



Pulse Replicated On-Farm Independent Trials

Chickpea Plant Population Trial

Commonly, as stated by the Saskatchewan Ministry of Agriculture, "Seeding rates range from 90–105 kg/ha (80–95 lb/ac) for desi types and 135–210 kg/ha (120–190 lb/ac) for Kabuli types. The desired plant population is 33–44 seedlings/m² (3–4/ft²)". While this conventional seeding rate has successfully produced high-yielding chickpea crops, a more precise approach to target the optimal plant stand is to adjust the seeding rate based on thousand-kernel weight (TKW) and seedling survivability. Also, understanding how much increasing plant density influences foliar and seed-borne disease levels is important. Achieving optimal plant populations may contribute to improvements in chickpea yield and inform agronomic management decisions important to sustaining economically viable chickpea production.

Objective

To evaluate seeding rates of chickpeas including comparisons of seedling survivability, harvested seed size, seed-borne disease, maturity, and yield in response to plant population across various landscapes.

Treatments

Low	20 plants/m ²
Standard	49 plants/m ²
High	78 plants/m ²

Trials were set up in randomized strips, with four replicates per strip, for a total of 12 plots. All plots were managed the same agronomically, except for the targeted seeding rates, TKW, and germination, including seeding date, variety, seeding depth, seed treatment, inoculant, and pesticides. Seed was sized using round hole sieves ranging from 14r to 24r.

Data Collection

- Seed and soil test
- Seeding information
- Field history and management practices
- In-season plant density, heights and disease assessment
- Weighed the yield and harvest sample
- Grain analysis
 - Seed size was determined using a subsample size of (2024: 350 g/2025: 250g)
- Harvested seed samples sent to an accredited lab for Ascochyta testing
- General in-season observations
- Weather data

The following footnotes will be referred to for the individual site report for this protocol

¹SED is a measure of how much variability (same units as mean) you would expect in the difference between sample means if you repeated the experiment several times. The LSD is approximately two times the SED.

²A linear regression was used to assess the effects of varieties on the response variables. The data was also analyzed using the Mixed Model procedure in JMP, with replicate considered a random effect and seeding rate considered a fixed effect. Treatment means were separated using the LSD test. All treatment effects and differences between means were considered significant at $p \leq 0.05$. However, p-values of 0.05–0.1 may also be acknowledged.

$P < 0.05$: There is a 95% probability (19 out of 20 times) that the observed difference is due to the treatment rather than random variation.

$P < 0.1$: There is a 90% probability (nine out of 10 times) that the difference is due to the treatment effect.

$P > 0.1$: There is a higher likelihood that the observed difference is due to random variability rather than the treatment.

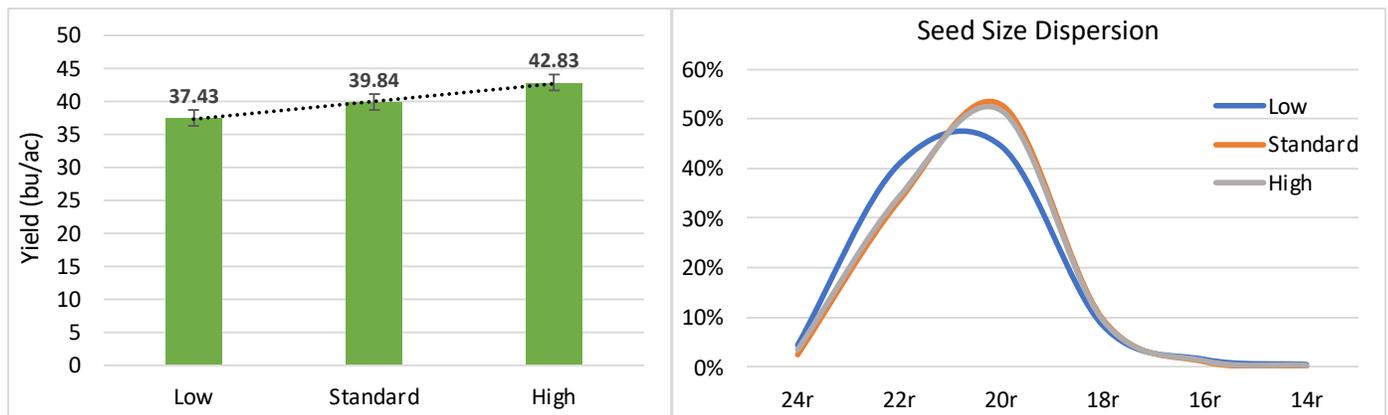
2024 Results

In 2024, there was only one site located at Luseland. Plant density ($p < 0.0001$) and seedling mortality ($p = 0.0093$) were both significantly impacted by seeding rates. The high seeding rate, targeting seven plants/ft², had the highest plant density and seedling mortality. Yield ($p = 0.0423$) was also significantly affected by seeding rate, with the highest rate yielding increases of 3.0 and 5.4 bu/ac over the low and standard seeding rates, respectively. The higher yields, along with the increased seed, seed treatment, and inoculant costs, still made the high seeding rate the most economical. No significant effect was found for seed size, other than for 20r ($p = 0.046$) and 14r ($p = 0.0011$).

Trt #	Description	Target Plant Population (plants/ft ²)	Target Plant Population (plants/m ²)	Actual Seeding Rate (lb/ac)
1	Low	2	20	57.5
2	Standard	5	49	139.3
3	High	7	78	221.1

Treatment Description	Plant Density (plants/ft ²)	Survival %	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)
Low	3 c	150.71 a	37.43 b	375.08 a	76.74 b	19.04 a	16.04 a
Standard	5 b	109.24 b	39.84 ab	367.00 a	78.96 ab	18.34 a	14.23 b
High	7 a	95.16 b	42.83 a	364.75 a	80.19 a	18.26 a	13.46 b
SED ¹	0.341	15.33	1.24	11.16	0.911	0.383	0.617
p-value ²	<.0001	0.0262	0.0136	0.644	0.024	0.163	0.015

	24r (%)	22r (%)	20r (%)	18r (%)	16r (%)	14r (%)	Ascochyta (%)
Low	4.3 a	41.0 a	44.5 b	8.3 a	1.4 a	0.4 a	0.0 a
Standard	2.5 a	33.6 b	52.8 a	9.7 a	1.1 a	0.2 b	0.0 a
High	3.4 a	34.3 b	51.7 a	9.3 a	1.1 a	0.2 b	0.0 a
SED ¹	1.21	2.66	2.75	1.41	0.216	0.033	0.1
p-value ²	0.390	0.060	0.046	0.614	0.294	0.0011	0

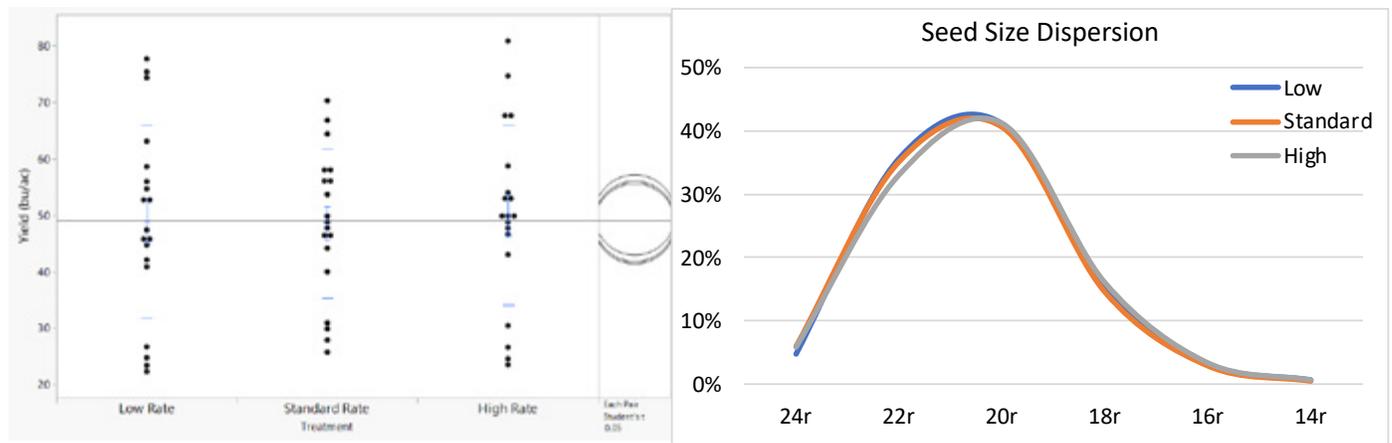


2025 Results

2025 consisted of five sites throughout Saskatchewan. Across low, standard, and high plant density treatments, seedling mortality declined steadily as plant density increased, and plant density itself differed sharply among treatments ($p < 0.0001$). Yield and grain quality characteristics, including TKW, TW, protein, and moisture, showed no meaningful response to density (all $p > 0.10$), suggesting that higher densities did not translate into performance gains. Kernel size distributions were similarly stable across treatments, with the only minor variation occurring in the 22r fraction, where the high-density treatment produced slightly fewer kernels than the others. Overall, increasing plant density altered early stand establishment but had little impact on yield, grain quality, or kernel size distribution.

Treatment Description	Plant Density (plants/ft ²)	Seedling mortality (%)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)
Low	2 c	123.93 a	49.26 a	366.14 a	79.44 a	19.04 a	14.67 a
Standard	4 b	100.76 b	48.85 a	369.23 a	79.23 a	19.06 a	14.60 a
High	5 a	79.29 c	50.23 a	365.02 a	79.40 a	18.96 a	14.47 a
SED ¹	0.164	4.37	1.34	4.84	0.396	0.146	0.097
p-value ²	<.0001	<.0001	0.574	0.670	0.853	0.765	0.110

	24r (%)	22r (%)	20r (%)	18r (%)	16r (%)	14r (%)
Low	5 a	35 a	41 a	15 a	3 a	1 a
Standard	6 a	35 a	41 a	15 a	3 a	1 a
High	6 a	33 a	41 a	16 a	3 a	1 a
SED ¹	1.39	1.15	1.41	0.87	0.218	0.050
p-value ²	0.581	0.094	0.920	0.278	0.293	0.373

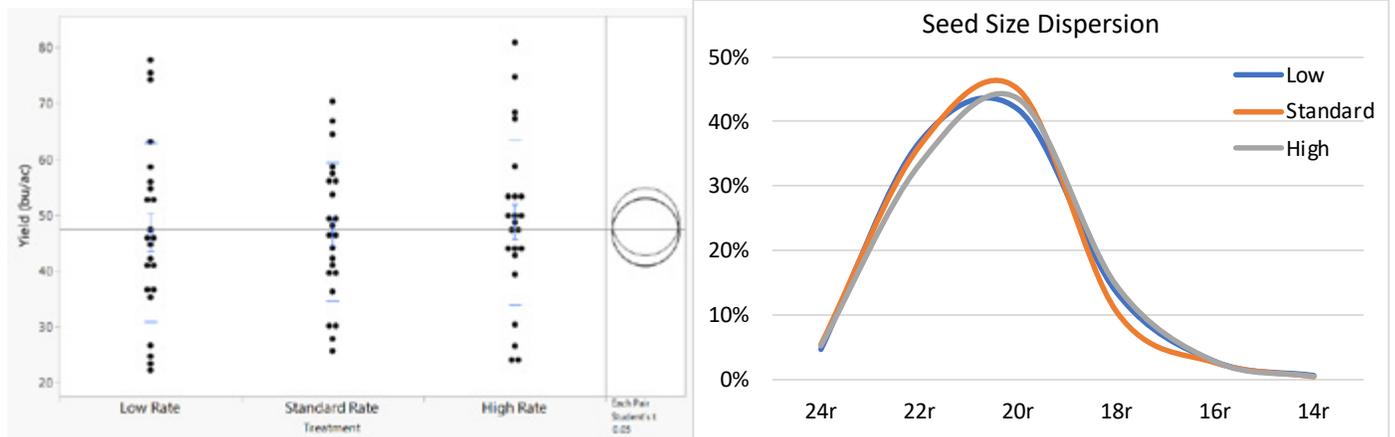


2024 and 2025 Results

Combining the one site in 2024 with the five sites in 2025, plant density and seedling mortality differed markedly among treatments, with mortality decreasing as density increased ($p < 0.0001$). Yield and grain quality characteristics, including TKW, TW, and protein—remained statistically unchanged across densities ($p > 0.23$), while moisture content declined slightly but significantly at higher densities ($p = 0.0003$). Kernel size distribution was largely stable, with no significant differences in the 24r, 20r, 18r, or 16r fractions ($p > 0.28$), though the high-density treatment produced slightly fewer 22r kernels ($p = 0.022$) and showed a minor, nonsignificant shift in the 14r class. Overall, increasing plant density influenced stand establishment and moisture levels but had minimal impact on yield, grain quality, or kernel size distribution.

Treatment Description	Plant Density (plants/ft ²)	Seedling Mortality (%)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)
Low	2 c	128.93 a	47.29 a	367.63 a	78.99 a	19.04 a	14.90 a
Standard	4 b	102.18 b	47.35 a	368.86 a	79.18 a	18.94 a	14.54 b
High	6 a	81.94 c	49.00 a	364.98 a	79.53 a	18.84 a	14.30 b
SED ¹	0.148	4.50	1.12	4.45	0.364	0.138	0.135
p-value ²	<.0001	<.0001	0.238	0.674	0.332	0.384	0.0003

	24r (%)	22r (%)	20r (%)	18r (%)	16r (%)	14r (%)
Low	5 a	36 a	42 a	14 a	3 a	1 a
Standard	5 a	35 ab	43 a	14 a	3 a	0 a
High	5 a	33 b	43 a	15 a	3 a	1 a
SED ¹	1.17	1.06	1.26	0.76	0.183	0.042
p-value ²	0.725	0.022	0.563	0.299	0.284	0.124





Chickpea Plant Population (Assiniboia)

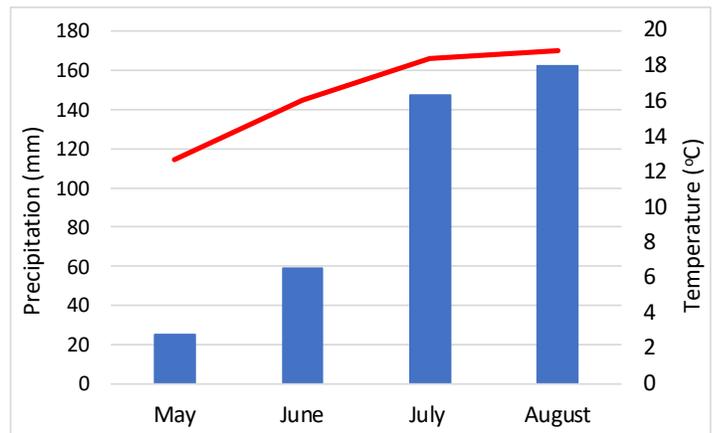
Objective: To evaluate seeding rates of chickpeas including comparisons of seedling survivability, harvested seed size, seed-borne disease, maturity, and yield in response to plant population across various landscapes.

Trt #	Description	Target Plant Population (plants/ft ²)	Target Plant Population (plants/m ²)	Actual Seeding Rate (lb/ac)
1	Low	2	18	56
2	Standard	5	45	140
3	High	7	72	223

General Trial Information

Variety	CDC Leader (Kabuli)
Thousand Kernel Weight (TKW)	278.7 g
Germination	80%
Seed Treatment	Apron [®] Advance (thiabendazole, fludioxonil + metalaxyl)
Inoculant	Primo GX2
Previous Crop	Durum
Soil Organic Matter	3.1%
Residual Nitrate-N	
- 0-6"	10 lb/ac
- 6-12"	1 lb/ac
Seeding Date	May 7, 2025
Seeding Equipment	Bourgault 3320 XTC
Seeding Depth	1 ¼"
Seeding Speed	4.5 mph
Row Spacing	12"
Total Applied Fertilizer (lb/ac N-P-K-S)	8 – 39 – 0 – 0

Precipitation from the local weather station and temperature from Environment Canada (Assiniboia airport)



Crop Protection

May 3: Authority[®] Supreme (pyroxasulfone + sulfentrazone) + Heat[®] (saflufenacil)
 June 9: Centurion[®] (clethodim)
 June 9: Delaro[®] (prothioconazole + trifloxystrobin)
 June 24: Miravis[®] Neo (pydiflumetofen, azoxystrobin + propiconazole)
 July 8: Delaro[®] Complete (prothioconazole, trifloxystrobin + fluopyram)
 July 21: Proline[®] (prothioconazole)
 September 14: Glyphosate + Reglone[®] (diquat)

Economics

Treatment Description	Seeding Rate (lb/ac)	Seed (\$/ac) ^x	Seed Treatment & Inoculant (\$/ac) ^y	Total Expenses (\$/ac)	Yield (bu/ac)	Target Price (\$/bu) ^z	Revenue (\$/ac)	Net (\$/ac)	Profit/Loss (\$/ac)
Low	56	32.48	3.33	35.81	56.4	22.80	1285.92	1250.11	62.83
Standard	140	81.20	8.32	89.52	56.0	22.80	1276.80	1187.28	0.00
High	223	129.34	13.26	142.60	54.1	22.80	1233.48	1090.88	-96.40

^x2025 Kabuli Chickpea, Large, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 145 lb/ac; seed price \$84.10/ac)

^y2025 Kabuli Chickpea, Large, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 145 lb/ac; seed treatment/inoculants \$8.62/ac)

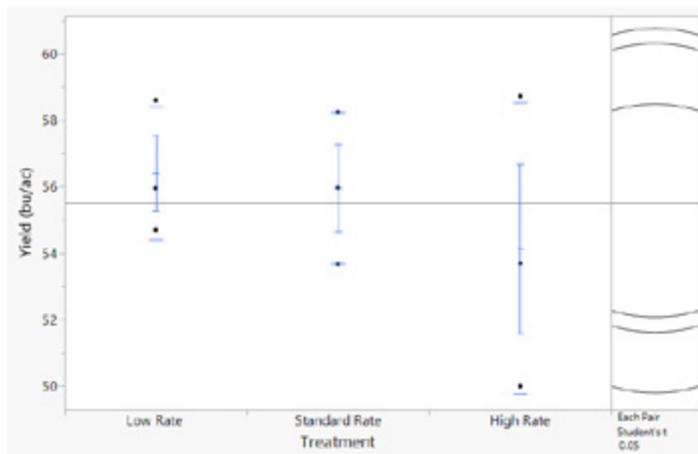
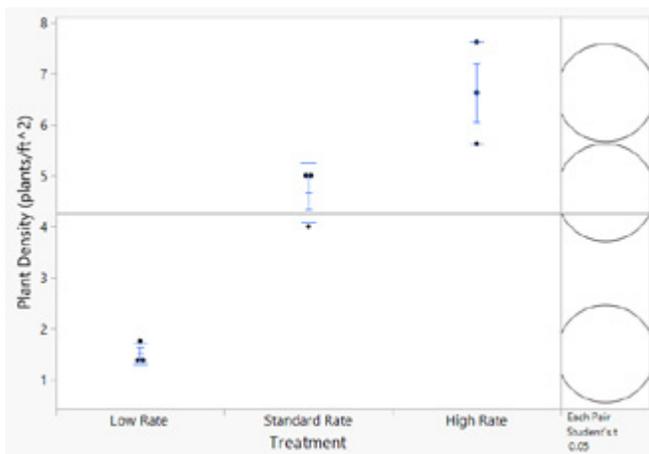
^z2025 Kabuli Chickpea, Large, 2025 Crop Planning Guide, Government of Saskatchewan (target price \$0.38/lb)

Results

Treatment Description	Plant Density (plants/ft ²)	Seedling Survival (%)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)
Low	2 c	90.03 a	56.42 a	392.22 a	81.28 a	19.38 a	12.48 a
Standard	5 b	112.04 a	55.96 a	399.67 a	80.74 a	19.65 a	12.43 a
High	6 a	99.41 a	54.14 a	402.78 a	80.94 a	19.23 a	12.25 a
SED ¹	0.636	13.14	2.34	6.21	0.185	0.222	0.147
p-value ²	0.0032	0.344	0.626	0.322	0.096	0.276	0.346

Description	24r (%)	22r (%)	20r (%)	18r (%)	16r (%)	14r (%)	Ascochyta (%)*
Low	4.25 a	44.47 a	42.10 a	7.21 a	1.52 a	0.45 a	0.3
Standard	7.91 a	49.21 a	34.47 b	7.07 a	0.94 a	0.41 a	0.3
High	6.49 a	45.32 a	39.55 a	7.58 a	0.73 a	0.33 a	0.8
SED ¹	1.49	2.41	1.68	0.830	0.259	0.119	
p-value ²	0.155	0.227	0.025	0.826	0.083	0.630	

*Results are based on a composite sample from each treatment, analyzed by Discovery Seed & Soil Labs



Summary

Plant density increased from the low to the high treatment, but this did not result in significant differences in seedling survival, yield, protein, or moisture content. TKW and TW showed slight numerical differences among treatments, with TW approaching statistical significance. Seed size distribution was partially affected by treatment, with a significant difference observed in the 20r fraction ($p = 0.025$), where the standard treatment produced a lower proportion compared with the low and high treatments. In contrast, other size classes did not differ significantly. Ascochyta levels on harvested seed were low (0.3–0.8%) across treatments. Overall, the seeding rate had minimal impact on most agronomic and quality traits measured.

✳ To review footnote references please refer to overall trial summary on page 142.



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Chickpea Plant Population (Eston)

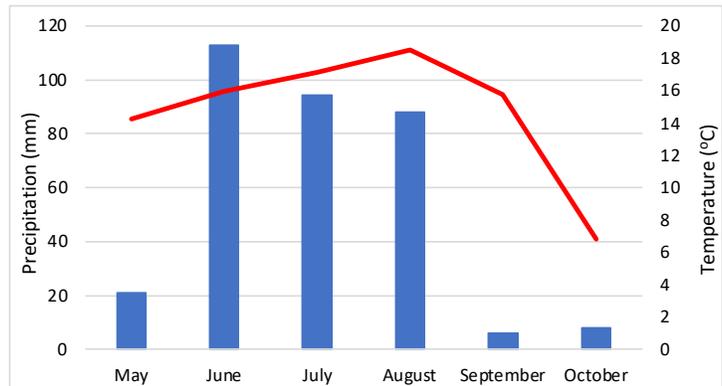
Objective: To evaluate seeding rates of chickpeas including comparisons of seedling survivability, harvested seed size, seed-borne disease, maturity, and yield in response to plant population across various landscapes.

Trt #	Description	Target Plant Population (plants/ft ²)	Target Plant Population (plants/m ²)	Actual Seeding Rate (lb/ac)
1	Low	2	18	76
2	Standard	5	45	190
3	High	7	72	304

General Trial Information

Variety	CDC Pasqua (Kabuli)
Thousand Kernel Weight (TKW)	436.4 g
Germination	92%
Seed Treatment	Apron [®] Maxx (metalaxyl, fludioxonil + sedaxane)
Inoculant	Laflix [®] Start
Previous Crop	Durum
Soil Organic Matter	4.8%
Residual Nitrate-N	
- 0-6"	12 lb/ac
- 6-24"	21 lb/ac
Seeding Date	April 28, 2025
Seeding Equipment	Bourgault 3320
Seeding Depth	2"
Seeding Speed	3.9 mph
Row Spacing	10"
Total Applied Fertilizer (lb/ac N-P-K-S)	7 – 23 – 0 – 6

Temperature and precipitation from local weather station (May 15 – October)



Crop Protection	May 28: Tricor LQ (metribuzin)
	June 5: Centurion [®] (clethodim)
	June 10: Miravis [®] Neo (azoxystrobin, propiconazole + pydiflumetofen)
	June 20: Revy [®] Pro (mefentrifluconazole + prothioconazole)
	September 20: Roundup [®] (glyphosate)
	October 3: Reglone [®] (diquat)

Economics

Treatment Description	Seeding Rate (lb/ac)	Seed (\$/ac) ^x	Seed Treatment & Inoculant (\$/ac) ^y	Total Expenses (\$/ac)	Yield (bu/ac)	Target Price (\$/bu) ^z	Revenue (\$/ac)	Net (\$/ac)	Profit/Loss (\$/ac)
Low	76	44.07	4.52	48.59	72.7	22.80	1657.56	1608.97	261.56
Standard	190	110.19	11.29	121.48	64.4	22.80	1468.82	1347.41	0.00
High	304	176.30	18.07	194.37	72.7	22.80	1657.56	1463.19	116.35

^x2025 Kabuli Chickpea, Large, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 145 lb/ac; seed price \$84.10/ac)

^y2025 Kabuli Chickpea, Large, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 145 lb/ac; seed treatment/inoculants \$8.62/ac)

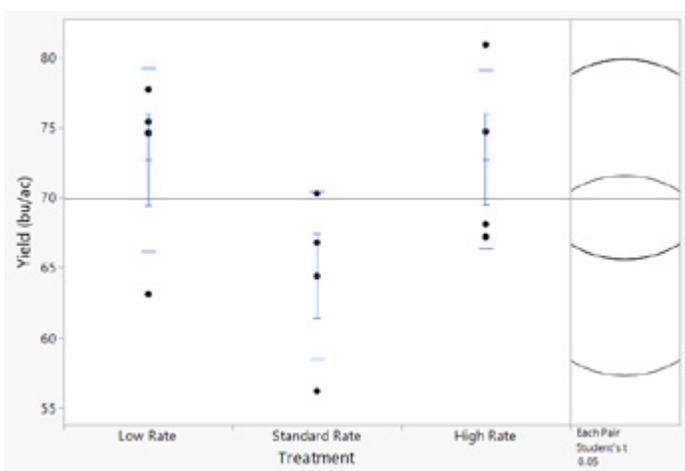
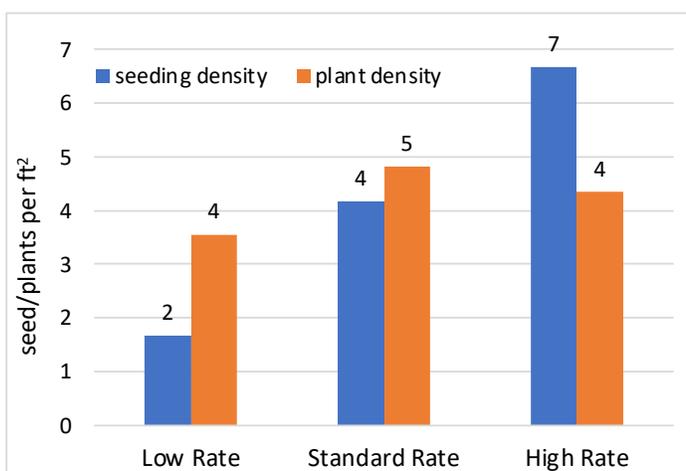
^z2025 Kabuli Chickpea, Large, 2025 Crop Planning Guide, Government of Saskatchewan (target price \$0.38/lb)

Results

Treatment Description	Plant Density (plants/ft ²)	Seedling Survival (%)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)
Low	4 a	213.08 a	72.70 a	403.17 a	76.74 a	20.98 a	16.38 a
Standard	5 a	115.64 b	64.43 a	417.58 a	76.97 a	21.04 a	16.05 a
High	4 a	65.27 c	72.73 a	413.58 a	77.02 a	21.06 a	16.11 a
SED ¹	0.243	8.67	4.54	19.00	1.69	0.259	0.246
p-value ²	0.0055	<0.0001	0.190	0.747	0.985	0.942	0.429

Description	24r (%)	22r (%)	20r (%)	18r (%)	16r (%)	14r (%)	Ascochyta (%)*
Low	11.35 a	52.14 a	28.32 a	7.36 a	0.78 a	0.06 a	0.0
Standard	15.85 a	48.74 a	26.23 a	7.93 a	1.10 a	0.17 a	0.0
High	17.20 a	49.65 a	25.50 a	6.32 a	1.13 a	0.20 a	0.0
SED ¹	6.36	3.38	4.56	2.47	0.484	0.131	
p-value ²	0.650	0.608	0.819	0.812	0.739	0.544	

*Results are based on a composite sample from each treatment, analyzed by Discovery Seed & Soil Labs



Summary

A low seeding rate produced the highest seedling survival, but a yield similar to the other treatments. Yield, kernel weight, TW, protein, and moisture did not differ significantly among seeding rates. Seed size distribution was not affected by treatment, with no significant differences observed among size classes ($p > 0.05$), and the majority of seeds occurred in the 22r and 20r fractions. Ascochyta was not detected on harvested seed across any treatment. The main treatment effects were therefore on plant density and survival, not on final grain performance.



✳ To review footnote references please refer to overall trial summary on page 142.



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Chickpea Plant Population (Kenaston)

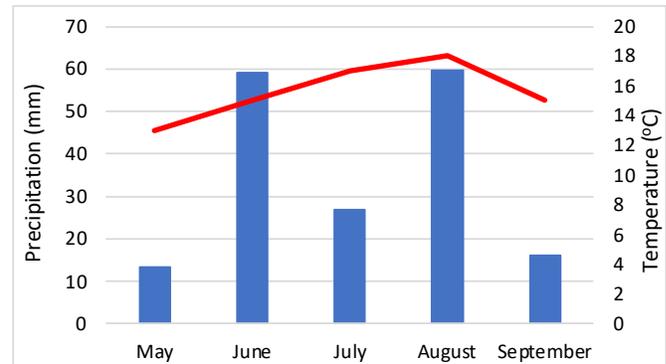
Objective: To evaluate seeding rates of chickpeas including comparisons of seedling survivability, harvested seed size, seed-borne disease, maturity, and yield in response to plant population across various landscapes.

Trt #	Description	Target Plant Population (plants/ft ²)	Target Plant Population (plants/m ²)	Actual Seeding Rate (lb/ac)
1	Low	2	18	65
2	Standard	5	45	161
3	High	7	72	258

General Trial Information

Variety	CDC Leader (Kabuli)
Thousand Kernel Weight (TKW)	390.7 g
Germination	97%
Seed Treatment	Vibrance [®] Total (thiabendazole, sedaxane, metalaxyl-M and its S-isomer, fludioxonil, and picarbutrazox) + Active [®] Prime
Inoculant	Lalfix [®]
Previous Crop	Fall Rye
Soil Organic Matter	3.3%
Residual Nitrate-N (Fall '25)	
- 0-6"	13 lb/ac
- 6-24"	9 lb/ac
Seeding Date	May 4, 2025
Seeding Equipment	Vaderstad 8012
Seeding Depth	1 ½"
Seeding Speed	4.5 mph
Row Spacing	12"
Total Applied Fertilizer (lb/ac N-P-K-S)	2 – 11 – 0 – 0

Temperature and precipitation from local weather station (May 1 – September 13)



Crop Protection

- May 3: Authority[®] (sulfentrazone) + glyphosate
- June 10: Sencor[®] (metribuzin)
- June 28: Prothio[®] (prothioconazole)
- July 17: Miravis[®] Neo (pydiflumetofen, azoxystrobin + propiconazole)
- September 2: Glyphosate
- September 7: Reglone[®] (diquat)

Economics

Treatment Description	Seeding Rate (lb/ac)	Seed (\$/ac) ^x	Seed Treatment & Inoculant (\$/ac) ^y	Total Expenses (\$/ac)	Yield (bu/ac)	Target Price (\$/bu) ^z	Revenue (\$/ac)	Net (\$/ac)	Profit/Loss (\$/ac)
Low	65	37.43	3.84	41.26	24.2	22.80	552.68	511.42	-34.78
Standard	161	93.56	9.59	103.15	28.5	22.80	649.35	546.20	0.00
High	258	149.70	15.34	165.04	26.3	22.80	599.06	434.01	-112.19

^x2025 Kabuli Chickpea, Large, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 145 lb/ac; seed price \$84.10/ac)

^y2025 Kabuli Chickpea, Large, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 145 lb/ac; seed treatment/inoculants \$8.62/ac)

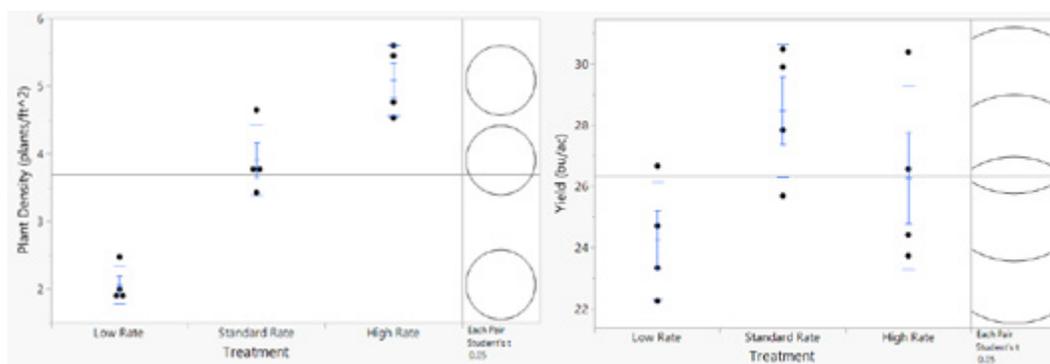
^z2025 Kabuli Chickpea, Large, 2025 Crop Planning Guide, Government of Saskatchewan (target price \$0.38/lb)

Results

Treatment Description	Plant Density (plants/ft ²)	Seedling Survival (%)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)
Low	2 c	103.37 a	24.24 a	373.42 a	78.56 a	18.28 a	14.01 a
Standard	4 b	97.66 a	28.48 a	371.17 a	78.07 a	18.74 a	14.28 a
High	5 a	72.68 b	26.27 a	361.50 a	78.68 a	18.64 a	13.99 a
SED ¹	0.381	9.70	1.42	7.55	0.427	0.200	0.228
p-value ²	0.0006	0.042	0.064	0.316	0.380	0.129	0.430

Description	24r (%)	22r (%)	20r (%)	18r (%)	16r (%)	14r (%)	Ascochyta (%)*
Low	5.14 a	43.17 a	40.40 a	9.80 b	1.21 c	0.29 a	0.0
Standard	4.60 a	42.56 a	39.53 a	11.15 b	1.85 b	0.31 a	0.3
High	3.12 a	36.61 a	41.34 a	15.65 a	2.89 a	0.38 a	0.0
SED ¹	0.849	2.79	2.18	0.880	0.240	0.083	
p-value ²	0.123	0.104	0.721	0.0013	0.0012	0.522	

*Results are based on a composite sample from each treatment, analyzed by Discovery Seed & Soil Labs



Summary

Seeding rate significantly affected plant density and seedling survival, with higher rates yielding more plants but lower survival. Yield showed a trend toward higher production at the standard seeding rate, but differences were not statistically significant. Grain quality metrics—including kernel weight, TW, protein, and moisture remained consistent across all treatments. Seed size distribution was influenced by disease level, with the high treatment producing a greater proportion of smaller seed sizes, particularly in the 18r and 16r categories ($p \leq 0.0013$). In contrast, larger seed fractions did not differ significantly among treatments. Ascochyta infection on harvested seed was negligible across treatments, remaining at 0–0.3%. Overall, seeding rate mainly influenced the smallest seed sizes, while larger residue classes remained consistent across treatments.

✳ To review footnote references please refer to overall trial summary on page 142.



This trial was conducted with
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Chickpea Plant Population (Luseland)

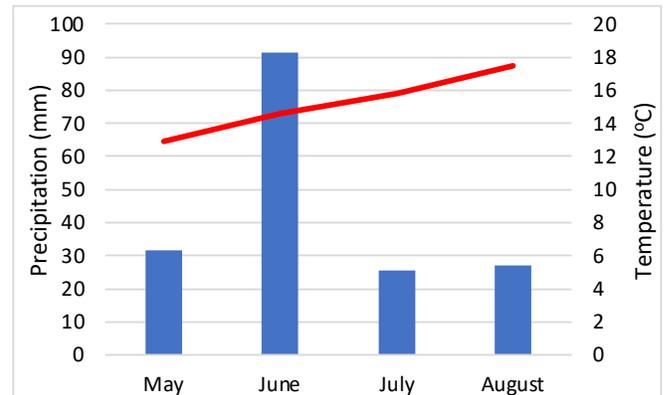
Objective: To evaluate seeding rates of chickpeas including comparisons of seedling survivability, harvested seed size, seed-borne disease, maturity, and yield in response to plant population across various landscapes.

Trt #	Description	Target Plant Population (plants/ft ²)	Target Plant Population (plants/m ²)	Actual Seeding Rate (lb/ac)
1	Low	2	22	85
2	Standard	5	54	213
3	High	7	75	298

General Trial Information

Variety	CDC Lancer (Kabuli)
Thousand Kernel Weight (TKW)	368 g
Germination	90%
Seed Treatment	Insure [®] Pulse (metalaxyl, fluxapyroxad + pyraclostrobin)
Inoculant	TagTeam [®] BioniQ [®]
Previous Crop	Canola
Seeding Date	May 4, 2025
Seeding Equipment	Bourgault 3335, Tri-Max Openers
Seeding Depth	1 ½"
Seeding Speed	4 mph
Row Spacing	12"
Total Applied Fertilizer (lb/ac N-P-K-S)	5 – 17 – 14 – 7

**Precipitation from rain gauge
Temperature from Environment Canada (Scott CDA)**



Crop Protection

October '23: Authority[®] Supreme (pyroxasulfone + sulfentrazone)
 October '23: Phantom[®] (imazethapyr)
 June 2: Davai[®] A Plus (imazamox + clethodim)
 June 26: Dyax[®] (fluxapyroxad + pyraclostrobin)
 July 13: Maxentis[®] (azoxystrobin + prothioconazole)
 July 13: Soratel[®] (prothioconazole)
 July 28: RevyPro[®] (mefentrifluconazole + prothioconazole)
 September 6: Armory (diquat)

Economics

Treatment Description	Seeding Rate (lb/ac)	Seed (\$/ac) ^x	Seed Treatment & Inoculant (\$/ac) ^y	Total Expenses (\$/ac)	Yield (bu/ac)	Target Price (\$/bu) ^z	Revenue (\$/ac)	Net (\$/ac)	Profit/Loss (\$/ac)
Low	85	49.30	5.05	54.35	44.8	22.80	1021.44	967.09	43.09
Standard	213	123.54	12.66	136.20	46.5	22.80	1060.20	924.00	0.00
High	298	172.84	17.72	190.56	48.3	22.80	1101.24	910.68	-13.32

^x2025 Kabuli Chickpea, Large, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 145 lb/ac; seed price \$84.10/ac)

^y2025 Kabuli Chickpea, Large, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 145 lb/ac; seed treatment/inoculants \$8.62/ac)

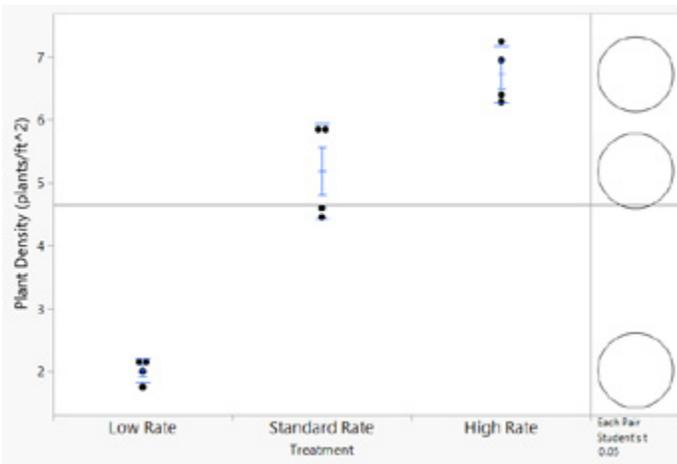
^z2025 Kabuli Chickpea, Large, 2025 Crop Planning Guide, Government of Saskatchewan (target price \$0.38/lb)

Results

Treatment Description	Plant Density (plants/ft ²)	Seedling Survival (%)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)
Low	2 c	100.63 a	44.83 a	372.50 a	80.69 a	18.48 a	15.31 a
Standard	5 b	103.75 a	46.49 a	368.42 a	80.34 a	18.18 a	15.36 a
High	7 a	96.07 a	48.28 a	361.25 a	80.12 a	18.33 a	15.20 a
SE ¹	0.367	7.71	1.40	4.85	0.523	0.188	0.203
p-value ²	<.0001	0.629	0.121	0.142	0.584	0.347	0.727

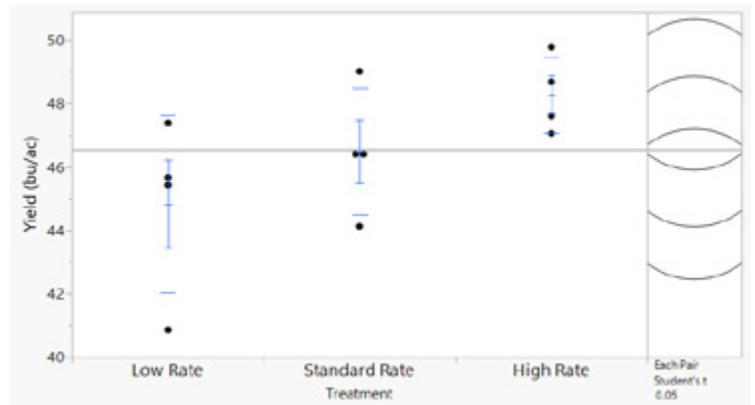
Description	24r (%)	22r (%)	20r (%)	18r (%)	16r (%)	14r (%)	Ascochyta (%)*
Low	2.02 a	33.54 a	56.02 a	7.82 a	0.54 a	0.06 a	0.0
Standard	1.46 a	30.88 a	59.05 a	7.97 a	0.58 a	0.06 a	0.0
High	1.90 a	29.58 a	59.38 a	8.48 a	0.56 a	0.10 a	0.0
SE ¹	0.350	2.47	2.36	0.970	0.206	0.035	
p-value ²	0.313	0.331	0.356	0.784	0.976	0.397	

*Results are based on a composite sample from each treatment, analyzed by Discovery Seed & Soil Labs



Summary

Plant density had no significant impact on grain quality traits, kernel-size distribution, or seedling mortality, and only a modest, non-significant trend toward higher yields at greater densities was observed. Seed size distribution did not differ among treatments, with no significant differences observed across any size class ($p > 0.05$), and the majority of seeds were concentrated in the 20r category. Ascochyta was not detected on harvested seed in any treatment. Overall, increasing the seeding rate did not substantially alter grain characteristics, though higher densities may offer a slight potential yield advantage without compromising grain quality.



✳ To review footnote references please refer to overall trial summary on page 142.



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Chickpea Plant Population (Marquis)

Objective: To evaluate seeding rates of chickpeas including comparisons of seedling survivability, harvested seed size, seed-borne disease, maturity, and yield in response to plant population across various landscapes.

Trt #	Description	Target Plant Population (plants/ft ²)	Target Plant Population (plants/m ²)	Actual Seeding Rate (lb/ac)
1	Low	2	18	60
2	Standard	3	36	118
3	High	5	54	176

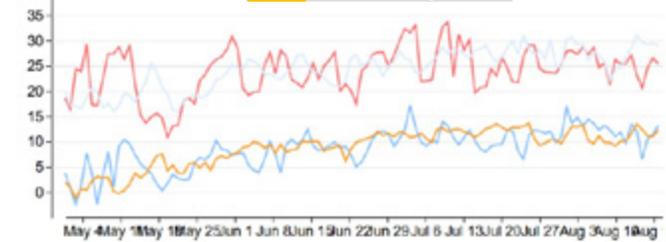
General Trial Information

Variety	CDC Pearl (Kabuli, small)
Thousand Kernel Weight (TKW)	325 g
Germination	89%
Seed Treatment	Trilex® EverGol (penflufen, trifloxystrobin + metalaxyl)
Inoculant	TagTeam® BioniQ®
Previous Crop	Wheat
Soil Organic Matter	3.1%
Residual Nitrate-N (Fall '25)	
- 0-6"	11 lb/ac
- 6-24"	6 lb/ac
Seeding Date	April 29, 2025
Seeding Equipment	Bourgault 5710 AHD
Seeding Depth	2"
Seeding Speed	5.2 mph
Row Spacing	10"
Total Applied Fertilizer (lb/ac N-P-K-S)	8 – 28 – 0 – 7

Accumulated Precipitation



High and Low Temperatures



October '24: Authority® 480 (sulfentrazone)
 April 27: Goldwing® (pyraflufen) + glyphosate
 May 25: Centurion® ADV (clethodim)
 May 29: Sencor® 75 (metribuzin) + YaraVita® Flex
 June 12: Miravis® Neo (pydiflumetofen, azoxystrobin + propiconazole)
 June 27: Revy® Pro (mefentrifluconazole + prothioconazole)
 July 15: Proline® 480 (prothioconazole) + Bravo® 500 (chlorothalonil)
 September 7: Desica® (diquat) + Cornerstone® (glyphosate)

Crop Protection

Economics

Treatment Description	Seeding Rate (lb/ac)	Seed (\$/ac) ^x	Seed Treatment & Inoculant (\$/ac) ^y	Total Expenses (\$/ac)	Yield (bu/ac)	Target Price (\$/bu) ^z	Revenue (\$/ac)	Net (\$/ac)	Profit/Loss (\$/ac)
Low	60	31.20	3.57	34.77	48.1	21.60	1038.96	1004.19	16.33
Standard	118	61.36	7.02	68.38	48.9	21.60	1056.24	987.86	0.00
High	176	91.52	10.46	101.98	49.8	21.60	1075.68	973.70	-14.16

^x2025 Kabuli Chickpea, Small, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 109 lb/ac; seed price \$56.68/ac)

^y2025 Kabuli Chickpea, Small, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 109 lb/ac; seed treatment/inoculants \$6.48/ac)

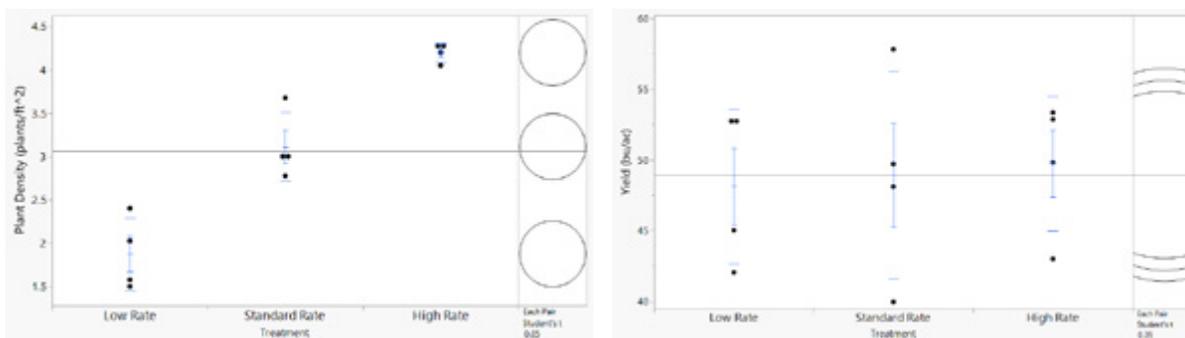
^z2025 Kabuli Chickpea, Small, 2025 Crop Planning Guide, Government of Saskatchewan (target price \$0.36/lb)

Results

Treatment Description	Plant Density (plants/ft ²)	Seedling Survival (%)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)
Low	2 c	112.54 a	48.13 a	289.42 a	79.94 a	18.08 a	15.19 a
Standard	3 b	74.73 b	48.89 a	289.33 a	80.04 a	17.71 a	14.88 a
High	4 a	63.02 b	49.75 a	286.00 a	80.25 a	17.54 a	14.78 a
SED ¹	0.224	10.10	3.43	7.21	0.332	0.548	0.201
p-value ²	0.0001	0.006	0.896	0.867	0.665	0.630	0.181

Description	24r (%)	22r (%)	20r (%)	18r (%)	16r (%)	14r (%)	Ascochyta (%)*
Low	0.42	4.04	38.99	43.01	11.54	2.00 a	0.3
Standard	0.21	4.54	44.41	39.08	10.17	1.59 a	0.0
High	0.15	4.24	40.64	42.10	11.07	1.80 a	0.3
SED ¹	0.141	0.873	3.29	2.91	0.817	0.149	
p-value ²	0.213	0.847	0.313	0.421	0.307	0.084	

*Results are based on a composite sample from each treatment, analyzed by Discovery Seed & Soil Labs



Summary

Plant density had a significant effect on seedling survival, with survival decreasing as plant density increased ($p = 0.0001$). Still, it did not significantly influence TKW, TW, protein, or moisture content. Yield remained statistically similar across treatments ($p = 0.896$), though the high-density treatment produced the numerically highest yield. Kernel-size fractions were not significantly affected by plant density, with all p -values > 0.12 , indicating no meaningful differences among treatments. Seed size distribution was not significantly affected by treatment, as no differences were observed among size classes ($p > 0.05$), with most seed falling within the 18r and 20r categories. Ascochyta infection on harvested seed was minimal across all treatments, remaining at 0–0.3%. Overall, increasing plant density reduced early survival but did not negatively impact grain quality, yield, or kernel-size distribution across treatments.



✳ To review footnote references please refer to overall trial summary on page 142.



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