

SASKATCHEWAN ON-FARM RESEARCH TRIALS



2023

SaskBarley 
DEVELOPMENT COMMISSION

 **SaskCanola**

SASKATCHEWAN
pulse
Growers



Sask  **Wheat**
DEVELOPMENT COMMISSION

the BarleyBin 
Field Lab

by SaskBarley 
DEVELOPMENT COMMISSION

Overview

SaskBarley launched the BarleyBin Field Lab in 2023. SaskBarley views the BarleyBin Field Lab as an integration of our research and communication core functions.

SaskBarley's goals for the BarleyBin Field lab are to generate farm-scale research results that complement small plot trials, gather farmer input on research questions facing Saskatchewan barley farmers, and encourage best practices for on-farm trials. Results from field scale trials will be distributed through our media platforms to share with other farmers, agronomists and researchers.

SaskBarley will continue the BarleyBin Field Lab beyond 2023, collaborating with producers and agronomists to adapt research for use on the farm.

Protocol: Barley Seeding Rates

Barley Seeding Rate

(Dodsland)

Objective: To evaluate the effect of seeding rate on seedling survivability, yield, and grain quality of barley.

Treatments:

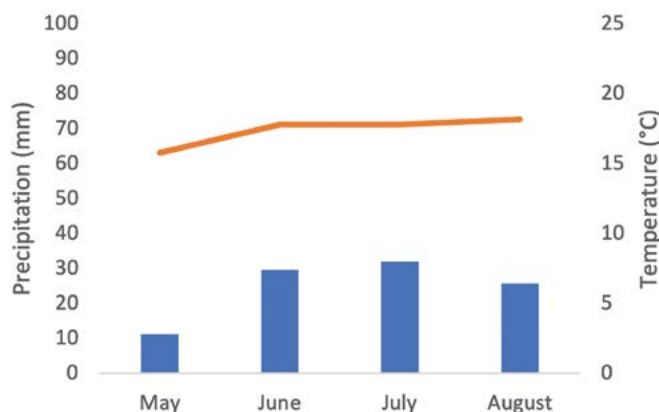
Replicates: Four

Treatment No.	Target plant population (plants ft ²)	Actual seeding rate (lbs. ac ⁻¹)
1	Low (19)	102
2	Standard (22)	118
3	High (26)	140
4	VR	141 (Depression) 142 (Midslope) 161 (Knoll)

General Trial Information:

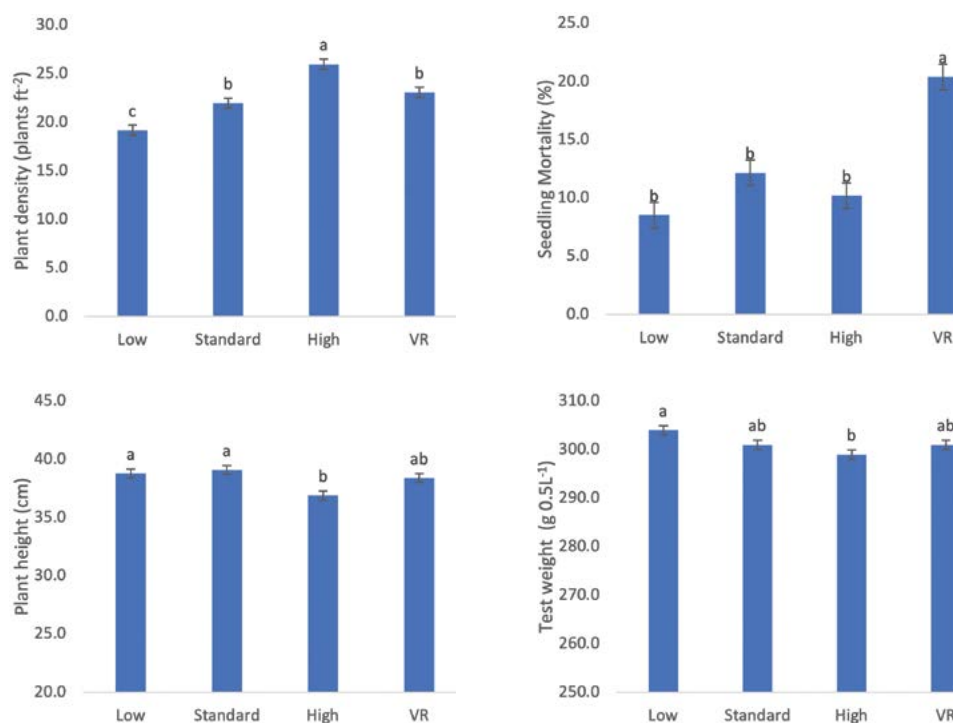
Variety	AAC Connect
Thousand kernel weight	49.88 g
Germination	99%
Seed treatment	Insure Cereal FX4
Previous crop	Lentils
Soil organic matter	3.6%
Residual Nitrate-N (0-6")	8 lbs. ac ⁻¹
Seeding date	May 14
Seeding depth	1.5 in.
Seeding speed	4.6 mph
Row spacing	12 in.
Total applied fertilizer	Average 50 N – 34 P – 19 K – 0 S lbs. ac ⁻¹ actual (VR)
Crop protection	May 11: Glyphosate 540 + DB-878 June 7: Axial Extreme + MCPA 600 Ester

Weather: In-field precip + Environment Canada (Kindersley) for temp



Results:

Target plant population (plants ft ⁻²)	Plant density (plants ft ⁻²)	Seedling mortality (%)	Height (in)	Yield ⁽¹⁾ (bu ac ⁻¹)	Protein (%)	Test weight (g 0.5L ⁻¹)	Plumps (%)	Thins (%)
19	19.2	8.5	15.3	32.6	14.0	304	80.9	0.69
22	22.0	12.2	15.4	30.3	14.2	301	78.8	0.71
26	26.0	10.2	14.5	29.3	14.2	299	74.5	0.87
VR	23.1	20.4	15.1	29.8	14.5	301	74.9	0.75
SE ⁽²⁾	± 0.3	± 1.1	± 0.2	± 1.7	± 0.2	± 0.9	± 1.8	± 0.1
<i>P-value</i> ⁽³⁾	<0.001***	<0.001***	0.011**	0.341	0.185	0.019**	0.067*	0.268



The effect of seeding rate on plant density, seedling mortality, plant height and test weight was significant. Treatments labeled with the same letter are not significantly different. Error bars indicate the standard error.



Summary:

Higher barley seeding rate increased plant density ($P < 0.01$). Seedling mortality was significantly higher with variable seeding rate than with the flat rates which had consistent seedling mortality. We were not able to detect a significant difference in yield, protein, or plumps and thins with increased seeding rates. However, plant height and test weight decreased significantly with seeding rates.



Economics:

The effect of seeding rate on yield was not significant, thus the yield difference between treatments is zero. Net profit declined with seeding rate.

1. Yields were adjusted to 13.5% seed moisture content
2. SE is the standard error which is in the same unit as the measurement and indicates the level of variability or uncertainty in the data.
3. Linear regression was used to assess the relationship between seeding rate and the response variables, thus the P-value indicates the likelihood that a change in the response variable with increased seeding rate is significantly different than zero:
 - P < 0.01 = Very likely that seeding rate affected the response variable (***)
 - P < 0.05 = Likely that the seeding rate affected the response variable (**)
 - P < 0.1 = Possible that the seeding rate affected the response variable (*)
 - P > 0.1 = Not likely that the seeding rate affected the response variable (not significant)



This trial was conducted with
the agronomic support of



Barley Seeding Rate (Luseland)

Objective: To evaluate the effect of seeding rate on seedling survivability, yield, and grain quality of barley.

Treatments:

Replicates: Four

Treatment No.	Target plant population (plants ft ²)	Actual seeding rate (lbs. ac ⁻¹)
1	Low (19)	89
2	Standard (22)	104
3	High (26)	122
4	VR	118 (Depression) 119 (Midslope) 135 (Knoll)

General Trial Information:

Variety	AAC Synergy
Thousand kernel weight	43.2 g
Germination	98%
Seed treatment	Terraxxa
Previous crop	Canola
Soil organic matter	4.7%
Residual Nitrate-N (0-6")	11 lbs. ac ⁻¹
Seeding date	May 12
Seeding depth	1 in.
Seeding speed	3.7 mph
Row spacing	12 in.
Total applied fertilizer	55 N – 28 P – 20 K – 0 S lbs. ac ⁻¹ actual (VR)
Crop protection	May 9: M-Power + Ammo June 6: Rumour + Bison 400 + MSO + Foxy

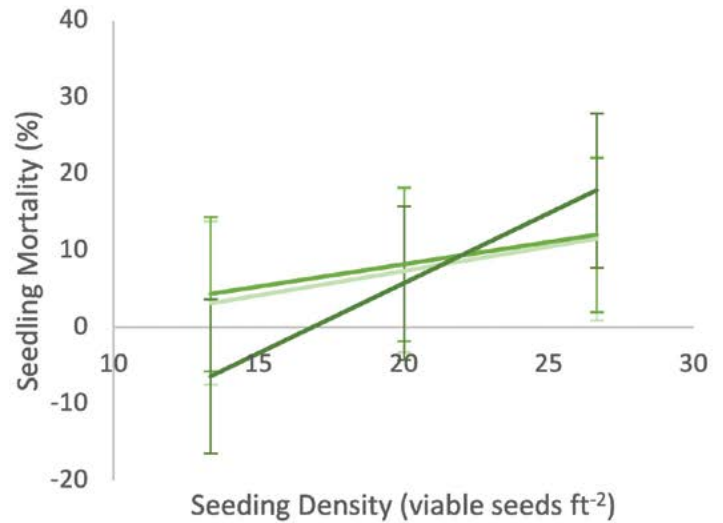
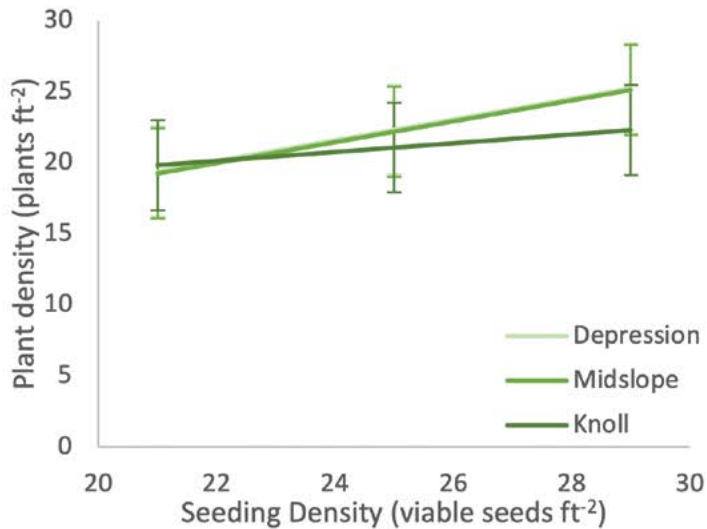
Weather: In-field precip + Environment Canada (Scott CDA) for temp



Results:

Plant density assessments were completed separately for depression, mid-slope, and knoll areas within each of the four treatments to determine if the effect of seeding rate on plant population and seedling mortality differed by landscape position.

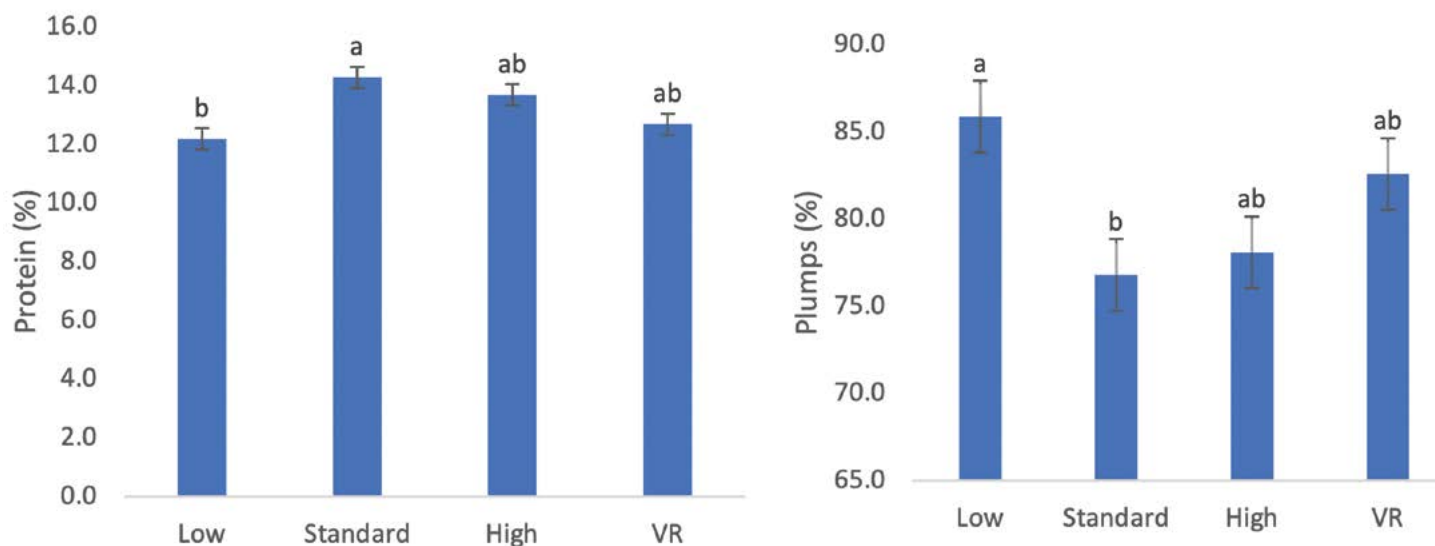
	Plant density	Seedling mortality
P-value (Seeding Rate) ⁽³⁾	<0.001***	0.001***
P-value (Landscape Position)	0.018**	0.058*
P-value (SR x LP)	0.005***	0.017**



Plant density significantly increased with seeding rate in depressions and midslope positions, but did not differ with seeding rate on knolls. Accordingly, seedling mortality was low overall and more uniform across seeding rates in the depression and midslope positions, where seedling mortality increased significantly with seeding rate on knolls.

Target plant population (plant ft ⁻²)	Height (in)	Yield ⁽¹⁾ (bu ac ⁻¹)	Protein (%)	Test weight (g 0.5L ⁻¹)	Plumps (%)	Thins (%)
19	20.5	70.4	12.2	287.0	85.9	1.5
22	20.1	65.0	14.3	266.0	76.8	2.6
26	20.9	62.6	13.7	272.0	78.1	2.3
VR	21.0	69.6	12.7	280.0	82.6	2.0
SE ⁽²⁾	± 0.5	± 2.7	± 0.4	± 5.6	± 2.1	± 0.3
P-value ⁽³⁾	0.288	0.176	0.006***	0.100	0.025**	0.108





The effect of seeding rate on protein and plumps was significant. Treatments labeled with the same letter are not significantly different. Error bars indicate the standard error.



Summary:

Higher barley seeding rate did not significantly affect plant height, yield, test weight, or percent thins under these trial conditions. However, protein was significantly lower and percent plumps significantly higher in the low compared to the standard seeding rate.



Economics:

The effect of seeding rate on yield was not significant, thus the yield difference between treatments is zero. Net profit declined with seeding rate.

1. Yields were adjusted to 13.5% seed moisture content
2. SE is the standard error which is in the same unit as the measurement and indicates the level of variability or uncertainty in the data.
3. Linear regression was used to assess the relationship between seeding rate and the response variables, thus the P-value indicates the likelihood that a change in the response variable with increased seeding rate is significantly different than zero:
 - P < 0.01 = Very likely that seeding rate affected the response variable (***)
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