

AGRONOMICS OF LUPIN PRODUCTION

There is growing interest in identifying a new pulse crop option for fields in Alberta that have been impacted by *Aphanomyces* root rot. Lupins are emerging as a promising alternative because they show strong resistance to *Aphanomyces* and offer high protein content, making them suitable for both livestock feed and human food products. As interest in this crop continues to build, it is important to better understand how different lupin varieties perform under local growing conditions. To help address this, Gateway Research Organization (GRO) is partnering with Lakeland College to evaluate a range of lupin varieties and determine which ones are best suited to the North-Central region of Alberta. GRO has been involved in this work since 2022 and is one of several research groups across Alberta replicating the trial to capture how these crops perform in different environments.

In 2025, the trial included seven blue lupin varieties, five white lupin varieties, three pea varieties, and three faba bean varieties. Each crop was seeded at rates recommended to achieve optimal plant populations: blue lupins at 110 plants per square meter, white lupins at 55 plants per square meter, peas at 80 plants per square meter, and faba beans at 44 plants per square meter. The trial aims to provide practical insights into crop performance and yield potential, helping producers assess whether lupins could be a suitable addition to their crop rotations as an alternative pulse crop.

AGRONOMIC INFORMATION:

Seeded: April 30, 2025

Seed depth: 1 ¼ inches for Lupins; 2 inches for Peas/Faba Beans

Soil temperature: 9°C

Rainfall recorded: April 30 to Sept. 21, 2025: 202.3 mm

Fertilizer:

Side Banded: 21-0-0-24 @ 83.3 lbs/ac

17.5 lbs/ac Actual N; 0 lbs/ac Actual P; 0 lbs/ac Actual K; 20 lbs/ac Actual S

Seed Placed: 11-52-0 @ 23 lbs/ac

2.5 lbs/ac Actual N; 11.96 lbs/ac Actual P

Pre-Emergence: Glyphosate + Heat @ 270 g ae/ac + 10.4 g/ac on May 6, 2025

In-crop Herbicide:

Lupins: Sencor @ 125 g/ac on June 5, 2025

Peas: Assure @ 150 ml/ac on June 5, 2025

Faba Beans: Viper + UAN @ 404 ml/ac + 810 ml/ac on June 5, 2025

Desiccant:

Blue Lupins: Reglone @ 1 L/ac on Aug. 11, 2025

White Lupins/Faba Beans: Reglone @ 1 L/ac on Sept. 17, 2025

Harvested:

Peas/Blue Lupins: Aug. 21, 2025

White Lupins/Faba Beans: Sept. 22, 2025

AGRONOMICS OF LUPIN PRODUCTION CONTINUED

Explanation of nodulation score:
11-13 Effective nodulation. Good nitrogen fixation potential.
7-10 Nodulation less effective. Fixation potential reduced.
1-6 Gennerally unsatisfactory nodulation.

LUPIN VARIETY TRIAL - GRO, WESTLOCK - 2025

Trt	Treatment	Crop	Yield	Height	Plant Count	Days to Flowering	Nodulation
No.	Name	Type	(bu/ac)	(cm)	(#/m2)	(# of days)	1 (poor) - 13 (excellent)
1	Lunabor	Blue Lupin	32	44.40	82.58	61.50	7.50
2	Boregine	Blue Lupin	45	53.30	74.63	59.30	8.80
3	Probor	Blue Lupin	49	59.55	70.53	61.00	10.80
4	Lima 1	Blue Lupin	36	47.00	75.20	58.50	9.30
5	Lima 2	Blue Lupin	28	37.00	84.18	63.50	8.30
6	Lima 3	Blue Lupin	33	45.80	73.83	61.00	8.00
7	Nor 1	Blue Lupin	28	38.20	88.05	62.00	7.50
8	LN4228	Yellow Peas	31	44.10	78.20	64.30	8.50
9	Carver	Yellow Peas	45	53.30	71.65	61.50	10.00
10	Lewochko	Yellow Peas	34	48.75	71.90	61.00	9.00
11	Dieta	White Lupin	34	46.65	48.95	59.80	8.30
12	UK1	White Lupin	40	54.60	46.48	56.80	7.30
13	UK2	White Lupin	42	56.65	43.75	60.00	8.30
14	Cer1	White Lupin	40	56.25	43.20	60.00	7.30
15	Cer 2	White Lupin	39	52.85	41.58	60.00	7.80
16	Fabelle	Faba Beans	46	72.35	36.38	58.80	10.00
17	219-16	Faba Beans	43	65.60	39.65	58.30	10.00
18	Snowbird	Faba Beans	43	62.10	43.75	57.50	9.80
LSD P=.05 (% mean diff)			20.82 (55%)	23.36 (45%)	15.74 (26%)	5.65 (10%)	3.55 (41%)
Standard Deviation			14.66	16.45	11.09	3.98	2.50
CV			38.36	31.56	17.91	6.61	28.82

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).

RESULTS AND DISCUSSION:

To conclude, although some varieties showed numerically higher yields than others, these differences were not statistically significant at the $P = 0.05$ level, as all treatments shared the same significance of grouping ("a"). The relatively large LSD value of 20.82 bu/ac, which represents about 55% of the trial mean, along with a high coefficient of variation (CV) of 38.36%, indicates substantial variability within the trial. This level of variability likely reduced the ability to detect meaningful statistical differences among the varieties. Similarly, other agronomic traits measured in the study, including plant height, days to flowering, and nodulation, did not differ significantly among treatments. While a few varieties within each crop group produced numerically higher yields, the lack of statistical significance and the high variability suggest that these results should be interpreted with caution. Additional years of data and repeated trials under similar conditions would help provide a more reliable assessment of varietal performance and confirm whether the observed trends are consistent over time.

FUTURE NOTES:

An exciting development for local producers is the establishment of new lupin processing capacity. Lupin Platform Inc. is set to open a lupin processing facility in Westlock County near the end of March 2026. The facility will be located along Highway 44 between Pickardville and Busby. This location was chosen because it sits within a 100 km radius of where most of the province's lupin growers are located, making it convenient for producers supplying the crop. The facility will begin operations on a smaller scale, focusing mainly on research, trials, and product development. As production and market demand increase, there is potential for the facility to expand in the future.

ACKNOWLEDGEMENTS

GRO would like to sincerely thank Robyne Davidson from Lakeland College, the principal investigator of the trial, for her leadership and coordination, which were essential to the successful conduct of this study. We also gratefully acknowledge RDAR for providing financial support, which made this research possible.

