

Sowing flexibility of chickpea and Lentil in the WA farming system

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Key messages

1. Chickpea and lentil can be successfully grown on sands outside the traditional growing areas for these crops
2. Chickpea and lentil can be sown to depths of up to 200 mm, with no delay to emergence and no impact on establishment, phenology and yield
3. In the low to medium rainfall areas earlier sowing produces higher yields in chickpea and lentil

Background

Chickpea and lentil offer a lot of potential across WA as alternate break crops to the more common options of canola and lupin. In addition to providing good gross margins, incorporating high-value pulses into rotation can improve soil nitrogen and provide a disease break for cereal crops. Over the past 20 years use of these crops has declined substantially in WA, however, recent good prices and newer cultivars with improved resistance to ascochyta blight and/or with herbicide resistance has renewed interest in these crops. The increasing occurrence of liming as part of farming practice has also broadened the potential growing area in WA for these acid intolerant crops. Agronomic packages for these newer varieties are still being developed within WA. We are focusing on the impact time and depth of sowing in lentil and chickpea have on plant emergence and establishment as well as yield in the low to medium rainfall areas.

Trials for sowing date and depth of pulses were sown at Merredin and Dandaragan in April and May (see Table 1). Trials were fully replicated ($n = 4$) with split plot designs.

Table 1: Field experimental conditions with sowing depths and dates for PBA Striker chickpea and PBA Bolt lentils in 2019.

Site	Sowing date	crop	Sowing depth			Soil moisture at sowing (%)		GSR (mm)	soil pH	
			50 mm	120 mm	200 mm	0 - 100 mm	100 - 200 mm		50 mm	200 mm
Dandaragan (Deep sand)	April 15/16	Chickpea	✓		✓	4.46 ± 0.2	3.32 ± 0.3	242	6.5 ± 0.2	6.1 ± 0.5
		Lentil	✓		✓					
	May 27	Chickpea	✓		✓	1.56 ± 0.2	1.78 ± 0.3	221.3		
		Lentil	✓		✓					
Merredin (Sandy loam)	April 9	Chickpea	✓	✓		5.84 ± 0.3	7.50 ± 0.4	176.4		
		Lentil								
	May 9	Chickpea	✓		✓	4.14 ± 1.2	8.05 ± 0.5	172.6		
		Lentil	✓		✓					

Results

In all our 2019 trials there was no significant difference in emergence time or number between the different sowing times and depths of all crops. In our sowing depth trials, plots sown at 120 mm emerged no later than those sown at 50 mm and the extreme depth plots (200 mm) emerged with only a few days delay (3 – 6 days), these plots showed slightly slower development (as canopy cover) but phenology was not affected and biomass cuts at harvest showed no difference between sowing depths. Sowing depth had no significant

impact on yield in any trial, although sowing at 50 mm tended to give slightly higher yields than at 200 mm. Sowing time, however did effect yield with higher yields being achieved by both crops in earlier sowing at both Dandaragan and Merredin (see table 2).

Table 2: Hand harvested yields from depth trials in 2019; sowing depths were pooled as no significant difference was found. Yields are t/ha \pm SD

SITE	SOWN	Chickpea (Striker)	Lentil (Bolt)
Merredin	April 9	1.06 \pm 0.27	na
Merredin	May 9	0.93 \pm 0.23	1.12 \pm 0.41
Dandaragan	April 16	2.22 \pm 0.47	1.50 \pm 0.39
Dandaragan	May 27	1.30 \pm 0.39	0.87 \pm 0.30

Discussion

In all our trials we found that depth of sowing did not significantly impact on plant emergence time, establishment, phenology, dry matter production and yield, even at depths as extreme as 200 mm. With only one year of data under current conditions this finding needs further validation and we intend to continue to use both modelling and field trials to ascertain the relationship between depth of sowing and variety, season and soil and how these relationships impact growth parameters. Our finding that early sowing is beneficial to yield in the low to medium rainfall offers options to growers wanting the try these high value pulses but not interfere with their main sowing program. Early sowing and deep sowing can also be stacked in the right season to offer added benefits of stored soil moisture capture.

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Further Information

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Figure 1: Chickpea seedling at ~4.5 months after sowing 200 mm deep; remains of seed can still be seen (arrow).