

# Disease Management on Lower Eyre Peninsula

SOUTH  
AUSTRALIAN  
RESEARCH &  
DEVELOPMENT  
INSTITUTE  
**PIRSA**

Blake Gontar  
Research Agronomist, SARDI



# SARDI-GRDC Bilateral Agreement

## **6 Regional Research Agronomists (RRA)**

- Blake Gontar (LEP) – Disease Management
- Fabio Arsego (UEP) – Remote Sensing for Nitrogen Management
- Navneet Aggarwal (MN/YP) – Weed Management
- Mariano Cossani (Adelaide) – Nitrogen Management
- Brian Dzoma (Mallee) – Low Rainfall/Mallee Farming Systems
- Amanda Pearce (SE) – Integrated Medium Rainfall Farming Systems



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# Eyespot Management



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# Research Aims

1. Improve understanding of the relationship between inoculum load, seasonal conditions, management and disease expression
2. Develop flexible strategies for managing eyespot which support high intensity cereal rotations (wheat-on-wheat)
3. Improve profitability by identifying opportunities to reduce eyespot management-related costs, particularly fungicides.



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# Yield effects of fungicide & variety strategies, 2014 - 2016

Variety	Untreated (t/ha)	Treated (t/ha)	Increase (t/ha)
Mace (2014)	3.65	5.0	1.35 (37%)
Mace (2015)	3.89	5.0	1.11 (29%)

Fungicide yield effects – Edillilie, 2014 & 2015

Variety	Untreated (t/ha)	Treated (t/ha)	Increase (t/ha)
Mace	3.8	5.0	1.2 (23%)
Trojan	6.0	6.4	0.4 (7%)

Fungicide x variety yield effects – Tarlee 2016



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# Inoculum carryover from wheat eyespot trials conducted in 2016

Variety	Untreated	Treated
Mace (S)	18,950,000	11,000,000
Trojan (MS)	19,600,000	2,880,000

Inoculum carryover – Tarlee 2016

Variety	Untreated	Treated
Mace (S)	850,000	59,000
Trojan (MS)	1,510,000	2,000

Inoculum carryover – Kangaroo Inn 2016



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# 2017 eyespot management trial, Yeelanna



## Detailed Measurement:

- Starting Inoculum
- Weather
- Spore release
- Crop development
- Disease expression
- Yield



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# Measuring starting inoculum levels

		Row															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Range	4	0.62	1.8	0	0	0	0	0.42	0	0	0	0	1.04	0	0	0.47	0
	3	0	0.64	0	0	0.61	0.9	0	1.42	0	1.36	0	0	0	0	0	0
	2	0	2.6	2.05	0	2.03	1.24	0	0	1.01	0	0	0	0	1.22	0	0
	1	0	0	0	1.46	0.4	0	0	0	0	2.23	0	0	0.53	1.09	0	0.46

Starting inoculum at Yeelanna in 2017 (log<sub>10</sub>kDNA copies/g soil),  
where 0.3-1.5 is considered low risk, 1.5-3.1 moderate and >3.1 high.



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# 2017 Yeelanna eyespot trial results



Variety	Fungicide	Yield (t/ha)	Incidence (%)	Severity (0-4)
Mace	+	2.85	6.7	0.08
	-	2.84	8	0.1
Trojan	+	2.64	6.7	0.09
	-	2.7	6	0.08

Yield and eyespot incidence & severity at Yeelanna in 2017



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Eyespot damage in wheat crop (south of Cummins) in 2017



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# Sclerotinia Management



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# Research Aims

1. Collect sclerotinia incidence and severity data to quantify effect of sclerotinia in our environment across a range of seasons;
2. Compare this data long-term to determine whether the issue is increasing;
3. Link sclerotinia incidence and severity to causal factors so that disease can be better predicted and management strategies can be applied efficiently.



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# Field Trial



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# 2017 Commercial Paddock Monitoring/Survey



6 monitoring points  
established in commercial  
paddocks



14 other paddocks surveyed for  
sclerotinia incidence and severity



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# 2017 Crop Development

Site	Germination	Flowering Initiation	30% Bloom	50 % Bloom	End Flowering	Maturity*
Coulta	27 April	08 Aug	14 Aug	21 Aug	24 Sep	27 Oct
Edillilie	28 May	14 Aug	24 Aug	03 Sep	24 Sep	24 Oct
Kapinnie	16 May	10 Aug	18 Aug	21 Aug	18 Sep	29 Oct
Mt Drummond	27 May	21 Aug	28 Aug	03 Sep	03 Oct	3 Nov
Mt Hope	3 June	28 Aug	03 Sep	18 Sep	10 Oct	14 Nov
Wangary	24 May	18 Aug	24 Aug	03 Sep	03 Oct	5 Nov



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# 2017 Growing Season Rainfall

Site	Apr	May	June	July	Aug	Sep	Oct	Total
Coulta	13.5	15.5	12	102.5	119	34.5	9.5	306.5
Edillilie	13.5	20.5	0	110	133	41	15	333
Kapinnie	3	18	8	94	91	42	21	277
Mt Drummond	13	20	15	92	95	36	22	293
Mt Hope	0	18	12.5	94	91	46.5	12	274
Wangary	18	28	10	106	102	33	13	310

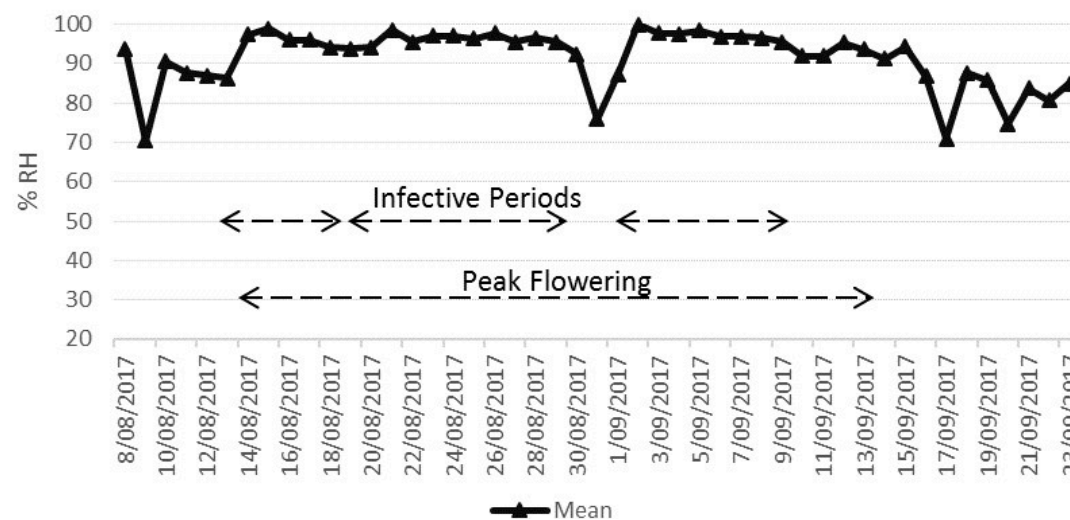


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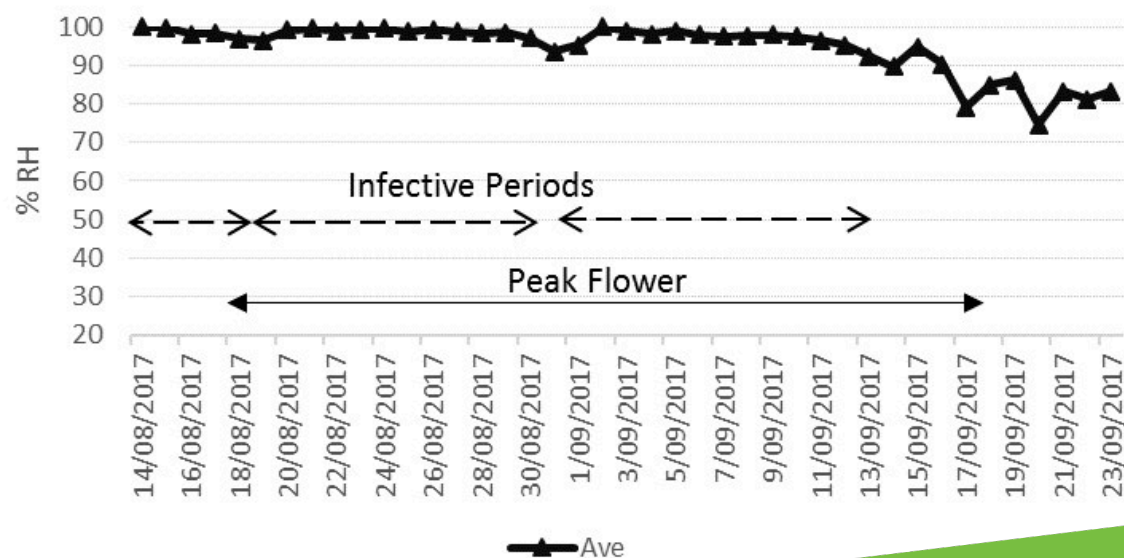


# 2017 In-crop %RH

Coulta 2017



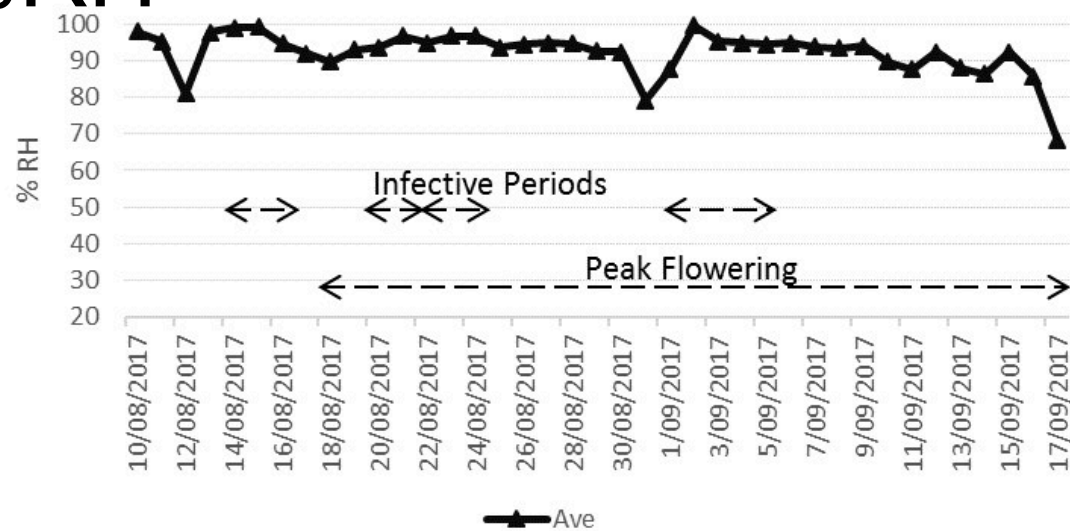
Edillilie 2017



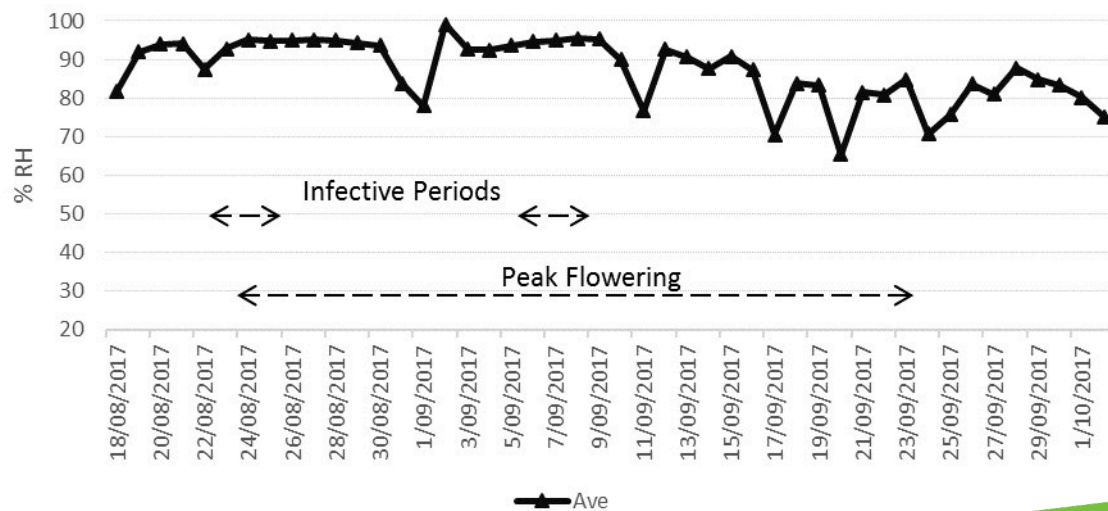
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# 2017 In-crop %RH

Kapinnie 2017

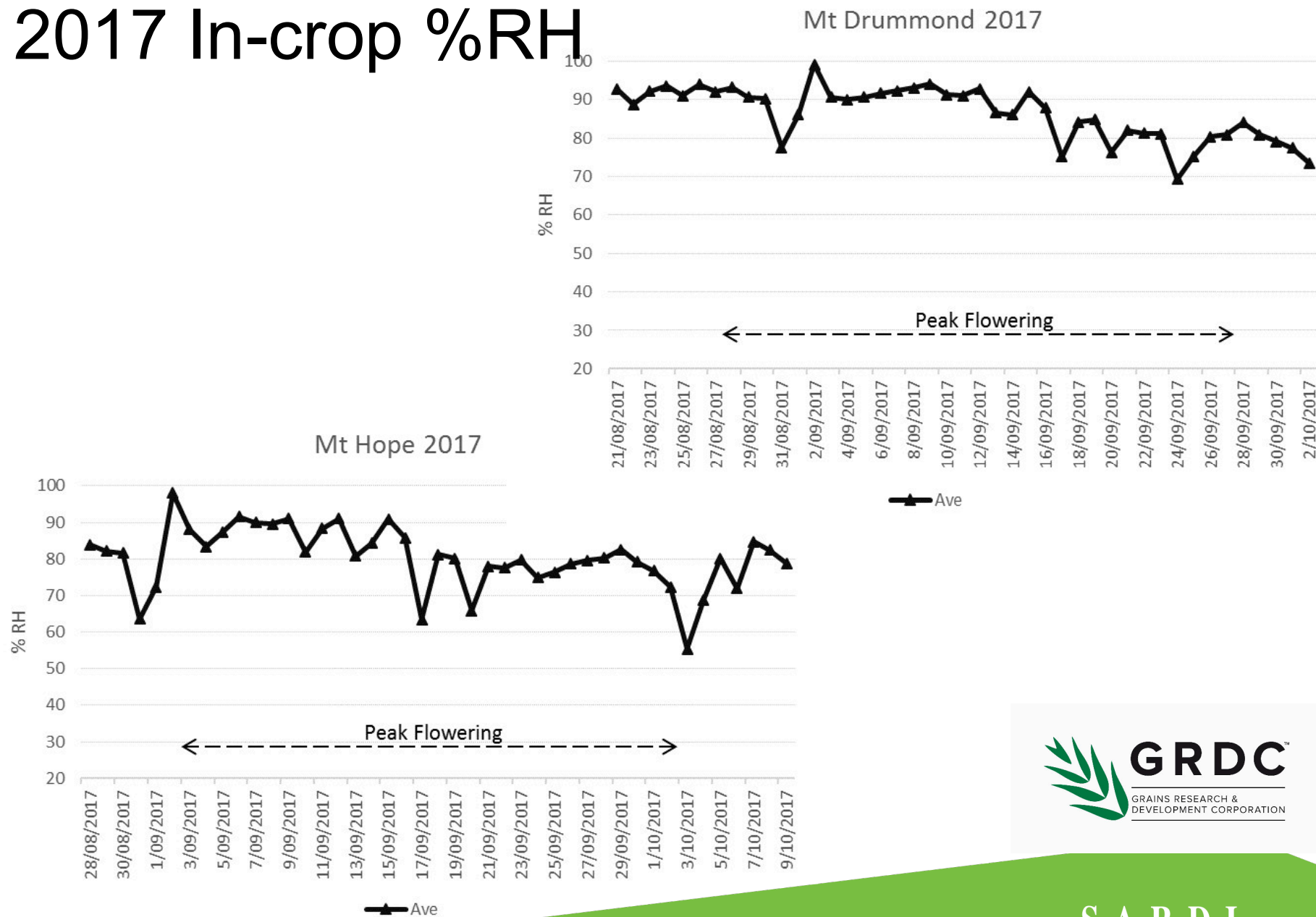


Wangary 2017



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# 2017 In-crop %RH



# Inoculum

Site	Sampling Date									Ave *
	30 Jul	7 Aug	14 Aug	21 Aug	28 Aug	3 Sep	11 Sep	18 Sep	24 Sep	
Coulta	20	75	90	90	35	30	95	55	0	70
Edillilie	NA	70	40	25	55	40	45	20	0	30
Kapinnie	0	10	0	35	45	0	45	5	0	25
Mt Drummond	NA	NA	0	45	5	0	10	5	0	5
Mt Hope	NA	NA	45	55	25	5	70	10	0	20
Wangary	NA	70	70	80	95	90	100	90	5	75

\* Average spore release through 'peak' flowering only



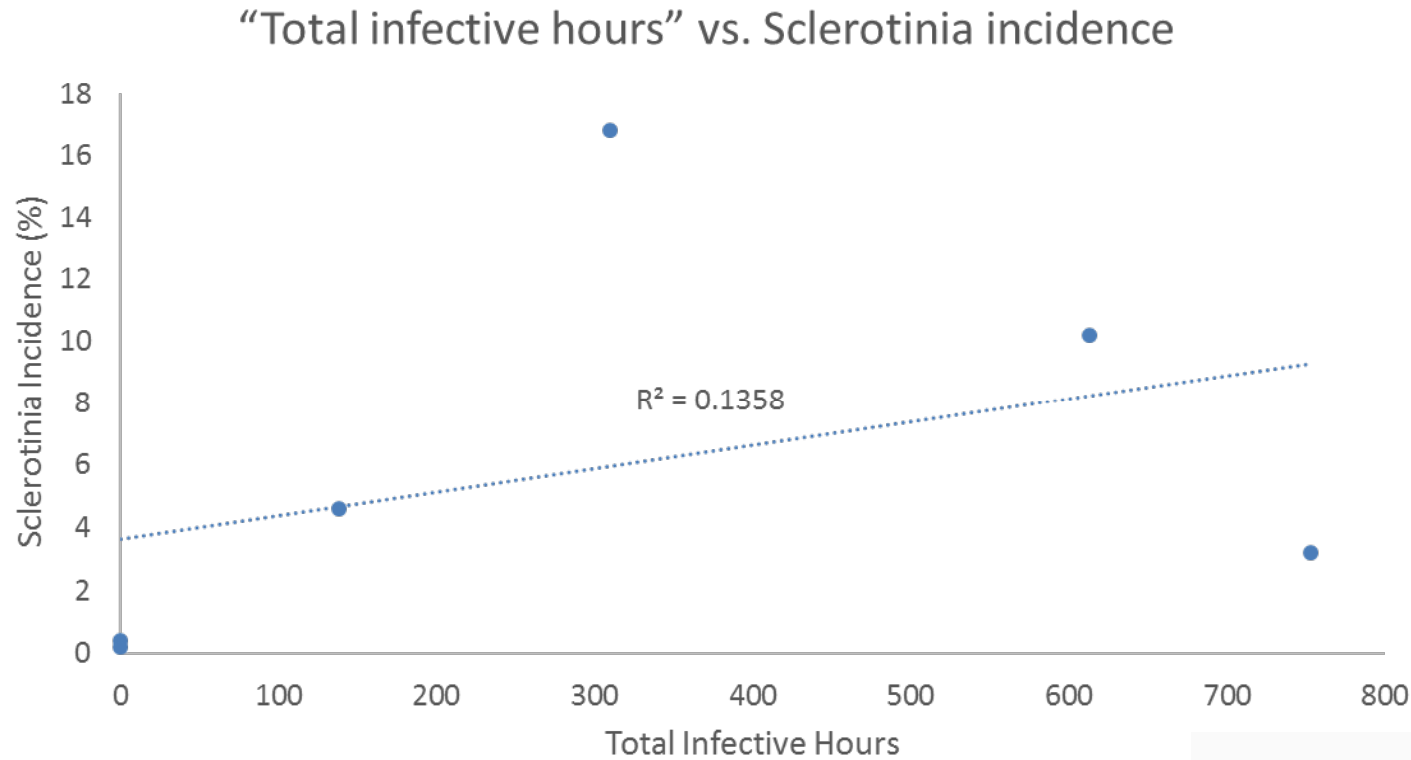
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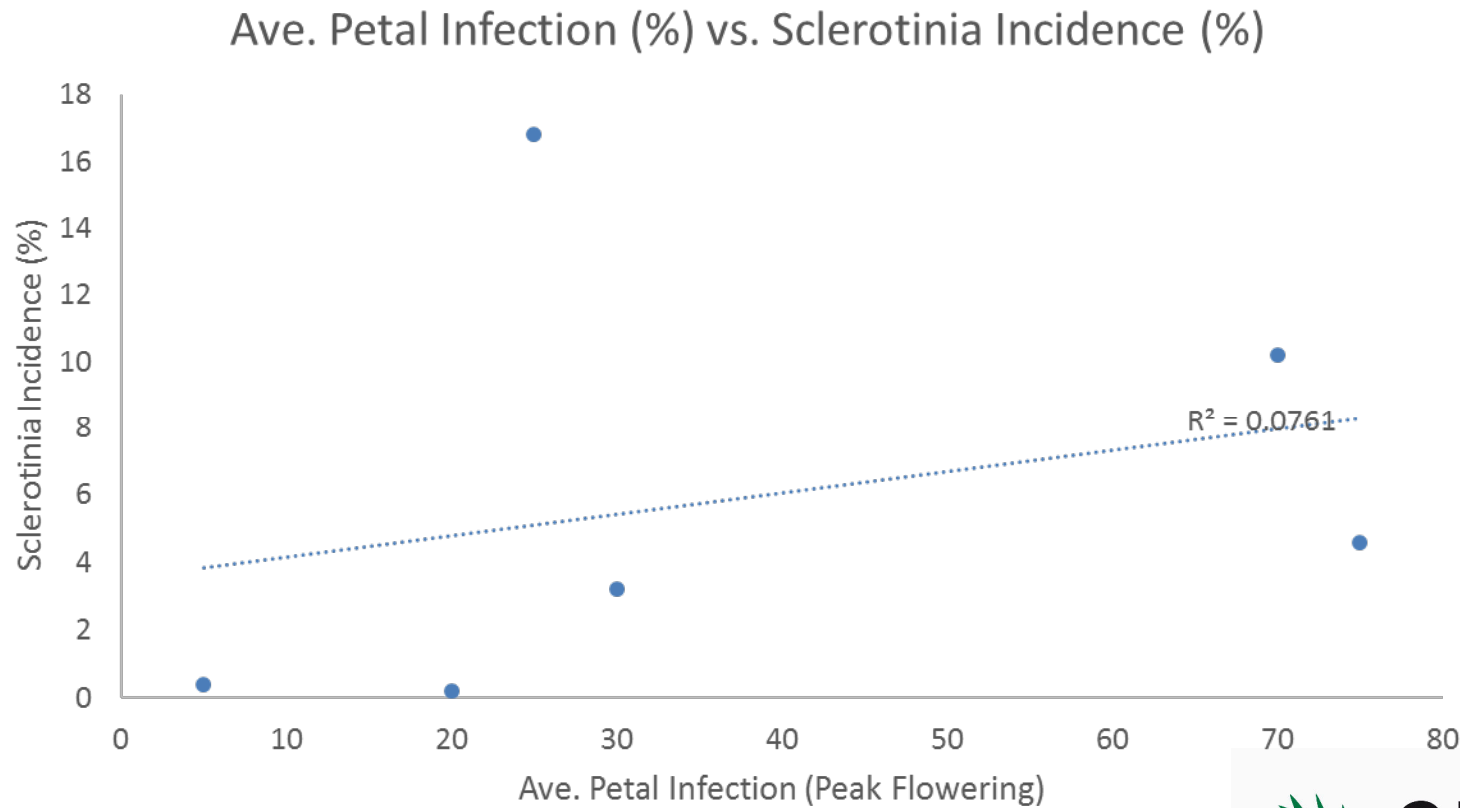
# Incidence

Site	Variety	Sclerotinia incidence (%)	Severity (yield difference) (%)	Total Estimated Yield Loss (%)
Coulta (Main)	45Y91	10.2	11.3	1.16
Coulta (2 <sup>nd</sup> )	45Y91	12.2	5.2	0.63
Edillilie (Main)	44Y90	3.2	20.8	0.67
Edillilie (2 <sup>nd</sup> )	44Y90	0.8	19.7	0.16
Kapinnie (Main)	Diamond	16.8	10.2	1.72
Kapinnie (2 <sup>nd</sup> )	Diamond	13.0	10.4	1.36
Mt Drummond (Main)	44Y90	0.4	NC	<0.5
Mt Drummond (2 <sup>nd</sup> )	44Y90	0.0	NC	0
Mt Hope (Main)	44Y89	0.2	NC	<0.5
Mt Hope (2 <sup>nd</sup> )	44Y89	1.0	NC	<0.5
Wangary (Main)	45Y91	4.6	4.9	0.23
Wangary (2 <sup>nd</sup> )	45Y91	6.6	6.2	0.41

# Predicting sclerotinia on LEP

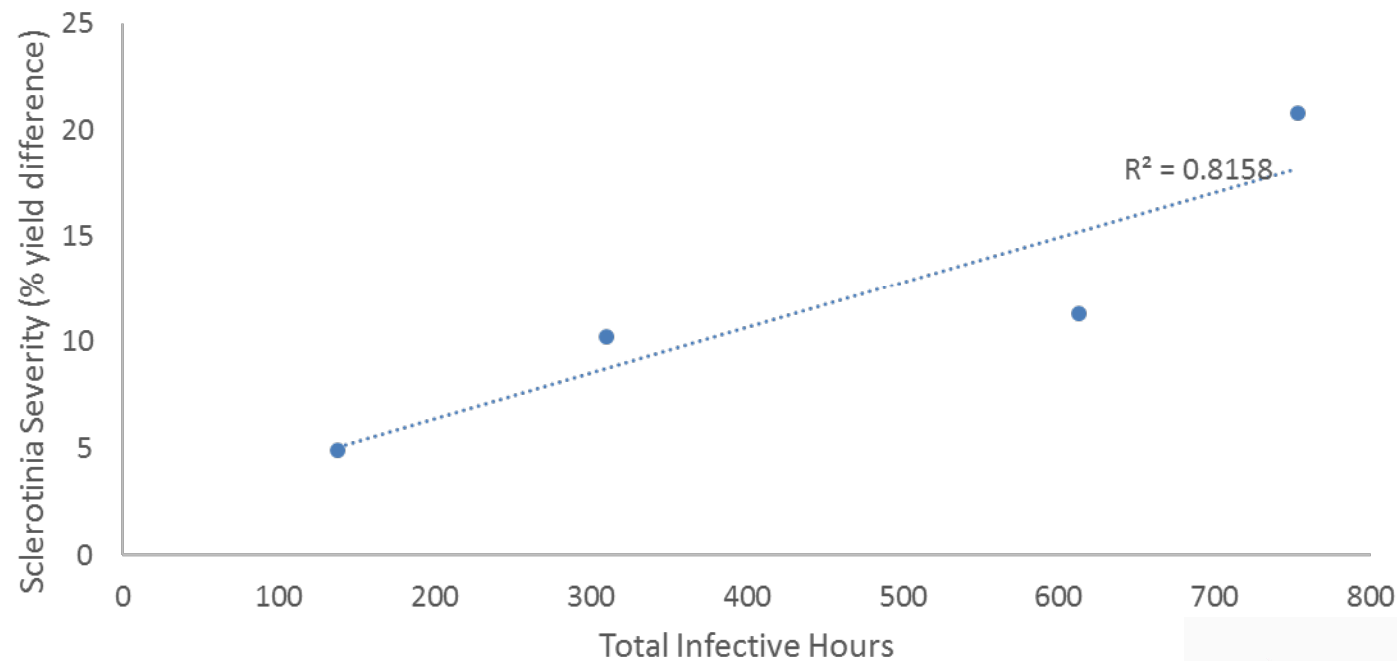


# Predicting sclerotinia on LEP



# Predicting sclerotinia on LEP

“Total infective hours” vs. Sclerotinia severity (% yield difference)





# 2018 and beyond

## Eyespot:

- Yeelanna to continue second year (wheat-on-wheat)
- Second site to be selected

## Sclerotinia

- Fungicide trial – timing/efficacy
- 10-12 monitoring sites (need monitoring sites!)

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- Currently discussing sampling methodology for fungicide resistance testing
- Other requirements?

## Disease x Nutrition

- SAGIT-funded project looking at effects of improved nutrition on disease levels (need 2 trial sites!)



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Thank you



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