SA Grain Legume Development and Extension Project

Summary of 2021 Field Trial Results

GRDC GRAINS RESEARCH & DEVELOPMENT CORPORATION

THE UNIVERSITY of ADELAIDE

Government of South Australia
Department of Primary Industries and Regions

SARDI RESEARCH AND DEVELOPMENT INSTITUTE

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MID NORTH HIGH RAINFALL ZONE

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Project Investment

Grains Research and Development Corporation: project UOA2105-013RTX "Development and extension to close the economic yield gap and maximise faming systems benefits from grain legume production in South Australia"

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Cover image: Melrose salt tolerant lentil variety trial, 10 September 2021

INTRODUCTION

The project aims to deliver local development and extension to close the economic yield gap and maximise faming systems benefits from grain legume production in South Australia.

Over the lifeline of the project (2021-2025), the proposed investment will:

- Address the current yield gap in grain legumes and drive its closure through supporting increased technical efficiency of growers with extension of best practice grain legume agronomy;
- Support grain growers and their advisers (100 per hub, 20 per spoke) in the target regions (Figure 1) to maximise system profitability by incorporating grain legumes in rotation;
- Drive and support sustainable expansion of the area grown to grain legumes; and
- A targeted 45% of growers adopt or intend to adopt new and novel practices emerging from linked proof-of concept and innovation research

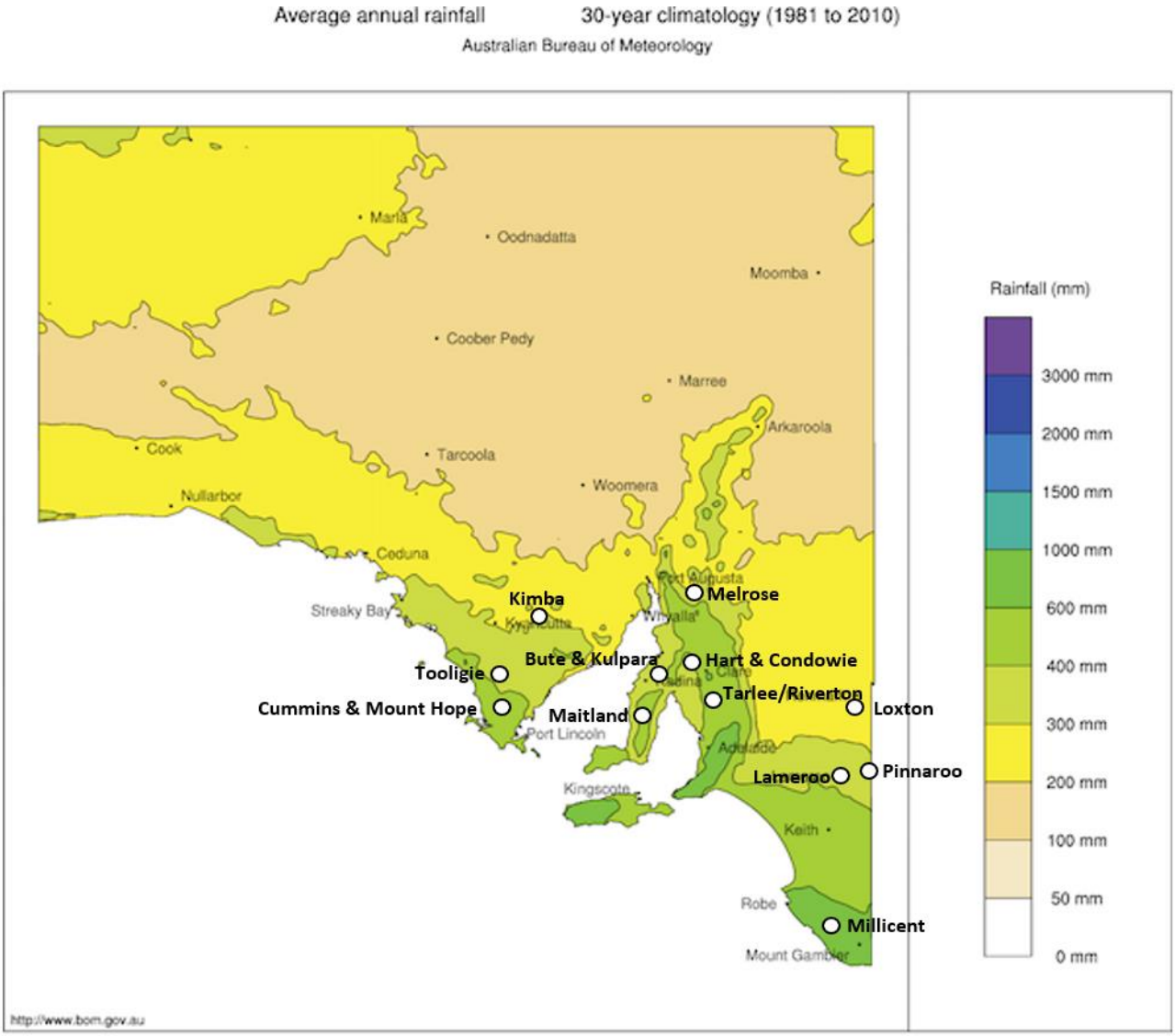

Figure 1. Trial locations for SA Grain Legume hub and spoke sites in 2021, selected by collaborators to represent the range of environments and soil types across the state's legume cropping regions.

MAITLAND

ASCOCHYA BLIGHT FUNGICIDE TRIAL

Jordan Bruce, Stuart Sherriff, Sam Trengove. ***Trengove Consulting***

Key messages

- No ascochyta blight of significance occurred at the trial in 2021.
- The fungicides boscalid and Miravis Star prevented fungi formation on the stubble at the time between desiccation and harvest.

Why do the trial?

Lentil diseases can have a major impact on grain yield and quality. The fungal pathogen *Ascochyta lentis* can cause widespread ascochyta blight disease through lentil growing regions under certain conditions. In years of high disease pressure fungicide demand increases resulting in supply issues. In these seasons it may be necessary to use products that are less well known to industry or have been issued an emergency permit by the APVMA. However, there is often little efficacy data available to know what product to use. Also, several new fungicides have been brought to market in recent years but there is little independent fungicide efficacy data available to compare these new and often more expensive products with the older chemistry that has been relied upon for many years. This trial aims to test the efficacy of all registered and permitted products for the control of ascochyta blight in lentils.

How was it done?

The trial was a randomised complete block design with 11 treatments and three replicates. Treatments were sown with knife points and press wheels and were 1.5m * 10m sown on 2m centers. Treatments were selected based on all currently registered and permitted products in the market for control of ascochyta blight in lentil in South Australia (Table 1). PBA Hallmark XT was chosen as the variety given its MRMS rating to pathotype 2 (PBA Hurricane XT virulent) of ascochyta and is the lowest for current commercial varieties. Combined with a rating of RMR for botrytis grey mould (BGM), it increases the likelihood any response to fungicide is solely due to ascochyta control.

Sowing date: 19th May 2021 **Fertiliser:** 100kg/ha MAP + Zn 2%

Variety: PBA Hallmark XT

Fungicide application: Fungicide treatments were applied using a 2m hand boom with water at 100L/ha using 110015 low drift nozzles at canopy closure 25th August and again approximately four weeks later 24th September. All treatments received an application of procymidone (500g/L) at 500ml/ha at both timings to provide BGM control. This assumes procymidone is not going to provide any level of ascochyta blight control.

No disease of significance was recorded in the trial at any time during the season, for this reason no fungicide efficacy data was gathered from this trial. The trial was scored for stubble colour, due to fungi formation on some plots, on a scale from 1 – 10 where 1 = black stubble and 10 = bright/clean stubble. Plots were harvested for grain yield.

Table 1. ***Fungicide treatment list for the ascochyta blight control trial at Maitland in 2021.***

Treatment	Product	Active ingredient (Concentration)	Rate (mL or g/ha)
1	Nil		
2	Dithane Rainshield	Mancozeb (750g/kg)	2200
3	Bravo	Chlorothalonil (720g/L)	1000
4	Bravo	Chlorothalonil (720g/L)	2000
5	Veritas	Azoxystrobin (120g/L) + tebuconazole (200g/L)	1000
6	Amistar Xtra	Azoxystrobin (200g/L) + cyproconazole (80g/L)	600
7	Aviator Xpro	Bixafen (75g/L) + prothioconazole (150g/L)	600
8	Polyram DF + BS1000 0.02%	Metiram (700g/kg)	2200
9	Captan 900	Captan (900g/L)	1100
10	Boscalid	Boscalid (500g/kg)	600
11	Miravis Star	Pydiflumetofen 100g/L + fludioxonil 150g/L	500

Results and Discussion

There was no significant ascochyta blight recorded at the site at any time in 2021. A wet June and July period led to early an ascochyta infection detectable at low levels at the trial site and in nearby crops. However, below average rainfall during August and September was not conducive for further disease development. As a result, no fungicide efficacy data was collected at this site. Grain yield averaged 3.62 t/ha and was not significantly affected by fungicide treatment.

Prior to harvest it was noted that the fungicides had affected the stubble colour. A score was conducted to assess if this was related to treatment. It was found that Aviator Xpro and Bravo at 2000 mL/ha had a small impact on stubble colour, but the two treatments Boscalid and Miravis Star reduced the discoloration of the stubble keeping it from turning black between desiccation and harvest.

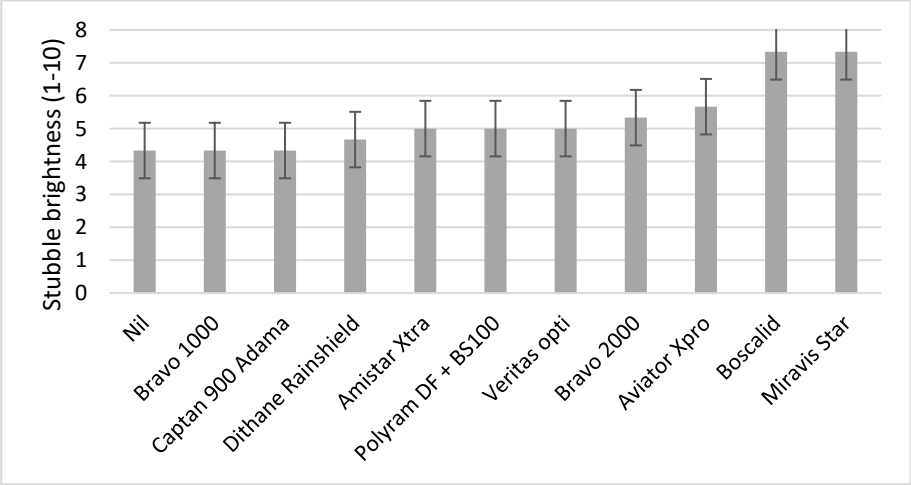

Figure 2. ***Stubble colour score (1 = black, 9 = bright and clean) as affected by fungicide treatment in the ascochyta blight efficacy trial at Maitland 2021.***

BOTRYTIS GREY MOULD (BGM) FUNGICIDE TRIAL

Jordan Bruce, Stuart Sherriff, Sam Trengove. ***Trengove Consulting***

Key messages

- No botrytis grey mold (BGM) of significance affected the trial in 2021 and grain yield averaged 3.85 t/ha.

Why do the trial?

Lentil diseases can have a major impact on grain yield and quality. The fungal pathogens *Botrytis cinerea* and *Botrytis fabae* can cause botrytis grey mould (BGM) disease in lentil crops under certain conditions. In years of high disease pressure fungicide demand increases resulting in supply issues. In these seasons it may be necessary to use products that are less well known to industry or have been issued an emergency permit by the APVMA however there is often little efficacy data available to know what product to use. Also, several new fungicides have been brought to market in recent years and there is little independent fungicide efficacy data available to compare these new and often more expensive products with the older chemistry that has been relied upon for many years**.**

How was it done?

The trial was a randomised complete block design with 12 treatments and three replicates. Treatments were sown with knife points and press wheels and were 1.5m * 10m sown on 2m centers.

Treatments were selected based on all currently registered and permitted products in the market for control of BGM in lentil in South Australia (Table 2**Error! Reference source not found.**). PBA Ace was chosen as the variety due to its large canopy and susceptibility (MRMS) to BGM. PBA Ace also has good ascochyta blight resistance (R), which limits the likelihood that ascochyta will confound the BGM response to fungicide.

Sowing date: 19thMay 2021 **Fertiliser:** 100kg/ha MAP + Zn 2%

Variety: PBA Ace

Fungicide application: Fungicide treatments were applied using a 2m hand boom in 100L water per ha using 110015 low drift nozzles at canopy closure on 12th August and approximately three weeks later 31st August.

No disease of significance was recorded in the trial at any time during the season, for this reason no fungicide efficacy data was gathered from this trial. The trial was scored for stubble colour, due to fungi formation on some plots, on a scale from 1 – 10 where 1 = black stubble and 10 = bright/clean stubble. Plots were harvested for grain yield.

Table 2. Fungicide treatment list for the botrytis grey mould control trial at Maitland in 2021.

Treatment	Product	Active ingredient (Concentration)	Rate (mL or g/ha)
1	Nil		
2	Dithane Rainshield	Mancozeb (750g/kg)	2200
3	Spinflo	Carbendazim (500g/L)	500
4	Bravo	Chlorothalonil (720g/L)	2000
5	Sumisclex	Procymidone (500g/L)	500
6	Veritas	Azoxystrobin (120g/L) + tebuconazole (200g/L)	1000
7	Amistar Xtra	Azoxystrobin (200g/L) + cyproconazole (80g/L)	600
8	Aviator Xpro	Bixafen (75g/L) + prothioconazole (150g/L)	600
9	Polyram DF + BS1000 0.02%	Metiram (700g/kg)	2200
10	Captan 900	Captan (900g/L)	1100
11	Boscalid	Boscalid (500g/kg)	600
12	Miravis Star	Pydiflumetofen 100g/L + fludioxonil 150g/L	500

Results and Discussion

There was no significant BGM recorded at the site at any time. A wet June and July period led to early BGM infection detectable at low levels at the trial site and in nearby crops, however below average rainfall during August and September was not conducive for further disease development. Modelling by Mohsen Khani (SARDI) using nearby weather station data showed that no risk was detected where the temperature was between 9-21°C and relative humidity greater than 95%. However, when a relative humidity threshold of greater than 80% is used it shows a moderate risk period between 5-11 August. This coincides with the week prior to the first canopy closure fungicide application on August 12th when detection of BGM at low level was made. However, with no significant risk periods from that time forward the BGM did not progress. As a result, no fungicide efficacy data was collected at this site. Grain yield averaged 3.85 t/ha and was not significantly affected by fungicide treatment.

Unlike the ascochyta trial, stubble colour was not significantly affected by fungicide treatment.