

# HMC

## TECHNICAL MEETING 2025



# Agenda

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- **Allen Giles**– Welcome & Introductions, 2024 Recap, 2025 Updates
- **PGRO – Dr Becky Howard** - PGRO Technical Update
- **HMC - Jack Harris / Allen Giles** - Seed rate trial results / Variety Trials
- **BREAK** – 15 mins
- **ADAS – Ben Hockridge** –PEASAT Yield Prediction Service
- **Greenyard Frozen – Stuart Ashton** – Greenyard & HMC Growing together
- **Princes – Charlie Stowe** – Overview from Princes
- **Allen Giles** – 2025 / AOB / Close

# Housekeeping

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- Fire Alarms
- Fire Exits
- Phones
- Toilets

# Allen Giles



# 2024 Recap

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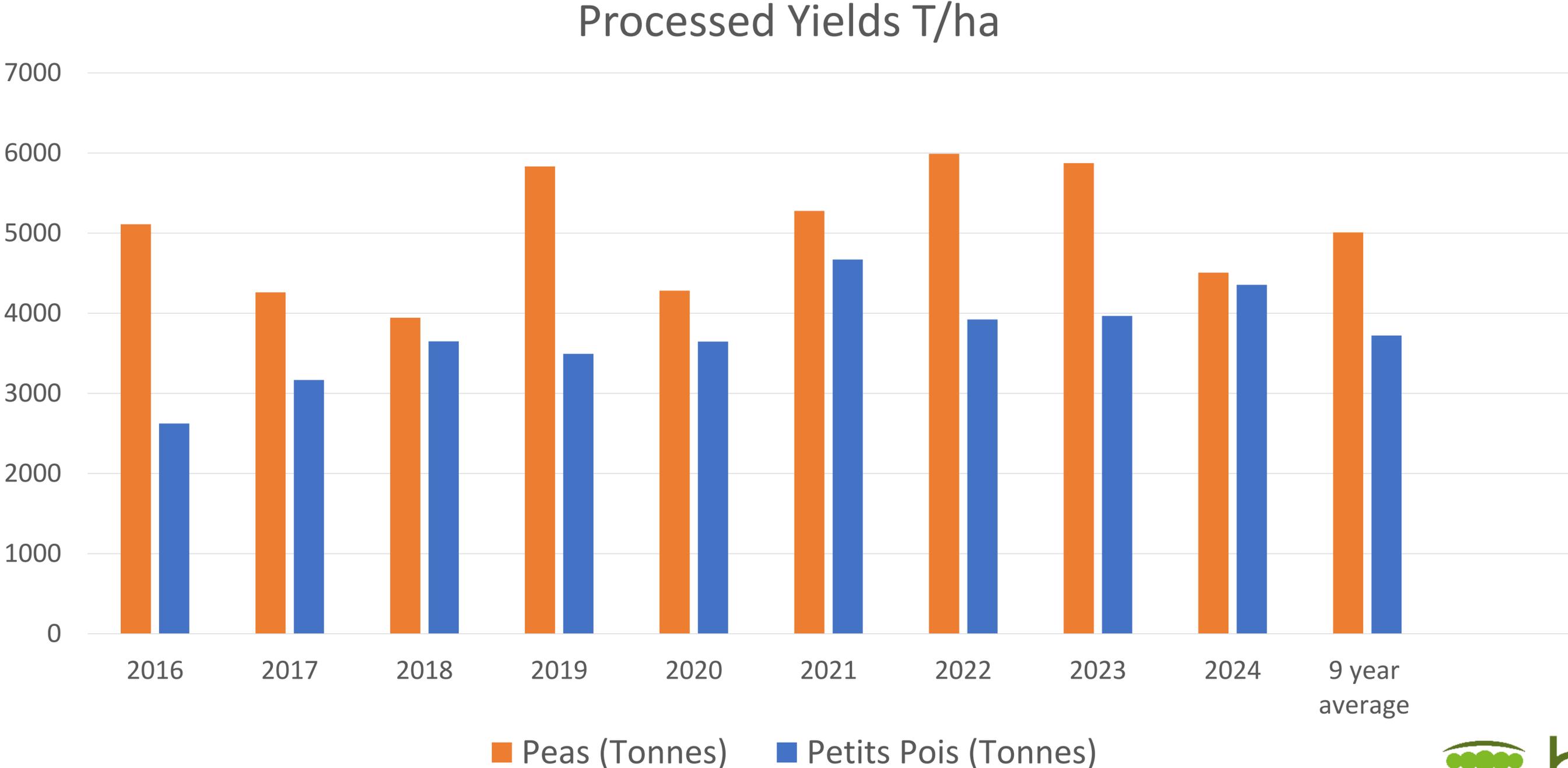
- Harvested 4,507 Tonnes Peas Total – Yields 26% above budget
- 15% under contract tonnages – 17.5% below financial budget
  
- Harvested 4,355 Tonnes Petits Total – Yields 17% above budget
- 8% over contract - 7.5% below financial budget
  
- Princes 4% over contracted volumes
- Greenyard 5% below contracted volumes
  
- 78% A-AA on Petits
- 75% A-AA on Standards

# Bypass Seed

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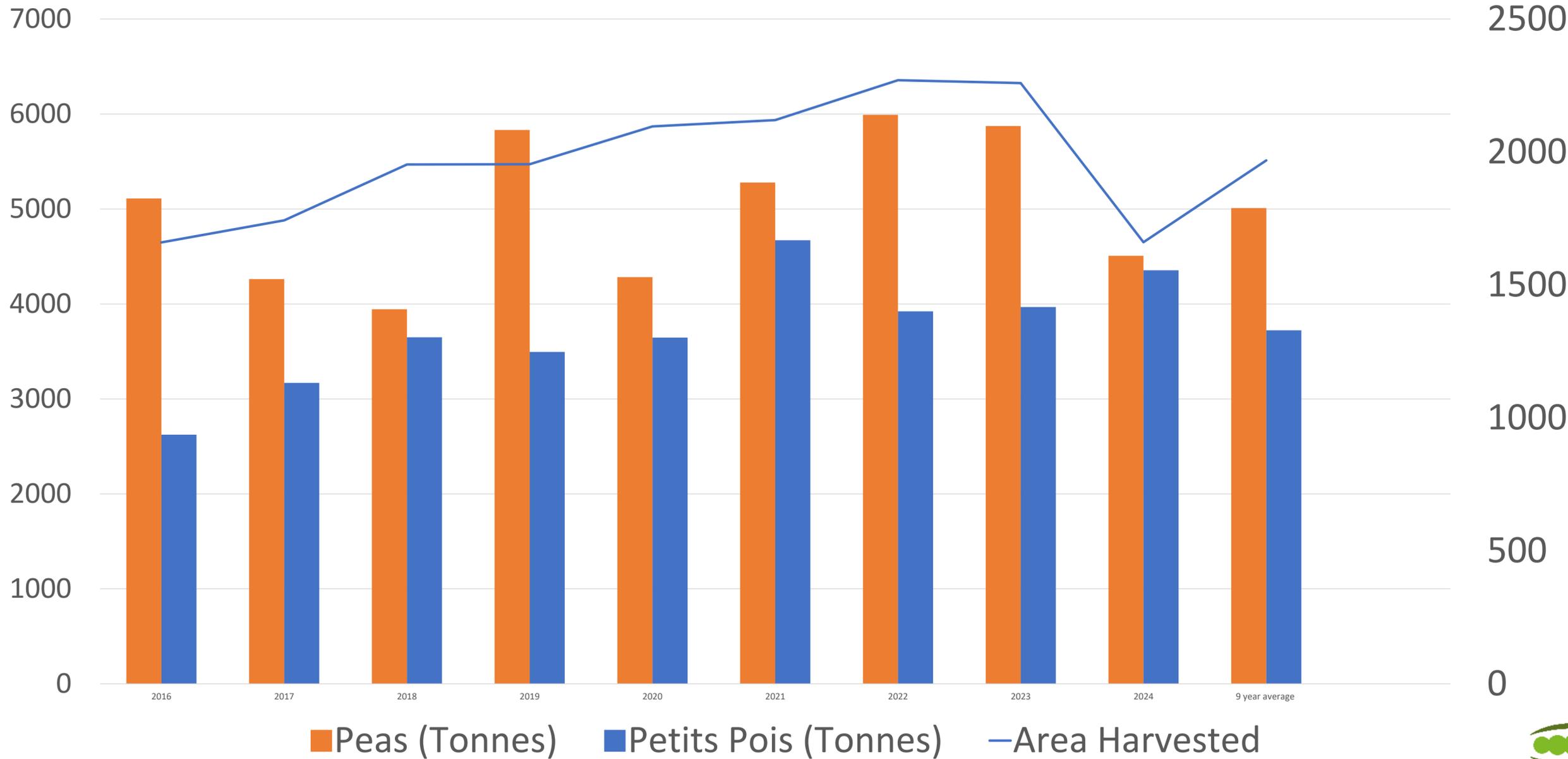
- Bypass 540ha (24%) Crop
- Higher Yields
- Reduced Projected tonnages due to wet winter
- GY not fulfilling their contracted tonnages
- Combined 385 ha producing 500 tonnes of protein peas
- 350 tonnes of seed after testing/drying and dressing

# Processed Yields T/ha

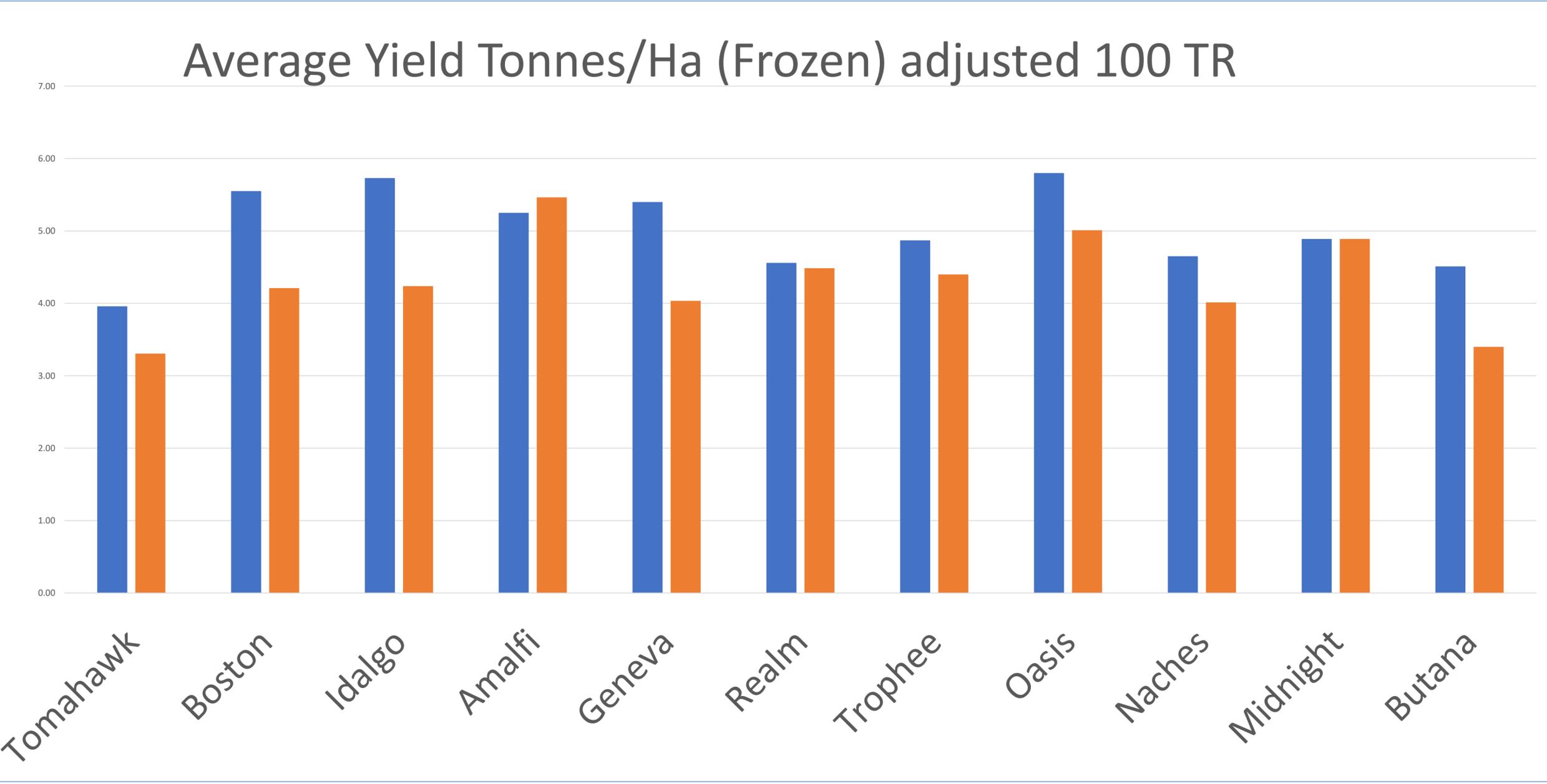


# Processed Yields Tonnes

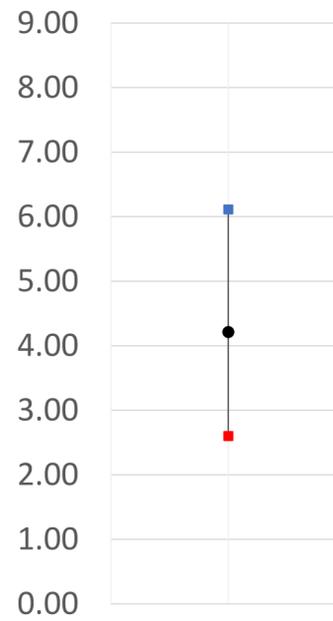
## Area Harvested vs Total Tonnage



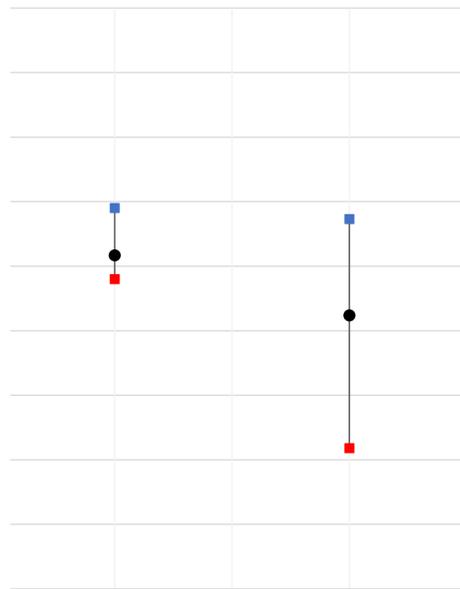
# Processed Yields Tonnes Against 9 Year Average



# Variety Yields

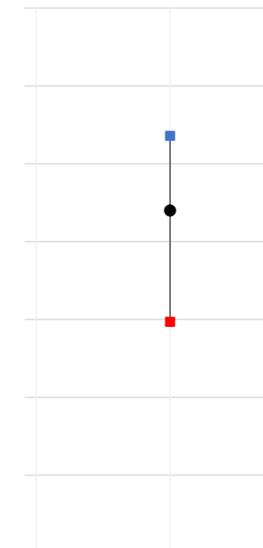
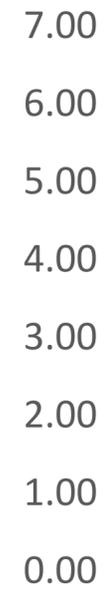


Boston

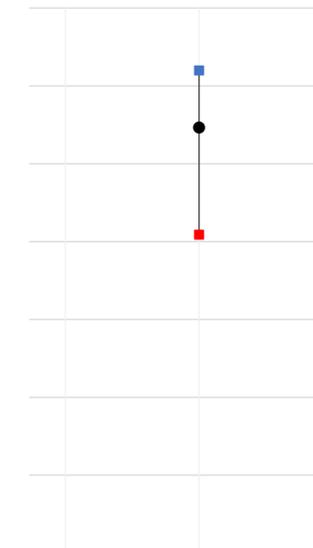


Style

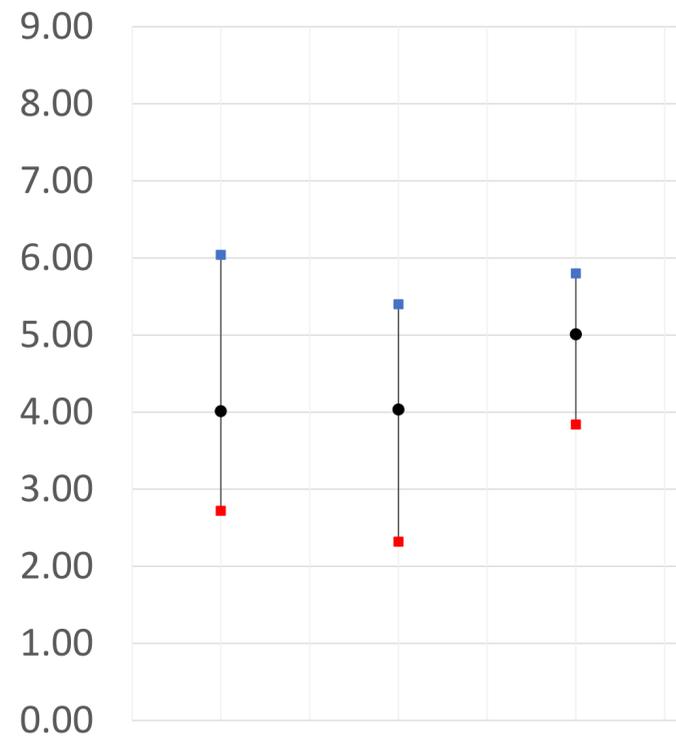
Idalgo



Trophee



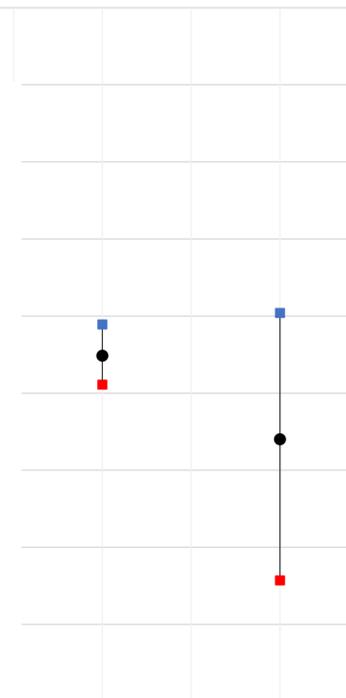
Amalfi



Naches

Geneva

Oasis



Realm

Butana

# Machinery & Personnel Update

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- Took delivery of a new harvester in 2024 this was prompted by the possible stopping of the PO scheme.
- Second one of the fleet to be on tyres rather than tracks. Tyres working better than tracks in all aspects.
- With the new viner coming with LED lights the remaining 3 viners had LED lights fitted. Big improvement with nighttime visibility and safety. Drivers commented on felling less fatigued.
- Changed CB's to Two-way radios which greatly improved range and communication for all the team.
- New additions to the team Oli Baker ( sampler) Jon Dring ( viner driver) Mark Clarke ( viner driver)
- Role changes Ben Roffe ( viner driver to Night Supervisor) Liam Groves (Relief driver to viner Driver) Thomas Baggaley ( viner driver to night engineer) Alex Cannon ( sampler to relief driver)
- All new personnel and existing that changed roles did a very good job. Teams worked well together, and moral was high

# Contracts 2025

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- Greenyard Frozen
  
- Organics 100 Tonnes
- Peas 3400 Tonnes
- Petits Pois 4800 Tonnes
- Prices for 2025 11% above 2024 prices one year fixed
  
- Princes
  
- Peas 1400 Tonnes
- Petits Pois 200 Tonnes
- Prices for 2025 10.5% above 2024 prices one year fixed

# Drilling Programme

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- Area 2,045 ha
- Need average yield of 4.87 tonnes / ha to achieve contracts. This is up from last season due to increasing the expected yields with the higher seed rates and a higher % of petits in the programme that yield higher than standards
- All growers should have received a copy of the programme.
- No seed issues for 2025. 10 main varieties this year with field trials of 6 varieties that performed well in 2024
- Organics to be grown again at Sandringham at the beginning of the programme as that's the only time Greenyard had line space available.
- Earlies in Norfolk followed by petits on the silts.
- Finish on Holbeach/Lutton Marsh

# Becky Howard





# PGRO Update

Becky Howard

## Industry Services

- Crop Clinic
- Prediction modelling
- Advisory Service



## Crop management

- Understanding the Problems
- Identifying and Testing Solutions



# Forecasting Harvest Date & Yield



## Vining pea group data

Crop data inc. drilling, flowering and harvest dates, varieties, quality (TR), yields.  
>18,000 crops

## Remote sensing

### Sentinel-2 satellite data

Multispectral canopy reflectance measurements

### Weather data

Daily data every 20km

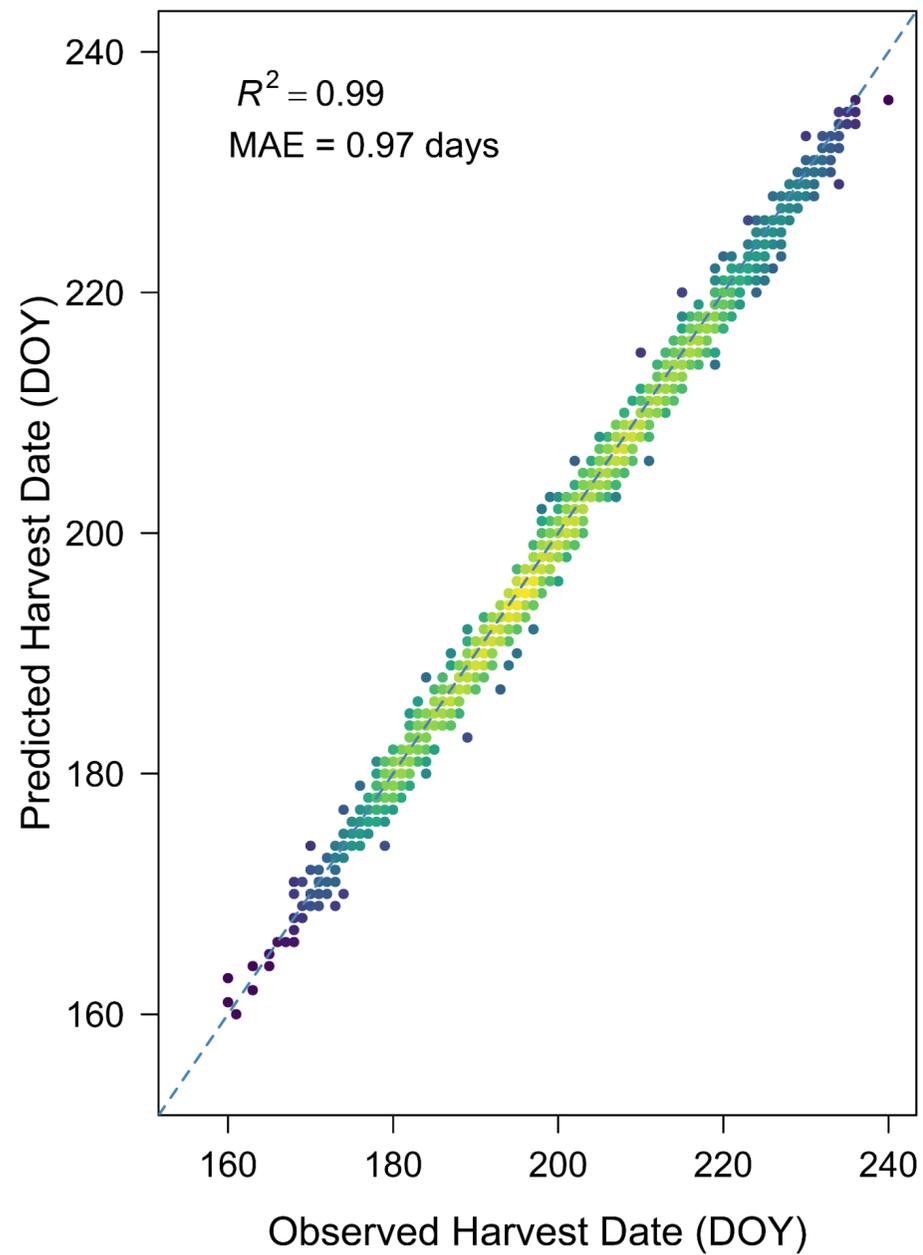
## Machine learning

Harvest date & yield prediction models

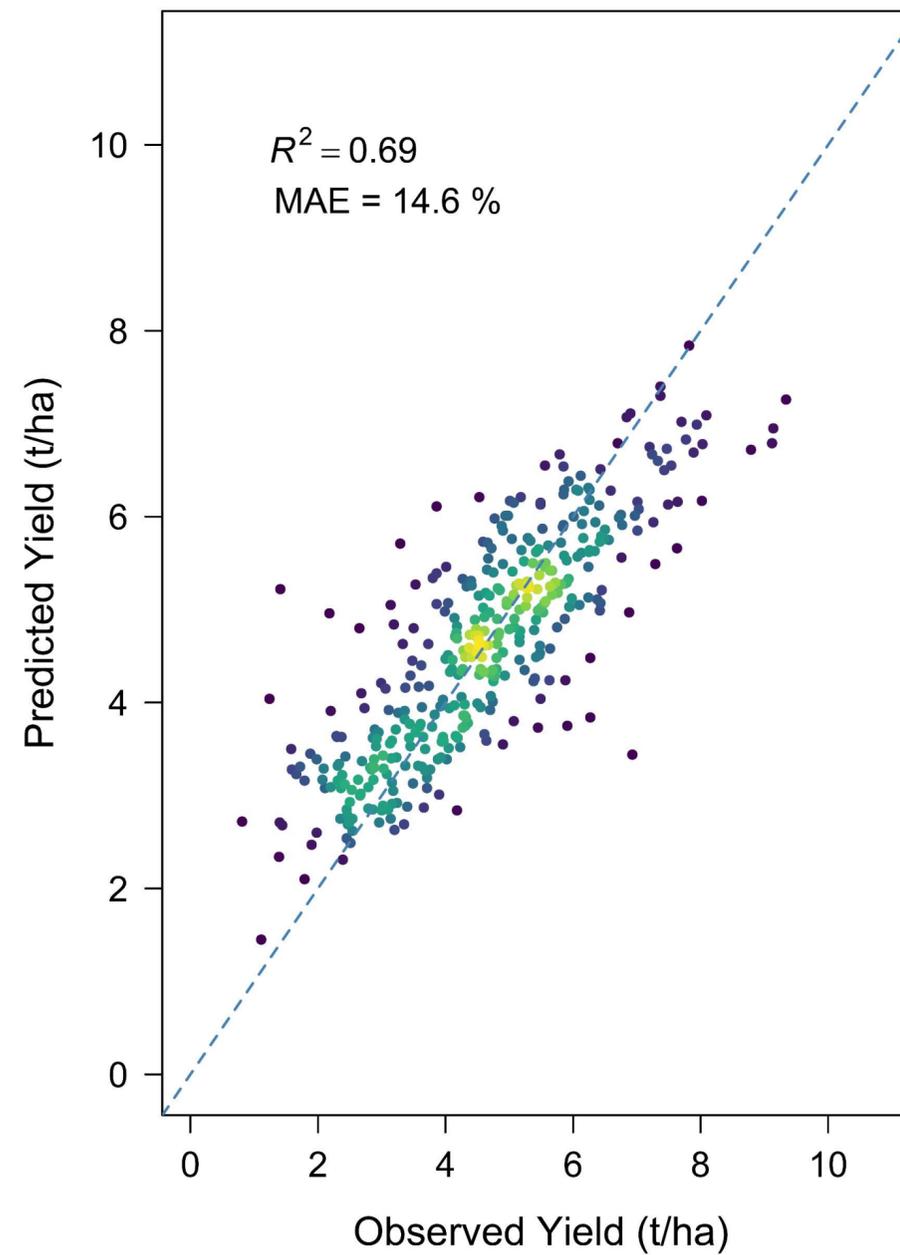
# Forecasting Harvest Date & Yield



## Harvest Date



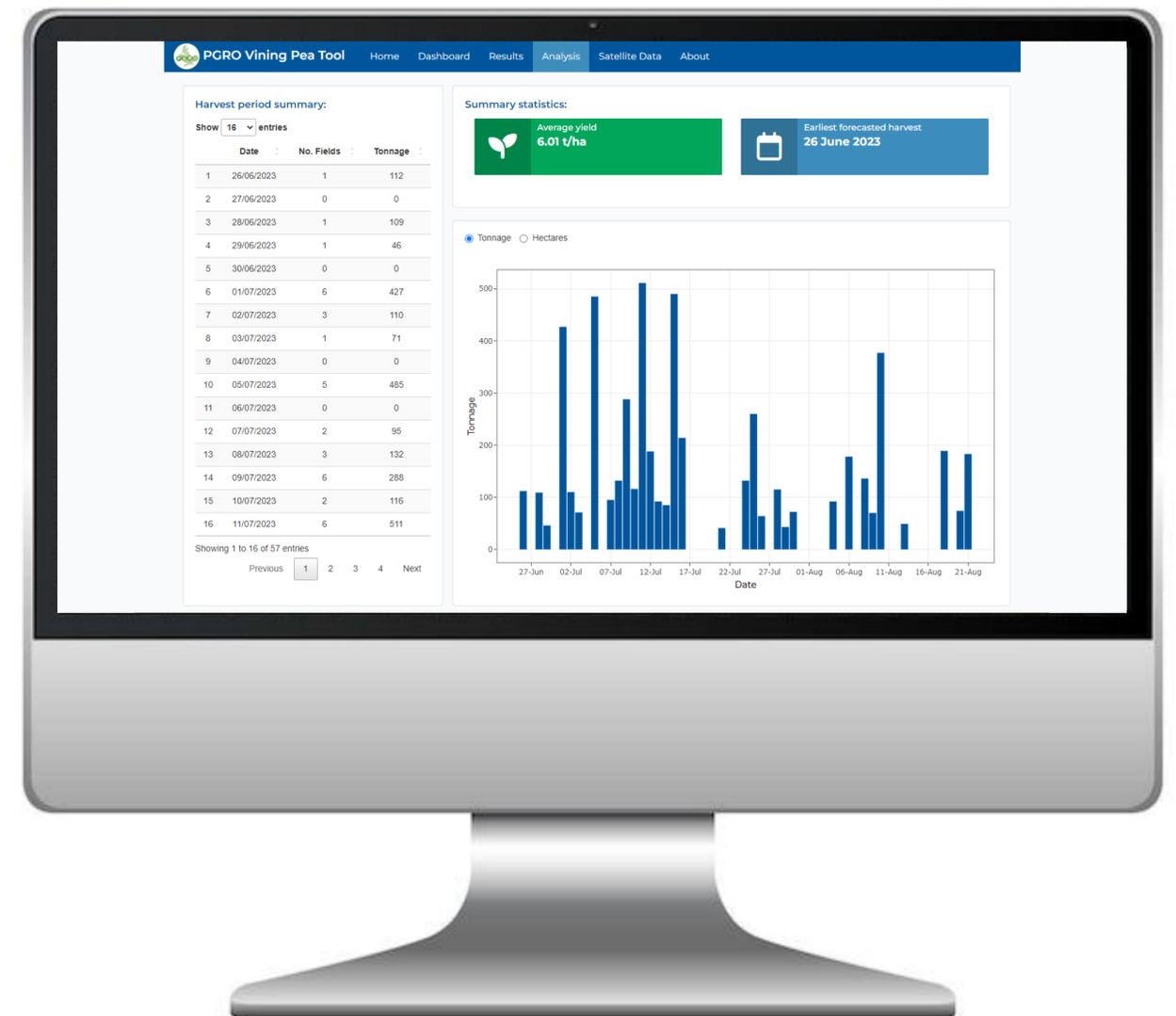
## Yield



# PGRO Vining Pea Tool- Forecasting 2024



- Vining pea yields were high throughout the UK for parts of the 2024 season.
- Preliminary results indicate the yield forecasting model was able to account for higher yields, despite fewer satellite images than average due to high levels of cloud.



# PGRO Crop Clinic

Monitoring pests, diseases and other factors throughout the season

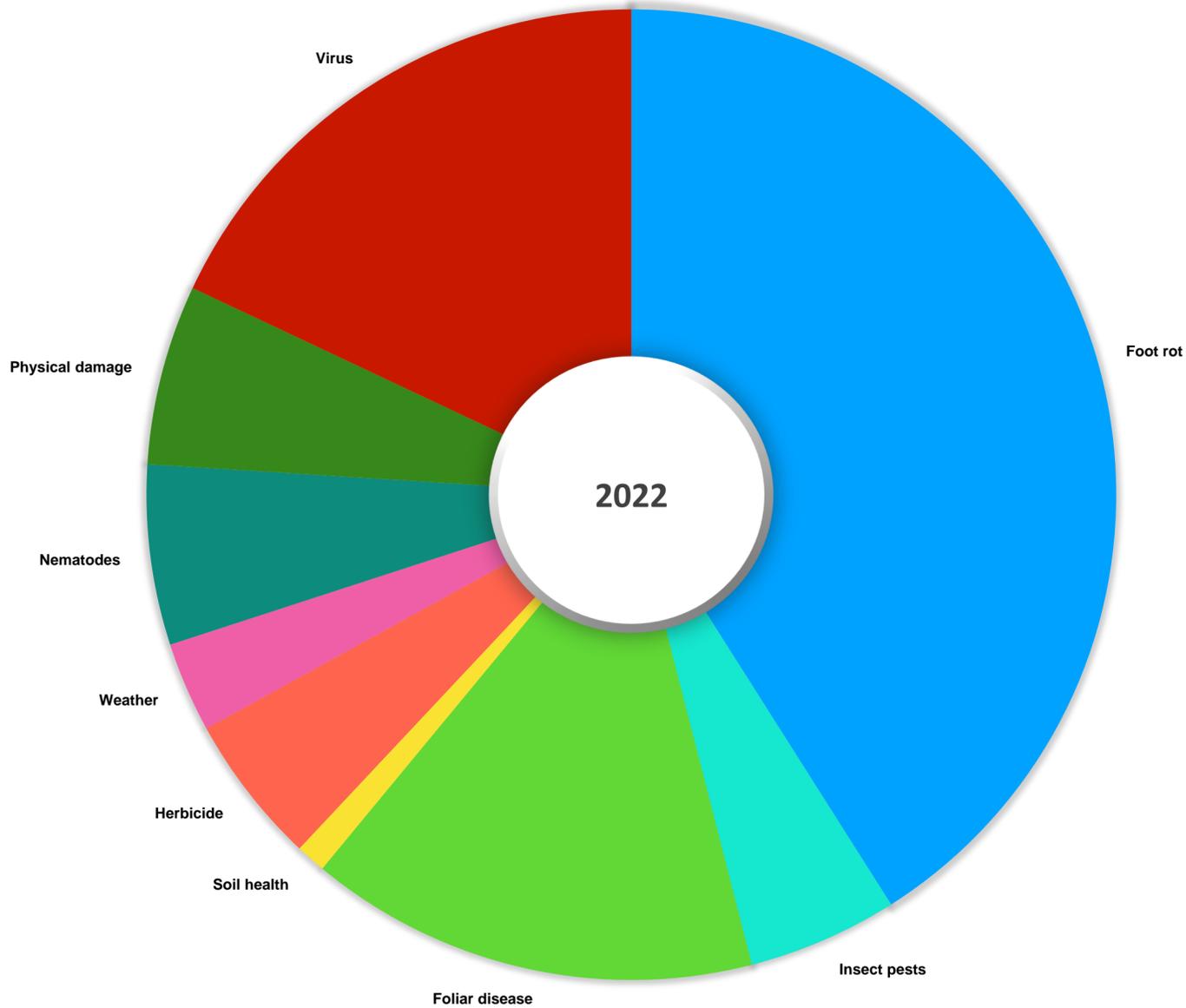
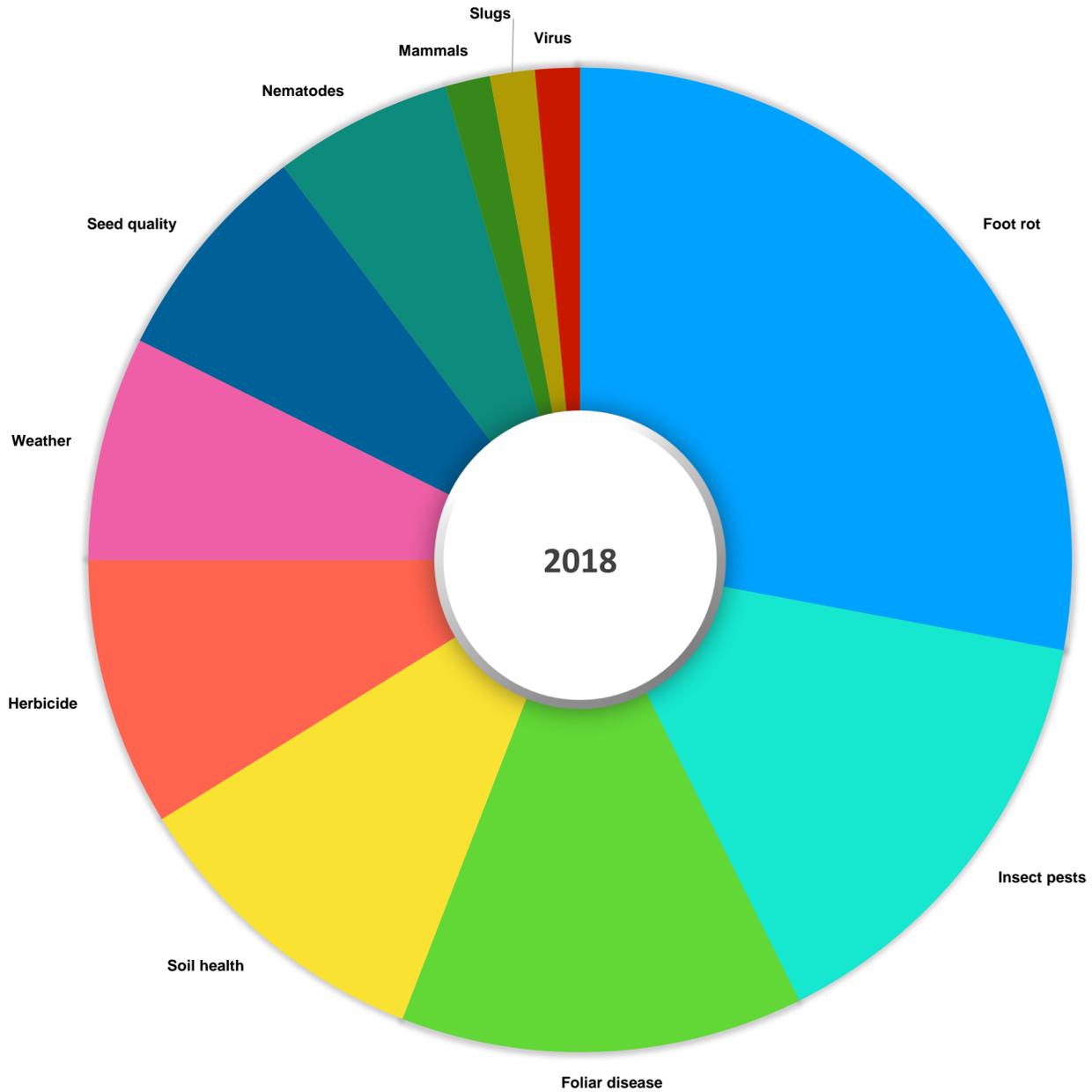
Interaction of crop health and weather conditions



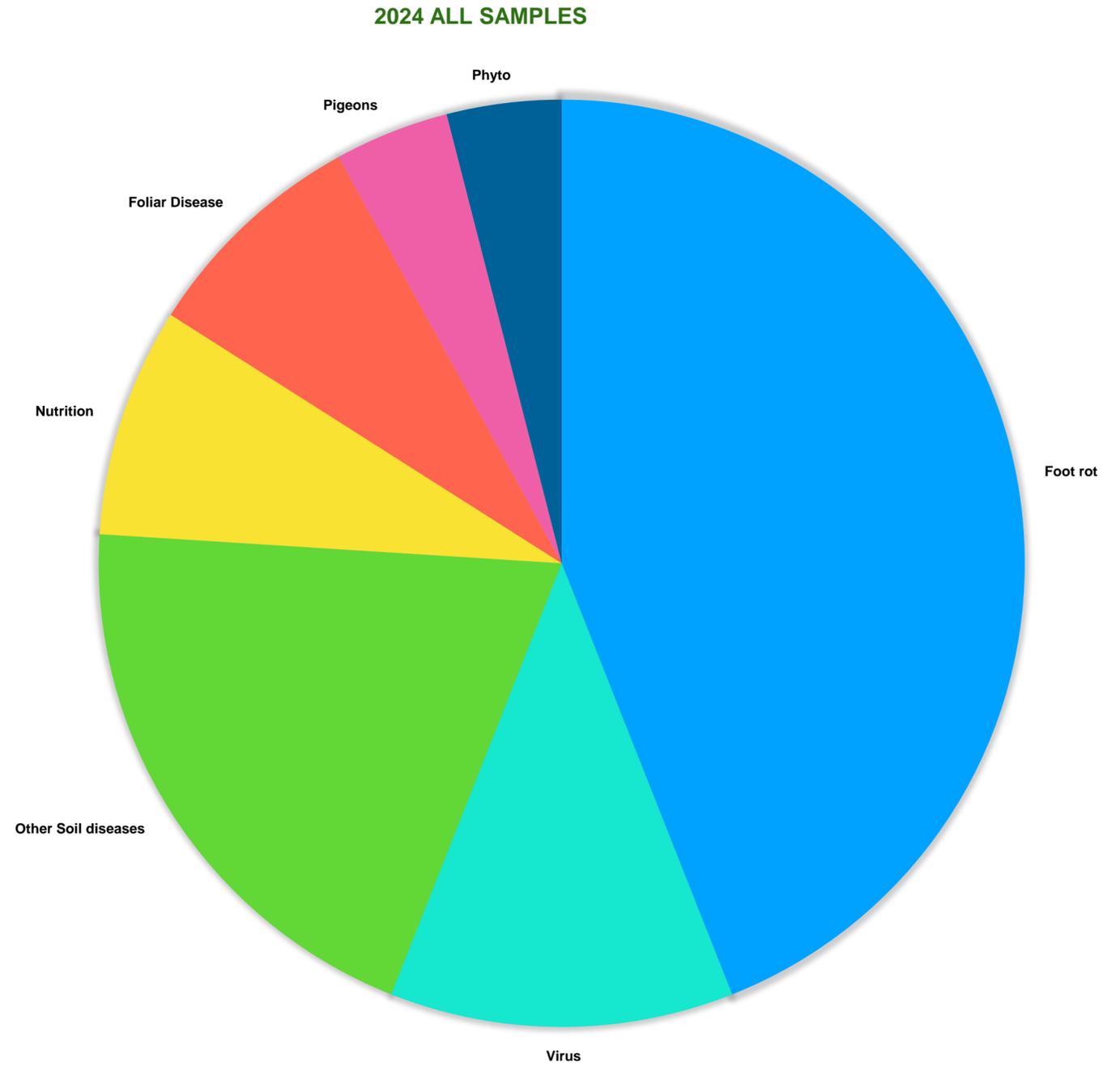
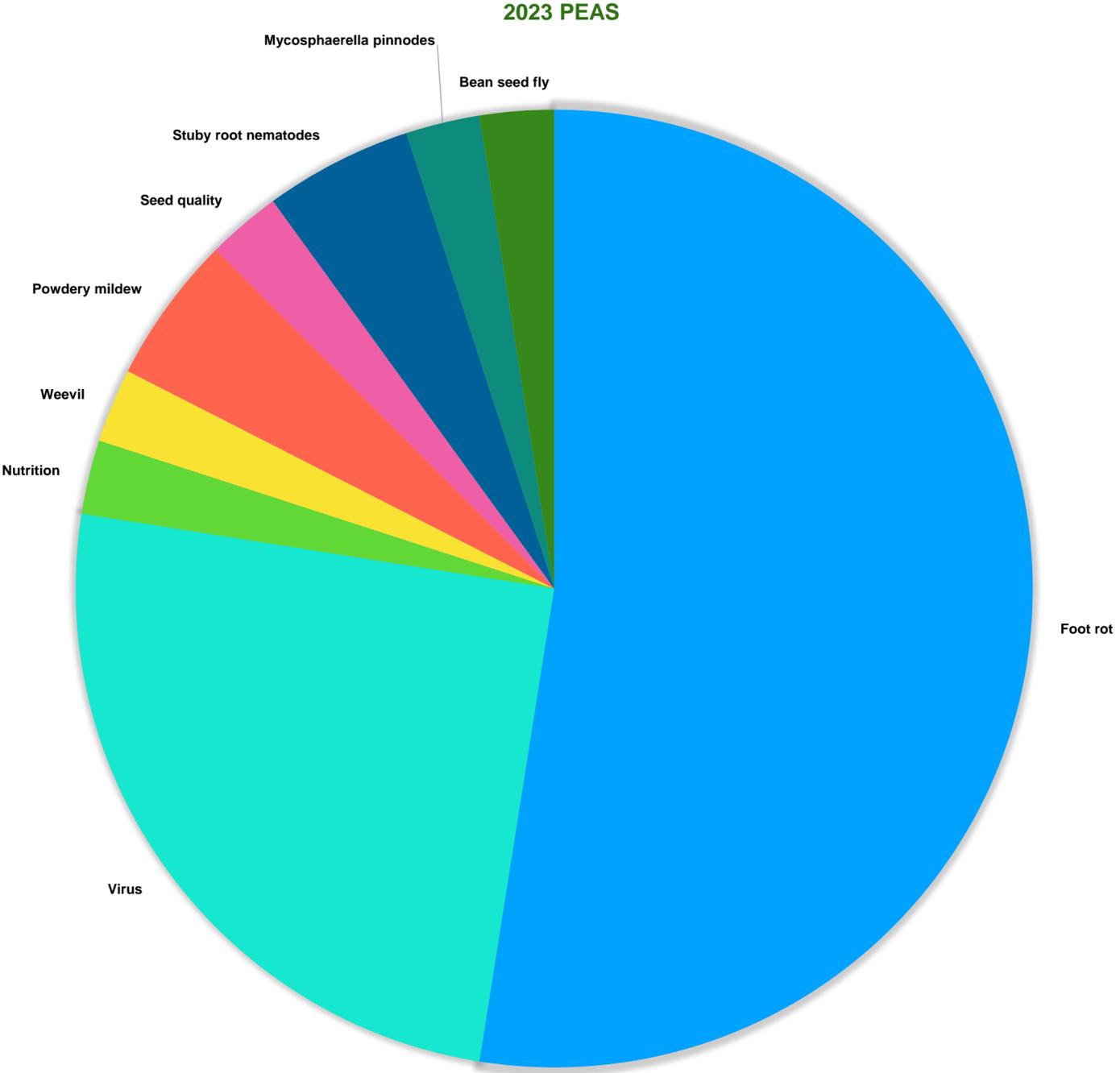
Support management systems to increase or maintain the productivity of legumes



# Crop clinic all pea and bean samples



# Crop clinic samples



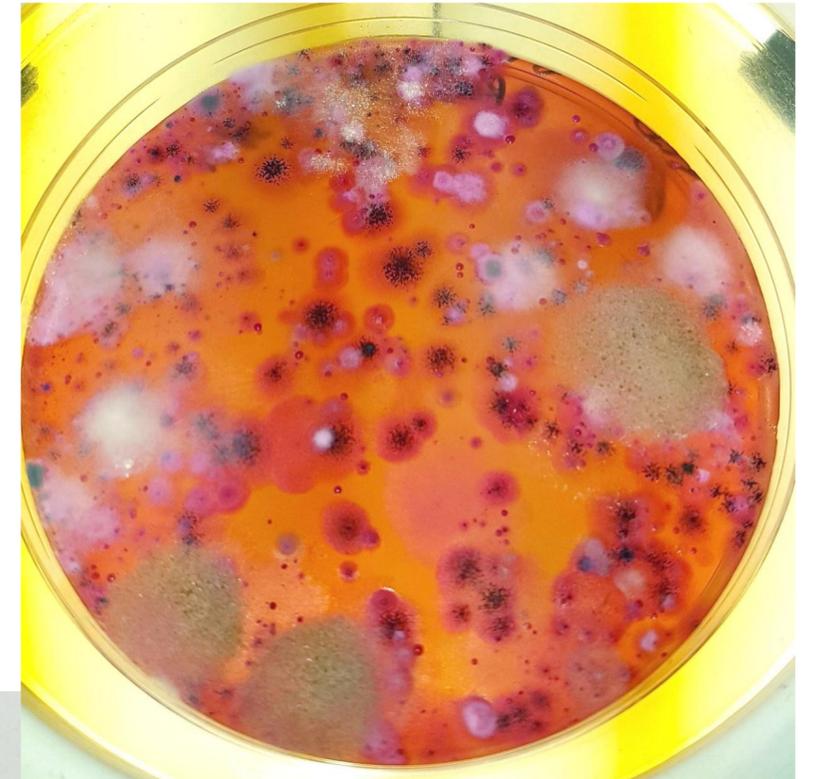
# Foot rot in peas

- Poor root systems
  - Pale or yellow plants
  - Stunted plants
  - Impact on yield
  
  - Cold, wet soils
  - Compaction
  - Water logging
  - Poor soil health
  - Plant stress (drought/ heat)
  - Frequent legume cropping
- Disease complex – *Aphanomyces euteiches*, *Fusarium spp.*, *Didymella pinodella*



# Disease management

- Lengthen rotations
- Encourage healthy soils – cover crops may help to improve soil structure  
[FinalsummaryInvestigatingcovercropsinviningpearotations.pdf](#)
- Prepper ST has Fusarium as a target on the label, although generally no chemical control available
- Soil tests for **peas**
  - ✓ Colony numbers – risk factor (Fusarium and Didymella)
  - ✓ Disease severity seedling – risk factor (Aphanomyces)



# Other non-crop legumes in rotations

- Benefits

- Improvement of soil structure, biology and nutrition
- Green bridge for natural enemies and reduction of pest risk
- Increase biodiversity
- Reduction of inputs
- Reduction of leaching
- Financial payments

- Risks

- Soil-borne diseases
- Foliar diseases
- Green bridge for aphids and viruses
- Insect pests
- Nematodes



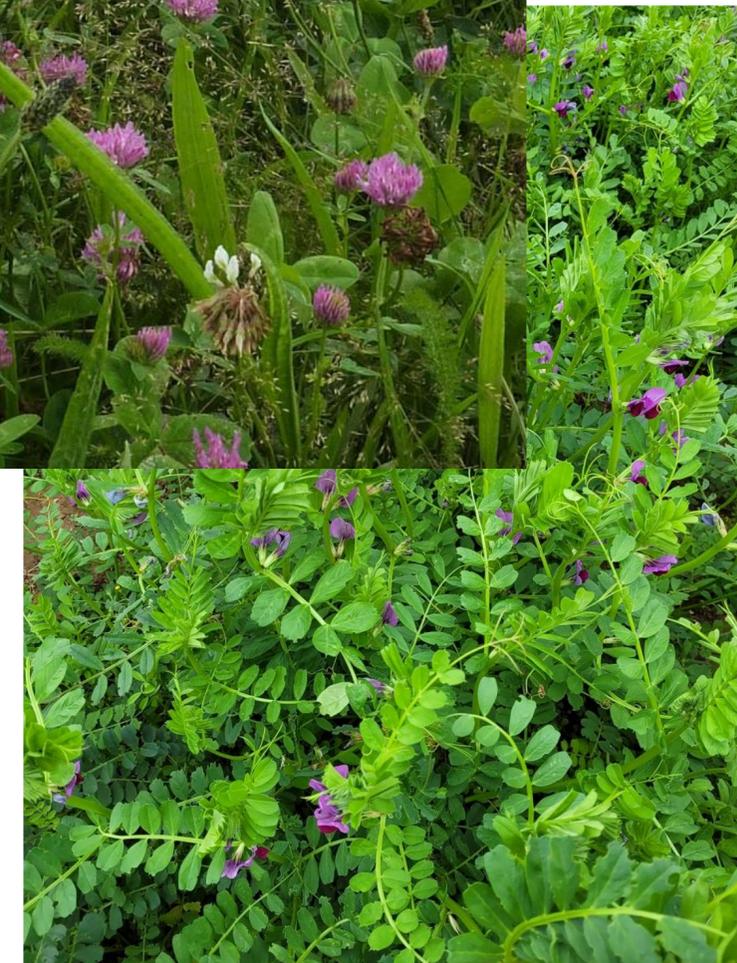
# Other non-crop legumes in rotations

- Options in SFI/ CS that may interact with vining peas and broad beans
  - NUM2 – legumes on improved grassland.
  - NUM3 – legume fallow.
  - IPM3 – Companion crop on arable and horticultural land.
  - AHL1 – Pollen and nectar flower mixture.
  - AHL2 – Winter bird food on arable and horticultural land.
  - AB15 – Two-year sown legume fallow (CS).
- SAM2 – Multi-species winter cover.

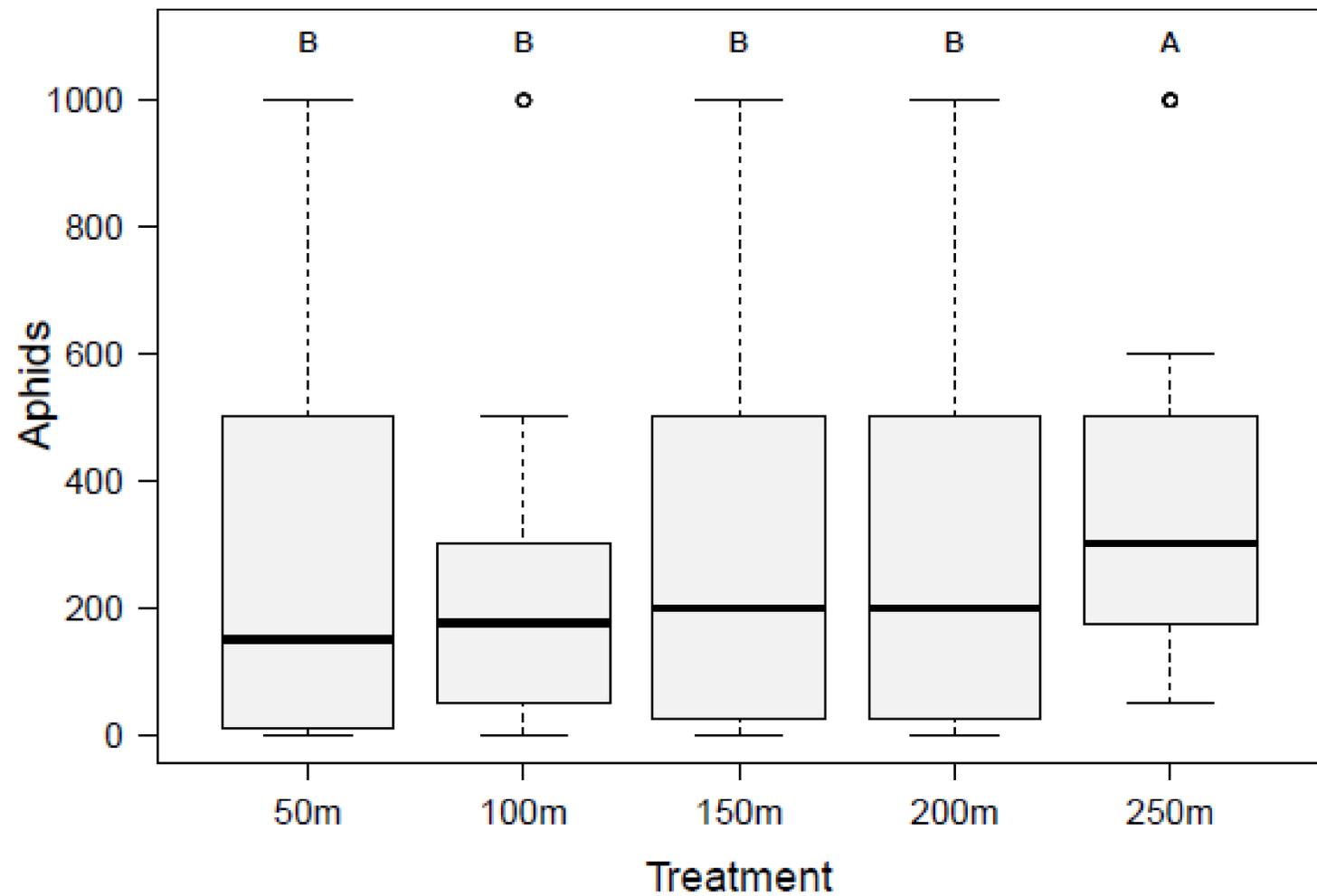


# Other non-crop legumes in rotations

- [Research Publications | PGRO](#)
  - ‘SFI Options that Include Non-Crop Legume Species in Legume Rotations’ – Review of key pathogens and pests and their legume hosts.
- <https://www.best4soil.eu/database>
  - Tools to cross-check disease or nematode plant hosts
- Research continues at PGRO to evaluate the effects of more frequent legume cropping, including non-crop options, on production – through direct work with pea groups and farmers, and through other projects (NCS/ PGRO Levy/ PCGIN/ YEN/ PhD’s)
- [IPM – Aphids and Viruses | PGRO](#)
  - A review of IPM techniques to better manage aphids and viruses in peas and beans.

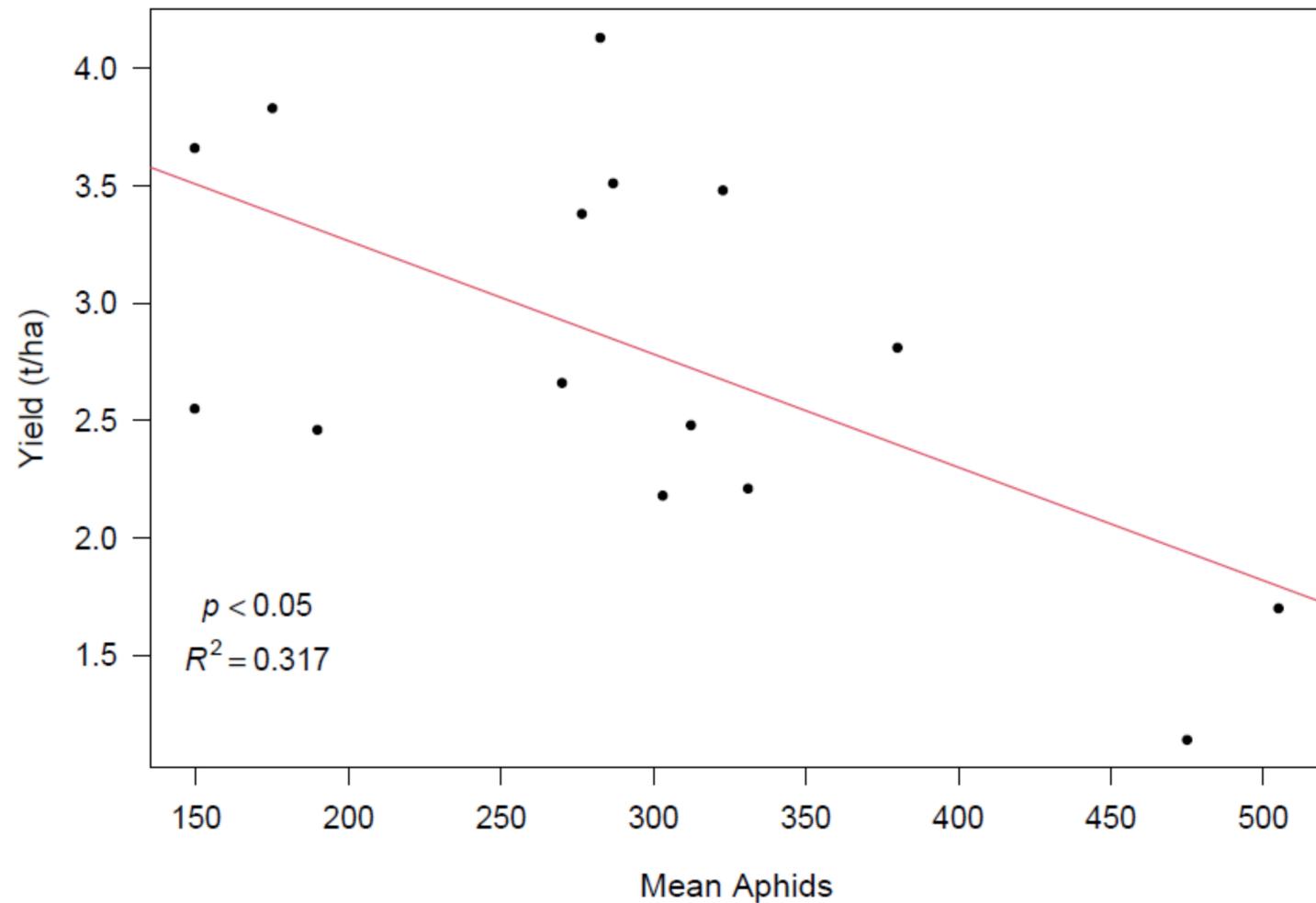


# Aphids



- Aphid numbers increased slightly with distance away from the mixed trap crop area in 2023.

# Aphids



- Yield correlated with aphid numbers.
- In previous work, pea yields increased, and aphid pressure was reduced, close to perennial flowering margins. [Perennial field margins with combined agronomical and ecological benefits for vegetable rotation schemes | AHDB](#)

# Bean Seed fly (*Delia platura*)



- Wide host range, affecting over 40 plant species, distributed widely across the world
- Flies are often associated with soils containing high levels of organic material such as farmyard manure and plant debris
- They prefer recently cultivated soil
- Damage is seed and stem tunnelling by larvae
- Reduces establishment (up to 60% in worst cases) and plant growth

# 2019 to 2022 Survey in Yorkshire and Lincolnshire



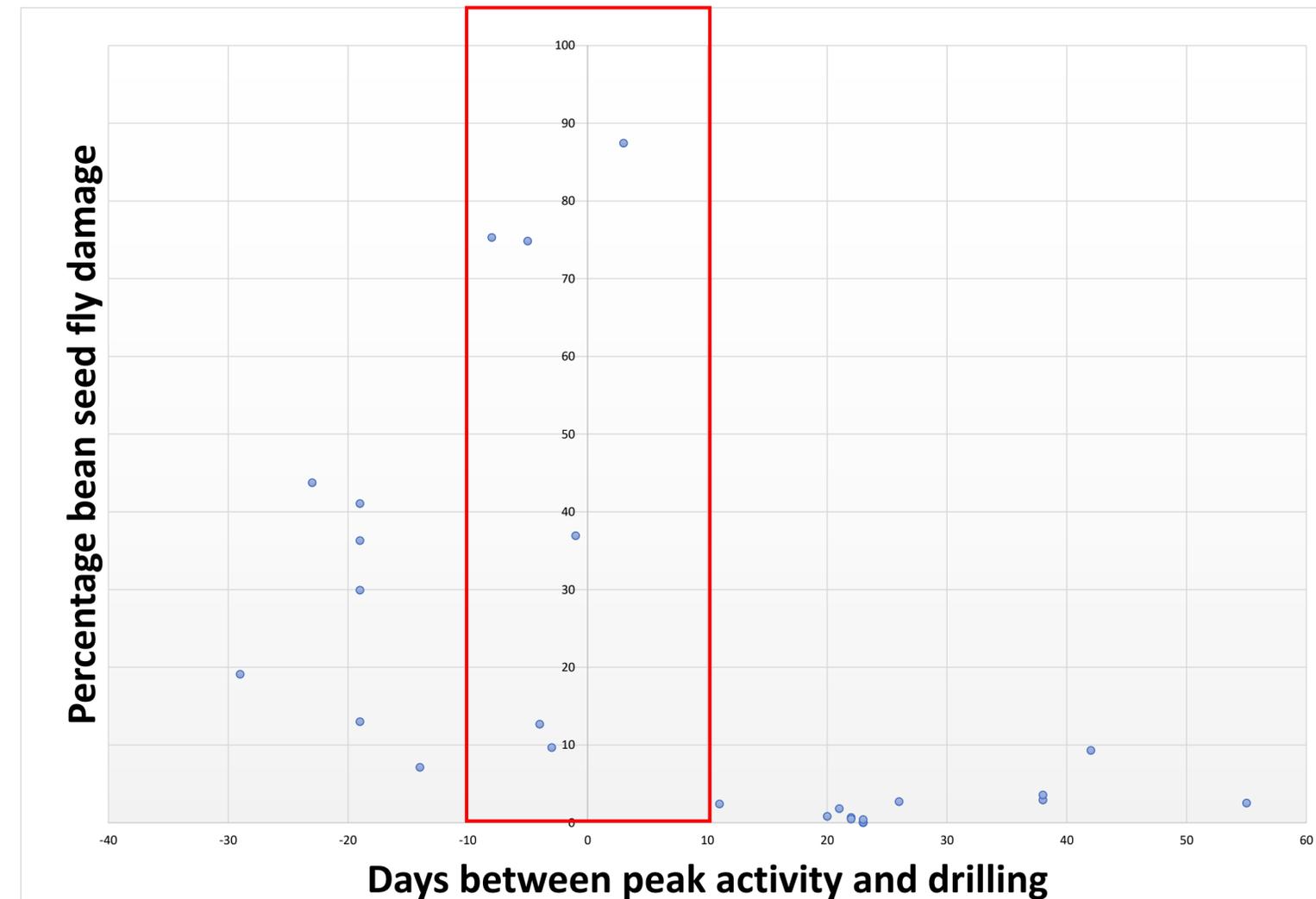
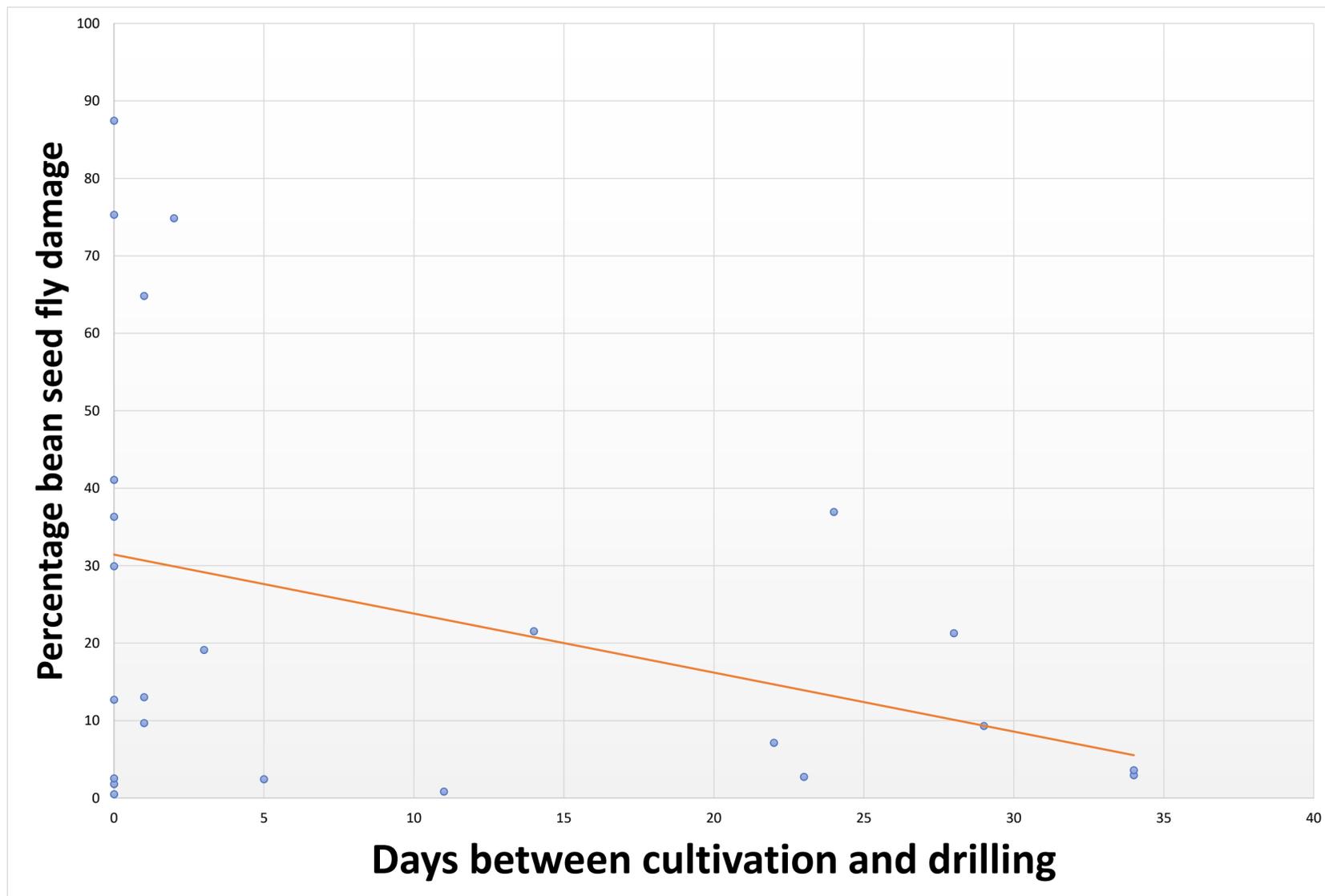
- Attractant traps to monitor peak pest presence (34 sites 2019 to 2022)
- Sowing timing both general and related to period following cultivation
- Cultivation techniques – drill type/ direct drilling/ min-till/ drilling depth
- Foot rot risk in BSF damaged plants
- Preliminary look at nematodes for control (*Steinernema feltiae*) at field scale



# Survey work indicated the following:



- There were differences in timing of peak adult activity in different regions – from mid-April to mid-June, and damage varied between years.
- The period 10 days before and after peak activity was high risk for drilling
- the period between cultivation and drilling seemed to influence damage levels

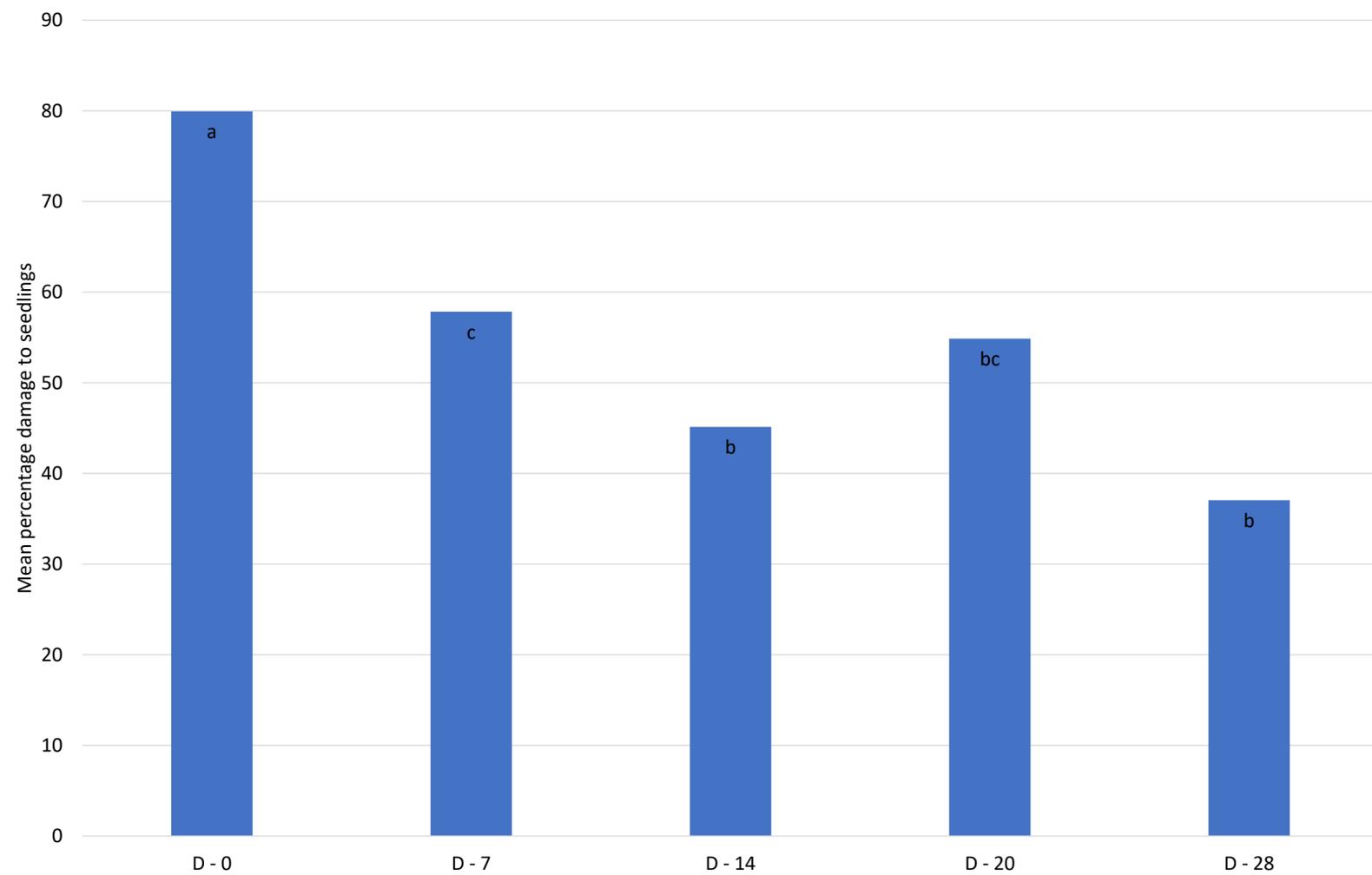


# Cultivation trials, Stubton and Yorkshire 2021



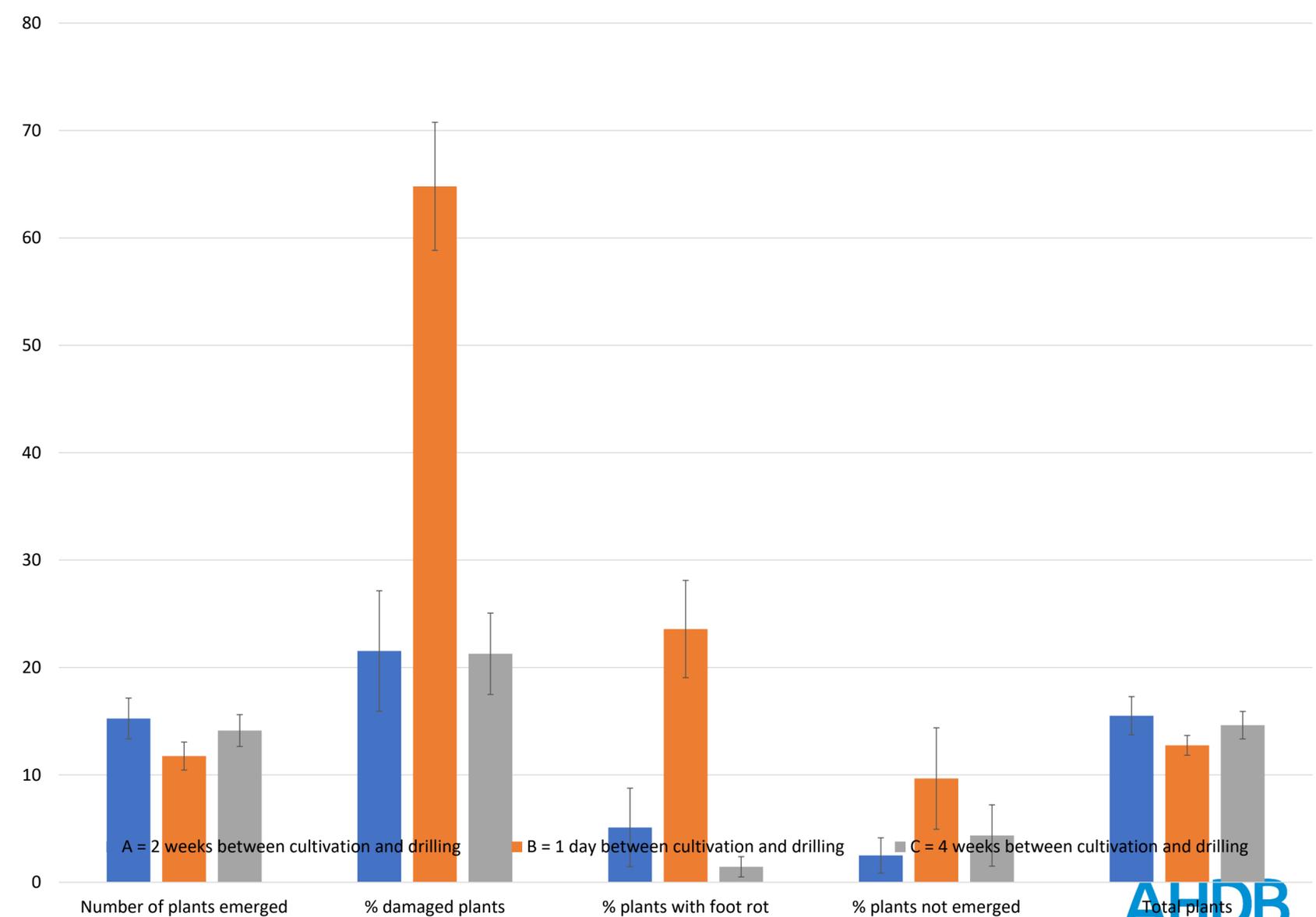
## Plot-scale trial

### Bean seed fly larval damage 2021



## Field-scale trial

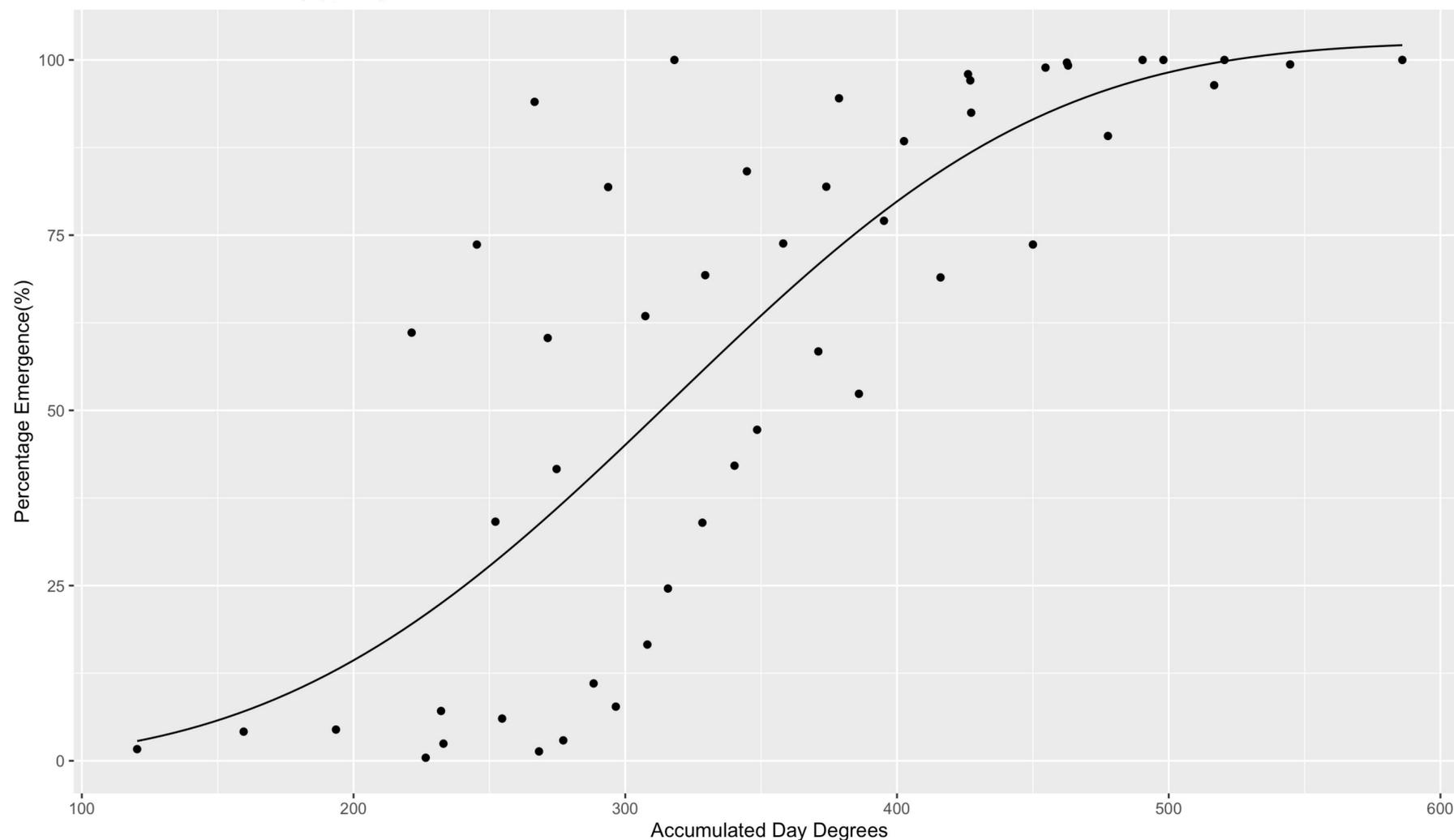
### Bean seed fly larval damage 2021



# Forecasting BSF damage



3 Parameter Weibull (Type 2) Model



Proportion of flies to emerge from the spring generation (%)	Accumulated Day-Degrees
10	178
25	241
50	313
75	384
90	442
100	523

# Monitoring and forecasting pea moth



## Pea Moth

Forecasting has now ended for 2024.

The table below gives predicted spray dates based on threshold catches in traps. For further information about pea moth or any other pest or disease, please call PGRO on 01780 782585.

It's important to monitor pea moth presence on your farm using pheromone traps to help us provide accurate spray forecasts or other management advice for you.



[www.pgro.org/pea-moth/](http://www.pgro.org/pea-moth/)

- One trap system per 50ha block of peas, placed in early May
- Threshold is 10 moths recorded on two consecutive occasions for combining peas
- Spray date is predicted by the PGRO model and available for all regions on the website



# Pea moth

 Pea Moth Model 

**Main**

Site List

Weather Data

About

Select threshold date:

2024-05-31

Select prediction date:

2024-11-02

**Run Model**

### Spray Dates by Region

Region	Date
Borders	24/06/2024
East	21/06/2024
East Midlands	20/06/2024
North	22/06/2024
South East	18/06/2024
South West	20/06/2024
Wales	23/06/2024
West Midlands	21/06/2024

### Filter Spray Dates by Site

Select a Site:

BEDFORD

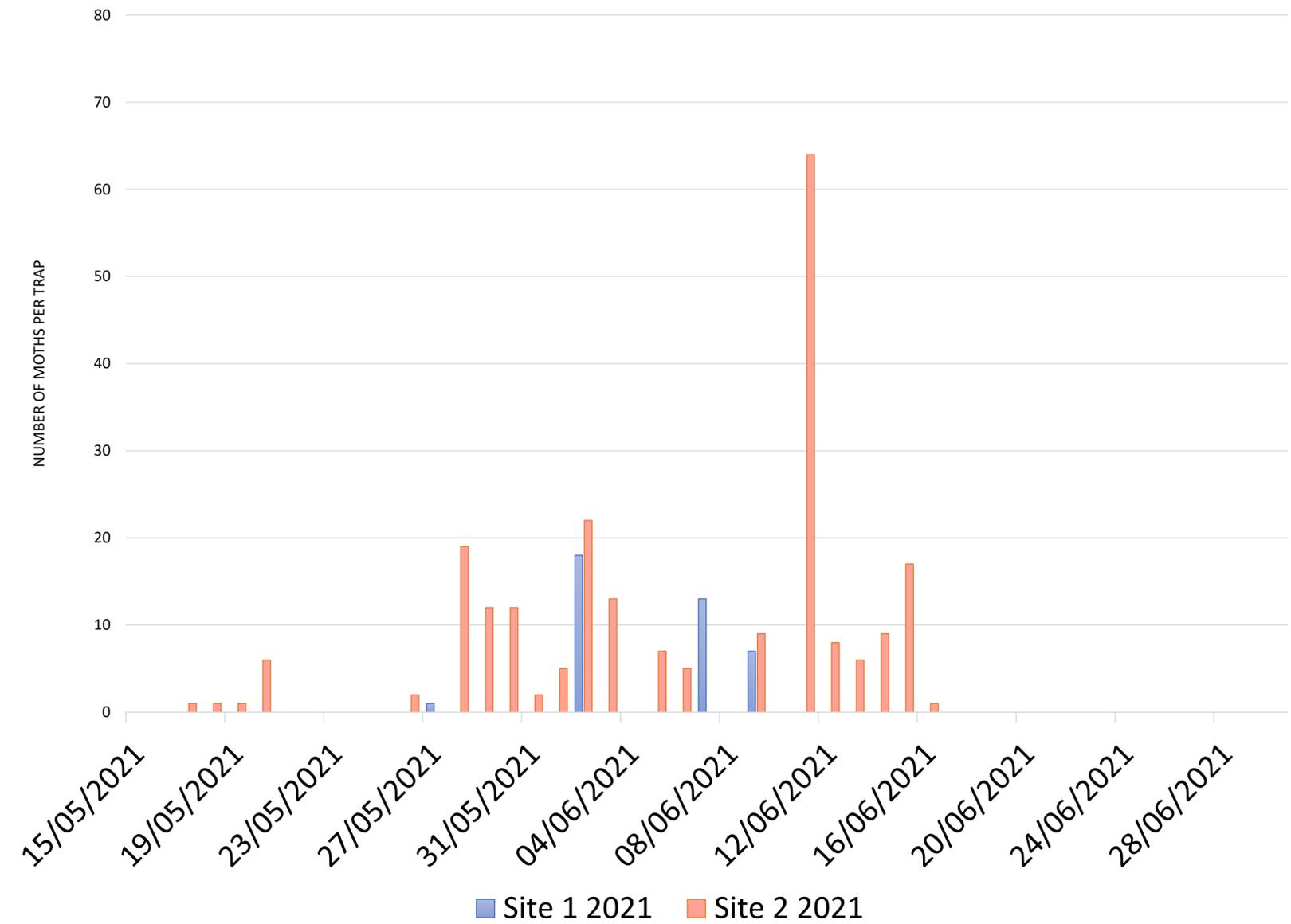
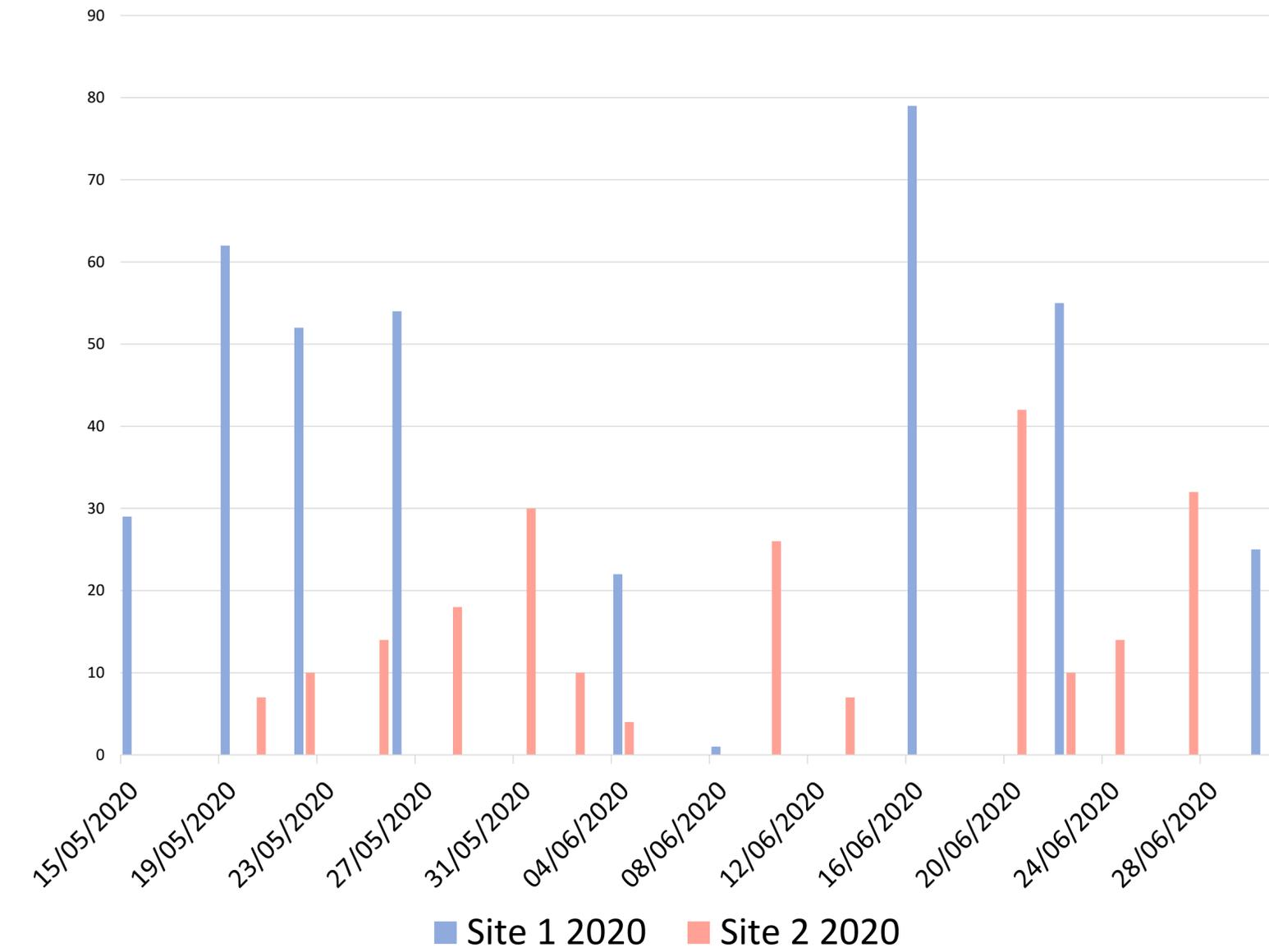
**Results for Site**

**Date of 100% egg development:**

21/06/2024

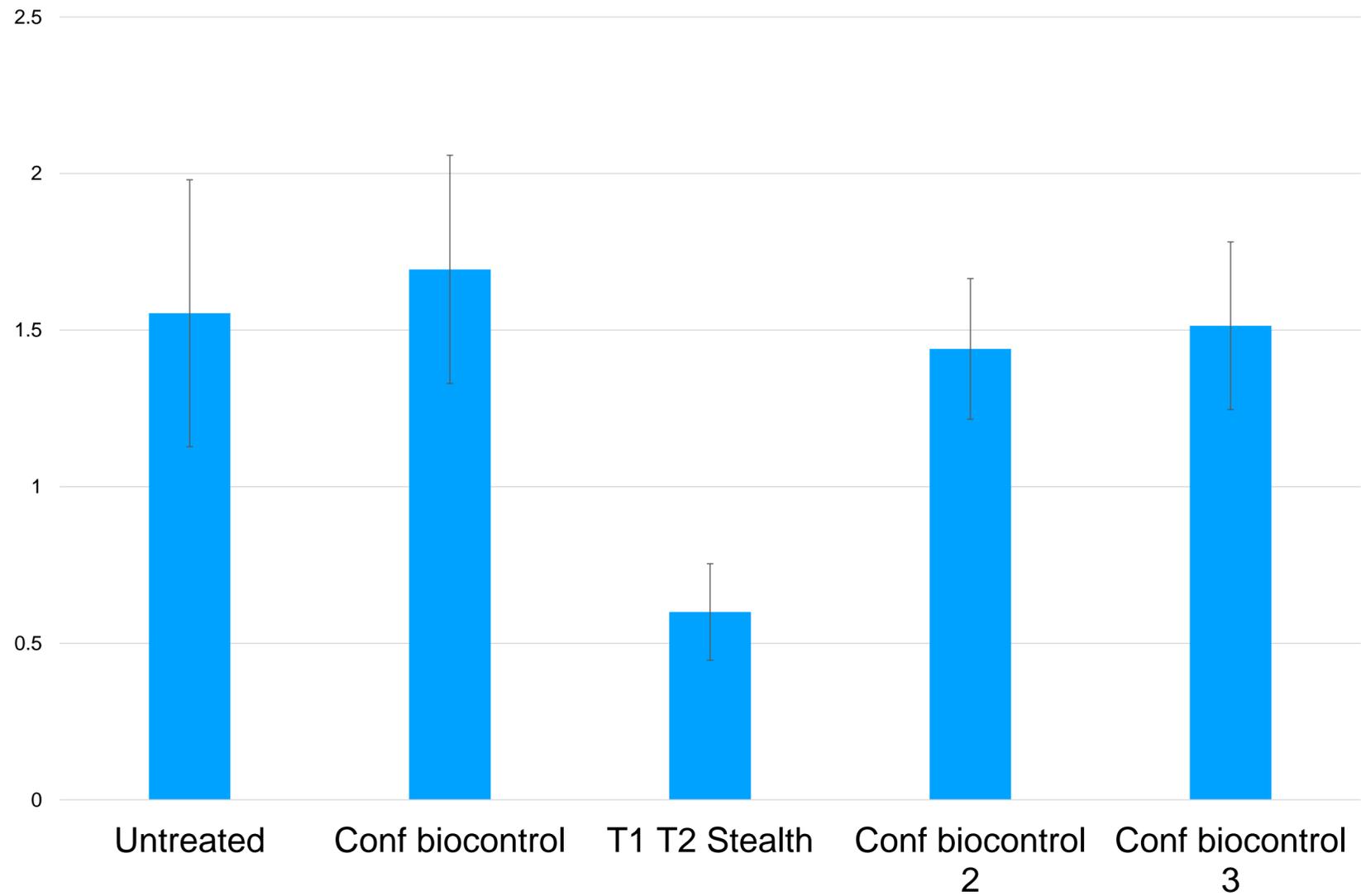


# Pea moth



# Pea moth

Percent pea moth damage 2024



- Pyrethroids still work when applied at the correct time



# Automatic camera trap



A screenshot of the FieldClimate software interface. The top header is green with the text 'FieldClimate by Pessi Instruments'. Below the header, there are navigation buttons: 'GALLERY', 'PREVIOUS', and 'NEXT'. A dropdown menu is open, showing 'CYDIA NIGRICANA'. To the right, there are filters for insect orders: 'Diptera 1', 'Hymenoptera 1', and 'Lepidoptera 122'. The main area displays a camera trap image of a yellow sticky trap with numerous purple moth larvae. Green bounding boxes are overlaid on the larvae, indicating automatic detection. A sidebar on the left lists 'CAMERA DEVICE' options: 'iScout', 'iScout Pests', 'iScout Glue Boards', 'iScout Seasons', 'Monitoring data', and 'Slideshow'. At the bottom of the image, there is a small text instruction: 'Press Ctrl and scroll on the image to zoom in and out.'





- 06 Dry seed
- 07 Shoot breaking through seed coat
- 08 Shoot growing towards soil surface; hypocotyl arch visible
- 09 Emergence: shoot breaks through soil surface

**PRINCIPAL GROWTH STAGE**  
**CODE 1: LEAF DEVELOPMENT**

- 11 First true leaf (with stipules) unfolded or first tendril developed
- 12 2 leaves (with stipules) unfolded or 2 tendrils developed
- 13 Stages continuous until
- 19 9 or more leaves (with stipules) unfolded or 9 or more tendrils developed



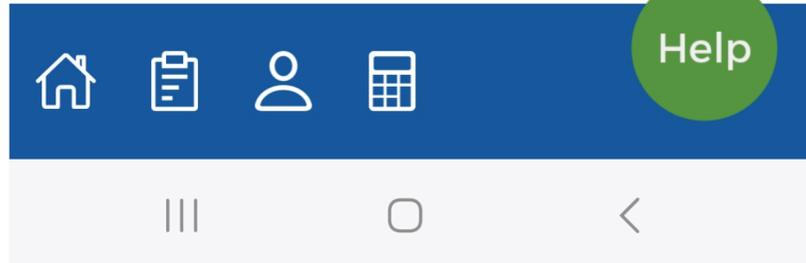
**SEED RATE** **LOSS IN WEIGHT**

$((215.0 \times 100.0) / 95.0) \times 100 / (100 - 5.0)$

**CALCULATED SEED RATE (kg/ha)**

**238.23**

**RESTART**





PGRO CROP MONITOR  
PESTS, DISEASES & DEFICIENCIES  
VINING PEAS

CREATE REPORT >

-  (DEROCERAS RETIC...
-  BEAN SEED FLY (DELIA PLATURA)
-  WIREWORM (AGRIOTES SPP.)
-  TORTRIX MOTH (CNEPHASIA ASSEC...
-  PEA THRIPS (KAKOTHRIPS PISIV...



PGRO CROP MONITOR  
GREEN AND RUNNER BEANS

CREATE REPORT >



Unable to identify the pest disease disorder or deficiency?

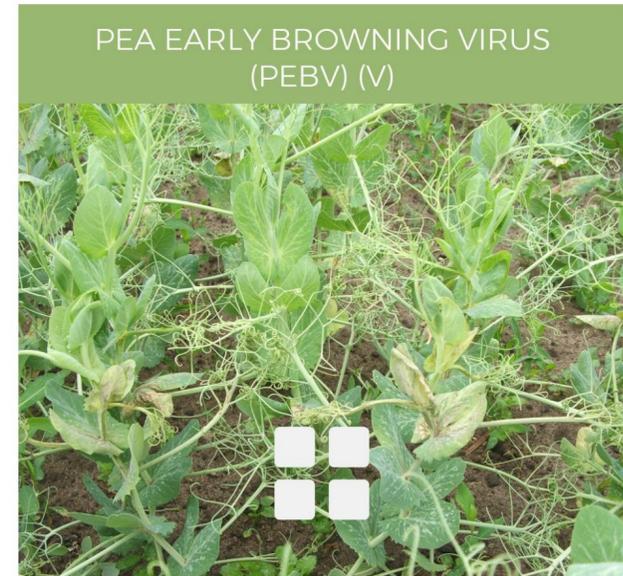
Please submit a report, with a photograph and the PGRO plant clinic will attempt to identify the problem.

Any information you can provid



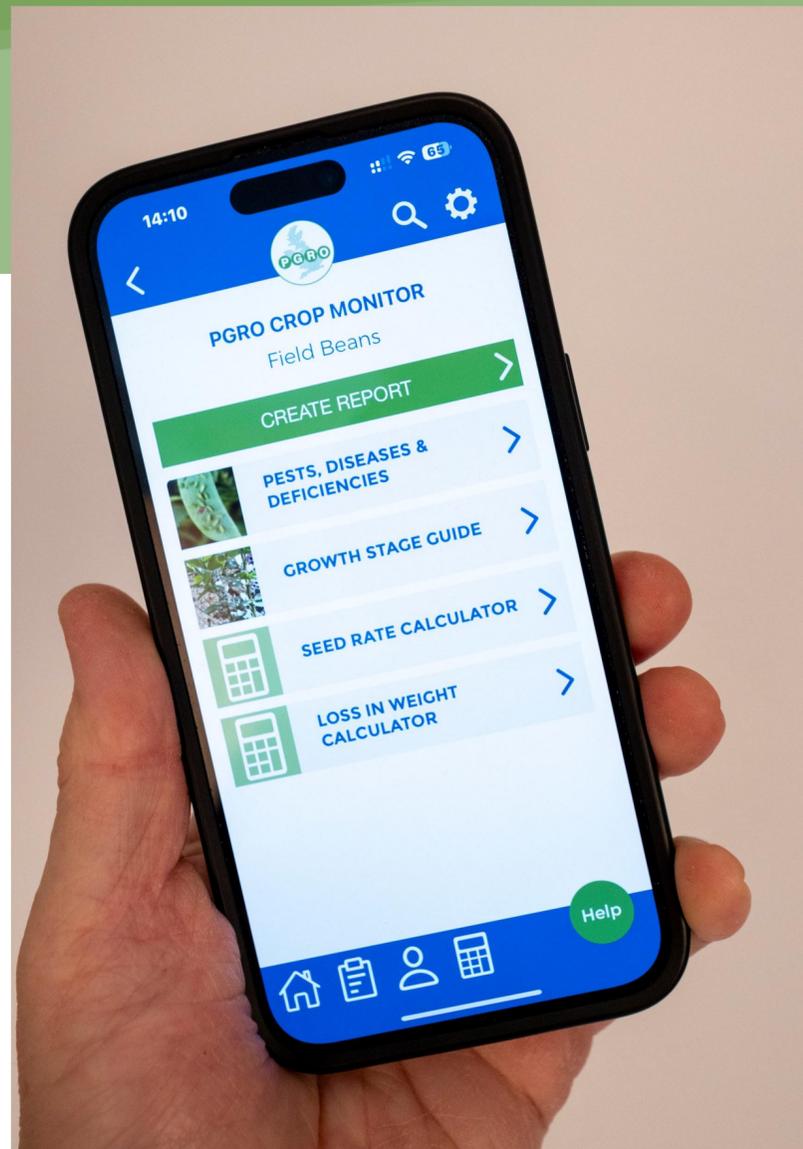
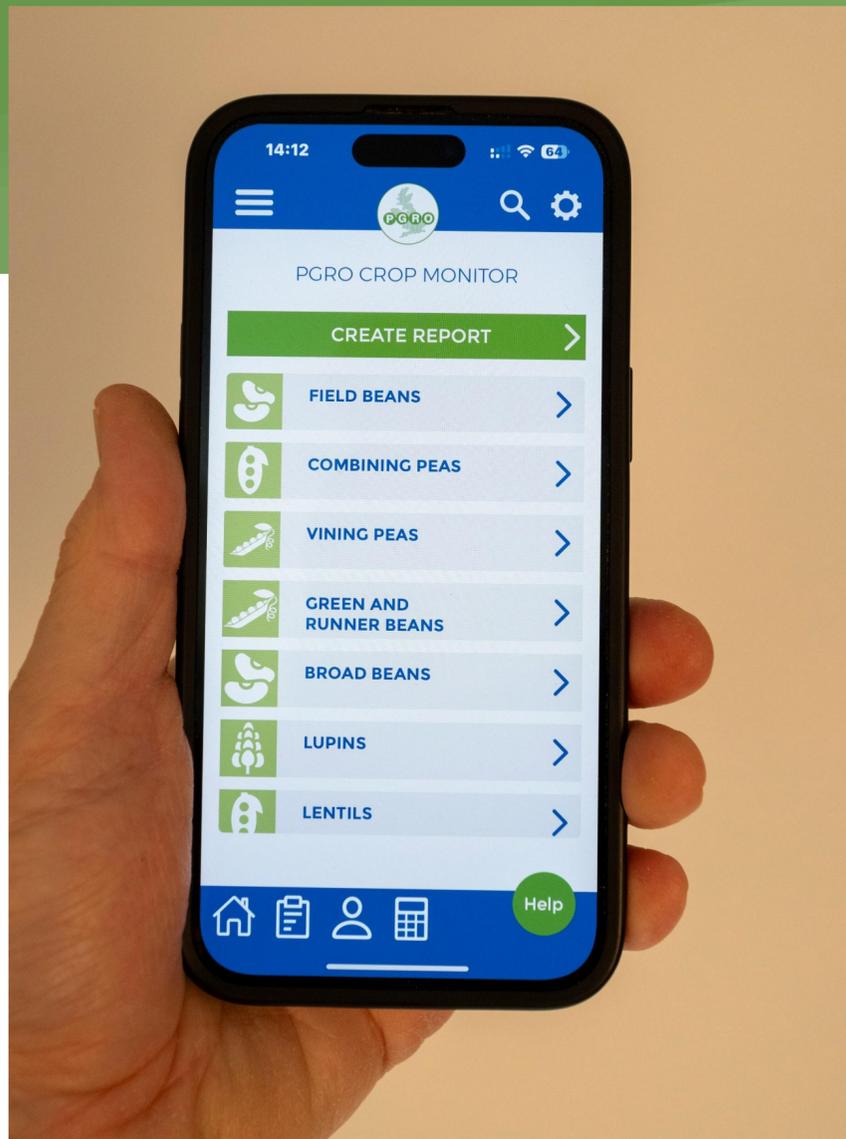
PGRO CROP MONITOR  
VINING PEAS

CREATE REPORT >



- Transmitted by the freeliving stubby root nematode (Trichodorus spp. and





- Thanks to everyone who has helped with trials.
- Thanks to Warwick Crop Centre for providing information for the bean seed fly model.
- For further information go to [www.pgro.org](http://www.pgro.org)
- [becky@pgro.org](mailto:becky@pgro.org)
- Or call 01780 782585
- Download the App from Google and Apple stores

# Jack & Allen



# Seed Rate Trials – Year 2 results

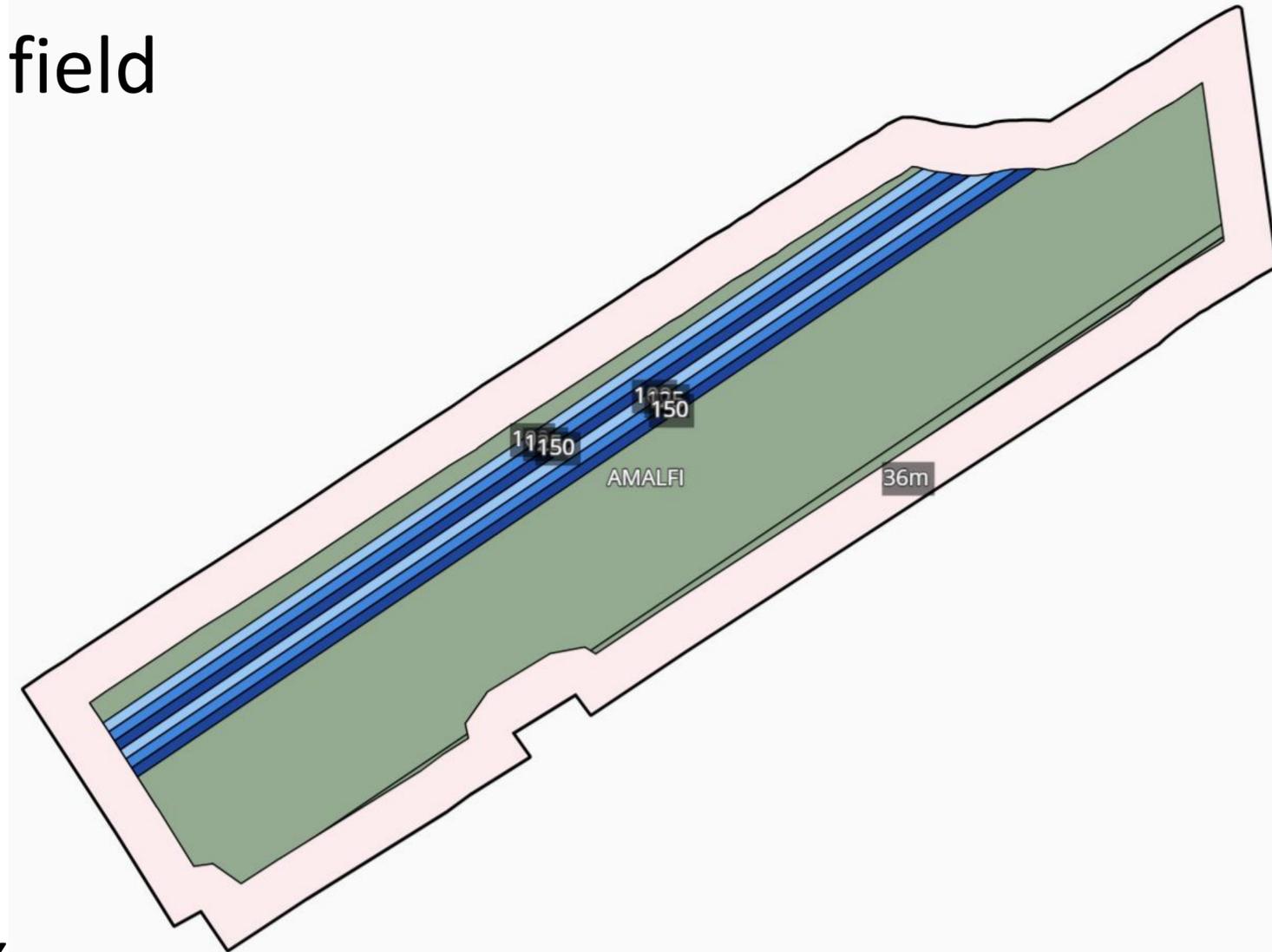
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- Aim was to see if increasing seed rates would have a benefit on yield
- Does it affect quality and TR?
- Does the extra seed cost cover the return?
- 5 trails over different periods in the season with different varieties
- Does it affect harvest timing?
- Does it aid harvesting?
- Does it supress weeds?

# Jack Buck Farms - Amalfi

- 3 different seed rates / replicated over field

- Field rate 140 kg/ha
- Increased 25% 175 kg/ha
- Increased 50% 210 kg/ha
- Drilled 19/04/2023
- Harvested 16/07/2024
- Rainfall 201mm approx





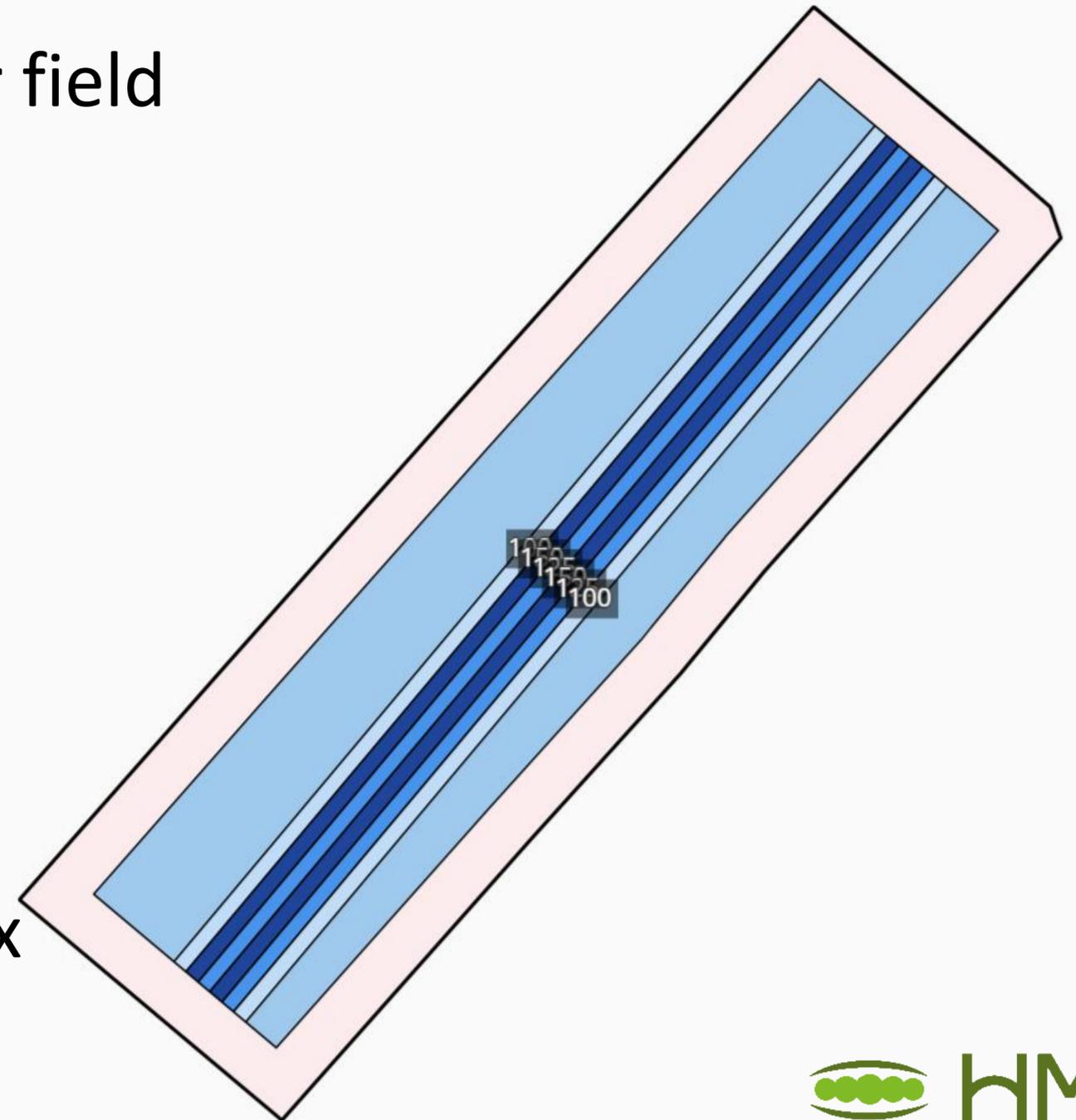
RATE %	Frozen Yield
100	5.83
125	5.25
150	6.00

FARM	RATE KG/HA	UNITS PER HA	RATE AS PERCENTAGE	PERCENTAGE CHANGE	FROZEN YIELD	RETURN FOR THAT FIELD PER TON	RETURN PER HECTARE	SEED COST PER HECTARE	BALANCE	EXTRA INCOME
JACK BUCK FARMS	140	13	100	0	5.83	£440	£2,565	£350	£2,215	0
JACK BUCK FARMS	175	16.25	125	-0.9	5.25	£440	£2,309	£438	£1,871	-£345
JACK BUCK FARMS	210	19.5	150	1.03	6.00	£440	£2,642	£525	£2,117	-£98

# J L Farms - Realm

- 3 different seed rates / replicated over field

• Field rate	280 kg/ha
• Increased 25%	350 kg/ha
• Increased 50%	420 kg/ha
• Drilled	02/05/2023
• Harvested	24/07/2023
• Rainfall	164mm approx



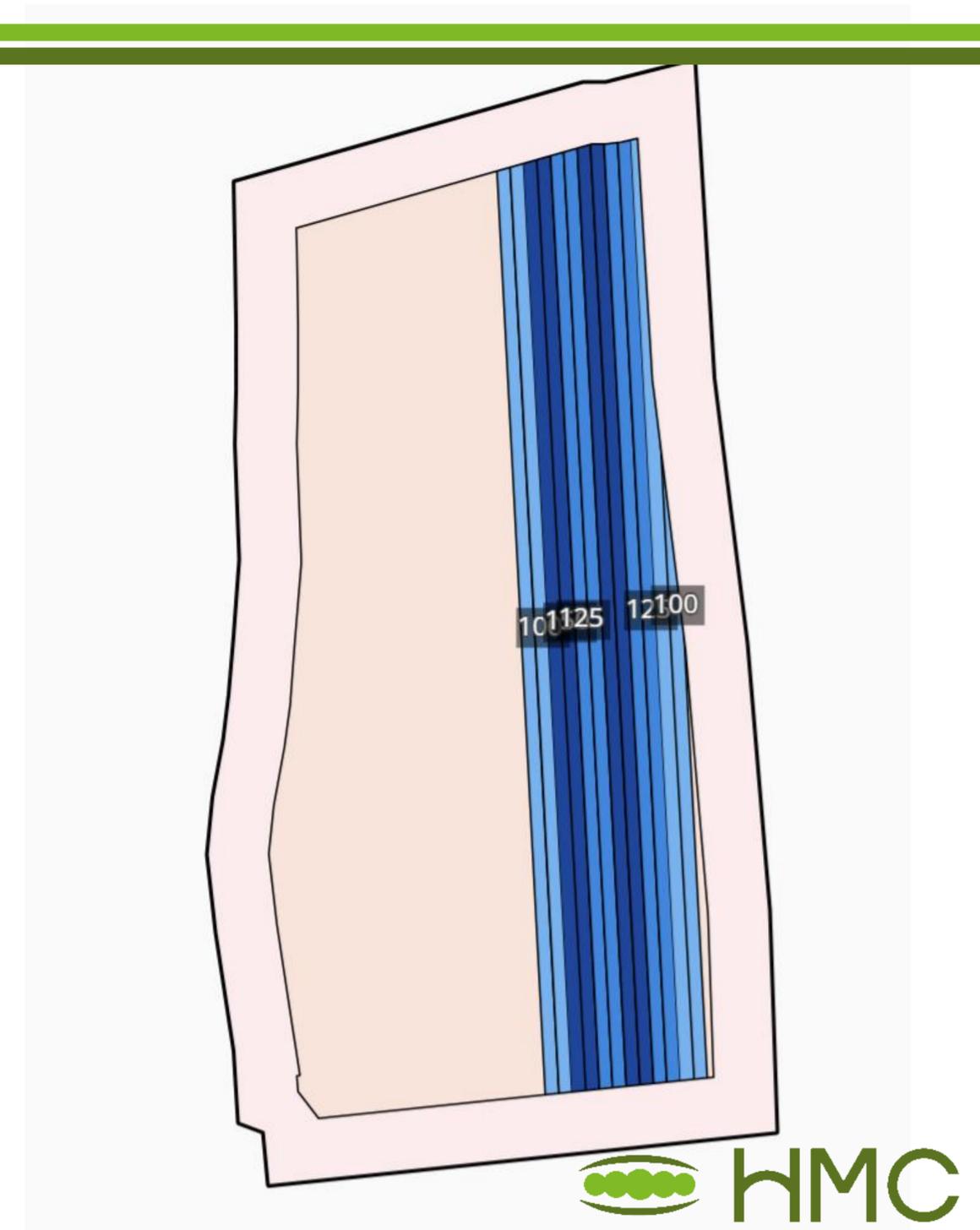


<b>RATE %</b>	<b>Frozen Yield</b>
100	5.29
125	6.38
150	5.77

FARM	RATE KG/HA	UNITS PER HA	RATE AS PERCENTAGE	PERCENTAGE CHANGE	FROZEN YIELD	RETURN FOR THAT FIELD PER TON	RETURN PER HECTARE	SEED COST PER HECTARE	BALANCE	EXTRA INCOME
J L FARMS	280	13	100	0	5.29	£490	£2,592	£281	£2,311	0
J L FARMS	350	16.25	125	20.64	6.38	£490	£3,126	£352	£2,774	£463
J L FARMS	420	19.5	150	9.14	5.77	£490	£2,827	£422	£2,405	£94

# A H Worths - Trophee

- 3 different seed rates / replicated over field
- Field rate 143 kg/ha
- Increased 25% 179 kg/ha
- Increased 50% 215 kg/ha
- Drilled 10/05/2023
- Harvested 25/07/2023
- Rainfall 172mm approx



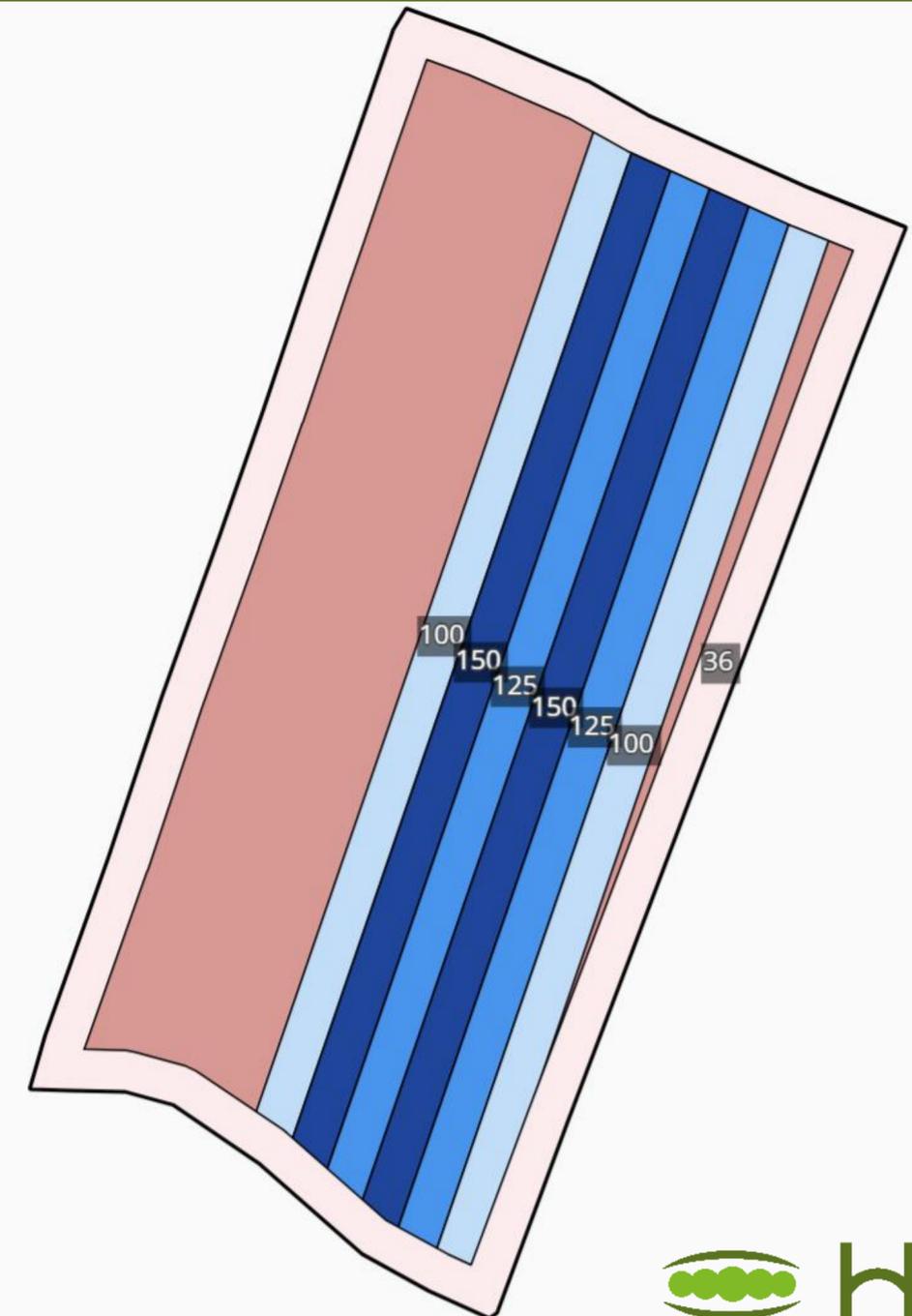


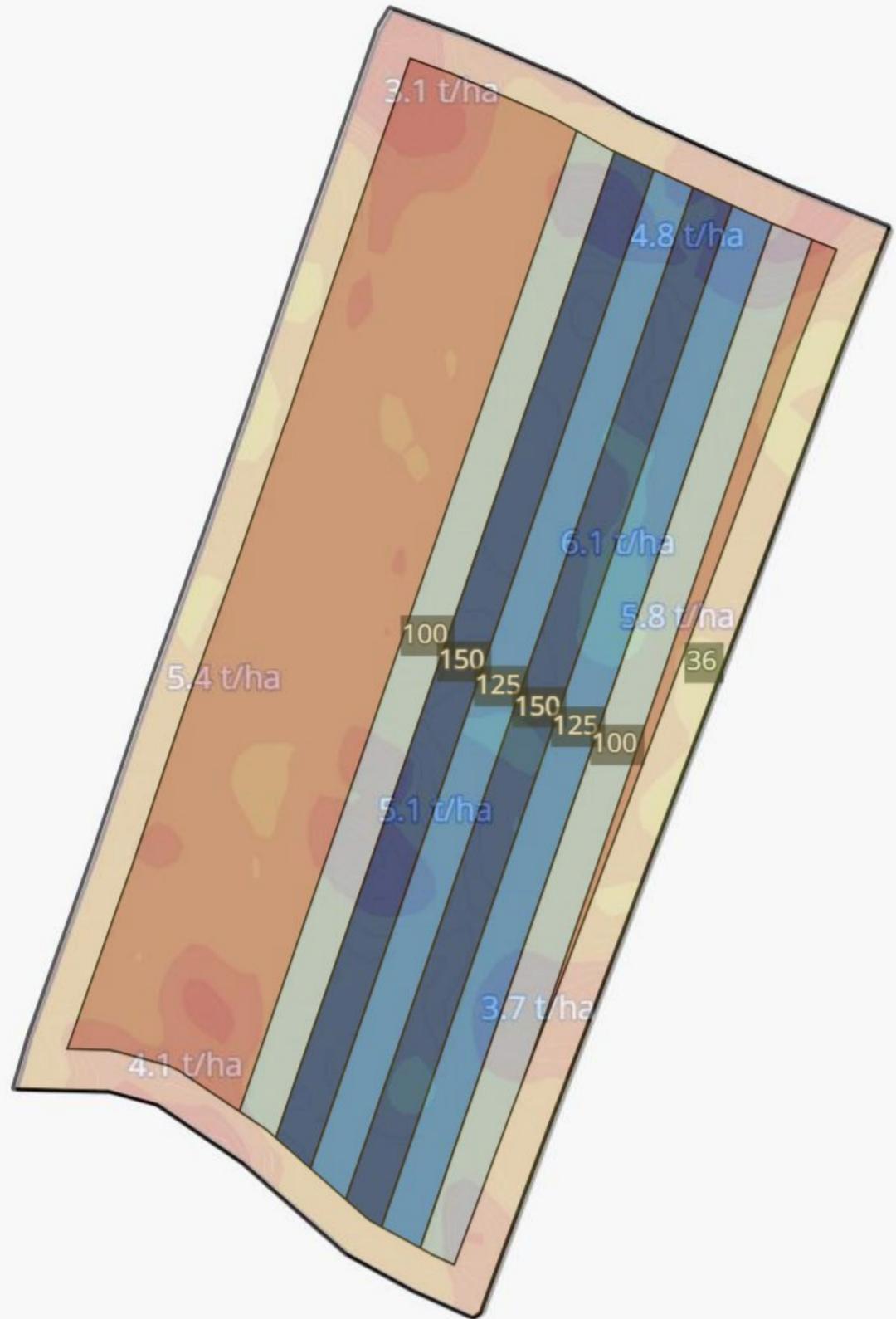
RATE %	Frozen Yield
100	7.22
125	8.71
150	7.88

FARM	RATE KG/HA	UNITS PER HA	RATE AS PERCENTAGE	PERCENTAGE CHANGE	FROZEN YIELD	RETURN FOR THAT FIELD PER TON	RETURN PER HECTARE	SEED COST PER HECTARE	BALANCE	EXTRA INCOME
A H WORTH	143	13	100	0	6.94	£640	£4,442	£358	£4,084	0
A H WORTH	179	16.25	125	15.43	8.01	£640	£5,126	£448	£4,678	£595
A H WORTH	215	19.5	150	11.42	7.73	£640	£4,947	£538	£4,409	£326

# Caley Farms - OASIS

- 3 different seed rates / replicated over field
- Field rate 295 kg/ha
- Increased 25% 369 kg/ha
- Increased 50% 443 kg/ha
- Drilled 21/05/2024
- Harvested 07/08/2024
- Rainfall 126mm approx



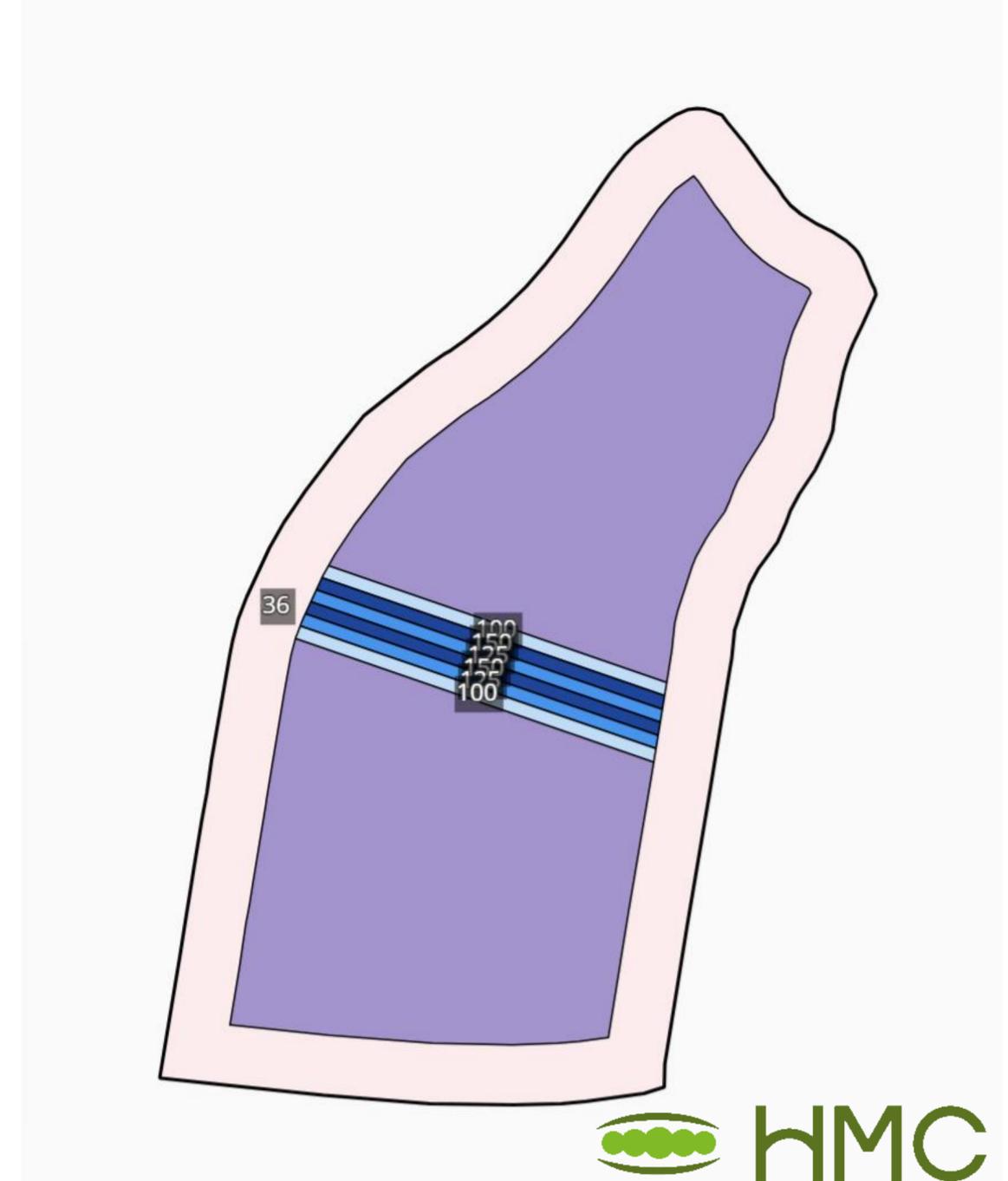


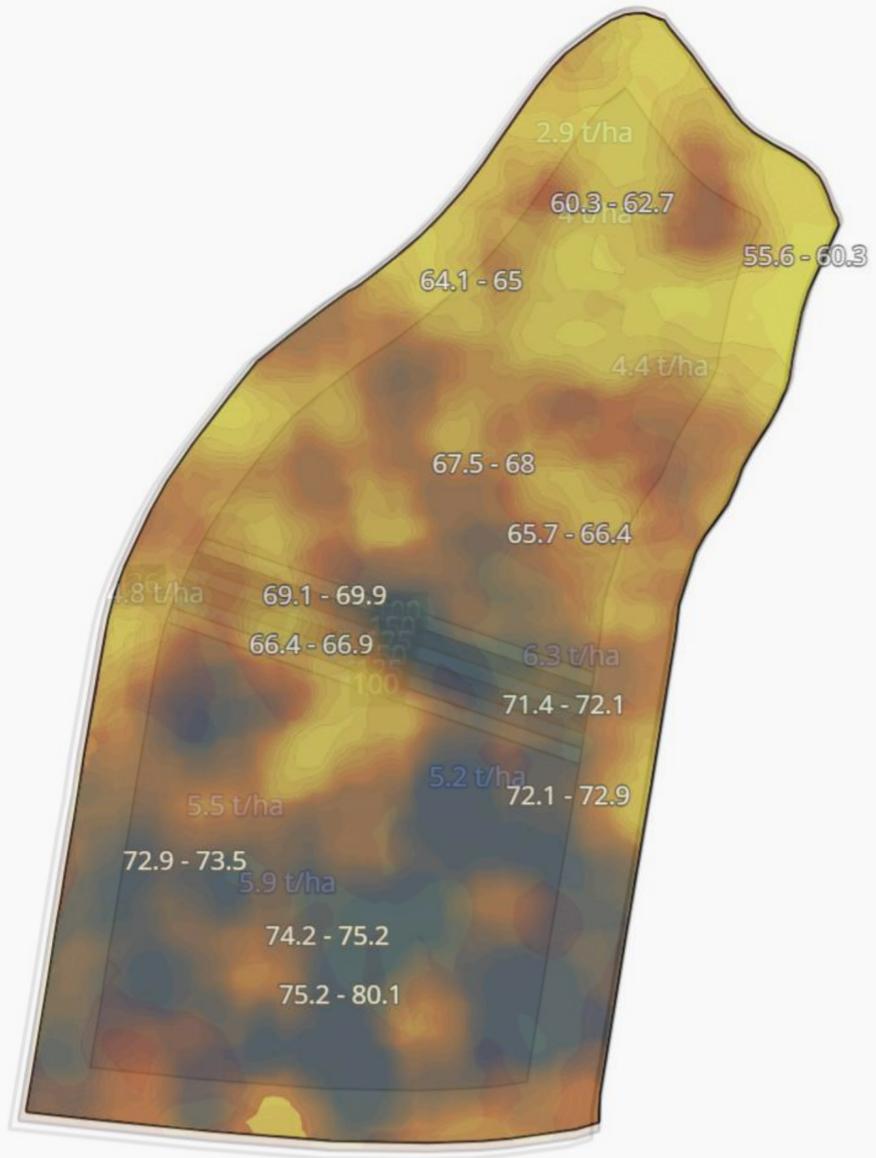
RATE %	Frozen Yield
100	6.71
125	6.91
150	6.91

FARM	RATE KG/HA	UNITS PER HA	RATE AS PERCENTAGE	PERCENTAGE CHANGE	FROZEN YIELD	RETURN FOR THAT FIELD PER TON	RETURN PER HECTARE	SEED COST PER HECTARE	BALANCE	EXTRA INCOME
CALEY FARMS	295	13	100	0	6.71	£490	£3,288	£296	£2,992	0
CALEY FARMS	369	16.25	125	2.93	6.91	£490	£3,386	£371	£3,015	£23
CALEY FARMS	443	19.5	150	2.93	6.91	£490	£3,386	£445	£2,941	-£51

# Caudwell Farms - Naches

- 3 different seed rates / replicated over field
- Field rate 220 kg/ha
- Increased 25% 275 kg/ha
- Increased 50% 330 kg/ha
- Drilled 01/06/2023
- Harvested 13/08/2023
- Rainfall 130mm approx





RATE %	Frozen Yield
100	7.51
125	8.58
150	7.53

FARM	RATE KG/HA	UNITS PER HA	RATE AS PERCENTAGE	PERCENTAGE CHANGE	FROZEN YIELD	RETURN FOR THAT FIELD PER TON	RETURN PER HECTARE	SEED COST PER HECTARE	BALANCE	EXTRA INCOME
CAUDWELL FARMS	220	13	100	0	7.51	£600	£4,506	£330	£4,176	0
CAUDWELL FARMS	275	16.25	125	14.19	8.58	£600	£5,148	£413	£4,735	£559
CAUDWELL FARMS	330	19.5	150	0.3	7.53	£600	£4,518	£495	£4,023	-£153

FARM	RATE KG/HA	UNITS PER HA	RATE AS PERCENTAGE	PERCENTAGE CHANGE	FROZEN YIELD	RETURN FOR THAT FIELD PER TON	RETURN PER HECTARE	SEED COST PER HECTARE	BALANCE	EXTRA INCOME
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FARM	RATE KG/HA	UNITS PER HA	RATE AS PERCENTAGE	PERCENTAGE CHANGE	FROZEN YIELD	RETURN FOR THAT FIELD PER TON	RETURN PER HECTARE	SEED COST PER HECTARE	BALANCE	EXTRA INCOME
JACK BUCK FARMS	140	13	100	0	5.83	£440	£2,565	£350	£2,215	0
JACK BUCK FARMS	175	16.25	125	-0.9	5.25	£440	£2,309	£438	£1,871	-£345
JACK BUCK FARMS	210	19.5	150	1.03	6.00	£440	£2,642	£525	£2,117	-£98

FARM	RATE KG/HA	UNITS PER HA	RATE AS PERCENTAGE	PERCENTAGE CHANGE	FROZEN YIELD	RETURN FOR THAT FIELD PER TON	RETURN PER HECTARE	SEED COST PER HECTARE	BALANCE	EXTRA INCOME
J L FARMS	280	13	100	0	5.29	£490	£2,592	£281	£2,311	0
J L FARMS	350	16.25	125	20.64	6.38	£490	£3,126	£352	£2,774	£463
J L FARMS	420	19.5	150	9.14	5.77	£490	£2,827	£422	£2,405	£94

FARM	RATE KG/HA	UNITS PER HA	RATE AS PERCENTAGE	PERCENTAGE CHANGE	FROZEN YIELD	RETURN FOR THAT FIELD PER TON	RETURN PER HECTARE	SEED COST PER HECTARE	BALANCE	EXTRA INCOME
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# Seed Rate Trials – Summary

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- 2024 saw the best performing results coming from 25% seed increase
- Only exception was JBF field which was extremely wet at harvest and was felt this season Amalfi didn't perform as expected
- 25% increase in seed averaged over all sites 10.4% increase in yield
- 50% increase in seed averaged over all sites 4.9% increase in yield
- Seed cost on 50% was not covered in 3/5 sites this year

# Seed Rate Trials – Average Units

---

- Up to 2022 HMC average seed rate was 11 units per ha
- 2023 this increased to 12 units per ha and seed rate trials saw 50% increase gave best results
- 2024 increased base rates again to 13 units per ha and seed rate trials saw 25% seed increase saw best results
- 2025 will do 14 units per as base rate

# Seed Rate Trials – Plant Counts

		93% Germination						
		036 HAM						
Expected plant counts Ms		121	151	181	151	181	121	
Actual Ms		100	117	160	133	167	110	Average
Difference		-17.36%	-22.74%	-11.60%	-11.70%	-7.92%	-9.09%	-13.40%
		92% Germination						
		069 HRL						
Expected plant counts Ms		120	150	179	150	179	120	
Actual Ms		103	133	150	137	160	100	Average
Difference		-13.89%	-11.11%	-16.20%	-8.89%	-10.61%	-16.67%	-12.90%
		95% Germination						
		085 HTR						
Expected plant counts		124	154	185	154	185	124	
Actual		87	120	133	123	140	93	Average
Difference		-30.11%	-22.08%	-27.93%	-19.91%	-24.32%	-24.73%	-24.85%
		97% Germination						
		115 HOS						
Expected plant counts		126	158	189	158	189	126	
Actual		77	93	103	100	113	73	Average
Difference		-39.15%	-40.93%	-45.33%	-36.71%	-40.04%	-41.80%	-40.66%
		91% Germination						
		155 HNC						
Expected plant counts		118	148	177	148	177	118	
Actual		93	103	127	110	123	73	Average
Difference		-20.90%	-30.18%	-28.44%	-25.68%	-30.32%	-37.85%	-28.89%

- Average seed loss 24%
- Why is this?
- Soil conditions?
- Loss of seed treatments?
- Soil Temp?
- Soil Type?
- Cultivation/Drilling Techniques?

# Seed Rate Trials – Conclusion

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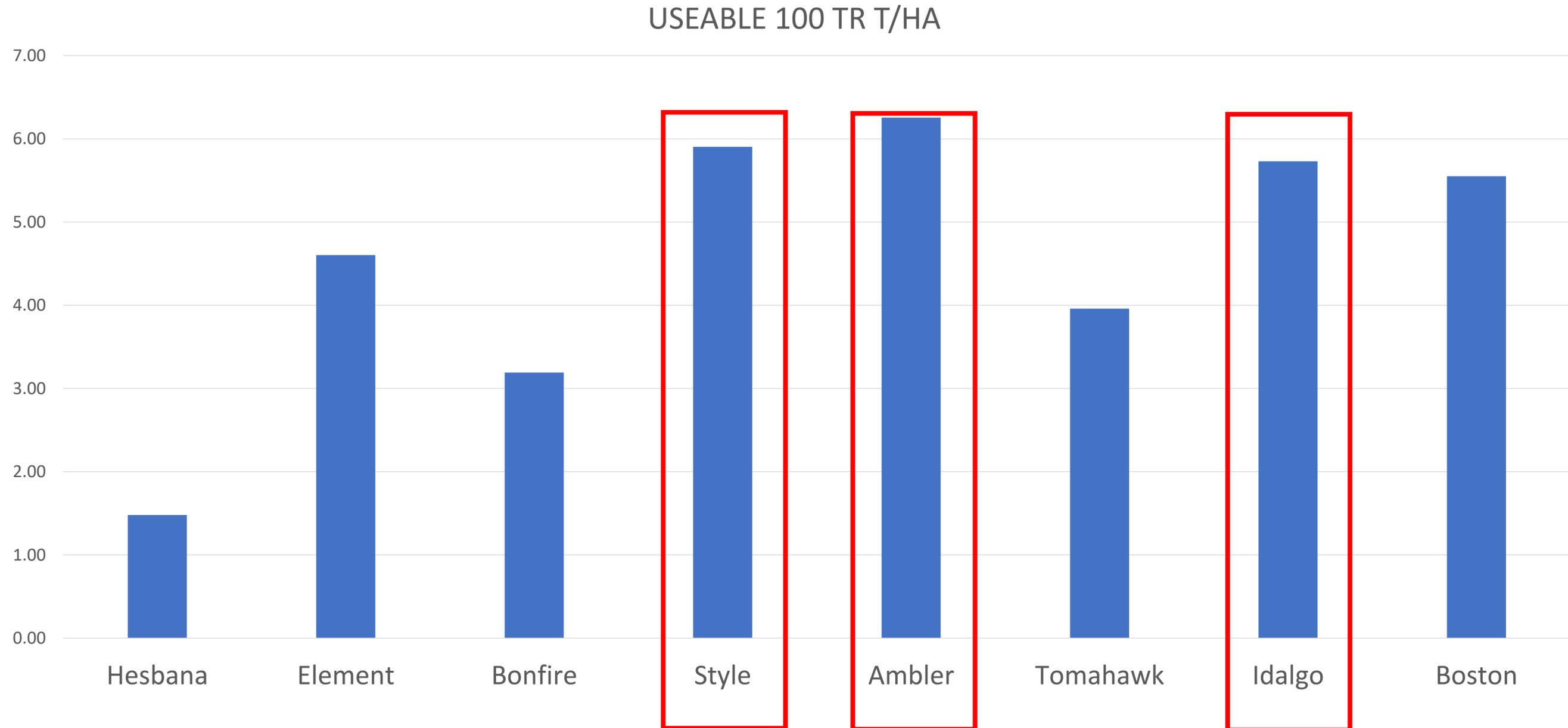
- 19.5 units too high to be economically sustainable
- 15 - 16 units per ha potentially ideal
- Thicker crops aided harvestability
- Different varieties may need different densities
- Loosing 24% of drilled seed on average
- 2025 will be year 3 of trials, continue with 2024 Unit/Ha rate
- 2025 More input and help from PGRO

# Variety Trials

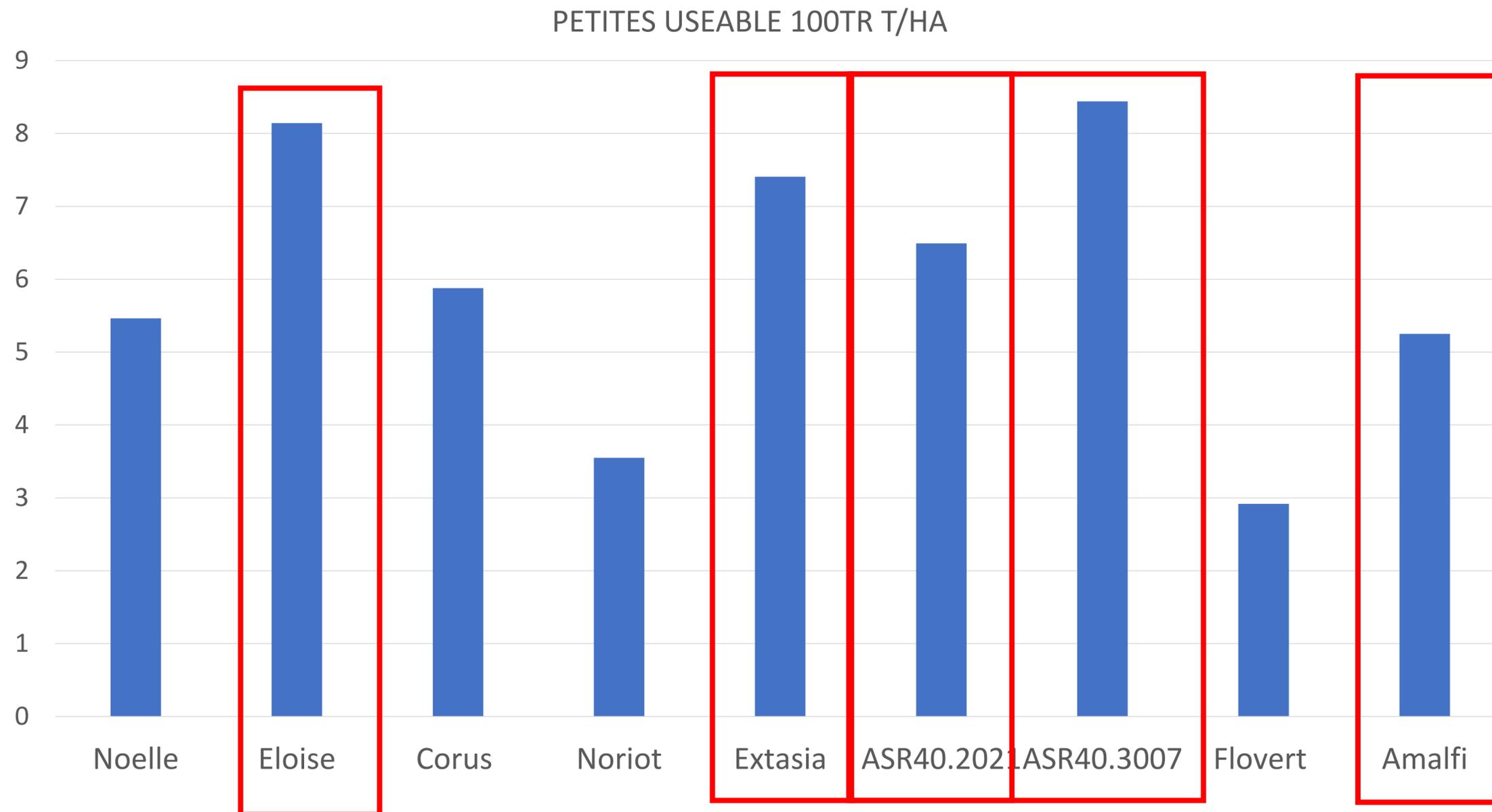
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- 18 variety trials in total
- 7 earlies to identify if we can find a better variety to Tomahawk for the land in Norfolk
- 8 petits made up of some new varieties and others that are being successfully grown in other parts of the country.
- 3 lates to see if we can condense the drilling programme.

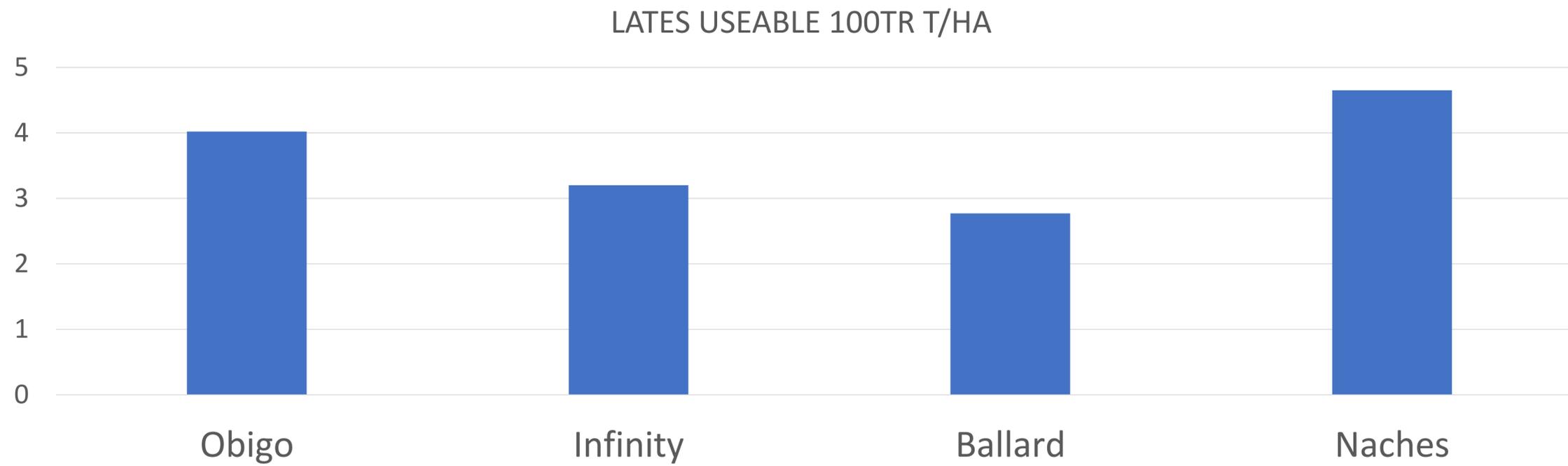
# Variety Trials Results



# Variety Trials Results



# Variety Trials Results



# BREAK



# Ben Hockridge





RESPONSIBLE  
SUSTAINABLE  
KNOWLEDGEABLE

## PeaSat

Yield Prediction Service

05/02/2025

[www.adas.co.uk](http://www.adas.co.uk)



# The Challenge



- Narrow harvest window - crop is only at optimum quality for 1 day of its 12 week growing cycle!
- Crop that cannot be harvested & processed within time requirement is 'bypassed' (wasted)
- HMC budget for 7% bypassed crop
- Across the UK market, 7% bypass is equivalent to 11,000 t/yr worth £5.5 million to grower (£11 million retail value)



# How do we address the challenge



## What we need to do

- Manage an even supply of crop into the factory
- Forecast harvest date
- Forecast harvest volumes

## Next step

- How can satellite data be used to help predict yield



# Data collection



- Field parcels
  - Variety
  - Sowing date
  - Harvest data
  - Yield
- Weather data
  - Temperature used to calculate heat units
  - Accumulated heat units used as a proxy for crop maturity

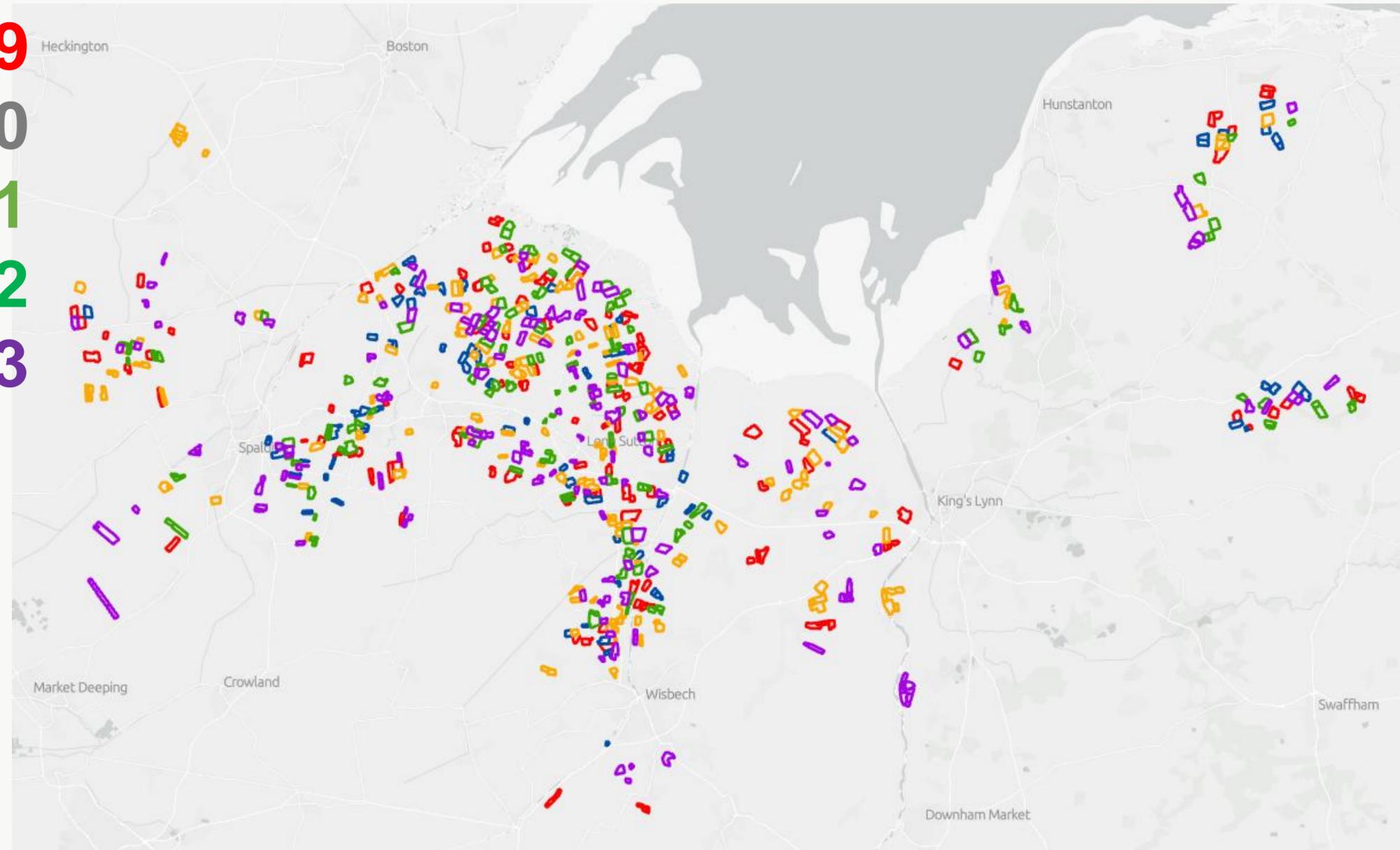
**2019**

**2020**

**2021**

**2022**

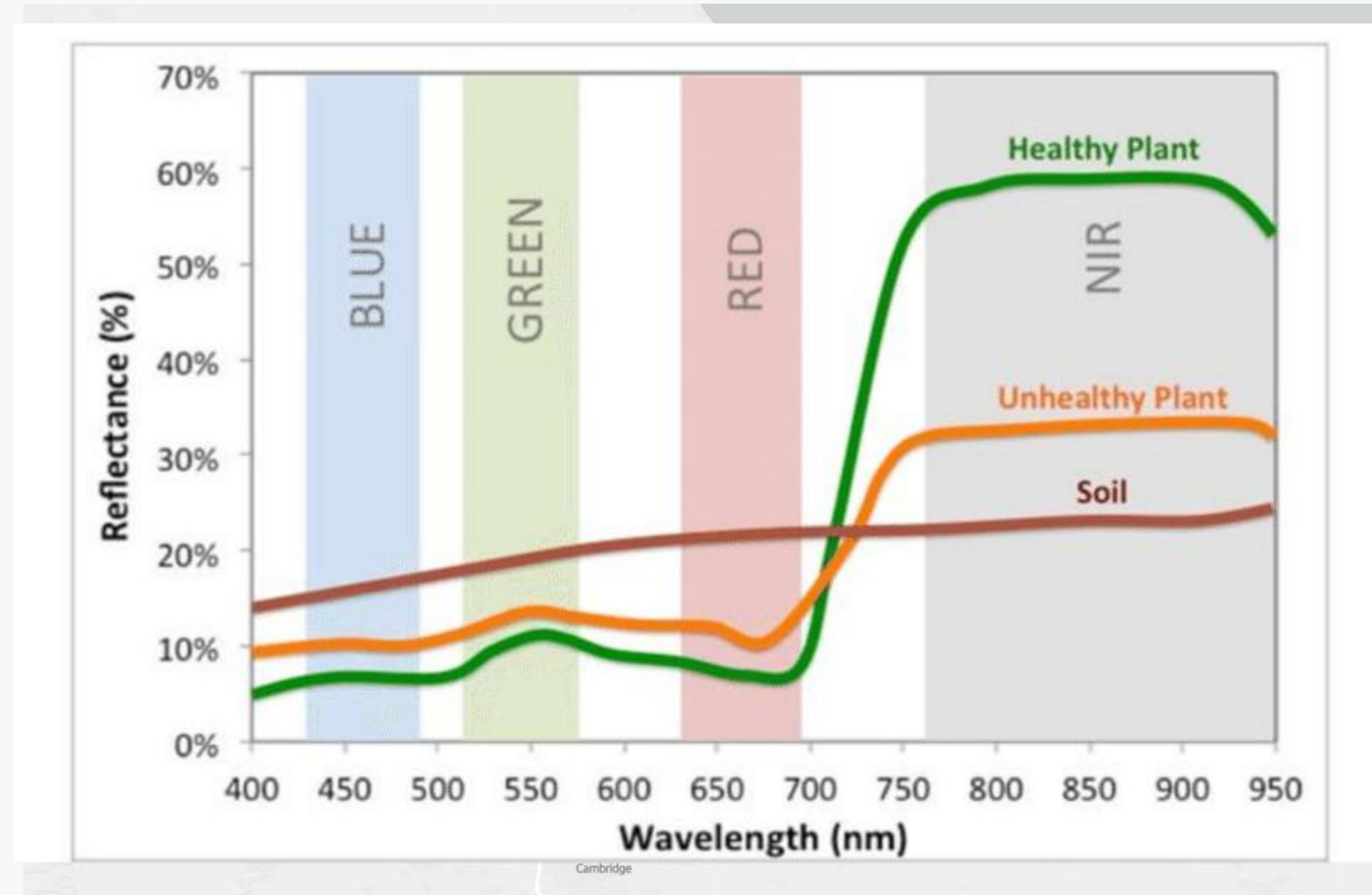
**2023**



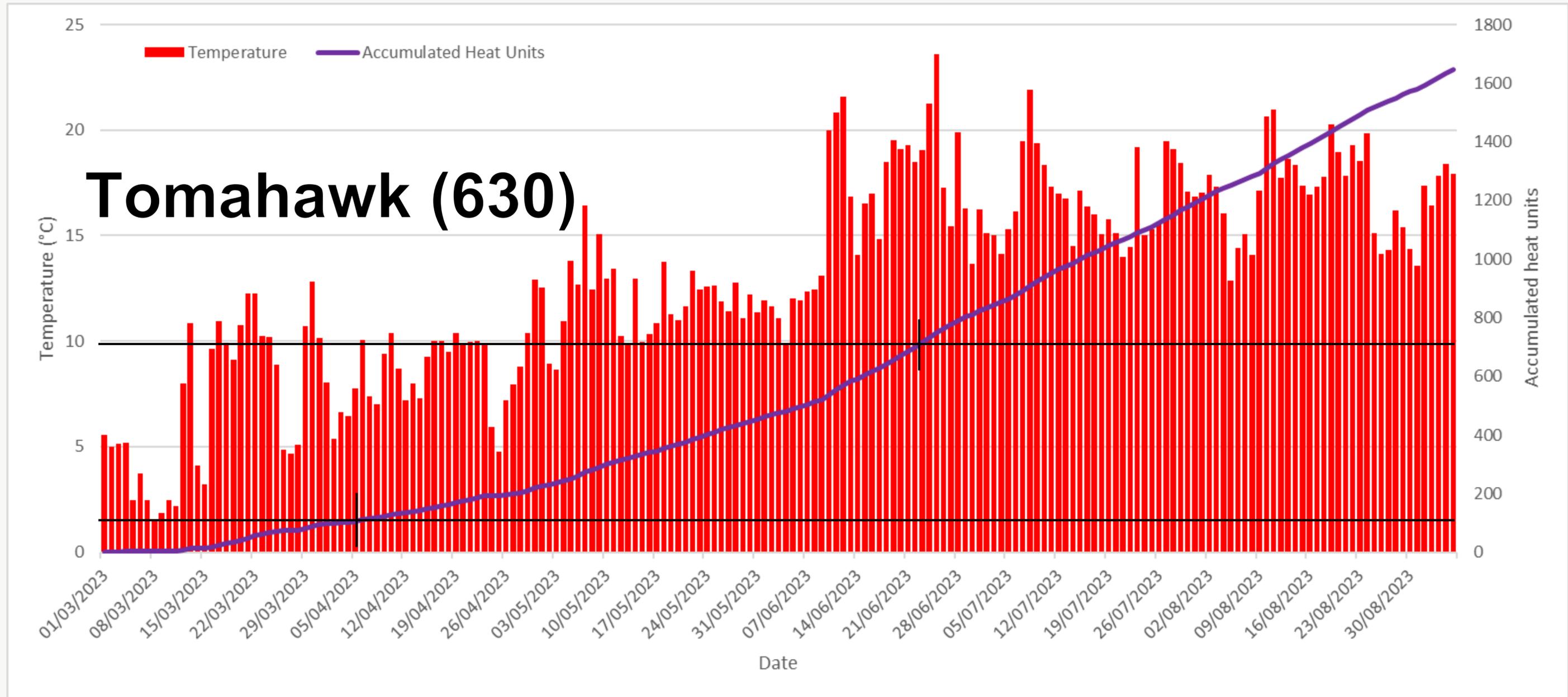
# Data collection



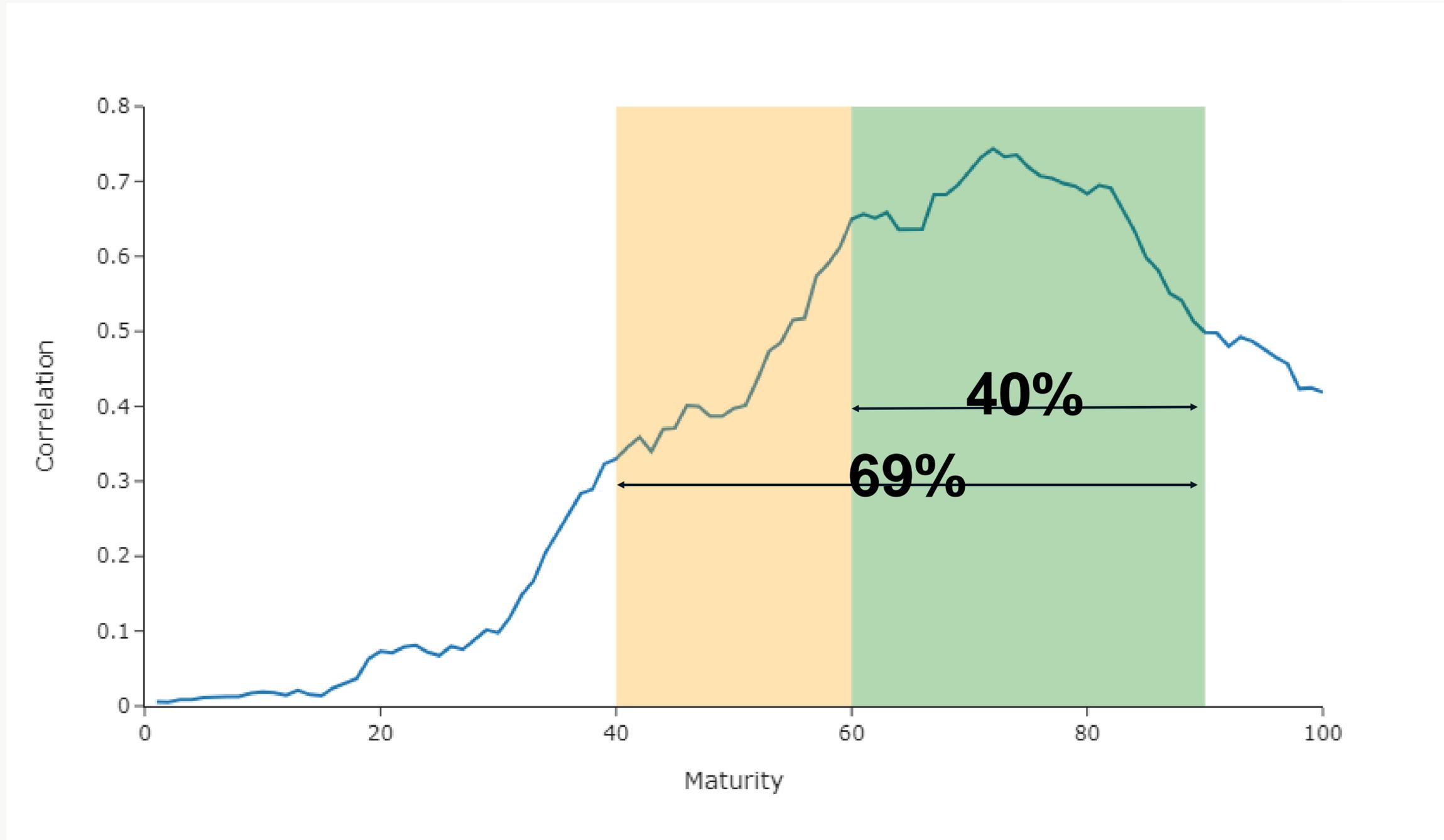
- Field parcels
  - Variety
  - Sowing date
  - Harvest data
  - Yield
- Weather data
  - Temperature used to calculate heat units
  - Accumulated heat units used as a proxy for crop maturity
- Satellite image searches



# Heat units



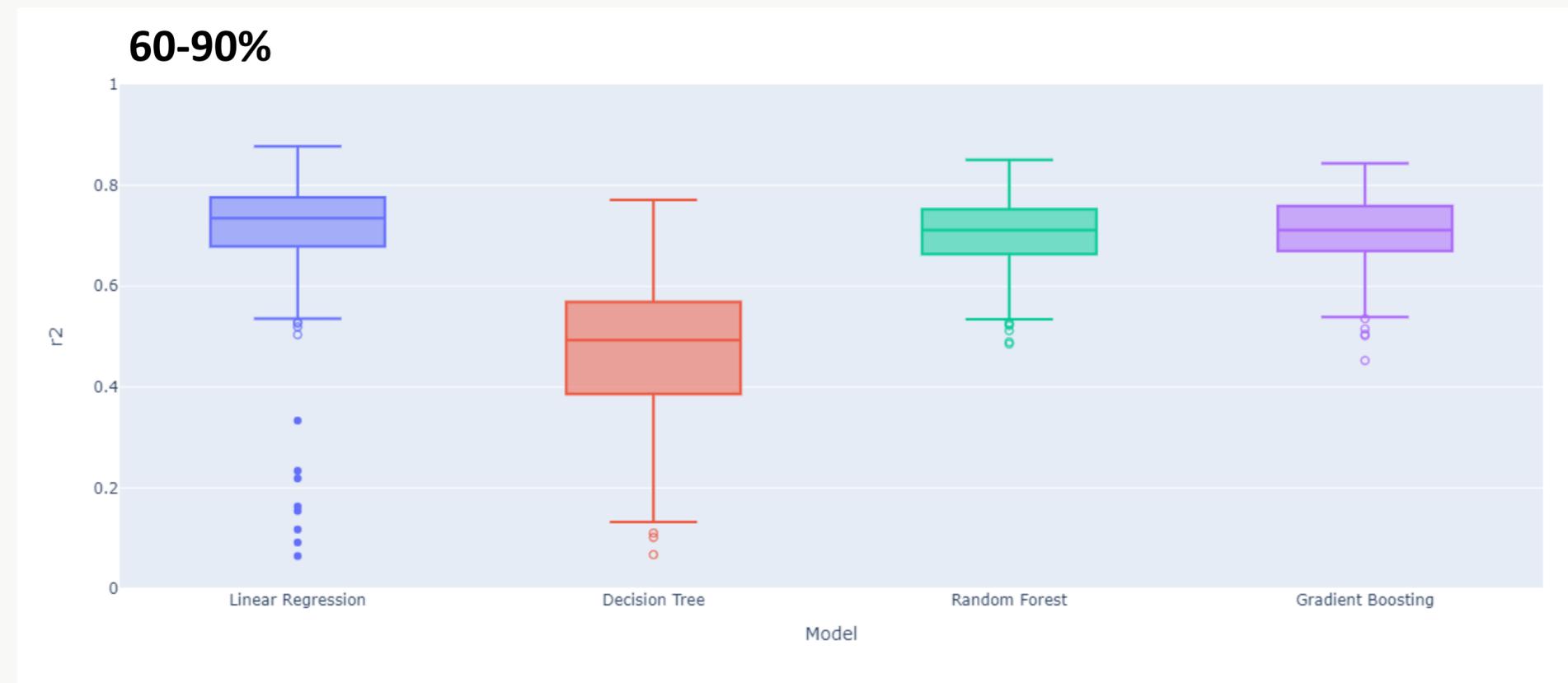
# Data explore



# Model development

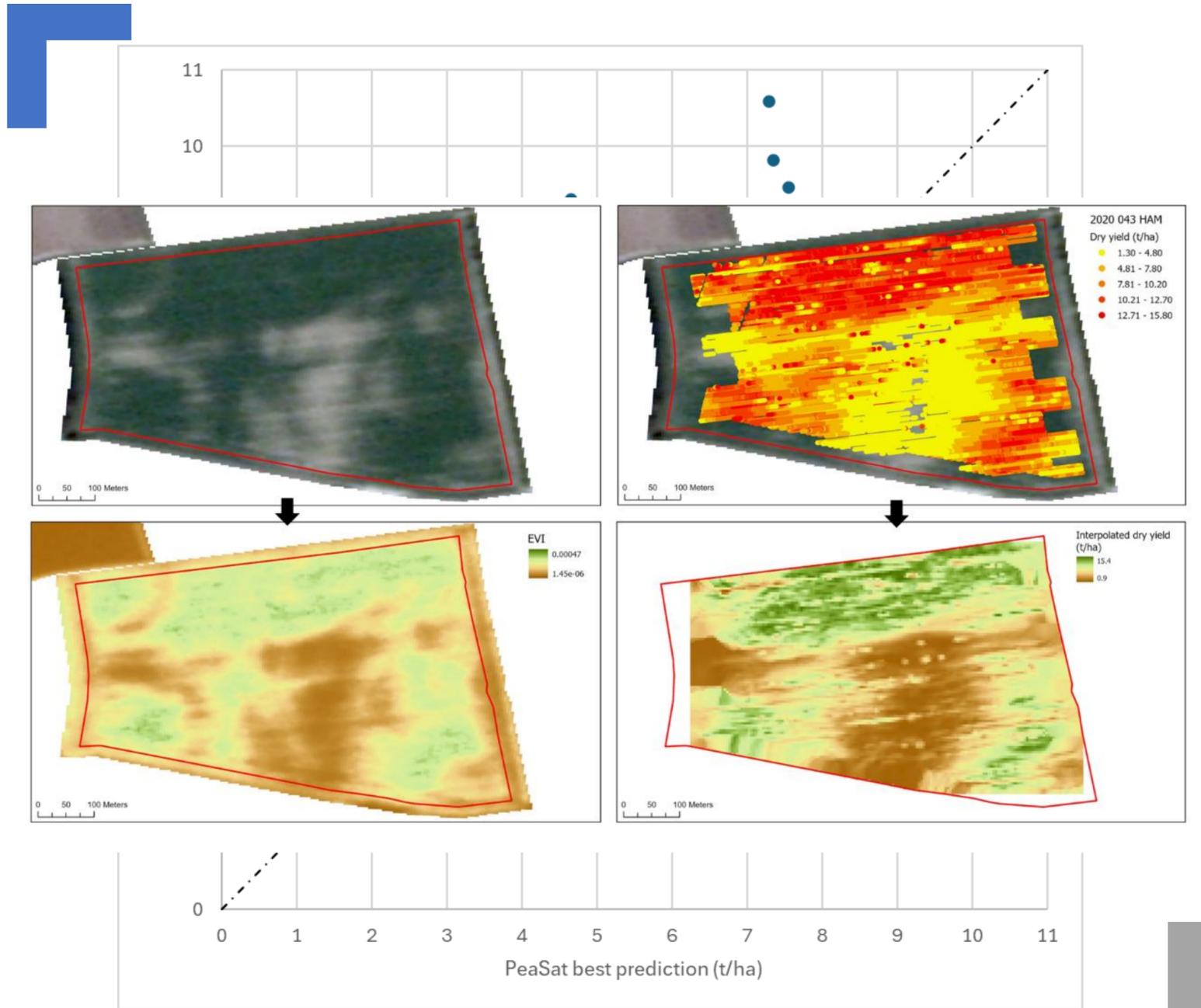


- **Range of different models available for analyzing the data**
- **80:20 split training/testing**
- **Experiment with different variable inputs to find optimum metrics to include**
  - **Vegetation Indices**
  - **Crop properties**
  - **Weather metrics**
- **Results from 500 model runs for the different maturity ranges**



# Testing

- Two cloud free images were obtained - 26/06/2024 and 19/07/2024
- Best available prediction from the two available images and two models
- Can be used for looking at sub-field variation in crop yields



# Feasibility outputs



- Able to help estimate volumes of crop coming into the factories
- Can be used for looking at sub-field variation in crop yields

## Next step

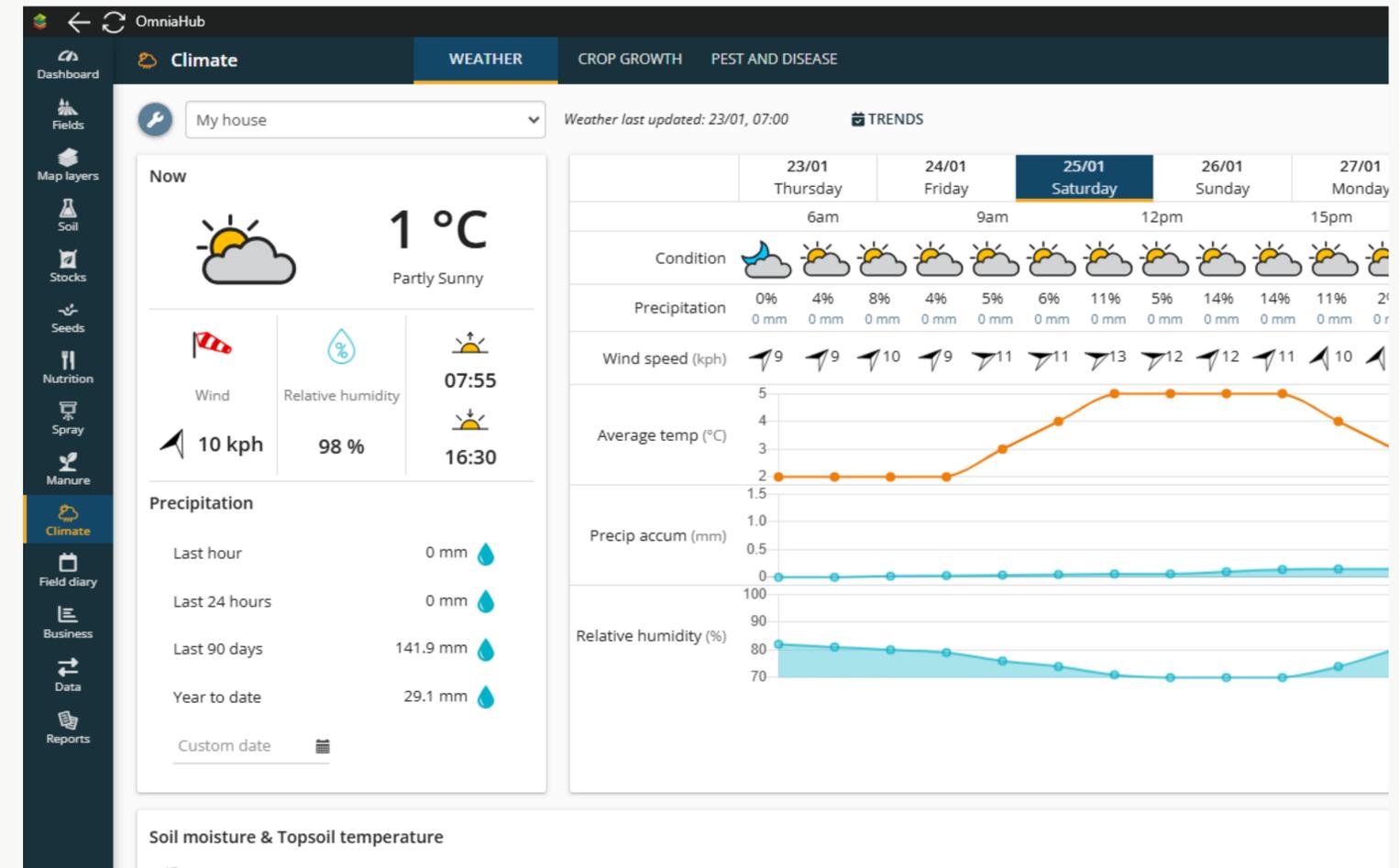
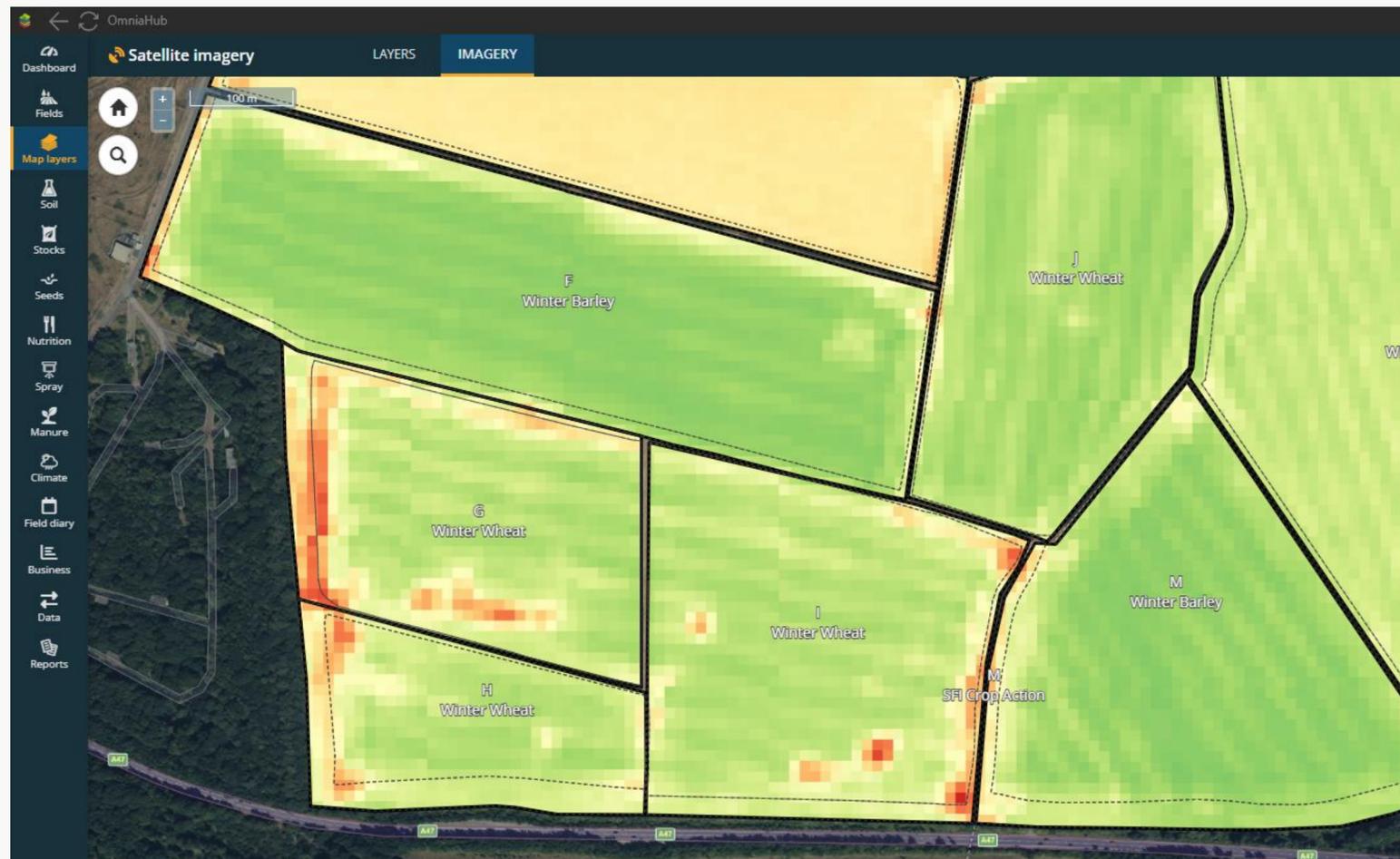
- Development of user interface and live system
- Improve communication of information between grower groups and processors
- Development of models – using other sensors and data



# Demonstration project



- Partnering with the Omnia Digital Farming Platform; commercial farm management platform with over 5,000 users and 1.8M ha
- Field maps, cropping information, weather data and satellite imagery (Sentinel-2) currently in the platform
- Development to connect these all together with the PeaSat model to provide; user interfaces, notifications and data feeds to the processors required

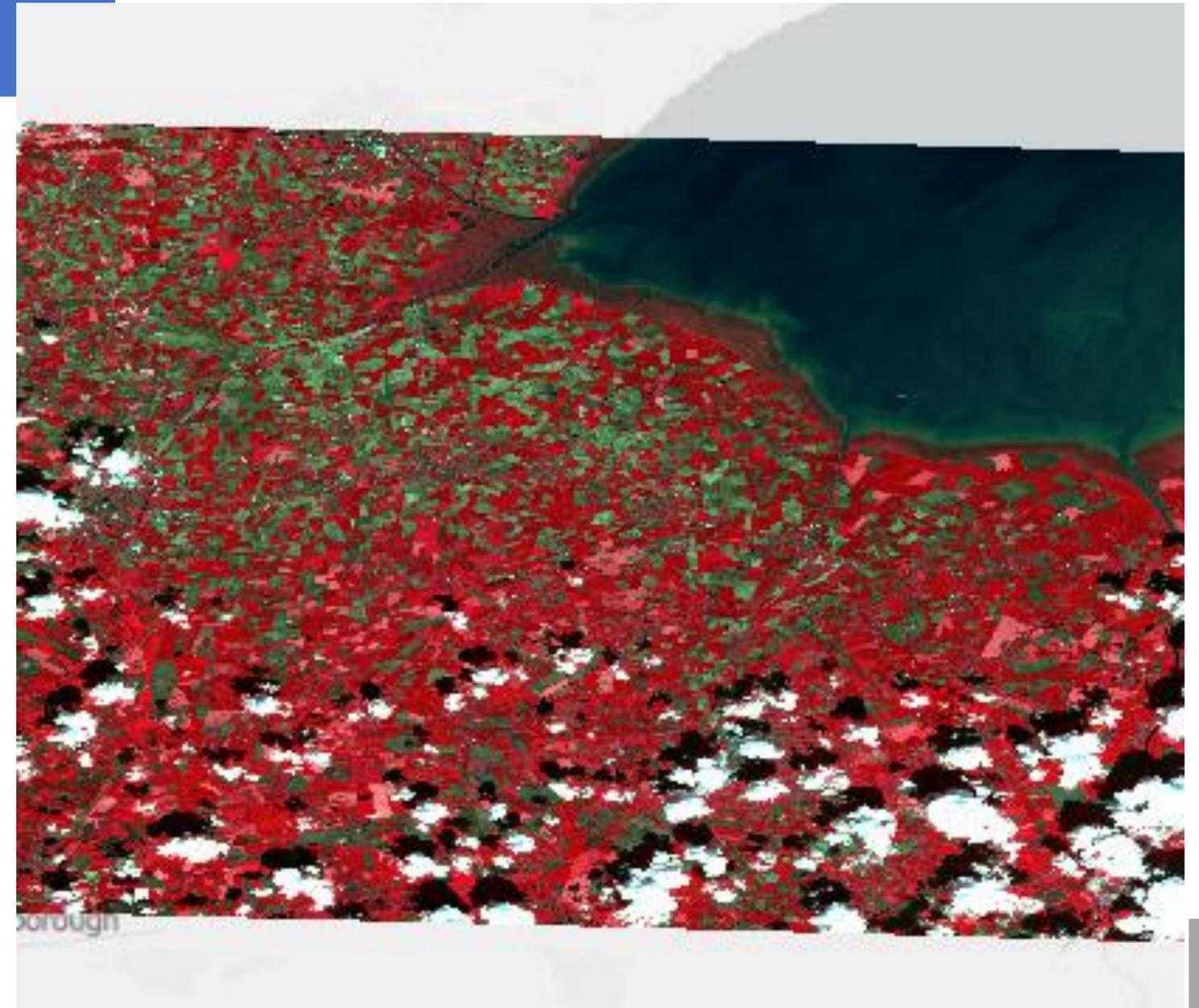


05/02/2025

# Demonstration project



- Project will also include improvement/refinement of the model:
  - Improving model based on PlanetScope model
  - Inclusion of 2024 (and 2025) yield data
  - Development of 'no imagery' model



# Going forward



- Improved communication
- More efficient planning of harvesting and processing
  - Reducing food waste; improving both yield and quality
  - Carbon emission reduction
- Additional stakeholder engagement – welcome your thoughts

**Thank you for listening**



# Stuart Ashton – Greenyard Frozen





**GREENYARD** 

**HMC 2024 Pea Season  
Growing Together**

**5th February 2024**



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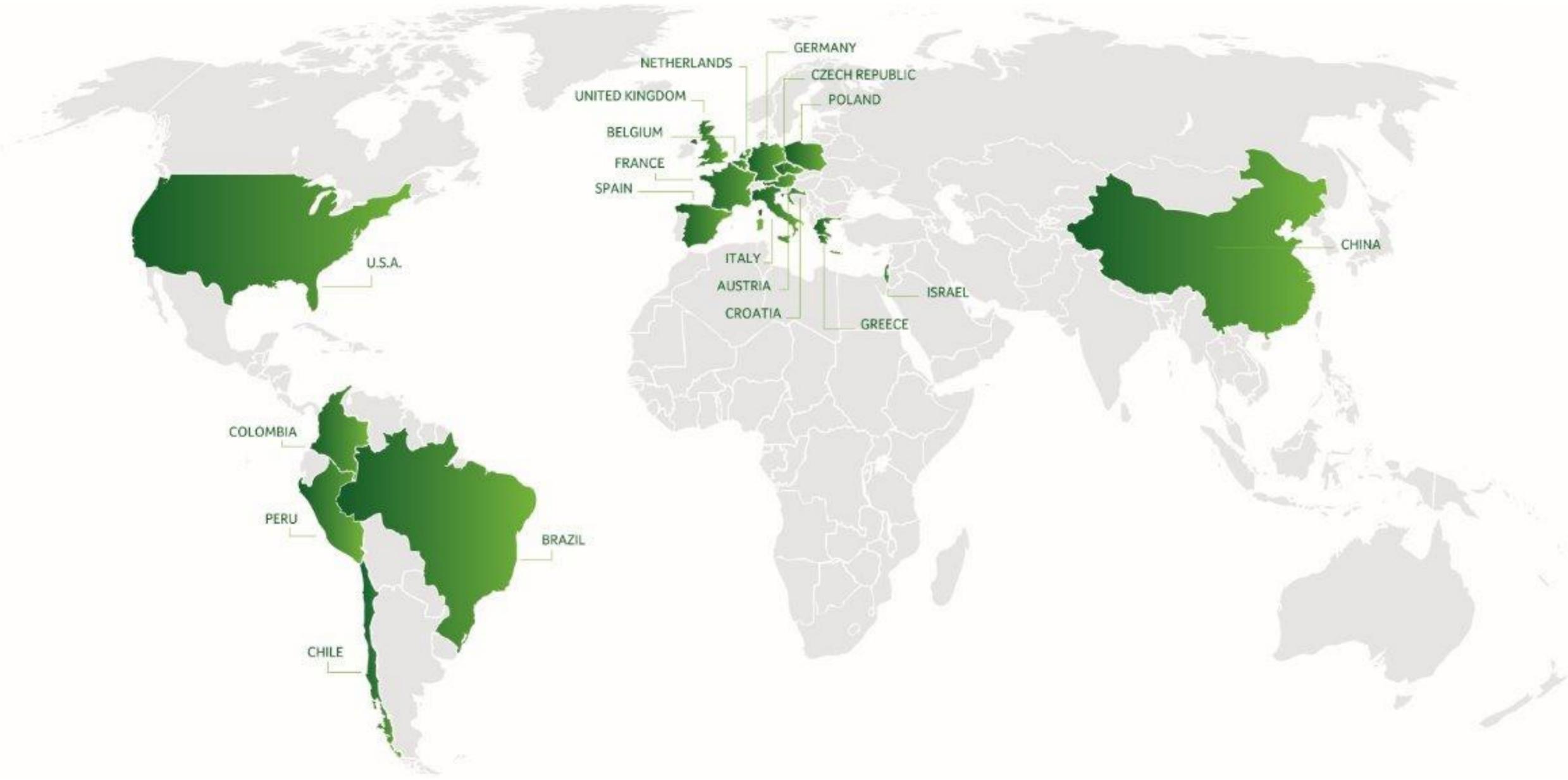
## What we do

Greenyard is a global market leader in fresh, frozen and prepared produce: fruits and vegetables, flowers and plants. We provide efficient and sustainable solutions to customers and suppliers through best-in-class products, market-leading innovation, and outstanding service. In doing so, we help enable a healthier future.

Our vision is to make lives healthier by helping people enjoy fruit and vegetables at any moment, easy, fast and pleasurable, while fostering nature.

# Greenyard's presence in the world

FROZEN



# Greenyard Frozen **key facts and figures**



**No. 2** in frozen vegetables and fruits in Europe



Annual **volume** of **450,000 tonnes**



**9** processing sites in Europe



Export to more than **80 countries**



Ca. **2,200** employees



More than **50 years** of experience

# The best of nature, **always fresh**

Greenyard Frozen offers a wide range of frozen food products that cater to the needs and desires of any lifestyle.

FROZEN



Nutritious

Fresh

Convenient

Less waste

Tasty

High quality

Variety

Cost efficient

Portion control

## 2024 Season Overview

Finished 44,886T

Contracted 49,700T

Achieved 90% of contract

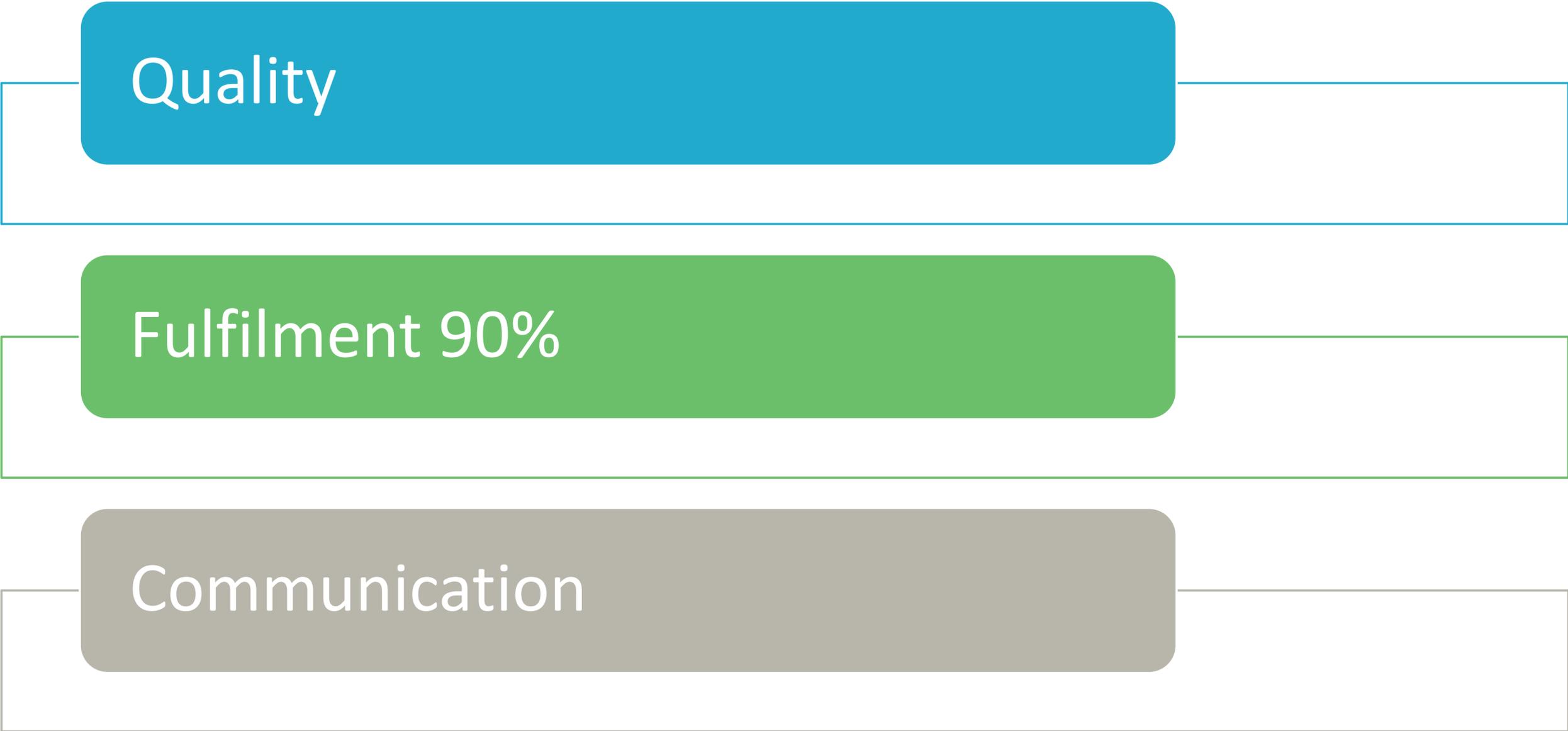
Profile slipped into the lower grades



FROZEN

GRADE	ACTUAL TONS	PERCENTAGE ACHEIVED
SPEED PEAS	10,413	77%
STANDARD PEAS	16,650	89%
VALUE PEAS (including VALUE PETITS 1,114T)	12,059	170%
SPEED PETITS	3,882	90%
STANDARD PETITS	1,862	130%

# Key Objectives for the 2024 Season



# Quality

Three cases of nightshade berries at the start of season, and then not seen after that.

AVERAGE PERCENTAGE OF GREEN PALLETS CREATED

	June	July	August
KL	67%	78%	79%
BN	5%	8%	77%



## “New Normal” Update

- Weighbridge QA reporting to the Technical team where historically they have reported to the operational team, hiccups early in the season which was to be expected, we continue to build on this for next year.
- We changed the number of samples from 3 back to 1 early on as it was agreed that it wasn't providing any additional information and would potentially create hold ups at the weighbridge.
- We were inspecting more at the infeed hopper and created an additional check for the QA at the sortex waste area.
- Online Quality App – we weren't able to have this in place in time for the season, we are still going ahead, and we will start to use / train out for the roots season which will mean we are in full swing of use.
- FM library; we wanted to create from the field to the factory the FM findings working with Kew Gardens, we have kept internal findings and we are continuing to make contact with Kew to see what this can look like for next season.
- Training programmes will continue pre, during and post the season for onsite teams.
- Senior team meeting weekly to discuss previous week, week ahead and part of this was to monitor grades, findings and actions taken for any issues identified, this will continue throughout the other crops and likely remain in place for seasons ahead.

## EHO Investigation – 2023 Recall



- The investigation that started mid October 2023 *remains open* with the Environmental Health Officer and the Food Standards Agency (FSA).
- The King's Lynn site had 2 officers visit across different dates, in the season, to review the changes that we had made on site to process control checks.
- We confirmed with them that we had identified berries early in the season from 2 growers; berries were found by Boston and by King's Lynn.
- Positive meeting with the EHO held in November 2024.
- Nightshade remains top of mind for the 2025 season.
- GY will expand its drone trial for the 2025 season across all the pea groups.



FROZEN

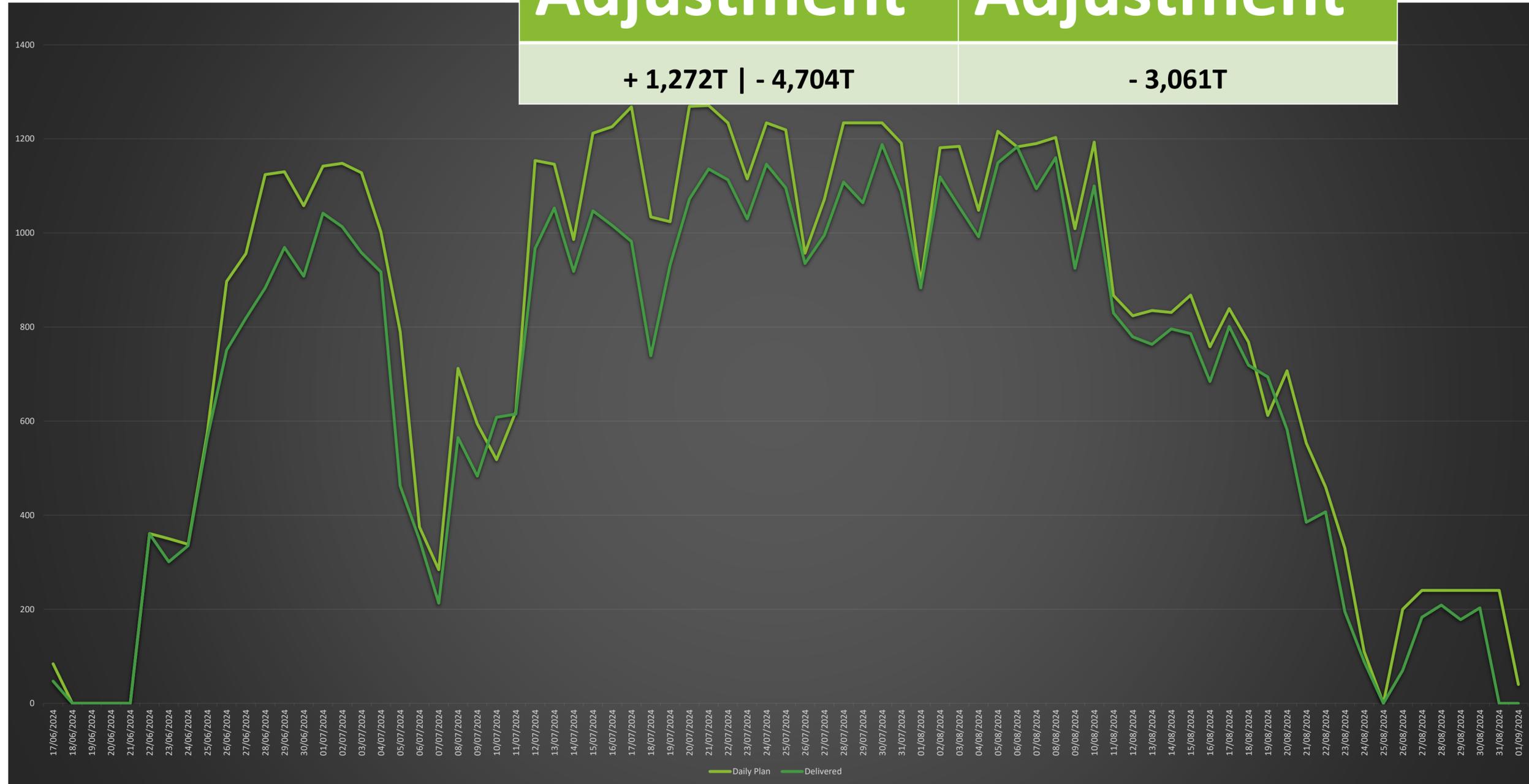
87% Fulfilment

Growers Adjustment

Factory Adjustment

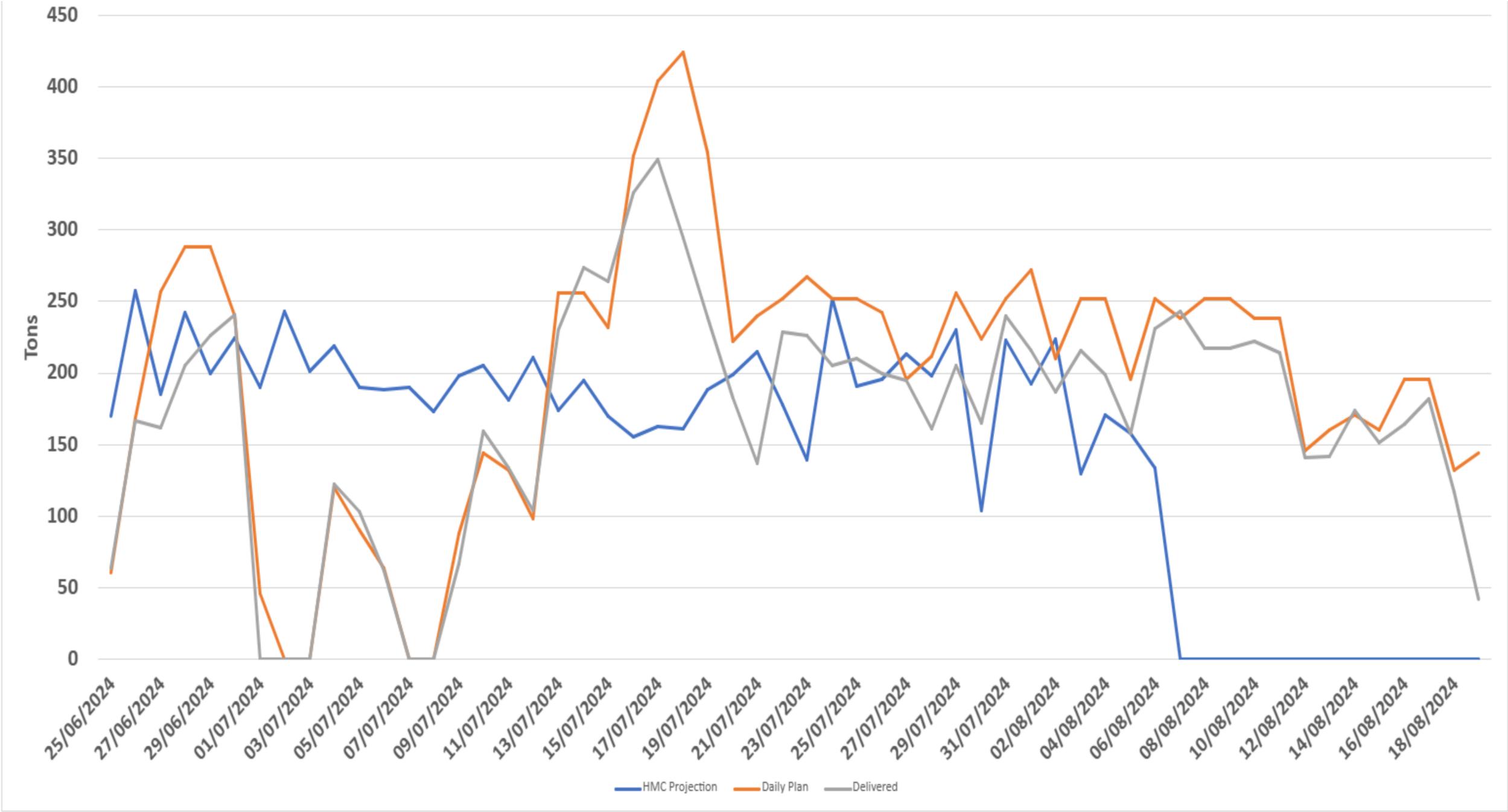
+ 1,272T | - 4,704T

- 3,061T



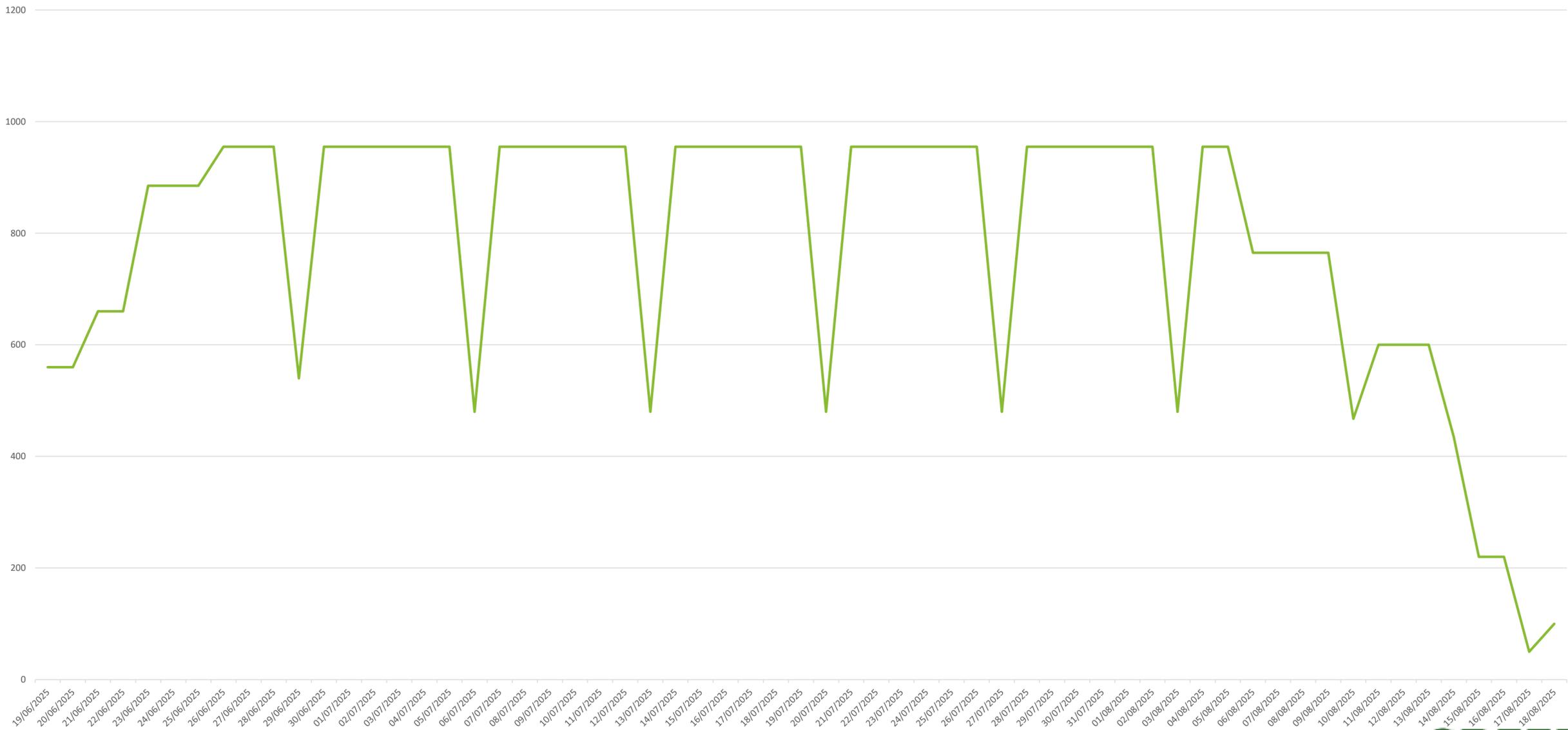
FROZEN

# HMC Programmed Tonnage vs Planned vs Delivered



# Looking forward

- We are adjusted our daily factory lines; using the 30 days that the factory had unlimited pea supply.
- More collaborative and transparent approach to planning this season; all the growers and GY met to discuss and agree the harvest plan for the season



---

**AOB**

**FROZEN**

**Any questions?**

Thank you  
Any question please contact:

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Agriculture Manager

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M: +44 (0) 7773 470719

Stuart Ashton

Agriculture Consultant

E:stuart.ashton@greenyardfrozen.co.uk

M: +44 (0) 7825 130330



WE  
ARE  
RELIABLE.



WE ARE  
SHARING.



WE  
ARE  
PASSIONATE.



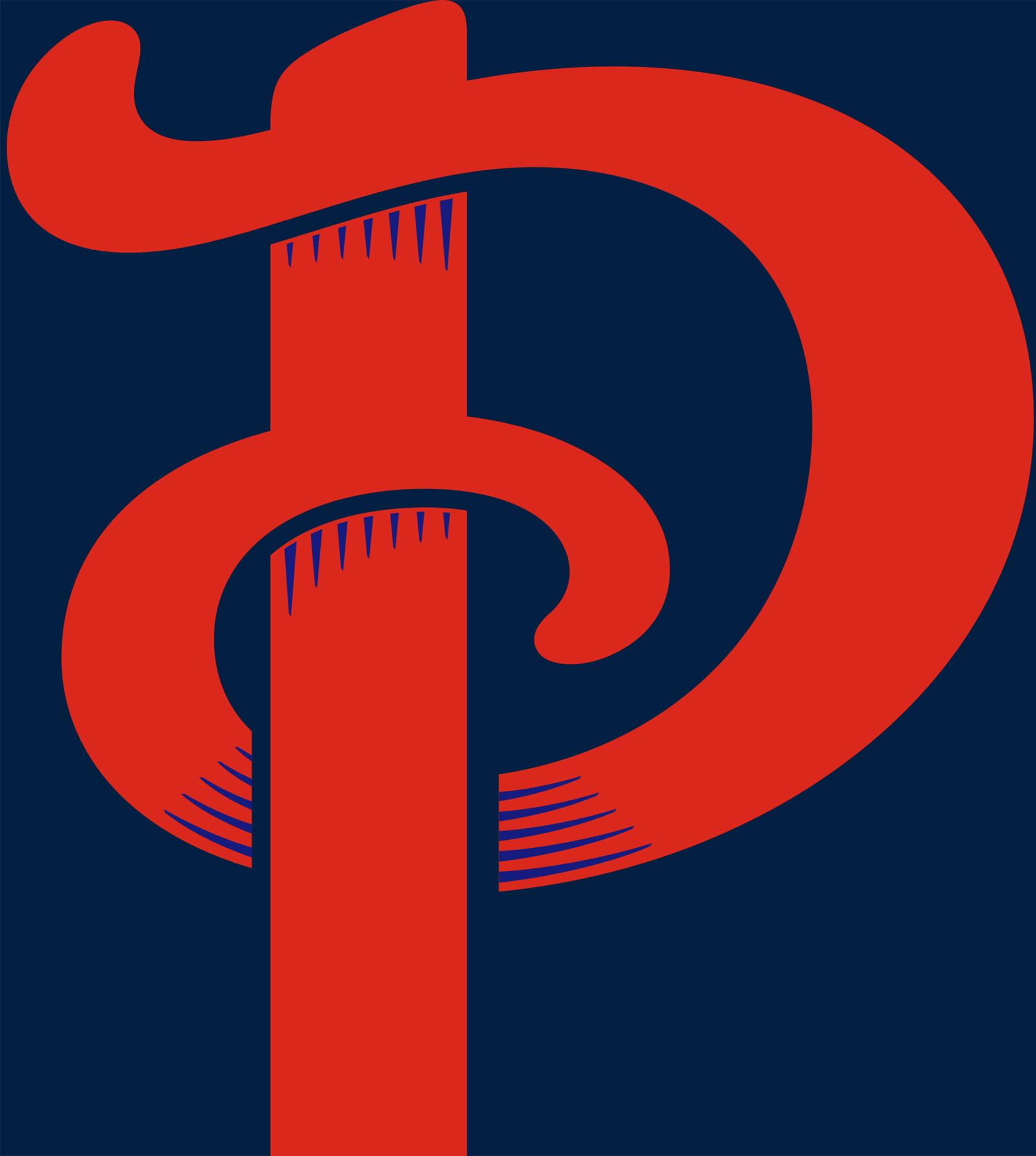
WE ARE  
ENTRE-  
PRENEURIAL.



WE  
ARE  
CREATIVE.

# Charlie Stowe - Princes





# Princes Group Overview

# OUR HERITAGE



1880

Founded in Liverpool by William Muirhead Simpson and Frank Roberts



1946

Opened first canned food factory



1989

Acquired by Mitsubishi Corporation



1999

Princes acquire Mauritian tuna operation



2005

Acquire cooking oil brands, forms Edible Oils Limited (a joint venture with Archer Daniels Midland)



2011

Princes expands canning operations. Acquires Crosse & Blackwell, plus major production sites at Long Sutton & Wisbech



2015

Princes Tuna Mauritius (PTM) enlarged tuna processing operation in the Indian Ocean region



2018

Major investments at Long Sutton and Cardiff announced



2020

COVID-19 global pandemic. Partnership with KICR and invested in state-of-the-art Innovation Centre



2022

Conclusion of 3 year £160m investments in our UK sites.



2024

Previously known as Newlat, New Princes acquires the Princes Group.



1915

World's largest exporter of lobsters



1960

Opened in the Netherlands



1991

Princes enters the soft drinks category through acquisition of Bradford site



2001

Acquire Napolina



2010

Open Polska office expands edible oils to Europe



2012

Princes Industrie Alimentari S.r.L. (PIA) created. Processing factory in Foggia, Italy acquired



2017

New Business Strategy; Customer and Consumer Focus, Operational Excellence, People Excellence



2019

New Vision: Proudly helping families to eat well, without costing the earth. Major investment in renewal of the Princes brand



2021

Princes are proud to win the Grocer Gold Award for Employer of the Year



2023

New Vision, Mission and Strategy established



# ABOUT PRINCES

## SIGNIFICANT SCALE & DIVERSITY...

AND A HERITAGE THAT SPANS OVER 140 YEARS



c.£1.7bn  
revenue\*



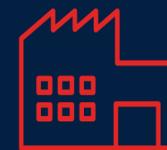
Focused on  
sustainability & ESG



#1 or #2 player  
across all categories



Diversified  
Portfolio



11 production  
sites worldwide



Employer of choice

### PRODUCT SEGMENTS

Foods



Oils



Fish



Drinks



Italian



\*Year ending 31 March 2024

# ABOUT PRINCES.

## OFFICES & OPERATIONS



1. GLASGOW 2. BRADFORD 3. CARDIFF 4. WISBECH 5. LONG SUTTON 6. ERITH 7. BELVEDERE  
8. SZAMOTULY, POLAND 9. PRINCES TUNA MAURITIUS (2 SITES) 10. FOGGIA, ITALY 11. LIVERPOOL, HEAD OFFICE  
12. PRINCES FOODS B.V., NETHERLANDS 13. PRINCES POLSKA, WARSAW, POLAND

### OFFICES

- Liverpool (UK)
- Warsaw (Poland)
- Rotterdam (Netherlands).

### FOOD PRODUCTION

- 2 x UK
- 1 x Italy
- 2 x Mauritius.

### SOFT DRINKS

3 x UK.

### EDIBLE OILS

2 x UK  
1 X Poland

# EDIBLE OILS

BELVEDERE

Customer Own Brand and  
is home to **Napolina Olive Oil**





Proudly offering great tasting choice for everyone  
without costing the earth





**PRINCES**  
— GROUP —



# PART OF THE NEWLAT GROUP



# PRINCES IS NOW PART OF A BIGGER COMPANY, ON AN EXCITING JOURNEY

*Newlat are a European food business with a great track record of growth.*



*From July 24, Princes Group became a wholly-owned subsidiary of Newlat Foods, retaining its legal name 'Princes Ltd'. From April '25, Newlat will become **New Princes Group**.*

New Princes is a Food & Beverage specialist, with **€2.8bn** combined revenue, **31 production sites** worldwide, a **diversified & complimentary portfolio** of brands and customer own brand, and long-term sustainable growth plans to achieve €5bn revenue by 2030.

## 4 KEY FOCUS AREAS TO MEET OUR CUSTOMER'S NEEDS:



Now a significant player in **10 categories:**

Canned Food  
c. €651m

Fish  
c. €448m

Drinks & Others  
c. €390m

Oil  
c. €387m

Milk & Dairy  
c. €317m

Pasta  
c. €230m

Ready Meals & Home Baking  
c. €165m

Canned Tomatoes & Sauces  
c. €127m

Bakery  
c. €50m

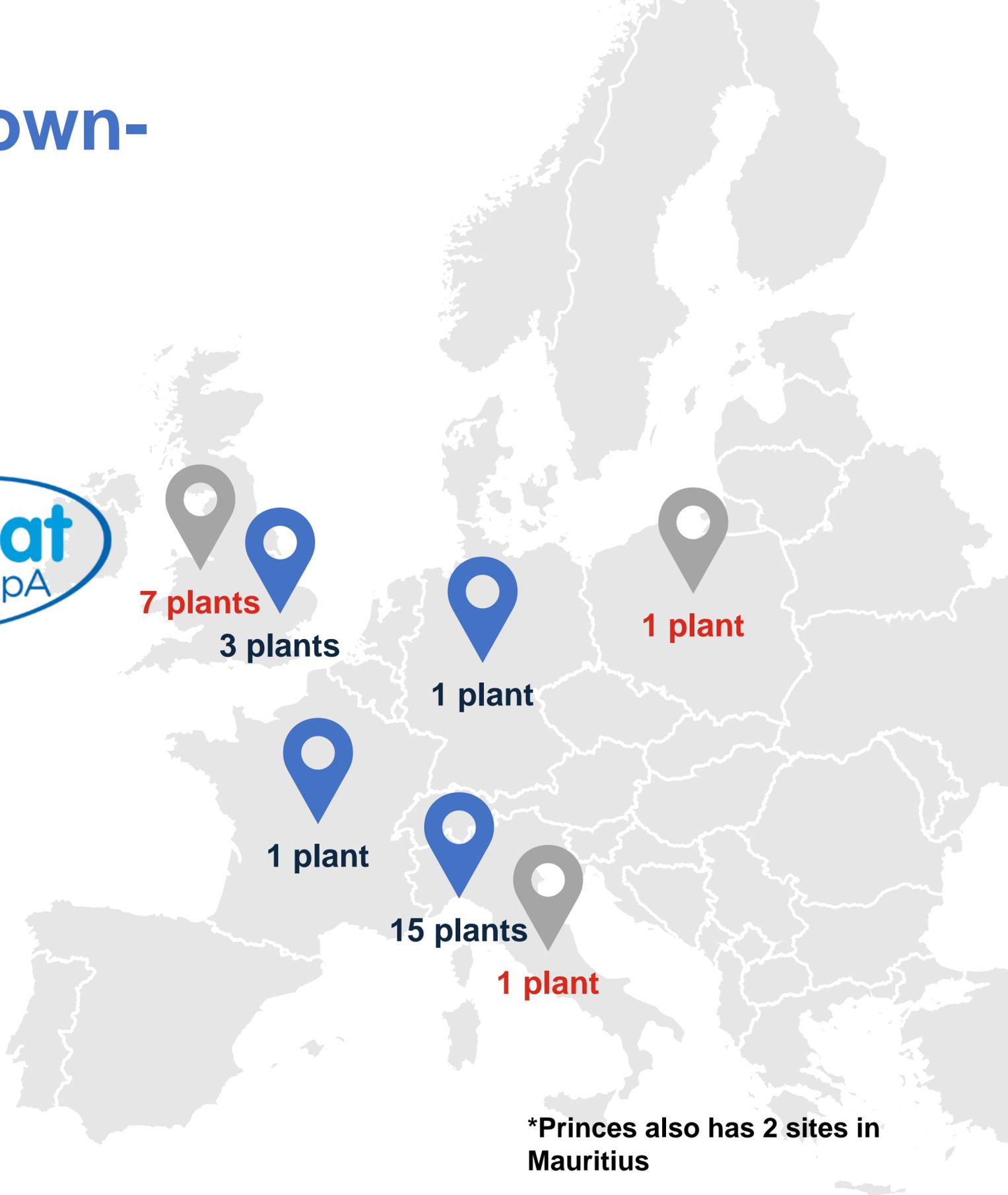
Special Products  
c. €34m

# We will have a broader, harmonised and balanced portfolio



# Our portfolio is majority own-manufactured

29 of our 31 manufacturing sites will sit within Europe



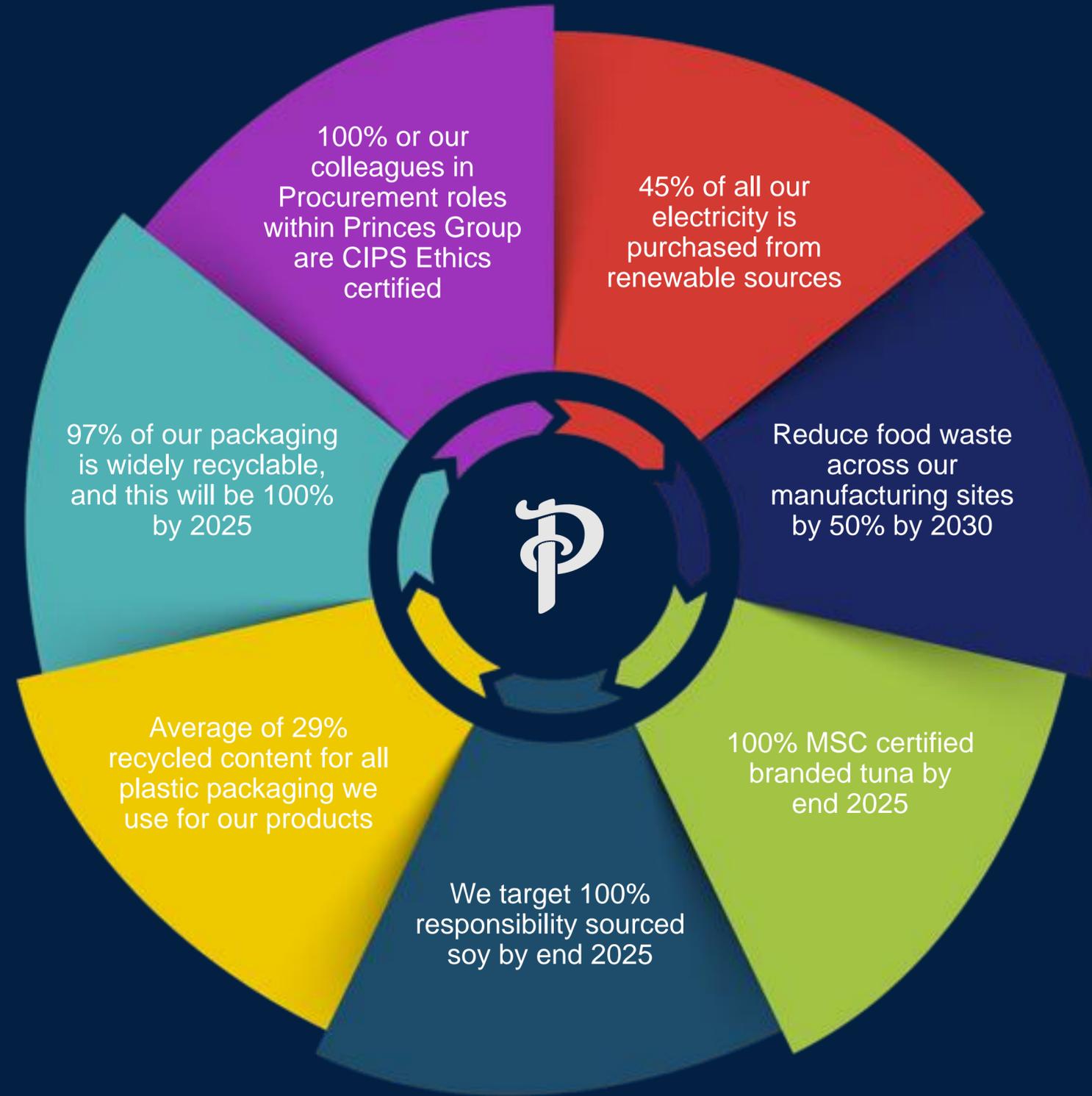
 CURRENT PRINCES GROUP SITES

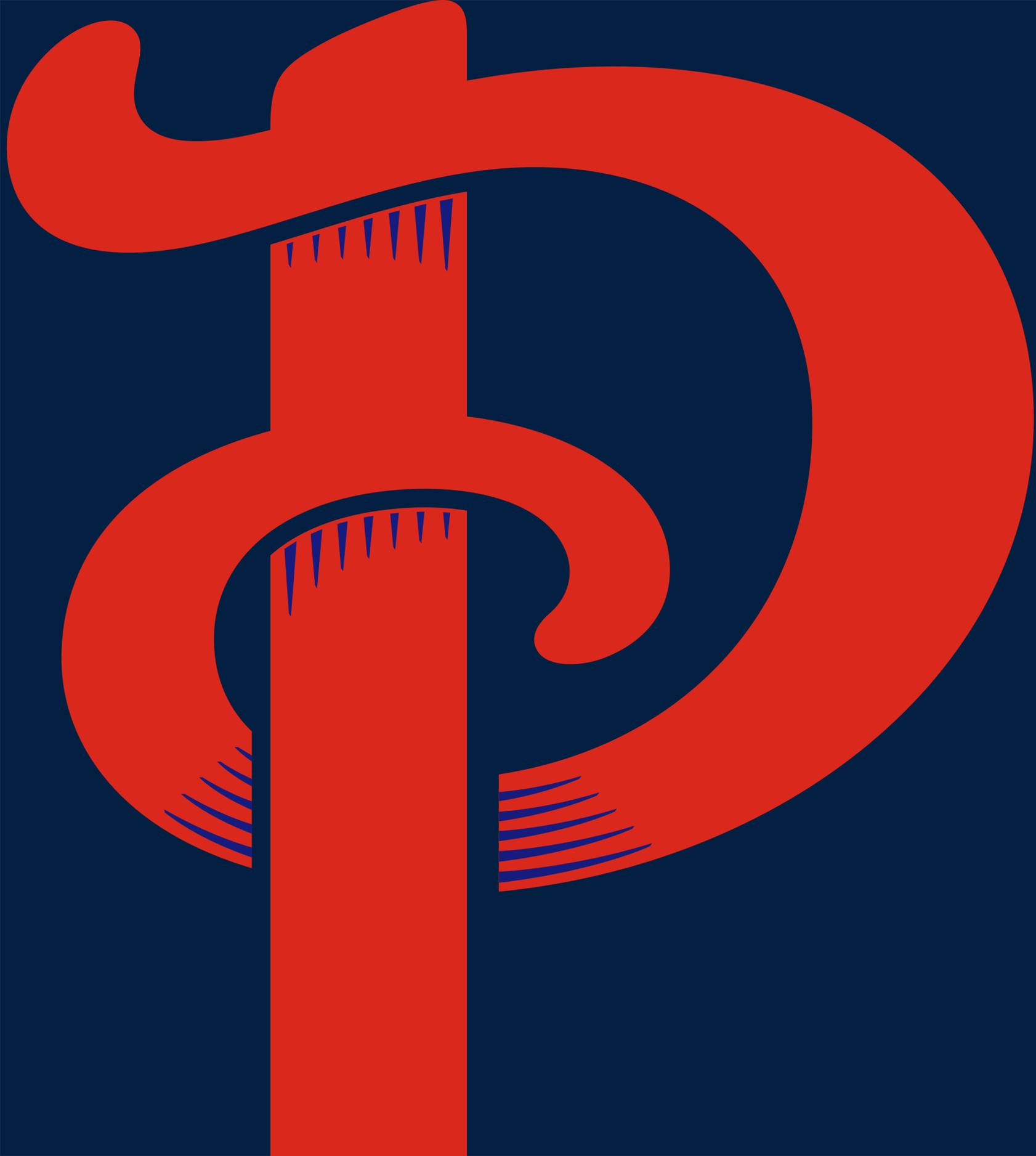
 BROADER NEWLAT FOOD SITES

\*Princes also has 2 sites in Mauritius



# Responsible, ethical, and sustainable at our core

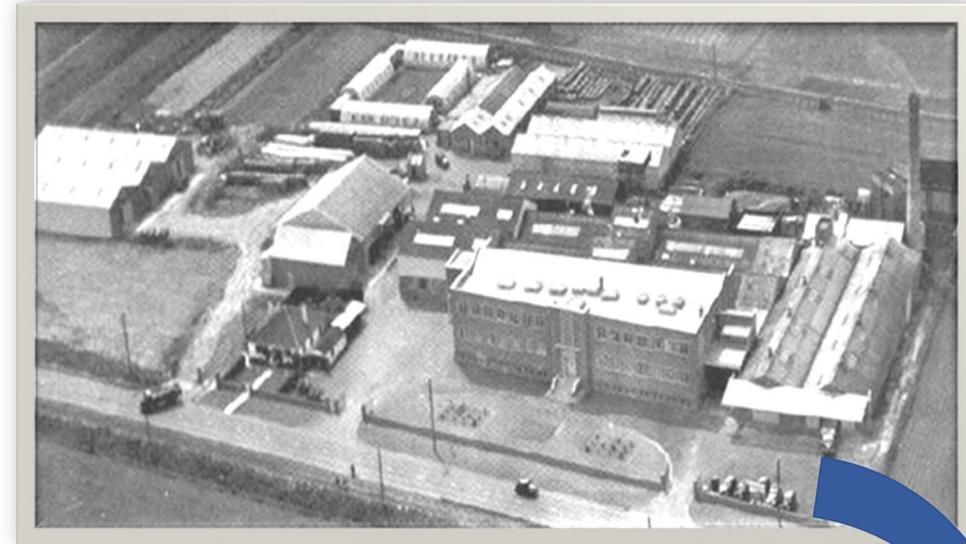




Long Sutton

# Long Sutton Site History

- 1930 Eastern Counties Preserves
  - 1942 J & J Beulah
  - 1950 Lockwoods Family
- 1981 Acquired by Hillsgate Holdings
  - 1999 Hicks, Muse, Tate & Furst
  - 2002 Premier Foods
  - 2011 Princes Foods



1950



2000



# Long Sutton Site



# Long Sutton Key Facts

Long Sutton Site	
Production Capacity	c.500 million cans per annum (currently produced)
# of SKUs	c. 420
# of Production Lines	11 Fillers, 16 Pack Lines
Other Key Facilities	12 Cookers (2 Hydrostatic & 10 Rotary)
Site Area	130,000 m <sup>2</sup>
# of Employees	c.530
Shift Operation	3 shifts / 105 hours per week
Main Products	Baked Beans, Bean Meals, Garden Peas, Processed Peas, Pasta, Fruit, Meatballs, Pulses, Canned Ready Meals (CRM)



# Long Sutton – Pea crop

- Dedicated pea cleaning plant
- Mushy and Marrowfat pea stock build starts Jan / Feb
  - 18,600,000 cans per season
  - 300g can size, that's nearly 1000 peas per can!
  - Enough to fill 2 Olympic size swimming pools!
    - >90% market share (UK)
  - Sales to all major UK retailers





Thank you

Any Questions?



# Allen Giles



# Back to Basics

- Long Rotation
- Previous Cropping
- Suitable and Best Land
- Cultivations
- Pest Control and Pigeon Control



# Rolling

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- If conditions allow, roll after drilling and before pre-emergence application
- If soil conditions too wet and if heavy rain is forecast, don't roll
- If needed peas can be rolled post emergence when they are 2-4 inches in height
- In some circumstances post emergence rolling is more beneficial than pre-emergence rolling
- Any rolling to be discussed and agreed between HMC and the grower

# WORKSHOP

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- Need to vacate Sandringham by Nov 2025
- We have been investigating possible locations over the last 6 months
- We currently hire separate workshop, offices and storage.
- We are looking to bring all these three sites together as one, and in a more central location.
- We have found a site that has all the above, but it will be more expensive than existing arrangements, this is mainly due in part to the length of time we have had the existing arrangements in place
- We will also require some equipment purchases to be able to function at the new site as currently we borrow some resources from Sandringham farms. This equipment we can utilise at harvest time to reduce the cost of tractor hire
- The move would mean that we would have 2 engineers fulltime working for HMC currently they split their time between ourselves and Aylsham growers.
- We would look to do some third-party maintenance and fabrication through the HMC workshop during the winter months and potentially utilise the office space for third party training both of these being able to help with the extra cost the move will incur.

# 2025 Variety Trials

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- Best performing trials will be grown on field scale
- 6 to be grown this season
  - Ambler (early)
  - Eloise (Petit)
  - Extasia (Petit)
  - ASR 40.3007 (Petit)
  - Valasa (Petit) – Previously ASR 40.2021
  - Dancer (Standard)
- 2024 was a good growing season for all varieties, 2025 will be important to see if the same varieties perform

# 2025 Syngenta Trials

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- Nuello iN – N fixing bacteria seed treatment aiding early vigour
  - Idalgo- 5ha
  - Amalfi- 5ha
- Vixeran – N fixing bacteria foliar treatment aiding pod fill
  - 5ha pack
  - To be applied 8 weeks before harvest temp above 10c warmer the better ideally end of the day.
  - On organics, Idalgo, Amalfi and Oasis

Syngenta heavily involved and offered as much help as we need.

# What is Nuello<sup>®</sup> iN

## Nuello<sup>®</sup> iN Seed Treatment

Two unique N-Fixing Endophyte Bacteria



Solo (Organic) or Co-applied standard seed treatment

*Pseudomonas  
siliginis*

Nuello<sup>®</sup> iN  
microbes

*Curtobacterium  
salicaceae*

A strong nitrogen fixing  
endophyte bacterial strain

A strong nitrogen fixing and soil  
insoluble phosphate mobilising  
endophyte bacterial strain



## Untreated

Contigo A84 – 5.732 t/ha 127TR



## Nuello<sup>®</sup> iN

Contigo A84 + Nuello<sup>®</sup> iN – 6.152 t/ha 124TR



# Vixeran<sup>®</sup> on pulses

Leguminous plants can provide their own nitrogen... so how can VIXERAN<sup>®</sup> help??

## If you think about how pulses fix nitrogen...

The N-fixing nodules on the roots (picture) are formed 3 to 5 weeks after emergence and will then actively fix nitrogen for the crop to use

- as long as the soil temperature is between 4 and 20°C

However, the nitrogen demand from a pulse crop is HIGH:-

- As pulses are a good source protein, the demand for nitrogen is highest when filling the seed, meaning the plant takes the required nitrogen from leaves
- But the root nodules are then no longer fixing nitrogen as they gradually senesce around the time of pod filling
- By supplementing the nitrogen need with VIXERAN<sup>®</sup>, it reduces the burden on the leaves and so prolongingly the GLA of the crop, therefore the plant can photosynthesise more and in turn increase yield



# Vixeran<sup>®</sup> recommendation on pulses

## Timing:-

- From GS16 to first flower
- Ensure crop is actively growing for optimum inoculation
- Avoid periods of intense UV light – on bright sunny days apply early morning or late afternoon

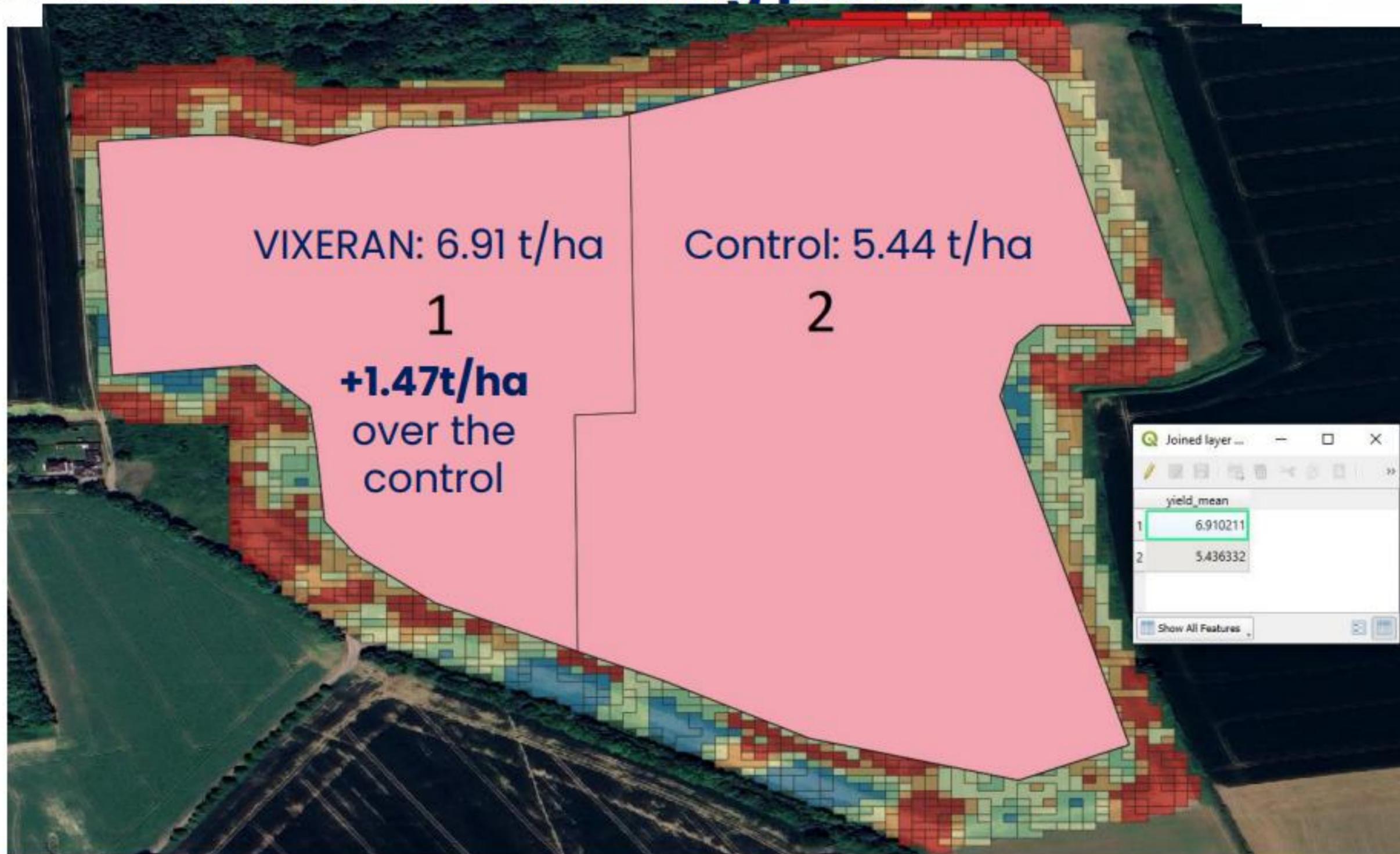
## Application:-

- 50 g/ha in 100–200 l/ha water
- Apply with foliar feeds to ensure nutrient availability – pulses have been shown to respond to sulphur, manganese, magnesium, boron and molybdenum
- Or apply with fungicide at earliest timing (first pod)

Ideal crop stages for application



# Vixeran<sup>®</sup> Benefit in combining peas



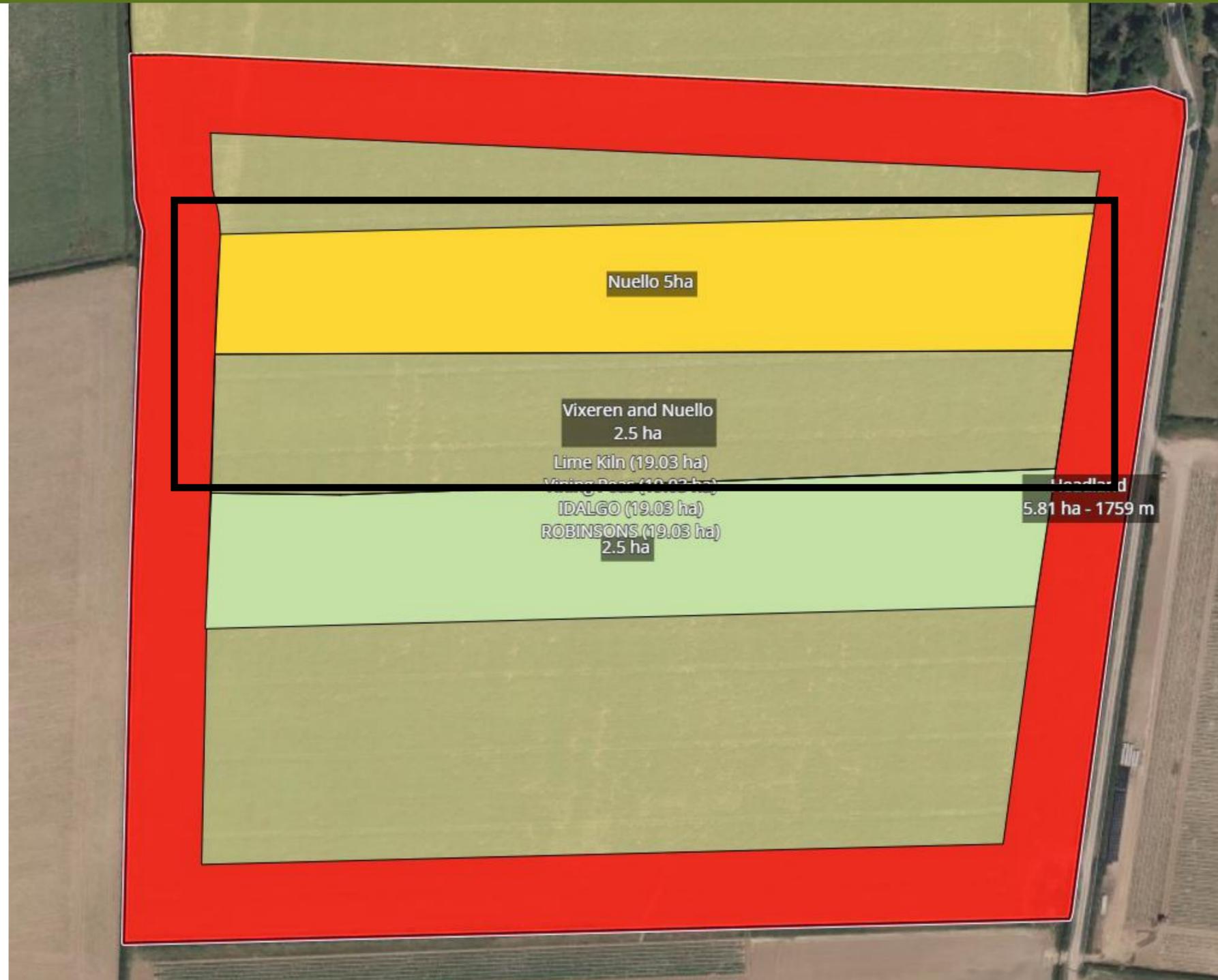
Trial No.: AC Grower Split Field  
Crop: Combining peas  
Foliar app date: **May '24** (BBCH 16)

Protocol no.: AGC101  
Variety: TBD

Location: Brodsworth, South Yorkshire  
Drilling Date: April '24



# 2025 Syngenta Trials



# Other Trials 2025

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- Ympact from Corteva – Seed treatment – currently looking at how to get seed treated for this
- Illex – Stimplex trial year 2

# AOB

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# THANK YOU

