Strategic Field Program (SFP)
Project Final Report

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Project Title: Faba Bean Seeding Rate

SFP File Number: 20230432

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Abstract *(maximum 500 words)*

Detail an outline on overall project objectives, methods, key findings and conclusions for use in publications and in the ministry's database. The abstract should address the following (usually 1–2 sentences per topic):

- Key aspects of the literature review
- Problem under investigation
- Clearly stated hypothesis or hypotheses
- Methods used (including brief descriptions of the study design, sample, and sample size)
- Study results
- Conclusions

Field trials conducted in 2024 and 2025 at three Saskatchewan locations, Outlook (ICDC/ISask), Indian Head (IHARF), and Melfort (NARF), evaluated the effects of faba bean variety, seeding rate, and their interaction on yield and other agronomic performance. Across both years, plant emergence consistently increased with higher seeding rates, with 45 and 60 seeds m^{-2} producing stronger stands than 30 seeds m^{-2}. Varietal differences in establishment remained stable across years, with Fabelle and Allison showing strong emergence, while CDC 1142 established most weakly at IHARF and NARF, though its emergence improved at Outlook in 2025. Disease pressure remained very low in both years. Plant height was primarily variety-driven, but overall plant height declined at Indian Head and Melfort in 2025, reflecting environmental differences. Phenology was consistent across years, with flowering governed by variety rather than seeding rate. Maturity continued to respond to seeding rate across sites, with higher rates maturing slightly earlier.
Yield patterns were consistent with 2024: at the treatment level, 45 and 60 seeds m^{-2} generally outperformed 30 seeds m^{-2}, and Fabelle and Allison remained the highest-yielding varieties, while CDC 1142 remained the lowest. Overall, the 2025 results strengthened the main agronomic findings from 2024, favouring seeding rates of 45-60 seeds m^{-2} and high-performing varieties such as Fabelle and Allison. The consistency of treatment responses across contrasting environments provides confidence that these recommendations remain stable under typical Prairie growing conditions and are compatible with ongoing breeding efforts targeting improved nutritional quality by reducing vicine/convicine content.

Extension Messages *(3 to 5 bullet point in plain language)*

Provide key outcomes and their importance for producers/processors and the relevant industry sector.

- Demonstrate different seeding rates for low vicine/convicine (large and small seed size) varieties to present to producers the ideal seeding rate of faba beans in Saskatchewan
    - Increasing the seeding rate also increases yield across all three sites. However, there was not a significant difference between the yields of the trials with a seeding rate of 45 seeds/m2 and the trials with a seeding rate of 60 seeds/m2
    - Plant density increases with increased seeding rates.
- Compare the yield of newer low vicine/convicine varieties
    - The larger-seeded varieties of Fabelle and Allison yielded higher than the smaller seeded varieties of CDC1142 and CDC 1089
- Examine the effect of seeding rates on plant stand and yield of vicine/convicine varieties
    - For all four varieties, Increasing the seeding rate also increase both plant density and yield

Introduction *(maximum 1,500 words)*

Provide a brief project background and rationale.

This project evaluates three seeding rates across four low-vicine/convicine faba bean varieties representing both large- and small-seeded types to help producers determine accurate seeding rates for faba beans under both dryland and irrigated conditions in Saskatchewan. Traditionally, normal-tannin faba beans are larger-seeded and marketed for food use, while low-tannin types are smaller-seeded and typically sold into feed markets. However, many producers are growing low-tannin varieties for food markets because their smaller seed size is more compatible with existing seeding equipment. According to the 2025 Irrigated Crop Survey, 2,616 acres of faba beans were grown in the Lake Diefenbaker Development Area. Under irrigation, producers often face higher disease pressure due to increased precipitation and warm summer temperatures. Incorporating faba beans into rotations where pea production is limited by root rot can provide a valuable alternative (Alberta Pulse Growers, 2025). Pulse crops play an important role in crop rotations by fixing nitrogen, improving soil fertility, and increasing rotational diversity. Faba beans, in particular, can meet up to 80% of their own nitrogen requirements, reducing the need for nitrogen fertilizer and lowering input costs (Saskatchewan Pulse Growers, 2025).In regions such as Melfort and Indian Head, pea and lentil production is constrained by disease pressure. Both sites are located in the Black Soil Zone, which receives adequate annual moisture, approximately 15.6 inches in Melfort and 16.8 inches in Indian Head. Under these conditions, faba beans represent a strong rotational option for producers seeking to maintain a pulse crop in their system while managing disease challenges.

Objectives and Progress *(add additional lines as needed)*

Please list the original objectives and/or revised objectives if ministry-approved revisions have been made to original objectives. A justification is needed for any deviation from original objectives.

Objective	**Progress** *(i.e., completed/in progress)*
Demonstrate different seeding rates for low vicine/convicine (large and small seed size) varieties to present the producers the ideal seeding rate of faba beans in Saskatchewan	Completed
Compare the yield of newer low vicine/convicine varieties	Completed
Examine the effect of seeding rates on plant stand and yield of vicine/convicine varieties	Completed
	Insert text here
	Insert text here

Methodology *(maximum of five pages)*

Specify project activities undertaken during this reporting period. Include approaches, experimental design, tests, materials, sites, etc. Please note that any significant changes from the original work plan will require written approval from the ministry.

The field study was conducted in 2024 and 2025 in Saskatchewan to evaluate three seeding rates across four low-vicine/convicine faba bean varieties representing both large- and small-seeded types under dryland and irrigated conditions. The trial was established in major pulse-growing regions, including Melfort and Indian Head in the Black Soil Zone, and in Outlook in the Brown Soil Zone. The experiment was arranged as a split-plot design with four replications. Varieties were assigned to main plots, while seeding rates were allocated to subplots within each variety. Treatments were randomized within each replication. Standard agronomic practices recommended for faba bean production in Saskatchewan were followed at all sites, including fertility management, weed and pest control.

Plots were seeded at the designated target plant populations corresponding to the three seeding rate treatments. Data were collected, including plant count, disease rating, date to flowering, plant height, date to maturity and yield, to evaluate the effect of variety, seeding rate and their interaction on overall plant performance.

Data were analyzed using a linear mixed-effects model appropriate for a split-plot arrangement. The analysis was performed using PROC MIXED in SAS (SAS Institute Inc., Cary, NC, USA). Replications and the replication × variety interaction were treated as random effects to account for block-to-block variability and main plot error, respectively. Variety, seed rate, and their interaction were treated as fixed effects. Denominator degrees of freedom were adjusted using the Kenward–Roger method to obtain more accurate F-tests for fixed effects.

The significance of main effects and their interaction was determined at the 5% probability level ($\alpha = 0.05$). When significant treatment effects were detected, least squares means were computed and separated using Tukey's Honestly Significant Difference (HSD) test. Ninety-five percent confidence intervals were also obtained for treatment means. Model assumptions, including normality of residuals, homogeneity of variance, and independence of errors, were assessed through residual diagnostic procedures.

Results and Discussions *(maximum of 30 pages (not including figures or tables))*

Describe project accomplishments during the reporting period under relevant objectives listed under "Objectives and Progress" section. Please accompany a written description of results with tables, graphs and/or other illustrations. Provide discussion necessary to the full understanding of the results. Where applicable, results should be discussed in the context of existing knowledge and relevant literature. Detail any major concerns or project setbacks.

Weather data:

At IHARF (Indian Head), seasonal temperatures were near the long-term average in both years, though monthly patterns differed (Table 1). In 2024, the May-August average was 15.4 °C, about 0.2 °C cooler than the long-term 15.6 °C, owing mainly to a cool June (−2.2 °C vs LT). In 2025, the average was 15.7 °C, about 0.1 °C warmer than the long-term, with a notably warm May (+1.9 °C). Precipitation contrasts were much sharper. Total May-August rainfall in 2024 was 247.8 mm right on the long-term total (101% of 244.2 mm) despite a dry July (−26.4 mm vs LT), as wet May and August surpluses (+11.9 and +20.6 mm) made up the deficit. In 2025, however, rainfall decreased to 136.0 mm (56% of LT), with deficits in every month (−9.2, −38.0, −36.7, and −24.3 mm from May to August), a pattern that would affect soil moisture during vegetative growth and early reproduction.

At NARF (Melfort), 2025 was distinctly warmer than both the long-term and 2024 (Table 1). The 2024 seasonal average matched the long-term at 15.0 °C. In 2025, the average rose to 16.0 °C, about 1.0 °C above the long-term average. Seasonal precipitation was near normal in both years, but driven by different monthly precipitation. In 2024, total rainfall reached 225.0 mm (99% of the long-term 228.4 mm) as a result of a very wet May (+39.6 mm) and slightly wet June (+4.5 mm) that offset a dry July (−33.5 mm) and dry August (−14.0 mm). In 2025, the total rose to 237.4 mm (104% of LT), with a very wet August (+67.6 mm) compensating for a dry May (−28.6 mm) and especially dry July (−43.7 mm). The year-to-year shift from early-season moisture in 2024 to late-season moisture in 2025 suggests that while emergence conditions were better in 2024, grain-fill support was stronger in August 2025.

At ISASK (Outlook), temperatures again tell a story of a warmer 2025 (Table 1). The seasonal average was 16.0 °C in 2024, on par with the long-term. In 2025, the average was 16.6 °C (+0.6 °C vs LT). Natural precipitation totaled 207.5 mm in 2024 (101% of the 206.5 mm long-term value), but its distribution was front-loaded: much wetter May and June (+21.1 and +56.7 mm) were followed by very dry July and August (−36.7 and −40.1 mm). In 2025 the total dropped to 151.1 mm (73% of LT), but late-season shortfalls were smaller than in 2024, with July and August slightly above or near LT (+3.6 and +17.0 mm), while May was markedly dry (−35.3 mm). Irrigation patterns supplemented the deficit. In 2024, applications were minimal early and ramped late (0, 12.7, 31.4, 56.1 mm from May to August; total 100.2 mm), consistent with the natural July-August dryness. In 2025, by contrast, irrigation was frontloaded (0, 63.5, 25.4, 12.7 mm; total 101.2 mm), compensating for a dry May and moderate June rain, while improved July-August rainfall reduced late-season irrigation needs.

In 2025, Melfort and Outlook were warmer than long-term benchmarks, while Indian Head stayed near normal. Rainfall patterns varied: Indian Head was very dry at 56% of LT with deficits; Melfort was slightly wetter at 104%, boosted by a wet August; Outlook was drier at 73% but benefited from July-August recovery and irrigation, reducing late-season moisture stress. Year-over-year, Melfort shifted from early-season moisture in 2024 to late-season in 2025; Indian Head saw a mid-season rainfall collapse; and Outlook changed its irrigation focus from late to early season. These changes show how in-season rainfall timing, not just total amount, influences management and crop response.

Table 1. Mean temperature and precipitation for all sites

		Year	May	June	July	August	Avg/Total
IHARF (Indian Head)	**Temperature (°C)**	**2024**	10.6	13.6	19.5	17.9	15.4
		2025	12.7	15.3	17.0	17.8	15.7
		Long Term	10.8	15.8	18.2	17.4	15.6
	Precipitation (mm)	**2024**	63.7	74.9	37.4	71.8	247.8
		2025	42.6	39.4	27.1	26.9	136
		Long Term	51.8	77.4	63.8	51.2	244.2
NARF (Melfort)	**Temperature (°C)**	**2024**	10.1	13.2	19.4	17.4	15.0
		2025	13.8	15	17	18	16
		Long Term	10.1	15.2	17.8	16.7	15.0
	Precipitation (mm)	**2024**	73.0	84.0	36.1	31.9	225.0
		2025	4.8	93.2	25.9	113.5	237.4
		Long Term	33.4	79.5	69.6	45.9	228.4
ISASK (Outlook)	**Temperature (°C)**	**2024**	11	14.2	20.4	18.3	16.0
		2025	13.6	16.2	17.4	19	16.6
		Long Term	11.3	16.1	18.9	17.9	16.0
	Precipitation (mm)	**2024**	62.6	122	19.1	3.8	207.5
		2025	6.2	83.1	59.4	60.9	151.1
		2024 Irrigation (mm)	0	12.7	31.4	56.1	100.2
		2025 Irrigation (mm)	0	63.5	25.4	12.7	101.2
		Long Term	41.5	65.3	55.8	43.9	206.5

Plant Emergence:

Compared with 2024, plant emergence in 2025 generally followed the same pattern of increasing plant density with higher seeding rates, especially at IHARF and NARF, where seeding-rate effects remained highly significant, and the ordering (60 > 45 > 30 seeds/m²) remained intact (Tables 2-8). At Outlook, the practical differences between the rates remained minimal, much like in 2024, even though they were statistically significant. This suggests that the site continues to show weaker separation in seeding-rate. Varietal emergence trends also largely matched those of 2024, with Fabelle and Allison maintaining strong establishment, and CDC 1142 generally remaining the weakest. The one notable change was at Outlook, where CDC 1142, previously among the lowest in 2024, moved into the statistically top group in 2025, showing improved establishment.

Disease:

Disease pressure remained very low across sites in 2025, as in 2024 (Tables 2-8). However, the pattern of significance shifted: IHARF, which showed no disease differences in 2024, exhibited a small but statistically meaningful varietal effect in 2025, driven by slightly higher scores in Snowbird. At NARF, the modest varietal differences seen in 2024 disappeared, and disease was uniformly near zero in 2025. At Outlook, disease remained extremely low as in 2024, and although ANOVA detected effects of variety and seeding rate, the absolute values were negligible and did not affect interpretation. Overall, disease again played a minimal agronomic role in 2025.

Plant Height:

Relative to 2024, plants in 2025 tended to be shorter at IHARF and NARF, consistent with environmental differences between years (Tables 2-8). Despite this shift, the varietal height hierarchy remained stable, with Fabelle ranking among the tallest and Snowbird among the shortest, similar to 2024. The noteworthy year-to-year change was the weakening of seeding-rate effects: at Outlook, the significant height response to seeding rate seen in 2024 disappeared in 2025, and at IHARF the rate effect was also non-significant in 2025 (unlike 2024). NARF continued to show height differences driven solely by variety, consistent with the previous year.

Days to flower:

The 2024 finding that variety not seeding rate determines flowering time carried forward to 2025 at both IHARF and NARF (Tables 2-8). The same varieties that were latest in 2024 (CDC 1142 and CDC 1089) again flowered latest in 2025, while others flowered a few days earlier. Outlook once again showed no meaningful differences among treatments. In short, flowering behaviour was stable and consistent between 2024 and 2025, with no major shifts in treatment responsiveness.

Days to Maturity:

Consistency between years occurred at all three sites, where the 2024 trend of earlier maturity at higher seeding rates persisted in 2025 (Tables 2-8). Variety effects also remained similar, with CDC 1142 continuing to mature later than most entries and Snowbird remaining among the earliest. The Outlook site experienced an extended period of rain in July and early August. The rainfall delayed maturity in Fabelle and Allision at the low-slope position by one week, whereas the CDC 1142 and CDC 1089 varieties were delayed by two weeks compared with the check variety Snowbird at the same low-slope position (Figure 1).

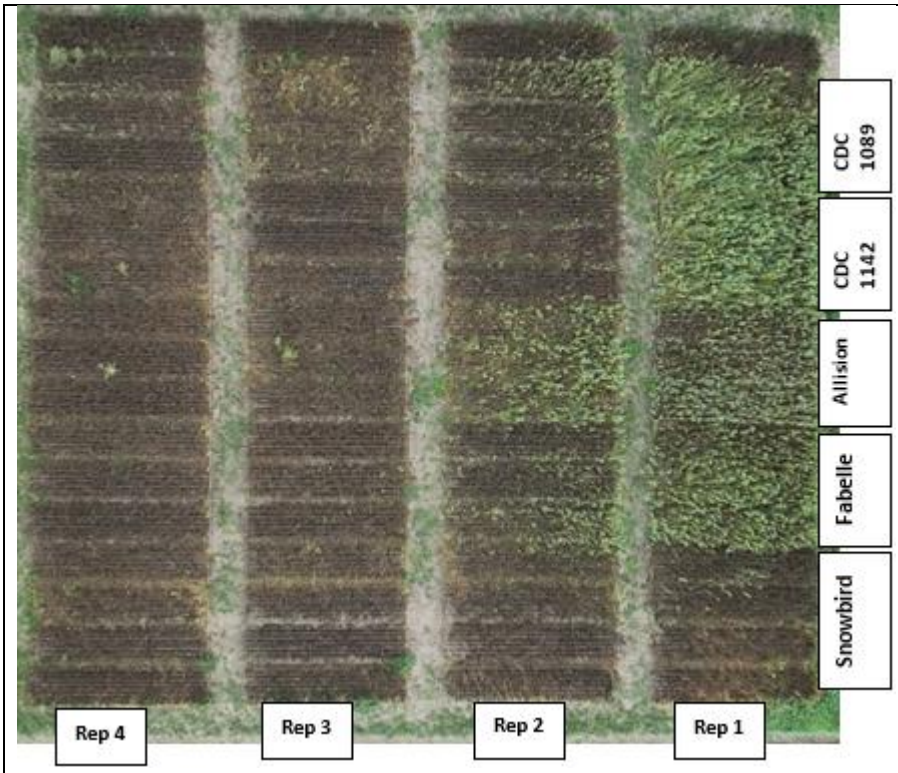

Figure 1. Top view of the Faba bean seeding rate trial at the Outlook trial site, 2025 field season. Delayed maturity of faba bean varieties in low-lying areas.

Yield:

Yield experienced year-to-year change (Tables 2-8). In 2024, Outlook had the highest yields, followed by NARF and then IHARF. In 2025, this ranking flipped: NARF became the highest-yielding site, while Outlook and IHARF produced similar, lower yields. However, treatment responses were remarkably stable. Across all three locations in 2025, as in 2024, 45 and 60 seeds/m² produced statistically similar top yields, both outperforming 30 seeds/m². Likewise, varietal yield rankings remained consistent, with Fabelle and Allison again among the highest-yielding entries and CDC 1142 among the lowest at all sites. Snowbird's performance fluctuated slightly, matching the top group at some sites in 2024 but slipping at Outlook in 2025. These were minor relative to the persistent varietal patterns.

Table 2. 2024 trial p-values of the factors for variety, seeding rate, and their interaction after performing Analysis of Variance (ANOVA) for faba bean seed rate project at three locations.

Location		Plant Density (plants/m^2)	Disease (Scale 0-9)	Height (cm)	Days to flowering	Days to maturity	Yield (kg/ha)	Lodging (% of plot flat)
ICDC/ ISask (Outlook)	Variety (p-value)	0.0132	0.0005	0.0009	Missed	0.0082	0.0015	Not recorded
	Seeding rate (p-value)	0.002	0.0026	0.0001		<0.0000	0.0017	
	Variety*Seeding rate (p-value)	0.939	0.7666	0.0359		0.6251	0.6495	
IHARF (Indian Head)	Variety (p-value)	<0.0001	0.327	<0.0001	<0.0001	<0.0001	0.0002	Not recorded
	Seeding rate (p-value)	<0.0001	0.4525	0.0004	1	<0.0001	0.0001	
	Variety*Seeding rate (p-value)	0.28	0.9467	0.766	1	0.6079	0.0224	

NARF (Melfort)	Variety (p-value)	0.001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Seeding rate (p-value)	<0.0001	0.5724	0.5033	0.1474	<0.0001	0.0382	0.0568
	Variety*Seeding rate (p-value)	0.4745	0.4316	0.7806	0.0606	0.0482	0.6905	0.3255

Table 3. 2025 trial P-values of the factors for variety, seeding rate, and their interaction after performing Analysis of Variance (ANOVA) for faba bean seed rate project at three locations.

Location		**Plant Density (plants/m²)**	**Disease (Scale 0-9)**	**Height (cm)**	**Days to flowering**	**Days to maturity**	**Yield (kg/ha)**
ICDC/ ISask (Outlook)	Variety (p-value)	<0.0001	0.0008	0.045	0.47	0.11	0.04
	Seeding rate (p-value)	<0.0001	0.02	0.35	0.67	0.002	0.0002
	Variety*Seeding rate (p-value)	0.37	0.45	0.34	0.89	0.16	0.15
IHARF (Indian Head)	Variety (p-value)	<0.0001	0.009	<0.0001	0.0001	0.052	<0.0001
	Seeding rate (p-value)	<0.0001	0.1	0.25	0.59	<0.0001	0.002
	Variety*Seeding rate (p-value)	0.25	0.3	0.96	0.68	0.98	0.39
NARF (Melfort)	Variety (p-value)	0.0241	0.1184	0.0166	0.0077	0.0003	0.0029
	Seeding rate (p-value)	<0.0001	0.9295	0.8691	0.3979	0.0001	0.0291
	Variety*Seeding rate (p-value)	0.6748	0.2795	0.3221	0.4827	0.4999	0.793

Table 3. 2024 trial treatment means for parameters after conducting pairwise comparisons using Tukey's test at alpha = 0.05 for Irrigation Saskatchewan (Outlook) location. Means followed by the same letter within a column do not significantly differ.

	Plant Density (plants/m²)		**Disease (Scale 0-9)**		**Height (cm)**		**Days to maturity**		**Yield (kg/ha)**	
Grand Mean	42		2.3		109.1		117		5774.2	
CV	22.07		17.09		3.93		3.47		12.55	
Variety										
Allison	41	AB	1.8	C	108.4	AB	117	AB	5935	AB
CDC 1809	44	AB	2.3	B	106.4	B	117	AB	5603	BC
CDC 1142	33	B	2.4	AB	112.6	A	122	A	4884	C
Fabelle	49	A	2.3	B	113.6	A	117	AB	6598	A
Snowbird	44	AB	2.8	A	104.6	B	112	B	5851	AB
Seed Rate										
30 seeds/m²	34	B	2.1	B	104.7	B	119	A	5281	B
45 seeds/m²	43	AB	2.3	AB	111.7	A	117	B	6068	A

60 seeds/m²	50	A	2.5	A	110.9	A	115	C	5973	A
*Var*Rate*										
Allison - 30 seeds/m²	33		1.6		106.4		119		5412	
Allison - 45 seeds/m²	44		1.9		110.7		117		6541	
Allison - 60 seeds/m²	46		1.8		108.1		115		5852	
CDC 1089 - 30 seeds/m²	37		1.9		104.6		120		5003	
CDC 1089 - 45 seeds/m²	48		2.6		108.7		118		5991	
CDC 1089 - 60 seeds/m²	47		2.5		105.9		115		5815	
CDC 1142 - 30 seeds/m²	24		2.2		100.8		124		4603	
CDC 1142 - 45 seeds/m²	35		2.3		117.8		121		5187	
CDC 1142 - 60 seeds/m²	40		2.6		119.4		120		4863	
Fabelle - 30 seeds/m²	40		2.1		109.9		119		6203	
Fabelle - 45 seeds/m²	47		2.2		116.4		117		6755	
Fabelle - 60 seeds/m²	61		2.6		114.3		115		6836	
Snowbird - 30 seeds/m²	37		2.6		101.8		113		5185	
Snowbird - 45 seeds/m²	41		2.8		105.2		112		5868	
Snowbird - 60 seeds/m²	54		3.2		106.8		111		6502	

Table 4. 2025 trial treatment means for parameters after conducting pairwise comparisons using Tukey's test at alpha = 0.05 for Irrigation Saskatchewan (Outlook) location. Means followed by the same letter within a column do not significantly differ.

	Plant Density (plants/m²)		**Disease (Scale 0-9)**		**Days to flowering**		**Height (cm)**		**Days to maturity**		**Yield (kg/ha)**	
Grand Mean	41		0.06		52		129		108		3946	
CV	22.6		53		0.7		4.1		2.4		3.8	
Variety												
Allison	40	A	0.05	A	52	A	128	A	106	B	5128	A
CDC 1809	33	B	0.05	A	53	A	128	A	110	A	4314	A
CDC 1142	45	A	0.02	A	52	A	130	A	108	A	3782	B
Fabelle	46	A	0.05	A	53	A	137	A	110	A	4670	A
Snowbird	40	A	0.13	A	52	A	123	B	106	B	3816	B

Seed Rate												
30 seeds/m²	43	A	0.25	A	52	A	130	A	111	A	3841	B
45 seeds/m²	43	A	0.26	A	52	A	130	A	109	B	3980	A
60 seeds/m²	38	A	0.34	A	52	A	127	A	103	C	4018	A
*Var*Rate*												
Allison - 30 seeds/m²	30	C	0.05		52		129		105	D	4512	
Allison - 45 seeds/m²	64	A	0.00		52		127		106	D	5035	
Allison - 60 seeds/m²	25	C	0.10		52		127		106	D	5837	
CDC 1089 - 30 seeds/m²	37	B	0.10		53		131		111	C	4049	
CDC 1089 - 45 seeds/m²	31	C	0.05		53		129		115	B	4512	
CDC 1089 - 60 seeds/m²	31	C	0.00		53		123		104	D	4383	
CDC 1142 - 30 seeds/m²	58	A	0.05		52		128		117	A	3361	
CDC 1142 - 45 seeds/m²	41	B	0.00		52		131		106	D	3982	
CDC 1142 - 60 seeds/m²	41	B	0.00		52		129		102	E	4003	
Fabelle - 30 seeds/m²	38	B	0.10		53		138		119	A	4587	
Fabelle - 45 seeds/m²	58	A	0.05		53		139		109	C	4525	
Fabelle - 60 seeds/m²	41	B	0.00		53		132		102	E	4898	
Snowbird - 30 seeds/m²	52	A	0.20		52		122		105	D	3618	
Snowbird - 45 seeds/m²	20	C	0.10		52		122		110	C	3915	
Snowbird - 60 seeds/m²	49	B	0.10		52		126		102	E	3915	

Table 5. 2024 Treatment means for parameters after conducting pairwise comparisons using Tukey's test at alpha = 0.05 for IHARF (Indian Head) location. Means followed by the same letter within a column do not significantly differ.

	Plant Density (plants/m²)		**Disease (Scale 0-9)**		**Height (cm)**		**Days to flowering**		**Days to maturity**		**Yield (kg/ha)**	
Grand Mean	42		1.1		90.4		54.0		99		2532.6	
CV	9.01		10.89		3.87		1.13		1.19		12.76	
Variety												
Allison	42	A	1.1	A	94.5	A	52	E	100	B	2914	A
CDC 1089	38	B	1.1	A	87.2	BC	55	B	99	B	2422	BC
CDC 1142	32	C	1.0	A	84.2	C	56	A	101	A	2037	C
Fabelle	48	A	1.1	A	96.8	A	53	D	99	B	2796	AB
Snowbird	50	A	1.1	A	89.1	B	54	C	97	C	2494	AB
Seed Rate												
30 seeds/m²	29	C	1.1	A	88.5	B	54	A	100	A	2419	B

45 seeds/m²	43	B	1.1	A	90.4	AB	54	A	99	B	2537	A
60 seeds/m²	54	A	1.1	A	92.3	A	54	A	98	C	2642	A
*Var*Rate*												
Allison - 30 seeds/m²	28		1.1		92.7		52		101		2749	
Allison - 45 seeds/m²	45		1.1		95.3		52		99		2906	
Allison - 60 seeds/m²	54		1.1		95.4		52		99		3086	
CDC 1089 - 30 seeds/m²	25		1.1		86.3		55		101		2471	
CDC 1089 - 45 seeds/m²	36		1.1		86.7		55		99		2436	
CDC 1089 - 60 seeds/m²	51		1.0		88.6		55		98		2361	
CDC 1142 - 30 seeds/m²	22		1.0		81.8		56		102		1869	
CDC 1142 - 45 seeds/m²	32		1.1		85.3		56		101		2138	
CDC 1142 - 60 seeds/m²	41		1.0		85.7		56		101		2105	
Fabelle - 30 seeds/m²	36		1.1		95.1		53		100		2701	
Fabelle - 45 seeds/m²	49		1.2		95.9		53		99		2687	
Fabelle - 60 seeds/m²	59		1.1		99.4		53		99		2999	
Snowbird - 30 seeds/m²	35		1.1		86.4		54		98		2305	
Snowbird - 45 seeds/m²	52		1.1		88.7		54		97		2517	
Snowbird - 60 seeds/m²	64		1.2		92.4		54		96		2660	

Table 6. 2025 trial Treatment means for parameters after conducting pairwise comparisons using Tukey's test at alpha = 0.05 for IHARF (Indian Head) location. Means followed by the same letter within a column do not significantly differ.

	Plant Density (plants/m²)		**Disease (Scale 0-9)**		**Days to flowering**		**Height (cm)**		**Days to maturity**		**Yield (kg/ha)**	
Grand Mean	33		0.28		54		84		107		3946	
CV	12.4		51		1.8		2.1		1.1		3.8	
Variety												
Allison	39	A	0.20	B	53	B	84	B	106	A	4247	A
CDC 1809	30	B	0.24	B	55	A	81	B	108	A	4027	A
CDC 1142	26	C	0.18	B	55	A	86	A	108	A	3387	B
Fabelle	34	B	0.23	B	53	B	89	A	108	B	4377	A

Snowbird	36	A	0.55	A	54	B	80	B	107	B	3693	B
Seed Rate												
30 seeds/m²	22	C	0.25	A	54	A	84	A	109	A	3841	B
45 seeds/m²	33	B	0.26	A	54	A	84	A	107	B	3980	A
60 seeds/m²	44	A	0.34	A	54	A	83	A	106	B	4018	A
*Var*Rate*												
Allison - 30 seeds/m²	27		0.15		53		84		108		4051	
Allison - 45 seeds/m²	40		0.2		52		84		106		4328	
Allison - 60 seeds/m²	50		0.25		53		83		106		4362	
CDC 1089 - 30 seeds/m²	21		0.2		55		81		109		4018	
CDC 1089 - 45 seeds/m²	31		0.13		55		81		108		4014	
CDC 1089 - 60 seeds/m²	39		0.4		55		79		106		4050	
CDC 1142 - 30 seeds/m²	16		0.15		56		86		110		3338	
CDC 1142 - 45 seeds/m²	27		0.2		56		85		108		3339	
CDC 1142 - 60 seeds/m²	34		0.2		55		86		108		3484	
Fabelle - 30 seeds/m²	27		0.3		53		89		109		4223	
Fabelle - 45 seeds/m²	34		0.2		53		89		108		4501	
Fabelle - 60 seeds/m²	47		0.2		53		88		106		4406	
Snowbird - 30 seeds/m²	23		0.45		54		80		108		3575	
Snowbird - 45 seeds/m²	33		0.55		53		80		107		3715	
Snowbird - 60 seeds/m²	52		0.65		54		79		106		3790	

Table 7. 2024 Treatment means for parameters after conducting pairwise comparisons using Tukey's test at alpha = 0.05 for NARF (Melfort) location. Means followed by the same letter within a column do not significantly differ.

	Plant Density (plants/m²)		**Disease (Scale 0-9)**		**Height (cm)**		**Days to flowering**		**Days to maturity**		**Yield (kg/ha)**		**Lodging (% of plot flat)**	
Grand Mean	37.6		0.5		98.1		58		107		4311.8		17.1	
CV	16.73		98.45		3.27		1.08		0.81		6.04		56.02	
Variety														
Allison	39	A	0.3	B	102.5	A	56	B	108	A	4906	A	0.0	B

CDC 1089	37	AB	0.2	B	94.6	B	60	A	107	B	3858	BC	77.3	A
CDC 1142	29	B	0.4	B	93.6	B	60	A	110	A	3477	C	8.4	B
Fabelle	45	A	1.4	A	106.0	A	56	B	107	B	5137	A	0.0	B
Snowbird	39	A	0.0	B	94.1	B	58	B	105	B	4182	B	0.0	B
Seed Rate														
30 seeds/m²	29	C	0.5	A	97.5	A	58	A	108	A	4171	A	13.1	B
45 seeds/m²	38	B	0.5	A	98.8	A	58	A	107	B	4369	A	16.8	AB
60 seeds/m²	46	A	0.4	A	98.1	A	58	A	107	B	4395	A	21.5	A
*Var*Rate*														
Allison - 30 seeds/m²	31		0.2		102.9		56		109		4653		0.0	
Allison - 45 seeds/m²	41		0.5		102.8		5		109		5012		0.0	
Allison - 60 seeds/m²	44		0.3		101.8		56		107		5053		0.0	
CDC 1089 - 30 seeds/m²	23		0.1		93.3		60		108		3770		65.6	
CDC 1089 - 45 seeds/m²	39		0.3		95.8		60		106		3772		77.5	
CDC 1089 - 60 seeds/m²	48		0.2		94.6		60		106		4032		88.8	
CDC 1142 - 30 seeds/m²	24		0.5		93.3		60		110		3448		0.0	
CDC 1142 - 45 seeds/m²	30		0.5		94.5		60		109		3618		6.3	
CDC 1142 - 60 seeds/m²	34		0.3		93.0		60		110		3365		19.0	
Fabelle - 30 seeds/m²	36		1.6		106.8		56		108		5001		0.0	
Fabelle - 45 seeds/m²	44		1.3		105.1		56		106		5214		0.0	
Fabelle - 60 seeds/m²	53		1.4		105.9		56		106		5197		0.0	
Snowbird - 30 seeds/m²	29		0.0		91.3		57		106		3984		0.0	
Snowbird - 45 seeds/m²	37		0.1		95.8		59		105		4232		0.0	
Snowbird - 60 seeds/m²	50		0.1		95.2		57		105		4329		0.0	

Table 8. 2025 trial treatment means for parameters after conducting pairwise comparisons using Tukey's test at alpha = 0.05 for NARF (Melfort) location. Means followed by the same letter within a column do not significantly differ.

	Plant Density (plants/m²)	**Disease (Scale 0-9)**	**Days to flowering**	**Height (cm)**	**Days to maturity**	**Yield (kg/ha)**
Grand Mean	27.7	55	0.2	85.8	119	6081

CV	18.14		0.96		83.91		3.88		0.88		4.3	
Variety												
Allison	29	AB	0.3	A	53	A	87	AB	119	B	6250	AB
CDC 1809	27	AB	0.2	A	56	A	83	AB	118	B	5940	B
CDC 1142	19	B	0.1	A	56	A	89	A	122	A	5467	B
Fabelle	34	A	0.4	A	54	A	90	A	119	B	6862	A
Snowbird	29	AB	0.2	A	56	A	80	B	118	B	5887	B
Seed Rate												
30 seeds/m^2	20	C	0.2	A	55	A	86	A	120	A	5945	B
45 seeds/m^2	29	B	0.2	A	55	A	86	A	119	B	6164	A
60 seeds/m^2	35	A	0.3	A	55	A	86	A	119	B	6135	AB
*Var*Rate*												
Allison - 30 seeds/m^2	20		0.4		53		83		120		6149	
Allison - 45 seeds/m^2	30		0.4		54		89		119		6257	
Allison - 60 seeds/m^2	37		0.2		54		88		119		6343	
CDC 1089 - 30 seeds/m^2	20		0.3		56		85		119		5881	
CDC 1089 - 45 seeds/m^2	27		0.2		56		83		118		5953	
CDC 1089 - 60 seeds/m^2	34		0.2		56		83		119		5988	
CDC 1142 - 30 seeds/m^2	13		0.1		56		90		123		5214	
CDC 1142 - 45 seeds/m^2	20		0.2		56		89		121		5530	
CDC 1142 - 60 seeds/m^2	22		0.2		56		89		121		5656	
Fabelle - 30 seeds/m^2	24		0.3		54		92		121		6715	
Fabelle - 45 seeds/m^2	36		0.2		54		91		119		7026	
Fabelle - 60 seeds/m^2	44		0.6		54		88		118		6847	
Snowbird - 30 seeds/m^2	22		0.2		56		80		119		5765	
Snowbird - 45 seeds/m^2	29		0.3		56		79		118		6056	
Snowbird - 60 seeds/m^2	36		0.3		56		80		118		5839	

Conclusions and Recommendations *(maximum 500 words)*

Highlight significant conclusions based on the findings of this project, with emphasis on the project objectives specified above. Provide recommendations for the application and adoption of the project findings.

Overall, the results indicate that higher seeding rates consistently improve plant stand and yield across low vicine/convicine faba bean varieties, with larger-seeded types like Fabelle and Allison outperforming smaller-seeded varieties, suggesting that an optimal seeding rate of 45 seeds/m² offers producers a reliable balance of stand establishment and yield potential in Saskatchewan.

Follow-up Work

Please identify if there is a need to conduct further work. Detail any further projects and/or communication needs arising from this project.

The 2025 trial at Irrigation Saskatchewan showed that all faba bean varieties except the Snowbird check experienced delayed maturity in wetter, low-lying field areas, indicating a strong interaction between soil moisture and varietal maturation date. Therefore, a follow-up study that compares irrigated and dryland conditions to quantify how moisture-induced maturity delays affect yield and key agronomic traits across low vicine/convicine varieties would be appropriate.

Patents/ IP generated/ Commercialized Products

List any products developed from this project.

NA

Sustainable Canadian Agricultural Partnership (Sustainable CAP) Performance Indicators

a) List of performance indicators

Sustainable CAP Indicator	Total Number
Scientific publications from this project (List the publications under section b)	
• Published	
• Accepted for publication	
HQPs trained during this project	
• Master's students	
• PhD students	
• Post docs	
Knowledge transfer products developed based on this project (presentations, brochures, factsheets, flyers, guides, extension articles, podcasts, videos)[1]	Presentation, Video, Article (Irrigator, Spring 2026)

[1] Please only include the number of unique knowledge transfer products.

b) List of scientific journal articles published/accepted for publication from this project.

Title	Author(s)	Journal	Date Published or Accepted for Publication	Link (if available)

c) List of knowledge transfer products/activities developed from this project.

Knowledge Transfer Product or Activity	Event/Location Where Knowledge Transfer Was Conducted	Estimated Number of Producers/Processors Participated In Knowledge Transfer	Link (if available)
Presentation	2025 Outlook Irrigation Field Day	300	
Presentation	2025 Irrigation Saskatchewan Conference – Break out room	30	
Online posts and videos	X and LinkedIn posts in 2024, 2025, and 2026 YouTube Video in 2025	130 – 200 for each post, 30 for the video	

Contributions and Support

List any industry contributions or support received.

Brianne Mcinnes – Northeast Agriculture Research Foundation

Chris Holzapfel – Indian Head Agriculture Research Foundation

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Appendices

Include any additional materials supporting the previous sections, e.g. detailed data tables, maps, graphs, specifications, literature cited (Use a consistent reference style throughout).

Reference List:

Alberta Pulse Growers. (2026, Feb 18). Faba beans for producers. https://albertapulse.com/growing-faba-beans/

Saskatchewan Pulse Growers. (2026, Feb 18). Faba Beans Seeding. https://saskpulse.com/growing-pulses/faba-beans/faba-beans-seeding/#Inoculation_And_Fertility

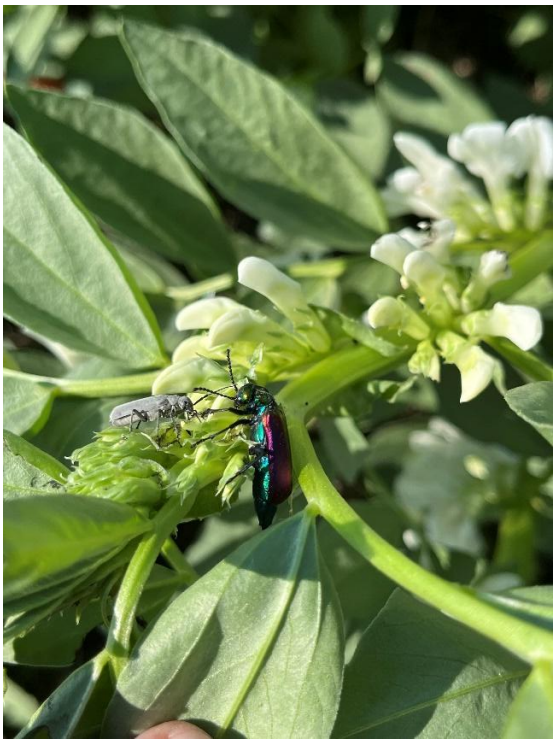

Figure 1. Blister beetle and another unidentified insect (possibly pea leaf weevil)

Figure 2. Flowers on plant starting to turn brown (develop pods)

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Figure 3. Insect bite on leaf

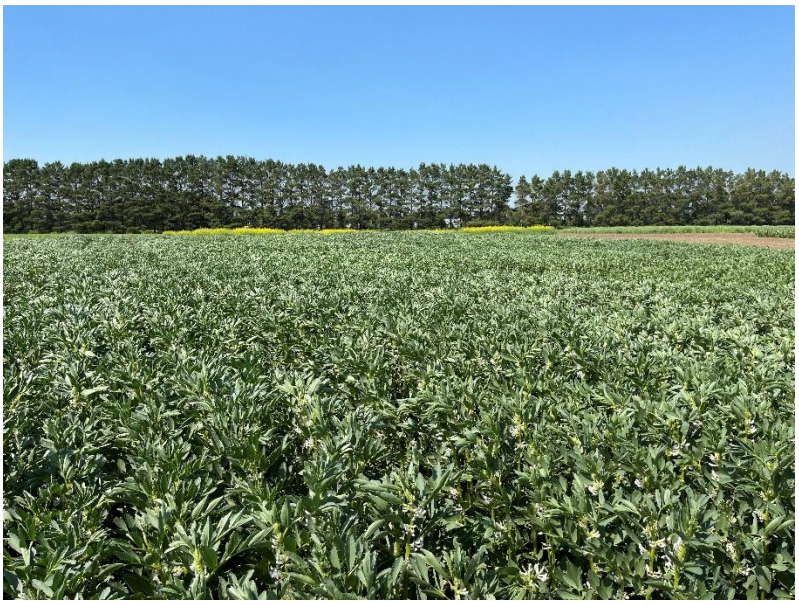

Figure 4. Overview of plot at Irrigation Saskatchewan

Figure 5. Overview of whole plant