B5. Sowing Date x Plant Density x Row Spacing, HRZ Mid North (Tarlee), South Australia

Aim

To determine optimum sowing dates, sowing densities and row spacings for maximising yield of new faba bean varieties.

Treatments

Varieties:	Nura, Farah, Fiord, 974*(611*974)/15-1 (abbreviated in text to 974*)
Sowing dates:	3 May (Early), 27 May (Mid)
Densities:	16, 24 and 32 plants/m^2
Row Spacing:	Narrow = 22.5cm (9 inch), Wide = 45cm (18 inch)
Fertiliser:	Map + Zn @ 90kg/ha at sowing

Results and Interpretation

Sowing date and row spacing had significant effects on grain yield of the four faba bean varieties (see Table B5.1). Farah and Fiord showed no difference in yield between sowing dates, while 974* and Nura showed yield improvements of 14% and 78% from delayed sowing. This is in contrast to previous seasons results, and is due to a combination of the favourable season and the onset of disease.

Narrow row spacing (22.5cm) was consistently higher yielding than at double width (45cm). The taller and bulkier variety 974* displayed the highest yield loss (22%) from wider row sowing, compared to 14-17% in the other varieties.

Ascochyta blight (AB) infection was rated at only low to moderate severity in 2010, compared to high severity in 2009, due to the drier start to the season. Sowing date plus variety, and sowing date plus plant density interactions for ascochyta severity were observed (Tables B5.2 and B5.3). Ascochyta blight infection was similar at both sowing dates for Farah and 974*, while Fiord and Nura showed increased severity at the early sowing date (Table B5.2). Fiord had the highest level of infection at both sowing dates. 974* had the least AB infection at the early sowing date, but only similar to Farah and Nura at the late sowing date. Ascochyta blight infection was increased by sowing early at the highest density (Table B5.3), while all other treatments were similar.

Lodging of faba beans at this site was influenced by plant density and a sowing date x row spacing interaction in 2010 (see Tables B5.4 and B5.5). Lodging was increased at the two higher plant densities (24 and 32 plants/m2) (Table B5.4). Lodging was greater for early sown beans, particularly at the wider row spacing in the taller varieties, Farah and 974* (Table B5.5). Nura was the only variety that showed a row spacing effect on lodging when sown late, which was higher at the wider row spacing.

Table B5.1. Effect of sowing date and row spacing on grain yield (t/ha) of four faba bean varieties, Tarlee 2010.

Variety	Sowing Date		Row Spacing	
	3 May	27 May	22.5cm	45cm
Farah	3.8	4.1	4.3	3.6
Fiord	3.3	3.7	3.7	3.2
Nura	2.3	4.1	3.5	2.9
974*(611*974)/15-1	3.7	4.2	4.5	3.5
LSD (P<0.05)	0.46 (0.21 same TOS)		0.25 (0.21 same spacing)	

Table B5.2. Effect of sowing date on ascochyta infection (% plant infected) of four faba bean varieties, Tarlee 2010.

Variety	3 May	27 May
Farah	3.5	1.9
Fiord	13.7	8.3
Nura	4.4	2.2
974*(611*974)/15-1	1.6	0.9
LSD (P<0.05)	1.6 (1.7 same TOS)	

Table B5.3. Effect of sowing date and plant density on ascochyta infection (% plant infected) of faba bean, Tarlee 2010

Plant Density (#/m2)	Ascochyta Blight (% infected)	
	3 May	27 May
16	4.2	3.4
24	5.0	3.3
32	8.2	3.3
LSD (P<0.05)	1.9 (2.3 same TOS)	

Table B5.4. Effect of plant density on lodging (1-9 score) of faba bean, Tarlee 2010.

Plant Density (#/m2)	Lodging (1-9 score)
16	5.7
24	5.1
32	4.3
LSD (P<0.05)	0.46

Table **B5.5.** Effect of sowing date and row spacing on lodging (1-9 score) of four faba bean varieties, Tarlee 2010.

Sowing Date:	3 May		27 May	
Row Spacing:	**22.5cm**	**45cm**	**22.5cm**	**45cm**
Farah	4.6	3	4.8	4.1
Fiord	4.3	4.2	6	5.9
Nura	4.1	4.7	7.1	5.0
974*	4.9	3.6	7.7	6.9
LSD (P<0.05)	1.11 (1.09 same TOS)			

Key Findings and Comments

- Winter and spring seasonal conditions favoured faba bean production in 2010, and as a consequence plants were able to maximise pod fill so that the highest sowing density yielded highest.
- Yield was generally maximised at the later sowing date except Farah and Fiord, which showed no difference in yield at either sowing date.
- Increasing plant density increased ascochyta blight infection, likely resulting from increased canopy humidity.
- Fiord and Nura showed increased ascochyta blight infection when sown early, consistent with other recent findings.
- Lodging was worse for thicker sown and earlier sown beans, particularly at wider row spacings in 974* and Farah due to their bulkier canopies.