

## MultiCrop Trials

### M1. Field Pea, Lentil and Chickpea Variety x Stubble Management, MRZ Mid North (Pinery), South Australia.

#### Aim

To assess the agronomic benefits of seeding pulses into standing cereal stubble and identify optimum standing stubble retention management strategies for maximising yields.

#### Treatments

Crop and variety agronomic features: presented in Table 1.

**Table 1:** Agronomic characteristics of crops and varieties sown at Pinery, 2014.

Crop	Variety	Maturity	Lodging resistance at Maturity	Plant type	Ascochyta Resistance Foliar / Seed
Chickpea	Genesis™ 090	Mid	MR	Kabuli	R*
	Genesis™ Kalkee	Late	R	Kabuli	MS*
	PBA Monarch	Early	MS	Kabuli	MS*
	Sonali	Early	MS	Desi	S*
	PBA Slasher	Mid	MS	Desi	R*
	PBA Striker	Early	MS	Desi	MR*
Field Pea	Kaspa	Mid	Fair-Good	Semi-dwarf dun	MS
	PBA Gunyah	Early	Fair-Good	Semi-dwarf dun	MS
	PBA Oura	Early	Fair-Good	Semi-dwarf dun	MS-MR
	PBA Pearl	Early	Good	Semi-dwarf white	MS
	PBA Percy	Early	Poor	Conventional dun	MS
	Parafield	Mid	Poor	Conventional dun	MS
Lentil	Boomer	Mid-Late	S	Prostrate	MR / MS
	PBA Hurricane XT	Mid	MR	Semi-erect	MR / R
	Nipper	Mid	MR	Erect	MS-MR / MR
	PBA Ace	Mid	MS/MR	Prostrate	R / R
	PBA Blitz	Early	MR	Erect	MR / MR-MS
	PBA Jumbo	Mid	MS	Prostrate	MR-MS / S

\*Rating currently under review and relates to foliage only

Treatments: Stubble height was cut to leave: a) Short– 5cm, b) Medium-20cm, and c) Tall– 40cm length straw above the ground.  
All slashed stubbles were retained in inter-row so that stubble loads were identical between treatments

#### Other Details

Sowing date: 20<sup>th</sup> May  
Stubble: 3.6t/ha of wheat stubble  
Row Spacing: 25cm (10 inches)  
Seeding system: Knife point cone seeder  
Rolled: Immediately post sowing  
Fertiliser: MAP + Zn (2%) @ 90 kg/ha at sowing  
Inoculum: Chickpea only Group N  
Seed dressing: PPT (+Apron on peas)  
Foliar Fungicides: Canopy Closure –Carbendazim @500ml/ha, Chlorothalonil @2L/ha  
Mid flowering to Early Podding – Carbendazim @500ml/ha, Chlorothalonil @ 2L/ha

#### Results and interpretation

- A crop type by stubble height interaction for yield and lodging was not recorded in this trial suggesting that stubble management treatments did not improve grain yields or level of lodging resistance across

the three pulse crops. There was however a significant yield and lodging response observed between the individual crops (data not shown).

- Lentils (1.94t/ha) and field peas (1.92 t/ha) yielding similarly and higher than chickpeas (1.64 t/ha).
- Chickpeas showed a significantly higher lodging resistance level compared with lentils and field peas whose susceptibility to lodging differed between each other with field pea showing reduced lodging resistance over lentils.
- When crops were analysed individually, still no variety by stubble height response for grain yield and lodging resistance was found. A significant variety response was however generated for grain yield for each pulse crop type.
- In chickpeas, PBA Striker was the highest yielding variety followed by PBA Monarch and PBA Slasher which had similar yields, while Genesis™ Kalkee had the lowest yields (Table 2).
- PBA Ace and PBA Blitz were the equal higher yielding lentil varieties with PBA Blitz yielding similar to PBA Hurricane XT. Boomer was the lowest yielding variety.
- A significant variety response for lodging was found for lentils and chickpeas but not for field peas. PBA Ace and PBA Hurricane XT, showed similar and greater lodging resistance compared to Boomer and PBA Blitz which showed similar and lower levels of lodging resistance. Genesis™ Kalkee had significantly higher lodging resistance followed by PBA Monarch with PBA Slasher and PBA Striker showing lower levels of lodging resistance.

**Table 2:** Grain yield (t/ha) of field pea, lentil and chickpea varieties at Pinery, 2014

Crop	Variety	Yield (t/ha)	LSD (P<0.05)
<b>Chickpea</b>	PBA Striker	1.90 <sup>a</sup>	0.16
	PBA Monarch	1.57 <sup>b</sup>	
	PBA Slasher	1.70 <sup>b</sup>	
	Genesis™ Kalkee	1.41 <sup>c</sup>	
<b>Field Pea</b>	07H031P006	1.85 <sup>a</sup>	0.15
	PBA Oura	2.32 <sup>a</sup>	
	PBA Twilight	1.87 <sup>a</sup>	
	Kaspa	1.63 <sup>b</sup>	
<b>Lentil</b>	PBA Ace	2.18 <sup>a</sup>	0.19
	PBA Blitz	2.05 <sup>ab</sup>	
	PBA Hurricane XT	1.96 <sup>b</sup>	
	Boomer	1.58 <sup>c</sup>	

#### Key findings and comments

- Our results show that stubble management (reduction in height from 40cm to 5cm) had no improvement on yield and lodging between crop types and varieties within a crop type under the seasonal conditions in 2014.
- These results are not consistent with those from similar trials conducted in 2013 and 2012 where stubble treatments generated significant responses for grain yield. In 2013, field pea showed significant stubble height response for grain yield compared to chickpeas and lentils which yielded similarly across the stubble treatments. Field pea grain yield improved by 6% by sowing into tall (40 cm) compared to short (5 cm), and medium (20 cm) stubble which yielded similarly. Although those results are not replicated in the current trial, previous results show that stubble management is important for some pulse types such as lentil and field pea.
- When individual crops were analysed in this trial, varieties yielded and lodged similarly across the stubble treatments. This again conflicts with previous similar trials conducted in 2012 which showed that retained standing stubble were important in some lentil varieties such as PBA Blitz which showed the greatest yield response compared to varieties such as Boomer.
- Sowing PBA Blitz into tall stubble (30 and 60 cm) has also been shown to provide protection from wind erosion by benefits from reduced wind speed at the zone of plant growth, (0-40 cm above the soil surface) and improved harvestability as a result of taller and more erect crop compared to seeding into shorter stubble (5 and 15 cm).

- Yields of varieties across pulse crops were consistent with those of previous years which demonstrates yield stability for those varieties across the seasons.
- Studies on stubble management especially those evaluating sowing crops into cereal stubble of varying heights have produced varied response to yield across seasons and the type and structure (arrangement/height) of stubble retention required to maximize benefits require further research. The interaction with seasonal conditions also requires further understanding and perhaps the lack of significant rainfall events during spring in 2014 was responsible for the lack of a response seen in 2014. It should also be noted that there was no stubble removed treatment (bare soil) in 2014 and previous work has shown yield benefit in lentil in all seasons between stubble retained and removed stubble treatments regardless of height.