

HART RESEARCH UPDATE

Presented by Miffy Purslow

Novel management strategies for
the control of fusarium root rot in
lentil



SARDI WAITE PROJECT



Waite Campus, Adelaide

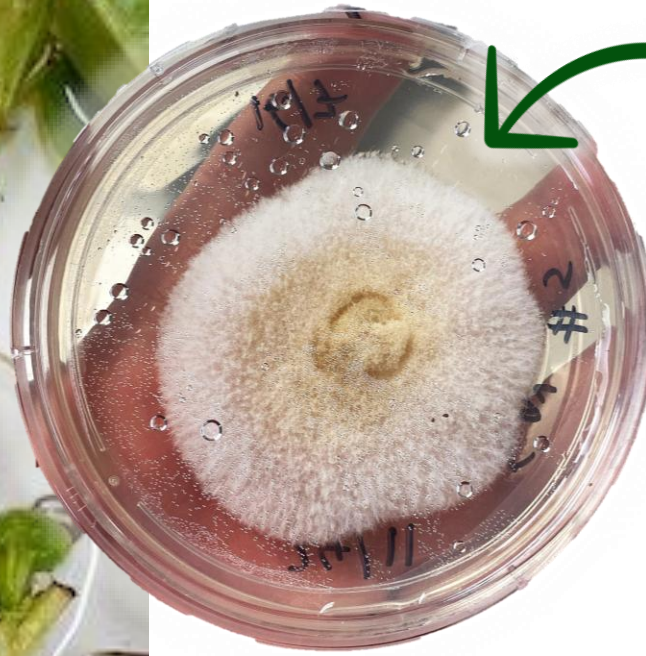


Dr Liz Farquharson

Research Scientist Legume N-Fixation and Microbiology

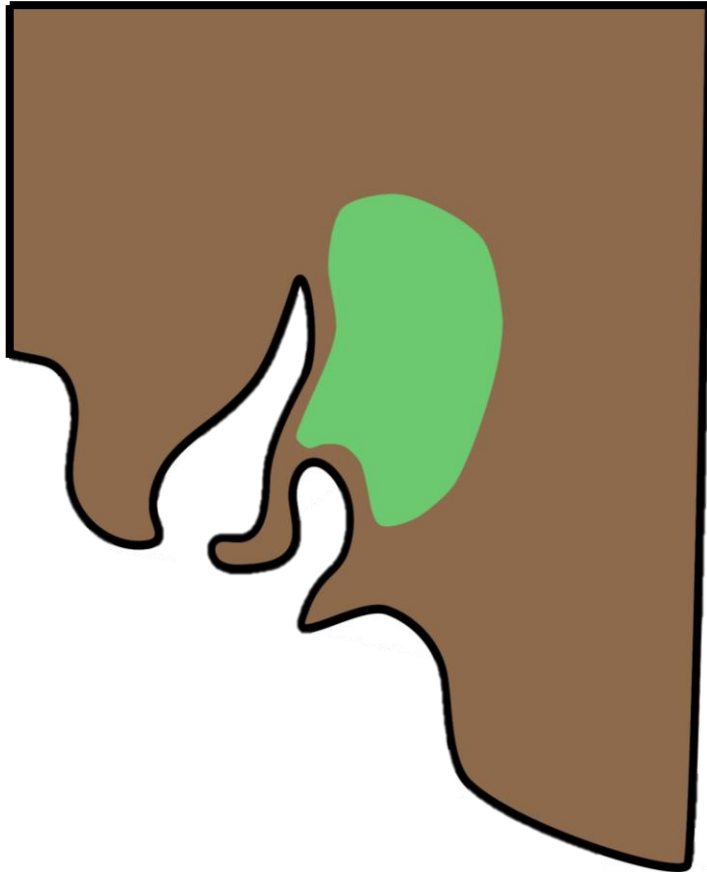
Blake Gontar

Senior Researcher in Soilborne Disease



***Fusarium
avenaceum***

Fusarium root rot
pathogen in faba beans



~ 39,000 hectares of
lentils were grown

Upper North

Mid North

Lower North

60% - 79% YIELD LOSS

in lentils under high inoculum conditions

In field trials at Roseworthy (2023) and Pinery (2024)

Looking at the interaction in lentils between **3 VARIABLES**

1



2



3



Looking at the interaction in lentils between **fusarium root rot**



**Fusarium root rot
pathogen**



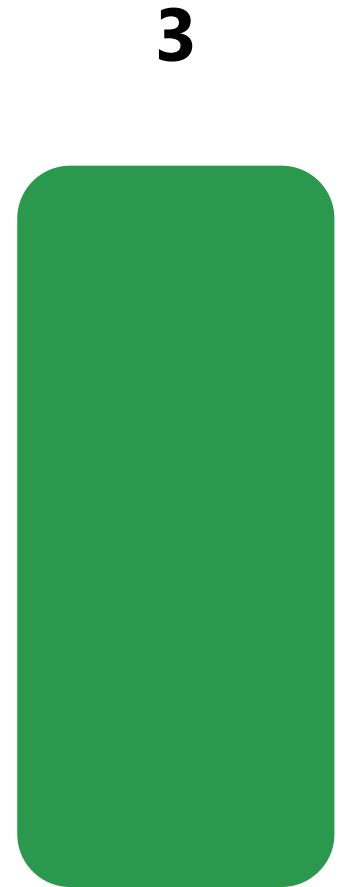
Looking at the interaction in lentils between **fusarium root rot**,
an **experimental seed treatment**



**Fusarium root rot
pathogen**



**Experimental
seed treatment**



Looking at the interaction in lentils between **fusarium root rot**, an **experimental seed treatment**, and **nodulation**.



**Fusarium root rot
pathogen**



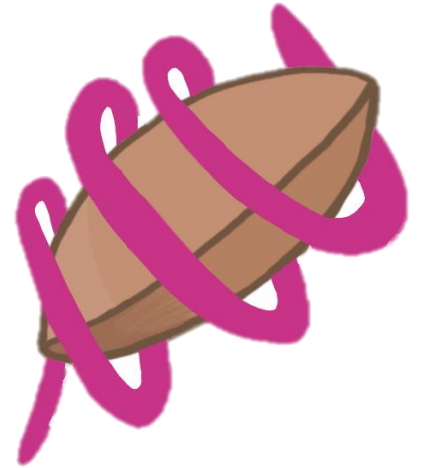
**Experimental
seed treatment**



**Nodulation
(Rhizobia)**

THE SEED TREATMENT

- Could it control Fusarium root rot in soil?
- Developed to control soil pathogens in cereals
- **EXPERIMENTAL ONLY** - Not a registered yet
- Fundamental chemistry is not new **BUT...**
- Formulation and application method are new

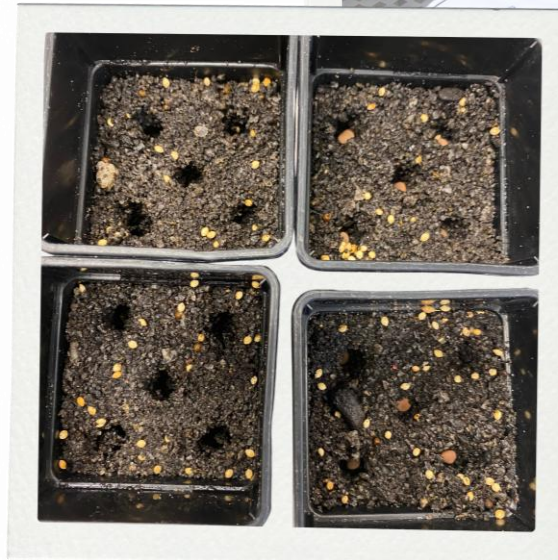


The background is a light green pattern of various garden-related icons, including potted plants, leafy branches, watering cans, and garden tools, arranged in a repeating, slightly offset manner.

EXPERIMENT SET UP

POT EXPERIMENT SET-UP

- PBA Hallmark lentils
- Temperature controlled glass house 20°C
- Watered every 2 days to 80% field capacity
- Rhizobia added after seedling emergence
- 5 seeds per pot



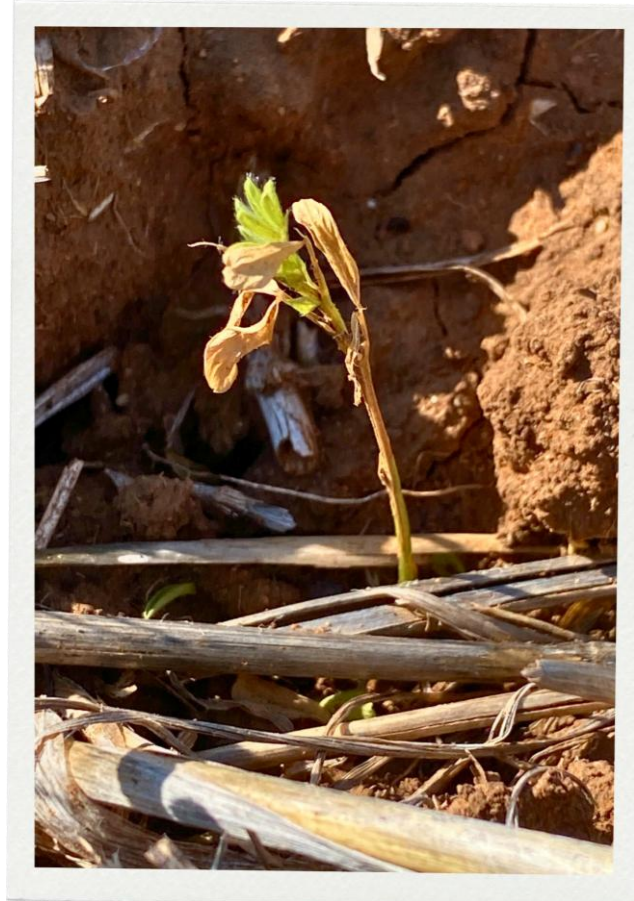
FIELD EQUIVALENT SET-UP

- Blake Gontar's trial



Hart field site

- Also, Pinery & Roseworthy
- Similar treatments to pot experiment



August 9



September 6

No seed treatment +
No pathogen



Seed treatment +
No pathogen

No seed treatment +
0.25% Fusarium pathogen



Seed treatment +
0.25% Fusarium pathogen

No seed treatment +
0.50% Fusarium pathogen

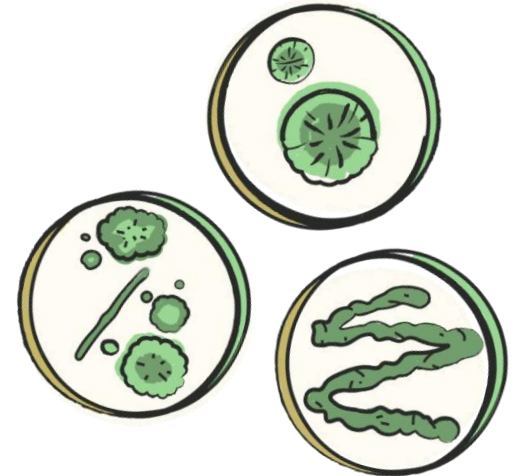


Seed treatment +
0.50% Fusarium pathogen



AGAR PLATE MINI EXPERIMENT

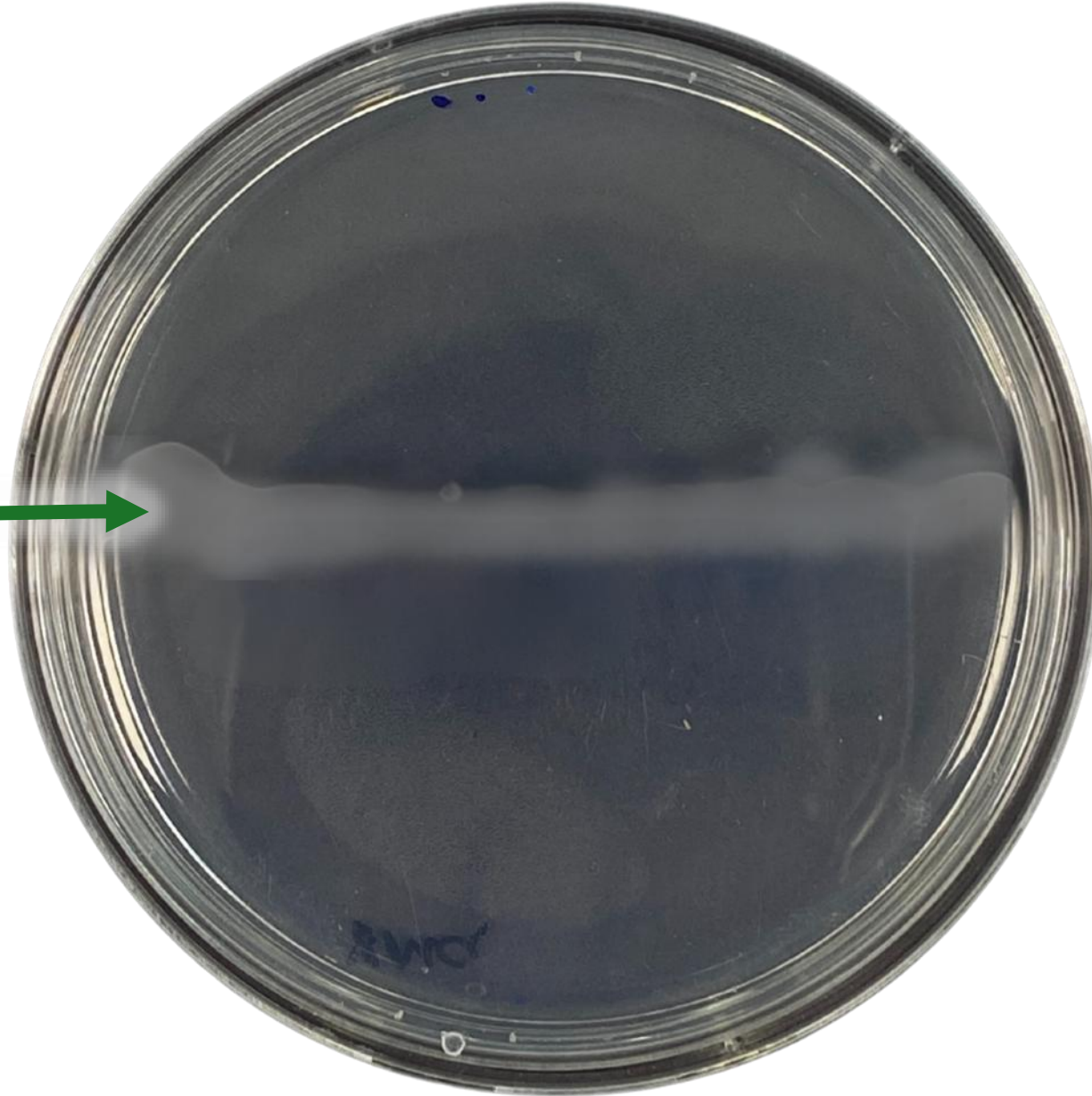
Rhizobia + seed treatment interaction





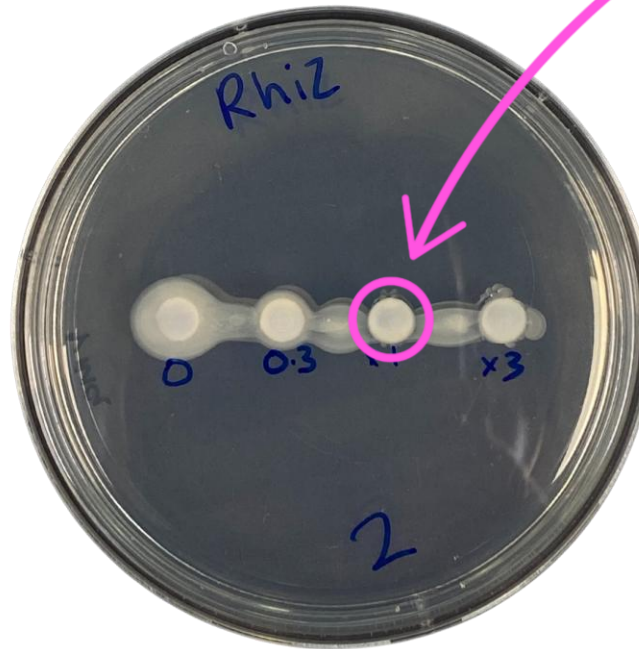
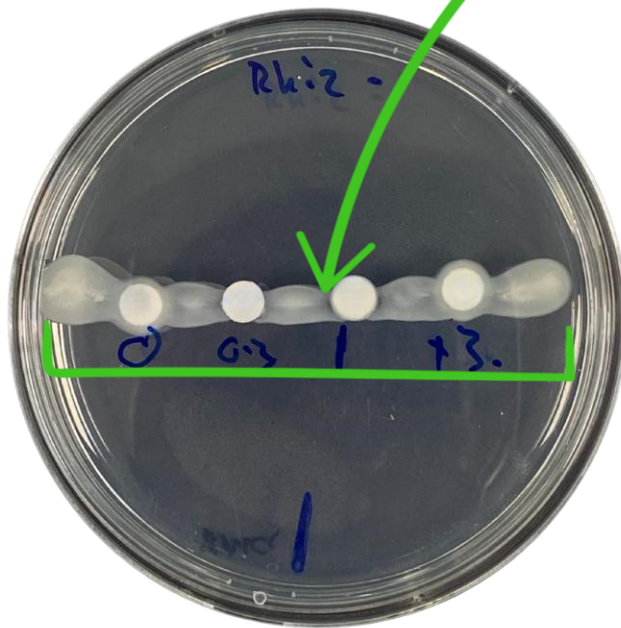
atment
rd disk

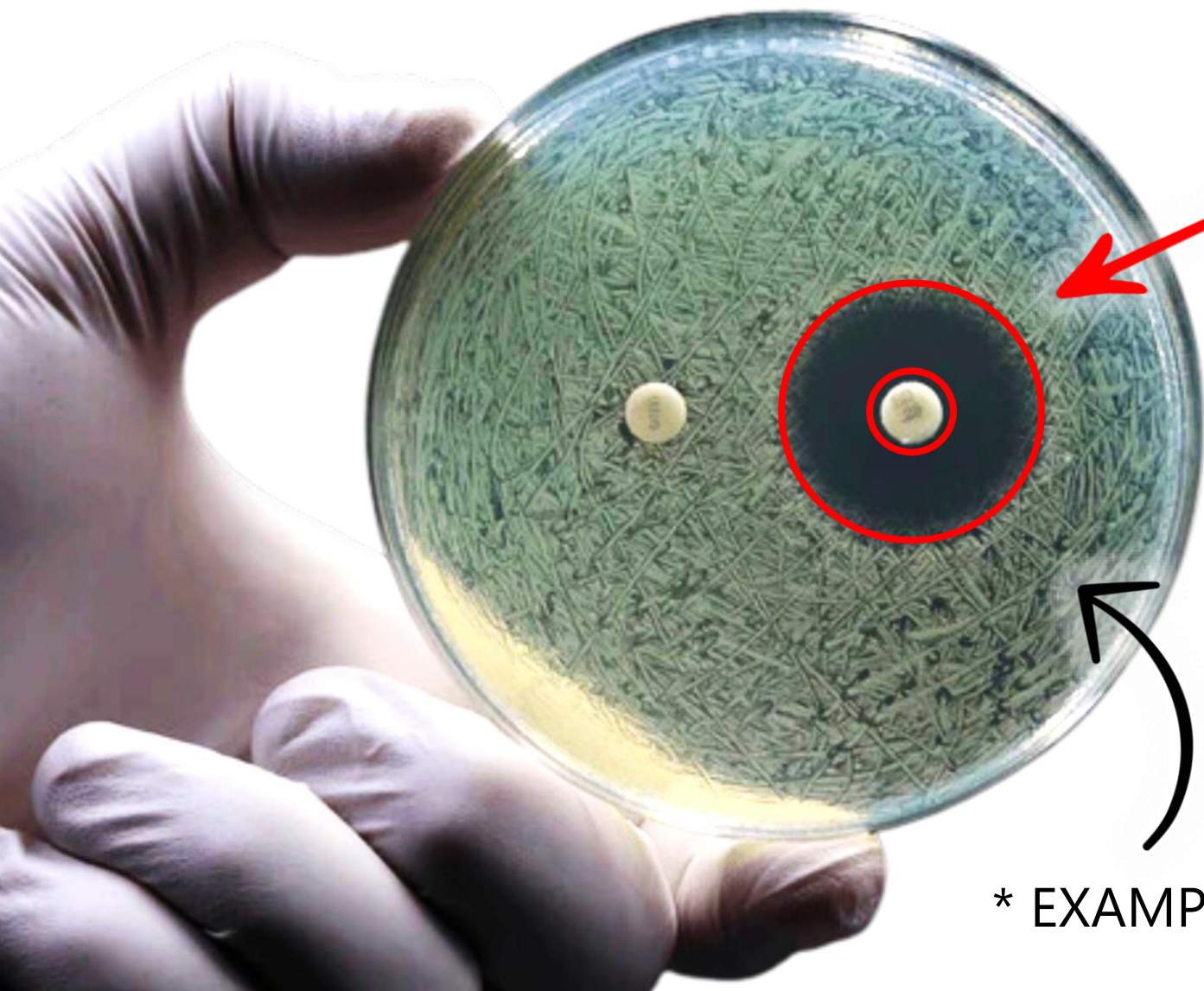
Rhizobia
streak



Rhizobia streak

Cardboard disks with seed
treatment pipetted onto

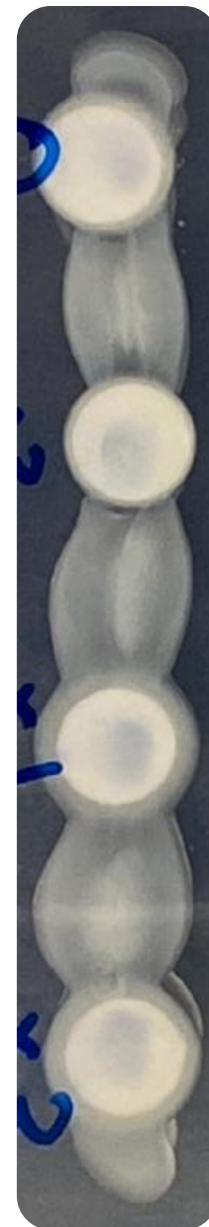




Inhibition Zone

* EXAMPLE *

Our results





THE DATA

Plant survival rate %

100
90
80
70
60
50
40
30
20
10
0

No seed
treatment
+
0.50%
Fusarium
pathogen

No seed
treatment
+
0.25%
Fusarium
pathogen

**Seed
treatment**
+
0.50%
Fusarium
pathogen

**Seed
treatment**
+
0.25%
Fusarium
pathogen

**Seed
treatment**
+
No pathogen

No seed
treatment
+
No pathogen

a

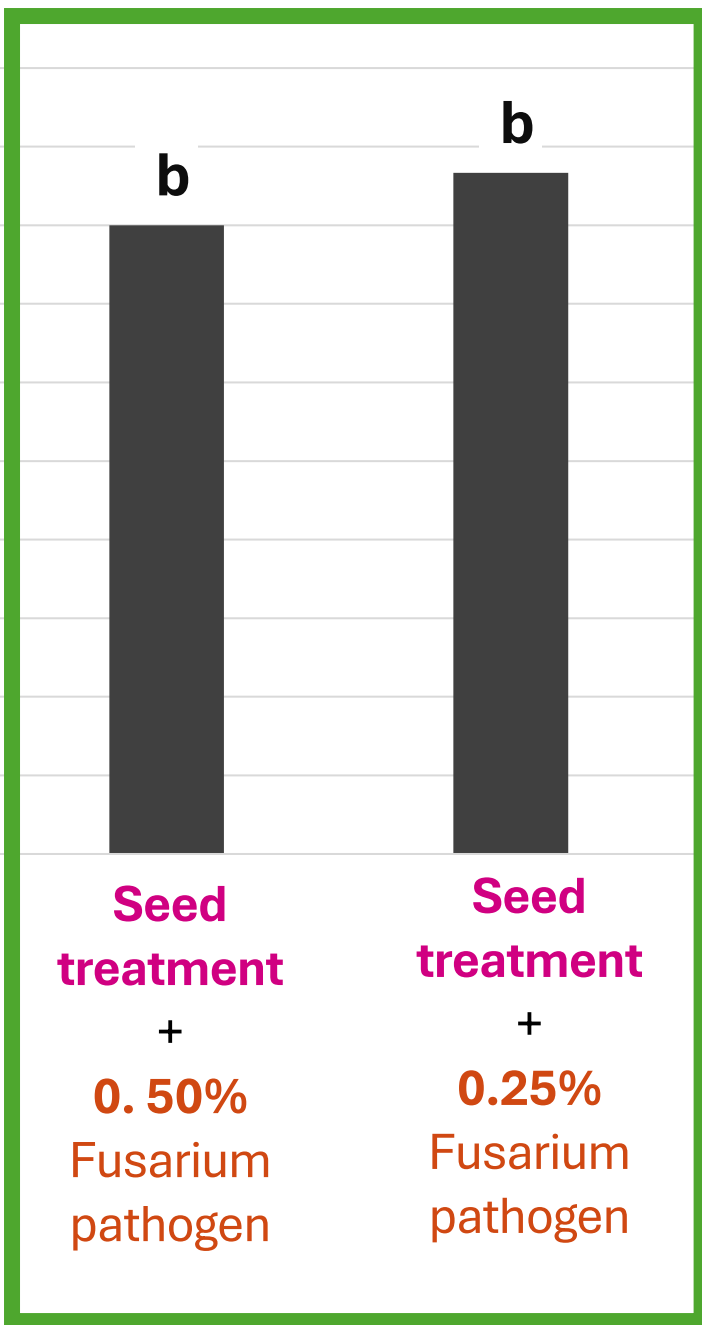
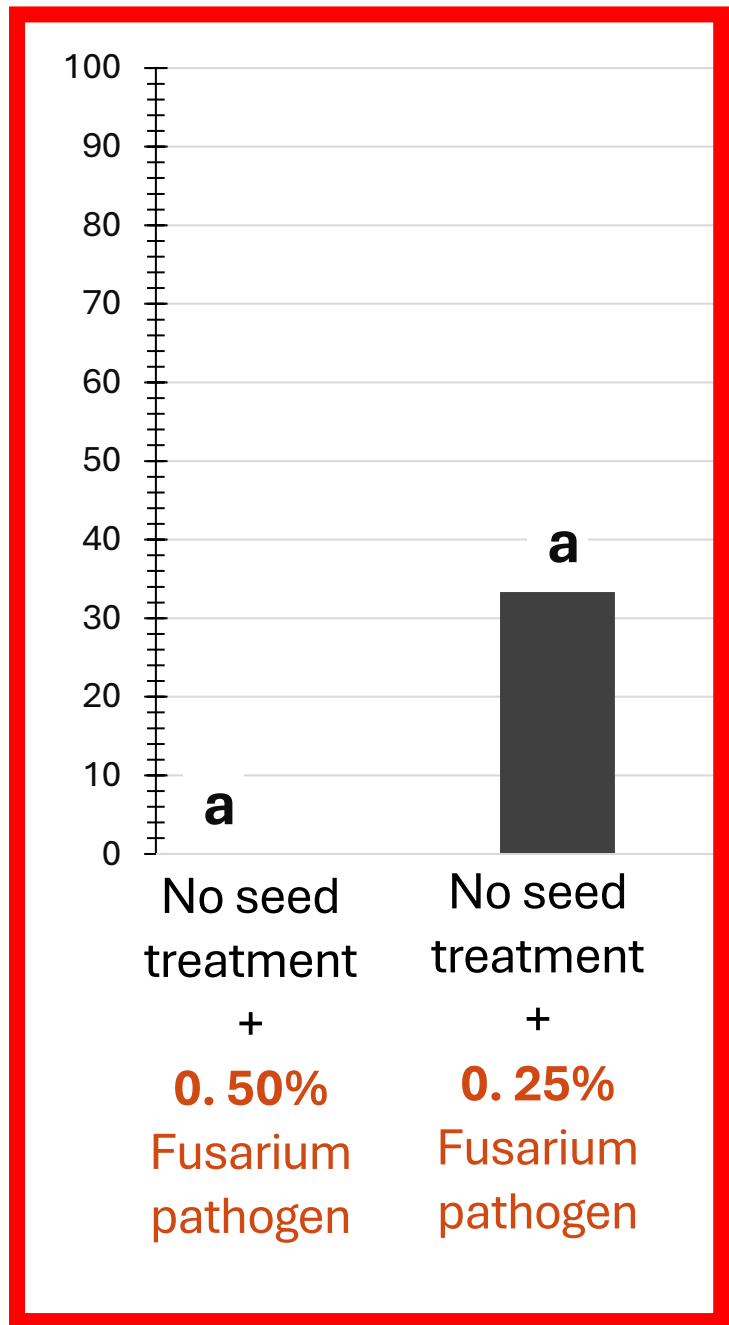
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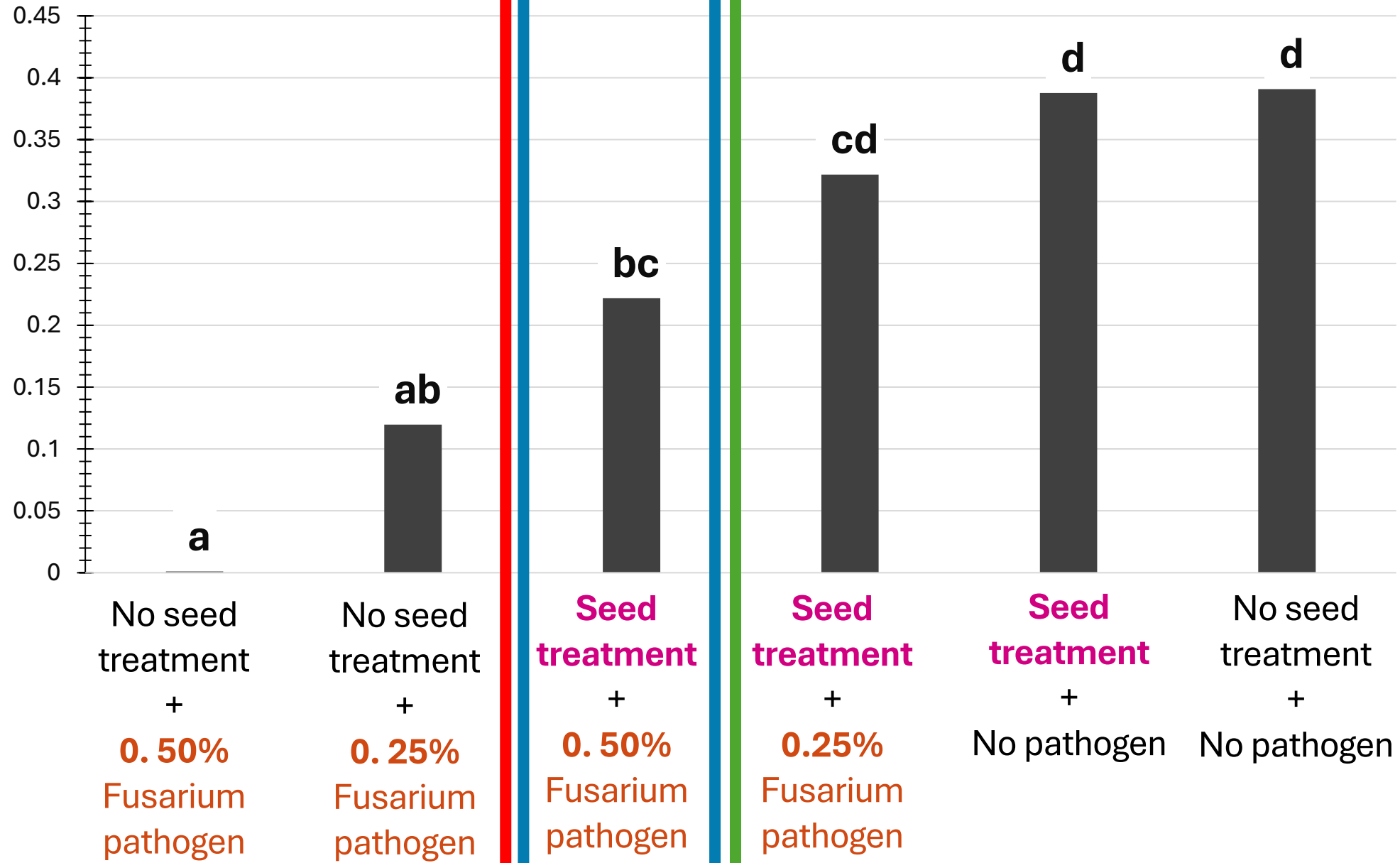
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b



Lentil biomass (g)



KEY FINDINGS



Plant survival

- Plant survival **increased** by up to **87%** with seed treatment



Lentil crop biomass

- Unfortunately, no control with seed treatment where high levels (0.50%) of fusarium are present
- Seed treatment applied where low levels (0.25%) of fusarium are present can increase lentil crop biomass



Agar plate results

- Rhizobia is not affected by the experimental seed treatment

WHERE TO NEXT?

- Further testing for registration and commercial use
- More field trials – different environments, soil types, varieties etc.
- If successful, hopefully seed treatment will become available to growers for use in lentils



2024 Trial Results

Download it now
FREE

www.hartfieldsite.org.au

Hard copies can be purchased today - \$28

*Please see Simone or Sandy
during morning tea*

