



Department of
Primary Industries and
Regional Development

“GIVE ME A BREAK!” – Options for paddocks infested with both root lesion nematodes and *Rhizoctonia solani* AG8



GRDC
GRAINS RESEARCH
& DEVELOPMENT
CORPORATION

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BACKGROUND

Aim:

Define effective and profitable break crops in rotation with cereals (wheat) for growers with RLN and *R. solani* in the same paddock.

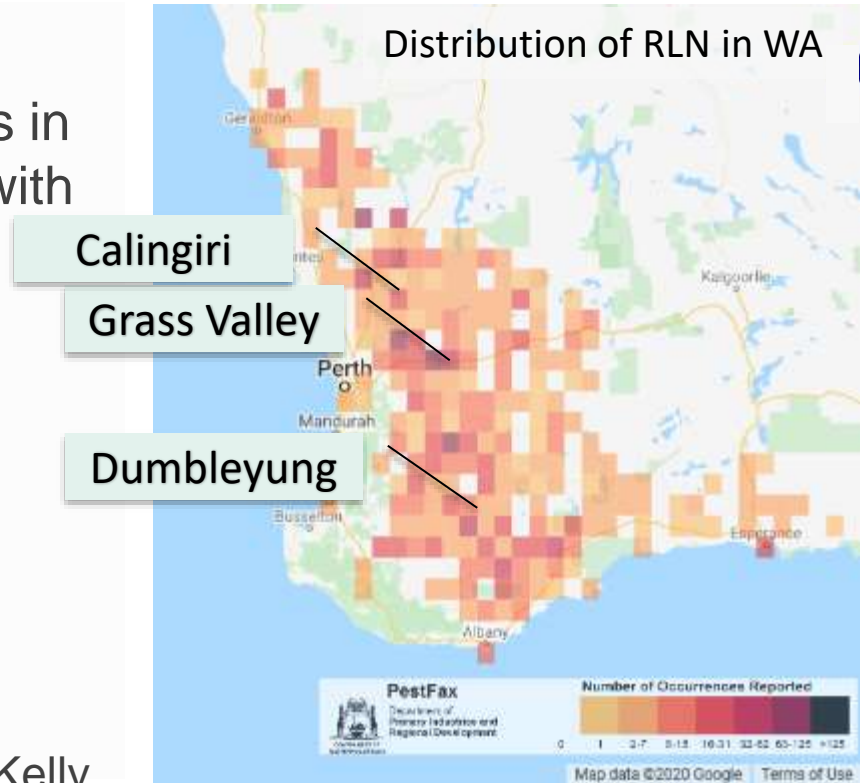
Trials:

Dumbleyung – Carla Milazzo, Alice Butler

Grass Valley – Bec Swift

Calingiri – Sarah Collins

Consulting researchers – Sarah Collins, Carla Wilkinson, Daniel Huberli, Jeremy Lemon, Sean Kelly



TRIAL DESIGNS



Year 1 – rotation crop

Year	2018		2019
	<u>Dumbleyung</u>	<u>Grass Valley</u>	<u>Calingiri</u>
Grains			
barley	-	La Trobe	La Trobe
canola	ATR Bonito	ATR Stingray	ATR Stingray
oats	-	-	Williams
wheat	-	Calingiri, Mace	Calingiri
Pulses			
chickpea	-	PBA Striker	PBA Striker
fabia bean	PBA Samira	-	-
field pea	-	PBA Butler	-
lupin	PBA Jurien	Mandelup	Mandelup
Legume			
serradella	Cadiz	Eliza	Eliza
sub-clover	-	Dalkeith	Dalkeith
vetch	-	-	RM4
Fallow (weed free)	-	yes	yes



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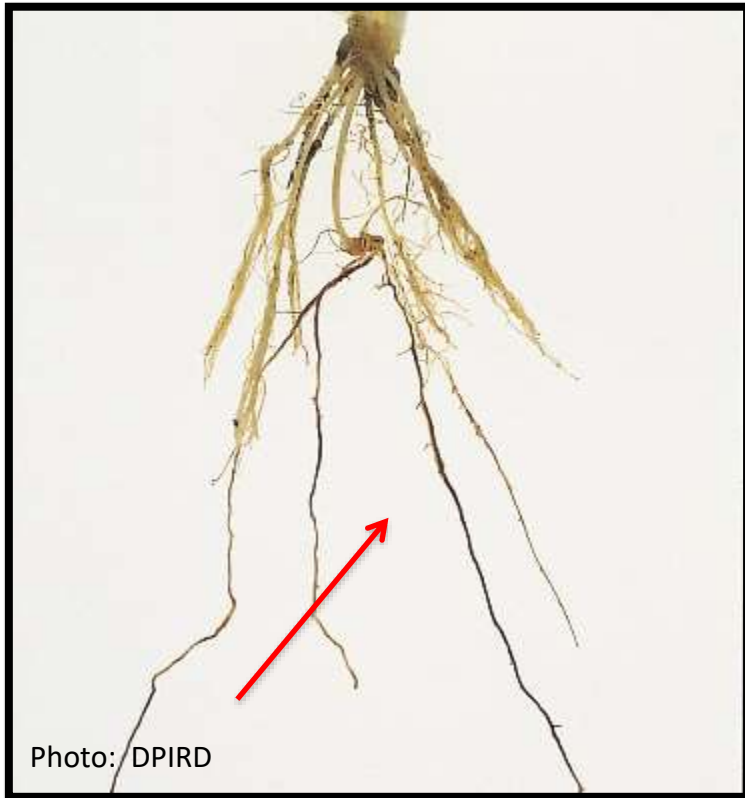
TRIAL DESIGNS

Year 2 – wheat oversow

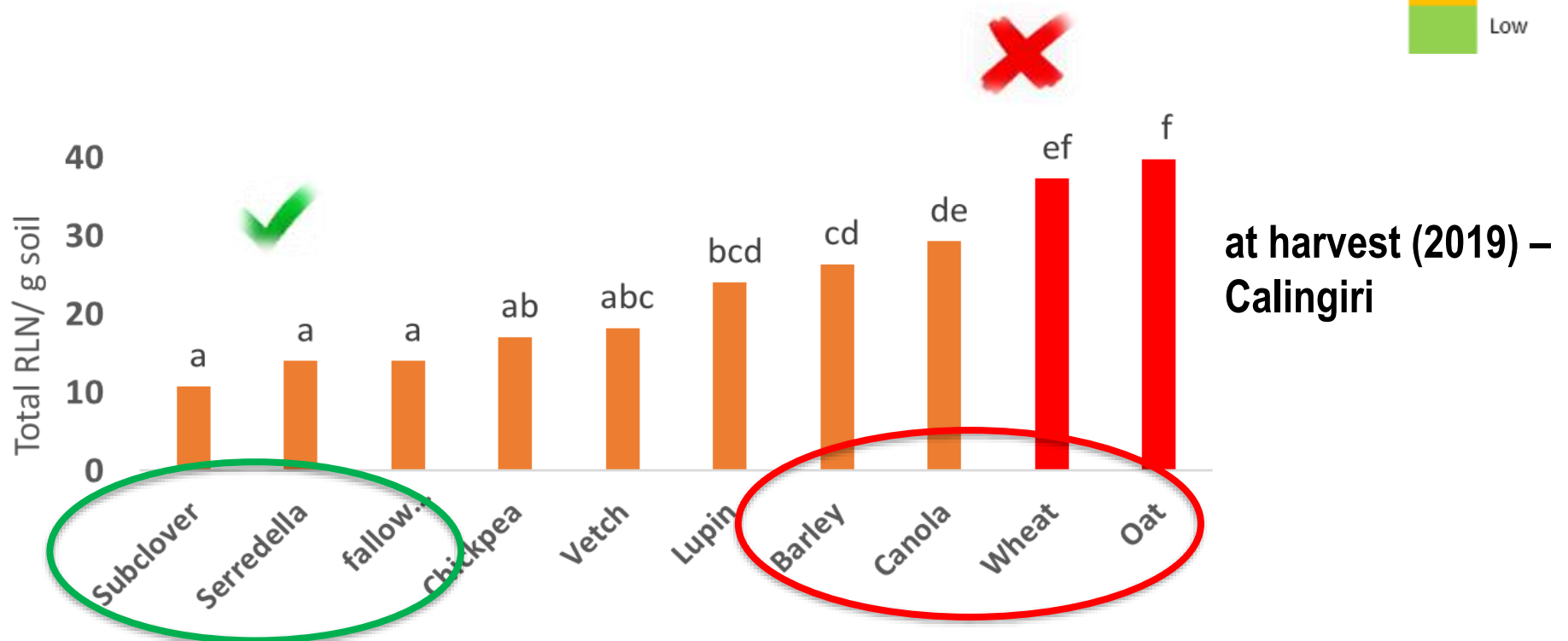
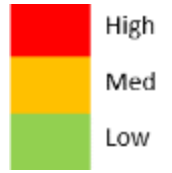
Year	2019	
	Over sow all plots with cereal crop	<u>Calingiri</u>
Grains	 <p>Grass Valley – Wheat - Chief CL</p> <p>Dumbleyung – Wheat - Scepter</p>	La Trobe
barley		ATR Stingray
canola		Williams
oats		Calingiri
wheat		
Pulses		PBA Striker
chickpea		-
faba bean		-
field pea		Mandelup
lupin		
Legume		Eliza
serradella		Dalkeith
sub-clover		RM4
vetch		
Fallow (weed free)		yes



Root lesion nematode symptoms

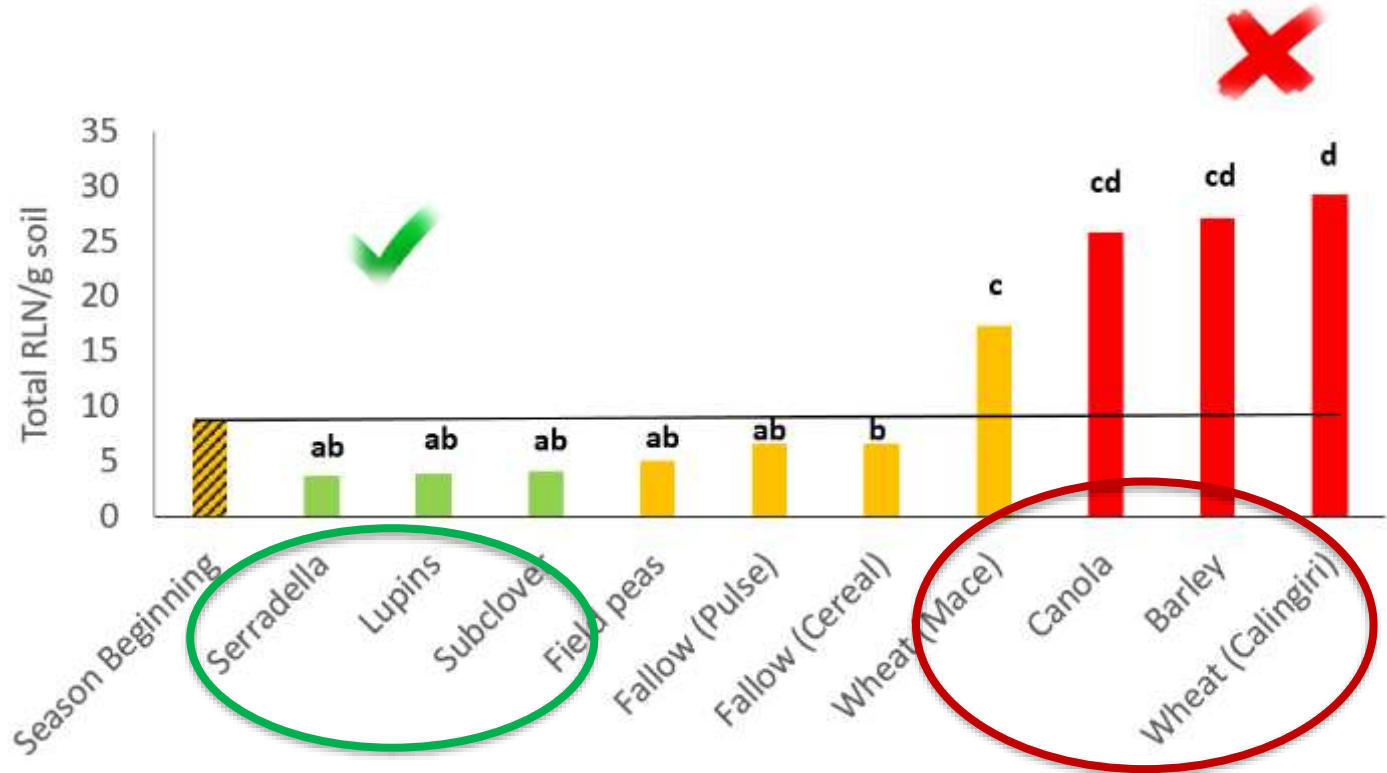
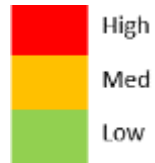


END YR 1 - How did the root lesion nematodes react to the break crops?

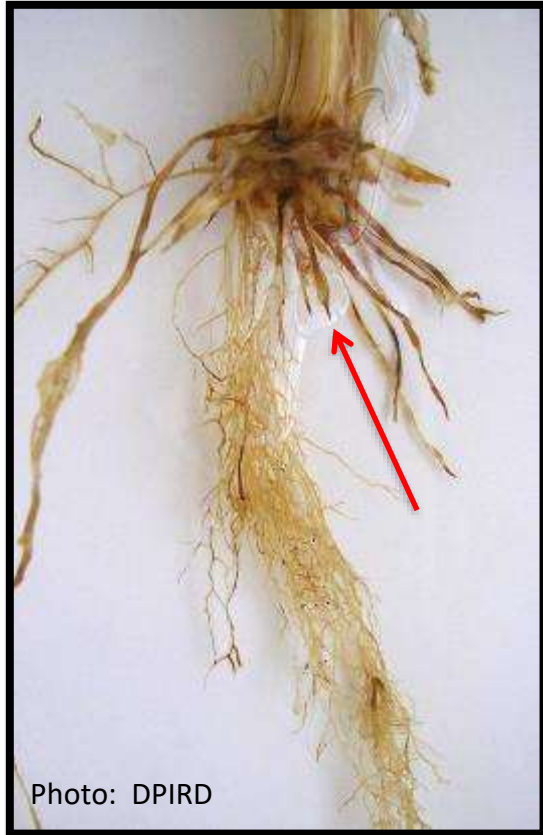


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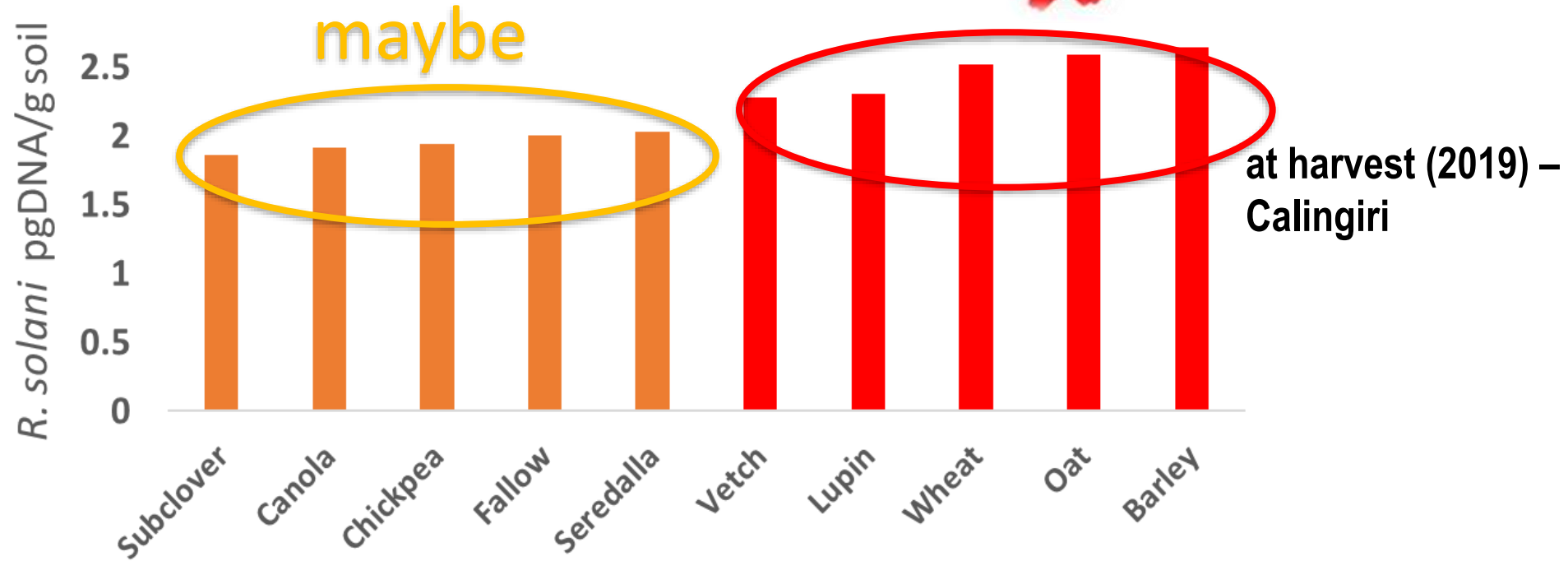
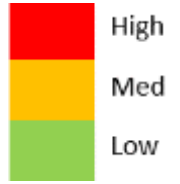
at harvest (2018) –
Grass Valley



Rhizoctonia symptoms

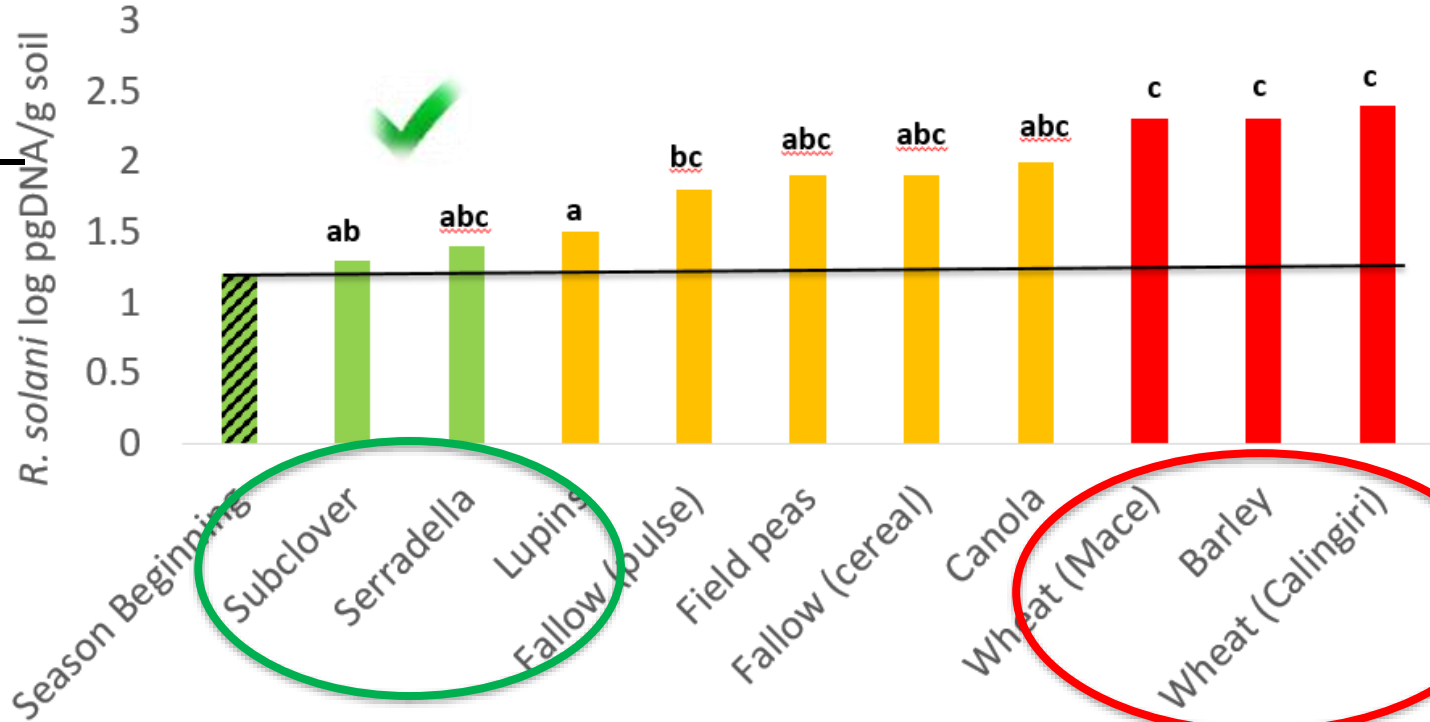


END YR 1 - How did the *Rhizoctonia solani* AG8 react to the break crops?



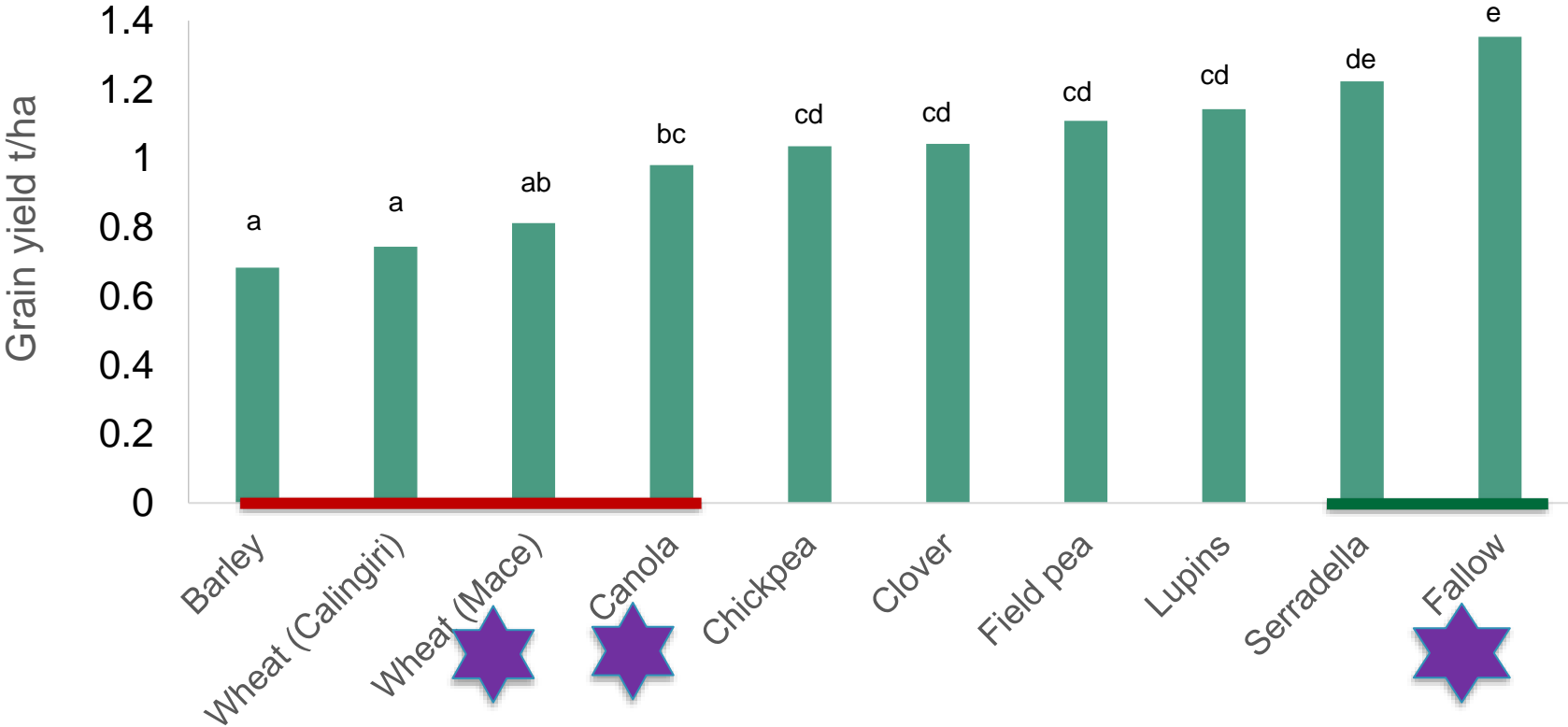
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at harvest (2018)
Grass Valley





Grass valley grain yields – 2019



Wheat yields season after break crops

Do break crop advantages remain in the next wheat crop?

Grass Valley – Year 2 – Root lesion nematode (*P. quasitereoides*) and Rhizoctonia bare patch (*R. solani* AG8) at harvest of wheat crop

Crop Type 2018	Crop 2018	<i>P. quasitereoides</i> (RLN/g soil)		<i>R. Solani</i> (log pgDNA/g soil)	
Pasture	after Serradella	3.7	a	2.0	abcd
	After Subclover	3.8	a	1.7	ab
Pulse	After Lupin	4.7	a	1.6	a
	After Field pea	6.1	abc	1.7	abc
	After Chickpea	6.2	ab	2.4	d
Fallow	After Fallow	5.4	ab	2.1	cd
Cereal	After Barley	9.3	bcd	2.1	bcd
	After Wheat (Calingiri)	9.5	cd	2.2	cd
	After Wheat (Mace)	8.4	bc	2.3	d
Oilseed	After Canola	17.1	d	2.3	d

Do break crop advantages remain in the next wheat crop?

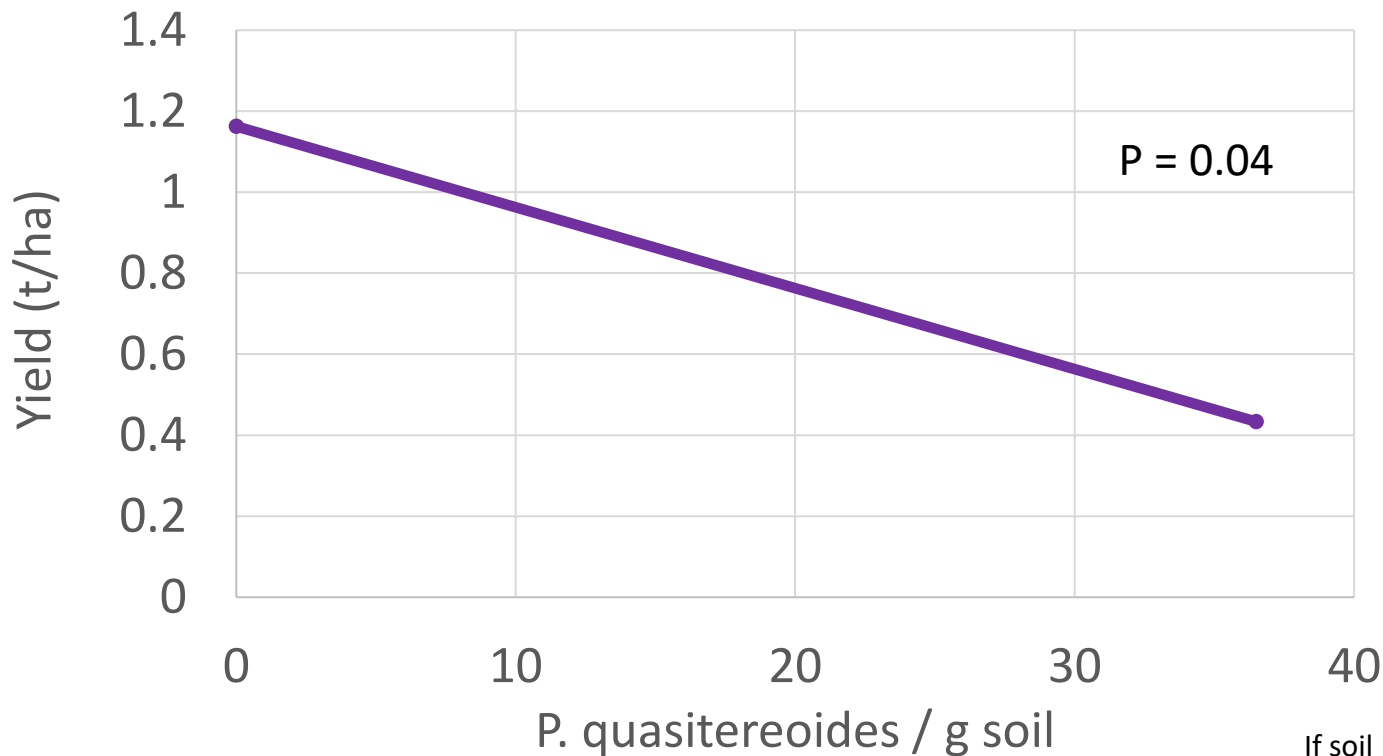
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What was important prior to sowing?



P. quasitereoides infestation



If soil NO₃ 25mg/kg before sowing

WHAT DID WE FIND?

- It is imperative to understand which soilborne pests and diseases are present before making decisions on the best rotation to reduce yield loss risks.
- Weed free fallow, pulses and pastures can be the best options where root lesion nematodes (RLN) and *Rhizoctonia solani* AG8 co-exist in a paddock.
- Canola is not an effective break crop for RLN.
- Cereals substantially increase RLN and *R. solani* levels in one cropping season.



Thanks for listening



A special thanks to the patient growers who offer us their land, advice, experience and knowledge