C5 Fertiliser Rate x Fertiliser Placement, LRZ Yenda, NSW

Aim

Primary to test the effects of fertiliser rates and its placement on the germination & establishment of desi and kabuli type chickpeas. Secondly to measure the grain yield responses to fertiliser rates. The information from this trial plus others is used to validate and improve grower recommendations.

Treatments

Varieties (2):	Desi - PBA Slasher.
	Kabuli – Genesis 090.
Fertiliser rate (4):	Nil, 10, 20 & 30kg/ha of Phosphorus.
Fertiliser type:	Single super
Sowing dates:	16th May
Row Spacing/Stubble:	30 cm into standing light stubble.
Fertiliser placements:	Sown with seed in same sowing boot (WITH)
	Sown separately to seed (AWAY)
Plant density:	35 plants/m^2

Results

Plant establishment

There were highly significant effects of fertiliser rates and placement detected across all treatments. There was also a slight effect detected between varieties (Desi v Kabuli) on plant establishment. Increasing rates on fertiliser reduced plant establishment when banded with the seed.

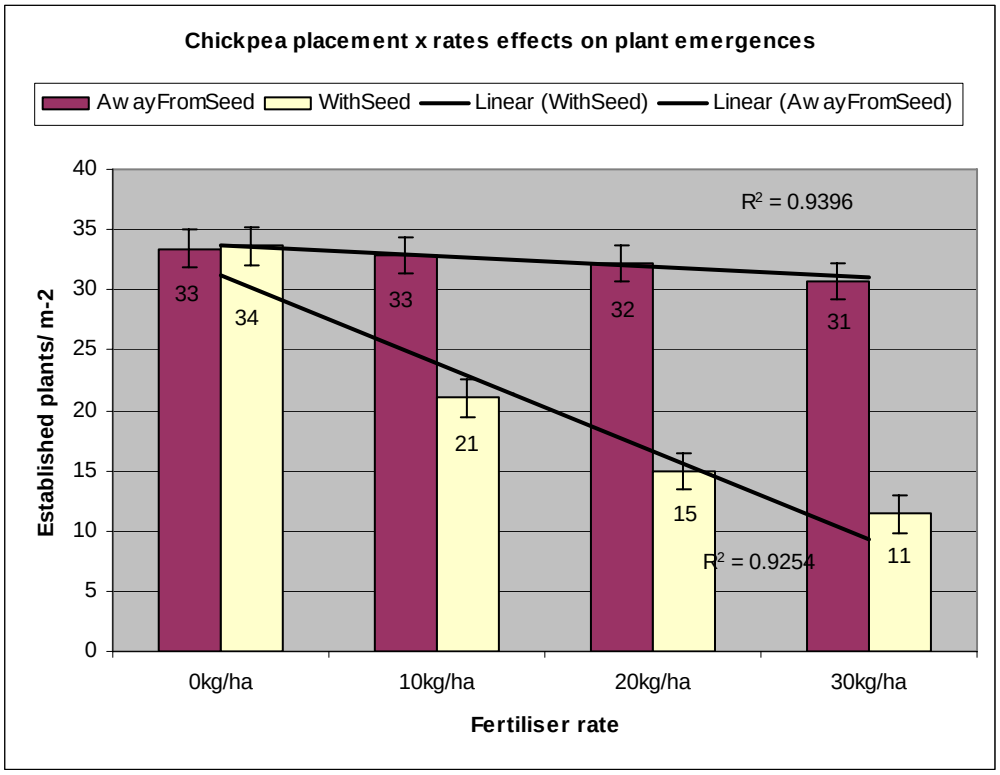

Figure C5.1. The effects of fertiliser rate and placement on chickpea emergence averaged across varieties.

Generally there was 39%, 55% and 67% reduction in plant establish when the seed was sown with the fertiliser at 10, 20 and 30kg/ha of fertiliser.

As can be seen below, there was a strong variety effect on establishment from fertiliser placement and rate. Genesis090 a kabuli had a severely reduced establishment rate. However it can be clearly stated that both varieties suffered severe plant establishment losses from fertiliser placement and with increasing fertiliser rates.

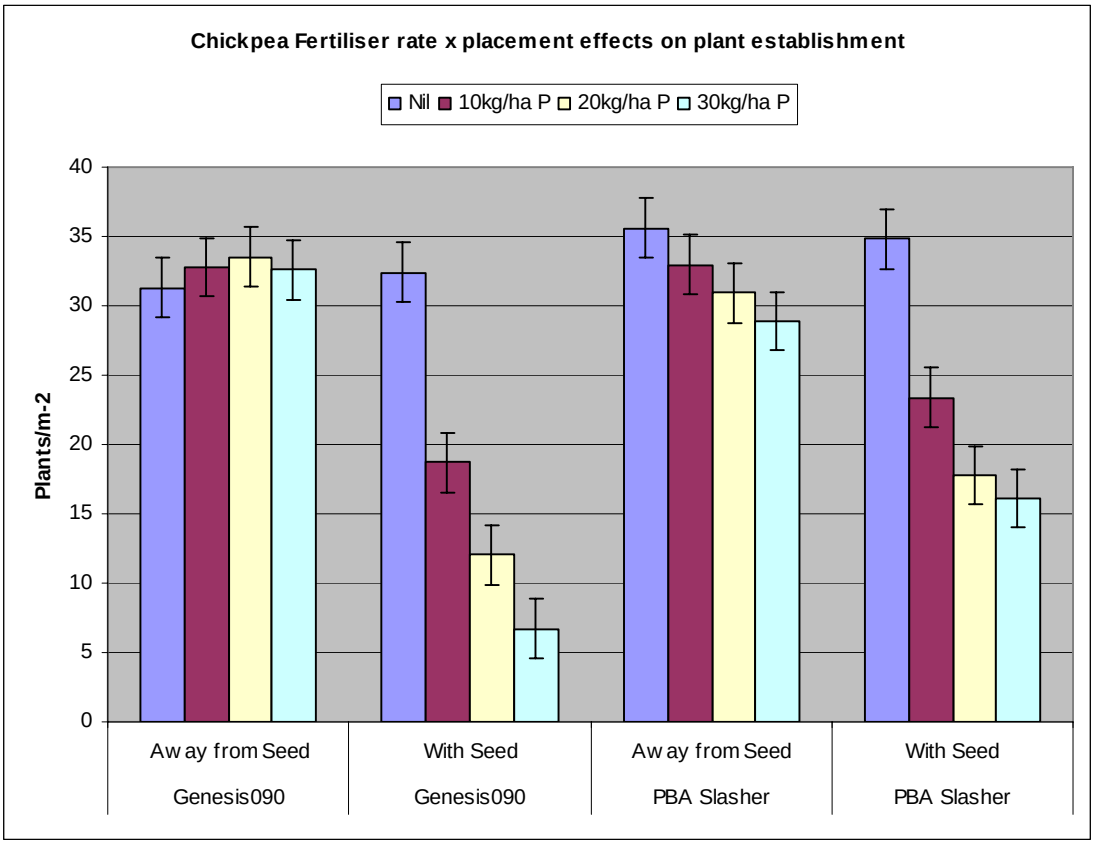

Figure C5.2. The effects of fertiliser rate and placement on chickpea emergence within varieties.

Yield results

There was a highly significant interaction effect detected for variety x location x rate for this trial. There was also a significant effect within variety from the location of fertiliser. All other effects were found not to be significant at the 5% confidence level.

As can be seen below with PBA Slasher, there were yield increases achieved by all treatment over the nil fertiliser treatment except for the maximum rate treatment which was placed with the seed. This was not statistically different from the nil treatment.

Interestingly, the kabuli Genesis090 showed greater sensitivity and yield declines with the fertiliser placements. All amounts of fertiliser placed with the seed had a significant negative effect of kabuli grain yields

As can be seen in the above emergence table, the high rate of fertiliser impacted on plant emergence and this possibly can be attributed as the main factor to this yield decline.

At the 10kg/ha, despite the reduction in plant numbers, this did not impede the grain yields compared to the fertiliser away treatment. At 10kg/ha of P there was not difference detected.

At the both the 20 & 30kg/ha fertiliser rates, there was significant yield decline detected with both PBA Slasher and Genesis090 when the fertiliser was placed with the seed.

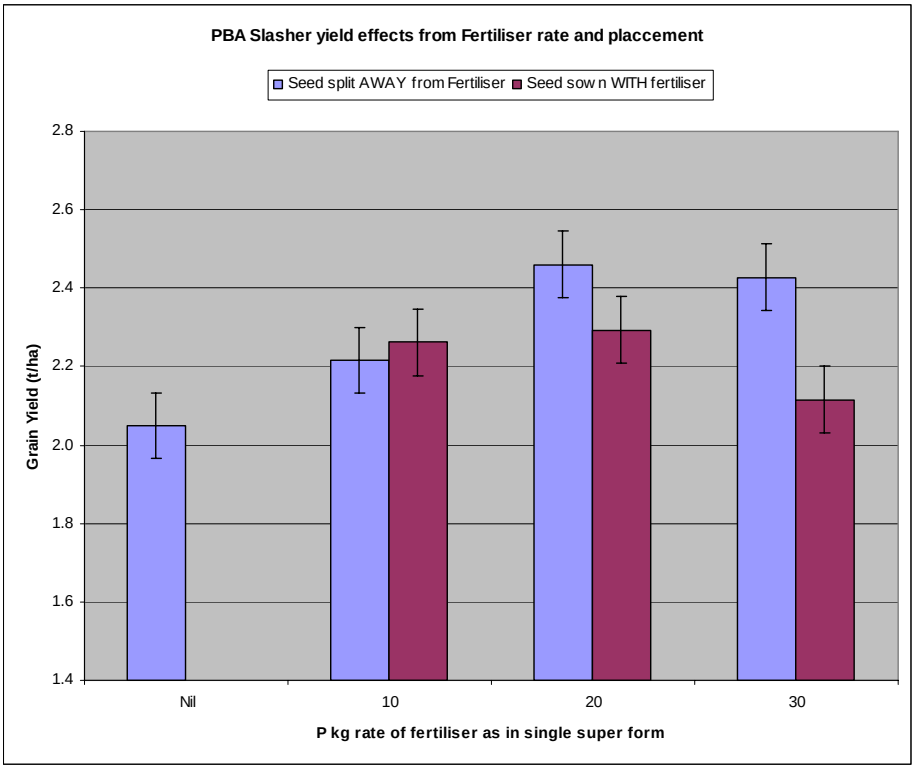

Figure C5.3. The effects of fertiliser rate and its placement on desi type PBA Slasher grain yields.

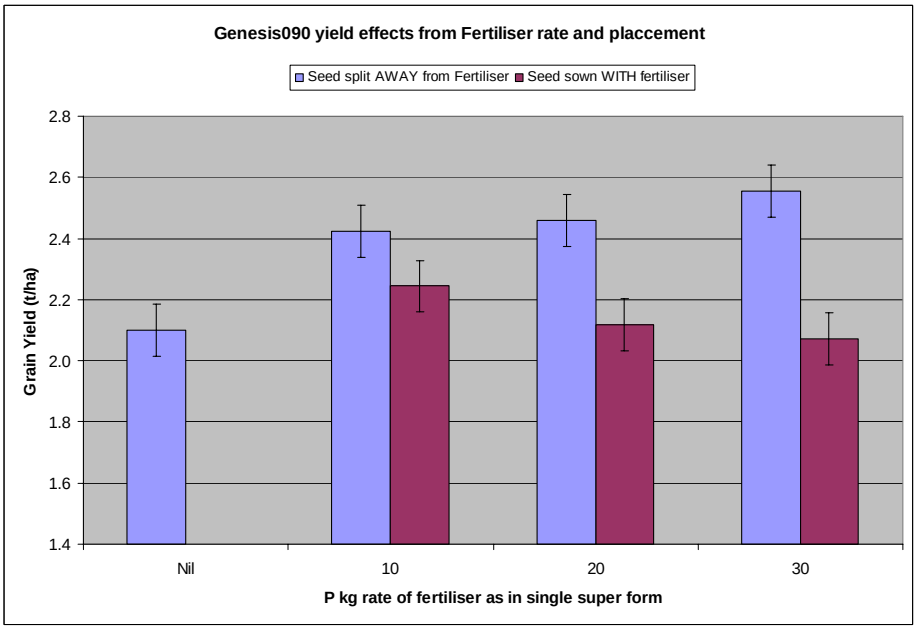

Figure C5.4. The effects of fertiliser rate and its placement on kabuli type Genesis 090 grain yields

This research whilst is only one year could lead to possible explanation of why some southern NSW growers have had difficulty getting the crop established successfully especially with the kabuli types.

Further work is required to validate this research over different soil types and seasons. The use of other fertilisers would also help validate the findings.

Irrespective of this, there is merit from this trial that show the effects of fertiliser damage on plant emergence and associated grain yields.

Summary

- Both desi and kabuli chickpea varieties suffered severe plant establishment reductions from fertiliser placement with the seed and with increasing fertiliser rates.
- All amounts of fertiliser placed with the seed had a significant negative effect of kabuli grain yields.
- Desi type PBA Slasher can tolerate low rate of fertiliser with the seed.
- Yields increased with fertiliser rate up to about 20kg/ha of P in this particular season and soil type
- More work is required to further validate and extend these findings.