The ‘GoldFutures’ Journey (2016 to 2020)

Presented by Phil Elmer
on behalf of
the GoldFutures Team

Psa R&D Meeting

Trustpower Arena, Tauranga

9th September 2020

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‘Band of brothers and sisters’ - on this journey

Zespri
- Greg Clarke, Sonia Whiteman & Kirsten Hintze

KVH
- Linda Peacock

G3 participants - provision of trial sites and ongoing support
- Eastern BOP/Whakatane
- Te Puke / Tauranga
- South Auckland / Waikato

Sub-contractors
- Lynda Hawes
- Fruition – BOP (Bryce Morrison, Phoebe Scherer and Sandy Scarrow)

PFR team retirements
- Mike Spiers and Joseph Taylor

PFR team

Stephen Hoyte, Kirsty Lyall, Frank Parry, Peter Wood, Nicola Park, Maryam Alavi, Jordan McAlinden, Anna Kokeny, Kai Lewis, Peter Scott, Annette Ah Chee, Ben Wyn-Jones, Judith Rees, Beth Parry, Jacqui Wallace

Business/client managers
- Mark Bullians, Annette Combridge

HortPlus
- Mike Barley

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Goal

"Identify and report back to the kiwifruit industry the 'best practice' combination of Gold3 orchard Psa management practices that reduce on-orchard Psa related risks to ensure the sustainable, profitable production of Gold3 for the foreseeable future"

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Lets go back in time….

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2016 – The cost of Psa was estimated

Average OGRs were;

Psa-managed	$114,500/ha
Psa-challenged	$ 84,000/ha
Opportunity cost	$ 30,500/ha

Our task – get Psa down …and OGR up!

Year 1 – 2016

Paired Psa-managed and Psa-challenged blocks

- 3 – Edgecombe / Whakatane
- 3 – Tauranga / Paengaroa
- 4 – Sth Auckland / Waikato
- Established 10 monitor plots (2 bays)

Measurements

- Canopy variables
- Psa symptoms
- Psa populations (‘Hayward’ trap plants)
- Spray coverage
- Microclimate
- Psa infection periods (IPs)
- Spray timing x Psa IPs
- Spray diaries
- Management practices
- Orchard gate returns

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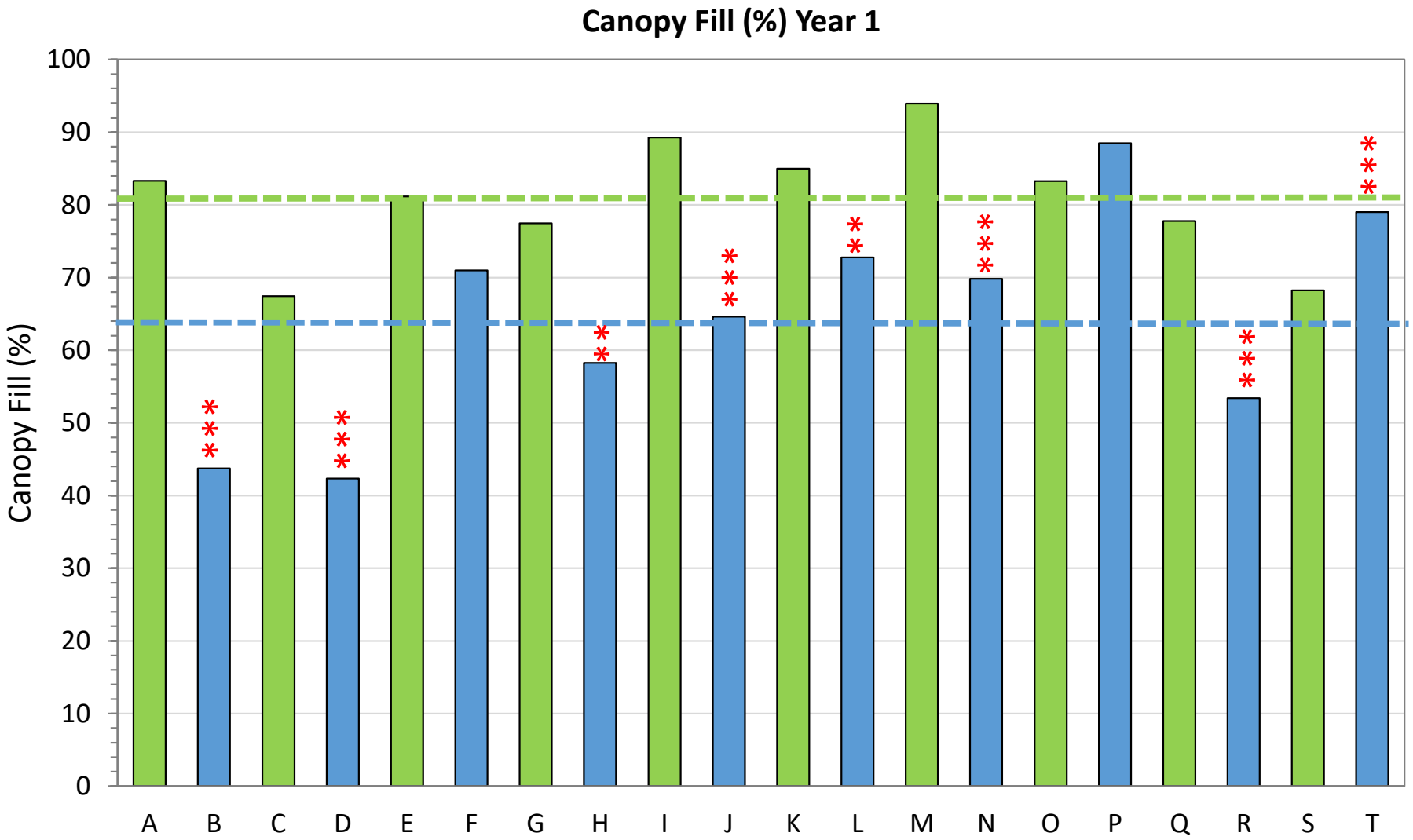
Year 1 Canopy fill – it was grim



Green bars = Psa-managed

80.7%

64.3%

Blue bars = Psa-challenged

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Year 4 Canopy fill (%) – a great success story

Canopy fill drives everything - recovery was possible with GoldFutures approach

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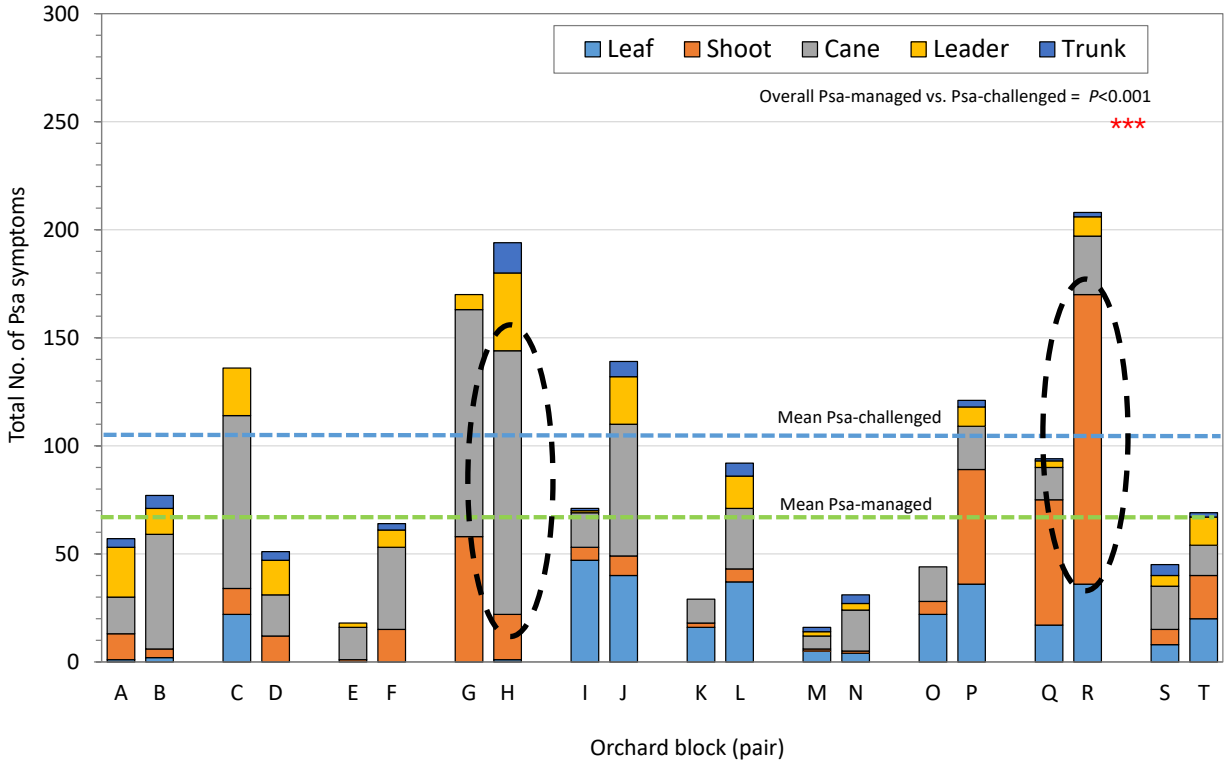
Psa symptoms (all sites)

Year 1



Year 4

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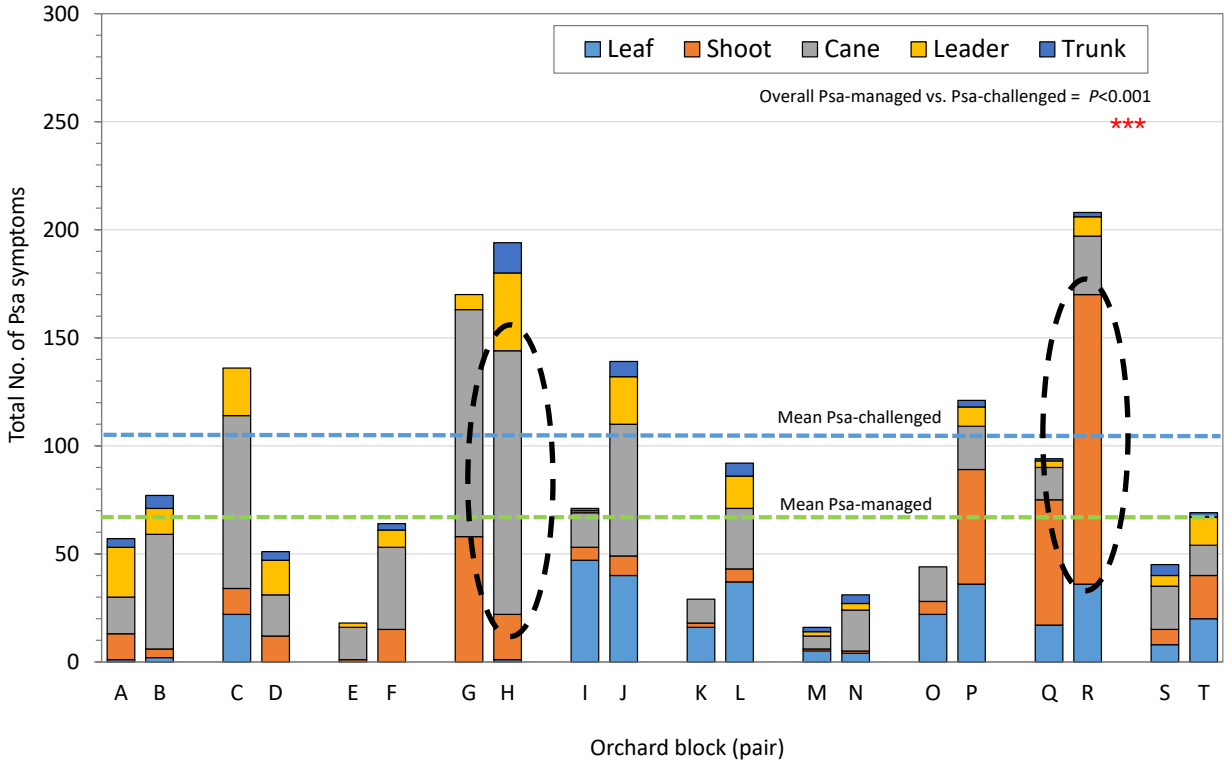
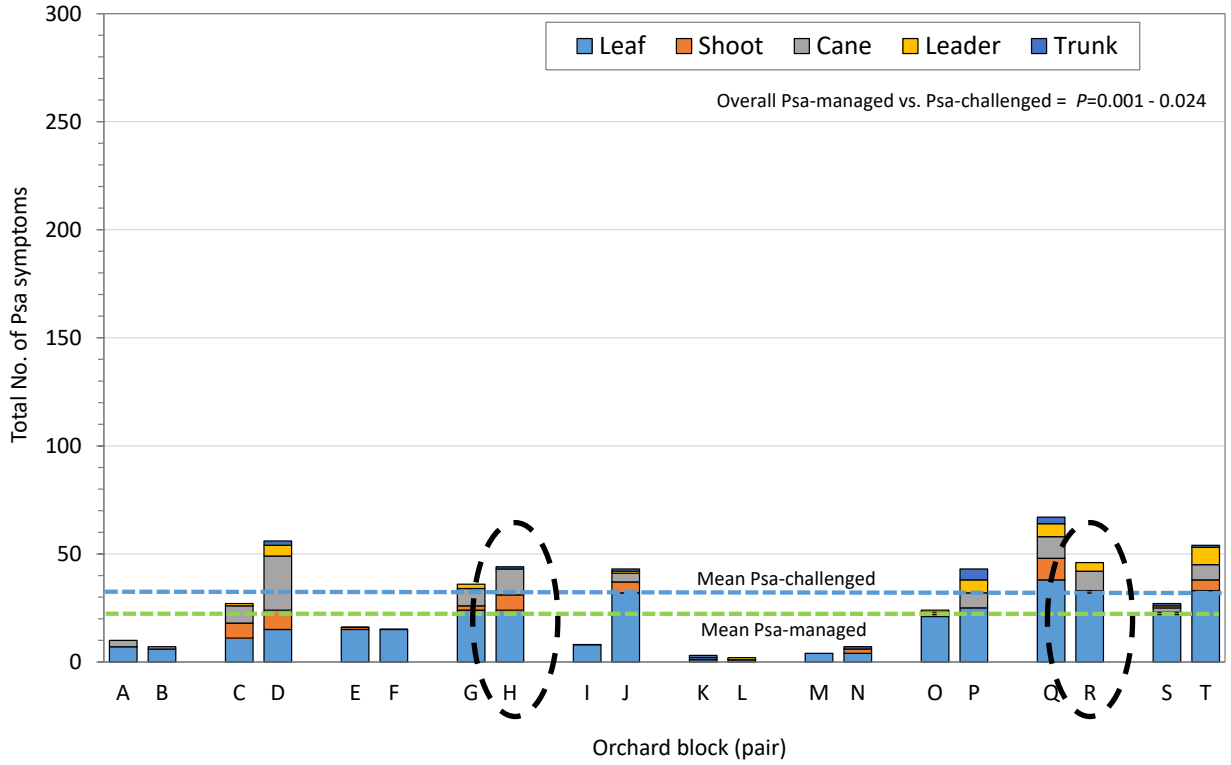
Psa symptoms (all sites)

Year 1



Year 4



Implementing GoldFutures approach reduced Psa symptoms

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Trap plants (2016–20) – to monitor Psa within orchards

Potted ‘Hayward’ plants

Suspended under leaders for 10+ days

Grown for 3 weeks for leaf spotting to develop

Psa incidence and severity scored

Year’s 3 & 4 = 5 time periods

- Sept / Oct
- Nov / Dec
- Feb
- April / May
- July / August

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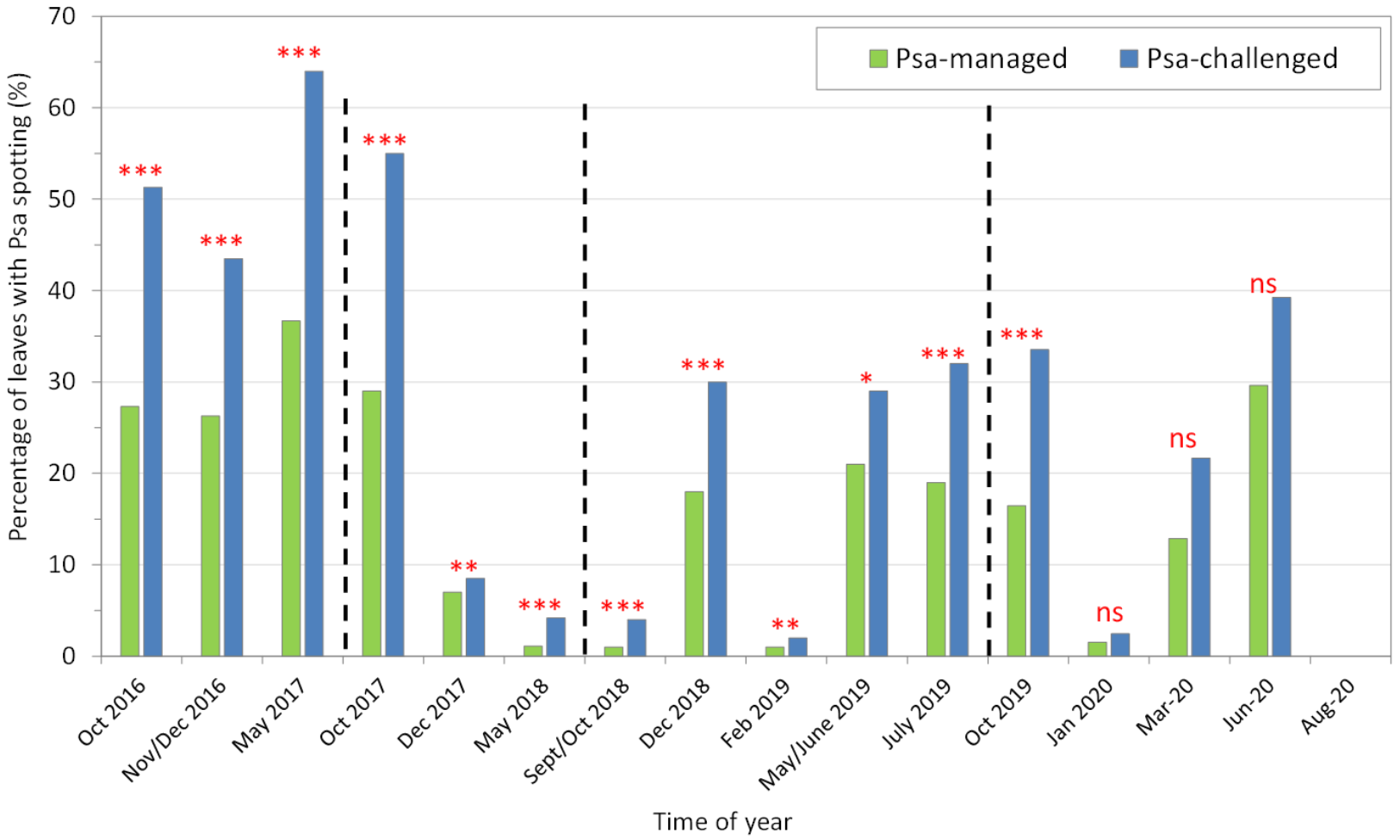
Trap plants – Yr1 to Yr4

Mid-winter Psa leaf spotting
June 2020



Psa inoculum can be present throughout the year

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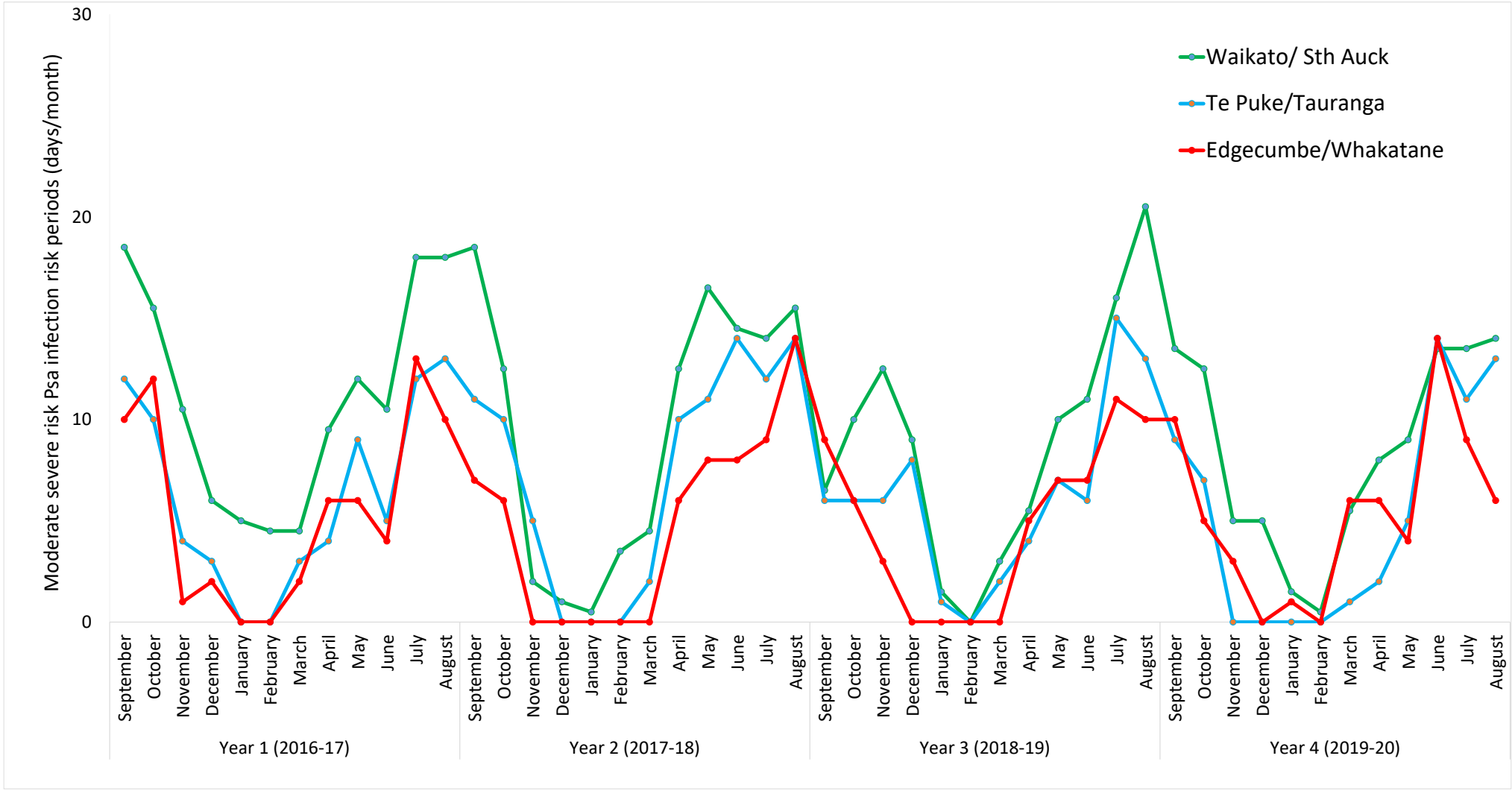
Block microclimate

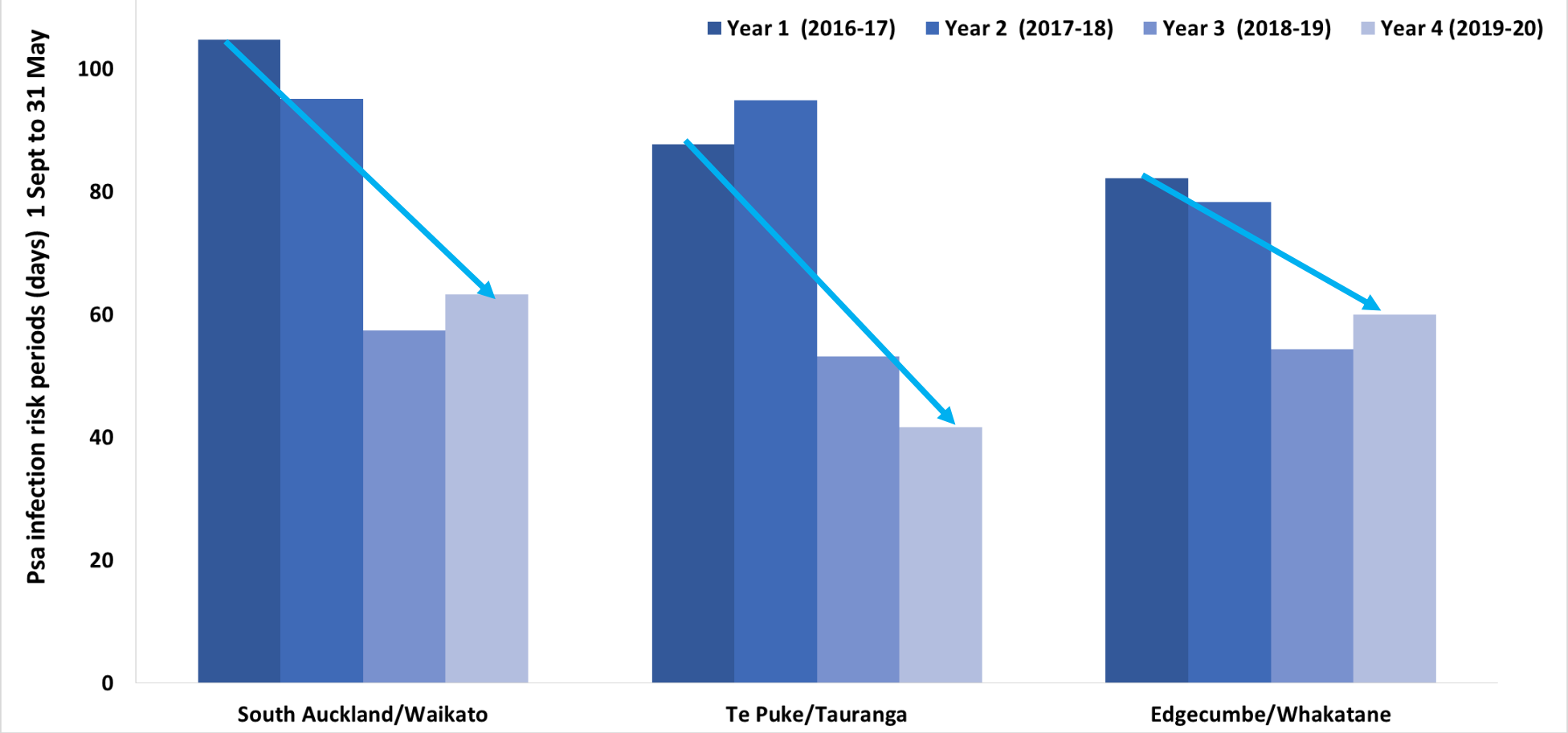
Year 1 ….'Cold, wet, windy blocks are the problem?…..'

- Determine if block microclimate was a factor in determining Psa risk
- Installed Met stations in all 20 blocks with the aim of -
    1. Measuring microclimate &
    2. Calculating Psa risk infection events

Psa infection risk events – regional patterns



Psa infection risk events – patterns across seasons



2016 & 2017 seasons = high risk; 2018 & 2019 = lower risk

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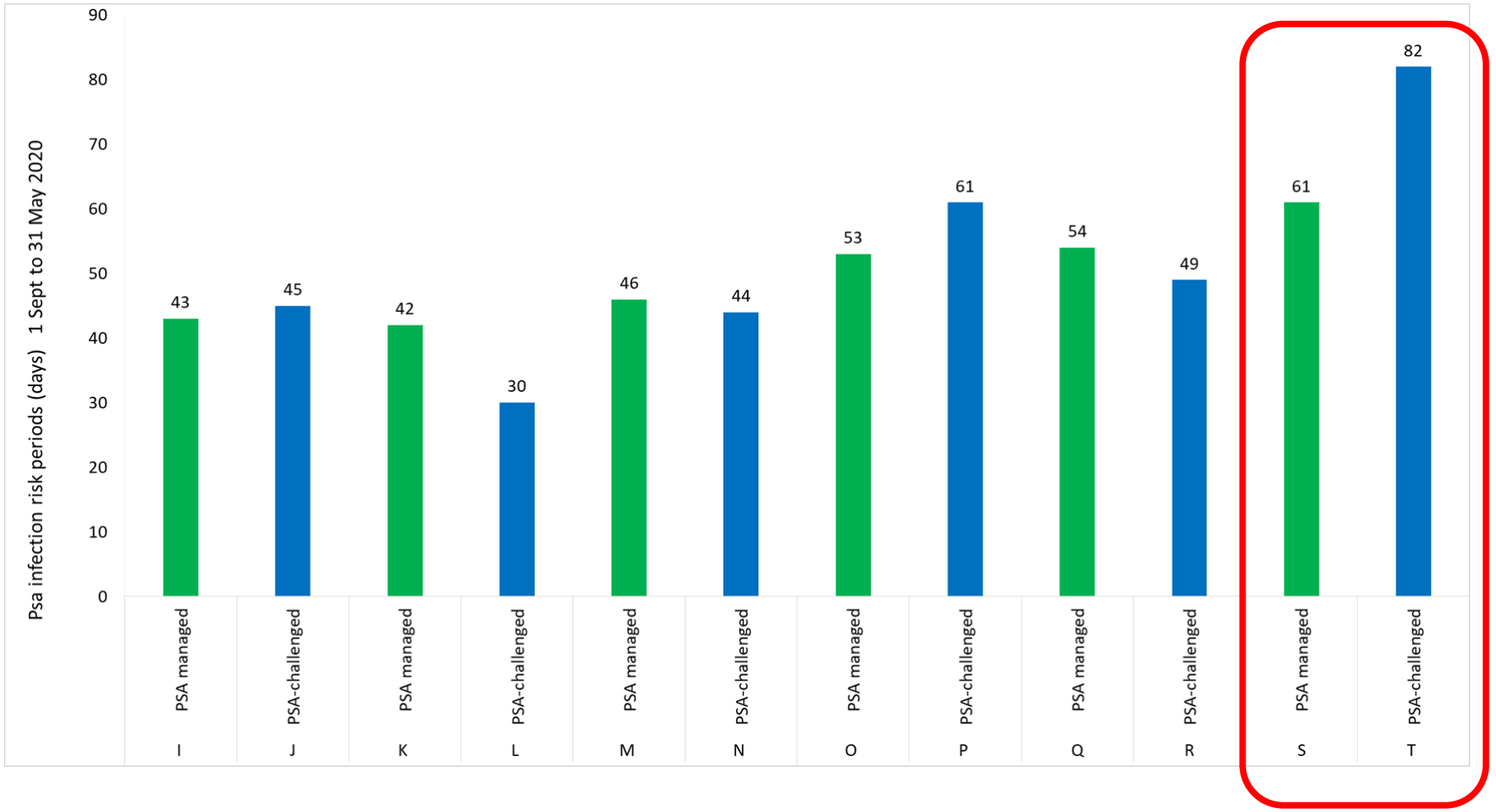
Psa infection risk events – example of blocks pairs



Overall block pairs were similar – only one or two differences

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Spray diary analysis

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Seasonal distribution of Psa sprays - Year 1

Overall

More sprays in Psa-managed

- 104 v 91 sprays
- & timing was different

Psa-managed blocks

27 winter copper sprays applied

Psa-challenged blocks

16 winter coppers sprays applied

Psa control product applications per month for each trial site

Psa-managed

Trial block	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
A		2	2	2	1	2	3	2		2		
C					2	1			1			
E		2	1	1	1		4	1			1	
G				1		2	3				1	
I		2	1	1		1	2	1	1		1	
K		2	1	1		1	2	1	1		1	
M		1		1	1	1	6	2	1	2		
O				1		2	1					
Q	1		2	1	1	3	3	1				
S		2	4		1	3	3	1		1		

Psa-challenged

Trial block	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
B	2		1	1	1	2	3		1	2	1	
D		2	2	1		1	1				1	1
F		2	1		1	2	4	2			1	
H		2				2	2	1	1			
J		2	1	1		1	2	1	1		1	
L				1		1	2	1	1		1	
N				1		1	5	1		1		
P			2	1		2	1					
R	1	1				2	1	1				
T					1	3	3	1		1		

Seasonal distribution of Psa sprays – Year 4

Overall

- Looking more similar
- 92 vs 86 sprays

Psa-managed blocks

Apr + May – sum of sprays = 23

Psa-challenged blocks

Apr + May – sum of sprays = 13

But did go harder in Nov.

Still gaps in some Psa-challenged blocks

- Responding to less risk?
- Risky?

Psa control product applications per month for each trial site

Psa-managed

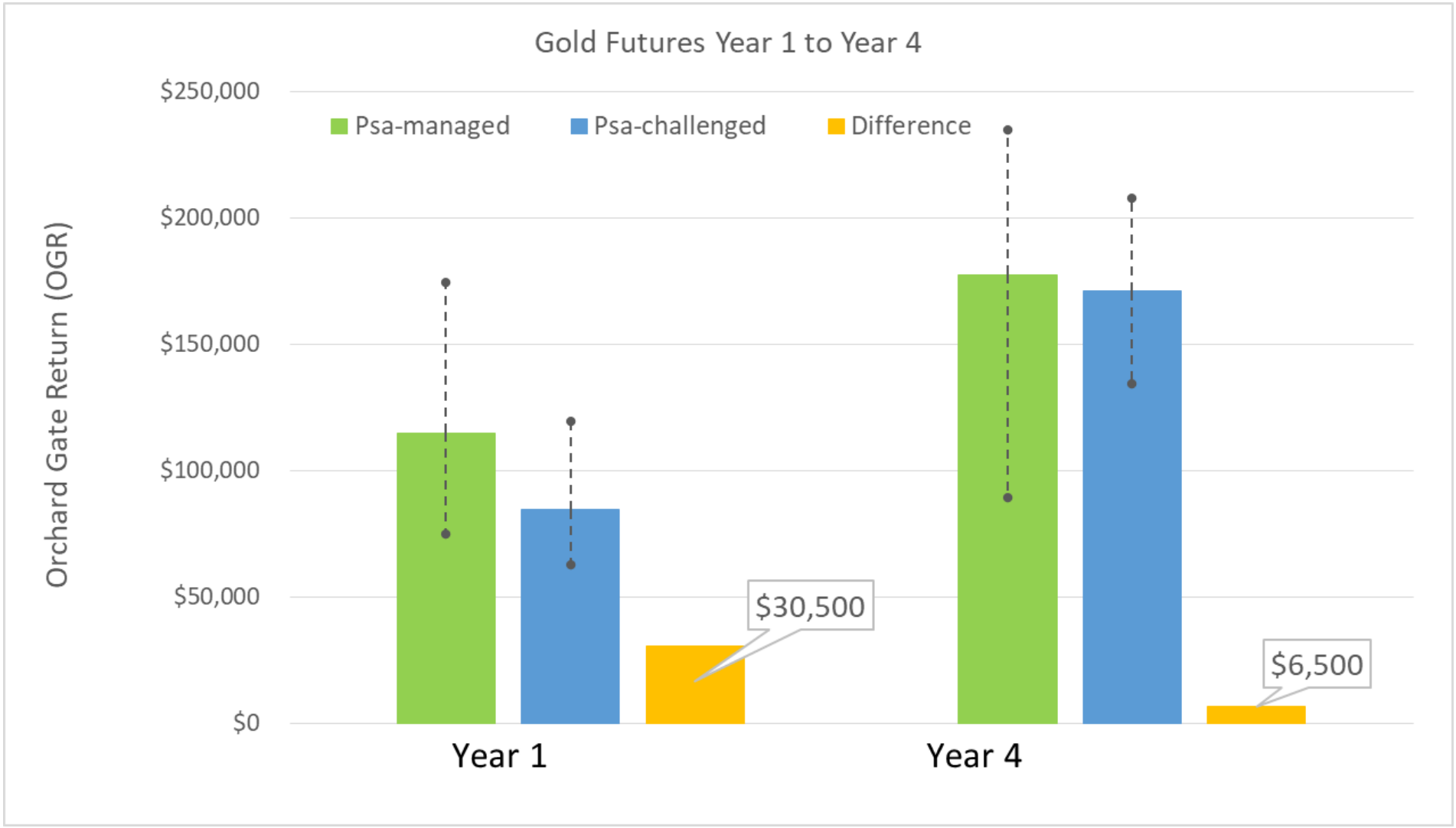
Trial block	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
A	2		1		1	1	3					
C	1			2	1	1	1					
E		2			1		2					
G	2	3	1	1	1	2	4		1			
I	2		2	1		1	3					
K		2	1		2		3					
M		2	1			1	4		1			
O		2	1	1	1	2	4	1				
Q			1	1	1	1	2					
S	2	3	1	2	1		3	2				

Psa-challenged

Trial block	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
B	2		1	1	1	1	3					
D					1	3	1	1				
F					1	1	2					
H			3	1		1	4	1				
J	2		2	1		1	3					
L		2	1		2		3					
N					1	1	3	1	1			
P		3	2	1	1	2	4	2				
R						1	3	1				
T	1	3	2	1	1		4	1				

Cost of Psa to our participants

Overall (estimated) OGR Summary – Yr1 to Yr4



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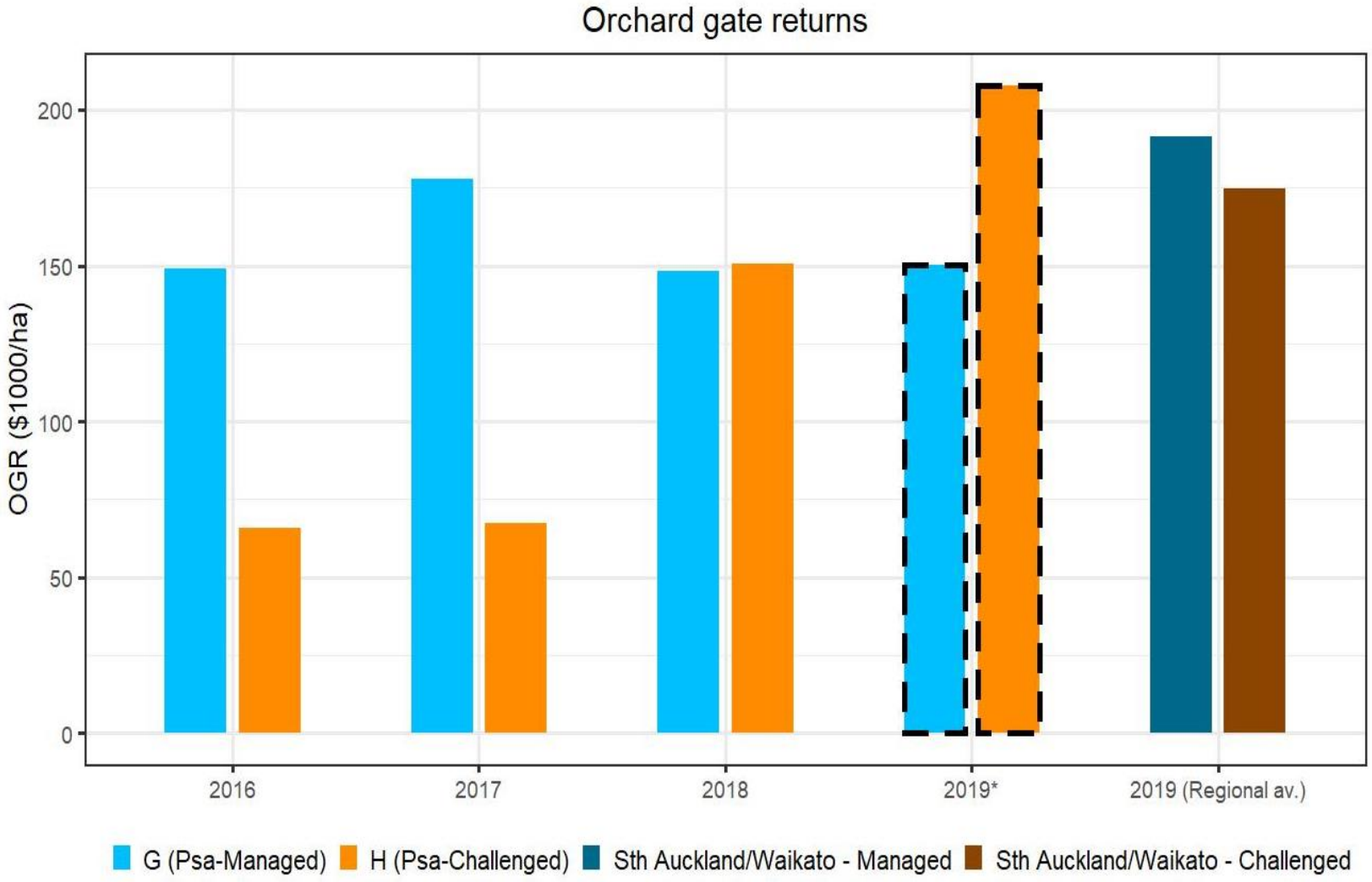
One of the best outcomes – Block H (Sth Auckland)

Yr4 COVID-19 severely disrupted our fruit sampling (FW & DM)

Hence, OGR values were calculated differently

= estimate only



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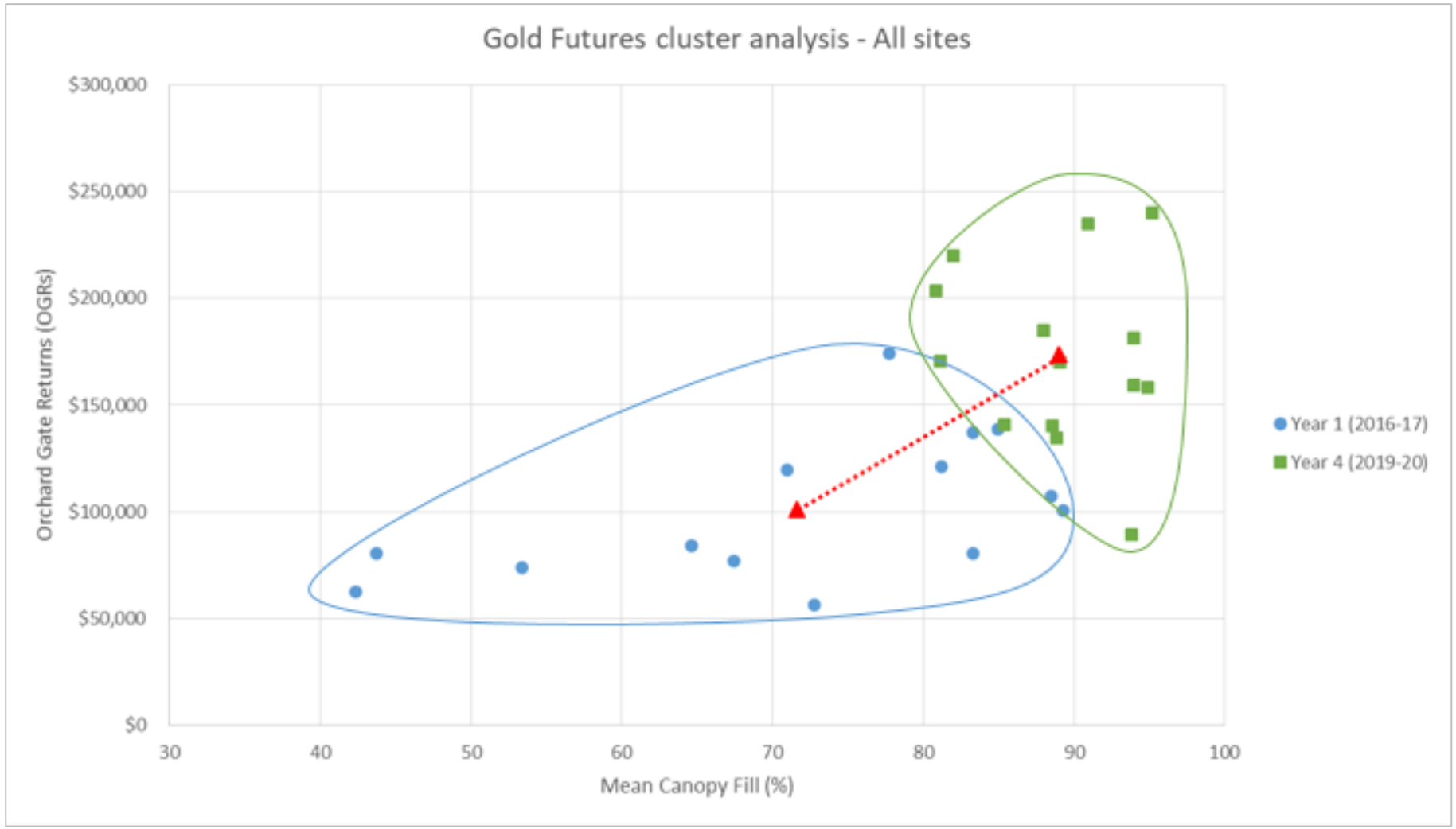
Canopy recovery = OGR increase



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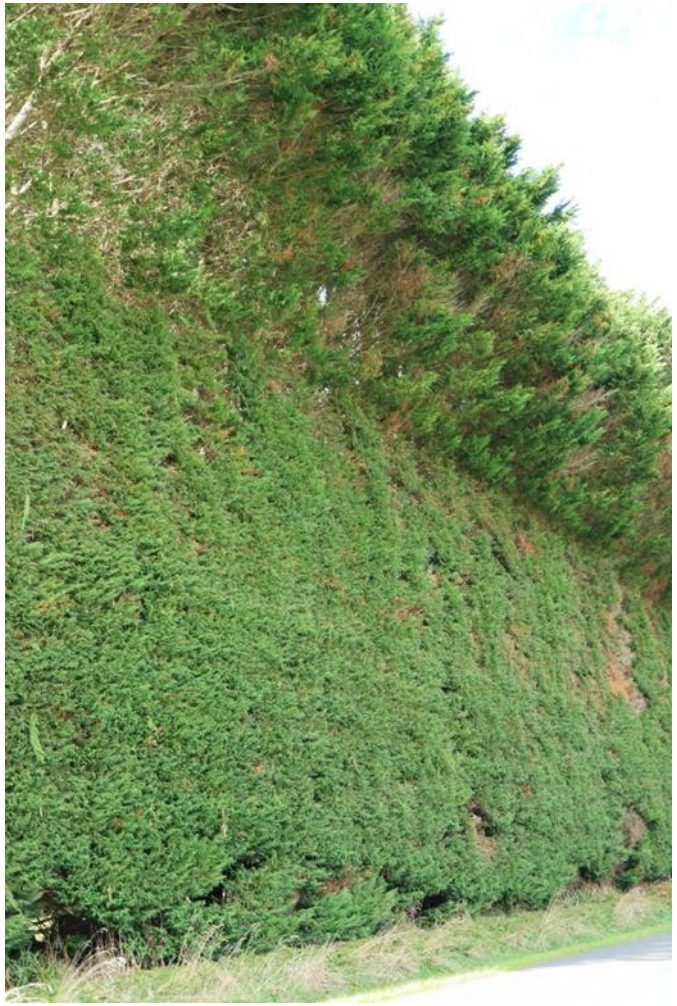
GoldFutures recommendations

1. Young plantings – aggressive Psa best practice programme from onset
2. Tool hygiene = critically important to reduce Psa spread
   - Simple + Easy + Effective ('SEE')
3. Adopt the 'cut-it-out' programme & protect wound sites
   - Remove Psa infections regularly (…and throughout the season)
4. String canopy - get replacement canes (or adopt 'strategic stringing')
5. Avoid gaps in Psa spray programmes & minimise number of missed IP's
6. Spray protectants (esp. before and after pruning – winter)
7. Learn to use KVH – Psa risk infection model
8. Get your own sprayer (or more sprayers) – be responsive to risk…..

GoldFutures recommendations

9. Make site changes (reduce vine stress)
    - Increase light, reduce wind damage, improve soil drainage & root health

Before



After

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Zespri™ KIWIFRUIT

FRUITION Horticulture

KVH KIWIFRUITVINEHEALTH

Lynda Hawes HORTICULTURAL CONSULTANCY

Plant & Food™ Research Rangahau Ahumāra Kai

Huge thank-you to all our participants

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FRUITION Horticulture

KVH KIWIFRUITVINEHEALTH

Lynda Hawes HORTICULTURAL CONSULTANCY

Plant & Food Research Rangahau Ahumāra Kai

And all the GoldFutures team!

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Acknowledgements

Zespri/KVH for funding this multi-year project

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Thank you!

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