SASKATCHEWAN pulse Growers

Pulse Replicated On-Farm Independent Trials

Lentil Seeding Rate Trial

A common seeding practice of small red and large green lentil is a flat seed rate of 60 lbs/ac (1 bu/ac) and 90–95 lbs/ac (1.5–1.6 bu/ac), respectively. While this conventional seeding rate has successfully produced high-yielding lentil crops, a more precise approach is to target an optimal plant stand and adjust seeding rate according to seed size (thousand kernel weight, TKW) and seedling survivability. A target lentil population of 12 plants/sq ft is generally recommended but research has shown that populations up to 22 plants/sq ft can provide the highest yield.

Objective

To evaluate seeding rate of small red or large green lentil including comparisons of seedling survivability and yield in response to plant population across various landscape positions.

Treatments

Seeding rates varied by site, but generally targeted three plant populations:

- **Standard:** 12 plants/sq ft
- **High:** 18 plants/sq ft
- **Very High:** 24 plants/sq ft

Seeding rates were determined precisely using the TKW and germination rate of each seed lot as indicated by a seed quality test at each site.

Trials were set up in randomized strips with four replicates, for a total of 12 plots.

Methodology

- Apart from seeding rates, all plots were managed the same agronomically.
- To evaluate the influence of variable topography on plant populations, sections of plots could be further identified by landscape position (knoll, mid-slope, and depression), and data collected separately within these subplots.
- Yield was determined for each plot separately by weighing with a weigh wagon or grain cart with scale.
- Grain samples were collected from each plot separately for quality analysis.

Data Collection

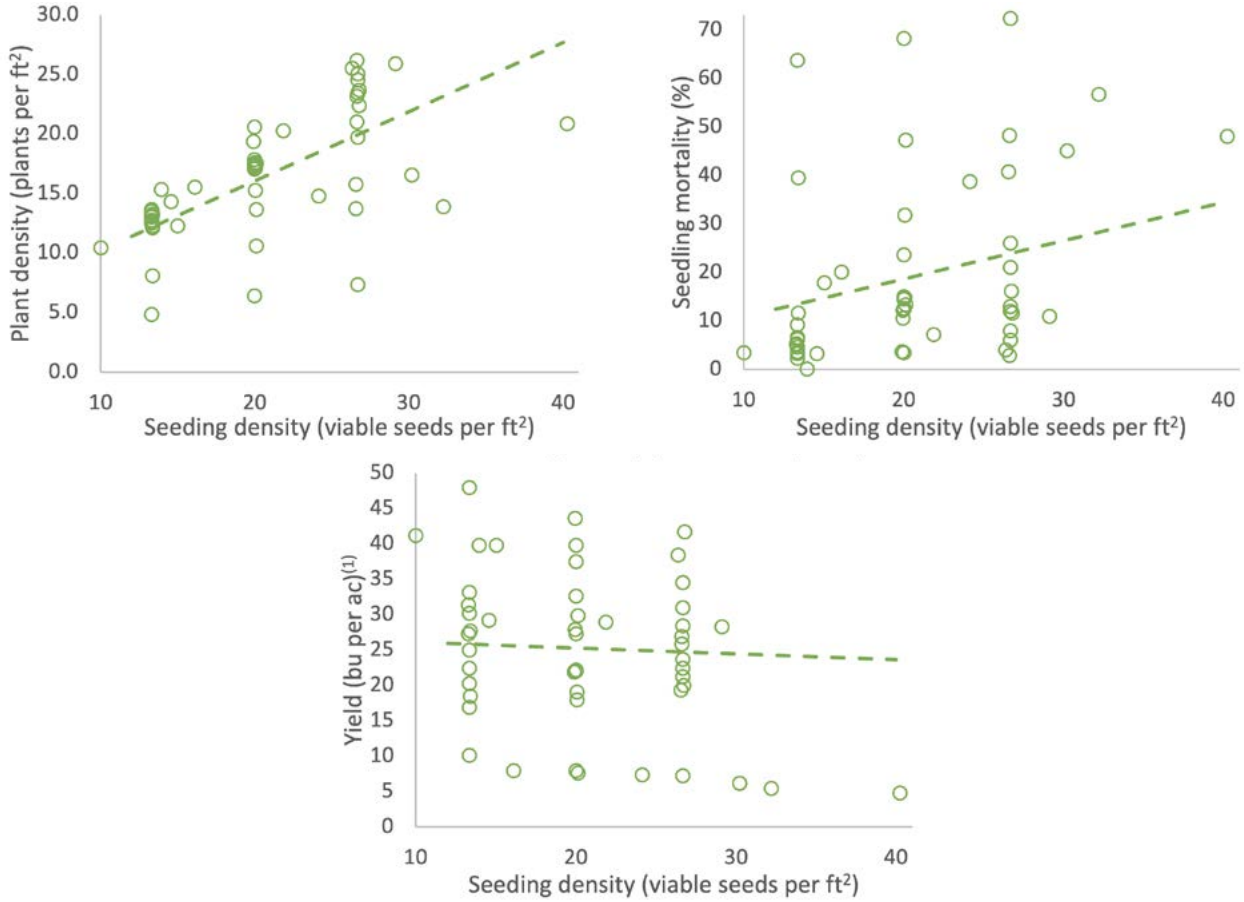
- Seed test
- Soil test
- In-season plant density, by landscape position within plots, if applicable
- Field history and management practices
- Yield by plot (corrected for moisture content at harvest)
- General in-season observations such as weed competition, disease susceptibility, standability, and maturity
- Weather data
- Beneficial but not required:
  - o As-applied files for seeding rates within the trial area.
  - o Digital map layer identifying topography / landscape position (knoll, mid-slope, depression) within the trial area.
  - o Digital yield data.

Lentil Seeding Rate: Results Summary

Data from all sites was combined to assess the overall effect of seeding rate on seedling survivability across landscape positions, and on yield and grain quality of small red and large green lentils.

Overall, plant density and seedling mortality did not differ significantly by landscape position at the five sites where this was assessed (not shown). However, plant density and seedling mortality both significantly increased with seeding rates across all sites (P<0.01). Across sites, yield decreased significantly with higher seeding rates (P<0.05), but protein and seed size were not affected (not shown). Thus, the additional seed cost was not economical overall[4,5].

	Plant density	Seedling Mortality	Yield	Protein	Seed size
P (Seed Rate)[3,6]	*<0.001***	*<0.001***	*0.013***	*0.710*	*0.615*
SE[2]	±1.2	±4.8	±2.8	±0.4	±1.7



The effect of lentil seeding rate on plant density, seedling mortality, and yield at all sites overall.

Individual site reports are provided in the following pages to indicate the variability in management, environmental conditions, yield potential, and responses to seeding rates across landscape positions that was observed across trial sites this growing season.

The following footnotes will also be referred to in the individual site reports for this protocol:

1. Yields were adjusted to 13% 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)
4. Seed cost of $0.53 per lb. for small red lentils and $0.72 for large green lentils was calculated from values provided in the Saskatchewan Ministry of Agriculture's 2023 Crop Planning Guide and includes the cost of seed treatment and inoculant.
5. Grain price of $34.76 per cwt for small red lentils and $57.40 for large green lentils is an average of weekly prices in 2023 as reported on the Government of Saskatchewan website.
6. P-value (Seed Rate) indicates the likelihood of a difference resulting from seeding rate only;
   P-value (Landscape Position) indicates the likelihood of a difference resulting from landscape position only;
   P-value (SR x LP) indicates the likelihood of seeding rates having differing effects on plant density and seedling mortality depending on landscape position.

Lentil Seeding Rate
(Cabri)

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

Treatments:

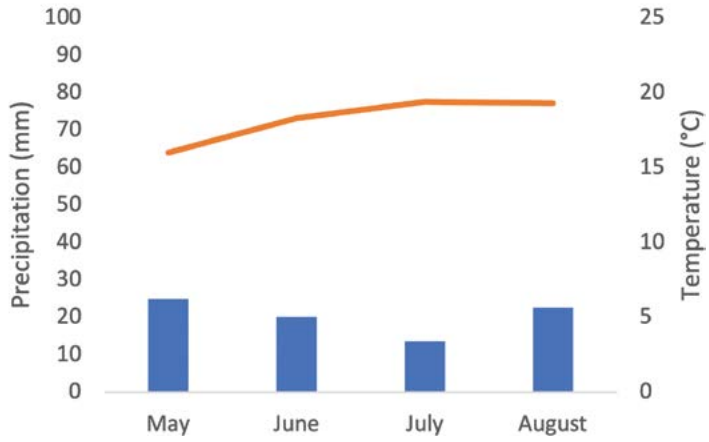
Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	13	60
2	20	89
3	26	119

Replicates: Four

General Trial Information:

Variety	CDC Proclaim Clearfield® (CL)
Thousand kernel weight	36.12 g
Germination	85%
Seed treatment	None
Inoculant	Nodulator XL Liquid®
Previous crop	Durum wheat
Soil organic matter	4.3%
Residual Nitrate-N (0-6")	9 lbs ac^{-1}
Soil type & Texture	Brown Chernozem, heavy clay
Seeding date	May 11
Seeding implement & openers	0.75 in. shank
Seeding depth	1.75 in.
Seeding speed	4.8 mph
Row spacing	10 in.
Total applied fertilizer	4 N – 18 P – 3 K – 0 S lbs. ac^{-1} actual – Seed-placed
Crop protection	May 5: Advantage 540 + MCPA + Aim® June 8: Sencor® June 16: Antler® July 20: Coragen®

Weather: *Environment Canada – Leader Airport*



Results:

Target plant population (plant ft^{-2})	Plant density (plants ft^{-2})	Seedling mortality (%)	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
13	14.4	3.3	29.3	24.9	42.7
20	20.2	7.1	28.8	25.0	42.3
26	26.0	11.0	28.4	25.1	42.0
SE [2]	± 1.4	± 5.7	± 1.9	± 0.6	± 0.5
P-value [3,4]	*<0.001****	*0.065**	*0.368*	*0.692*	*0.047***

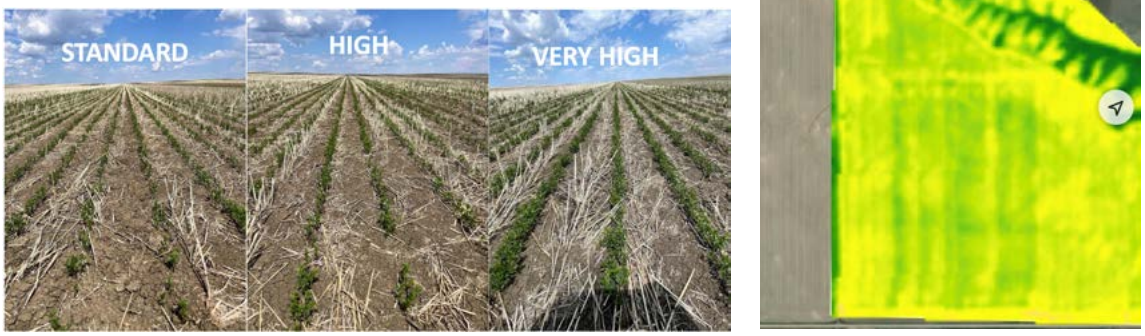
Summary:

Increased seeding rate resulted in significantly higher plant populations (P<0.001), even though seedling mortality may have been higher (P<0.1). Yield and protein were not significantly affected by differences in plant populations, but seed size decreased significantly with seeding rate (P<0.05). The lowest seeding rate was the most economical.

Economics:

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

Target plant population (plant ft^{-2})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
13	-	-	-	-	$0.00
20	+ 29 lbs.	- $15.37	+ 0 bu	+ $0	(- $15.37)
26	+ 59 lbs.	- $31.27	+ 0 bu	+ $0	(- $31.27)



There were visual differences in emergence and vegetation index between treatments.

To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

Simplot GROWER SOLUTIONS

Lentil Seeding Rate
(Gravelbourg)

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

Treatments:

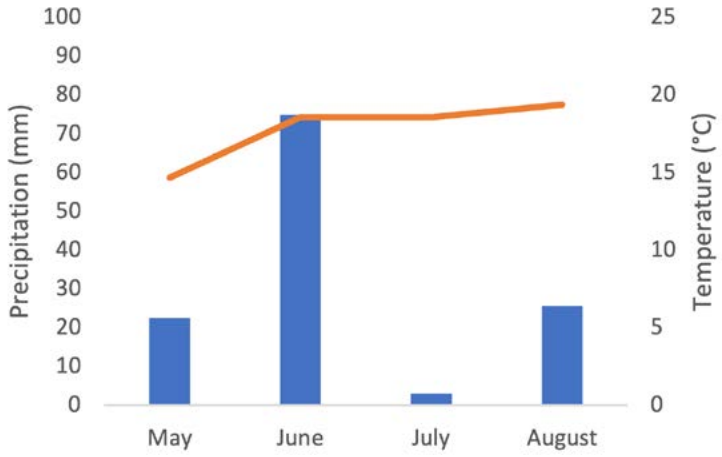
Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	12	97
2	18	146
3	24	195

Replicates: Four

General Trial Information:

Variety	CDC Greenstar (Large Green)
Thousand kernel weight	72.1 g
Germination	95%
Seed treatment	Vibrance Maxx®
Inoculant	TagTeam® BioniQ®
Previous crop	Durum wheat
Soil organic matter	2.7%
Residual Nitrate-N (0-12")	24 lb ac^{-1}
Soil type & Texture	Brown Chernozem,clay
Seeding date	May 17
Seeding implement & openers	Bourgault 3320, 0.75 in. bourgault openers
Seeding depth	1.25 in.
Seeding speed	4.5 mph
Row spacing	10 in.
Total applied fertilizer	5.5 N – 26 P actual lbs. ac^{-1} – seed-placed
Crop protection	Fall 2022: Fierce® EZ June 2: Sencor® June 28: Elatus® + Coragen®

Weather: *Environment Canada – Assiniboia Airport*



Results:

Target plant population (plant ft^{-2})	Plant density (plants ft^{-2})	Seedling mortality (%)	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
12	13.4	4.5	9.8	23.1	63.7
18	16.7	15.2	8.4	22.9	63.8
24	20.0	25.8	7.0	22.7	63.8
SE [2]	± 2.8	± 11.4	± 4.2	± 0.3	± 1.2
P-value [3,4]	*0.004***	*0.001***	*0.334*	*0.054**	*0.900*

Summary:
Increased seeding rate resulted in significantly higher plant populations (P<0.01) even though seedling mortality also significantly increased with seeding rate (P<0.01). Much of the trial area was affected by root rot due to early season moisture, and dry conditions in the remainder of the growing season resulted in low yield potential. Thus, yield and seed size were not significantly affected by seeding rate, but protein content may have been slightly lower at higher seeding rates (P<0.1). The lowest seeding rate was the most economical.

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

Target plant population (plant ft^{-2})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
12	-	-	-	-	$0.00
18	+ 49 lbs.	- $35.28	+ 0 bu	+ $0	(- $35.28)
24	+ 98 lbs.	- $70.56	+ 0 bu	+ $0	(- $70.56)

To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

HAWK'S AGRO

Lentil Seeding Rate
(Indian Head)

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

Treatments:

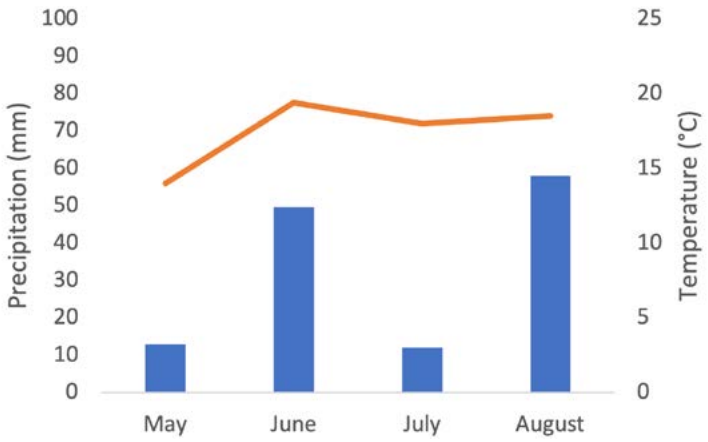
Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	9	42
2	13.5	63
3	18	84

Replicates: Four

General Trial Information:

Variety	CDC Proclaim (CL)
Thousand kernel weight	41.85 g
Germination	96%
Seed treatment	Vibrance Maxx® RFC + Intego®
Inoculant	Nodulator® + AGTIV® Peat
Previous crop	Canaryseed
Soil organic matter	4.5%
Residual Nitrate-N (0-6")	10 lbs ac^{-1}
Soil type & Texture	Black Chernozem, clay
Seeding date	May 9
Seeding implement & openers	Morris C2, Dutch universal opener
Seeding depth	0.75 in.
Seeding speed	4.5 mph
Row spacing	12 in.
Total applied fertilizer	10 N – 46 P – 30 K – 0 S lbs. ac^{-1} actual, all side-banded
Crop protection	Fall: Glyphosate + Fierce® + Express® June 5: Odyssey Ultra® Q June 22: Dyax® + Arrow® July 3: Cotegra®

Weather: *In-field weather station*



Results:

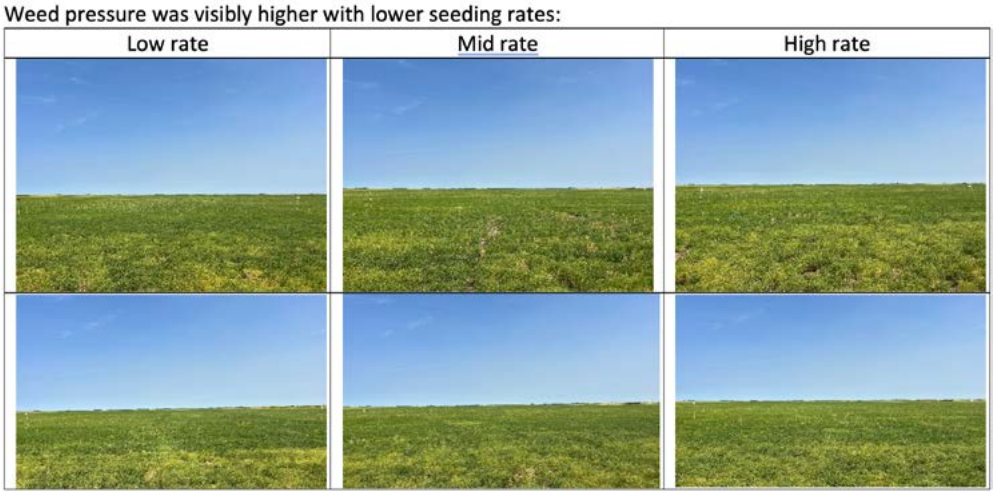
Target plant population (plant ft^{-2})	Plant density (plants ft^{-2})	Seedling mortality (%)	Yield (1) (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
9	10.3	5.0	41.0	24.7	41.8
13.5	12.7	15.1	40.3	23.9	42.2
18	15.1	25.2	39.5	23.0	42.5
SE (2)	± 1.5	± 9.0	± 3.8	± 2.5	± 0.9
P-value (3,4)	*0.001***	*0.006***	*0.543*	*0.319*	*0.250*

Summary:
Increased seeding rate resulted in significantly higher plant populations (P<0.01), even with increased seedling mortality (P<0.01). Yield, protein, and seed size were not significantly affected by differences in plant populations. The lowest seeding rate was the most economical.

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

Target plant population (plant ft^{-2})	Seeding rate	Seed cost (4)	Yield	Grain profit (5)	Net profit
9	-	-	-	-	$0.00
13.5	+ 21 lbs.	- $11.13	+ 0 bu	+ $0	(- $11.13)
18	+ 42 lbs.	- $22.26	+ 0 bu	+ $0	(- $22.26)

Weed pressure was visibly higher with lower seeding rates:



To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

IHARF
INDIAN HEAD AGRICULTURAL RESEARCH FOUNDATION

Lentil Seeding Rate
(Kindersley)

Objective: To evaluate the effect of seeding rate on seedling survivability and yield of small red lentils.

Treatments:

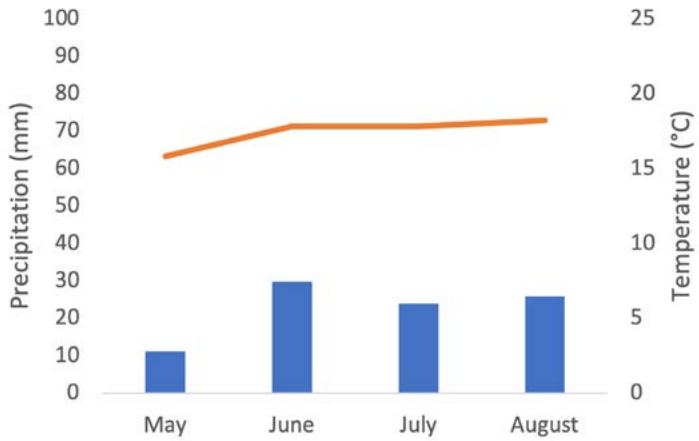
Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	12	49
2	18	73
3	24	97

Replicates: Four

General Trial Information:

Variety	CDC Maxim (CL)
Thousand kernel weight	37.12 g
Germination	98%
Seed treatment	Insure Pulse®
Inoculant	TagTeam Granular®
Previous crop	Barley
Soil organic matter	3.9%
Residual Nitrate-N (0-6")	14 lbs ac^{-1}
Soil type & Texture	Brown Chernozem, Variable texture - clay loam to heavy clay
Seeding date	May 17
Seeding implement & openers	Bourgault, 0.75 in. knives
Seeding depth	1.5 in.
Seeding speed	4.9 mph
Row spacing	10 in.
Total applied fertilizer	6 N – 20 P – 0 K – 5 S + 0.5 Zn lbs ac^{-1} actual (50 lbs ac^{-1} MESZ) All seed-placed
Crop protection	Fall: Edge® May 15: Voraxor® + Glyphosate June 10: Solo® Ultra Q® June 22: Decis®

Weather: *Environment Canada – Kindersley Airport*



Results:			
Target plant population (plant ft^{-2})	Plant density (plants ft^{-2})	Seedling mortality (%)	Yield [1] (bu ac^{-1})
12	12.8	5.7	31.9
18	17.0	13.6	31.7
24	21.1	21.5	31.5
SE [2]	± 1.3	± 6.5	± 2.4
P-value [3,4]	*<0.001***	*0.003***	*0.696*

Summary:
Increased seeding rate resulted in significantly higher plant populations (P<0.01), even though seedling mortality was also significantly higher (P<0.01). Yield was average overall and was not significantly affected by differences in plant populations. Thus, the lowest seeding rate was the most economical. Grain quality was not assessed at this site.

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

Target plant population (plant ft^{-2})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
12	-	-	-	-	$0.00
18	+ 24 lbs.	- $12.72	+ 0 bu	+ $0	(- $12.72)
24	+ 48 lbs.	- $25.44	+ 0 bu	+ $0	(- $25.44)

To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

Simplot GROWER SOLUTIONS

Lentil Seeding Rate
(Lucky Lake)

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

Treatments:

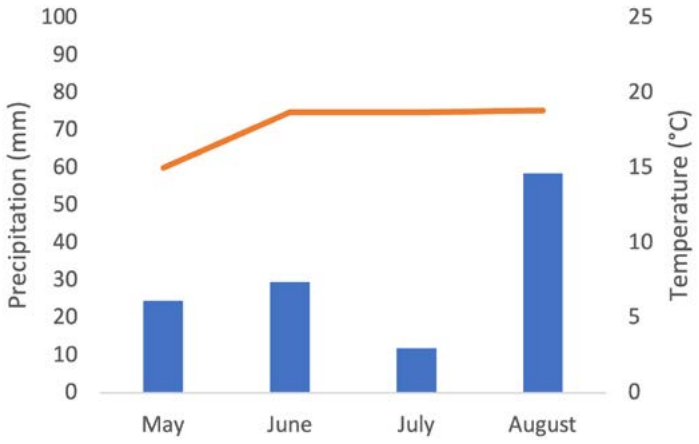
Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	12	46
2	18	69
3	24	92

Replicates: Four

General Trial Information:

Variety	CDC Maxim (CL)
Thousand kernel weight	35.46 g
Germination	99%
Seed treatment	Vibrance Maxx® RFC
Inoculant	Agtiv® Fuel™ Liquid
Previous crop	Durum wheat
Soil organic matter	2.8%
Residual Nitrate-N (0-6")	3 lb ac^{-1}
Soil type & Texture	Brown Chernozem, fine sandy loam
Seeding date	May 10
Seeding implement & openers	Flexicoil™ 5000, paired row
Seeding depth	1 in.
Seeding speed	4.2 mph
Row spacing	12 in.
Total applied fertilizer	4.5 N – 23 P – 3.5 K – 0 S lbs. ac^{-1} actual
Seed-placed fertilizer	None
Crop protection	Pre-emerg: Goldwing® + Glyphosate June 6: Davai® + Antler® July 6: Elatus®

Weather: *Environment Canada – Lucky Lake*



Results:

Target plant population	Plant density (plants ft^{-2})	Seedling mortality (%)	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
12	4.9	63.8	24.7	23.9	39.1
18	6.2	68.1	22.8	24.0	39.0
24	7.5	72.4	20.8	24.0	38.9
SE [2]	± 0.9	± 5.7	± 3.2	± 0.7	± 0.5
P-value [3,4]	*0.002***	*0.040***	*0.101*	*0.886*	*0.543*

Summary:

Increased seeding rate resulted in significantly higher plant populations (P<0.01), even though seedling mortality was very high overall, and also increased with seeding rates (P<0.05). Yield, protein, and seed size were not significantly affected by differences in plant populations. The lowest seeding rate was the most economical.

Economics:

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

Target plant population (plant ft^{-2})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
12	-	-	-	-	$0.00
18	+ 23 lbs.	- $12.19	+ 0 bu	+ $0	(- $12.19)
24	+ 46 lbs.	- $24.38	+ 0 bu	+ $0	(- $24.38)

To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

Simplot GROWER SOLUTIONS

Lentil Seeding Rate
(Luseland)

Objective: To evaluate the effect of seeding rate on seedling survivability across landscape positions, and on yield and grain quality of small red lentils.

Treatments:

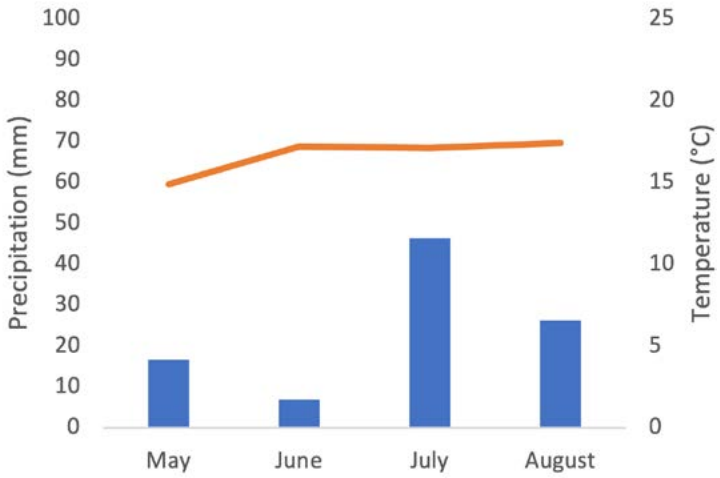
Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	12	55
2	18	83
3	24	111
4	Variable Rate (VR)	55 (depression) 69 (midslope) 99 (knoll)

Replicates: Four

General Trial Information:

Variety	CDC Proclaim (CL)
Thousand kernel weight	42.28 g
Germination	98%
Seed treatment	Insure Pulse®
Inoculant	Verdesian LIFT-kit™
Previous crop	Wheat
Soil organic matter	4.2%
Soil type & Texture	Dark Brown Chernozem, Various – loam, clay, heavy clay
Seeding date	May 16
Seeding depth	1.25 in.
Seeding speed	3.6 mph
Row spacing	12 in.
Total applied fertilizer	VR: Average 7 N – 27 P – 1 K – 0 S actual lbs. ac + Mg
Crop protection	May 13: Leopard® + Revenge® + M-power® June 9: Independence® + Assassin II® + Alpine G22® + Ninja® July 6: Spade® + Boron

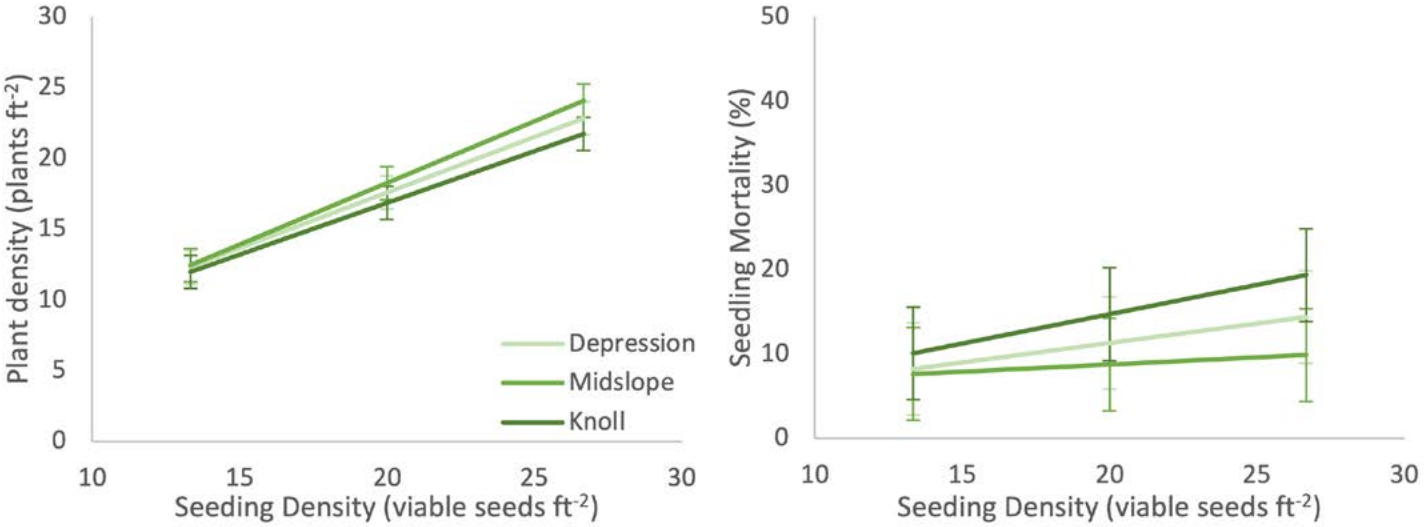
Weather: *Local station for precip + Environment Canada – Scott CDA for temps*



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)* [6]	*<0.001***	*0.017***
P-value *(Landscape position)*	*0.750*	*0.874*
P-value *(SR x LP)*	*0.339*	*0.504*



Plant density significantly increased with seeding rate (P<0.01), even though mortality also increased (P<0.05). Neither plant density nor mortality were affected by landscape position.

Target plant population (plant ft^{-2})	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
12	34.6	24.4	43.7
18	35.2	24.7	43.3
24	35.8	25.1	42.8
SE [2]	± 5.4	± 0.6	± 0.5
P-value [3,4]	*0.664*	*0.069**	*0.012***

An average seeding rate was determined for the VR treatments and included in the yield and grain quality regression analyses.

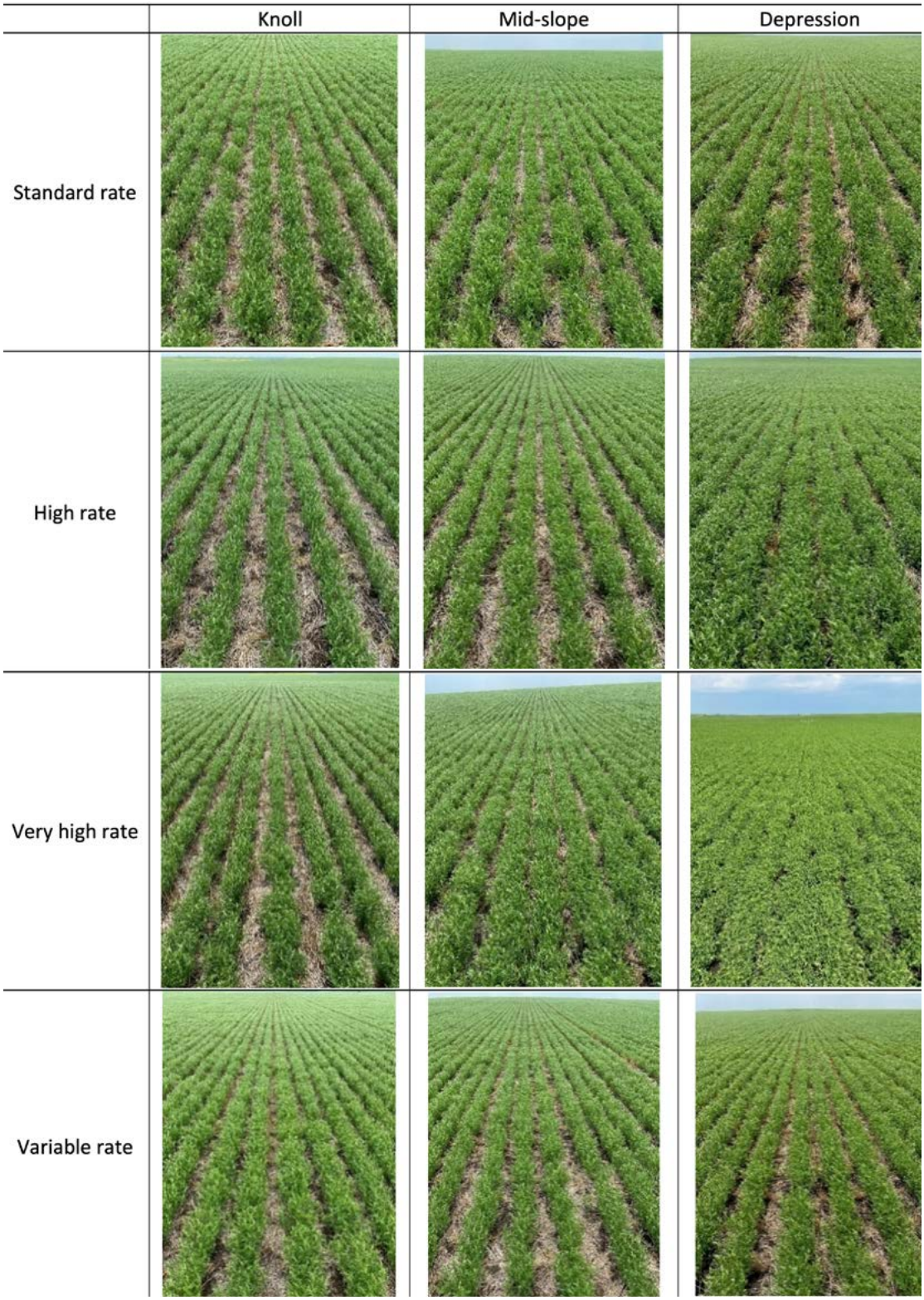
Lentil Seeding Rate (Luseland) continues...

Summary:
Higher plant populations with increased seeding rates did not have a significant effect on yield. Thus, the lowest seeding rate was the most economical. Higher seeding rates negatively affected seed size ($P<0.05$) and may have resulted in increased protein content ($P<0.1$). Yield may also be differentiated by landscape position within seeding rate treatments using yield monitor data, but this analysis has not been completed at this time.

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

Target plant population (plant ft^{-2})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
12	-	-	-	-	$0.00
VR	+ 19 lbs.	$10.07	+ 0 bu	+ $0	(-$10.07)
18	+ 28 lbs.	$14.84	+ 0 bu	+ $0	(-$14.84)
24	+ 56 lbs.	$29.68	+ 0 bu	+ $0	(-$29.68)

There were visual differences in emergence and canopy closure with different seeding rates.



To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

MAX AG CONSULTING Ltd.

Lentil Seeding Rate
(Major)

Objective: To evaluate the effect of seeding rate on seedling survivability across landscape positions, and on yield and grain quality of small red lentils.

Treatments:

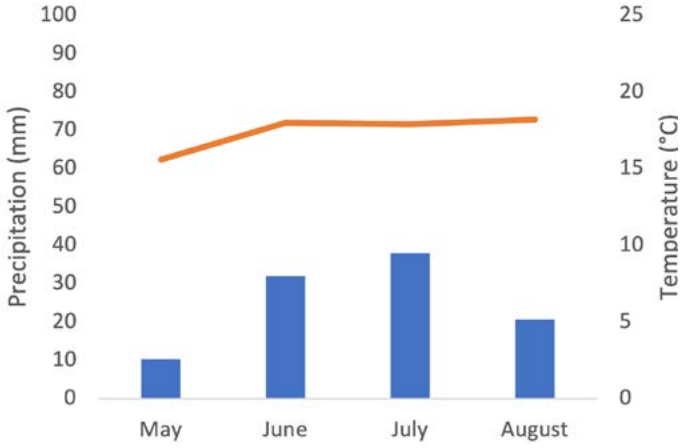
Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	12	55
2	18	83
3	24	110
4	Variable Rate (VR)	55 (depression) 69 (midslope) 99 (knoll)

Replicates: Four

General Trial Information:

Variety	CDC Proclaim (CL)
Thousand kernel weight	43 g
Germination	100%
Seed treatment	None
Inoculant	Nodulator Duo®
Previous crop	Barley
Soil organic matter	3.6%
Soil type & Texture	Dark Brown Chernozem, heavy clay
Seeding date	May 27
Seeding depth	1.25 in.
Seeding speed	4 mph
Row spacing	12 in.
Total applied fertilizer	VR: Average 7 N – 33 P actual lbs. ac^{-1}
Crop protection	May 27: Glyphosate + Voraxor® June 17: Davai® + Leopard®

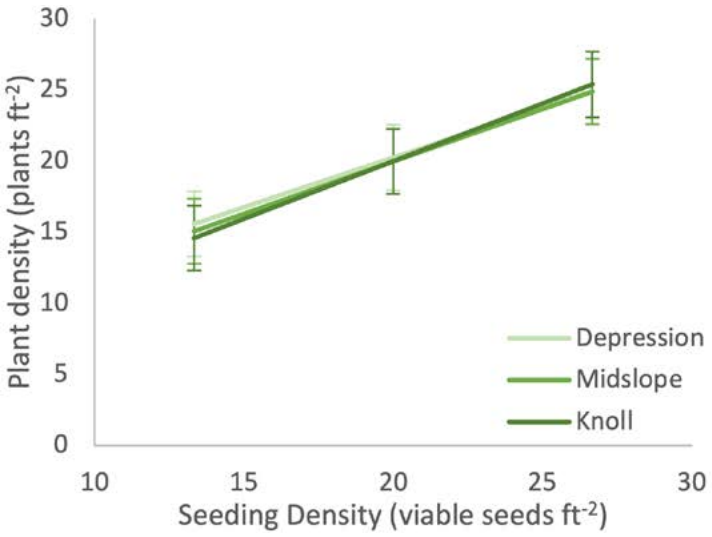
Weather: *Local station for precip + Environment Canada – Kindersley A for temps*

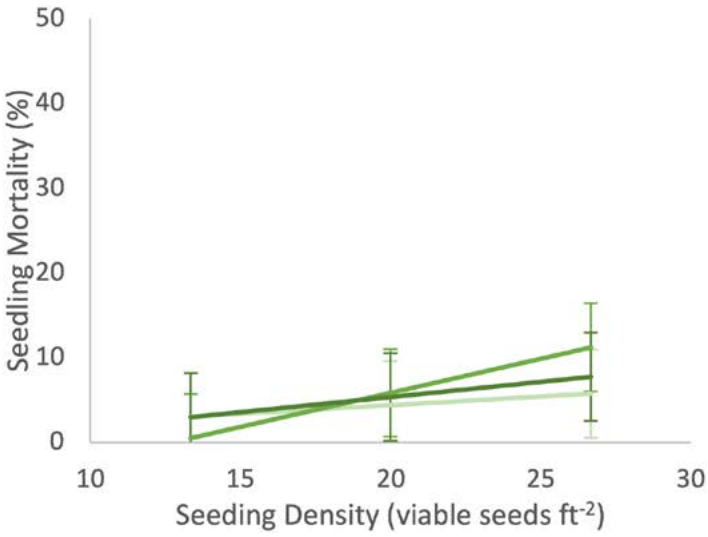


Results:

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)* [6]	*<0.001***	*0.039***
P-value *(Landscape position)*	*0.769*	*0.268*
P-value *(SR x LP)*	*0.801*	*0.204*





Plant density significantly increased with seeding rate (P<0.01), even though mortality also increased (P<0.05). Neither plant density no mortality were affected by landscape position.

Target plant population (plant ft^{-2})	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
12	30.1	24.8	38.4
18	29.0	24.9	38.5
24	28.0	24.9	38.7
SE [2]	± 2.5	± 0.6	± 0.4
P-value [3,4]	*0.118*	*0.973*	*0.217*

An average seeding rate was determined for the VR treatments and included in the yield and grain quality regression analyses.

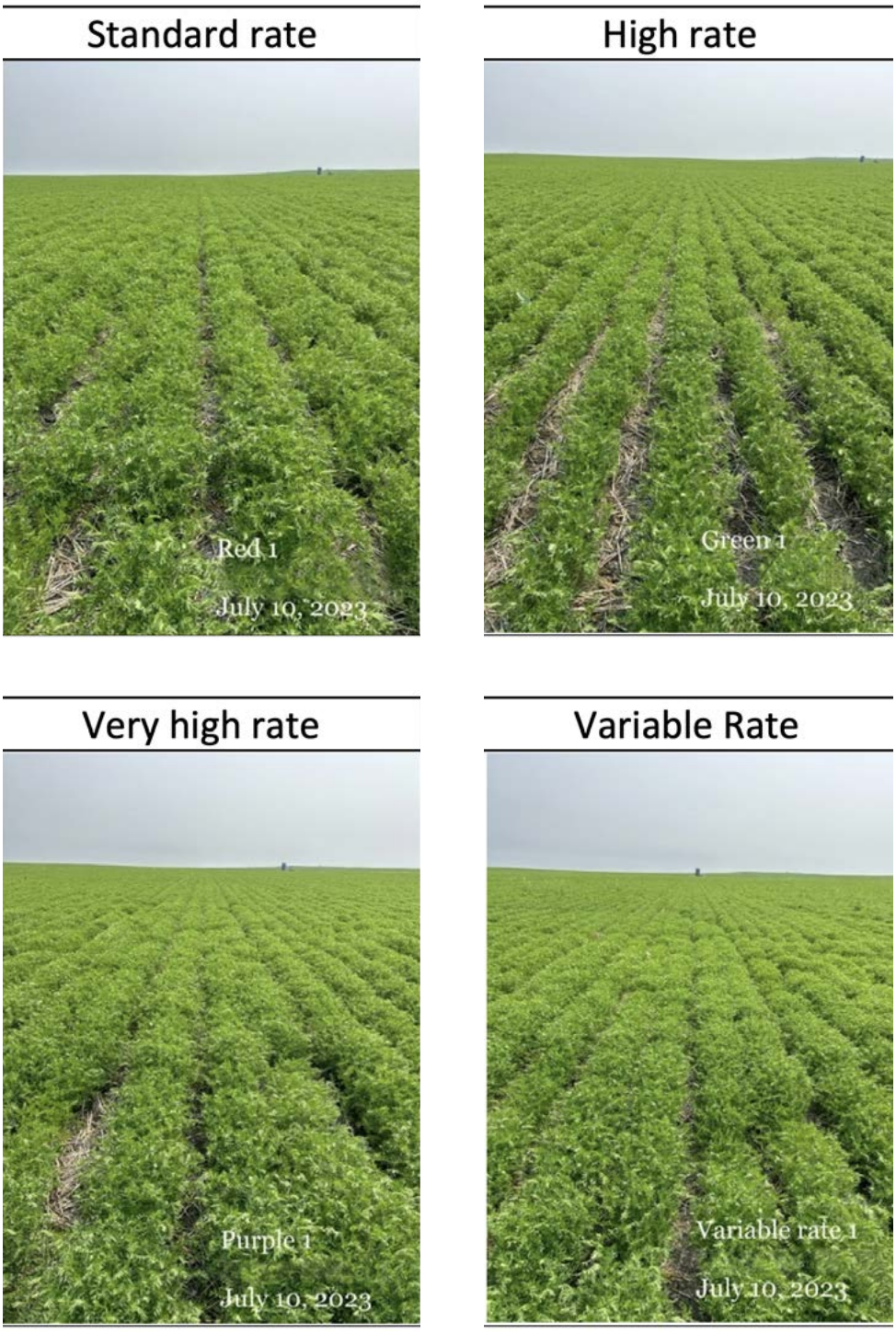
Lentil Seeding Rate (Major) continues...

Summary:
Higher plant populations resulting from increased seeding rates did not have a significant effect on yield. Thus, the lowest seeding rate was the most economical. Higher seeding rates did not affect protein content or seed size. Yield may also be differentiated by landscape position within seeding rate treatments using yield monitor data, but this analysis has not been completed at this time.

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

Target plant population (plant ft^{-2})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
12	-	-	-	-	$0.00
VR	+ 19 lbs.	$10.07	+ 0 bu	+ $0	(-$10.07)
18	+ 28 lbs.	$14.84	+ 0 bu	+ $0	(-$14.84)
24	+ 55 lbs.	$29.15	+ 0 bu	+ $0	(-$29.15)

Lentil stand under varying seeding rates, visual differences can be noted in canopy closure between treatments.



To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

MA AG CONSULTING Ltd.

Lentil Seeding Rate
(Marengo)

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

Replicates: Four

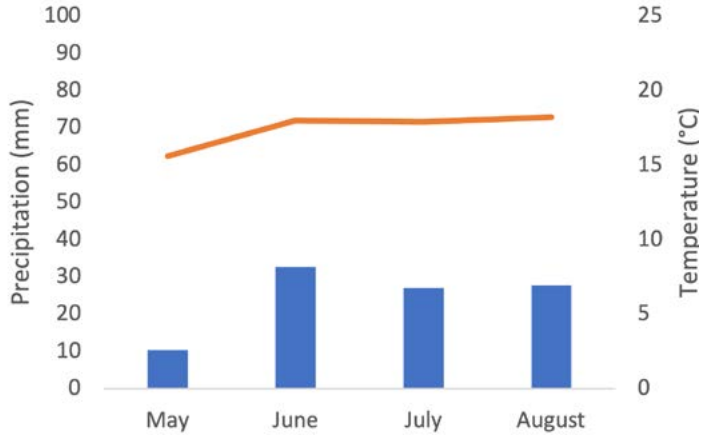
Treatments:

Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	12	52
2	18	78
3	24	104

General Trial Information:

Variety	CDC Maxim (CL)
Thousand kernel weight	40.24 g
Germination	99%
Seed treatment	Vibrance Maxx® RFC
Inoculant	TagTeam® BioniQ® Granular
Previous crop	Durum wheat
Soil organic matter	4.6%
Residual Nitrate-N (0-6")	13 lbs ac^{-1}
Soil type & Texture	Brown Chernozem, clay
Seeding date	May 4
Seeding implement & openers	Bourgault 3320 – 0.75 in. openers
Seeding depth	1.5 in.
Seeding speed	4 mph
Row spacing	10 in.
Total applied fertilizer	20 N – 20 P – 0 K – 5 S lbs ac^{-1} actual – all seed-placed
Crop protection	April 29: Glyphosate + Aim® May 29: Imazomox + Clethodim June 23: Elatus® + Coragen®

Weather: *Environment Canada – Kindersley A*



Results:

Target plant population (plant ft^{-2})	Plant density (plants ft^{-2})	Seedling mortality (%)	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
12	12.5	7.2	27.7	26.0	37.9
18	19.0	6.1	27.0	25.1	38.3
24	25.6	5.1	26.3	24.1	38.7
SE [2]	± 1.6	± 6.0	± 2.0	± 3.8	± 1.1
P-value [3,4]	*<0.001****	*0.590*	*0.207*	*0.441*	*0.303*

Summary:
Plant population increased significantly with seeding rate (P<0.01), and seedling mortality did not differ between seeding rates. Yield or grain quality were not significantly affected by the differences in plant populations. Thus, the lowest seeding rate was the most economical.

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

Target plant population (plants ac^{-1})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
12	-	-	-	-	$0.00
18	+ 26 lbs.	- $13.78	+ 0 bu	+ $0	(- $13.78)
24	+ 52 lbs.	- $27.56	+ 0 bu	+ $0	(- $27.56)

To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

Simplot GROWER SOLUTIONS

Lentil Seeding Rate
(Mendham)

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

Replicates: Four

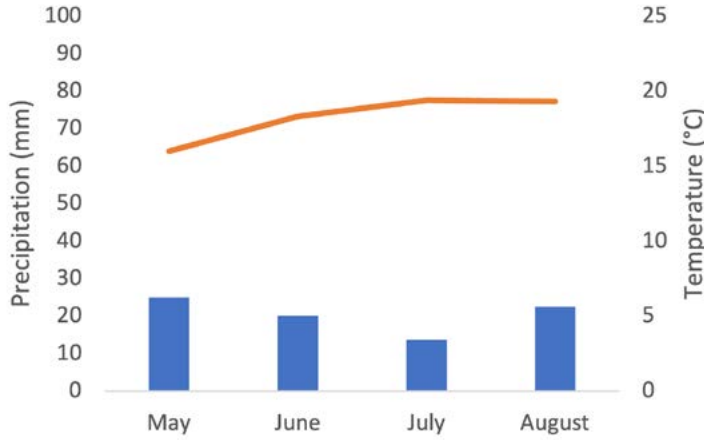
Treatments:

Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	18	60
2	27	90
3	36	120

General Trial Information:

Variety	CDC Maxim (CL)
Thousand kernel weight	30.7 g
Germination	99%
Seed treatment	None
Inoculant	LALFIX® Spherical
Previous crop	Durum wheat
Soil organic matter	2.4%
Residual Nitrate-N (0-6")	16 lbs. ac^{-1}
Soil type & Texture	Brown chernozem, silty loam
Seeding date	May 19
Seeding implement & openers	Disc
Seeding depth	2 in.
Seeding speed	6.7 mph
Row spacing	10 in.
Total applied fertilizer	4.6 N – 16.5 P – 3.2 K – 9.6 S + 7.3 Ca actual lbs. ac^{-1} – Seed-placed
Crop protection	May 18: Glyphosate + Aim® May 31: Insecticide

Weather: *Environment Canada – Leader Airport*



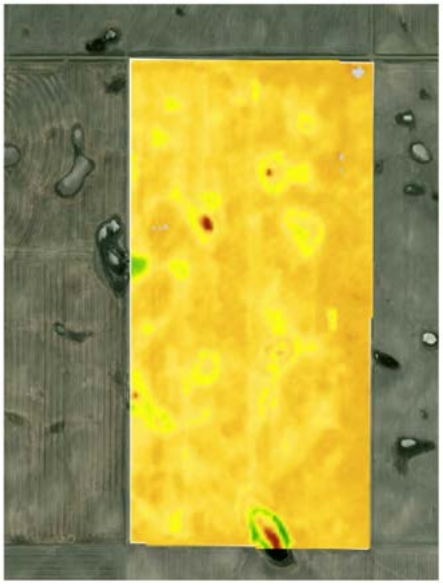
Results:

Target plant population (plant ft^{-2})	Plant density (plants ft^{-2})	Seedling mortality (%)	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
18	10.9	46.3	7.6	24.5	38.2
27	16.0	46.8	6.2	24.4	38.2
36	21.2	47.2	4.8	24.2	38.2
SE [2]	± 2.6	± 7.5	± 2.7	± 0.6	± 0.5
P-value [3,4]	*<0.001****	*0.795*	*0.148*	*0.402*	*0.936*

Summary:
Increased seeding rate resulted in significantly higher plant populations (P<0.01). Seedling mortality was very high overall and did not differ significantly with seeding rate. Dry conditions throughout the growing season resulted in low yield potential. Thus, yield and grain quality were not significantly affected by seeding rate. The lowest seeding rate was the most economical.

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

Target plant population (plants ac^{-1})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
18	-	-	-	-	$0.00
27	+ 30 lbs.	- $15.90	+ 0 bu	+ $0	(- $15.90)
36	+ 60 lbs.	- $31.80	+ 0 bu	+ $0	(- $31.80)



NDVI Imagery taken June 19.

Visual differences in maturity with different seeding rates.

To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

Simplot GROWER SOLUTIONS

Lentil Seeding Rate
(Milden 1)

Objective: To evaluate the effect of seeding rate on seedling survivability across landscape positions, and on yield and grain quality of small red lentils.

Treatments:

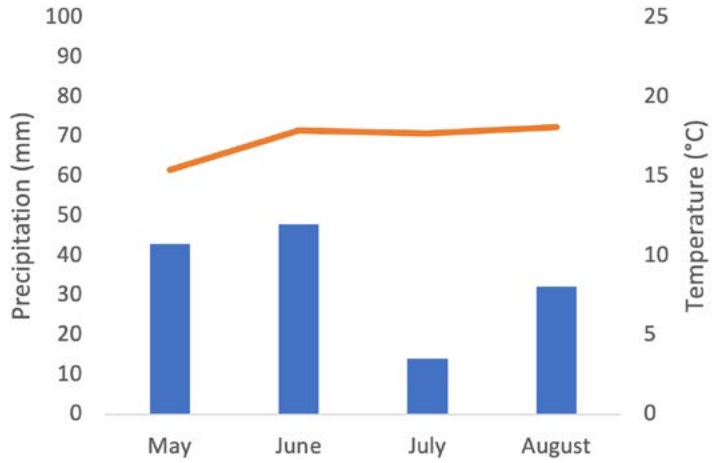
Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	12	54
2	18	81
3	24	108

Replicates: Four

General Trial Information:

Variety	CDC Maxim (CL)
Thousand kernel weight	37.78 g
Germination	90%
Seed treatment	Vitaflo™
Inoculant	Xite Bio™
Previous crop	Wheat
Soil organic matter	3.9%
Residual Nitrate-N (0-6")	76 lbs. ac^{-1}
Soil type & Texture	Dark Brown Chernozem, loam / clay loam
Seeding date	May 13
Seeding implement & openers	John Deere 1830 single shoot air drill
Seeding depth	1 in.
Seeding speed	4.5 mph
Row spacing	12 in.
Total applied fertilizer	5 N – 16 P – 0 K – 4 S + 0.4 Zn actual lbs. ac^{-1} – seed-placed
Crop protection	May 11: Voraxor® Complete + Glyphosate June 12: Davai®+ Antler® Unpacked Silencer®

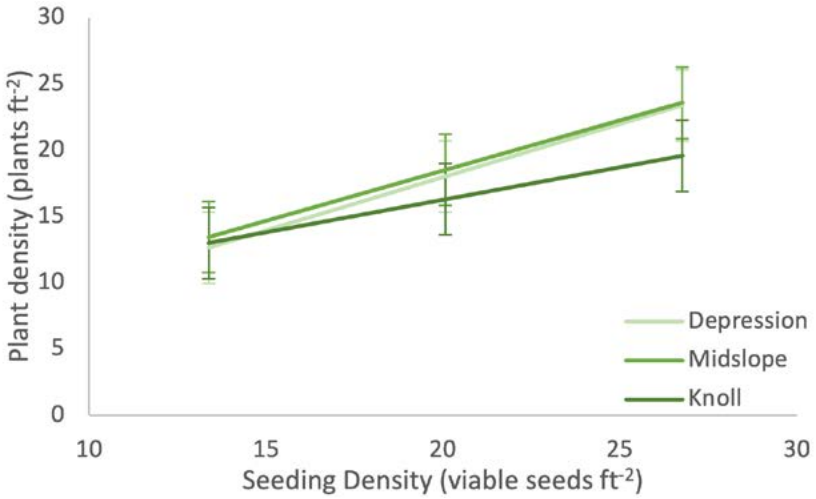
Weather: *Environment Canada – Rosetown East*



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)* [6]	*<0.001***	*0.055**
P-value *(Landscape position)*	*0.393*	*0.638*
P-value *(SR x LP)*	*0.133*	*0.256*



Seeding rate significantly increased plant populations overall (P<0.01) but did not differ significantly by landscape position. Error bars indicate the standard error.

Target plant population (plant ft^{-2})	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
12	16.8	21.9	33.5
18	18.3	22.7	33.7
24	19.9	23.9	33.8
SE [2]	± 1.4	± 0.9	± 0.5
P-value [3,4]	*0.006***	*0.013***	*0.450*

Lentil Seeding Rate (Milden 1) continues...

Summary:

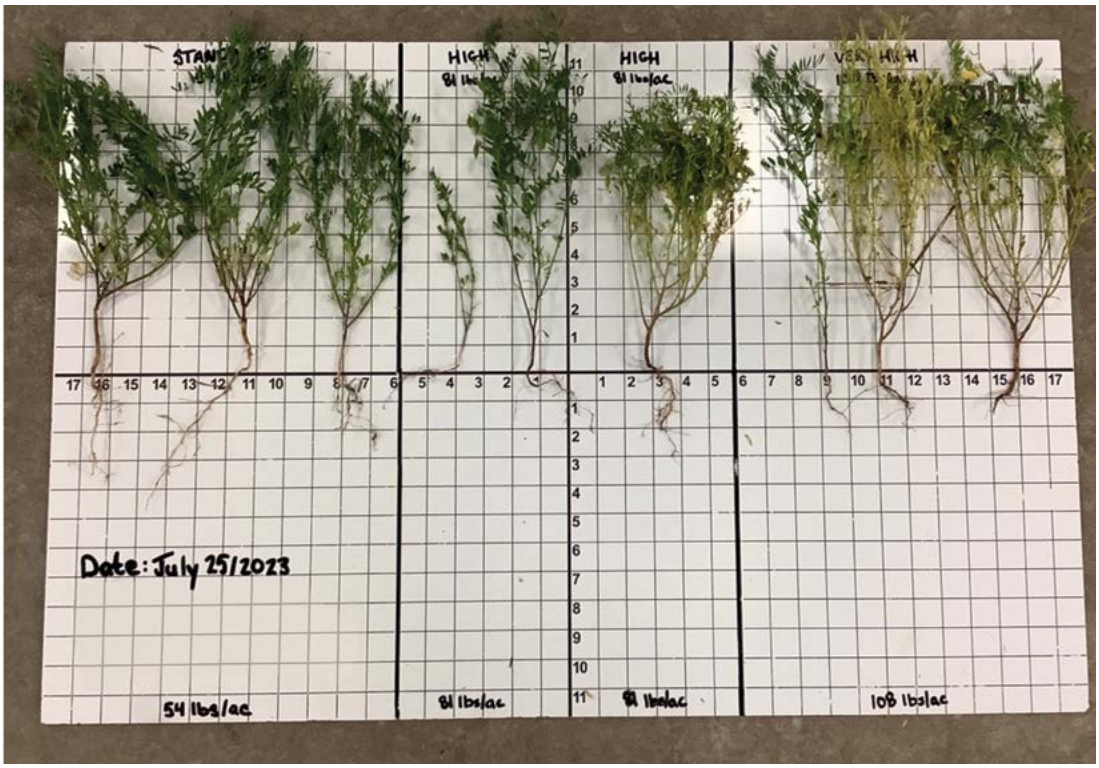
Plant populations increased significantly with seeding rates (P<0.01), even though seedling mortality may also have been higher as a result of increased seeding rates (P<0.1, not shown). Neither plant density or mortality varied significantly with landscape position. Yield and protein both increased with seeding rates, so the higher seeding rates were economically beneficial. Seed size did not differ between seeding rates.

Economics:

Seeding rate had a positive effect on yield. The increase in grain profit was more than the additional seed cost, thus net profit increased with higher seeding rates.

Target plant population (plants ac^{-1})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
12	-	-	-	-	$0.00
18	+ 27 lbs.	- $14.31	+ 1.5 bu	$31.28	$16.97
24	+ 54 lbs.	- $28.62	+ 3.1 bu	$64.65	$36.03

Lentil emergence on rows seeded at 54 lbs/ac (left) and 81 lbs/ac (right).



Visual differences in plant development in response to seeding rate.

To review footnote references please refer to overall trial summary on page 57.

Lentil Seeding Rate
(Milden 2)

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

Replicates: Four

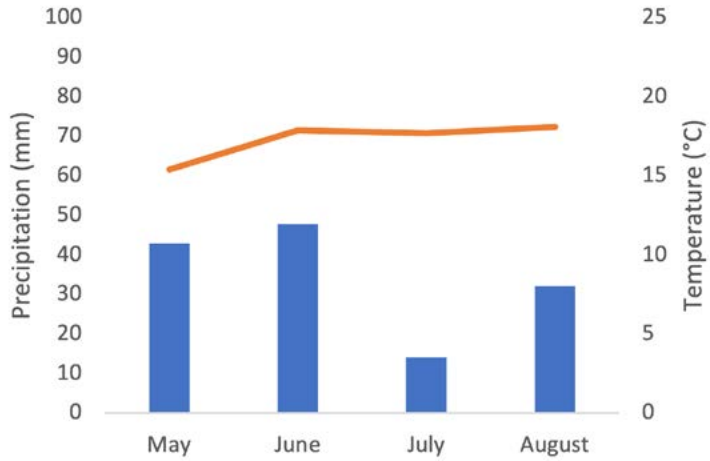
Treatments:

Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	12	57
2	18	85
3	24	114

General Trial Information:

Variety	CDC Proclaim (CL)
Thousand kernel weight	41.34 g
Germination	93%
Seed treatment	Vibrance Maxx® RFC
Inoculant	XiteBio® PulseRhizo
Previous crop	Barley
Soil organic matter	4.1%
Residual Nitrate-N (0-6")	19 lbs. ac^{-1}
Soil type & Texture	Dark Brown Chernozem, heavy clay
Seeding date	May 18
Seeding implement & openers	Seedhawk 1 in. openers
Seeding depth	1 in.
Seeding speed	4.8 mph
Row spacing	12 in.
Total applied fertilizer	7 N – 24 P – 0 K – 6 S lbs. ac^{-1} actual (S10) – Seed-placed
Crop protection	May 16: Aim® + Glyphosate June 9: Squadron® + Power2L June 29: Elatus® Silencer® + Coragen Max®

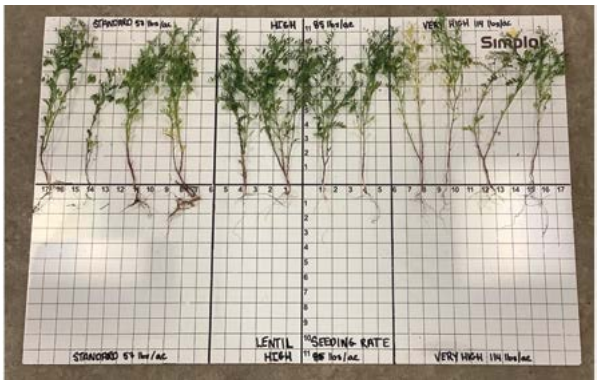
Weather: *Environment Canada – Rosetown East*



Results:

Target plant population (plant ft^{-2})	Plant density (plants ft^{-2})	Seedling mortality (%)	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1,000 seeds^{-1})
12	13.6	2.6	20.3	24.8	40.7
18	19.1	4.9	22.0	24.9	40.9
24	24.7	7.4	23.6	25.1	41.1
SE [2]	± 1.2	± 4.5	± 1.5	± 0.8	± 0.7
P-value [3,4]	*<0.001****	*0.041***	*0.008****	*0.464*	*0.484*

Summary:
Increased seeding rate resulted in significantly higher plant populations (P<0.01), even though seedling mortality was also significantly higher at higher seeding rates (P<0.05). Yield increased significantly with seeding rate (P<0.01), but grain quality was not affected. Increasing the seeding rate was economically beneficial at this site.



Visual differences in plant development under different seeding rates.

Weed pressure was visibly lower with very high seeding rate compared to high and standard rates.

Economics:
Seeding rate had a positive effect on yield. The increase in grain profit was greater than the cost of additional seed, thus net profit increased with higher seeding rates.

Target plant population (plant ft^{-2})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
12	-	-	-	-	$0.00
18	+ 28 lbs.	- $14.84	+ 1.7 bu	+ $35.46	+ $20.62
24	+ 57 lbs.	- $30.21	+ 3.3 bu	+ $68.82	+ $38.61

To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

Simplot GROWER SOLUTIONS

Lentil Seeding Rate
(Plenty)

Objective: To evaluate the effect of seeding rate on seedling survivability across landscape positions, and on yield and grain quality of small red lentils.

Replicates: Four

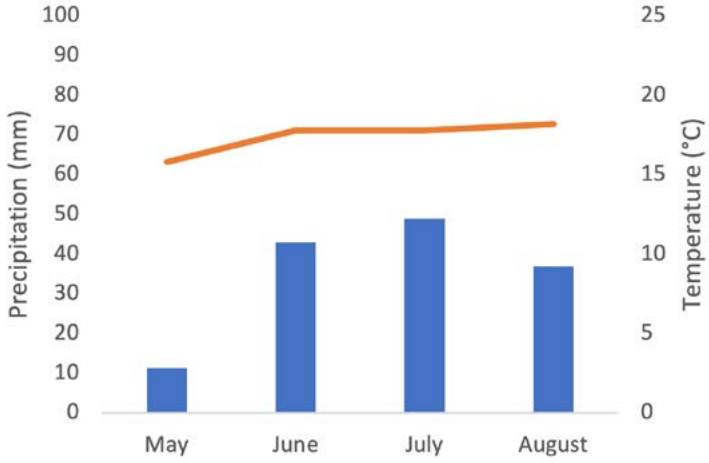
Treatments:

Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	12	55
2	18	82
3	24	110
4	Variable Rate (VR)	55 (Depression) 68 (Midslope) 99 (Knoll)

General Trial Information:

Variety	CDC Maxim (CL)
Thousand kernel weight	41.02 g
Germination	96%
Seed treatment	Vitaflo™
Inoculant	Agtiv® Fuel® Granular
Previous crop	Durum Wheat
Soil organic matter	4.1%
Residual Nitrate-N (0-6")	9 lbs ac^{-1}
Soil type & Texture	Dark Brown Chernozem, heavy clay
Seeding date	May 21
Seeding depth	1 in.
Seeding speed	6-8 mph
Row spacing	10 in.
Total applied fertilizer	VR: Average 4 N – 20 P + 2 Mg actual lbs. ac^{-1}
Crop protection	May 19: Glyphosate + Goldwing® June 11: Sencor® June 16: Solo® + Centurion®+ Nexicor®

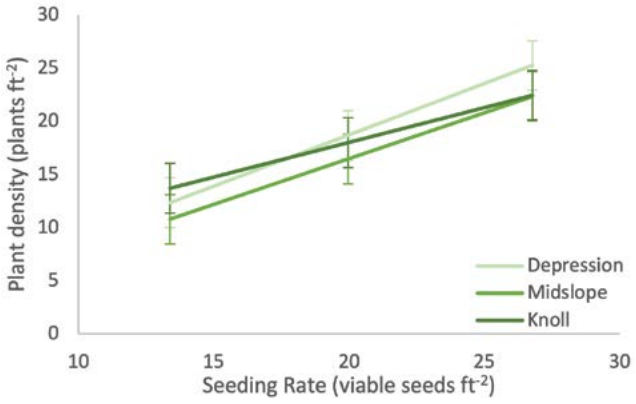
Weather: *Local station for precip + Environment Canada – Kindersley Airport for temps*



Results:

Plant density was assessed 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)* [6]	<0.001***	0.406
P-value *(Landscape position)*	0.265	0.103
P-value *(SR x LP)*	0.235	0.162



The effect of seeding rate on plant density was significant (P<0.01) but did not differ significantly by landscape position. Error bars indicate the standard error.

Target plant population (plant ft^{-2})	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
12	47.0	24.7	40.9
18	44.1	24.6	41.0
24	41.1	24.4	41.1
SE [2]	± 3.2	± 0.6	± 0.6
P-value [3,4]	*0.014***	*0.419*	*0.580*

An average seeding rate was determined for the VR treatments and included in the yield and grain quality regression analyses.

Summary:

Plant populations increased significantly with seeding rates but seedling mortality was not affected by seeding rate, regardless of landscape position. Yield decreased with increased seeding rates, thus the lowest seeding rate was the most economical. Grain quality was not significantly affected by seeding rate. Yield may also be differentiated by landscape position within treatments using yield monitor data, but this analysis has not been completed at this time.

Economics:

There was a negative effect of seeding rate on yield, thus net profit declined with increased seeding rate.

Target plant population (plant ft^{-2})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
12	-	-	-	-	$0.00
VR	+ 19 lbs. (avg)	- $10.07	- 2.0 bu (avg)	(- $41.71)	(- $31.64)
18	+ 27 lbs.	- $14.31	- 2.9 bu	(- $60.48)	(- $74.79)
24	+ 55 lbs.	- $29.15	- 5.9 bu	(- $123.05)	(- $152.20)

To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

MA AG CONSULTING Ltd.

Lentil Seeding Rate
(Rosetown 1)

Objective: To evaluate the effect of seeding rate on seedling survivability across landscape positions, and on yield and grain quality of small red lentils.

Treatments:

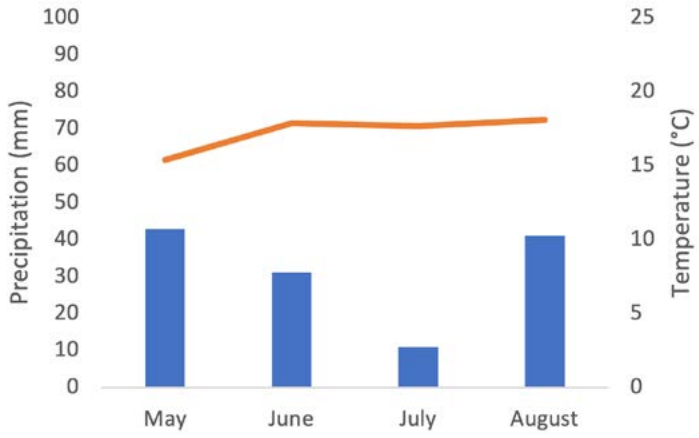
Replicates: Four

Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	12	50
2	18	75
3	24	100
4	Variable Rate (VR)	50 (Depression) 66 (Midslope) 90 (Knoll)

General Trial Information:

Variety	CDC Maxim (CL)
Thousand kernel weight	38.35 g
Germination	98%
Seed treatment	Vibrance Maxx®
Inoculant	Liquid Nodulator®
Previous crop	Malt barley
Soil organic matter	4.3%
Soil type & Texture	Brown Chernozem, clay loam
Seeding date	May 19
Seeding depth	2 in.
Seeding speed	4.6 mph
Row spacing	12 in.
Total applied fertilizer	VR: Average 6 N – 14 P – 1 K – 0 S (MAP + Alpine)
Crop protection	May 19: Goldwing® + Glyphosate June 10: Metribuzin June 15: Coragen® Max

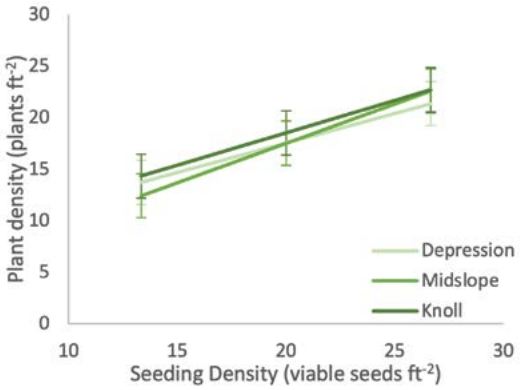
Weather: *Local station for precip + Environment Canada – Rosetown East for temps*



Results:

Plant density was assessed 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)* [6]	*<0.001****	*0.052**
P-value *(Landscape position)*	*0.348*	*0.411*
P-value *(SR x LP)*	*0.382*	*0.450*



Plant density significantly increased with seeding rate (P<0.01), but was not affected by landscape position. Seedling mortality may have increased with seeding rate (P<0.1, not shown), but also was unaffected by landscape position.

Target plant population (plant ft^{-2})	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
12	21.9	23.3	37.7
18	22.1	23.4	38.0
24	22.2	23.5	38.3
SE [2]	± 1.9	± 0.6	± 0.4
P-value [3,4]	*0.794*	*0.629*	*0.030***

An average seeding rate was determined for the VR treatments and included in the yield and grain quality regression analyses.

Summary:

Higher plant populations with increased seeding rates did not have a significant effect on yield. Thus, the lowest seeding rate was the most economical. Higher seeding rates positively affected seed size (P<0.05) but did not result in increased protein content. Yield may also be differentiated by landscape position within seeding rate treatments using yield monitor data, but this analysis has not been completed at this time.

Economics:

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

Target plant population (plant ft^{-2})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
12	-	-	-	-	$0.00
VR	+ 19 lbs.	$10.07	+ 0 bu	+ $0	(-$10.07)
18	+ 25 lbs.	$13.25	+ 0 bu	+ $0	(-$13.25)
24	+ 50 lbs.	$26.50	+ 0 bu	+ $0	(-$26.50)

Plant growth across various treatments was observed on July 17.

To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

MAX AG CONSULTING Ltd.

Lentil Seeding Rate
(Rosetown 2)

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

Replicates: Four

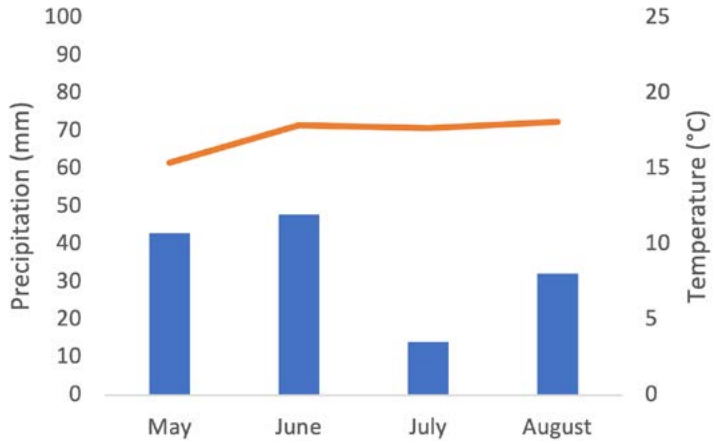
Treatments:

Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	12	56
2	18	84
3	24	111

General Trial Information:

Variety	CDC Maxim (CL)
Thousand kernel weight	40.4 g
Germination	93%
Seed treatment	Vibrance Maxx® RFC
Inoculant	N-Row®
Previous crop	Durum wheat
Soil organic matter	5.2%
Residual Nitrate-N (0-6")	70 lbs. ac^{-1}
Soil type & Texture	Dark Brown Chernozem, heavy clay
Seeding date	May 13
Seeding implement & openers	Bourgault .75 in. knives
Seeding depth	1.75 in.
Seeding speed	4.5 mph
Row spacing	12 in.
Total applied fertilizer	4.5 N – 20.3 P actual lbs. ac^{-1}, Seed-placed
Crop protection	Fall: Fierce® May 12: Glyphosate June 17: Antler® Unpack July 27: Silencer®

Weather: *Environment Canada – Rosetown East*



Results:

Target plant population (plant ft^{-2})	Plant density (plants ft^{-2})	Seedling mortality (%)	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
12	8.7	36.8	18.6	26.4	39.7
18	12.6	37.3	19.0	25.6	39.3
24	16.3	37.8	19.4	24.8	39.0
SE [2]	± 1.8	± 8.5	± 1.5	± 4.0	± 1.8
P-value [3,4]	*<0.001****	*0.861*	*0.429*	*0.544*	*0.593*

Summary:
Increased seeding rate resulted in significantly higher plant populations (P<0.01). Seedling mortality was very high overall and did not differ significantly with seeding rate. Dry conditions throughout the growing season resulted in low yield potential. Thus, yield and grain quality were not significantly affected by seeding rate. The lowest seeding rate was the most economical.

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

Target plant population (plant ft^{-2})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
12	-	-	-	-	$0.00
18	+ 28 lbs.	- $14.84	+ 0 bu	+ $0	(- $14.84)
24	+ 55 lbs.	- $29.15	+ 0 bu	+ $0	(- $29.15)

To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

Simplot GROWER SOLUTIONS

Lentil Seeding Rate
(Shaunavon)

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

Replicates: Four

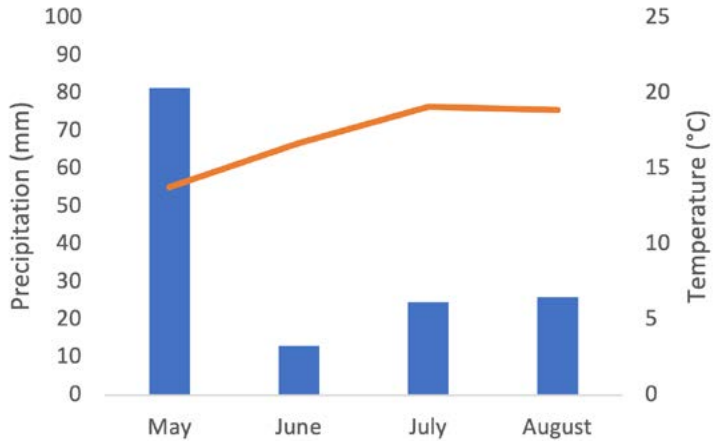
Treatments:

Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	15	60
2	22	90
3	29	120

General Trial Information:

Variety	CDC Proclaim (CL)
Thousand kernel weight	38.75 g
Germination	100%
Seed treatment	Vibrance Maxx®
Inoculant	LALFIX®
Previous crop	Barley
Soil organic matter	3.4%
Residual Nitrate-N (0-6")	13 lbs. ac^{-1}
Soil type & Texture	Dark Brown Chernozem, clay loam
Seeding date	June 2
Seeding implement & openers	Bourgault 0.75 in.
Seeding depth	1 in.
Seeding speed	4.9 mph
Row spacing	10 in.
Total applied fertilizer	9.5 N – 24 P – 0 K – 11 S + 0.3 B lbs. ac^{-1} actual – Seed-placed
Crop protection	May 19: Focus® June 28: Coragen Max®

Weather: *Environment Canada – Eastend Cypress*



Results:

Target plant population (plant ft^{-2})	Plant density (plants ft^{-2})	Seedling mortality (%)	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
15	15.6	20.3	8.2	24.7	39.8
22	14.8	38.6	7.0	24.7	39.9
29	14.0	56.8	5.8	24.6	39.9
SE [2]	± 5.3	± 13.9	± 1.2	± 0.8	± 0.7
P-value [3,4]	*0.644*	*0.002****	*0.003****	*0.897*	*0.787*

Summary:

Increased seeding rate did not significantly affect plant populations, as seedling mortality was significantly higher with increased seeding rate (P<0.01). Heavy weed pressure as well as hot and dry growing conditions at this site resulted in low yields overall. Yield declined significantly with increased seeding rate (P<0.001) but grain quality was not affected. The lowest seeding rate was the most economical.

Economics:

Seeding rate had a significant negative effect on yield and so higher seeding rates resulted in a loss in grain profit. Net profit declined with increased seeding rate.

Target plant population (plant ft^{-2})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
15	-	-	-	-	$0.00
22	+ 30 lbs.	- $15.90	- 1.2 bu	(- $25.03)	(- $40.93)
29	+ 60 lbs.	- $31.80	- 2.4 bu	(- $50.05)	(- $81.85)

To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

Simplot GROWER SOLUTIONS

Lentil Seeding Rate
(Stranraer)

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

Treatments:

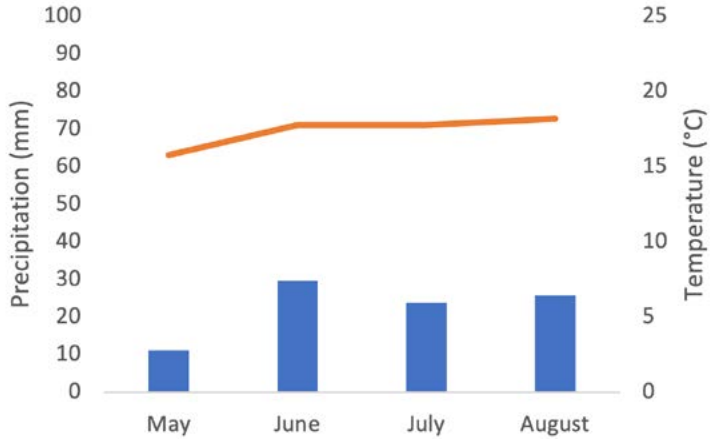
Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	12	62
2	18	93
3	24	123

Replicates: Four

General Trial Information:

Variety	CDC Impulse (CL)
Thousand kernel weight	47.62 g
Germination	99%
Seed treatment	Trilex® Evergol®
Inoculant	Cell-Tech® Liquid
Previous crop	Spring wheat
Soil organic matter	3.1%
Residual Nitrate-N (0-6")	10 lbs. ac^{-1}
Soil type & Texture	Dark Brown Chernozem, heavy clay
Seeding date	May 9
Seeding implement & openers	Pillar disc drill, disc style opener
Seeding depth	1 in.
Row spacing	10 in.
Total applied fertilizer	10 N – 3 P actual lbs. ac^{-1} – Seed-placed
Crop protection	9.5 N – 24 P – 0 K – 11 S + 0.3 B lbs. ac^{-1} actual – Seed-placed
Crop protection	April 27: Edge® June 13: Squadron® June 19: Centurion® June 23: Labamba®

Weather: *Environment Canada station – Kindersley airport*



Results:

Target plant population (plant ft^{-2})	Plant density (plants ft^{-2})	Seedling mortality (%)	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
12	13.8	6.1	28.5	23.8	50.5
18	14.5	24.6	28.2	24.0	50.5
24	15.3	42.6	27.8	24.3	50.6
SE [2]	± 3.6	± 14.7	± 4.4	± 0.8	± 1.0
P-value [3,4]	*0.526*	*0.005****	*0.789*	*0.342*	*0.833*

Summary:
Plant populations did not differ significantly between seeding rates, and seedling mortality was significantly higher at higher seeding rates (P<0.01). Yield and grain quality did not differ significantly with seeding rates, but this could be a result of increased seedling mortality and lower than targeted plant populations with higher seeding rates. Thus, the lowest seeding rate was the most economical.

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

Target plant population (plant ft^{-2})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
12	-	-	-	-	$0.00
18	+ 31 lbs.	- $16.43	+ 0 bu	+ $0	(- $16.43)
24	+ 61 lbs.	- $32.33	+ 0 bu	+ $0	(- $32.33)

To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

Simplot GROWER SOLUTIONS

Lentil Seeding Rate
(Vibank)

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

Replicates: Four

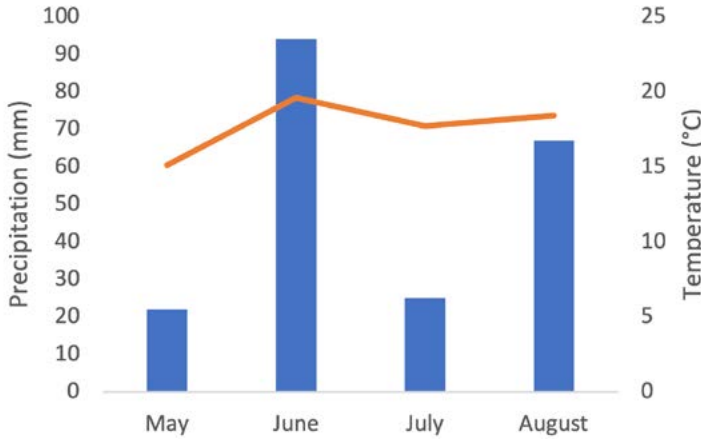
Treatments:

Treatment No.	Target plant population (plants ft^{-2})	Actual seeding rate (lbs. ac^{-1})
1	12	46
2	24	87

General Trial Information:

Variety	CDC Plato (French greens)
Thousand kernel weight	31.6 g
Germination	92%
Seed treatment	Vibrance Maxx® RFC
Inoculant	AGTIV® Fuel™ Liquid
Previous crop	Spring wheat
Soil organic matter	3.5%
Residual Nitrate-N (0-6")	8 lbs. ac^{-1}
Soil type & Texture	Dark Brown Chernozem, loam
Seeding date	May 10
Seeding implement & openers	Morris Paired Row
Seeding depth	1.5 in.
Seeding speed	4.3 mph
Row spacing	10 in.
Total applied fertilizer	4 N – 21 P – 21 K – 40 S lbs. ac^{-1} actual
Crop protection	May 9: Glyphosate (Valtera™ EZ in fall) June 6: Solo® ADV + Quizalofop July 16: Coragen® Elatus®

Weather: *In-field precip + Environment Canada temps*



Results:

Target plant population (plant ft^{-2})	Plant density (plants ft^{-2})	Seedling mortality (%)	Yield [1] (bu ac^{-1})	Protein (%)	Seed size (g 1000 seeds^{-1})
12	15.4	0.0	39.8	22.7	38.2
24	25.5	4.0	38.5	22.6	38.6
SE [2]	± 1.3	± 2.6	± 2.1	± 0.2	± 0.4
P-value [3,4]	*0.001***	*0.067**	*0.650*	*0.326*	*0.158*

Summary:
Increased seeding rate resulted in significantly higher plant populations (P<0.01). Plant populations were higher than targeted, so estimated seedling mortality was low. The trial area was affected by root rot early in the season but visibly appeared to recover as the season progressed. Yield, protein, and seed size were not significantly affected by seeding rate, so the lowest seeding rate was the most economical.

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

Target plant population (plant ft^{-2})	Seeding rate	Seed cost [4]	Yield	Grain profit [5]	Net profit
12	-	-	-	-	$0.00
24	+ 41 lbs.	$29.52	+ 0 bu	+ $0	(- $29.52)

Visual differences in plant emergence with different seeding rates.

To review footnote references please refer to overall trial summary on page 57.

This trial was conducted with the agronomic support of

CORE AG INPUTS