2. Chickpeas

C1. Sowing Time x Row Space, LRZ Southern Mallee (Curyo), Victoria

Aim

To investigate the adaptability of a range of chickpea varieties and breeding lines to wider row spacing's sown inter-row in to standing stubble compared with conventional cropping systems (narrow row spacing with slashed stubble). The interaction sowing times is also compared.

Note: Trial is a comparison of systems, not just row space. In the wider row spacing's plots were sown with narrow lucerne points, press wheels and chemicals applied pre-sowing. In the narrow row spacing's plots were sown with narrow lucerne points, harrows and chemicals applied post-sowing, pre-emergent.

Treatments

Varieties:	Genesis 090, Genesis 509, PBA Slasher, Almaz, 01040-1057, 03-024C*04HS003, 99-447G*02H015, CICA0613, CICA0721, Genesis 079, Sonali.
Sowing dates:	6 May (Early), 7 June (Late).
Row Spacings/Stubble:	30 cm row spacing, inter-row, standing stubble (ST30), 60 cm row spacing, inter-row, standing stubble (ST60), 17.2 cm row spacing, slashed stubble (sl17).

Other Details

Fertiliser:	MAP + Zn @ 40 kg/ha at sowing
Plant Density:	35 plants/m^2

Results and Interpretation

- Key Message: Early sowing maximised yield potential resulting in a gain of 20%-120% dependant on the genotype grown. Wider row spacing (>=30cm) resulted higher grain yields for all genotypes.

- Plant establishment – Establishment for all chickpea genotypes averaged across all treatments was between 20 and 27 plants/m^2. Generally the kabuli types (i.e. Genesis 090, Genesis079 and Almaz had lower establishment (Table C1.1). Plant establishment was generally greater at the second sowing date and in the narrow row spacing (sl17; Table C1.2).
- Flowering Dates - See Table C1.3

Table C1.1. The main effect of genotype space on plant establishment in chickpeas at Curyo in 2010.

Genesis 090	Genesis 509	PBA Slasher	Almaz	01040-1057	03-024C*04HS003
23	28	25	22	27	27
99-447G*02H015	**99226*02HS001**	**CICA0613**	**CICA0721**	**Genesis 079**	**Sonali**
24	25	27	26	20	27

lsd(P<0.05)Var = 2

Table C1.2. The effect of the interaction between sowing date and row space on plant establishment in chickpeas at Curyo in 2010.

Row Space	6 May	7 June
sl17	26	32
ST30	25	25
ST60	20	22

lsd(P<0.05)SDxRS = 2

Table C1.3. Flowering dates of chickpea genotypes sown May 6 and June 7 at Curyo in 2010.

Sowing Date	Genesis 090	Genesis 509	PBA Slasher	Almaz	01040-1057	03-024C*04HS003
6 May	29-Sep	27-Sep	22-Sep	27-Sep	28-Sep	26-Sep
7 June	8-Oct	9-Oct	3-Oct	10-Oct	9-Oct	8-Oct
	99-447G*02H015	**99226*02HS001**	**CICA0613**	**CICA0721**	**Genesis 079**	**Sonali**
6 May	28-Sep	19-Sep	27-Sep	28-Sep	19-Sep	8-Sep
7 June	9-Oct	3-Oct	9-Oct	5-Oct	2-Oct	2-Oct

- Maturity Biomass – Selected varieties were sampled for biomass and yield component analysis. There was a significant main effect of sowing date and genotype, but no interactions (Table C1.4). Early sown (May 6) treatments produced approximately 60% more biomass than later sown (June 7) treatments. Sonali produced approximately 20% less biomass than other genotypes. There were no significant differences in biomass between the row space treatments, however, there appeared to be a trend towards greater biomass in the wider row spacings in standing stubble (ST30 and ST60; Table C1.4).

Table C1.4. The main effect of genotype, row space and sowing date on maturity biomass (t/ha) of chickpea at Curyo in 2010.

Genotype	t/ha	Row Space	t/ha	Sowing Date	t/ha
Genesis090	5.65	sl17	4.84	6 May	6.34
PBASlasher	5.34	ST30	5.34	7 June	4.04
01040-1057	5.39	ST60	5.40		
Sonali	4.39				
lsd(*P*<0.05)	0.83		ns		0.70

- Grain Yield – Similar to lentils, due to extreme rainfall events throughout harvest grain yields were reduced, but significantly less so than observed in lentils. It was estimated that grain yield losses were 15-25% (data not shown). Chickpeas sown May 6 showed grain yields between 18% and 119% more than those sown June 7 (Table C1.5). Almaz was the most responsive to early sowing, followed by Genesis 090 and Genesis 509. PBA Slasher and 99226*02HS001 were the least responsive to delayed sowing. At the May 6 sowing date, Genesis 090 had the highest yields, while at the June 7 sowing date PBA Slasher was highest yielding (Table C1.5). Similar to previous seasons there was a significant grain yield increase in wider row spacings and standing stubble (ST30 and ST60; Table C1.6).

Table C1.5. The effect of the interaction between sowing date and chickpea genotype on grain yield (t/ha) at Curyo in 2010.

Sowing Date	Genesis 090	Genesis 509	PBA Slasher	Almaz	01040-1057	03-024C*04HS003
6 May	1.85	1.49	1.63	1.54	1.29	1.52
7 June	1.05	0.90	1.38	0.70	0.88	1.11
	99-447G*02H015	**99226*02HS001**	**CICA0613**	**CICA0721**	**Genesis 079**	**Sonali**
6 May	1.41	1.56	1.52	1.59	1.54	1.35
7 June	0.98	1.31	1.21	1.08	0.98	1.04

lsd(P<0.05)SDxGen = 0.22, except when comparing genotypes within a sowing date = 0.19

Table C1.6. The main effect of row space treatment on grain yield (t/ha) of chickpeas at Curyo in 2010.

Row Space	t/ha
sl17	1.18
ST30	1.31
ST60	1.37

lsd(P<0.05)RS = 0.12

Key Findings and Comments

Early sowing is essential to maximise grain yield and minimise production risks in the southern mallee. However, if sowing is delayed it is important to carefully select varieties that perform best

for each sowing date. For example, in the later sowing date PBA Slasher had the highest yields. In addition, this research has again indicated the benefits of wider row spacings (>=30cm) and standing stubbles for chickpea production.