

Lentil, Nutrition, LRZ Central Mallee (Ouyen), Victoria

Aim

To investigate the response of lentil to application of macro and micro-nutrients on a sandhill and swale soil.

Treatments

Variety: PBA Jumbo2

Treatments: See Table 1. The All_Nut treatment had 10 kg/ha N, 15 kg/ha P, 30 kg/ha K, 12 kg/ha S, 2.5 kg/ha Zn, 2kg/ha Cu, 3.5 kg/ha Mn and 0.06 kg/ha Mo.

Soil types: Sandhill and swale

Other Site Details

Stubble (height cm)	Standing (10)
Row Spacing (cm)	30
Plant density (plants/m ²)	120

Results and Interpretation

- **Key Messages:** A significant reduction in biomass was observed when phosphorus was omitted from the fertilizer on both soil types, however grain yield was reduced only on the sandhill, not swale.
- The dry growing season conditions may have reduced movement and uptake of the applied macro and micro-nutrients by the crop. Hence, results should be treated with caution.
- **Establishment and Plant Growth:** Establishment and early growth was very slow due to dry start to the season. Plant growth during the rest of the season was significantly impacted by dry seasonal conditions. Furthermore, vegetative and reproductive frost events significantly impacted plant growth and caused flower and pod abortion.
- **Biomass at Maturity:** Biomass varied significantly between soil nutrition treatments and ranged between 1.67 and 2.48 t/ha on the sandhill and 0.33 t/ha and 0.84 t/ha on the swale (Table 1). The lower biomass production on the sandhill than the swale is probably due to the lower water holding capacity and poorer base level nutrition of the light sandy soil. On both soil types, movement and uptake of the applied macro and micro-nutrients by the crop may have been reduced by the dry growing season conditions. Hence, results should be treated with caution. Despite this limitation, a significant reduction was observed when phosphorus was omitted from the fertilizer on both soil types. Biomass was reduced by 23 and 48 % on the swale and sandhill, respectively (Table 1). Interestingly, the all nutrient minus phosphorus treatment had lower biomass yield than the no fertilizer treatment, probably due to nutrient imbalance exacerbating phosphorus deficiency.
- **Grain Yield:** Grain yield was very low in 2018 due to dry seasonal conditions and several reproductive frost events. There was no significant grain yield difference between soil nutrition treatments in the swale (Table 1). On the sandy soil, the all nutrient minus phosphorus treatment had significantly lower grain yield than all other treatments including the nil (Table 1).

Table 1. Biomass (t/ha) and grain yield (t/ha) response of lentil to application of various soil nutrients on sandhill and swale soil types at Ouyen in 2018.

Treatment	Swale		Sandhill	
	Biomass (t/ha)	Grain Yield (t/ha)	Biomass (t/ha)	Grain Yield (t/ha)
No fertilizer	1.92	0.63	0.64	0.17
Nut_All	2.17	0.71	0.63	0.20
Nut_All - N	2.48	0.71	0.75	0.20
Nut_All - P	1.67	0.71	0.33	0.07
Nut_All -K	2.16	0.67	0.75	0.18
Nut_All - S	1.92	0.62	0.70	0.15
Nut_All - Zn	2.46	0.77	0.84	0.21
Nut_All - Cu	2.27	0.64	0.84	0.19
Nut_All - Mn	2.38	0.79	0.80	0.15
Nut_All - Mo	2.04	0.68	0.82	0.14
LSD (P<0.05)	0.41	ns	0.26	0.08
CV	13.0	20.9	24.9	32.9