

Demonstrating the Place of Wide Row Spacing in Lupins

Aim: To demonstrate the benefit of wide rows in lupins.

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Location: Liebe Main Trial Site, West Buntine

Background: Growing lupins in wider than normal rows really can improve yield reliability when there is a harsh finish to the season. Research conducted across the wheatbelt in the past 2 years shows a strong relationship between row spacing response and seasonal conditions.

Tanjil lupins were grown in 25, 50, 75, and 100cm rows in 11 environments in 2003 and 2004, including sites at Mullewa, Wongan Hills, Merredin, and Newdegate. Yield responses varied from a strong linear yield decline with increasing spacing to a substantial yield advantage in wide rows. Yield analysis in relation to weather data shows that narrow rows were better in long, moist, cool growing seasons; and wide rows were best especially when the grain filling period was dry and hot. Rows 50cm and wider were consistently high yielding at Mullewa, and suffered a yield penalty at Newdegate. Wide rows had an advantage at Merredin in 2004, and the response at Wongan Hills was fairly “flat”.

Trial Details:

Plot size and replication	3.1m x 40m. 6 reps
Soil type	Sandy loam
Sowing date	26 th May 2004
Conditions at sowing	Moist
Machinery	Cone seeder
Seeding rate	110 kg/ha Belara
Fertiliser	85 kg/ha Big Phos + Mn deep banded
Herbicides and Insecticides	13 th May: 1.1 kg/ha Simagranz + 0.8 L/ha Sprayseed 250 26 th May: 2 L/ha Sprayseed 250 before seeding 24 th June: 150 mL/ha Brodal 9 th July: 250 mL/ha Select + Hasten Weed control was excellent.
Paddock History	2003 = wheat, 2002 = wheat, 2001 = lupins

Rainfall (mm)											
Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
13.5	0	0	0	86	38.75	70.5	31.75	21	4.5	2.5	0

Results:

Row spacing	Yield (kg/ha)
25 cm	1594
50 cm	1821
LSD (p 0.05)	120

The results show a clear advantage of sowing lupins on 50cm wide rows in this season. The Liebe Main Trial Site had a very good break of season and sowing conditions were perfect for crop establishment. The finish was not as dry as normally expected for this part of the wheatbelt: 21mm of rain was received in the month of September. From studies of crop growth and soil moisture at Merredin in 2004 it is clear that early in the growing season growth is limited by light, but during grain filling it is limited by water availability. This explains why row spacing response differs between environments: in long, cool, moist growing seasons narrow rows capture more light than wide rows without running into water deficit, but when the grain filling period is dry and hot, wide rows experience less severe water deficit than narrow rows. It is possible that the response to wide rows at this site would be greater if the finish was drier than 2004.

Summary:

- A clear advantage in yield was seen with 50cm rows compared to 25cm row spacing.
- It is possible that the response to wide rows at this site would be greater if the finish was drier than 2004.
- Consideration needs to be given to ensuring excellent weed control in the wide row system.

Technically reviewed by: Bob French

Comment [DoA1]: 50 cm doesn't really seem to be that wide for lupins. In the context of dry seasons it would be relevant to put in total growing season rainfall if you have it. Tha helps determine row spacing response too.