B5 Row Spacing x Disease Management x Stubble, MRZ Wimmera (Rupanyup), Victoria

Aim

To investigate if optimum chocolate spot management strategies change in different row spacing's and standing and burnt residue across a range of faba bean varieties.

Experimental Treatments

Varieties: Farah, Nura, PBARana, AF03063, AF03109, AF04053, AF05069, AF05073.

Fungicide Regimes:

Regime	Chemical & Application Rate[1]	Timing
Complete (Fort)	chlorothalonil 720 @ 2L/ha carbendazim 500 @ 500ml/ha	Fortnightly starting 6 weeks after emergence.
Double Choc (Cx2)	carbendazim 500 @ 500ml/ha	Early and late flower
Triple Choc (Cx3)	carbendazim 500 @ 500ml/ha	Early, mid and late flower
Nil	Nil	Nil

1. Refers to application rate of the product

Row Spacings/Stubble: 30 cm row spacing, standing stubble (ST30),
30 cm row spacing, burnt stubble (B30),
60 cm row spacing, inter-row, standing stubble (ST60),
60 cm row spacing, inter-row, burnt stubble (B60).

Note: Stubble treatments were sown as independent trials.

Other Details

Sowing date: 10 May (burnt stubble); 17 May (standing stubble).
Fertiliser: MAP + Zn @ 60 kg/ha at sowing.
Plant Density: 20 plants/m^2.

Results and Interpretation

- Key Message: Grain yield in the standing stubble trial averaged 20% more than the burnt stubble trial. Disease, predominately rust resulted in grain yield losses of >20%. While there were varieties with less susceptibility to the disease present, it did not confer a grain yield advantage in the unsprayed treatment.

- Disease Symptoms – Due to suitable winter and spring time conditions, disease pressure was moderate to high in the faba beans. Aschochyta blight and chocolate spot were noticed in mid August and rust at the end of August. During September and October, rust became the predominant disease, probably because environmental conditions were conducive for rust development and the trial was designed to assess management options for chocolate spot and chemicals used only have limited efficacy on rust. The level of disease was assessed October 25, just prior to the beginning of leaf drop. Across all varieties there appeared to be a slight, but insignificant trend toward lower disease levels in the wider row spacing, particularly in standing stubble (data not shown). However there were large differences between stubble treatments. In the standing stubble trial disease scores were less for all varieties and fungicide regimes (Fig's. B5.1 and B5.2). This was particularly evident in the more susceptible varieties, Farah and AF03063 which, in the 'nil' fungicide regime had scores of approximately '7' in the burnt stubble trial and '5' in the standing stubble trial. The general response of varieties across the fungicide regimes was relatively consistent in the two trials. As the number of fungicide applications increased, the level of disease decreased. While among varieties PBA Rana and AF05069 showed the lowest level of disease, while Farah and AF03063 had the highest levels of disease (Fig's. B5.1 and B5.2).

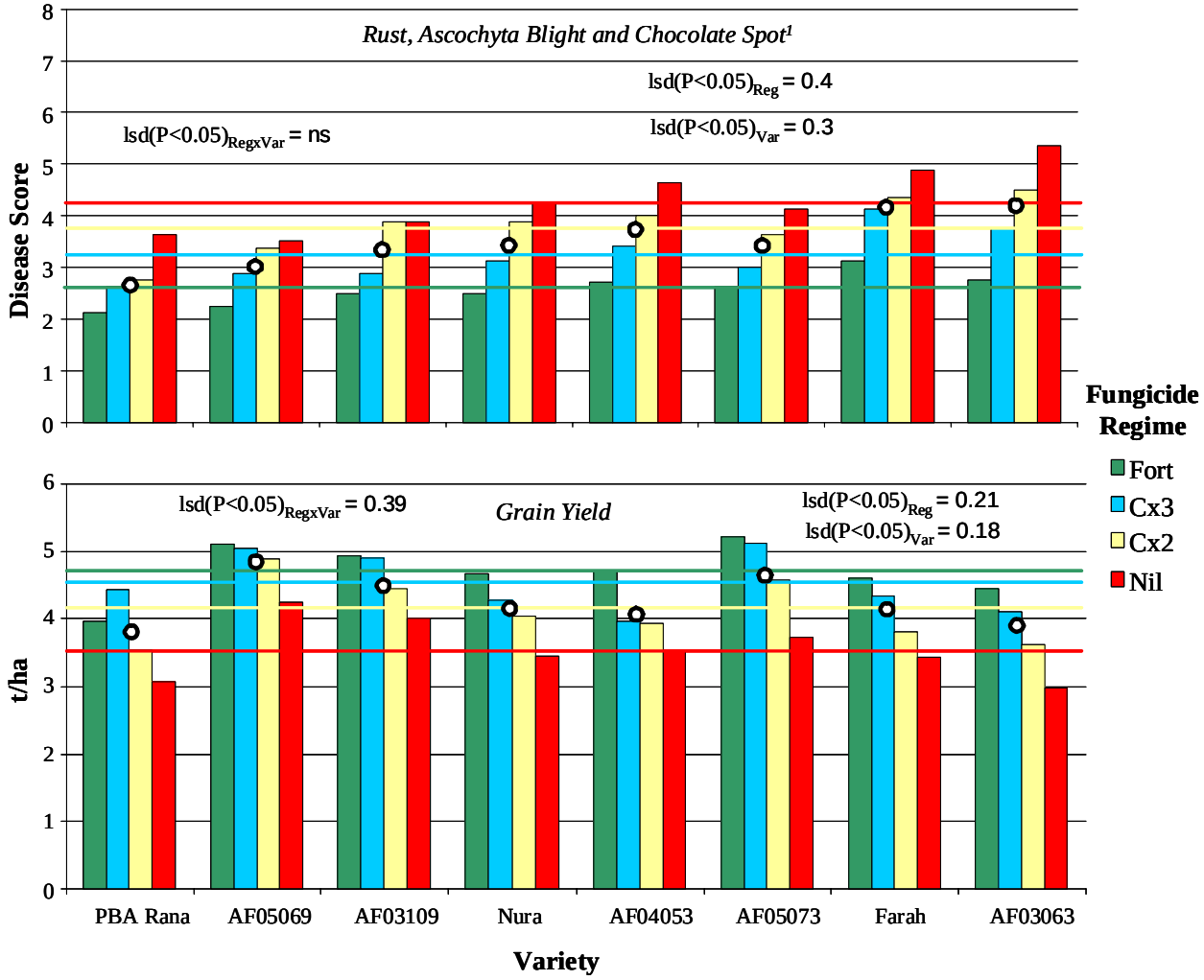

Figure B5.1. The interaction effect of fungicide regime and variety on disease damage score recorded October 25 (1 – no symptoms present, 9 – complete plot death) and grain yield of faba beans in standing stubble at Rupanyup in 2011. *[1]Disease damage was a combination of Rust, Ascochyta Blight and Chocolate Spot. Rust was the predominant disease present.*

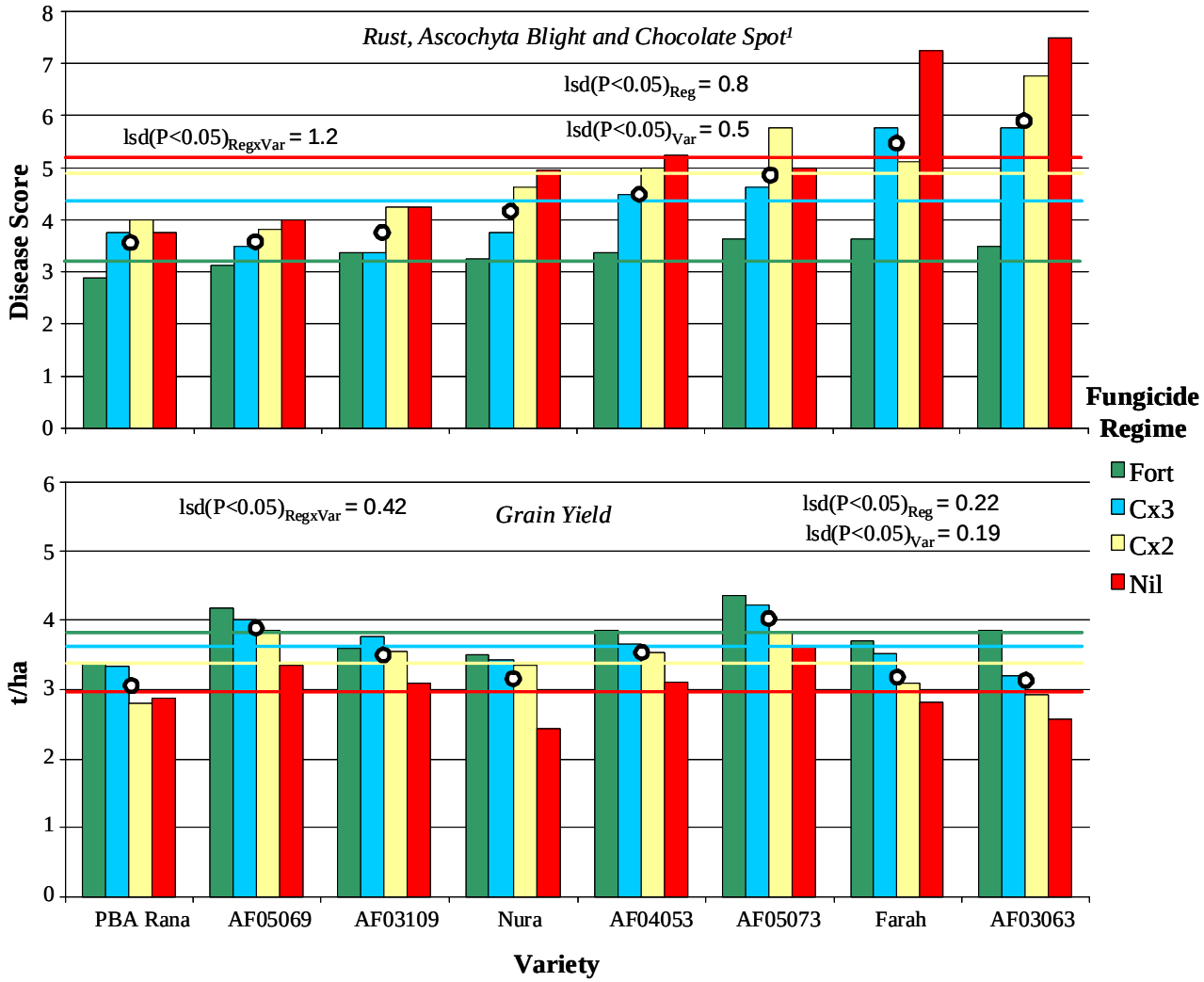

Figure B5.2. The interaction effect of fungicide regime and variety on disease damage score recorded October 25 (1 – no symptoms present, 9 – complete plot death) and grain yield of faba beans in burnt stubble at Rupanyup in 2011. *[1]Disease damage was a combination of Rust, Ascochyta Blight and Chocolate Spot. Rust was the predominant disease present.*

- Pod Height – Height to the lowest pods in the standing stubble were 10-25% higher than in the burnt stubble (Table B6.1). In the standing stubble trial, all varieties had a similar bottom pod height, except Nura and AF03063, which were significantly lower than the best variety AF05069. In the burnt stubble trial PBA Rana had the highest bottom pod height and Nura and AF03063 the lowest (Table B5.1).

- Grain Yield - Grain yields in 2011 were relatively high, ranging from 4.0 to 5.2t/ha on the standing stubble and 3.4 to 4.4t/ha on the burnt stubble, both in the fortnightly fungicide regime (Fig's. B5.1 and B5.2). No difference was noted between row spacings, so data presented is based on the interaction between fungicide regime and variety only. Overall grain yield in the standing stubble trial averaged 20% more than the burnt stubble trial. The maturity of the plots in the standing stubble was up to 2 weeks later than the burnt stubble. The response to fungicide regimes across varieties was relatively similar in both trials. In comparison to the fortnightly regime the average yield loss for the 'Cx3' regime was approximately 5%, for the 'Cx2' regime 12% and the 'nil' treatment 23% (Fig's. B5.1 and B5.2). The relative response of varieties did not appear to be related to the disease score, in that, the varieties with highest disease scores, did not show significantly greater yield loss in the 'nil' treatment than the varieties with lowest disease scores. When comparing the overall grain yield of varieties, AF05069 and AF05073 were 15-20% greater than Farah in all stubble treatments and fungicide regimes (Fig's. B5.1 and B5.2). While disease was relatively severe in this trial there appeared to be no effect on seed quality.

Table B5.1. The height (cm) to bottom pod of Faba Bean varieties grown in the disease management trials on standing and burnt stubble at Rupanyup in 2011.

Trial	AF03063	Nura	AF03109	AF05073	AF04053	Farah	AF05069	PBA Rana	Average
Standing	29.9	30.1	32.4	32.9	32.4	33.0	34.6	32.8	32.3
Burnt	24.2	24.2	24.8	24.9	26.5	27.1	28.2	29.2	26.1

Standing stubble trial: lsd(P<0.05)Var = 3.0
Burnt stubble trial: lsd(P<0.05)Var = 3.3.

Key Findings and Comments

Similar to other pulse crops growing conditions in 2011 were excellent for faba beans, due to extreme rainfall events during the summer of 2010/11 which resulted in soil profiles at or near field capacity at sowing. In addition, temperatures were mild in the in the flowering and podding periods with few frosts or high temperatures, so yield potential was high. Similar to chickpeas, row spacing had no major effect on grain yields in 2011 in either standing or burnt stubble. The importance of residue when seasonal conditions are dry to maintain stored moisture was again highlighted with grain yield in the standing stubble trial averaging 20% more than the burnt stubble trial. The main reason for reduced yields was likely to be greater evaporation from the soil surface as similar to lentils the maturity of plots on the burnt stubble was significantly earlier than the standing stubble.

There were no major difference in the response of varieties to fungicide regimes between the two stubble trials. Disease, predominately rust, resulted in grain yield losses of >20% (generally between 0.5-1t/ha). There were clear differences in the susceptibility of varieties to the disease present, however the varieties with greater tolerance, did not appear to have a grain yield advantage in the unsprayed treatment. It is unclear why there were no differences and further work will occur in 2012 to more clearly understand the impacts of rust in faba beans. Also despite severe disease in this trial there appeared to be no effect on seed quality. This is indicative of the relatively dry finish to the season meaning that it is less likely for disease to be transferred from the plant or pods onto seed.

A particular highlight of this trial was the yield gains of two new varieties, AF05069 and AF05073 compared with Farah. This confirms results of 2010 at Vectis in the Wimmera where AF05073 had similar yield gains compared with Farah (AF05069 was not tested in 2010).