



POME:  
Precision Orchard Management and  
Environment

**Charles Whitfield**

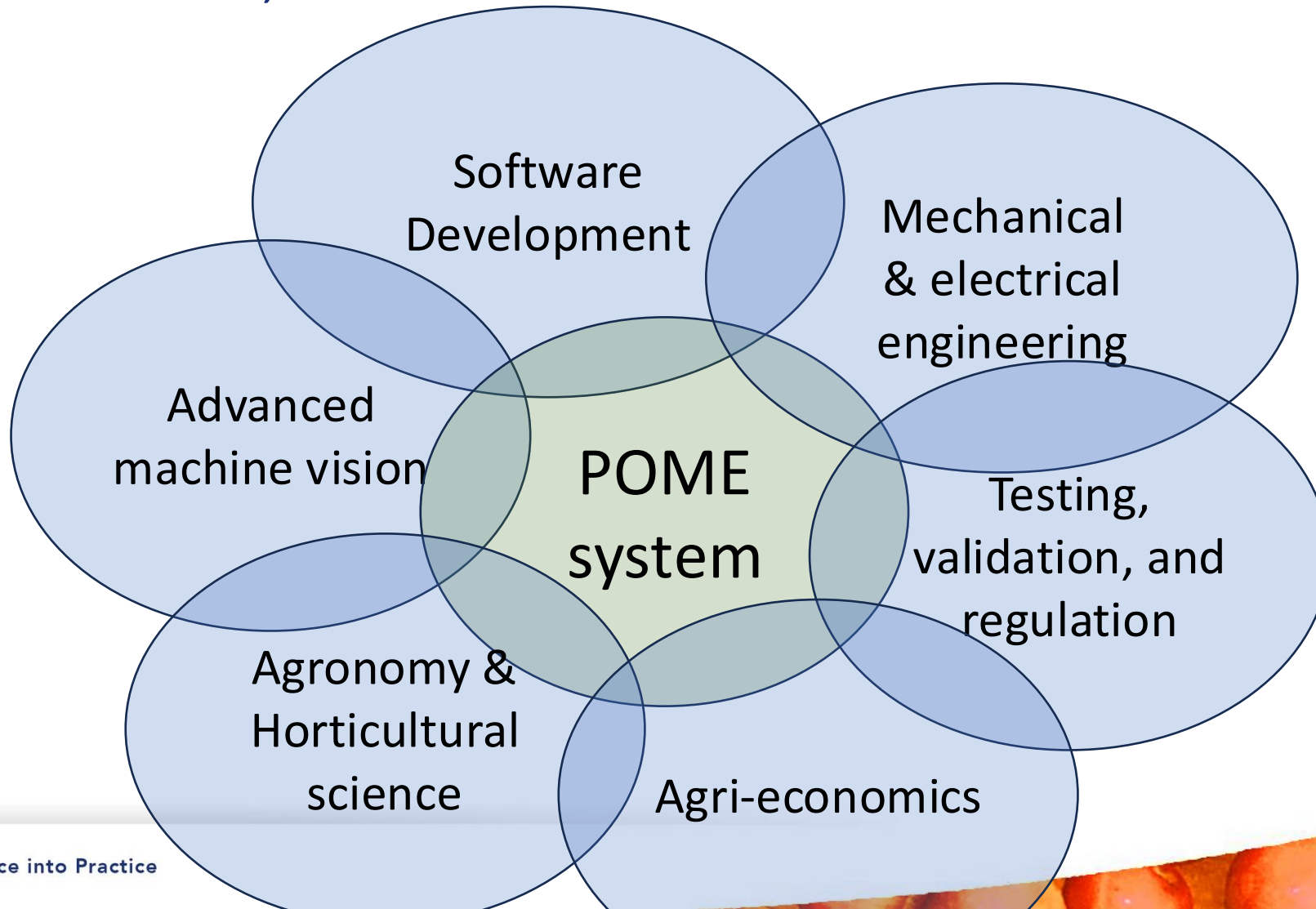
Feb 2026

*Michelle Fountain, Ji Zhou, Adrian Harris, Rob Jackson, Tom Passey, Adam Walker, Celine Silva, and many more*

# Precision Orchard Management and Environment (POME)

Closing the loop in precision technologies

Started in Nov 2023, ends in Oct 2027



Innovate  
UK



Department  
for Environment  
Food & Rural Affairs



# POME SYSTEM

Total project value:	£4,505,549
Industry contribution:	£1,039,666
Funding for NIAB:	£734,870
Funders:	I-UK and DEFRA
Application number:	10072930



## DATA GATHERING

Ground and UAV based  
Multiple sensor techs  
Geospatially related



## DATA PROCESSING

Cloud based  
Machine learning  
Novel algorithms



## RESULTS

Tree level data  
Spraying all season  
Production tracking



## INTERVENTIONS

Informing decisions  
Precision spraying  
Confident sales



# Plot layout and trial design for 2025

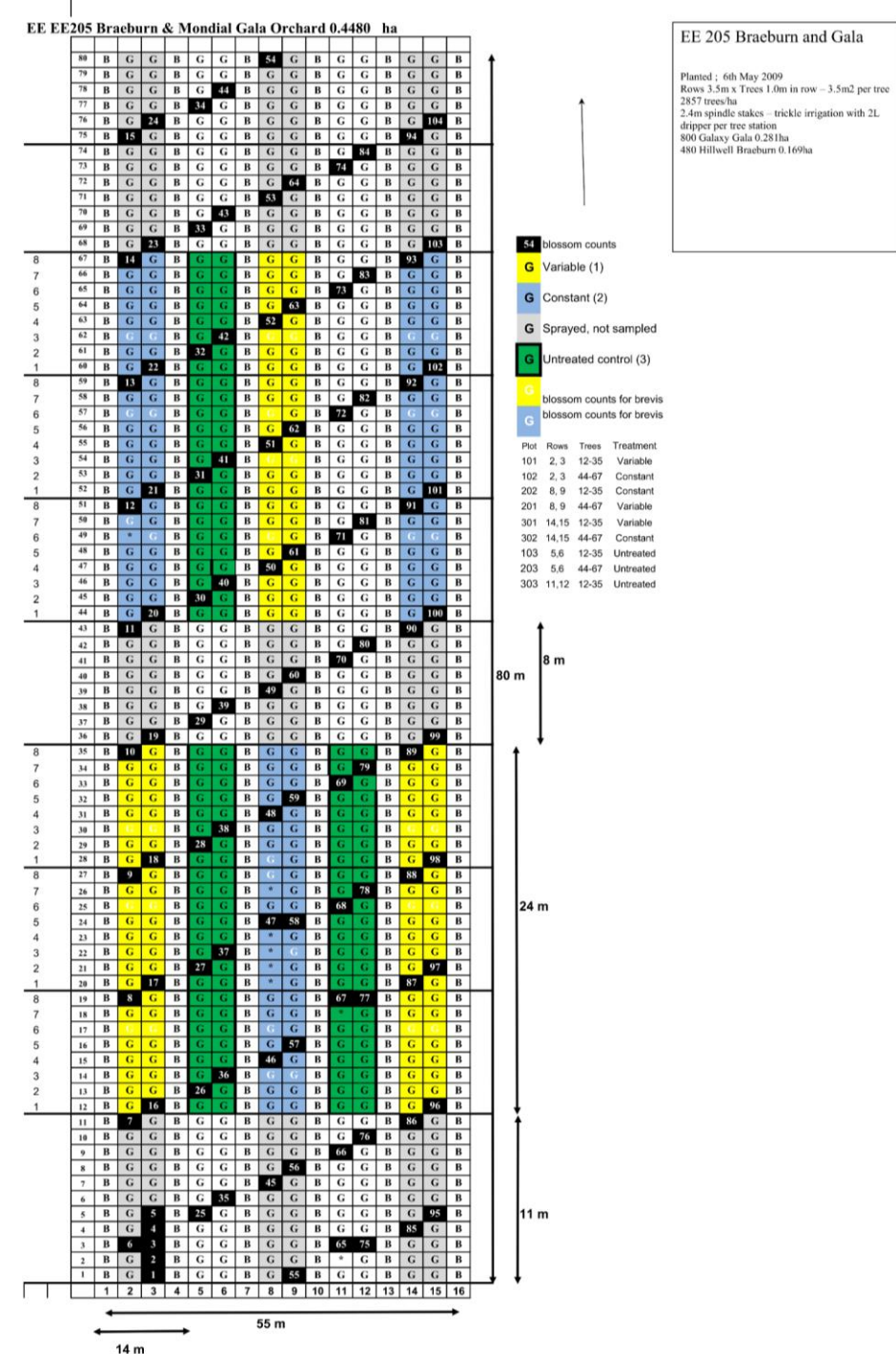
- Trial area = 0.5 ha (16 rows, 80 trees/row)

- 9 plots, 3 treatment, 3 replicates, 2x rows of 24 trees per plot (**48 trees/plot**)

- Treatments:

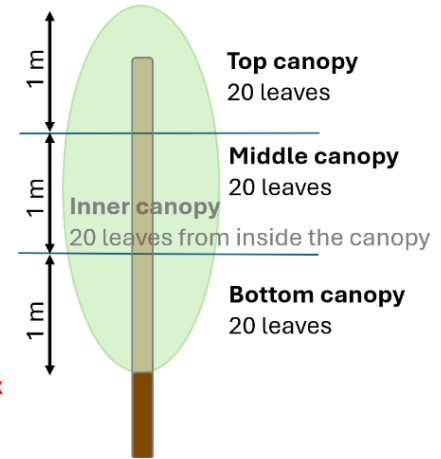
- Constant rate (blue) positive control
- Variable rate (yellow) POME system
- No spray (green) negative control

- Applications applied in this pattern all season



# Field trial results: spray deposition

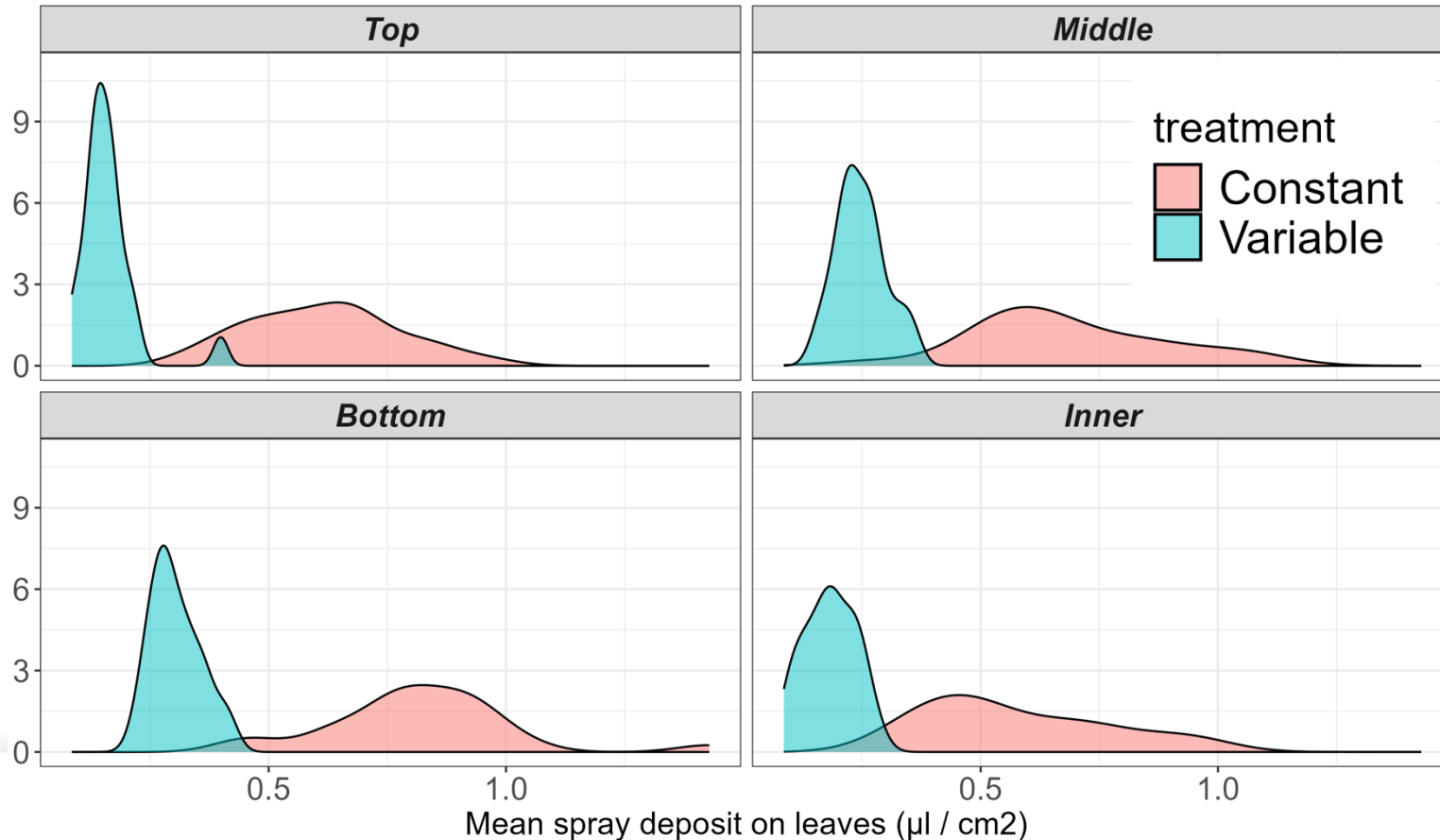
Spray deposition trials comparing constant and precision variable rate spraying. Variable rate adjusts output according to canopy density.



## 2024 results

In 2024 spray deposition on the variable rate trees was significantly more uniformly distributed across the leaves in all canopy zones

But the amount of deposition was too low



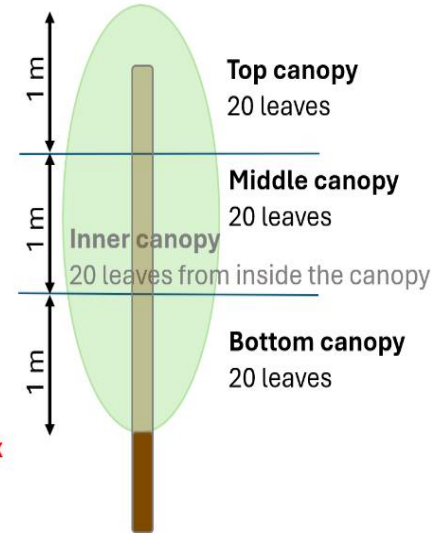
# Field trial results: spray deposition

Spray deposition trials comparing constant and precision variable rate spraying. Variable rate adjusts output according to canopy density.

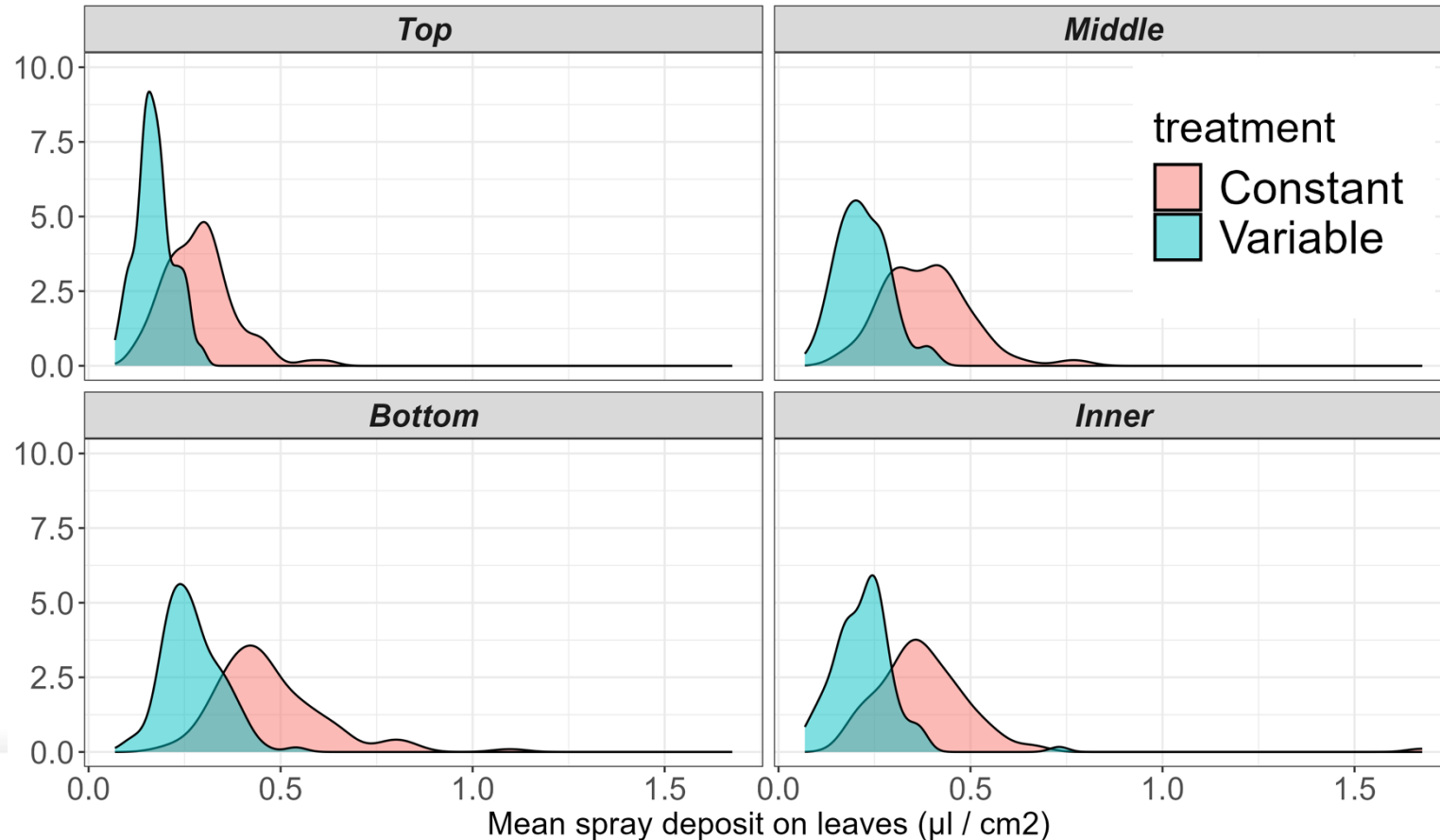
2025: new dose adjustment algorithm implemented to increase spray output from the variable rate system.

Increased amount of spray on leaves for variable rate treatment, but still lower than constant treatment.

Uniformity of spray deposition was maintained.



## 2025 results

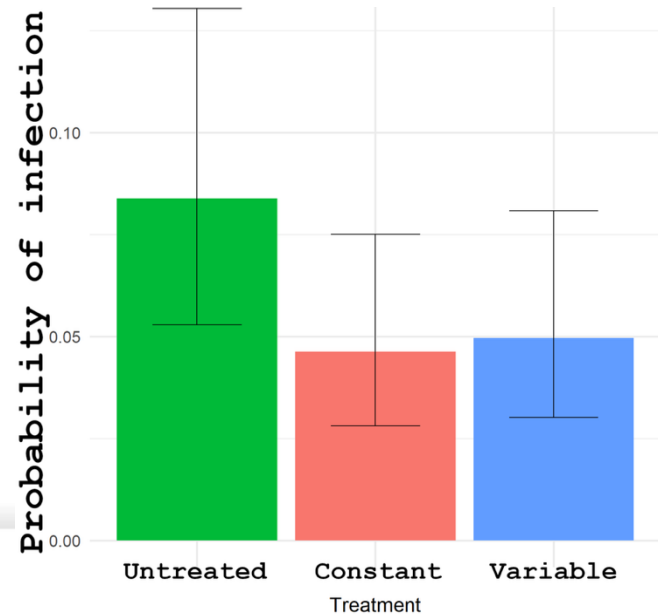


# Field trial results: scab control

- Primary scab infection on rosette leaves = no significant difference between Constant and Variable rate spraying
- Secondary scab infection on fruitlets = no significant difference between Constant and Variable rate spraying
- Large significant difference between sprayed and unsprayed treatments

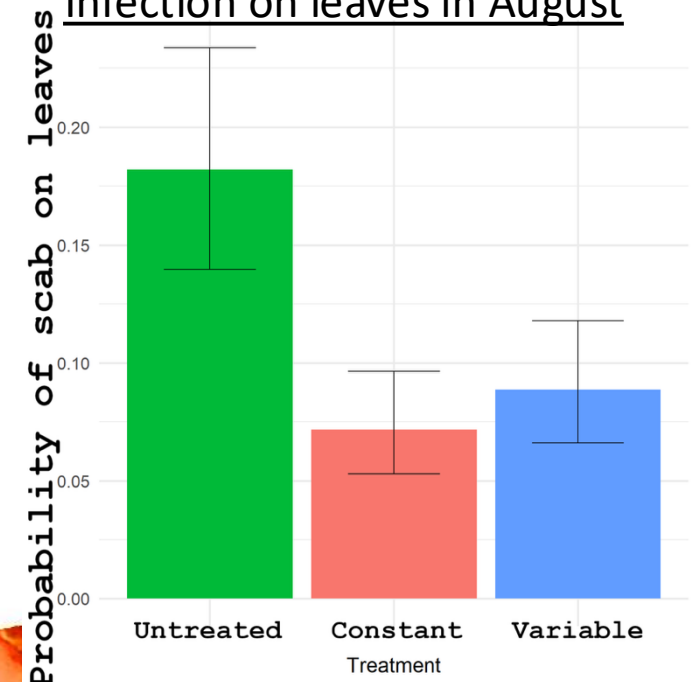
## Early to mid-season = no difference between Constant and Variable spraying

Infection on rosette leaves June



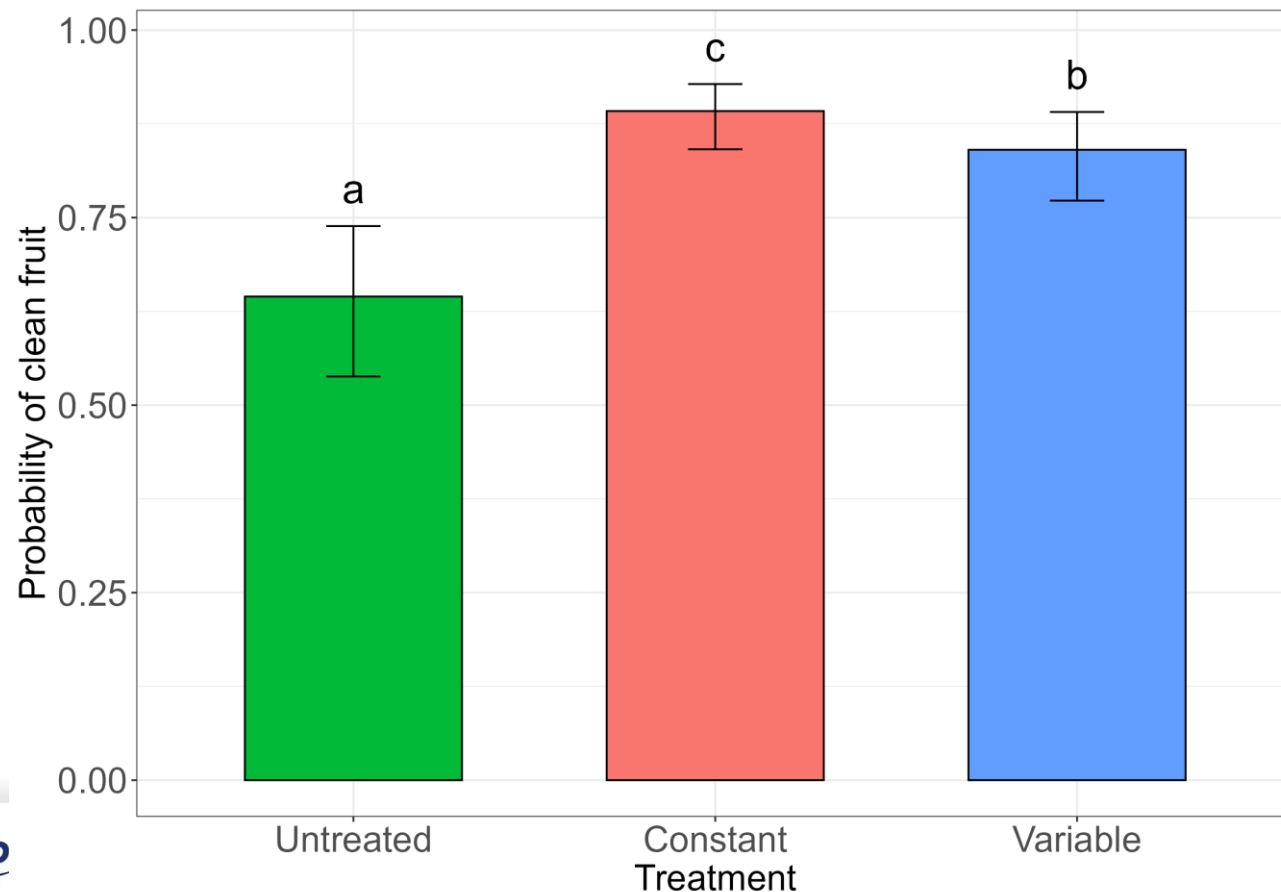
Variable rate spraying saved ~35% of spray input costs compared to constant rate, but gave same level of scab control

Infection on leaves in August



# Field trial results: scab control

- Scab infections on fruit at harvest = significant difference between all treatments
- Approximately 5% increase in probability of scab on fruit sprayed with Variable compared to Constant rate. But this occurred only in 1 block.



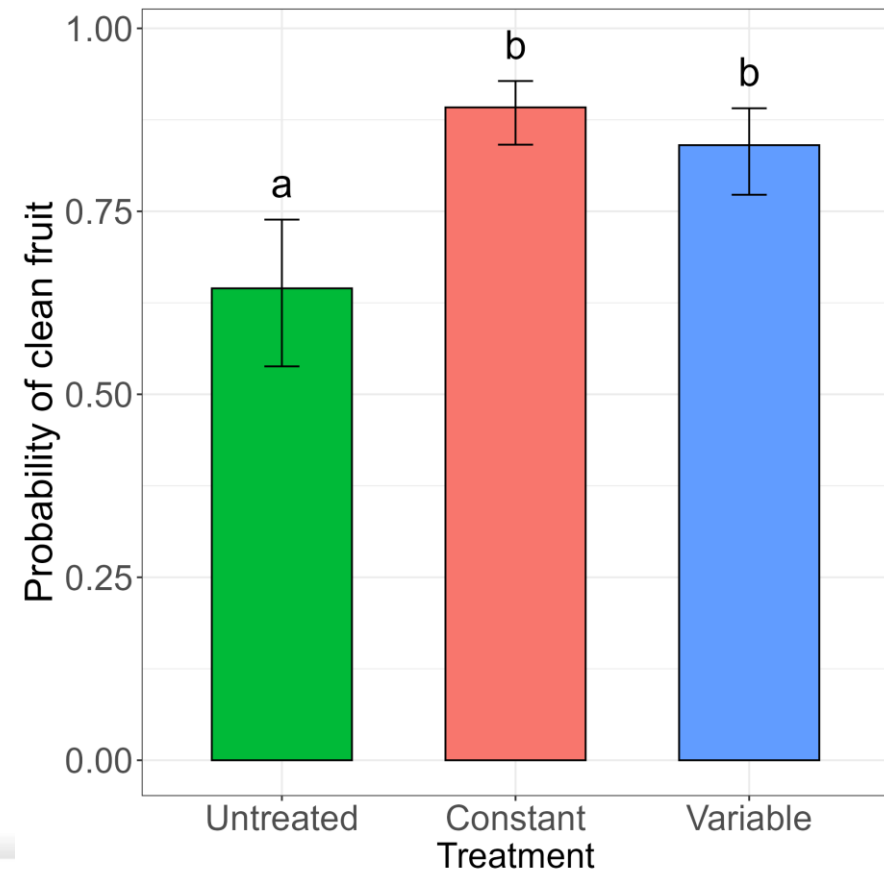
At harvest, probability of fruit being clean or having scab was significantly different between all the treatments. ~5% difference between Constant and Variable



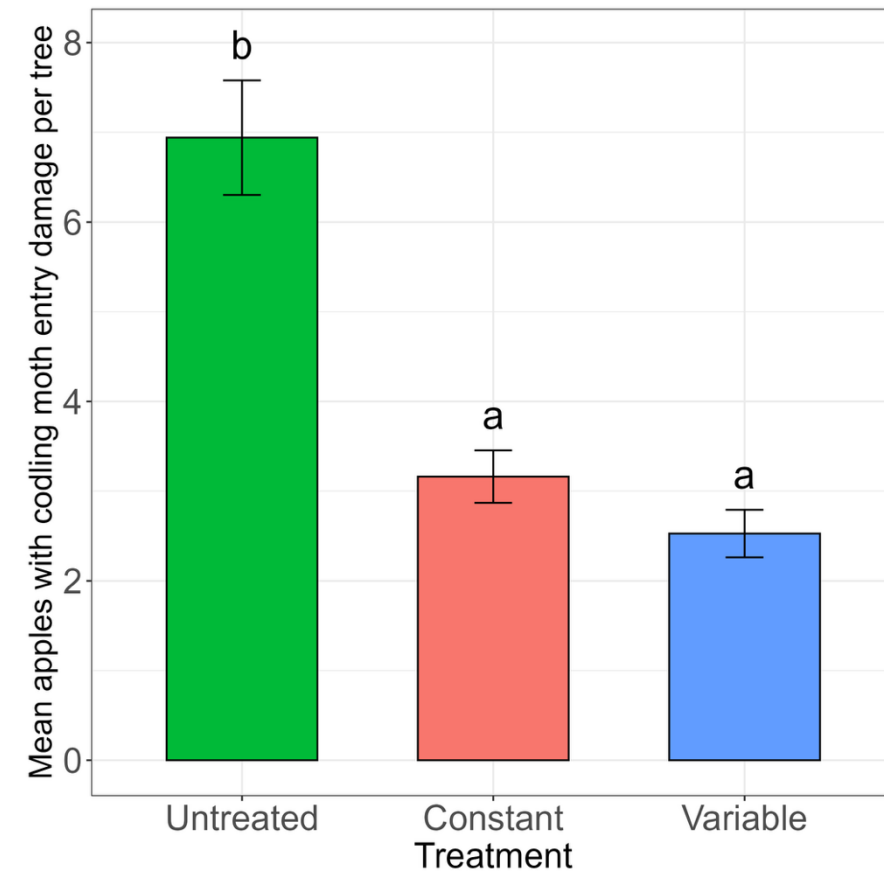
# Field trial results: codling moth control

- Codling moth damage to fruit was assessed at harvest, comparing untreated, constant and variable rate spray application.

## No significant difference between Constant and Variable rate spraying



**Variable rate spraying saved ~35% of spray input costs compared to constant rate, but gave same level of codling moth control**



# Summary

- Variable rate sprayed trees had significantly less spray deposit on, but the spray was significantly more uniformly distributed compared to constant rate.
- Variable rate applications applied 35% less inputs compared to constant rate.
- Despite 35% reduction in pesticides applied there was no significant difference in scab control early to mid season.
- At harvest there was a 5% increase in scab damage in variable rate spray trees, but this difference was localised to one area out of three in the trial.
- At harvest there was no significant difference in codling moth damage between constant and variable rate sprayed trees.
- Next steps: modifying the dose adjustment algorithm to further improve spray deposition, and testing out the system at a much larger scale on commercial farms.



**HUTCHINSONS**

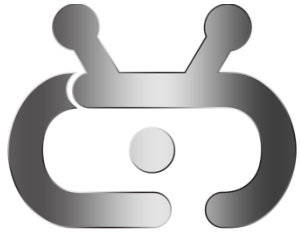
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