Response of lentil to in-season application of nitrogen - Ridley

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Key Messages

- Applying nitrogen to lentil had no positive effect in 2020

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 lentil responds to applied nitrogen.

Trial Details

Property	Kim and Abbie Jones, Mt Ridley, GPS - 33.399267S, 122.032196E
Plot size & replication	2 m centres x 10 m sown x 4 reps
Soil type	Sandy loam duplex
Soil pH ($CaCl_2$)	0-10 cm:5.8 10-20 cm: 7.7
EC (dS/m)	0-10 cm: 0.101 10-20 cm: 0.27
Sowing date	22/4/2020.
Sowing rate	PBA Highland XT 50 kg/ha
Fertiliser	100 kg/ha Superphosphate at seeding plus treatments applied on 15th July (12WAS - flowering) and 26th August (18WAS podding)
Herbicides, insecticides & fungicides	22nd April 1.5 L/ha Sprayseed + 1.1 L/ha Ultro ((900 g/kg carbetamide) + Terbyne Xtreme, 23rd April 1 L/ha Pyrinex Super (400 g/L chlorpyrifos + 20 g/L bifenthrin),9th June 100 mL/ha Factor + 500 mL/ha Clethodim + 0.01% Uptake + 0.01% Ammonium Sulphate, 7th July 1.5 L/ha Mantrac Pro (50% Mn, 6.9% N) + 330 g/ha TwinZinc (70% Zn, 1.8%N), 25th August 600 mL/ha Aviator Xpro, 4th September 100 mL/ha Alpha Duo + 100 mL/ha Dominex Duo, 2nd Oct 150 mL/ha Affirm + 00.02% BS1000, 15th Oct 30 mL/ha Trojan (150 g/L gamma- cyhalothrin), 29th Oct 3 L/ha Reglone
Harvested	18th November – machine harvest
Growing season rainfall	158 mm

Treatments

4 nitrogen rates x 2 timing (12WAS and 18WAS)

1. Nil
2. N25 - 25 kg N/ha applied as urea
3. N50
4. N100

Results

Table 1 Seed yield (kg/ha) and gross margin ($/ha) of lentil with applied N at Ridley in 2020 (20ES32)

N applied	12WAS Early flowering	18WAS Podding	Mean	
0	1298	1086	1192	b
25	1174	1152	1163	b
50	976	1008	992	a
100	1099	1170	1135	b
Mean	1137	1104	1120	
	P	LSD		
Ntreat	0.030	140		
Timing	0.419	95		
Ntreat.Timing	0.191	195		

Comments

Rainfall in 2020 was lower than average, with a particularly dry September. Fortunately, August had higher than average rainfall. Harvest was hampered by rainfall in November. Drier than normal conditions resulted in less transient waterlogging which is often seen on the sandy loams at Ridley during July and August. However, in the dry conditions we did see some necrosis on both lentil and chickpea which were possibly related to roots hitting the salt and boron layers at depth. The wet August helped crops to recover.

Seed yield of lentils were over 1 t/ha, and with good prices over $600/t in 2020 were very profitable. Nearby chickpea yielded around 600 kg/ha.

Nitrogen treatments were applied as urea on July 15 (12WAS) and August 26 approximately 18 weeks after sowing. Following the application of nitrogen, it was not self-evident that the treatments had been applied, with Nil plots looking as good as the N treatments.

Plants from the 0N and 100N treatments applied 12WAS were sampled for assessment of nodulation. Both had good nodulation – rated 7, probably to be expected on paddock with a good GROUP EF rhizobia history.

Applying nitrogen to lentil had no positive effect in 2020. The only significant response was for the 50N treatment to be lower yielding than the other nitrogen treatments.

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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

For more information, contact

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