Response of chickpea to in-season application of nitrogen - Grass Patch

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Key Messages

- Chickpea seed yield responded to 50 kg N/ha applied 8 weeks after sowing at Grass Patch in 2020
- Higher rates did not increase yields when applied at 8 weeks after sowing or in a split application at 8 and 12 weeks after sowing.
- Within plot variation resulted in no significant difference in the gross margin.

Background

Pulses have high demand for nitrogen during the reproductive stage when their growth rate increases and pods are set and filled. We wish to determine if applying nitrogen in-season will increase nitrogen supply, pod set and yield.

Aim

To determine if chickpea respond to applied nitrogen.

Trial Details

Property	Graeme Perks Kent Road, Grass Patch East, GPS - 33.186623°S 121.857784°E
Plot size & replication	1.8 m centres x 10 m sown x 4 reps
Soil type	Sandy loam duplex
Soil pH ($CaCl_2$)	0-10 cm:6.5.6 10-20 cm: 6.4
EC (dS/m)	0-10 cm: 0.133 10-20 cm: 0.143
Sowing date	13/5/2020.
Sowing rate	90 kg/ha
Fertiliser	100 kg/ha Superphosphate plus treatments
Herbicides, insecticides & fungicides	13th May 1.5 L/ha Sprayseed + 1.2 L/ha Triflurex, 8th June 1 L/ha Pyrinex Super (400 g/L chlorpyrifos + 20 g/L bifenthrin), 21st July 100 mL/ha Factor + 38 mL/ha Haloxyfop 520 + 1% Hasten, 6th August 500 mL/ha Sumisclex, 15th October 30 mL/ha of Trojan (150 g/L gamma- cyhalothrin)
Harvested	20th November – machine harvest
Growing season rainfall	148 mm

Treatments

1. Nil
2. N25 - 25 kg N/ha applied as urea eight weeks after sowing (8WAS)
3. N50 8WAS
4. N100 8WAS
5. N100 (25N at 8WAS and 75N 12WAS)
6. N100 (50N at 8WAS and 50N 12WAS)

Results

Table 1 Seed yield (kg/ha) and gross margin ($/ha) of chickpea with applied N at Grass Patch in 2020 (20ES33b)

Treatment	Seed yield		GY % of Nil	Gross margin ($/ha)	
Nil	633	ab	100	148	ab
N25 8WAS	625	a	99	119	ab
N50 8WAS	882	cd	139	235	b
N100 8WAS	847	bcd	134	166	ab
N100 (25N at 8WAS and 75N 12WAS)	690	abc	109	80	a
N100 (50N at 8WAS and 50N 12WAS)	947	d	150	221	b
Mean	771			161	
P	0.031			0.113	
LSD	198		31	121	

Comments

Chickpea seed yield responded to 50 kg N/ha applied 8 weeks after sowing at Grass Patch in 2020. Higher rates did not increase yields when applied at 8 weeks after sowing or in a split application at 8 and 12 weeks after sowing. On paper the increase in yield of ~250 kg/ha following 50N would be worth $115/ha when chickpea is selling for $550/t and N is costing $1/kg. However, when we calculated gross margins per plot and conducted a statistical analysis of the treatments this indicated no difference between treatments. The result from this experiment indicates we may need to repeat this style of trial in a better rainfall season.

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Links

For other reports related to this trial visit GRDC's on-farm trial web site at https://www.farmtrials.com.au

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