Grain Crops

Pulses - Faba Bean

Table 1B-1 Mean values obtained from parameters studied in faba bean varieties sown in St. Paul, Alberta in 2025

Variety	Individual count		Height		Test weight	Thousand seed weight (TSW)	
	Plant m-2		cm		g/L	g	
1142	40.11	ABC	51.00	BCDE	786.1	276.48	D
CDC1089	34.03	ABCD	54.38	BCD	786.1	314.26	C
CDC1310	51.36	A	51.56	BC	776.7	270.9	D
Dosis	17.36	CDE	57.25	BCDE	786.5	337.72	C
Futura	21.78	BCD	58.19	BCDE	783.5	396.37	AB
Hammer	43.34	AB	57.75	B	788.2	384.34	B
Juno	16.67	CDE	56.63	G	770.0	417.88	A
Navi	3.67	E	49.16	A	793.6	-	-
Fabelle	15.34	DE	57.19	BCD	801.6	387.67	B
P-value	0.0006		≤0.0001		0.0937	≤0.0001	
Standard error	5.2		1.2		5.5	8.5	

In general, Faba bean varieties struggled from the extensive rain scarce periods occurring in the growing season. It is possible drought may have exacerbated the difference in parameters studied across the varieties planted. Number of plants per squared metre, height and thousand seed weight varied significantly across nine faba bean varieties sown in St. Paul (Table 1B-1), whereas test weight was statistically the same. CDC 1310 Faba bean variety individuals were more numerous compared to those individuals from the Navi faba bean variety. Faba bean individuals were as statistically numerous as those found in CDC 1310, 1142, CDC 1089, and Hammer (Table 1B-1). Navi faba bean plants were the tallest in comparison to the other eight faba bean varieties. In contrast, the shortest faba bean plants were observed in plots sown to the Juno faba bean variety. Thousand seed weight (TSW) was heaviest in plants from the Juno variety compared to lightest TSW found in plants from the Dosis and the CDC 1089 faba bean varieties (Table 1B-1). Statistically similar to Juno faba beans, Futura faba beans TSW was also among the heaviest.

There was barely enough Navi faba beans to estimate a proper mean TSW value. Hammer faba bean plants produced the greatest yield compared to those plants from the Navi variety (Table 1B-1). All but 1142 and Navi faba bean plants produced yield statistically similar to that brought out by Hammer faba bean individuals.

In comparison to Fabelle faba bean (control), all faba bean varieties with the exception of Navi, had significantly more plants according to mean values calculated (Table 1B-1). Navi faba bean plants were taller than the control. This is likely because there were fewer stands at each plot and therefore lack of intra specific competition from other faba bean plant stands caused Navi faba bean individuals to gain height advantage. However, Fabelle faba bean individuals were still significantly taller than Juno faba bean plant stands (Table 1B-1).
Thus, all other varieties were as tall as Fabelle plant individuals. Juno and Futura seem to produce heavier TSW compared to that recorded from the Fabelle variety. Yield produced from Hammer faba bean stands in the end was statistically similar to that produced by the control variety plant stands.

Overall, Fabelle faba bean variety plants may emerge in low numbers, have average height and TSW but yield obtained is still competitive compared to those from other faba bean varieties tested. As such, Fabelle is still a safe choice to grow faba beans and to some extent, Hammer, CDC 1089, Dosis, CDC 1310, Futura, Juno and CDC 1310 can be acceptable alternatives.

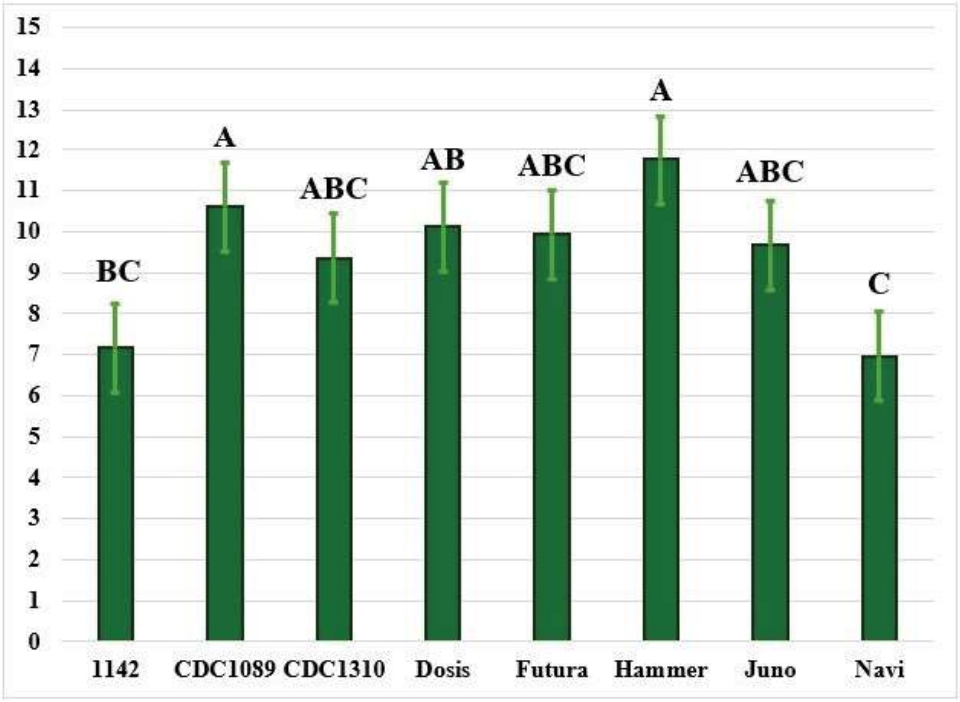

Figure 1B-1. Faba bean mean yield in bu acre-1 collected from 17 varieties in St. Paul, Alberta in 2025.

Grain Crops

Pulses - Field Pea

Yellow Field Pea

Plots sown to CDC Bound had the greatest number of field pea individuals per squared metre compared to other field pea varieties such as CDC Amarillo and PS Boost. However, AAC Harrison, AAC McMurphy, CDC 5791, CDC 5845, CDC Canuck, CDC Engage, CS ProStar, DL 995-96, LAP 23-14, LAP 23-17 and LN 4228 varieties had individual plant count statistically on par compared to plant number recorded from CDC Bound (Table 1B-2).

Table 1B-2 Mean values obtained from parameters studied in yellow and green field pea varieties sown in St. Paul, Alberta in 2025

Variety	Individual count		Height		Test weight	Thousand seed weight (TSW)	
	Plant m-2		cm		g/L	g	
Yellow field pea							
AAC Harrison	191.36	ABC	52.56	BCDE	831.96	177.32	CDE
AAC McMurphy	156.25	ABC	53.78	BCD	829.06	212.71	A
CDC 5791	205.44	AB	54.50	BC	832.00	189.03	BC
CDC 5845	171.17	ABC	53.28	BCDE	831.70	186.40	BCD
CDC Bound	245.45	A	52.66	BCDE	822.80	177.54	CD
CDC Canuck	132.25	ABCD	56.72	B	837.06	196.88	AB
CDC Engage	136.11	ABC	46.03	G	824.00	147.04	F
CS ProStar	132.25	ABCD	61.59	A	825.46	171.70	DE
DL 995-96	160.45	ABC	54.34	BCD	829.26	148.04	F
LAP 23-14	203.06	AB	50.25	DEF	821.20	182.69	BCD
LAP 23-17	200.70	AB	54.31	BCD	841.80	183.64	BCD
LN 4228	212.67	AB	50.72	CDEF	834.86	208.16	A
PS Boost	93.45	CDE	61.59	A	826.90	159.77	EF
CDC Amarillo	50.17	DE	52.13	CDE	836.66	177.71	CD
Green field pea							
CDC Huskie	138.06	ABC	49.16	EFG	819.40	159.99	EF
LAP 23-4	106.78	BCDE	47.63	FG	832.94	177.40	CD
CDC Limerick	38.03	E	51.69	CDEF	824.86	178.37	CD
P-value	0.0008		≤0.0001		0.511	≤0.0001	
Standard error	13.86		1.5		6.2	5.8	

On a different note, CS ProStar field pea variety individuals were significantly taller than all other varieties sown in St. Paul. CDC Engage field pea individuals were the shortest and individuals from LAP23-4 had heights statistically the same as those measured for CDC Engage individuals (Table 1B-2).

Yield varied across field pea varieties (P=0.0008, Figure 1B-2). Most yielding variety was PS Boost. Moreover, LAP 23-17, DL 995-96, CS ProStar, CDC 5845. CDC 5791, AAC McMurphy and AAC Harrison yielded statistically on par compared to the bushel acre^{-1} value obtained from PS Boost individuals.

Least yielding yellow field pea varieties were CDC Amarillo and LN 4228. Weight from a thousand seeds (TSW) was heaviest from CDC McMurphy and LN 4228 field pea plant varieties. Similarly, TSW in CDC Canuck, was statistically the same to that in the aforementioned varieties. In contrast, field pea varieties such as CDC Engage and DL 995-96 produced the lightest TSW weights. These weights were similar in statistical terms to that found in CDC Huski and PS Boost. Test weight was statistically the same among all varieties seeded.

The check for yellow field pea varieties was CDC Amarillo. Compared to this field pea variety, CDC Bound had more plants per squared metre, whereas CS ProStar and LN 4228 were 15% taller. AAC McMurphy and LN 4228 seeds were heavier in groups of thousand compared to CDC Amarillo (Table 1B-2). Finally, yield in CDC Amarillo was toppled by yield produced from PS Boost individuals (Figure 1B-2). Overall, PS Boost is likely the most yielding because it produces more seeds than other varieties as shown by it yield, and also had greater yielding potential as shown by it recorded mean height. Thus, it can be concluded that PS Boost is an acceptable option for field pea yield, especially during the particular dry conditions experienced during the growing season.

Green Field Pea

CDC Huskie field pea individuals were the most numerous among those varieties compared and produced heavier thousand seed weights compared to those from the CDC Limerick green field pea variety (Table 1B-2).

There were no differences among green field pea varieties neither in height, test weight (Table 1B-2) or yield (Figure 1B-2). Results indicated that green field pea varieties were on par in terms of yield, test weight and height in comparison to the check (CDC Limerick) and there is potential for yield advantage from CDC Huskie individuals as they can grow taller.

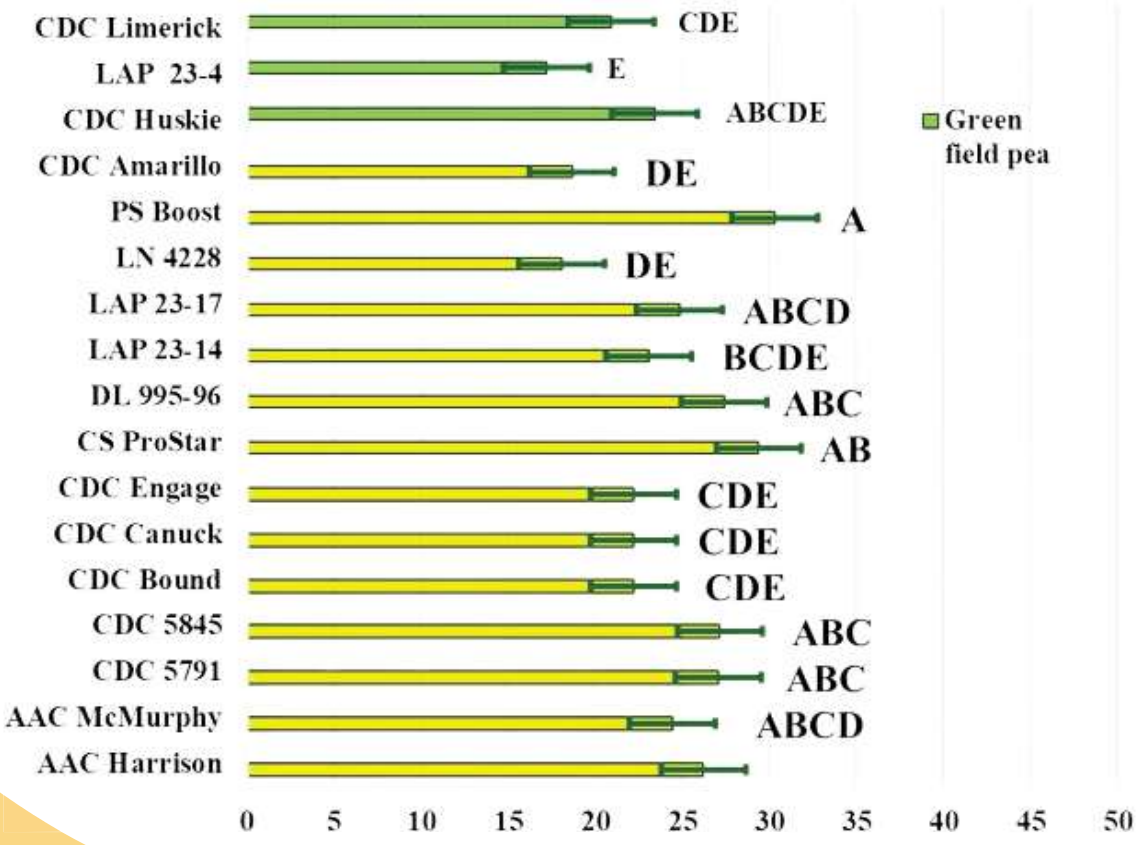

Figure 1B-2. Field pea yield in bu acre-1 collected from 17 varieties in St. Paul, Alberta in 2025.

Grain Crops

Pulses - Lupin

Lupin trials are generally composed of four pulse species: yellow field pea, white lupin, blue lupin and faba bean. In this way, lupin productivity is tested against other widely known pulse species in the province. As for the lupin varieties, five varieties were tested for wide leaf lupin and seven varieties for narrow leaf lupin.

Wide leaf lupin varieties tested are Dieta, which is the most studied here in Canada and thus the one with most potential for commercialization. It has been shown to grow well all over the province except in the Central region, because its growth and development goes further than the length of the growing season. Other wide leaf varieties such as UK1 and UK2 are originated from the United Kingdom. The maturity of these varieties can occur much later after the end of the growing season, so they are being tested to see if maturity can appear sooner, given current climate conditions in the province. Finally, Cer1 as well as Cer2 are new French varieties brought for testing.

Narrow leaf lupin varieties such as Lunabor and Probor, are originated from Europe. These two have the most attention by researchers from Lakeland College because they have shown adaptability and yield potential. Lima varieties (Lima1, Lima2 and Lima3) are varieties shipped from Australia which were tried this year by LARA.

Yellow Pea in Lupin Trial
Yellow field pea varieties showed statistically the same mean number of individuals compared to other varieties sown in lupin and faba bean (Table 1B-3). Yellow pea individuals from the Carver variety were significantly taller than those from the LN4228 variety. More nodules were found in yellow pea plant roots in comparison to those counted in lupin plant roots.

Among yellow pea varieties however, nodulation rating was statistically the same (Table 1B-3).

Thousand seed weight (TSW) in LN4228 yellow pea was the heaviest compared to those thousand seed bunches weighed from Carver and Lewochko varieties (Table 1B-3). Like nodulation, yield was the same among yellow pea varieties but is significantly differ from yield obtained from lupin and faba bean plant stands ($P \leq 0.0001$, Figure 1B-3).

Wide Leaf Lupin
Mean number of individuals and mean height in wide leaf lupin were the same statistically (Table 1B-3). Like most pulses, lupin is a poor competitor against other grassy and broadleaf plant species.

Wide leaf lupins were heavily impacted by presence on annual ryegrass (Lolium multiflorum L.), quackgrass (Elymus repens L.) and lambs quarters (Chenopodium album L.) in the field. Annual ryegrass and quackgrass proliferated aggressively despite the few precipitation events.

Nodulation ratings in lupin roots were difficult to assess. Nodules were hard to find in narrow leaf lupin plant roots. Many nodes were not present and those present were vary scarce and not fully formed; possibly due to the inoculant used or both the inoculant and plant intolerance to drought.

Cer2 wide leaf lupin had the heaviest lot of thousand seeds compared to Cer1, UK1 and UK2 varieties (Table 1B-3). This was difficult to measure because yield from wide leaf lupin plants overall was scarce. In other words, by the time of harvest, lupin seeds collected from varieties of this species were hardly greater than a human fist. This explains the low yield in Figure 3C-1. Compared to Dieta wide leaf lupin (control), varieties from the same species were statistically the same. Thus, results indicated that wide leaf lupin is extremely sensitive to drought and will not prosper in the face of water scarcity.

Narrow Leaf Lupin

As for narrow leaf lupin, number of plants per meter squared were greater in the Lima1, Lima3, Lunabor and Boregine varieties compared to the Probor variety from the same species (Table 1B-3). Nor1 narrow leaf lupin plants were the tallest compared to plants from varieties such as Lima1, Lima2, Lima3, and Probor. Height in Nor1 plant stands however was statistically the same as those from Lunabor and Boregine varieties (Table 1B-3).

Like wide leaf lupin, nodulation in narrow leaf lupin roots was negatively impacted. There were very little nodules and many of them were not fully formed. Similarly to wide leaf lupin it is possible that the inoculant added to the seeds is likely a work in progress and like the plant, very sensitive to rain shortage in the summer.

Thousand seed weight in Lima1 and Lima3 narrow leaf lupin was heavier than that weighed in Nor1 narrow leaf lupin. Yield in narrow leaf lupin was also compromised by drought and interspecific competition from annual ryegrass, quackgrass, and lambs' quarter. Although yield in narrow leaved lupin was greater than wide leaf lupin, some narrow leaf lupin varieties struggled to produce yielding seed. Lima2 and Probor narrow leaf lupin plants had less individuals and due to the low number of seeds, thousand seed weight had to be extrapolated.

Compared to other narrow leaved lupin varieties, Boregine (the control) had more plants than the Probor variety; taller than Probor plants and all plants from the Lima varieties; with same nodulation ratings as the other varieties. Lot of thousand seeds was as statistically heavy as other varieties except Nor1, whose thousand seed weight was lighter. As a final note, Boregine plants yielded the same as the other varieties (Figure 1B-3), but Lima1 plants were more yielding. Narrow leaf lupin has shown that it could be planted and taken to harvest at promising yields.

Nevertheless, planting should be carried out with caution as it is poorly competitive with weeds and does not produce acceptable yields at the behest of drought.

Table 1B-3 Mean values obtained from parameters studied in yellow field pea, narrow leaf lupin, wide leaf lupin and faba bean varieties sown in St. Paul, Alberta in 2025

Species / Variety	Individual count		Height		Nodulation		Thousand seed weight (TSW)	
	Plant m-2		cm		1-13 scale		G	
Yellow field pea								
Carver	158.02	A	54.3	A	11.25	BC	172.55	F
LN4228	164.60	A	48.62	BC	10.68	C	208.65	E
Lewicki	164.60	A	50.80	AB	11.50	ABC	167.77	F
Wide leaf lupin								
Cer1	50.32	E	33.25	FGH	5.50	D	262.07	CD
Cer2	51.40	E	32.43	GH	6.25	D	302.29	B
UK1	59.07	E	34.38	FG	6.25	D	266.16	CD
UK2	69.42	DE	35.08	FG	5.25	D	270.01	CD
Dieta	55.77	E	35.85	FG	5.25	D	277.37	BC
Narrow leaf lupin								
Lima1	139.43	ABC	29.35	H	6.00	D	141.20	G
Lima2	108.28	BCD	29.18	H	5.00	D	135.76	GH
Lima3	149.28	AB	32.88	FGH	5.00	D	142.59	G
Nor1	111.55	BCD	41.05	DE	5.50	D	114.96	H
Lunabor	126.85	ABC	37.56	EF	5.00	D	119.85	GH
Probor	73.85	DE	34.40	FG	5.25	D	121.86	GH
Boregine	140.52	AB	40.28	E	6.25	D	132.10	GH
Faba bean								
219-16	94.07	CDE	45.69	CD	12.25	ABC	248.71	D
Fabelle	74.92	DE	45.75	C	12.50	AB	354.82	A
Snowbird	59.6	E	48.88	BC	13.00	A	367.03	A
P-value	0.0009		≤0.0001		≤0.0001		0.0009	
Standard error	19.6		1.8		0.6		10.4	

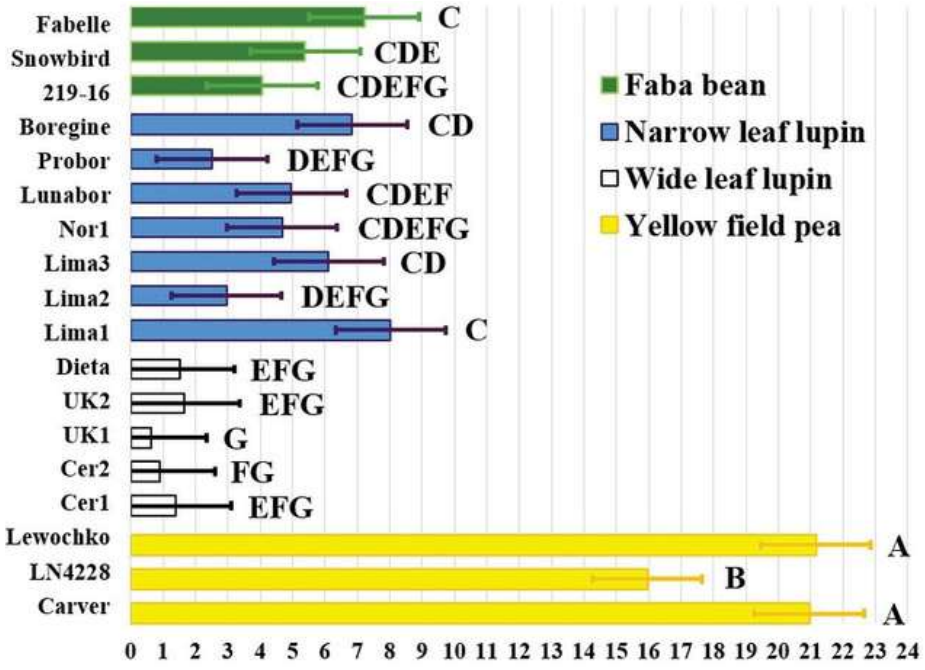

Figure 1B-3. Yellow pea, faba bean, wide leaf as well as narrow leaf lupin mean yield in bu acre-1 from varieties planted in St. Paul, Alberta in 2025.