



Closing the economic yield gap for grain legumes in Western Australia

Nathan Dovey, CEO, SCF

Trial objectives

This project involves a small plot trial being managed alongside a farm-scale demonstration site. The objectives for these two trials are;

Small Plot Trial - Demonstrate the effects of different sowing times and row spacings on the level of disease and profitability in faba beans and lupins.

Farm-Scale Demonstration - Compare three different Faba bean sowing rates to determine the optimum plant density required to optimise grain yield at West Cranbrook.

Background

Stirlings to Coast Farmers (SCF) consulted local growers and agronomists to determine the current pulse research requirements. A plan was devised to expand the local agronomic knowledge of Faba beans. Faba beans are the preferred pulse crop in the Frankland River/Tenterden region because they have the greatest waterlogging tolerance. Many growers are replacing lupin hectares with faba beans because they are more profitable. Adding lupins to the trial design will allow us to compare the productivity and profitability of the two pulse crops in the small plot trial.

Faba beans require more protection from disease than any other common broad-acre crop grown in Western Australia (WA). In 2021, local Frankland farmers recorded up to five different fungicide applications during the season to protect faba beans from chocolate spot *Botrytis fabae*. Local growers and advisors want to know if sowing later lowers the disease pressure and reduces the number of fungicide applications. The accepted downside to sowing later is a lower yield potential, but recently, growers have seen extraordinary yields from later sown crops, especially wheat & barley. The project will investigate whether a later sown faba bean crop may have less disease while maintaining profitable yields in the Frankland/Tenterden region.

The small plot trial will investigate the interaction between row spacing, disease levels and sowing times. The wider the row, the lower humidity in the crop canopy, which means the causal agent of Chocolate Spot (*Botrytis fabae*) is less likely to infect faba bean plants successfully. However, most growers have 25-30cm row spacings in WA to suit other crops (wheat, barley and canola) and need considerable motivation to sow faba beans with wider spacings. A small number of WA growers have separate seeders to plant faba beans at wider spacings, but it is not common practice.

Farm-scale demonstrations are included in the project design to give growers greater confidence in the viability of Faba beans at a paddock level in the HRZ. For example, small plot trials are typically located in a part of the paddock that will not get waterlogged, which means observers don't get to assess faba beans' tolerance to the constraint. Although faba beans don't 'like' to be waterlogged, they are the most tolerant pulse crop to saturated soils. Broad-scale paddock strips allow growers and researchers to observe the crops' strengths and weaknesses across paddock as opposed to small research plots which are generally more uniform in soil conditions.



Methodology

Small plot Trial

The small plot trial will be managed by Living Farm (Trials Contractor & Grower Group) and grown on the Preston family's property at West Cranbrook. The six treatments measured in the two separate sowing times are:

1. Amberly faba beans sown on 25mm tyne spacing
2. Amberly faba beans sown on 50mm tyne spacing
3. Bendoc faba beans sown on 25mm tyne spacing
4. Bendoc faba beans sown on 50mm tyne spacing
5. Jurien lupins sown on 25mm tyne spacing
6. Jurien lupins sown on 50mm tyne spacing

The two sowing dates will be one month apart, with the first sowing date planned for late April. SCF will complete as many of the trial site observations as possible to reduce the costs. To ensure essential factors for growing pulse crops (nutrition, rhizobial inoculation plus herbicide and fungicide management) do not impact our experimental variables of sowing time, luxury applications of these will be applied across the whole trial.

The most challenging factor is managing the fungicide applications since they require six independent visits to the trial site to control the disease. Once the first sowing date needs spraying at the start of flowering, the trial contractors will be spraying the trial site every three weeks until October, aiming to provide the best disease protection possible.

Farm-Scale Demonstration

The Preston family are experienced lupin growers trying faba beans for the first time in many years. The paddock was seeded on the 6th of April with 50mm spacing after Mark and Neil Preston blocked every second tyne on their seeding bar. The paddock seeding rate of Amberly faba beans was 150kg/ha. After consultation with Mark Preston, SCF decided to do two seeding strips each of:

- 120kg/ha
- 150kg/ha
- 180kg/ha

The SCF research team will measure plant emergence and potential disease differences over the 2022 growing season. The final grain yield of the farm-scale trial will be determined from the harvest yield monitor data and analysed by Phil Honey (SCF Smart Farms Coordinator).

