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Chickpea yields with and without *Pratylenchus thornei* – Coonamble & Trangie 2013

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Key findings

Yield varied significantly with chickpea genotype at two sites, one with high starting numbers of *Pt*, the other with no detectable *Pt*.

The new kabuli, PBA Monarch$^{\Phi}$, yielded as well as the industry standards Jimbour and PBA HatTrick$^{\Phi}$.

Three interspecific hybrids also performed well.

There was no evidence that an experimental product had any beneficial effect on yield in the presence or absence of *Pt*.

Introduction

Current strategies to minimise the impact of Root Lesion Nematodes (RLN) on northern region farming systems are based on: (i) growing resistant crops and varieties to reduce the reproduction of nematodes, (ii) growing tolerant varieties to reduce the impact of nematodes on growth and yield and (iii) hygiene to limit spread.

As a crop, chickpea is considered susceptible (and intolerant) to both *Pratylenchus thornei* (*Pt*) and *P. neglectus* (*Pn*) which are the main RLN species in the region. However, varieties differ in their influence on nematode reproduction (level of resistance) and the impact of nematode on yield (level of tolerance)

This paper reports on the tolerance of two chickpea genotypes at a field site (Coonamble) with natural populations of *Pt*. The potential of an experimental agent to limit yield loss from *Pt* was also included. A second site (Trangie) was found to have undetectable levels of both species and thus presented an opportunity to compare yields of 16 chickpea genotypes in the absence of RLN; the experimental agent was also included at this site on two genotypes.

Site details

Location:	**Trangie Agricultural Research Centre**	**"Woolingar", Coonamble**
Co-operator:	**NSW DPI**	**Lindsay Meers, Manager Jason Peters**

Treatments – Trangie

- Ten desi varieties: PBA Boundary$^{\Phi}$, PBA HatTrick$^{\Phi}$, Kyabra$^{\Phi}$, Yorker$^{\Phi}$, Jimbour, Genesis^{TM} 090, Genesis^{TM} 090, CICA0709, CICA1007, CICA0912.
- Three kabulis: Genesis^{TM} 425, PBA Monarch$^{\Phi}$, Almaz$^{\Phi}$.
- Three interspecific hybrids with a wild relative of chickpea purported to have improved resistance to *Pt*, CICA0313, CICA0314 and one designated D5253.
- The trial also included a coded chemical product (BAY) claimed to have activity against *Pratylenchus* spp. This was applied to the seed of Kyabra$^{\Phi}$ (the least *Pt* resistant entry in the trial) and CICA0912 (most resistant entry).
- There were 4 replicates.

Treatments – Coonamble

- Kyabra$^{\Phi}$ and CICA0912 with and without the experimental agent; 6 replicates.

Results

- At Trangie, *Pt* and *Pn* were not detected in post sow PreDicta B testing of a composite sample from each rep.
- At Coonamble, post sow PreDicta B *Pt* numbers of a composite sample from each rep varied from 6,709 to 17,788, mean 11,579 *Pt*/kg soil (*Pn* undetected).
- At both sites, genotype had a highly significant ($P<0.001$) effect on yield (Figure 1, Figure 2).
- At both sites, Kyabra$^{\Phi}$ was the highest yielding entry, possibly reflecting its high root to shoot ratio (FitzGerald 2010).

- Kyabra's performance at Coonamble under high *Pt* pressure confirms other research that has shown no relationship between resistance and tolerance to *Pt* (Moore et al, 2013).
- The overall low yields at Coonamble are thought to have resulted from severe frosts in August and a dry quick finish.
- At Trangie, the kabulis as a group were the lowest yielders except for the recently released PBA Monarch$^{\phi}$, which yielded as well as the industry standards Jimbour and PBA HatTrick$^{\phi}$ (Figure 1).
- At Trangie, the interspecific hybrids also yielded well, particularly CICA0313, demonstrating their inherent yield potential.
- There was no significant effect of the experimental agent on yield of Kyabra$^{\phi}$ or CICA0912 at either site.

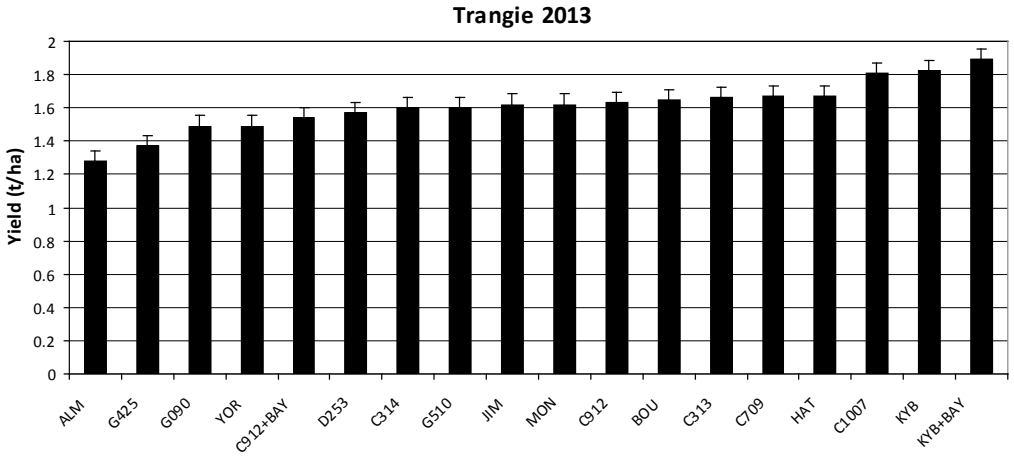

Figure 1. *Yield of 16 chickpea genotypes in the absence of RLN and effect of an experimental agent (BAY) on yield of two genotypes, Trangie 2013.*

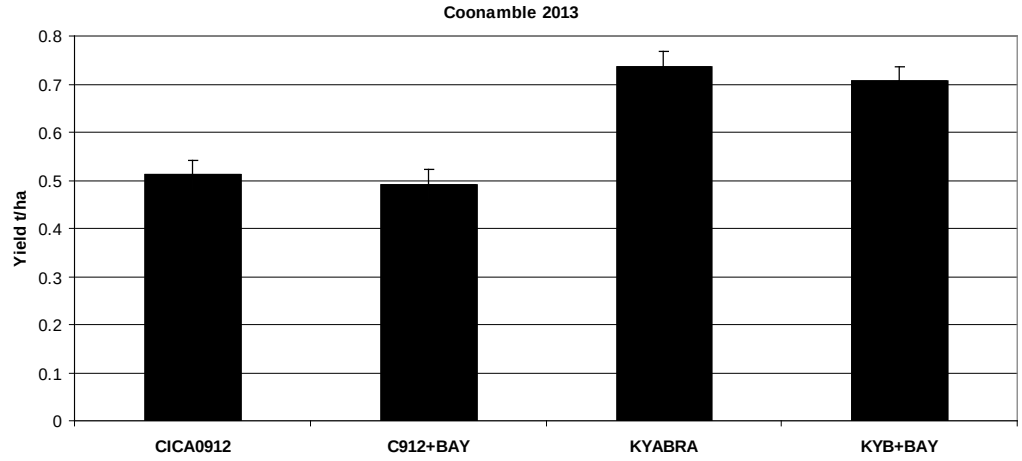

Figure 2. *Yield of Kyabra$^{\phi}$ and CICA0912 chickpeas in the presence of RLN, with and without an experimental agent (BAY), Coonamble 2013.*

Summary

Chickpea yield varied with genotype at the two sites, one with high starting numbers of *Pt*, the other with no detectable *Pt*. The new kabuli, PBA Monarch$^{\phi}$ and one interspecific hybrid yielded as well as the industry standards Jimbour and PBA HatTrick$^{\phi}$. The Coonamble trial confirmed that resistance to *Pt* is a poor predictor of tolerance. There was no evidence that an experimental product had any beneficial effect on yield in the presence or absence of *Pt*.

Acknowledgements

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