

Lupin variety x fertiliser x row spacing trial – Merriwagga 2013

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Sowing date: 30th April

Herbicide: 1.0L/ha Roundup CT + 1kg/ha Terbyne IBS

No post emergent herbicides

Fungicide: Nil

Insecticide: Nil

Harvest date: 8th November

December

Key Points

- Albus varieties were generally higher yielding than angustifolius varieties.
- The application of 60kg/ha Granulock 15 had no effect on grain yield of albus varieties but resulted in a significant grain yield increase in two of the three angustifolius varieties.
- The albus lupin varieties Kiev Mutant and Rosetta had significantly lower grain yield at the 75 cm row spacing than the 50 cm row spacing. There was no effect of row spacing on the other varieties.

Trial aim

To measure the effect of the application of Granulock 15 fertiliser on establishment and grain yield of six lupin varieties.

Trial details

Soil type: Red sandy loam

Soil test: 0 – 10 cm:

pH = 5.7, Al% = 1.5

Sulphur = 7 mg/kg;

Colwell P = 39 mg/kg

Nitrate N = 30.7mg/kg

Ammonium N = 1.5 mg/kg

Previous crop: Wheat

Seeder used: Morris Contour drill tines (12mm knife point and press wheel)

<5% Seed Bed Utilisation

Treatments

Varieties

Albus	Rosetta
	Kiev Mutant
	Luxor
Angustifolius	Jenabillup
	Mandelup
	Wallan2333

Row Spacing

25, 50 and 75cm.

Fertiliser

Nil and 60 kg/ha Granulock 15 (14.3N, 12P, 10.5S) applied with seed at sowing time.

Seasonal review

The soil profile was reasonably dry at sowing with only about 40cm depth of moisture.

The trial was sown into marginal moisture and established evenly. Weed control was exceptional, and the trial was very even throughout the season.

Above average winter rainfall allowed crop growth to progress well. Conditions became very dry towards the end of August and early September, however rain arrived just in time to allow the crop to fill grain adequately. There were fewer winter frosts in 2013 than normal, so winter growth was strong and spring frosts did not limit grain yield.

Table 1: Monthly rainfall at Merriwagga 2013.

	Rainfall (mm)
Jan	0
Feb	60
Mar	45
Apr	0
May	15.5
Jun	57
Jul	49
Aug	24.5
Sep	33
Oct	7.5
Nov	-
Dec	-
Total	291.5
In-crop	186.5

Trial results

Lupin establishment

Plant numbers were counted 10th June 2013.

Plant numbers were significantly ($P < 0.001$) higher at 25cm row spacing than 50 and 75cm row spacing. The application of fertiliser significantly ($P < 0.001$) reduced plant number at 25cm row spacing, but not at 50 and 75cm row spacing (Table 2). This is difficult to explain and counts were variable.

There were no significant differences in plant numbers between varieties.

Table 2. Plant numbers on 10th June, 2013.

Row spacing (cm)	Fertiliser (Granulock 15 kg/ha)	Plants/m ²	LSD (95%)
25	Nil	55	5.7
	60 kg	49	
50	Nil	36	
	60 kg	42	
75	Nil	33	
	60 kg	33	

Yield

The average yield for the trial was 1154 kg/ha.

There was a significant ($p < 0.001$) effect of variety in this trial. The albus lupin varieties were significantly higher yielding than the angustifolius varieties. (Figure 1)

There was a significant ($p = 0.017$) interaction between variety and row spacing. The albus lupin varieties Kiev Mutant and Rosetta had significantly lower grain yield at the 75 cm row spacing than the 50 cm row spacing. There was no effect of row spacing on the other varieties (Figure 2).

There was a significant interaction ($p = 0.049$) between variety and fertiliser application. Jenabillup and WALAN2333 both had increased grain yield as a result of the application of fertiliser; however there was no effect of fertiliser on the grain yield of Mandelup or the albus varieties (Figure 3).

Discussion

This is the third year that this trial has been conducted at Merriwagga. A similar trial has also been conducted at Wagga Wagga in the same three years.

The addition of fertiliser has generally resulted in reduced plant numbers in most trials, especially at wider row spacing's. This is thought to be due to a crowding effect of seeds/plants in the crop row and increased concentration of fertiliser reducing germination. In this trial there was not a negative effective of fertiliser on plant numbers, which may have been due to the wetter than normal conditions experienced during the early part of the season (after sowing).

Kiev mutant, Luxor and Rosetta were higher yielding in this trial. These albus varieties were more vigorous and may have tapped into a deeper band of soil moisture. They also matured later than the angustifolius varieties, which allowed them to benefit from the rain that fell in September. There is a general trend of albus lupins being higher yielding than angustifolius lupins at this trial site. Mandelup performed unexpectedly poorly, which may be due to it flowering earlier than the other varieties in a period of frost and moisture stress in August.

The interesting outcome from this trial was the interaction between variety and fertiliser on yield, where there was a positive response to fertiliser application for two of the three angustifolius lupin varieties. This response to fertiliser application had not been observed in any other VSAP trials. More commonly in other trials, fertiliser has had no positive impact on yield across all varieties (figure 4).

In this trial when considering economic returns and gross margins, it is difficult to justify the application of fertiliser to albus lupins but the returns were reasonable on the varieties Jenabillup and WALAN2333 (table 3).

Table 3: Economic returns from fertiliser across varieties in 2013. Note Granulock 15 @ \$690/t on farm, albus lupins @ \$520, angustifolius lupins \$380/t on farm.

Variety	Fert cost (\$/ha)	Grain yield (kg/ha)	Grain income (\$/ha)	Return from fertiliser (\$/ha)
Jenabill up	0	612	233	0
	41.4	1171	445	171
Kiev Mutant	0	1339	696	0
	41.4	1323	688	-49
Luxor	0	1595	829	0
	41.4	1544	803	-67
Mandel up	0	498	189	0
	41.4	709	269	39
Rosetta	0	1554	808	0
	41.4	1678	873	23.6
WALAN 2333	0	732	278	0
	41.4	1090	414	95
Average return from fertiliser albus				-\$31
Average return from fertiliser angustifolius				\$102

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (December 2013). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of NSW Department of Primary Industries or the user's independent adviser.

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Figure 1: Grain yield of individual varieties in a trial at Merriwagga 2013.

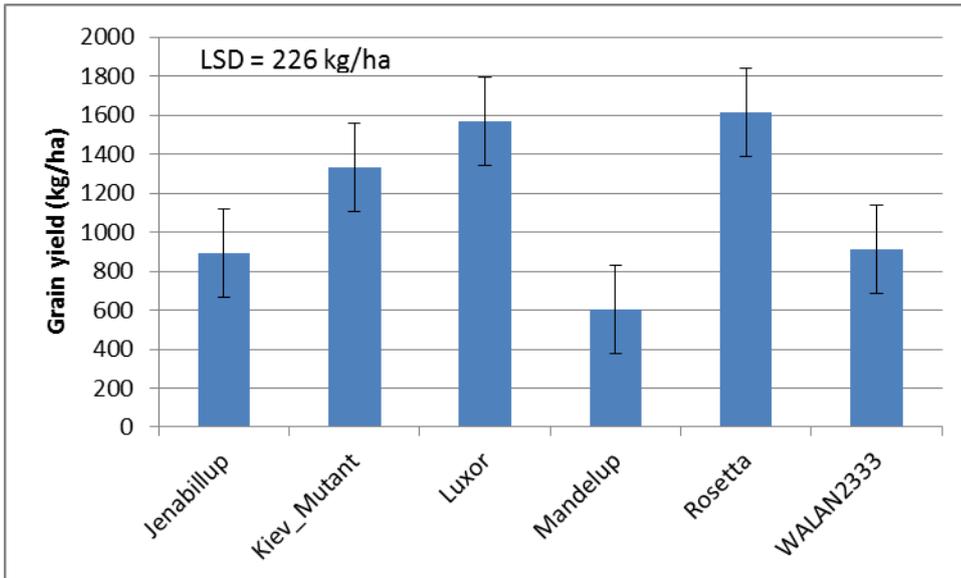


Figure 2: Grain yield across all varieties and row spacings in a trial at Merriwagga 2013.

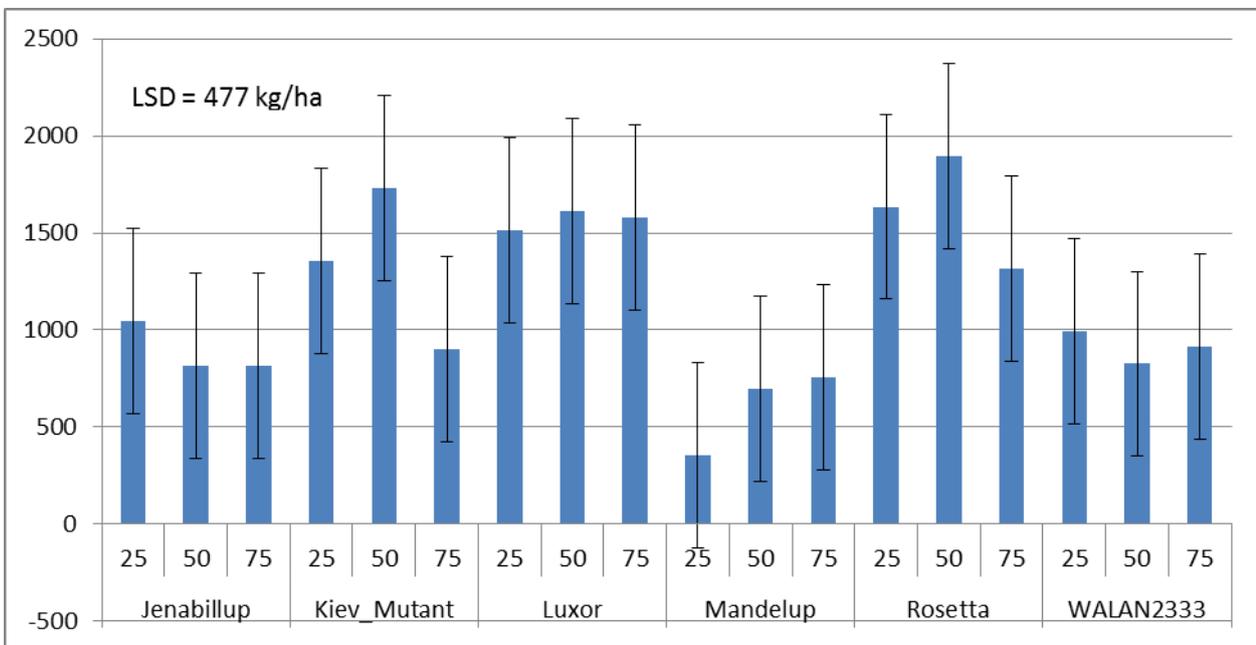


Figure 3: Grain yield across all varieties and fertiliser in a trial at Merriwagga 2013.

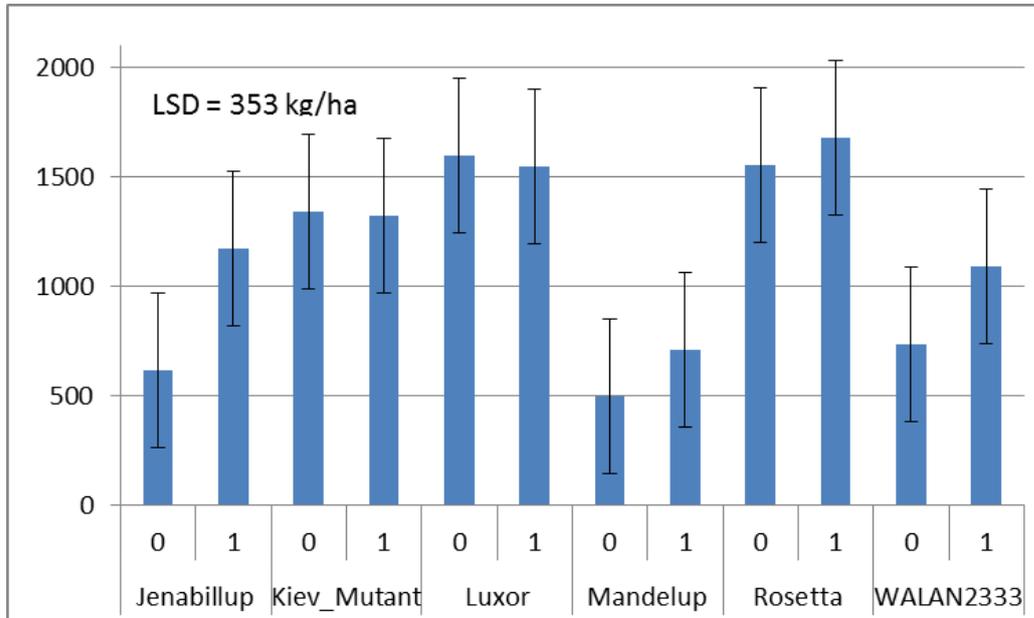


Figure 4: Grain yield across all varieties and fertiliser in a trial at Merriwagga 2011-2013. Note LSD 95% 2011 = 215kg/ha, 2012 = no significant difference, 2013 = 353kg/ha. 0 = Nil fertiliser, 1 = 60 kg/ha Granulock 15.

