CHICKPEA SEED TREATMENT IMPROVES CROP ESTABLISHMENT AND INCREASES YIELDS – 2011 TRIALS USING SEED FROM 2010 CROPS

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Take home message: Treating chickpea seed with registered seed dressings controls seedling disease, improves crop establishment and increases yield but proper coverage and rate are essential.

BACKGROUND: The survey (see paper by Moore, Chiplin and Nash "Chickpea seed tests from 2010 harvest explain establishment problems in 2011 crops") of chickpea seed harvested in the 2010 season identified two seed lots that satisfied three requirements for seed treatment research (i) high levels of seed borne Botrytis, (ii) emergence to meet the Pulse Australia minimum of 70% and (iii) they had to be PBA HatTrick® to minimise problems with Ascochyta blight. These were used in 2011 on-farm trials in the Moree (Murray's Rd), Narrabri (Bellata) and Liverpool Plains (Breeza) districts. A fourth trial was conducted at the Tamworth Agricultural Institute. This paper summarises the Moree trial – the results at the other sites were very similar to the Moree trial.

METHODS:

Seed lots: One seed lot (SL1 – number 68 in the above mentioned paper) came from Biniguy (south east of Moree); the other (SL2 – number 71) was from Edgeroi (north of Narrabri). Off the header, SL1 had 80% emergence and 41% infection by *Botrytis cinerea*. SL2 had 82% emergence and 13% Botrytis. To simulate commercial practice, both seed lots were machine graded (in a Kimseed® sieve grader). After grading, SL1 had 78% emergence and 22% Botrytis and SL2 had 84% emergence and 4% Botrytis. Sowing rates were adjusted to target 35 plants per square metre.

Trial design: The trial was a Randomised Complete Block, with two seed lots, four seed treatments and four replicates. Plots were 2m x 11.5m (trimmed to 10m), 5 rows @32cm row spacing.

Seed Treatments: Treatments were: Crop Care Thiram600 (600g/L thiram), Crop Care P Pickel-T® (360g/L thiram, 200g/L thiabendazole) both at label rates, an Untreated control (Nil) and a fourth off-label treatment (data not presented). Seed was treated in Hege® centrifugal seed treater until all seeds were thoroughly covered.

Trial management: The trial was sown with a cone seeder on 19 May 11 and managed for foliar disease, weeds and insects following recommended agronomic practices.

Assessments: On 10 June 11 (21 days after sowing), establishment was assessed by counting all plants that had emerged in the central three rows. Plants showing symptoms of seedling disease in the same rows were also recorded. Representative samples were examined at Tamworth for the presence of fungal pathogens.

Statistical Analyses: Establishment counts and grain yields were analysed by ANOVA. Data for the percentage of plants with seedling disease was not normally distributed and was analysed using a Generalised Linear Model (GLM). Seedling disease was not detected in P Pickel-T® plots, so that data was excluded from the analyses to test for differences between the Nil, Thiram and off-label treatments. Data for Nil plots was then excluded to test for differences between Thiram and the off-label product. After analyses, the data was back transformed to the original scale.

RESULTS:

Establishment: Untreated seed lot SL1 had significantly (P=0.004) fewer plants per square meter 21 days after sowing than untreated SL2 (Table 1). Treating seed with either Thiram or P Pickel-T® significantly increased establishment but these products were not different from each other (Table 1) or the off-label treatment (data not shown).

Table 1 Plants per square metre (plsqm) in a 2011 Moree chickpea seed treatment trial for two seed lots and three seed treatments

Seed Lot	Seed treatment		
	Nil	Thiram	P Pickel-T®
SL1	8	29	31
SL2	16	29	29

Botrytis Seedling Disease: Laboratory tests confirmed the seedling disease to be caused by *Botrytis cinerea*. GLM analyses showed a significant difference (P<0.001) between the Untreated (Nil) and treated seed but there were no differences between fungicides (Table 2). The off-label product was no better than Thiram or P Pickel-T® (data not shown). The incidence of disease in untreated SL1 (25.7%) approximated the level of Botrytis seed infection (22%). The higher incidence of disease in untreated SL2 (15.0%) relative to seed infection (4%) probably reflects the higher plant population (16 plsqm) in the untreated plots, facilitating root contact between primary infections and nearby uninfected plants.

Table 2 Percentage plants with Botrytis seedling disease in a 2011 Moree chickpea seed treatment trial for two seed lots and three seed treatments

Seed Lot	Seed treatment		
	Nil	Thiram	P Pickel-T®
SL1	25.7	0.9	0.0
SL2	15.0	0.5	0.0

Grain Yield: Treating seed with either Thiram or P Pickel-T® significantly (P<0.001) increased yield compared with untreated seed (Table 3). There was no difference between these fungicides or the off-label treatment (data not shown). The only significant difference between seed lots was in the Nil treatment, reflecting the higher plant establishment in SL2 (see Table 1).

Table 3 Grain yield (t/ha) in a 2011 Moree chickpea seed treatment trial for two seed lots and three seed treatments

Seed Lot	Seed treatment		
	Nil	Thiram	P Pickel-T®
SL1	1.86	2.66	2.91
SL2	2.37	2.80	2.86

CONCLUSION: This trial (and the others) showed clearly that the fungus causing chickpea Botrytis pre- and post-emergence seedling disease is readily controlled with registered seed treatments, provided they are applied correctly. However, we do not recommend using Botrytis infected grain

as planting material even if treated properly. The seed will have lower vigour and this will increase the risk of other seedling diseases, render weed management more difficult and may increase the risk of viruses. Also, sowing rates will need to be increased to account for the reduced vigour, which may make using grower retained seed uneconomical.

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