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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HART SA's premier cropping field site

AIR EP Ag Innovation & Research Eyre Peninsula

MID NORTH HIGH RAINFALL ZONE

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Project management

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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

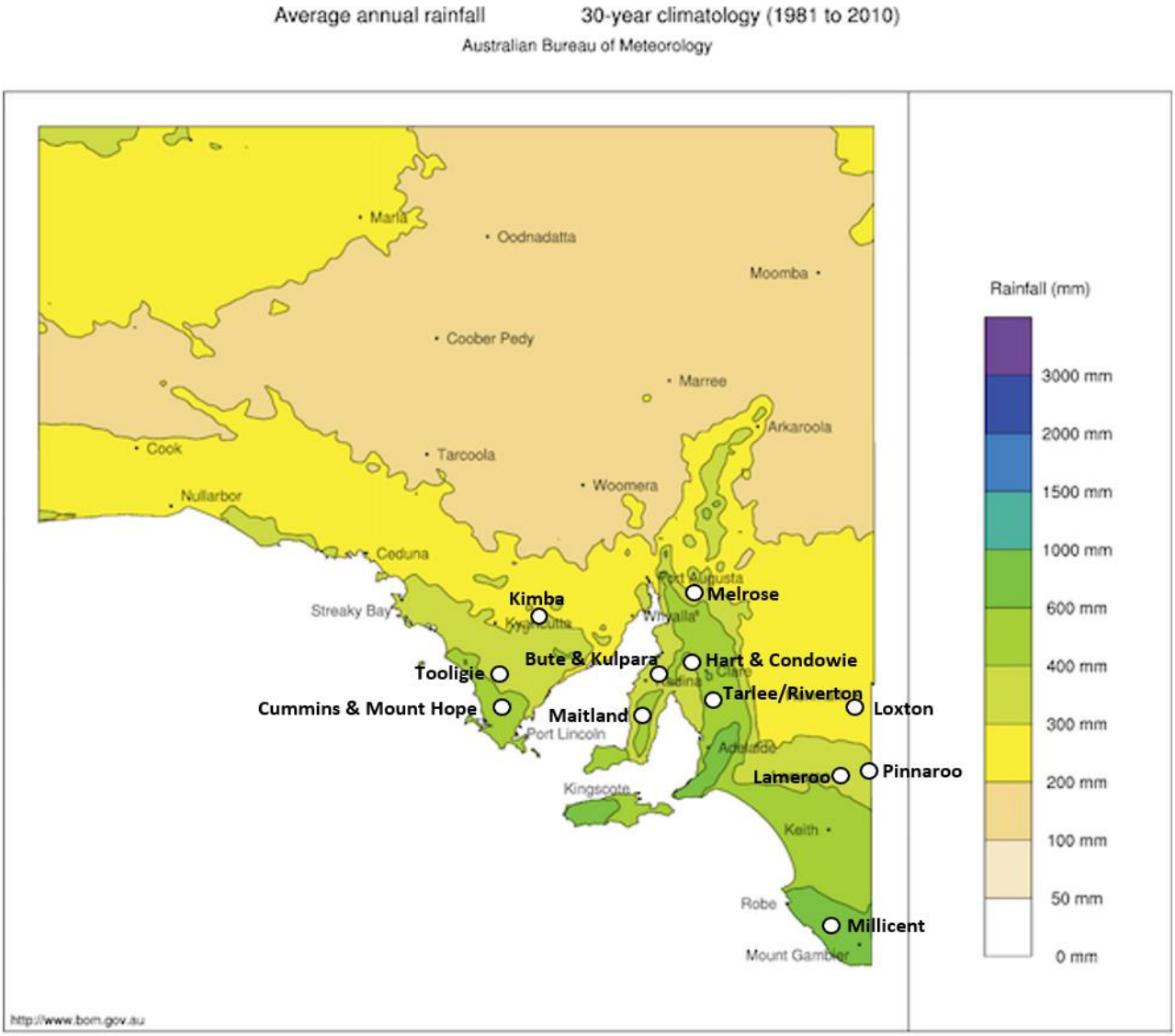

Figure 1. Trial locations for SA Grain Legume hub and spoke sites in 2021, selected by collaborators to represent the range of environments and soil types across the state's legume cropping regions.

LOXTON

SITE SUMMARY

The major climate influence at the Loxton hub site in 2021 was the very dry Summer, Autumn, and Winter. Trials were sown dry during May 2021, with emergence delayed until mid-June following a cumulation of 17 mm rainfall between the 28 May to 8 June 2021. Total rainfall received for the first half of the year was less than 50 mm with approximately 100 mm of rainfall received to the end of August (Figure 2). On the 4th of September 25 mm of rainfall was received at the site and this was followed by average rainfall and mild temperatures during September and October 2021. These favourable spring conditions provided for some recovery of yield potential that ranged generally ranged from 0.5 – 1 t/ha.

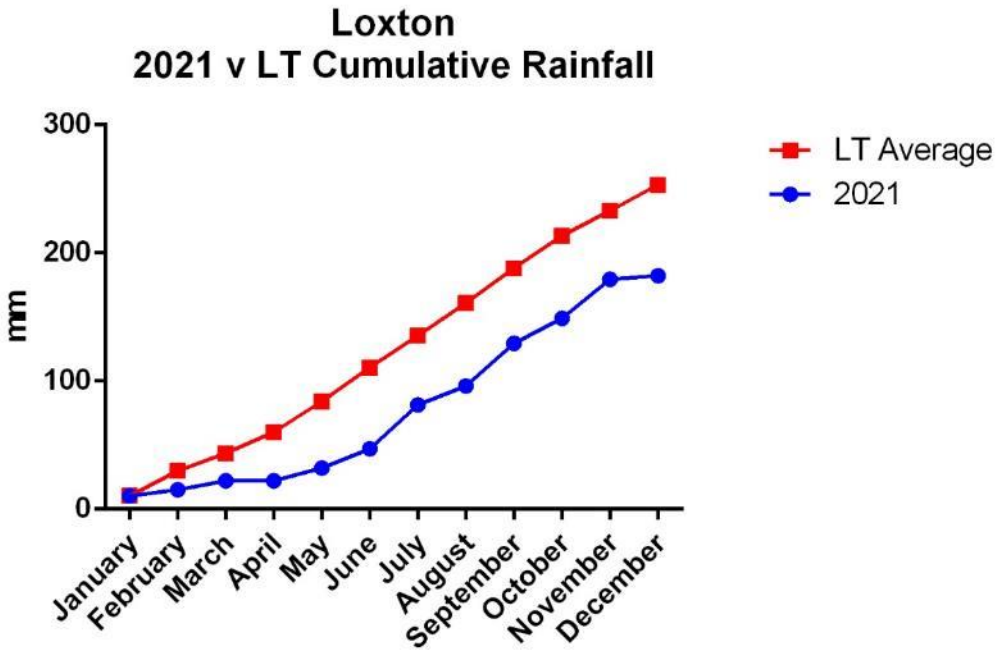

Figure 2. Cumulative rainfall for 2021 compared to the long-term average rainfall for Loxton.

The soil type at the site is an alkaline sandy loam soil that has high sandy content in the top 40 cm with increasing clay content below this depth. There were no obvious subsoil constraints however salt content increases with depth and grades to a moderate salinity range below 70 cm. The site had generally low fertility with OC of 0.48%. Phosphorus was low when measured using the Colwell method, however the DGT method suggested P levels were adequate, which reflects the low PBI.

Table 1. Site soil characteristics for Loxton hub, 2021.

Depth (cm)	NH_3-N	NO_3-N	P (Colwel) mg/kg	PBI	DGT µg/L	K (mg/kg)	S (mg/kg)	OC ($CaCl_2$)	EC (dS/m)	pH ($CaCl_2$)
0-10	8.7	1.8	10	29	72	274	5.3	0.48	0.12	8.03
10-20	3.6	1.2					3.4		0.093	8.12
20-40	1.4	<1					3.8		0.086	8.22
40-70	3.5	1.1					8.4		0.18	8.35
70-100	5.9	1.1					25		0.39	8.52

Depth (cm)	Cu	Fe	Mn (mg/kg)	Zn	B	Exc Ca	Exc Mg	Exc K (meq/100g)	Exc Na
0-10	0.23	2.3	6.1	0.69	0.59	10.2	1.32	0.701	0.081
10-20					0.5				
20-40					0.84				
40-70					1.7				
70-100					6.1				

ECONOMIC MANAGEMENT OF ASCOCHYTA BLIGHT IN CHICKPEA IN THE LOW RAINFALL ZONE

Michael Moodie and Wayne Reid. ***Frontier Farming Systems***

Aim: To compare the economic outcome of managing Ascochyta blight in chickpea with using a preventive and reactive fungicide management regime.

Methodology:
The trial was established on a sandy loam soil type. The trial was regularly monitored throughout the season, however there was no evidence of the development of Ascochyta, despite the disease being present in the district the season prior. Samples were sent to SARDI Pathology, which confirmed the disease was not present. Measurements on the trial included crop establishment and grain yield.

Treatments:

- Factor 1: Fungicide application
  - No fungicide
  - Full control (Full protection with regular applications of chlorothalonil fungicide)
  - Strategic: 2-3 application chlorothalonil across growing season
  - Tactical: control disease with appropriate curative fungicide when/if disease detected.
- Factor 2: Variety:
  - Genesis™090
  - PBA Royal
  - PBA Striker

Table 2. Trial details, including sowing date and fertiliser, Loxton 2021.

Trial design	**Split Plot**
Replicates	**4**
Sowing date	**14/5/21**
Plant density	**Target 35 plants/m^2**
Row spacing	**28 cm**
Fertiliser	**50 kg/ha Granulock**
Harvest date	**e.g 22/11/21**

Results and Discussion:

The very dry seasonal conditions were not conducive to the development of Ascochyta in Chickpea. Therefore, tactical fungicides were not applied. There was no significant difference between varieties for grain yield, with a low mean yield of 0.43 t/ha.