/a
6	Miravis Top	14 fl oz/a
	Bravo Weather Stik	32 fl oz/a

Figure 1: Correlation Between Disease and Yield



2025 Chickpea Foliar Trial — Sidney, MT

Frankie Crutcher, Marie Dorval, Caitlin Gross, Amlan Arman

OBJECTIVE: Test the efficacy of different fungicide combinations for control of *Ascochyta rabiei* on chickpeas under irrigation.

MATERIALS AND METHODS:

Irrigated
Variety: Sierra
Location: Sidney, MT
Planted: May 4
Harvested: Aug 26
Plot Size: 5' x 20'
Seeding Rate: 4 LS/ft²
Soil Type: Savage silty clay loam
Previous Crops: Spring wheat
Applied Fertilizer: None
Irrigated (sprinkler) on: Jun 5, Jun 18, Jun 30 (1.9 in total)
Herbicide Applications: Panther 2 fl oz/ac (Fall), Outlook 21 fl oz/ac (Spring)
Precipitation April – September: 11.4 in
Treatment application dates: A) Jun 17, B) Jul 1, C) Jul 18, D) Aug 2
Disease assessments: Jun 30, Jul 14, Jul 29, Aug 12

COMMENTS:

Seeds were inoculated with peat-based commercial Exceed® (Visjon Biologics, Henrietta, TX). Fungicides were applied using a Teejet 80015VS Even Flat Spray nozzle tips at 14 GPA. Trial was desiccated with Gramoxone (1.3 pts/A) on Aug 14.

RESULTS:

Table 1: Effect of Fungicide Treatments on Chickpeas to control *A. rabiei*

Trt #	% Sev[a] 6/30	% Inc[b] 6/30	% Sev 7/14	% Inc 7/14	% Sev 7/29	% Inc 7/29	% Sev 8/12	% Inc 8/12
1	2.1	35.0	9.5	100	4.1	72.5 a	24.3 a	97.5 a
2	1.9	32.5	10.9	100	2.8	52.5 ab	16.4 ab	90.0 a
3	2.0	35.0	10.4	100	4.9	55.0 ab	11.4 b	82.5 ab
4	1.9	30.0	9.8	100	2.6	47.5 b	6.6 b	57.5 b
5	1.6	30.0	9.9	100	3.0	52.5 ab	9.5 b	67.5 ab
6	1.8	32.5	9.1	100	2.9	52.5 ab	8.1 b	75.0 ab
7	2.8	42.5	11.6	100	2.4	47.5 b	10.5 b	82.5 ab
Mean	2.0	33.9	10.2	100	3.2	54.3	12.4	78.9
P-value	0.6828	0.8917	0.7382	-	0.3320	0.0242	0.0023	0.0083
CV (%)	43.6	38.8	21.1	0	52.3	21.5	59.9	22.2
HSD (0.05)	-	-	-	-	-	22.15	12.35	31.23

Letters in common did not differ significantly according to a Tukey's HSD test at a significance level of 5%.

[a]Severity: Average percent area of root covered by disease. Ten plants were evaluated for each plot.

[b]Incidence: Percent of ten plants per plot that had visible Ascochyta blight symptoms. Incidence was not included in this report.

Table 2: Effect of Fungicide Treatments on Agronomics

Trt #	Adj. Yield[a] (lbs/acre)	Test Wt. (lbs/bu)	TKW[b] (grams)
1	2933.9	59.6	551.1 c
2	3096.2	59.4	573.3 ab
3	3027.7	59.4	568.0 a-c
4	3131.2	59.6	559.8 bc
5	3116.3	59.4	578.5 a
6	2957.3	59.9	560.0 a-c
7	2984.7	59.4	564.3 a-c

Mean	3035.3	59.5	565.0
P-value	0.7871	0.7873	0.0020
CV (%)	6.92	0.88	1.98
HSD (0.05)	-	-	18.5

[a]Yield was adjusted to 13% moisture.

[b]TKW indicates thousand kernel weight.

Table 3: Fungicide Treatments for Irrigated Chickpeas

Trt #	Application Timing	Fungicide*	Rate
1	None	NT	
2	A	Bravo Weather Stik	32 fl oz/ac
	A	Miravis Top	14 fl oz/ac
	B	Proline	5.7 fl oz/ac
	C	Miravis Top	14 fl oz/ac
	D	UPL Experimental	7 fl oz/ac
3	A	Bravo Weather Stik	32 fl oz/ac
	A	Miravis Top	14 fl oz/ac
	B	Proline	5.7 fl oz/ac
	C	Miravis Top	14 fl oz/ac
	D	UPL Experimental	7 fl oz/ac
	D	Vacciplant	7 fl oz/ac
4	A	Bravo Weather Stik	32 fl oz/ac
	A	Miravis Top	14 fl oz/ac
	B	Proline	5.7 fl oz/ac
	B	Vacciplant	7 fl oz/ac
	C	Miravis Top	14 fl oz/ac
	D	UPL Experimental	7 fl oz/ac
	D	Vacciplant	7 fl oz/ac
5	A	Bravo Weather Stik	32 fl oz/ac
	A	Miravis Top	14 fl oz/ac
	B	Proline	5.7 fl oz/ac
	B	Vacciplant	7 fl oz/ac
	C	Miravis Top	14 fl oz/ac
	C	Vacciplant	7 fl oz/ac
	D	UPL Experimental	7 fl oz/ac
	D	Vacciplant	7 fl oz/ac
6	A	Miravis Top	14 fl oz/ac
	A	Bravo Weather Stik	32 fl oz/ac
	B	Proline	5.7 fl oz/ac
	B	Bravo Weather Stik	32 fl oz/ac
	C	Miravis Top	14 fl oz/ac
	C	Bravo Weather Stik	32 fl oz/ac
	D	Proline	5.7 fl oz/ac
	D	Bravo Weather Stik	32 fl oz/ac
7	A	Bravo Weather Stik	32 fl oz/ac
	A	Miravis Top	14 fl oz/ac
	A	Vacciplant	7 fl oz/ac
	B	Proline	5.7 fl oz/ac
	B	Vacciplant	7 fl oz/ac
	C	Miravis Top	14 fl oz/ac
	C	Vacciplant	7 fl oz/ac
	D	Zolera FX	5 fl oz/ac
	D	Vacciplant	7 fl oz/ac

Previewing *CruiserMaxx® Vibrance Elite* Seed Treatment for *Pythium* Control in Field Pea

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Background

CruiserMaxx® Vibrance Elite, a yet-to-be-released seed treatment premix, contains Vayantis® (picarbutrazox), a unique active ingredient with a new mode of action against water molds like *Pythium* and *Rhizoctonia* species. Furthermore, CruiserMaxx® Vibrance Elite has another mode of action targeting fungi such as *Fusarium* spp.

Objective

The objective of this study was to evaluate the performance of CruiserMaxx® Vibrance Elite seed treatment in comparison to existing active ingredients (metalaxyl and mefenoxam) which are commonly used to control *Pythium* spp. in field pea.

Materials and Methods

This randomized field study, consisting of seven treatments (Table 1), was conducted in 2024 using the Aragorn pea variety. The trial was inoculated with *Pythium* spp. at planting to ensure consistent disease pressure. Data were analyzed using JMP® version 18.2.2 software program. Grain and straw from this trial were destroyed to ensure that no plant material entered the food or feed system.

Table 1. Seed treatments/active ingredients tested in this study

Treatments
Inoculated control
Mefenoxam (VMP-RTA) - Vibrance Maxx Pulses RTA
Non-inoculated control
Picarbutrazox Conceptual
Mefenoxam (CMVP) - CruiserMaxx Vibrance Pulses
Metalaxyl
Picarbutrazox (CruiserMaxx Vibrance Elite)

Results **(on following page)**

Results demonstrated that CruiserMaxx® Vibrance Elite was the only seed treatment that led to a significant increase in grain yield under *Pythium* pressure when compared to the *Pythium*-inoculated control (Figure 1). In addition to yield benefits, it performed on par with currently available products in improving emergence (Figure 2) as well as suppressing root rot symptoms (Figure 3).

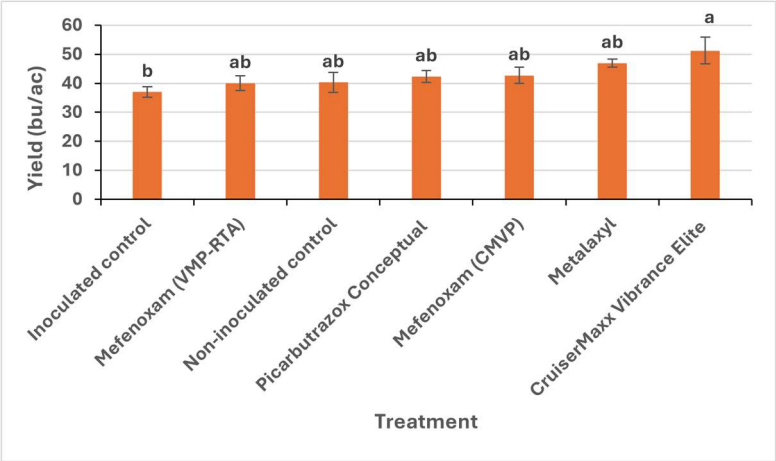

Figure 1. ***Yield (bu/ac)*** as impacted by different seed treatments (P = 0.0255). Treatments sharing the same letter are not significantly different (Tukey's HSD, $\alpha < 0.05$, n = 6).

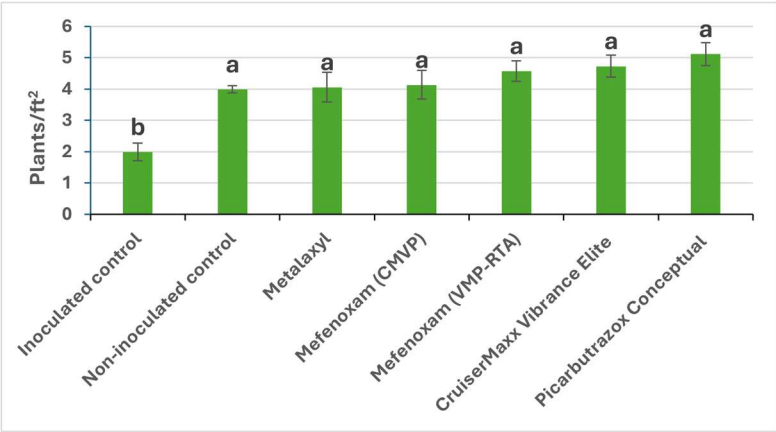

Figure 2. ***Plant stand (plants/ft²)*** as influenced by different seed treatments (P < 0.0001). Treatments sharing the same letter are not significantly different (Tukey's HSD, $\alpha < 0.05$, n = 6).

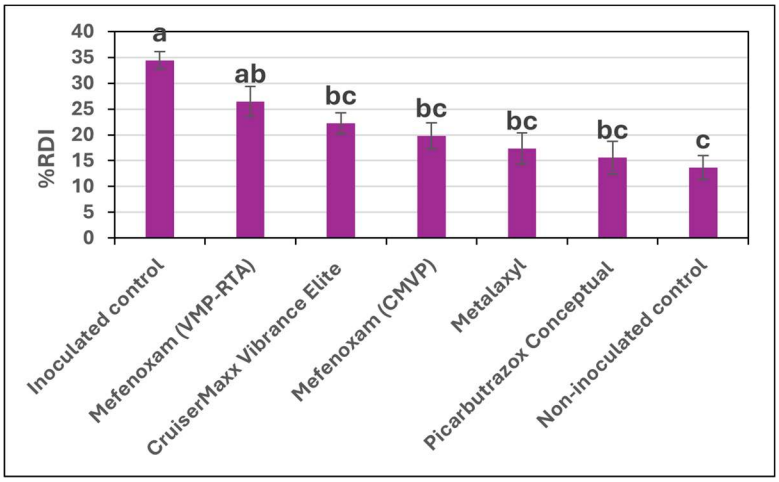

Figure 3. ***Root disease index (%)*** as influenced by different seed treatments (P < 0.0001). Treatments sharing the same letter are not significantly different (Tukey's HSD, $\alpha < 0.05$, n = 6).

Table 2. Root rot pathogens detected in pea roots by diagnostic testing at the National Agricultural Genotyping Center (✓ = pathogen was detected; ✗ = pathogen **was not** detected)

Treatment	Pythium	R. solani	F. avenaceum + F. acuminatum	F. solani	Aph.
Non-inoculated control	✓	✓	✗	✗	✗
Inoculated control	✓	✓	✗	✗	✗
Mefenoxam (CMVP)	✗	✓	✗	✗	✗
Mefenoxam (VMP-RTA)	✓	✗	✓	✗	✗
Picarbutrazox Conceptual	✓	✓	✗	✗	✗
CruiserMaxx Vibrance Elite	✗	✗	✗	✗	✗
Metalaxyl	✗	✓	✗	✗	✗

Samples of symptomatic roots were tested at the National Agricultural Genotyping Center (NAGC) in Fargo. The pathogens tested were: *Pythium*, *Rhizoctonia solani*, *Fusarium avenaceum*, *F. acuminatum*, *F. solani*, and *Aphanomyces euteiches*. Results showed that plants treated with CruiserMaxx® Vibrance Elite did not have detectable levels of pathogens in the roots, even though *Pythium* was inoculated at planting (Table 2). This shows that CruiserMaxx® Vibrance Elite is highly effective against *Pythium* and *Rhizoctonia* resulting in improved emergence and plant stand that leads to yield gains (Figure 1). *Fusarium avenaceum* and *F. acuminatum* were detected in plants treated with Mefenoxam (Vibrance Maxx Pulses RTA) suggesting limited activity on these pathogens (Table 1). Furthermore, this product was also not effective against root rot (Figure 3).

Conclusion

These results suggest that CruiserMaxx® Vibrance Elite offers strong protection against root rot pathogens, likely due to its dual mode of action targeting fungi such as *Fusarium* spp. and water molds like *Pythium* and *Rhizoctonia* species. This product will soon be available for cereals, with a pulse crop label anticipated later, pending EPA approval.

Acknowledgements

This study was sponsored by Syngenta Crop Protection. Collaboration with the National Agricultural Genotyping Center (NAGC) is hereby acknowledged. We thank Mackenzie Cunningham, Brandon Schuler, Lauren Hammock, and Bryce Miles for technical assistance.

Evaluation of Nitrogen Fertilizer and Rhizobium Inoculation to Improve Grain Yield and Quality of Soybean and Dry Bean in Montana

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Introduction

Following the closure of the Sidney Sugars processing plant in 2023, interest in production of irrigated soybean and dry bean in Eastern Montana increased substantially. Yields of soybean and dry bean in the Lower Yellowstone River Valley in 2023 varied significantly from 20 to 60 bu ac^{-1}, indicating a need for improved management practices. However, research-based information addressing appropriate agronomic practices for the climate and soils of the region is generally lacking. Nitrogen fertility management in these crops is complicated by their ability to fix nitrogen symbiotically with rhizobia. Nitrogen fixation is dependent upon the presence of crop specific rhizobia either present in the soil or introduced via commercial inoculants. The success of commercial inoculants can vary based on product selection, crop type and field cropping history. Furthermore, the addition of fertilizer Nitrogen can have variable effects on the establishment and productivity of symbiotic nitrogen fixation. Understanding when commercial rhizobium inoculants are needed and what levels of nitrogen fertilizer applied at planting are beneficial is critical for profitability of these crops.

Objectives

The objectives of this study are to: 1) evaluate the response of soybean and dry bean to commercial rhizobium inoculants in fields lacking a history of these crops; 2) examine the need for the additional nitrogen fertilizer at planting and assess what nitrogen rates are appropriate.

Methods

In 2024 and 2025, two soybean (R0422XF and CP0337x) and two dry bean (Cowboy (pinto) and Viper (red)) cultivars were planted under overhead irrigation at the Eastern Agricultural Research Center in Sidney, MT in fields with no recent history (five years) of either crop. Seeds were treated with Cruiser 5FS insecticide and Obvius (dry bean) or Apron Maxx (soybean) fungicides prior to planting. Soybeans were planted at four seeds per square foot and dry beans two seeds per square foot on 18-inch row spacing. Plots dimensions were five by 20 feet. Fertilizer was side banded at planting at three levels including: none (Control), 10 lb N a^{-1} and 26 lb P_2O_5 a^{-1} (10N) or 50 lb N a^{-1} and 26 lb P_2O_5 a^{-1} (50N). Each fertilizer rate was evaluated with and without a rhizobium inoculant resulting in a total of six treatment levels. Soybeans were inoculated with granular Primo GX2 (Verdesian Life Sciences, Cary, NC) and dry beans with peat-based N-Charge (Verdesian Life Sciences, Cary, NC) immediately prior to planting. Four replications of each treatment were planted in a randomized complete block design. Planting dates were May 21, 2024 (soybean and dry bean), May 13, 2025 (soybean) and May 27, 2025 (dry bean). Soybean and dry bean trials were physically separated in both years to facilitate different weed and irrigation management practices. Plants from one row meter were dug from each plot at the R3 growth stage. Above-ground biomass was dried and weighed. Plant roots were scored for nodulation based on three categories including plant growth and vigor, nodule color and number, and nodule position with scores of 0, 1, 3, or 5 assigned for each category and summed to give a total nodulation score. Trials were harvested on Sept. 3, 2024 (dry beans), Sept. 25, 2024 (soybean), Sept. 10, 2025 (dry bean) and Sept. 25, 2025 (soybean). Grain yields were adjusted to 13 percent moisture content and soybean protein and oil were analyzed by near-infrared spectroscopy.

Results and Discussion

Soybean

A combined analysis of variance for both years of the study indicated significant interaction effects for year with variety and year with treatment for soybean grain yield, biomass yield, and grain protein (data not shown). Therefore, variety and treatment effects on grain yield, biomass yield, and grain protein were analyzed separately for 2024 and 2025 and are presented in Table 1. Interaction effects involving year were not observed for soybean grain oil and nodule score and their combined analysis for both years is presented in Table 2.

Soybean grain yields and grain protein were higher in 2024 than in 2025. Conversely, biomass yields were higher in 2025 than in 2024. Soybean varietal effects were significant for grain yield and grain protein but not biomass yield. Grain yields in 2024 were significantly higher for R0422XF (4140 lb a^{-1}) than CP0337x (3959 lb a^{-1}). Grain yields for R0422XF (3231 lb a^{-1}) and CP0337x (3373 lb a^{-1}) were not significantly different in 2025. R0422XF produced higher grain protein in both years as compared to CP0337x . No variety level effects were observed for biomass yield in either year of the study.

Table 1. Effects of Variety and Treatment on Soybean Grain Yield, Biomass Yield, and Grain Protein in 2024 and 2025

Source of Variation	Grain Yield		Biomass Yield		Grain Protein	
	2024	**2025**	**2024**	**2025**	**2024**	**2025**
	Pr>F	*Pr>F*	*Pr>F*	*Pr>F*	*Pr>F*	*Pr>F*
Variety	**0.0164**	0.0932	0.7061	0.2334	**<0.0001**	**<0.0001**
Treatment	**<0.0001**	**<0.0001**	**0.0124**	**<0.0001**	**<0.0001**	**<0.0001**
Variety x Treatment	0.6199	0.6598	0.5679	0.464	0.4081	0.9849
Variety	lb a^{-1}	lb a^{-1}	lb a^{-1}	lb a^{-1}	g kg^{-1}	g kg^{-1}
R0422XF	4140 a	3231	3367	4539	311 a	279 a
CP0337x	3959 b	3373	3421	4792	291 b	268 b
Treatment	lb a^{-1}	lb a^{-1}	lb a^{-1}	lb a^{-1}	g kg^{-1}	g kg^{-1}
Untreated	3667 c	2775 d	3341 ab	3797 c	281 c	261 c
10N	3837 bc	2756 d	3375 ab	4252 c	290 bc	258 c
50N	3813 bc	3194 cd	3042 ab	5410 ab	292 bc	262 c
Inoc	4451 a	3665 ab	3834 a	4315 bc	321 a	290 a
Inoc + 10N	4445 a	3941 a	3782 ab	4446 bc	317 a	293 a
Inoc + 50N	4081 ab	3479 bc	2989 b	5775 a	306 ab	274 b

Significant treatment level effects were observed for all measured soybean parameters. The inoculation (Inoc) and inoculation plus 10 lb N a^{-1} (Inoc + 10N) treatments produced the highest grain yield, grain protein and nodulation scores in both years. However, biomass was not different from the untreated control in either year for these treatments. Fertilization at 10 lb N a^{-1} (10N) or 50 lb N a^{-1} (50N) without inoculation did not result in grain yield or grain protein gains relative to the untreated control in either year. Addition of 50 N lb a^{-1}, either with (Inoc + 50N) or without (50N) inoculation resulted in the lowest biomass yields in 2024 and the highest biomass yields in 2025. Furthermore, fertilization at 50 lb N a^{-1} with inoculation (Inoc + 50N) resulted in nodule scores significantly lower than the other inoculated treatments and closer in value to the uninoculated treatments. Inoculation, regardless of fertilization rate, produced grain oil concentrations lower than that of uninoculated treatments.

Table 2. Effects of Year, Variety, and Treatment on Soybean Grain Oil and Nodule Score.

Source of Variation	Grain Oil	Nodule Score
	Pr>F	*Pr>F*
Year	**0.0146**	**<0.0001**
Variety	**0.0178**	0.4585
Treatment	**<0.0001**	**<0.0001**
Year x Variety	0.0536	0.0701
Year x Treatment	0.1354	0.0526
Variety x Treatment	0.4077	0.8692
Year	g kg^{-1}	
2024	197 b	6.6 b
2025	200 a	9.2 a
Variety	g kg^{-1}	
R0422XF	199 a	8.0
CP0337x	197 b	7.7
Treatment	g kg^{-1}	
Untreated	204 a	6.5 b
10N	203 a	5.8 bc
50N	201 a	4.1 bc
Inoc	192 c	11.8 a
Inoc + 10N	193 c	12.0 a
Inoc + 50N	196 b	7.1 b

The results of this study indicate that variety selection and management practices can have significant impacts on soybean grain yield and seed quality. Varietal effects on soybean grain yield varied by year with significant differences observed in the higher-yielding 2024 but not the lower-yielding 2025. On the other hand, varietal effects on grain protein were consistent across years with R0422XF producing higher grain protein levels in both years even though overall levels decreased from 2024 to 2025. These observations are consistent with the idea that genotype by environment interactions typically impact grain yield more than grain protein. Therefore, variety selection for grain yield needs to be evaluated on a location-by-location basis across multiple years highlighting the need for robust variety testing in the region.

Regarding agronomic practices, rhizobium inoculation was required to achieve the highest grain yield and grain protein in both years of the study. Fertilization at 10 lb N a^{-1} had very little impact with or without inoculation. The addition of 50 lb N a^{-1} with inoculation suppressed the yield gains observed by inoculation alone and reduced the effectiveness of inoculation as evident in the reduction of nodulation scores relative to the other inoculated treatments. These results indicate that successful rhizobium inoculation is critical to achieve maximum soybean grain yield and grain protein in fields with no recent history of soybean as utilized in this study. Furthermore, the benefits of nitrogen fertilization at planting are negligible at 10 lb N a^{-1} to detrimental at 50 lb N a^{-1}. A yield response to 50 N lb a^{-1} without inoculation was observed in 2025 but not 2024 with preplant soil tests indicated the presence of 48 and 65 residual lb N a^{-1} (0-24”) for those two years, respectively. At lower soil N, 50 N lb a^{-1} is sufficient to produce a yield increase but not sufficient to provide the quantity of N derived from successful symbiotic nitrogen fixation.

Dry Bean

Analysis of dry bean grain yield revealed a year by treatment interaction (data not shown) and therefore grain yields for 2024 and 2025 were analyzed separately and are presented in Table 3. Likewise, treatment by variety interactions were observed for biomass yield and nodule score, and as such, biomass yield and nodule score were analyzed independently for the two bean types and are presented in Table 4.

Variety and treatment significantly affected dry bean grain yield in 2024 but not 2025. Grain yields were higher for both beans in 2025 than in 2024. Grain yield was significantly higher for the red bean, Viper, at 3119 lb a^{-1} than the Pinto bean, Cowboy, at 2993 lb a^{-1} in 2024. The yield trend was reversed but not significant in 2025 with Cowboy at 4401 lb a^{-1} and Viper at 4262 lb a^{-1}. Biomass yields were similar for both varieties and higher in 2025 than 2024. Nodulation scores were higher for Cowboy in 2024 but identical between the two beans in 2025.

Treatment had no effect on dry bean grain yield in 2025 with an average of 4331 lb a^{-1} across treatments and a difference of only 147 lb a^{-1} between the highest- and lowest-yielding treatments. In 2024, 10 lb N a^{-1} without inoculation produced the highest observed grain yield at 3340 lb a^{-1}, an increase of 215 lb a^{-1} relative to the untreated control. In addition, N fertilization at 50 lb a^{-1} (with or without inoculation) resulted in a significant decrease in dry bean grain yield relative to the untreated control. This decrease in nodulation score was observed with the 50 lb N a^{-1} treatments. Nodulation scores were higher for Cowboy than for Viper. No treatment-dependent differences in dry bean biomass yield were observed in this study and the increase in biomass yield observed in soybean from 2024 to 2025 was not observed for the dry beans.

Table 3. Effects of Variety and Treatment on Dry Bean Grain Yield in 2024 and 2025

Source of Variation	**Grain Yield 2024**	**Grain Yield 2025**
	Pr>F	*Pr>F*
Variety	**0.0231**	0.0648
Treatment	**<0.0001**	0.8985
Variety x Treatment	0.9964	0.1769
Variety	lb a^{-1}	lb a^{-1}
Viper	3119 a	4262
Cowboy	2993 b	4401
Treatment	lb a^{-1}	lb a^{-1}
Untreated	3125 ab	4383
10N	3340 a	4338
50N	2899 bc	4359
Inoc	3064 abc	4236
Inoc + 10N	3094 abc	4342
Inoc + 50N	2815 c	4330

Table 4. Effects of Year and Treatment on Dry Bean Biomass Yield and Nodule Score.

Source of Variation	Biomass Yield (Cowboy)	Biomass Yield (Viper)	Nodule Score (Cowboy)	Nodule Score (Viper)
	Pr>F	*Pr>F*	*Pr>F*	*Pr>F*
Year	**<0.0001**	**0.0069**	0.0648	**0.0012**
Treatment	0.4646	0.1702	**0.0009**	**0.0146**
Variety x Treatment	0.9875	0.0967	0.4533	0.5341
Year	lb a^{-1}	lb a^{-1}		
2024	3358 b	3536 b	9.4	5.9 b
2025	4390 a	4512 a	10.6	10.6 a
Treatment	lb a^{-1}	lb a^{-1}		
Untreated	3992	3899	11.8 ab	10.0 a
10N	4284	3672	10.3 abc	9.3 ab
50N	3778	4108	8 c	8 ab
Inoc	3796	4362	12.3 a	6.8 b
Inoc + 10N	3881	3791	9.3 abc	8.5 ab
Inoc + 50N	3514	4311	8.5 bc	7 b

In this study, rhizobium inoculation and N fertilization at 10 lb a^{-1} provided no consistent grain or biomass yield benefits and a higher rate of N fertilization (50 lb a^{-1}) resulted in grain yield reductions. Fertilization at 50 lb N a^{-1} is likely adequate to inhibit nodulation and thereby reduce the total amount of N available to the plant from fixation without supplying enough soil N to support full yield potential. The lack of response to nodulation could be explained in several ways. Even though there was no prior field history of dry bean in either year of the study, the presence of an indigenous soil rhizobium population capable of competing with an inoculant strain for nodulation sites and thereby preventing the inoculant strain from engaging in symbiotic nitrogen fixation is feasible. Another possible explanation is that the indigenous soil rhizobium population is capable of symbiotic nitrogen fixation at rates comparable to that of the inoculant and therefore even in the presence of a successful inoculation, differences between inoculated and uninoculated treatments are difficult to observe. Finally, inoculation failure due to the inability of the inoculant strain to survive long enough in the soil to allow contact with the emerging root cannot be ruled out. The results of this study indicate that inoculant and N fertilizer inputs in irrigated dry bean cropping systems should be evaluated carefully on a farm-by-farm basis and with broad recommendations being avoided.

Effect of Rhizobia Inoculation Rates on Soybean Yield in Western North Dakota

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Background

Soybean acreage has expanded substantially across central and western North Dakota. This westward expansion has resulted in increased growers' interest on production practices, particularly the use of rhizobia inoculants. Soybeans rely heavily on rhizobia bacterial nitrogen fixation to meet nitrogen requirements. Therefore, effective rhizobia inoculation can enhance nitrogen availability in the soil and support sustainable soybean production.

Objectives

Soybean producers in western North Dakota, particularly those new to the crop, often seek data on inoculation, including its necessity, available product types, and recommended application rates. To address these information gaps, this study evaluated the effects of rhizobia inoculant product format (liquid *vs.* granular), application rate (1x, 2x, and 3x), and supplemental soil nitrogen (20 lbs/ac urea) on soybean yield in the region.

Materials and Methods

The ND17009GT soybean variety was seeded in mid-May and harvested in late September 2025. The trial was conducted as a randomized experiment on a site that had not grown soybeans for at least 10 years, thereby minimizing the presence of native nitrogen-fixing rhizobia in the soil. Eleven treatments were evaluated (Table 1), focusing on different application rates of liquid and granular inoculant formulations, their combined effects, as well as a 20 lbs/ac urea application. Seed was treated with Allegiance®-FL (metalaxyl) fungicide to protect against damping-off and seedling blight. All inoculants were applied directly to the seed immediately prior to planting, and the ND17009GT soybean variety was seeded at a rate of 50 lbs/ac. Data were analyzed using JMP® version 18.2.2 software program.

Table 1. Treatment descriptions, rhizobia inoculant products (Lallemand Plant Care), and their active ingredients.

Treatment	Active Ingredients
1x Liquid*	*Bradyrhizobium japonicum*
2x Liquid	*B. japonicum*
3x Liquid	*B. japonicum*
1x Granular**	*B. elkanii + Bacillus velezensis*
2x Granular	*B. elkanii + Bacillus velezensis*
3x Granular	*B. elkanii + Bacillus velezensis*
1x Lq + 1x Gr	*B. japonicum + B. elkanii + Bacillus velezensis*
1x Lq + 20 lbs N	*B. japonicum* + Urea
1x Gr + 20 lbs N	*B. elkanii* + *Bacillus velezensis* + Urea
20 lbs N	Urea
Check	-

*Liquid (Lq) = BYSI-N, **Granular (Gr) = LALFIX® START SPHERICAL Soybean

Results and Discussion

Results from the Williston trial showed that both liquid and granular inoculants significantly improved soybean yield and protein content compared to the non-inoculated check (Figures 1 and 2). However, applying 20 lbs/ac of urea did not significantly affect either yield or protein levels. Increasing the inoculant rate by doubling, tripling, or combining liquid and granular formulations did not lead to additional yield gains (Figure 1). This shows that the manufacturer-recommended inoculation rate (1x rate) is sufficient in Williston. Moreover, the liquid inoculant formulation significantly outperformed the granular formulation in protein content at the manufacturer-recommended inoculation rate (Figure 2), while underperforming in oil content (Figure 3). These differences are likely due to rhizobia strain composition (Table 1) and better adherence of the liquid formulation to the seed.

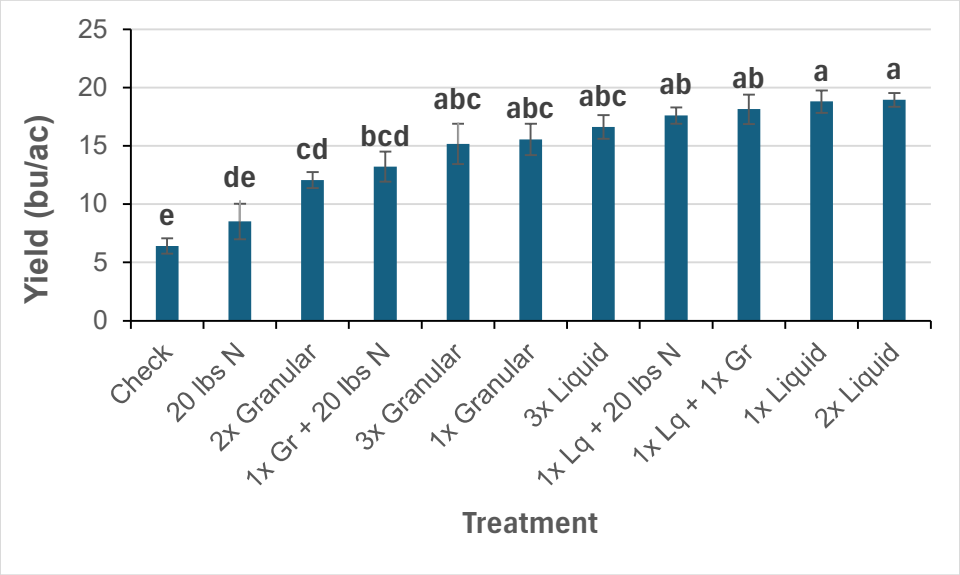

Figure 1. Yield (bu/ac) as influenced by varying rates of rhizobia inoculants ($P < 0.0001$). Bars with a common letter are not significantly different (Tukey's HSD, $\alpha < 0.05$, n = 4).

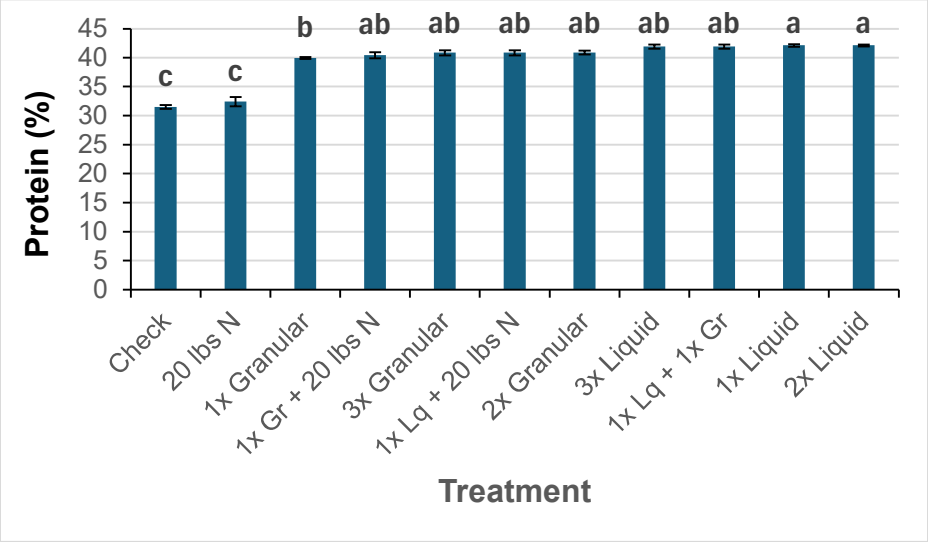

Figure 2. Protein content (%) as influenced by varying rates of rhizobia inoculants ($P < 0.0001$). Bars with a common letter are not significantly different (Tukey's HSD, $\alpha < 0.05$, n = 4).

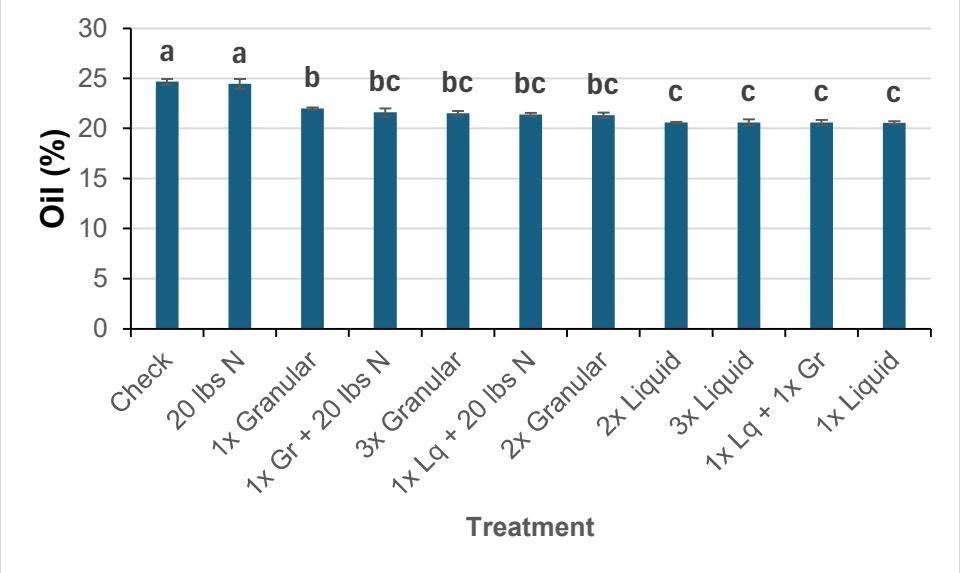

Figure 3. Oil content (%) as influenced by varying rates of rhizobia inoculants ($P < 0.0001$). Bars with a common letter are not significantly different (Tukey's HSD, $\alpha < 0.05$, n = 4).

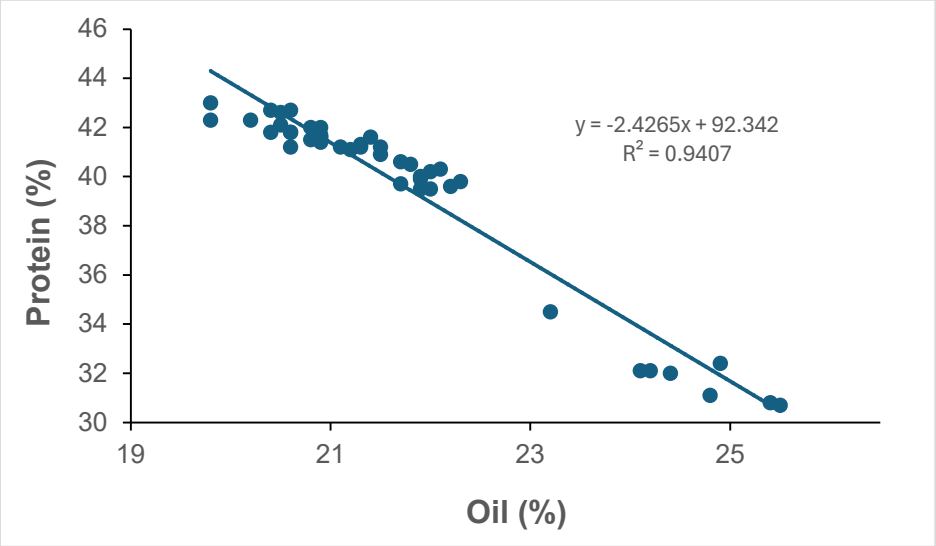

Figure 4. Correlation between protein and oil content ($P < 0.0001$)

Notably, protein content showed an inverse relationship with oil content (Figure 4). This is a common trend in soybeans because protein and oil are produced through competing biological pathways. Soybean plants may prioritize one pathway over the other depending on variety and environmental conditions such as nitrogen fixation levels in the soil.

Conclusion

This study demonstrated the important role of rhizobia inoculation in soybean production. Both liquid and granular inoculant formulations tested in the study were effective when applied at manufacturer-recommended application rates, resulting in high soybean yield and protein content. The study will be repeated in 2026 to better understand the effects of seasonal variation.

Acknowledgements

This work was sponsored by the North Dakota Soybean Council. Special thanks to Kyle Dragseth for field and technical support, and to Caleb Boothe and Bella Lofgren for their technical assistance.

Horticulture Program at Williston Research Extension Center

Rojee Chipalu Pradhan

"A garden requires patient labor and attention. Plants do not grow merely to satisfy ambitions or to fulfill good intentions. They thrive because someone expended effort on them."- Liberty Hyde Bailey

Every year is different in terms of weather as well as team. This year we had only one part time summer staff to help manage the horticulture program. Despite all challenges, we were able to maintain the WREC horticulture garden and landscapes at their absolute best. There is a sprinkler system in garden as well as the landscape area. The total seasonal rainfall from January 1 to November 17, 2025 was 15.74 inches. The last spring frost occurred on April 29, 2025, and the first fall-killing frost on October 5, 2025. The growing season was 160 days long. (Source https://ndawn.ndsu.nodak.edu)

WREC Garden

The Williston Research Extension Center has a big garden, and a portion of garden is dedicated to the All-America Selection Display Garden, Certified Pollinator Garden, Daylily Collection Bed, Home Garden Variety trials, Herb Bed, small High Tunnel and areas of small fruits. Over the years we did lot of research in small fruits such as Juneberry, Raspberry, Strawberry, Grapes and Haskap.

Williston Research Extension Center Garden. Aerial Photo by Gautam Pradhan.

All-America Selections Display Garden

The Williston Research Extension Center Garden has been an All-America Selection (AAS) public display garden for more than a decade. All-America Selection is the only national, non-profit plant trialing organization in North America founded in 1932. The AAS Mission Statement is "to promote new garden varieties with superior garden performance judged in impartial trials in North America" (https://allamericaselections.org/about). The display garden project was started with stem cuttings of different varieties of Geranium from the beginning of December 2024. AAS flower and vegetable seeds

as well as other seeds were seeded in the Horticulture lab under the light shelves (Photos1-2) from the beginning of March to the first week of May 2025. Before transplanting in the ground, they need to be acclimatized to natural environments. For this we kept the seedlings outside everyday gradually increasing hours of exposure in sun for two to three weeks. The seeding date was based on the growing requirements of a variety given in a seed packet. Some varieties required at least ten weeks before they were suitable for transplanting outside. The list of AAS winners' flowers and vegetables grown in the garden are given in Tables 1 and 2. In addition to the All-America Selection varieties, other annual flowers and vegetables were also planted in the display garden. The list of flowers and vegetable is given in Table 3. The vegetable and flower seedlings were transplanted in the garden from the end of May until middle of June, whereas some seeds were sown directly in the fourth week of May. The AAS winners produced around 200 lbs. of fresh vegetables. We received flower and vegetable seeds from All-America Selections around December 2024 and live plants (flower) in April 2025. AAS sent us vegetable and flower varieties that won national or regional competitions in recent and previous years. People interested in gardening can visit their website (https://allamericaselections.org) for cultivar information, gardening tips, the latest winners as well as recipes, and landscape ideas.

Seeding flower seeds in the tray & 4 to 6 weeks Seedling under light shelves. Photo by Rojee Chipalu Pradhan.

Table 1. List of AAS winners' flowers planted in display garden in 2025

2025 Winners	
Dianthus, Interspecific Capitán™ Magnifica	**2022 Winners**
Marigold, Mango Tango	Celosia, Flamma Orange
Nasturtium, Baby Gold	Sunflower, Concert Bell
Nasturtium, Baby Red	Verbena, Vanity
Nasturtium, Baby Yellow	**2019 Winners**
Petunia, Dekko™ Maxx™ Pink	Begonia, VikingTM XL Red on Chocolate
Petunia, Shake™ Raspberry	Marigold, Garuda Deep Gold
Snapdragon, DoubleShot™ Yellow Red Heart	**2018 Winners**
Zinnia, Zydeco™ Fire	Zinnia, Queeny Lime Orange

2024 Winners	**2017 Winners**
Celosia, Burning Embers	Geranium, Calliope® Medium Dark Red
Impatiens, Solarscape® XL Pink Jewel	**2016 Winner**
Marigold, Siam Gold	Geranium, Brocade Fire
Verbena, Sweetheart Kisses	**2013 Winner**
Geranium, Big EEZE Pink Batik	Geranium, Pinto Premium White to Rose
2023 Winners	Canna, South Pacific Scarlet
Coleus, Premium Sun Coral Candy	
Snapdragon, DoubleShot™ Orange Bicolor	
Salvia, Blue by You	

Table: 2. List of AAS winners' vegetables planted in display garden in 2025

2025 Winners	Pepper, Quickfire
Kohlrabi, Konstance	Tomato, Pink Delicious
Pepper, Pick-N-Pop Yellow	**2020 Winners**
Squash, Green Lightning	Tomato, Apple Yellow
2024 Winners	**2019 Winners**
Broccoli, Purple Magic	Tomato, Mountain Rouge
Pepper, Dragonfly	**2018 Winners**
Pepper, Red Impact	Tomato, Valentine
2023 Winners	Pepper, Dragonfly
Pepper, San Joaquin	**2016 Winners**
Tomato, Zenzei	Pumpkin, Pepitas
2022 Winners	Strawberry, Delizz
Eggplant, Icicle	**2015 Winners**
Lettuce, Bauer	Basil, Dolce Fresca
Pepper, Buffy	Basil, Persian

Table: 3. List other flowers and vegetables planted in display garden in 2025

Flowers:	Lupin
Celosia, Century Mix	Shasta Daisy
Coleus, Rainbow Mix	Zinnia, Berry Tart
Dahlia, Figaro Mix	Zinnia, Blushing Bride
Dusty Miller, Silver Dust	Zinnia, Fruity Beauty
Geranium, Mix Varieties	Zinnia, Strawberry Parfait
Holy Hock	
Vegetables:	
Asparagus	Rhubarb
Radish	Swiss Chard

Historic Daylily Collection

The World Collection of Daylilies was established in the Williston Research Extension Center dryland station in 2004. Over the years, different cultivars of Daylilies have been added to the collection area. The Daylily plants were relocated in 2018 to another area to maintain plant distance, and landscape fabric was used to reduce weed infestation. The Daylily collection area has been maintained by watering once a week, regular hand weeding, dead heading, and fertilization. There are 123 different cultivars of Daylily in our collection.

Daylily collection. Photo by Rojee Chipalu Pradhan.

Certified Pollinator Garden

The certified pollinator garden was established in 2016. The objectives of Master Gardener Certified Pollinator Garden are to provide Master Gardeners with volunteering opportunities, to build a habitat that will nourish pollinators, and to create a public teaching garden that Master Gardeners and Extension Agents can jointly utilize. These activities encourage members of the public to build home pollinator gardens. Different pollinator-friendly annual and perennial flowers were planted in the pollinator garden in 2025. This garden was maintained by regular watering, and hand weeding.

Certified Pollinator Garden. Photo by Rojee Chipalu Pradhan.

Herb Garden

Small portion of long bed was assigned for herb garden. We grew different herbs such as, Cilantro, Dill, Mint, Oregano, Parsley, Rosemary, Sage, and Thyme.

Herb Collection. Photo by Rojee Chipalu Pradhan

Small Fruits

Over the years we conducted lot of research on small fruits. Hence, there are few plants of sour cherry, juneberries, four varieties of raspberry and twelve different varieties of Haskap in the garden. We harvested around 50 lbs. of small fruits and give to community members.

Small fruits raspberry, sour cherry, haskap plants and fruits. Photo by Rojee Chipalu Pradhan.

North Dakota Home Garden Variety Trial 2025

Every year Dr. Tom Kalb, NDSU Extension Horticulturist, offers home gardeners across the state an opportunity to try some new promising varieties along with older varieties of flowers, vegetables, and herbs. This research program is a comparison of two varieties and planted beans, cucumbers, okra, spinach and squash (Table 4). We harvested around 165 lbs. of vegetables from these trials. If you are a gardener interested in joining this study, contact Mr. Kalb at tom.kalb@ndsu.edu for more information. To view 2024 results, go to http://www.dakotagardener.com/trials/.
Results from 2025 trials will be out soon.

Table: 4. List of trial planted in garden in 2025

S.No	Crop	Varieties
1.	Bush Bean	Compass & Maxibel
2.	Cucumber (Pickling)	Double Yield & Provision
3.	Green Zucchini (Squash)	Desert & Kefren
4.	Okra	Clemson Spineless & Jambalaya
5.	Spinach (Savoyed-Leaf)	Green Beret & Sunangel

Cucumbers and Squash. Photo by Rojee Chipalu Pradhan

Landscape Management

One of the major tasks of the horticulture program is to manage the landscaping area around The Ernie French Center. The areas had new plantings in 2015 that highlight the ever-increasing hardy plant selections for western North Dakota. In addition to the existing perennial plants, different cultivars of annual flowers and some new shrubs were planted this year in the landscape to enhance the embellishment of the periphery of the office building. These landscape and lawn areas were regularly maintained by running sprinklers, applying nutrients, deadheading, and mowing lawn on a weekly basis. Some glimpses of the landscapes are given below.

Perennial and annual flowers around The Ernie French Center building. Photo by Rojee.

Collaboration, Outreach Activities, and Dissemination of Information

The activities and findings of the projects were delivered to the target audiences by presenting at:

- **Field Day**: This year we did not have a scheduled Horticulture Field Day but the WREC garden was open for a visitor's self-tour and provided answers to any of their questions. Visitors were very excited to learn about the garden related activities, as well as getting the opportunity to pick some fruits, like sour cherry and raspberry.

Visitors enjoying tour and picking some cherries. Photo by Rojee Chipalu Pradhan.

- **Garden Tour**: Williston Research Extension Center Garden is a public display garden; hence individuals and groups are welcomed to take a garden tour. In 2025, we gave a group tour to students of Trenton summer school.

Students enjoying garden tour and picking Raspberry. Photo by Samantha.

2025 North Dakota Exotic Woodboring/Bark Beetle Survey:

Every year the North Dakota Department of Agriculture conducts a North Dakota Exotic Woodboring/Bark Beetle Survey in the shelter belt trees of the Williston Research Extension Center. There were five different traps on five trees (different tree species such as Ash, Pine, Spruce, Oak etc.). These traps were installed on May 14, 2025, and removed on September 4, 2025. Lures were replaced according to scheduled instructions. Every two weeks, I collected insects and shipped to the ND Department of Agriculture.

Exotic wood borer trap hanging in WREC Tree. Photo by Rojee Chipalu Pradhan.

Community Service:

We gave away seedlings of peppers, tomatoes, and squash to our community members. The local community also received small fruits (raspberry, sour cherry and grapes) as well as vegetables harvested from our WREC garden. Around 21 pounds of fresh vegetables (peppers) were donated to the St. Joes Catholic School for their Farmers Market Event.

"Flowers always make people better, happier, and more helpful; they are sunshine, food, and medicine for the soul." - Luther Burbank

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