

# Nutrient omission in canola

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**Purpose:** To determine the relative importance of nitrogen (N), phosphorus (P), potassium (K) and sulphur (S) in canola.

**Location:** Dandaragan

**Soil Type:** Sandy loam

**Soil Test Results:** see below (2.0t/ha lime applied pre-seeding in 2015)

**Rotation:** 2014: Oats; 2013: Pasture; 2012: Oats

**Growing Season Rainfall (April- October 2015):** 325mm

Depth (cm)	pH	EC	OC	Nit N	Amm N	P	PBI	K	S
0-10	5.2	0.05	1.4	6	5	33	29	53	5
10-20	4.3	0.05	1.0	4	1	36	36	30	3
20-30	4.0	0.03	0.6	2	7	36	34	35	3

## BACKGROUND SUMMARY

Omission trials are a good visual way of highlighting the importance of each nutrient. In this trial we looked at each macronutrient and its importance to canola. Soil tests run through NUlogic suggested the potential for deficiencies in nitrogen (N), sulphur (S) and possibly potassium (K).

## TRIAL DESIGN

Trt	Description	Banded (L/ha)	Banded (kg/ha)	Early Ros. (kg or L/ha)	2-3 wks later (L/ha)	N	P	K	S
1	Complete	50 Flexi-N	120 K-Till Extra Plus	120 NS41	50 Flexi-N	96	12	16	19
2	No top up NS	-	120 K-Till Extra Plus	-	-	12	12	16	11
3	Mod N	50 Flexi-N	120 K-Till Extra Plus	120 NS41	-	75	12	16	19
4	No P	50 Flexi-N	11 Urea/34 SoA/32 MoP	120 NS41	50 Flexi-N	96	0	16	19
5	No K	50 Flexi-N	86 Agstar Extra	120 NS41	50 Flexi-N	96	12	0	19
6	No S	50 Flexi-N	14 Urea/53 MAPS/32 MoP	91 Urea	50 Flexi-N	96	12	16	0
7	Low S	50 Flexi-N	120 K-Till Extra Plus	91 Urea	50 Flexi-N	96	12	16	8
8	NPS	50 Flexi-N	3 Urea/84 MAPS/32 MoP	91 Urea	50 Flexi-N	96	12	16	13

**Plot size:** 2.5m x 20m

**Machinery use:** CSBP Conserva Pac cone seeder

**Repetitions:** 3

**Crop type and varieties used:** Gem TT Canola

**Seeding rates and dates:** 3kg/ha sown on 12 May

**Fertiliser rates and dates:** June 25: NS41 and Urea, August 4: Flexi N

**Herbicide rates and dates: Seeding:** 1L/ha Powermax, 2L/ha Treflan, 2L/ha Atrazine, 300ml/ha Lorsban,

**Other applications/ treatment rates and dates:** 300 ml/ha Prosaro and 500 g/ha Pirimor on 12 August

**Harvest:** 5 November

## RESULTS/STATISTICS

Trt	Description	N	P	K	S	Harvest Yield (t/ha)
1	Complete	96	12	16	19	1.62
2	No top up N (or S)	12	12	16	11	1.14
3	Mod N	75	12	16	19	1.50
4	No P	96	0	16	19	1.51
5	No K	96	12	0	19	1.58
6	No S	96	12	16	0	1.64
7	Low S	96	12	16	8	1.59
8	MAPS	96	12	16	13	1.59
Prob						0.009
Lsd						0.23

## FINANCIAL ANALYSIS OF RESULTS

- Cost of additional 63kg N above the no top up N (Flexi N @ \$464/T, NS41 @ \$479/T) = \$88/ha
- Additional income with a canola yield increase of 360kg (canola @ \$550/T) = \$198/ha
- ROI of 200%
- No yield response to P, K or S.

## OBSERVATION/ DISCUSSION/ MEASUREMENTS

- The site was very responsive to nitrogen (N) fertiliser. Increasing N inputs from 12 to 75 kg N/ha increased yields by about 0.36 t/ha
- NUlogic suggested very little response to P and K after soil testing. It is important to be soil testing at least every 3-4 years so that fertiliser rates recommended are applied for maximum economic returns to the grower.
- Tissue tests on the 3<sup>rd</sup> July indicated marginal S deficiency in the no S treatments but there was no yield response.
- Wind and rain after seeding caused furrow fill resulting in poor germination (5-15 plants m<sup>2</sup>).
- Yield potential probably limited by low soil pH
- Decile 1 rainfall year for the area, interpret results accordingly.
- Quality analysis not yet available.

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