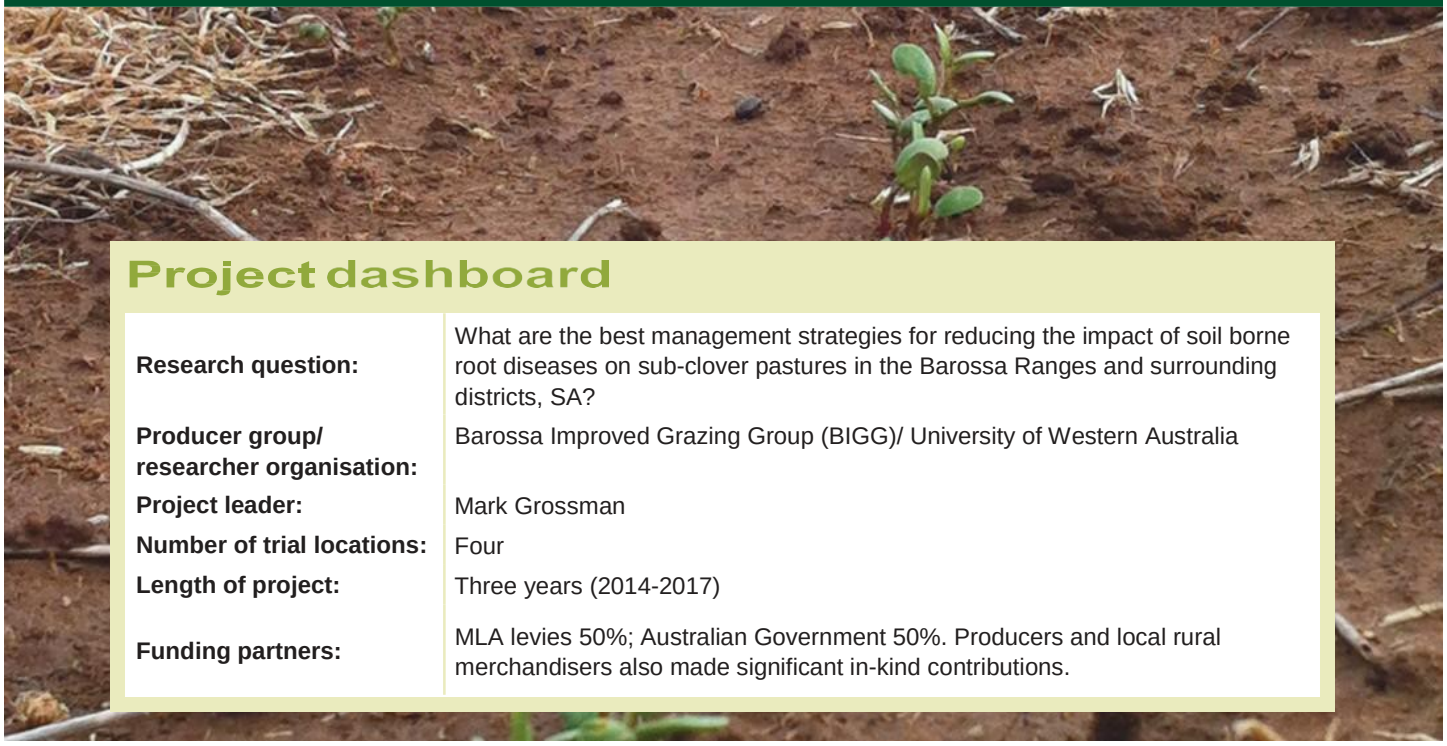
Soil borne diseases of sub-clover

Barossa Ranges and surrounding districts, SA



Project dashboard

Research question:	What are the best management strategies for reducing the impact of soil borne root diseases on sub-clover pastures in the Barossa Ranges and surrounding districts, SA?
Producer group/ researcher organisation:	Barossa Improved Grazing Group (BIGG)/ University of Western Australia
Project leader:	Mark Grossman
Number of trial locations:	Four
Length of project:	Three years (2014-2017)
Funding partners:	MLA levies 50%; Australian Government 50%. Producers and local rural merchandisers also made significant in-kind contributions.

Locations of these Producer Research Trial Sites

Site	Rainfall	Soil type
Craneford, SA	600mm	Sandy loam
Eden Valley, SA	600mm	Sandy loam
Moculta, SA (2 sites)	520mm	Loam

Why this topic is important

Sub clover is the dominant pasture legume of grazing systems in the Barossa region, therefore its production must be optimised, particularly to fill the winter feed gap.

Local producers wanted to know the effect soil borne root diseases have on the productivity of their sub clover pastures and what management strategies are available to reduce their impact.

Project objectives

1. To determine the effect of soil borne root diseases on winter production of sub clover

2. To determine the effect of soil borne root diseases on sub clover regeneration

3. To identify cost-effective management strategies to reduce the impact of soil borne root diseases in sub clover pastures to improve their production.

Sub clover emergence in one of BIGG's small-plot experiments.

Craig John, local agronomist and BIGG producer group member, helping sow sub clover seeds at the Eden Valley trial site.

Research approach

BIGG carried out a range of small-plot field experiments throughout the Barossa region at several research sites in 2014–16. Prior to the experiments, the sites were confirmed to comprise various soil pathogens, and at levels expected to compromise pasture production.

The experiments focused on evaluating management strategies that may improve sub clover winter productivity in the presence of root diseases. These included the use of fungicides, inoculants and fertilisers.

The **fungicides,** Metalaxyl (seed treatment) and phosphoric acid (foliar treatment) had no effect on sub clover dry matter production for the test varieties, Clare and Trikkala.

Peat and granular **inoculants** applied to sub clover plants at the cotyledon stage (to determine their potential use in regenerated pastures) had no effect on dry matter production.

Phosphorous **fertiliser** application generally improved winter/early spring sub clover production (by 28–112%) at research sites with marginal soil phosphorous levels (<21 mg/kg Colwell).

Key Findings

Based on the project results its key findings are;

1. There is no 'silver bullet' for managing soil borne root diseases in Barossa sub clover based pasture systems. The diseases generally occur as complexes of two to four key pathogens (*Pythium, Phytophthora, Rhizoctonia, Aphanomyces*) and no currently-registered fungicide is effective in controlling all diseases.
2. The lack of a positive result to fungicide application suggests the sub clover varieties, Clare and Trikkala can perform well in the presence of root diseases. When sowing a new pasture, it is critical producers choose varieties that perform well locally.
3. The positive sub clover production response to fertiliser application highlights the importance of producers knowing the soil nutrition status of their paddocks and the benefit of maintaining soil nutrients (particularly phosphorus) at adequate levels, irrespective of the presence of root diseases.

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