

Summit Nutrition in Rotation

Aim: To examine liquid and granular N when used with either high phosphorous or potassium rates in rotation.

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Location: PINGRUP

Background:

Liquid nitrogen fertilizers can offer growers some flexibility in application as they can be applied via boom spray or injected during the seeding operation. This trial aims to compare injected MAXamFLO to Urea applied immediately before seeding. Nitrogen grain yield response when increased amounts of phosphorous and potassium are applied is also compared. In 2002, 500kg of TSP (103kg P/ha) was applied to one block and 100kg MOP (50kg K/ha) was applied to another to lift the soil levels of these nutrients (Figure 1).

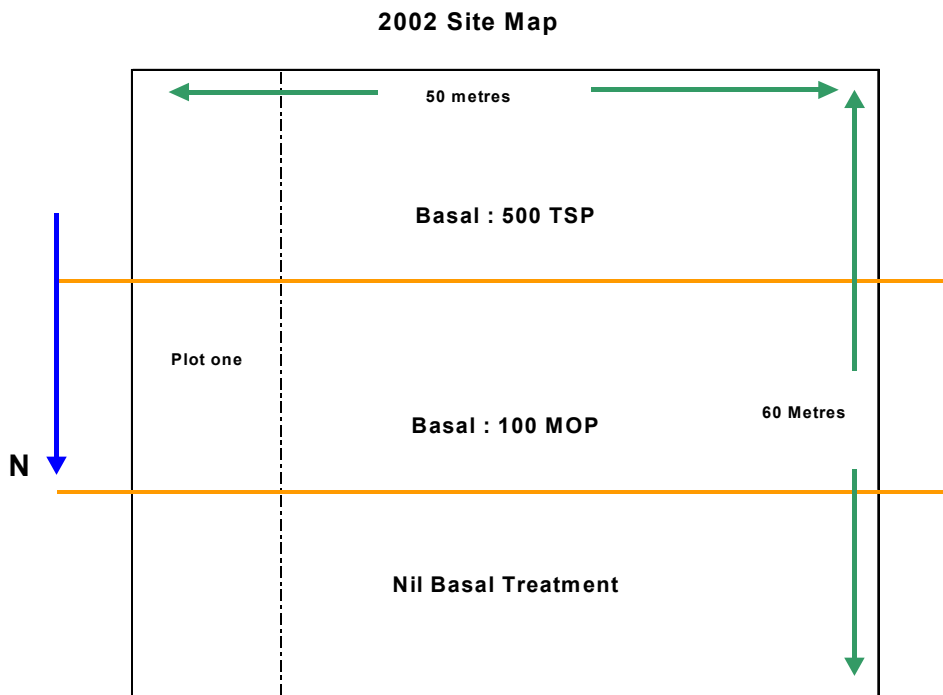


Figure 1. Site layout at Pingrup.

Trial Details:

Plot size and replication	2.2 * 20m, 3 reps SPLIT PLOT		
Soil type	Sandy loam		
Sowing date	28 th May 2003		
Conditions at sowing	Moist		
Machinery	Harrington Point with Gumbo Boot		
Seeding rate	5kg Surpass501TT		
Fertiliser	80kg MAPSZC® as basal (see Figure 1)		
Herbicides and Insecticides	SpraySeed	2	L/ha
	Atrazine	1.1	kg/ha
	Chlorpyrifos	1	L/ha
	Chlorpyrifos	500	ml/ha
	Dimethoate	200	ml/ha
	Atrazine	1.11	kg/ha
	Select	250	mL/ha
	Uptake	1	% v/v
	Reglone	2	L/ha
	Glyphosate	1.5	L/ha
Paddock History	2002 = Wheat, 2001 = Barley, 2000 = Wheat		

Soil Test results:

	P	K	S	Cu	Zn	O.C.%	pH	PRI
Top Soil	45	80	13	0.45	1.05	1.55	4.65	2.5
Sub Soil (20-30cm)	8	19	4	0.1	0.1	0.125	6.05	4.5

Results:

This site responded to applied nitrogen in both liquid and granular form. The optimum nitrogen rate for canola grain yield was 60kg N/ha applied as urea across the 100kg MOP, 500kg TSP and basal fertilizer blocks (Figure 2).

Maximum canola yield was achieved at 60kg N/ha applied as urea, immediately before sowing (IBS) with 100kg/ha MOP (Figure 2). This was significantly (Isd = 5%) more grain yield than all other treatments. At nearly all nitrogen rates, grain yield was higher in those treatments supplied with 100kg/ha MOP (Figure 2). The soil test result for this site indicated there would be little grain yield response to applied potassium. However, these results suggest that at soil test levels of 80ppm, canola will respond to applied potassium.

Canola grain yield was higher than the basal fertiliser treatment at all nitrogen rates with the addition of 500kg TSP in 2002 (Figure 2). At the lowest and highest rate of nitrogen applied as urea, the TSP treatment produced significantly (Isd = 5%) more grain yield than the basal fertiliser treatment (Figure 2).

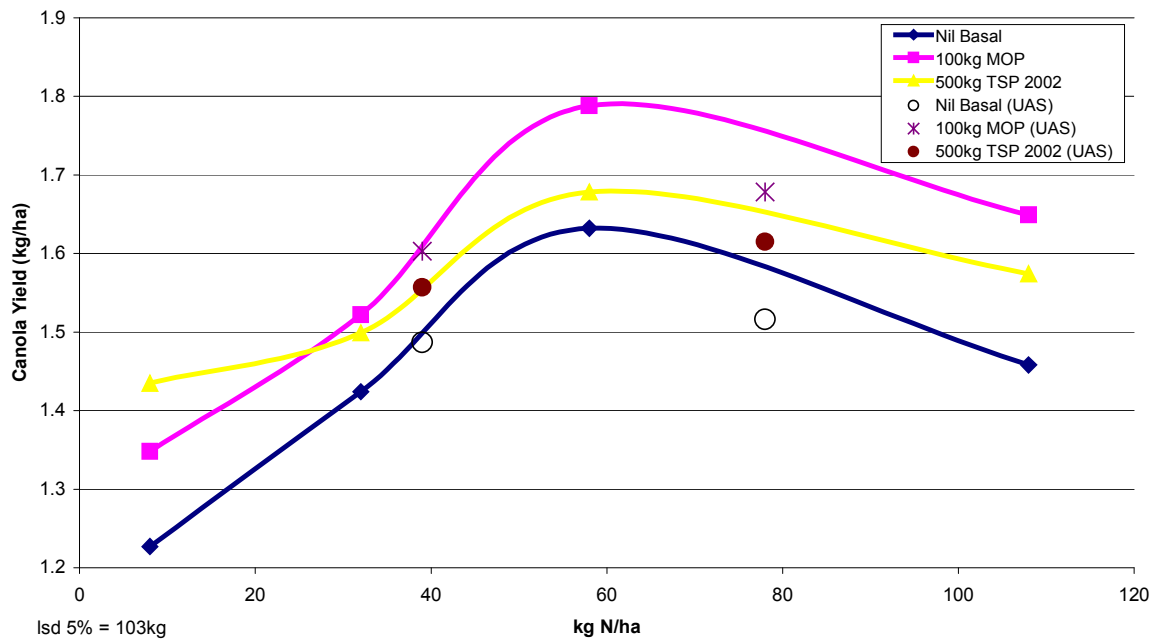


Figure 2. Canola nitrogen response to increased applications of phosphorous and potassium

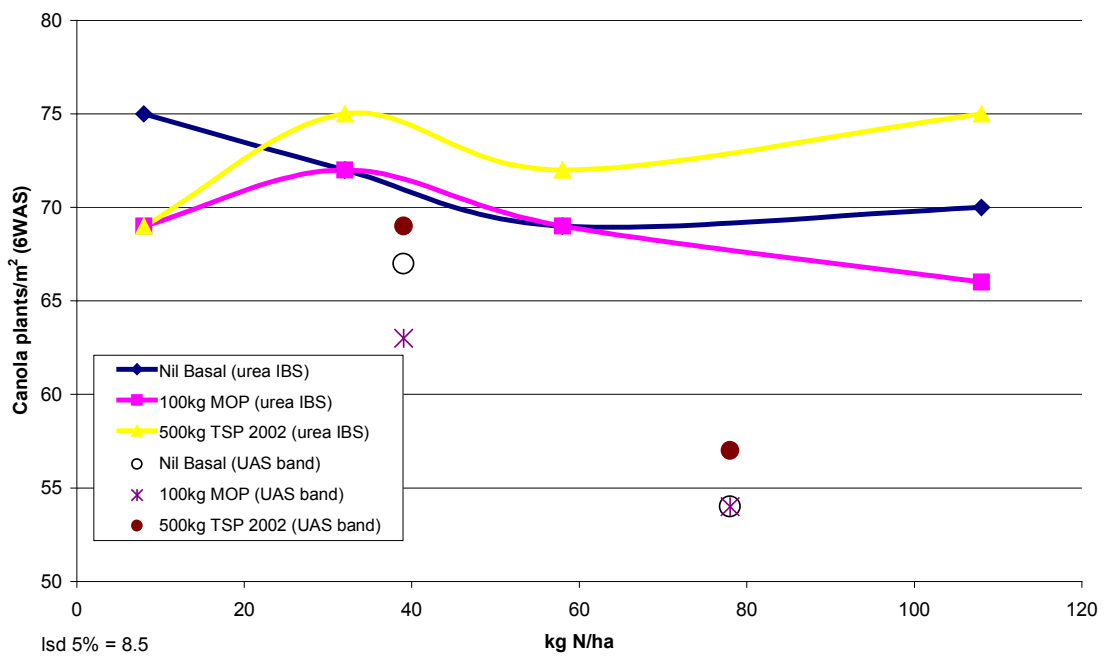


Figure 3. Canola emergence, 6 weeks after sowing, after increasing rates of nitrogen applied as MAXamFLO (UAS - inject) or Urea (Top-dress)

Nitrogen supplied as injected MAXamFLO appeared to be as effective as top-dressed urea at 40kg N/ha for all fertiliser treatments (Figure 2). However, at 80kg N/ha there was a decline in canola grain yield when MAXamFLO was injected away from seed. A significant (lsd = 5%) reduction in canola plant emergence at the high rate of injected MAXamFLO may explain the reduction in yield (Figure 3).

Summary:

- Canola produced more grain yield when supplied with increased rates of Nitrogen, Phosphorous and Potassium
- Applying 100kg/ha MOP produced more canola grain yield at nearly all nitrogen rates – even when soil test levels were 80ppm
- High residual P resulted in greater grain yield at all nitrogen rates above the basal treatment of 17kg P/ha – even when soil test levels were 45ppm
- MAXamFLO injected below the seed was as effective as top-dressed urea applied immediately before sowing at low nitrogen rates
- High rates of injected MAXamFLO (80kg N/ha) resulted in a reduction in plant numbers and yield.