

Lentils on Sandy Acidic Soil Compared to Lupins

Daenia Dundon, R&D Co-ordinator, Liebe Group

KEY MESSAGES

- Lentils and lupins both established well in the sandy acidic soil.
- Lupins yielded higher than lentil treatments, 2.55 t/ha compared to 0.6-1.0 t/ha, respectively.
- Lentils could be a potential profitable pulse crop in the Northern Wheatbelt region.

AIM

This trial aims to evaluate whether lentils are a potential alternative option to lupins on sandy acidic soils in the Northern Agriculture's low rainfall zone.

BACKGROUND

Lentils are a widely grown crop in south-eastern Australia, valued for their financial and rotational benefits within broadacre cropping systems. Compared to other legumes, lentils can go for a premium price due to strong demand for high-quality grains suitable for human consumption. Currently, lentil prices sit around \$600/t, higher than the current lupin price of \$365/t (Grainbrokers, 2025). However, this price can fluctuate significantly depending on global production levels and has previously reached up to \$1200/t (GRDC, 2017). As Australia exports close to 100% of its lentil production, international supply and demand strongly influence price trends (GRDC, 2017).

Recently, there has been growing interest in whether lentils could be a viable break-crop option for the wheatbelt. Extensive liming programs have raised soil pH, enabling lentil production on soils that were previously too acidic. The development of improved varieties and acid-tolerant rhizobia strains has further increased their potential in these environments. Additionally, lentils can tolerate drier and hotter conditions, suggesting they may offer more flexibility in the variable seasons common to the low-rainfall zone (GRDC, 2017). This trial aims to compare the performance of lentils with the more established option of lupins on acidic sandy soils in the low-rainfall zone of the Wheatbelt.

TRIAL DETAILS

Trial location	BA & JM Hirsch, Bunjil
Plot size & replication	12 m x 800 m x 2 replications
Soil type	Sandy loam
Paddock rotation	2022 canola, 2023 wheat, 2024 wheat
Sowing date	21/05/2025
Sowing rate	70 kg/ha Jurien lupin 24 kg/ha Thunder lentil
Fertiliser	24/03/2025: 100 kg/ha MOP
Trial management	Lupin pre-em: 0.4 kg/ha diuron 900 WG, 2 L/ha Glyphosate 450, 0.6 kg/ha Propyzamide 900 WG, 0.7 kg/ha simazine Lentil pre-em: 2 L/ha Glyphosate 450, 0.4 kg/ha Propyzamide 900 WG, 1 L/ha Reflex 01/07/2025 (all): 1.5 L/ha Clethodim 240, 0.1 kg/ha Butoxydim, 0.6 L/ha Hasten 01/08/2025 (all): 1L/ha clethodim 240, 0.6L/ha hasten. 08/08/2025 (all): 0.2 L/ha DFF, 0.2 kg/ha metribuzin, 25g picolinafen (camera spray). 30/08/2025 (all): 0.5L/ha Prosaro fungicide 15/09/2025 (all): 20mL/ha Trojan insecticide
Growing season rainfall	302 mm
Harvest date	15/11/2025

TREATMENTS

Treatments	
1	Jurien lupin
2	Thunder lentil

SOIL COMPOSITION

Depth (cm)	pH (CaCl ₂)	Col P (mg/kg)	Col K (mg/kg)	S (mg/kg)	N (NO ₃) (mg/kg)	N (NH ₄) (mg/kg)	EC (ds/m)	OC (%)
0-10	4.9	41	121	8.8	15	1	0.08	0.68
10-20	4.4	17	23	27.3	4	1	0.046	0.33
20-30	4.6	3	29	38.5	3	0	0.045	0.15

RESULTS**Table 1.** Plant density (plants/m²) and yield (t/ha) for lupin and lentil treatments. Yield data supplied from grower.

Measurement	Lupin	Lentil
Plant Density (plants/m ²)	67	68
Yield (t/ha)	2.55	0.6-1.0

COMMENTS

Plant density was similar between the two pulse crops (Table 1). Despite comparable establishment, differences in grain yield were observed with lupins produced a higher yield, 2.55 t/ha, compared to lentils, 0.6-1.0 t/ha. During harvest, it was advised that the lentils were cut higher than required, which is estimated to have left a percentage on the ground.

Additionally, Dylan noted that the lentils suffered two lots of chemical damage throughout the season. “The first was from 1 L/ha of Reflex. This caused an early to mid-season ‘bonsai effect’ on the plants; stunting their biomass. In the future, I will leave the Reflex out or use 0.5 L/ha”. The second lot of chemical damage was due to the spot spray algorithm being on the lupin settings for the broadleaf camera spray. “They were sprayed with 300 mL/ha Brodal, 300 g/ha Metribuzin and 35 g/ha Glocker which bleached them severely. At a difficult time of the year when it was cold and wet. I thought they wouldn’t recover and would have to spray them out, however, they did grow back and produced some pods in September and October”.

In terms of harvesting, he was impressed how easy they were to harvest with their 740D draper front, which “skidded along the rolled runs very easily”. In areas where lentils were not rolled, they were observed climbing the stripper stubble, allowing the Hirsch's to harvest the lentils a lot higher. Going forward, Dylan plans to only roll them when they are seeded into draper stubble in the future.

A key challenge with growing lentils compared to lupins is fewer options for broadleaf control. To mitigate the risk of herbicide injury and managing broadleaf weeds, Dylan plans on targeting paddocks with lower radish burden. This is an area where further research into herbicide tolerance and broadleaf weed management in lentils would be valuable.

Overall, lentils demonstrated they are an option for a break-crop, as well a potentially profitable pulse crop option that can be grown on typical lupin country in the Northern Wheatbelt region.

ACKNOWLEDGMENTS

Thank you to the Hirsch family for implementing and managing the trial. This demonstration is part of the GRDC Investment “Closing the Economic Yield Gap in Grain Legumes” led by the Grower Group Alliance. GRDC Project Code: CSP2212-005RTX.

REFERENCES

1. Grainbrokers. (2025, 10 21). Grain Brokers Australia: Daily Pricing. Perth, WA, Australia.
2. GRDC. (2017). Lentil Grow Notes. Perth: GRDC.

PEER REVIEW

Dylan Hirsch, BA & JM Hirsch

CONTACT

Daenia Dundon research@liebegroup.org.au 0448 476 925

