

AIM:

To investigate the effect of nitrogen and potassium on yield and grain quality of noodle wheat varieties in the northern agricultural region.

KEY MESSAGES:

- ▲ Calingiri did not respond to K and N fertilizer application as strongly as the new noodle wheat varieties Supreme and Zen.
- ▲ Supreme showed lower grain protein content than Calingiri and Zen but all achieved ANW1 grade.
- ▲ Zen showed the highest top-end yield potential with sufficient K and N fertilizer rates applied, followed by Supreme and Calingiri, respectively.
- ▲ Calingiri is a consistent performer, however the new varieties Supreme and Zen show potential to utilise K and N fertilizer application better to improve yield and returns.

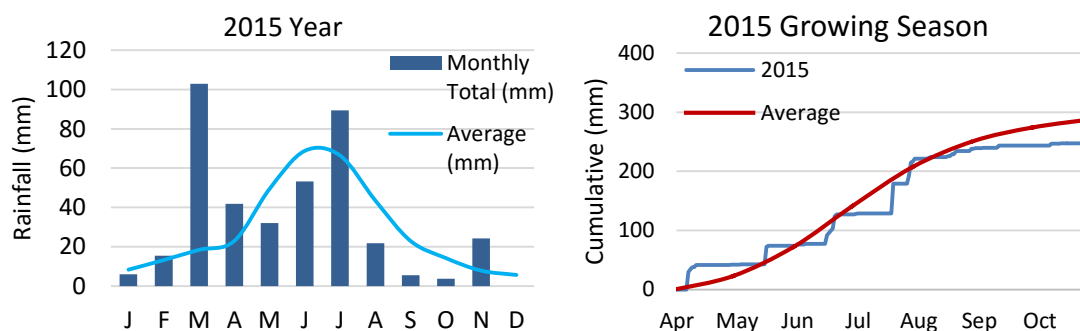
TRIAL DETAILS:

Property:	NAG Trial Site, Yanjanooka Farms, Binu Road East, Binu
Treatment plots per rep:	10m, 24 Treatments in 3 Randomised Replicates
Soil Type:	Yellow/Grey Sand
Crop Variety, seeded:	Zen, Supreme & Calingiri wheat, 70 kg/ha, 18/05/2015

Soil Test Results

Depth	NO ₃ ⁻	NH ₄ ⁺	OC	P	PBI	K	S	Cu	Zn	pH _[Ca]	Al
0-10cm	19	4	0.46	23	13	33	6			5.8	0.3
10-20cm	2	2	0.27	30	14	29	2			4.6	2.6
20-30cm	1	1	0.16	25	16	30	3			4.3	2.4

2015 monthly rainfall data (mm) for Binu BOM Stn 8010, ~9 km W of trial site

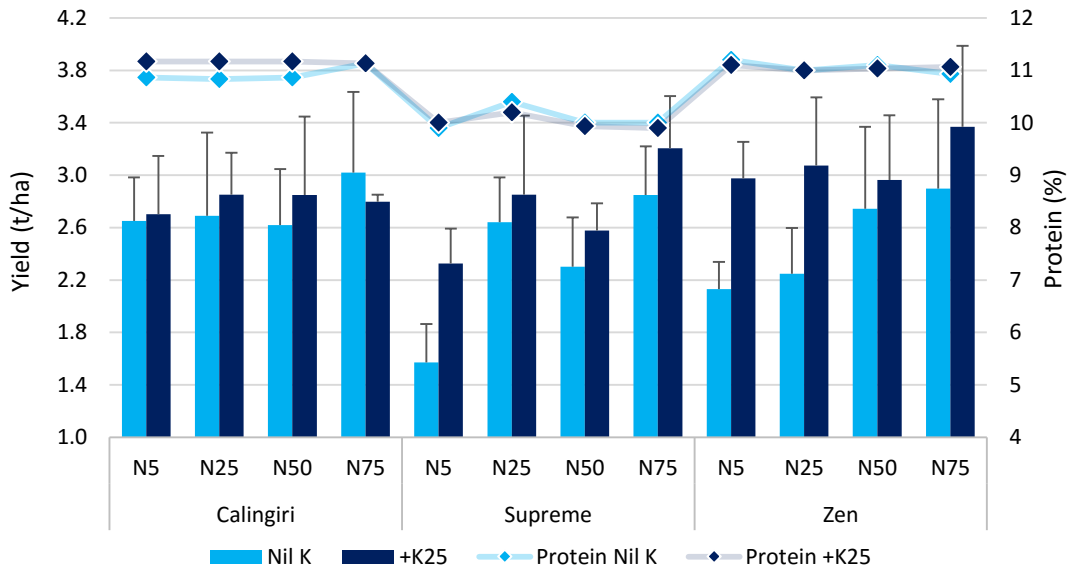


Fertiliser application and treatments.

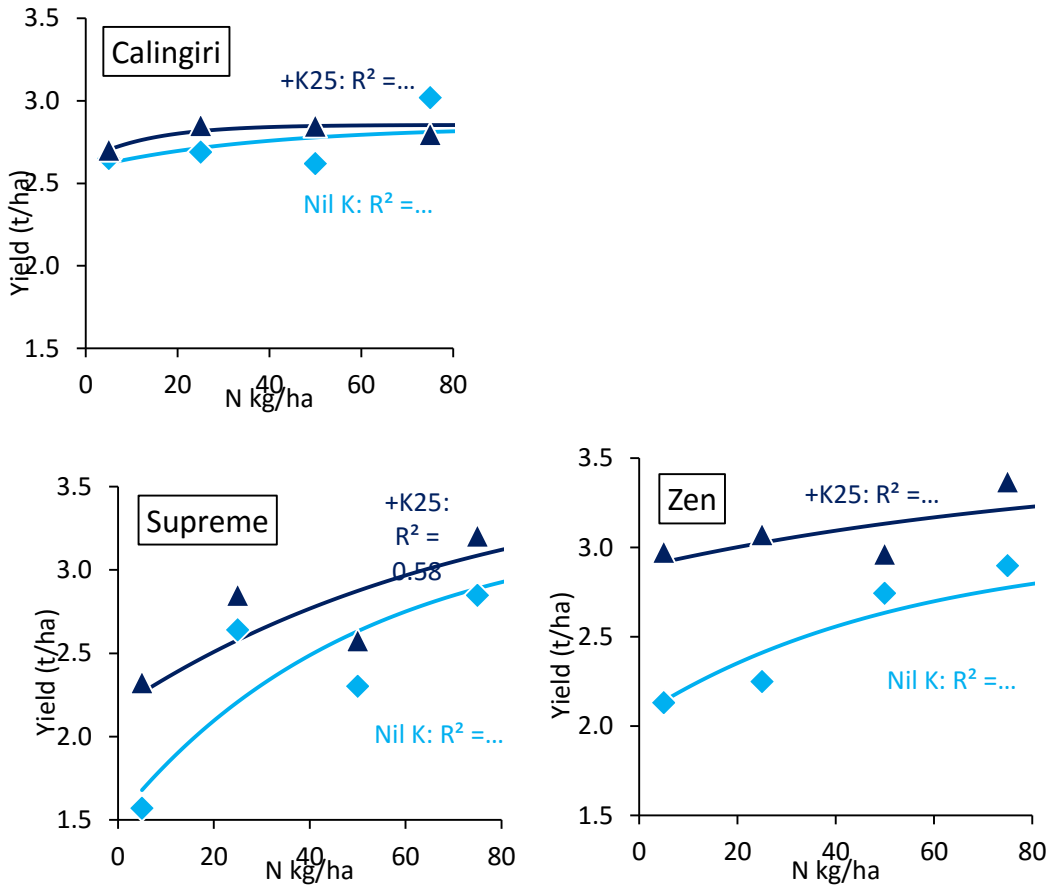
Trt	Varieties	Fertiliser banded (kg/ha)	6WAS (L/ha)	N	P	K	S
1,5,9	Fertilizer	40 MAPSZC		5	8	0	2
2,6,10	treatments	40 MAPSZC, 45 Urea		25	8	0	2
3,7,11	applied	40 MAPSZC, 45 Urea	60 UAN	50	8	0	2
4,8,12	for each of	40 MAPSZC, 45 Urea	120 UAN	75	8	0	2
13,17,21	Calingiri	40 MAPSZC, 50 MOP		5	8	25	2
14,18,22	Zen &	40 MAPSZC, 45 Urea, 50 MOP		25	8	25	2
15,19,23	Supreme	40 MAPSZC, 45 Urea, 50 MOP	60 UAN	50	8	25	2
16,20,24	varieties	40 MAPSZC, 45 Urea, 50 MOP	120 UAN	75	8	25	2

RESULTS:

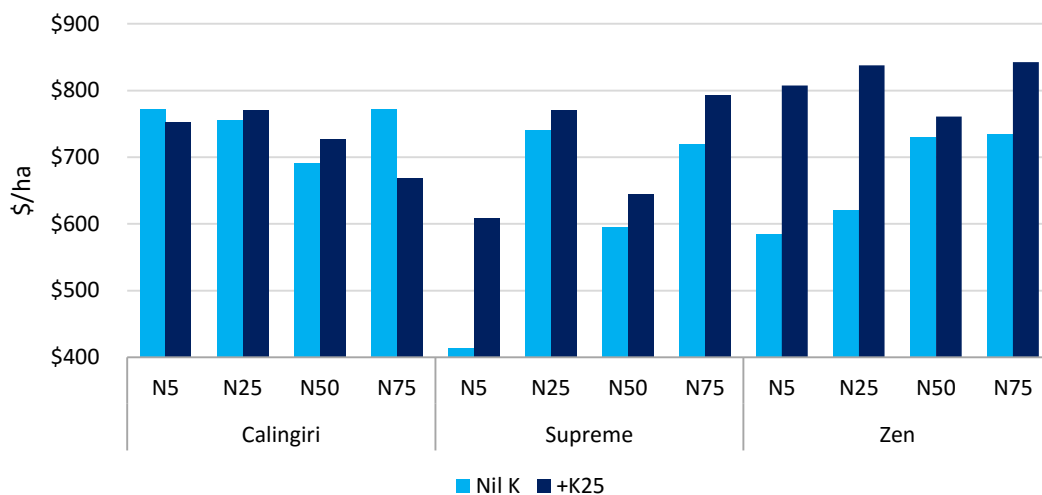
Grain yield response to N and protein content of different varieties with or without K applied.



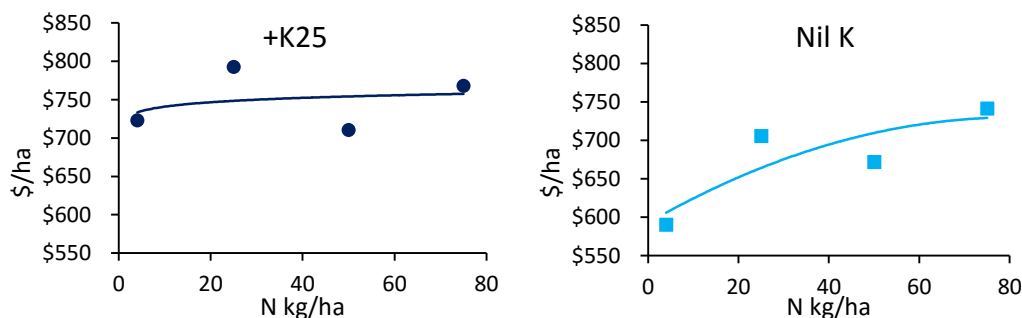
Yield response curves of varieties to N with or without K applied. Mitscherlich fitted.



Noodle wheat gross margins net of all fertilizer costs for a range of N rates applied with or without K.



Gross margin pooled means of all varieties with (left) or without K applied (right). Excel polynomial trend line fitted.



- ▲ Yields ranged from 1.5 t/ha in Supreme with nil K and N 5 kg/ha applied, to 3.4 t/ha in Zen with K 25 and N 75 kg/ha applied. Response to K would be expected on a soil with Colwell K of 30 mg/kg at the surface and lower at depth.
- ▲ Varieties responded differently to nutrient rates. Generally, application of K increased yield of noodle wheats and the response was significant for both Supreme and Zen, but not for Calingiri.
- ▲ Zen showed the greatest potential for top-end yield and had the greatest relative yield response to K application.
- ▲ Supreme had the lowest yield at low K and N rates but showed the greatest relative yield response to N application.
- ▲ Calingiri performed better than both Supreme and Zen at low K and N but was much less responsive to both K and N application.
- ▲ Neither K nor N affected grain protein content.
- ▲ Supreme consistently showed lower protein (9.9-10.4%) than both Calingiri and Zen (10.8-11.2%). However, all three varieties were within the quality specifications to achieve ANW1 grade.
- ▲ Gross margins net of cost of fertiliser applied weigh strongly in favour of K application and increased N in the new noodle wheat varieties Supreme and Zen, and much less-so in Calingiri.



Fertilizer cost, wheat yield, grain quality and gross margin net of total fertilizer input costs.

Tmt	N kg/ha	K	Fert cost [#] \$/ha	Yield (t/ha)	Protein (%)	Weight kg/hl	Screenings %	Grade	Grain* \$/ha	Returns \$/ha
Calingiri	5	0	\$40	2.65	10.87	82.26	1.57	ANW1	\$811	\$772
	25	0	\$67	2.69	10.83	82.52	1.73	ANW1	\$823	\$755
	50	0	\$110	2.62	10.87	82.23	1.68	ANW1	\$801	\$691
	75	0	\$153	3.02	11.13	82.41	1.56	ANW1	\$924	\$771
Supreme	5	0	\$67	1.57	9.90	83.05	2.78	ANW1	\$481	\$414
	25	0	\$67	2.64	10.40	82.99	1.98	ANW1	\$808	\$741
	50	0	\$110	2.30	10.00	83.05	2.61	ANW1	\$705	\$594
	75	0	\$153	2.85	10.00	82.81	2.83	ANW1	\$872	\$719
Zen	5	0	\$67	2.13	11.20	81.89	1.09	ANW1	\$652	\$585
	25	0	\$67	2.25	11.00	82.32	1.17	ANW1	\$688	\$621
	50	0	\$110	2.74	11.10	82.31	0.99	ANW1	\$840	\$729
	75	0	\$153	2.90	10.93	82.43	1.24	ANW1	\$887	\$734
Calingiri	5	25	\$75	2.70	11.17	81.80	1.46	ANW1	\$827	\$752
	25	25	\$103	2.85	11.17	82.52	1.46	ANW1	\$873	\$770
	50	25	\$145	2.85	11.17	82.02	1.65	ANW1	\$872	\$726
	75	25	\$188	2.80	11.13	82.48	1.31	ANW1	\$856	\$668
Supreme	5	25	\$103	2.33	10.00	83.34	2.47	ANW1	\$712	\$609
	25	25	\$103	2.85	10.20	83.55	2.65	ANW1	\$873	\$770
	50	25	\$145	2.58	9.93	83.39	2.94	ANW1	\$789	\$644
	75	25	\$188	3.21	9.90	83.32	2.77	ANW1	\$981	\$793
Zen	5	25	\$103	2.97	11.10	81.83	0.96	ANW1	\$910	\$807
	25	25	\$103	3.07	11.00	82.28	1.19	ANW1	\$941	\$838
	50	25	\$145	2.96	11.03	82.28	1.09	ANW1	\$907	\$761
	75	25	\$188	3.37	11.07	82.09	1.07	ANW1	\$1,031	\$843

Notes: All prices net delivered/received Geraldton and GST Exclusive
 * Delivery grade \$/t Geraldton, 7 December 2015: ANW1 \$306
 # Total of all fertilizer products applied. March 2015 retail price (ex Geraldton)

CONCLUSION:

▲ Calingiri is a consistent performer across various fertilizer rates, however the new varieties Supreme and Zen show potential to better utilise K and N fertilizer to improve yield and returns.

▲ ACKNOWLEDGEMENTS:

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