The effect of various planting dates on development and yield of two cultivars of chickpea

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Recently chickpeas have become an increasingly important winter legume crop in Queensland. They are grown as an alternative to cereal crops, for cash flow purposes, to break disease and pest cycles and to provide fixed nitrogen. Desi (small seeded) types are usually grown as winter crops in India, and Kabuli (large seeded) types as summer crops in the Middle East and Mediterranean (1). Chickpeas are known to show considerable genotypic variation in response to temperature and daylength (1). Because little is known about the optimum time for planting of chickpeas in Queensland, a study was undertaken to examine the effect of time of planting on plant characteristics and yield.

Methods

Two cultivars (Tyson — Desi type and Opal — Kabuli type) were planted on six planting dates (pl date) (050485, 260485, 180585, 160685, 100785 and 310785) in 50 cm rows. Seed was inoculated with Rhizobium strain CB1192, and the trial spray irrigated regularly. Data collected included days to 50% of plants flowering (days 50% flr), days to maturity (days m). plant height (plht), plant width (plw), pods per plant (pods $p1^{-1}$), seeds per pod (s pod^{-1}), seed weight (sw) and yield.

Results and Discussion

Days to flower tended to increase in Tyson but remained constant in Opal fa plantings to 160685, with later plantings flowering more quickly in both cultivars. Days to maturity declined ($P < 0.05$) with each successive planti date, Opal consistently 30-40 days slower than Tyson. Yield of both cultiv peaked from 180585 planting. Tyson consistently outyielded Opal e.g. 2.74 t ha^{-1}, 3.21 t ha^{-1} and 2.86 t ha^{-1} (Tyson) cf. 1.42 t ha^{-1}, 1.91 t ha and 1.39 t ha^{-1} (Opal) for plantings on 260485, 180585 and 160685 respectiv

Table 1. Significant (P <0.05) correlations between sowing date and plant characteristics and among plant characteristics.

Tyson		Opal	
Positive	Negative	Positive	Negative
pl date	days m	pl date	pl date
– plw	– pods pl^{-1}	– plht	– days m*
– sw	plht	– yield*	– plw
days 50% flr	– yield	days 50% flr	– s pod^{-1}
– plht	plw	– plht	days m
– plw	– sw	– pods pl^{-1}	– plht*
– s pod^{-1}	s pod^{-1}	days m	– s pod^{-1}*
– sw	– yield	– plw*	plht
– yield		s pod^{-1}	– plw
	days 50% flr	– yield*	
	– pods pl^{-1}	sw	
	days m	– yield*	
	– plw		
	– sw		
	plw		
	– pods pl^{-1}		
	pods pl^{-1}		
	– sw		

*First 4 planting dates only

These data suggest that Tyson and Opal respond differently to the Lockyer Valley environment, and that Opal is less well adapted. The differences may be related to a combination of temperature and daylength effects. Opal may have more specific environmental requirements. Nevertheless, for both cultivars, planting in late April to early June would be recommended, and probably earlier in this range for Opal than Tyson.

13. Roberts, E.H., Summerfield, R.J., Minchin, F.R. and Hadley, P. (1980). Exptl. Agric. 16(343-360).