



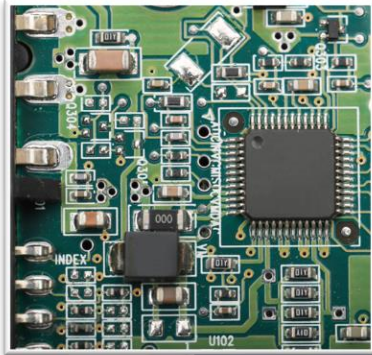
How can data help optimize Horticulture?

Chris Mendes, NZ Apples and Pears Conference



July 2023

A bit about me...



About The Yield

- Precision Yield Management platform for specialty crops
Linking on-farm production with your value chain
- Trusted by global agrifood businesses since 2014
- World leader in applied AI/ML for agrifood



Ros Harvey
Founder & CEO



Ryan Bolduan
CPO



Chris Mendes
CTO



Patrick Maguire
COO/CFO



Dr. Evan Webster
Lead Data Scientist



Helen Mihelic
Lead Product Manager

INVESTORS



INDUSTRY PARTNERS

RESEARCH PARTNERS





What feedback have we heard?

Research from over 900 Agribusiness in US



Specialty crops teams are fighting an uphill battle both on-farm and off-farm using legacy methods



Top 3 Stressors

for specialty crops agribusinesses

93%

of specialty crops agribusinesses find it challenging to use data to improve on-farm activities



Increasing costs



Excessive workloads



Not enough time/
juggling competing demands

Currently, on-farm data is being collected by
(respondents were able to select all that apply)



Machinery
64.5%



Apps in the field
60%



Sensors
55%

The future of agriculture: specialty crops agribusinesses believe AgTech can help them and they are overwhelmingly positive about advanced technologies



80.7%

agree that using
real-time data and AI
can improve yield
outcomes at lower
cost per unit

The vast majority of respondents agree (98.7%) that advanced data analytics is important to the future of agriculture.

This is an important evolution because **more than half of specialty crops** already rely primarily on their on-farm data to guide growing.



Over 80%

believe AI can improve data analysis and the accuracy of yield prediction and estimation



3 out of 4

say AI will help them accomplish complicated data analysis at scale



75%

say inflation is a top factor driving AgTech adoption at their company



95.5%

believe that digital transformation will drastically change their jobs as they know it from now into the next decade

AgTech procurement and budgets are increasing to solve pressing challenges faced by specialty crops agribusinesses

66%

say their company's budget for AgTech will increase in the next 12 months

Companies have identified an initiative or have established budget for
(respondents were able to select all that apply)



Precision crop management
64.4%

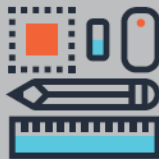


Improving irrigation
59.7%



Yield prediction
55.2%

In the next 24 months, companies will increase investment in



Precision agriculture tools



Farm management software



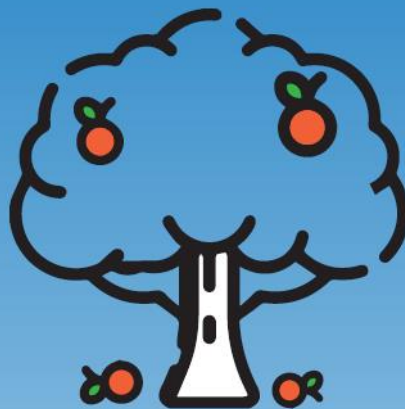
Data consolidation

97%

would find it valuable to have one place to access all the data and apps needed to do their jobs

Top 3 Challenges

with on-farm data that's being collected



Incomplete data collections



Data inconsistencies



Difficulty accessing or deriving value from data

Not only are people using many different applications, but their data is scattered, and **they're spending excessive time on data analytics**

11+
HOURS
PER WEEK

to collect, collate and analyze data for **77%** of respondents

16+
HOURS
PER WEEK

to collect, collate and analyze data for **25%** of respondents

WHY DOES DATA MATTER?



IF YOU MEASURE IT THEN YOU CAN MANAGE IT

- Making better decisions every day based on data.
- Understanding the past and recognizing patterns.
- Using data and tools to scale operations.
- Industry: benchmarks, competitor analysis, trends, sharing the cost.
- Compliance and Sustainability.

IF YOU PREDICT IT THEN YOU DE-RISK IT

- Weather
- How much will I produce?
- When will harvest happen?
- What Quality/Size/'x' am I likely to get?
- What's driving that outcome?
- Supply Chain and Logistics
- Pricing
- Climate Change





IF YOU MEASURE IT THEN YOU CAN MANAGE IT

Business Intelligence, Analytics,
Backward facing or at best near real time.

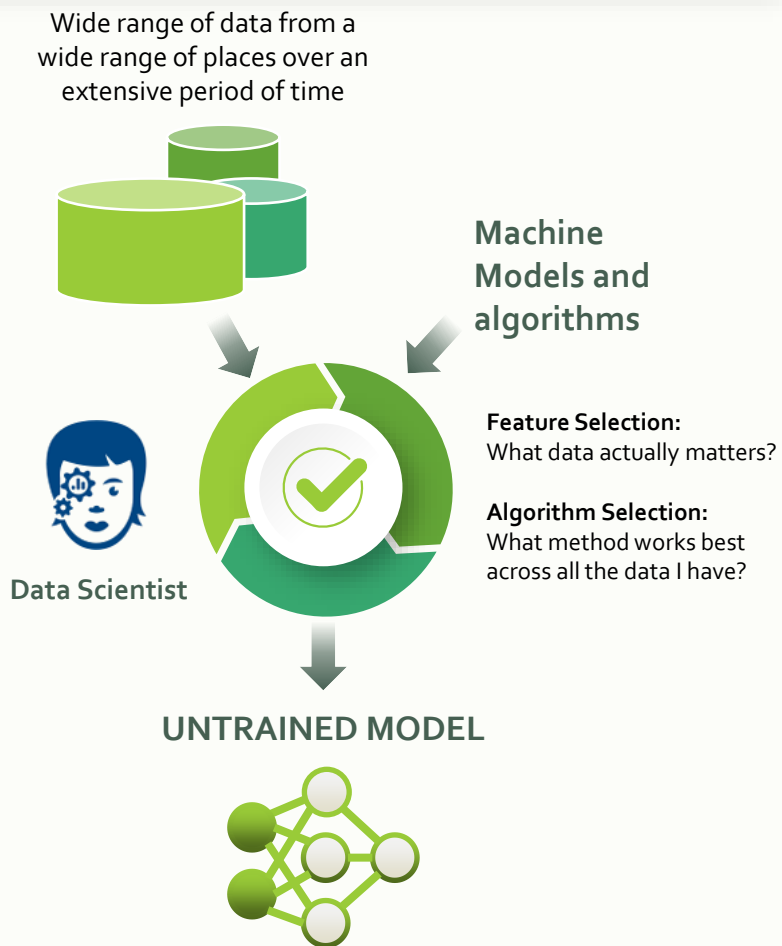
IF YOU PREDICT IT THEN YOU DE-RISK IT

Predictive Models, including Machine Learning / AI
Recommenders
Forward looking.

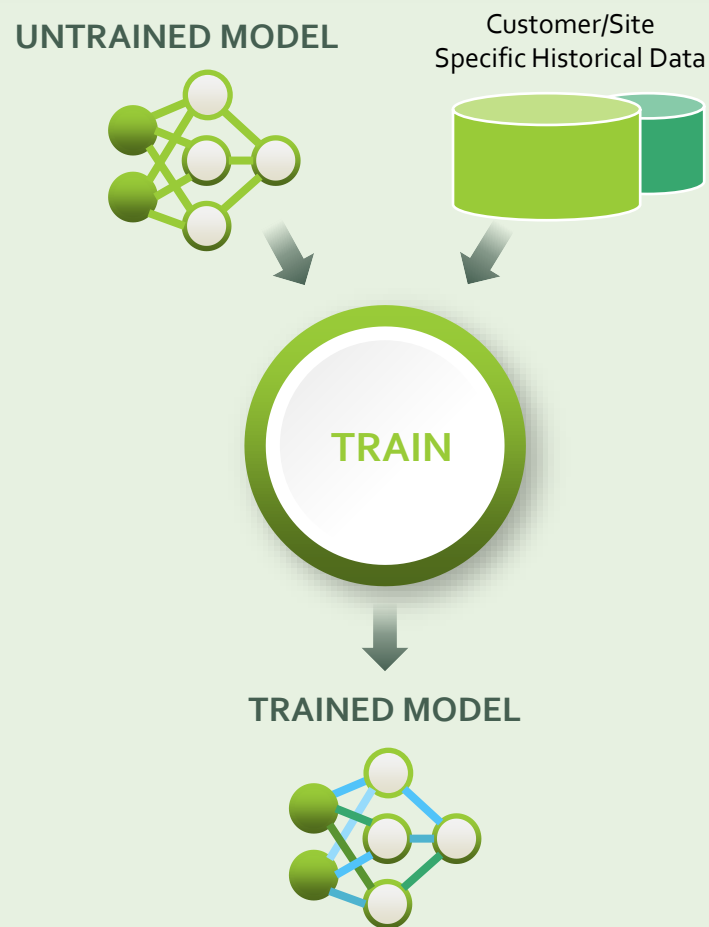


Demystifying Machine Learning

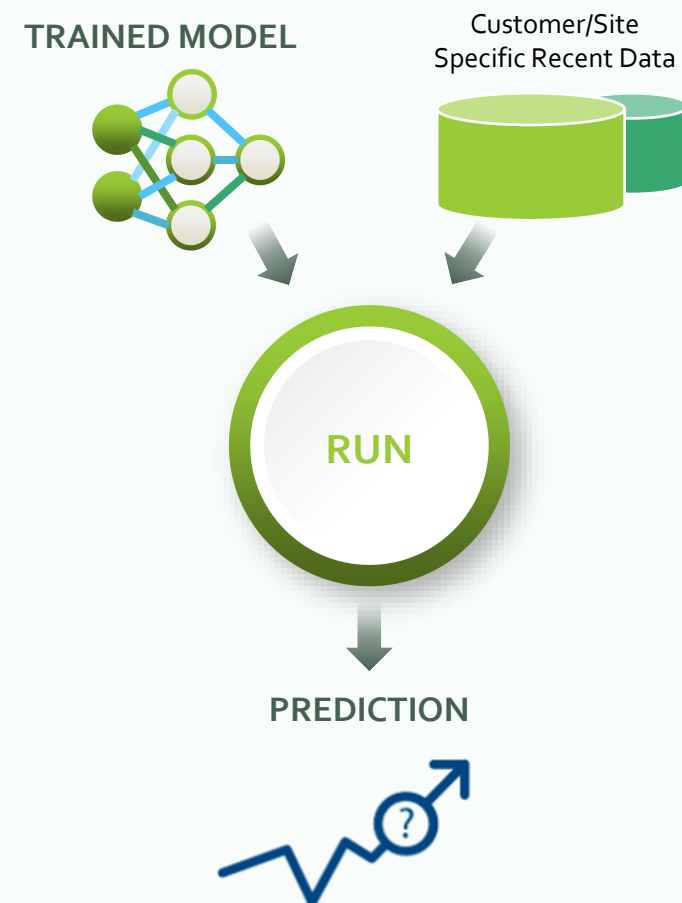
Model Development



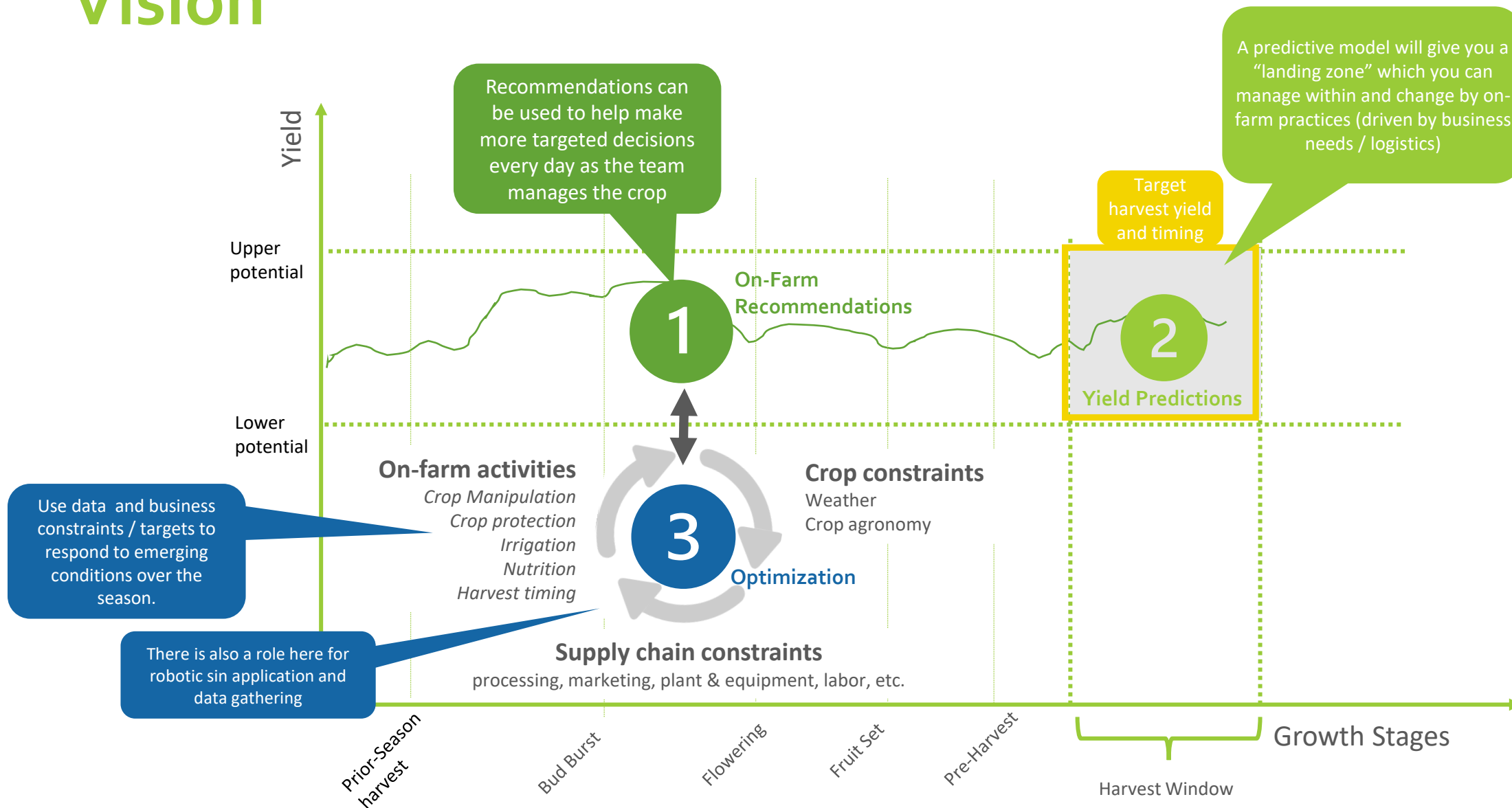
Training



Running



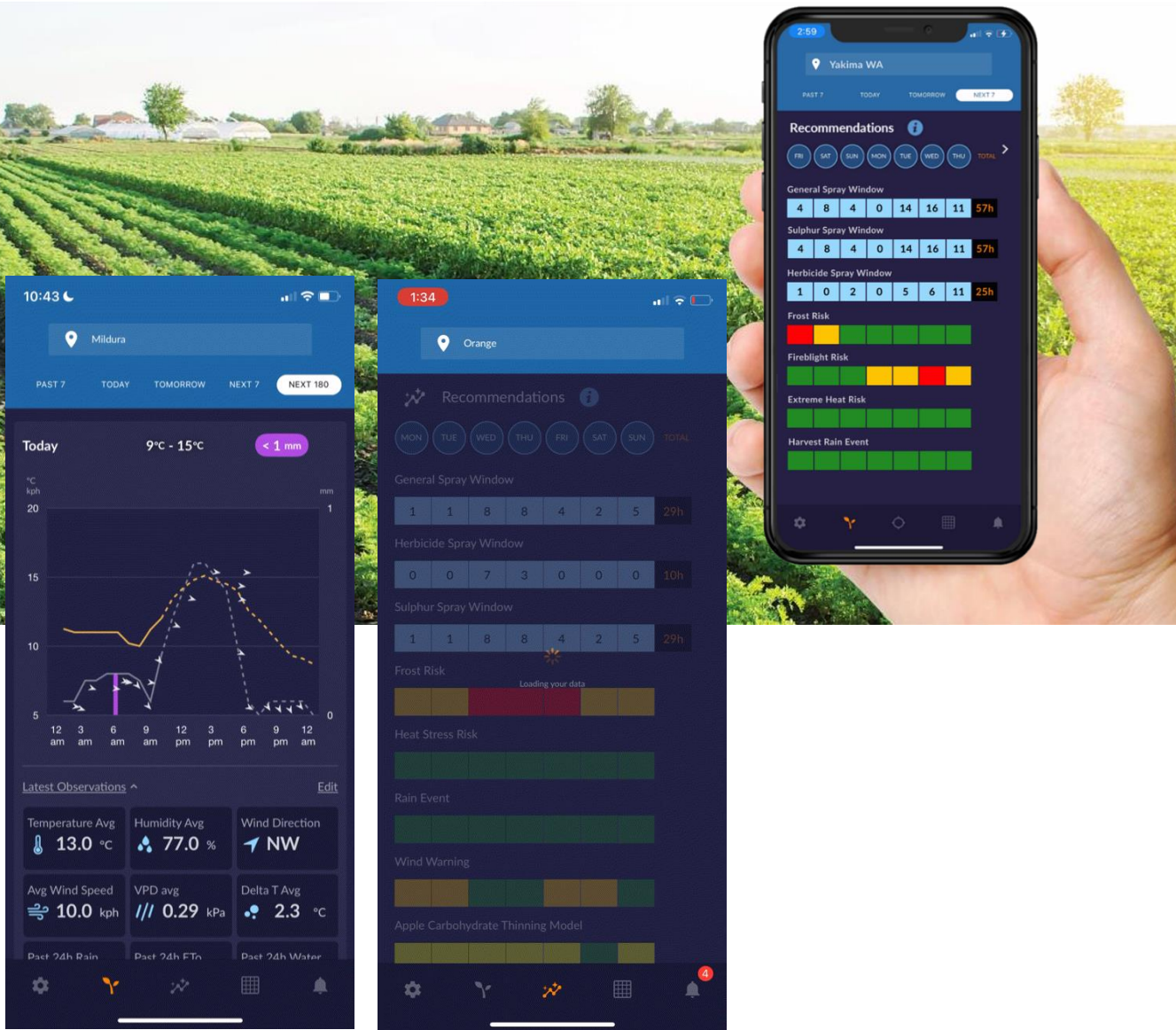
Vision





Let's look at what
data can tell you





Putting Weather Data to Work

Microclimate-informed recommendations at your fingertips.

The Yield turns complex analytics into **actionable insights**

Our platform send these insights:

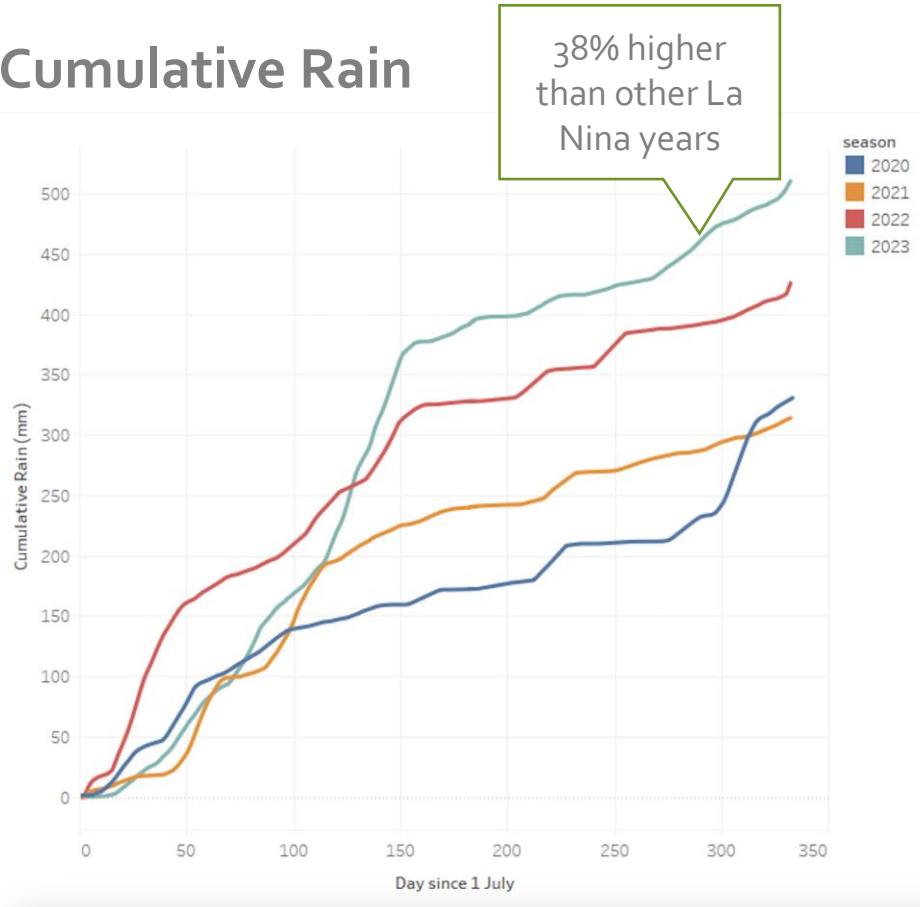
- to people in easy-to-use apps
- to robots and IT systems

The future: closing the loop with data collected by robots feeding back into our algorithms, making The Yield's recommendations even more valuable

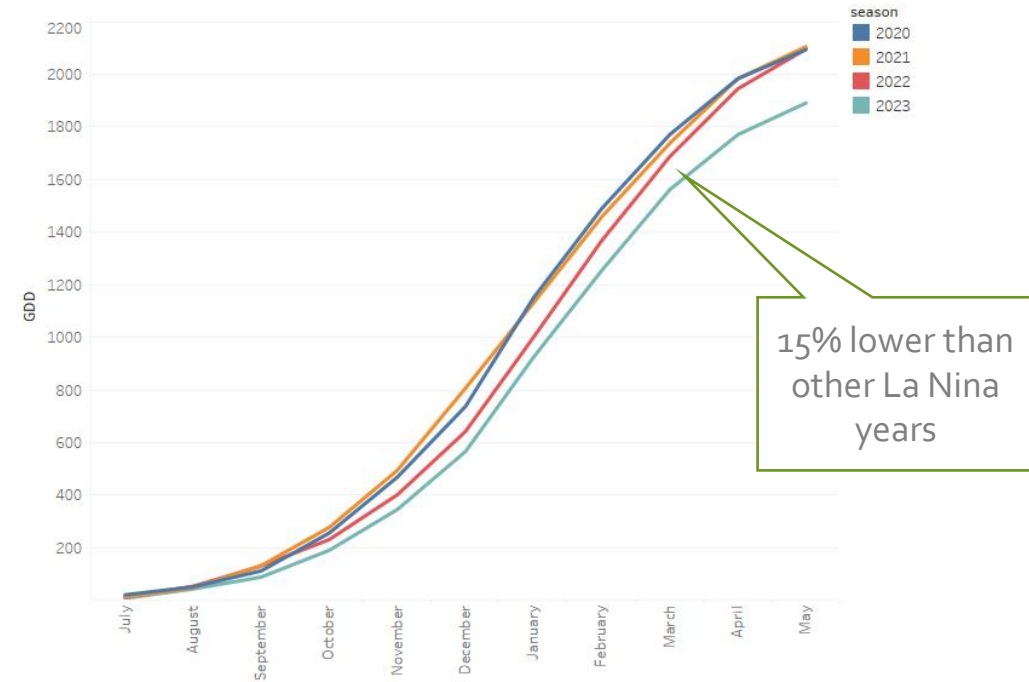
Australian V23 ~ 3 - 4 weeks late and 30 - 40% down

Example of the impact on La Nina in Barossa (2021 – 2023)

Cumulative Rain



Growing Degree Days

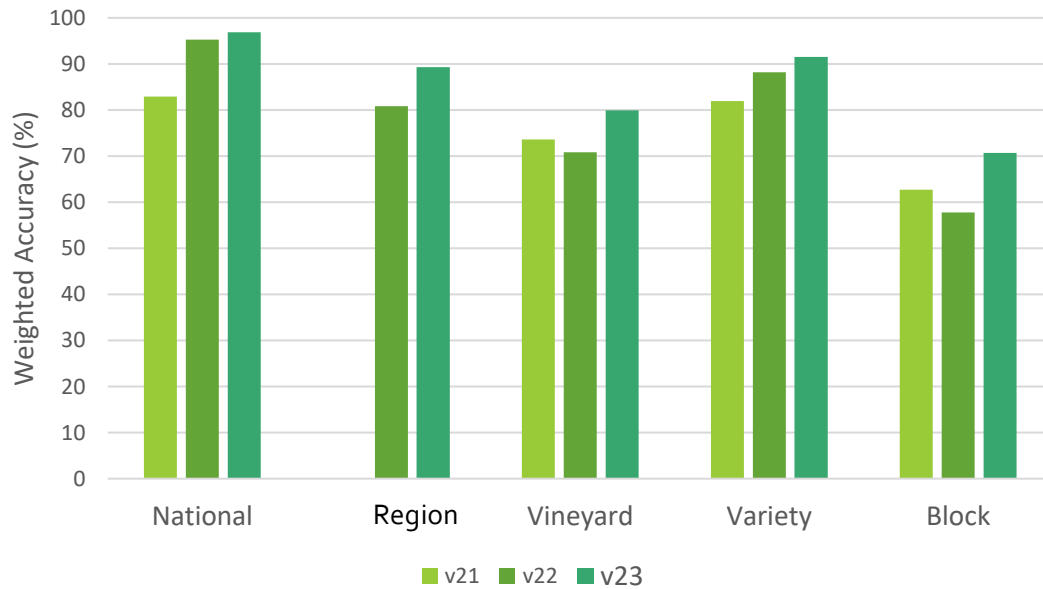


GDD = hours over 10C and below 32C

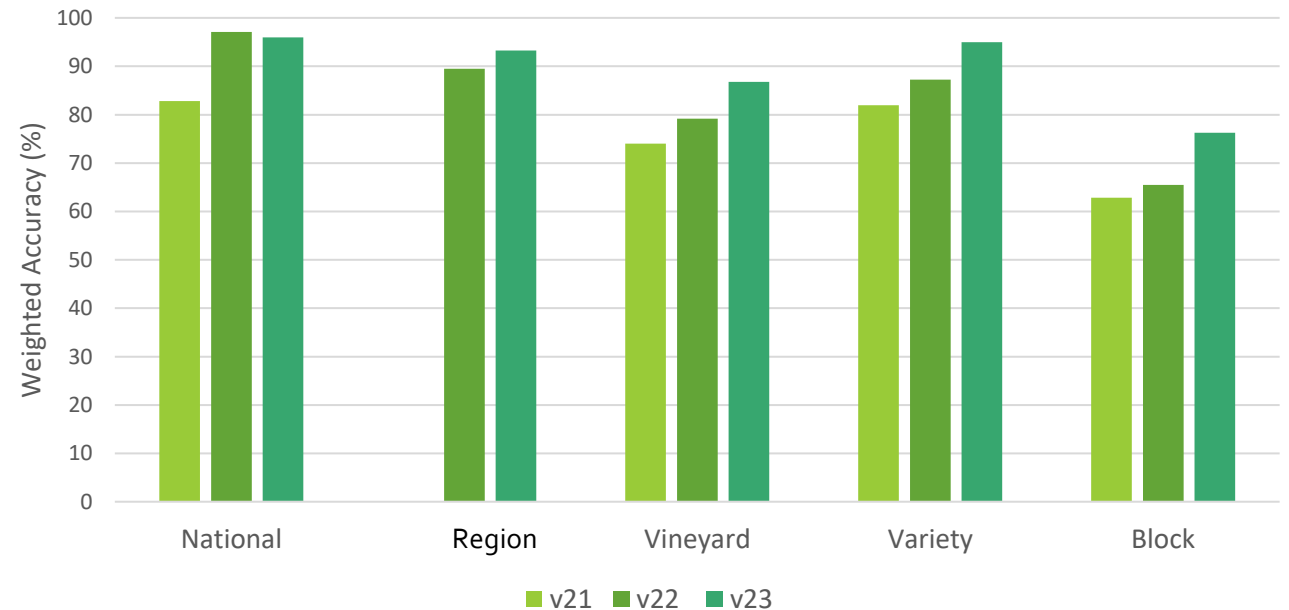
Wine: The Yield's predictions are improving over time

wine sector – 40% more accurate than using long term averages

Fruit Set (end of **November**)

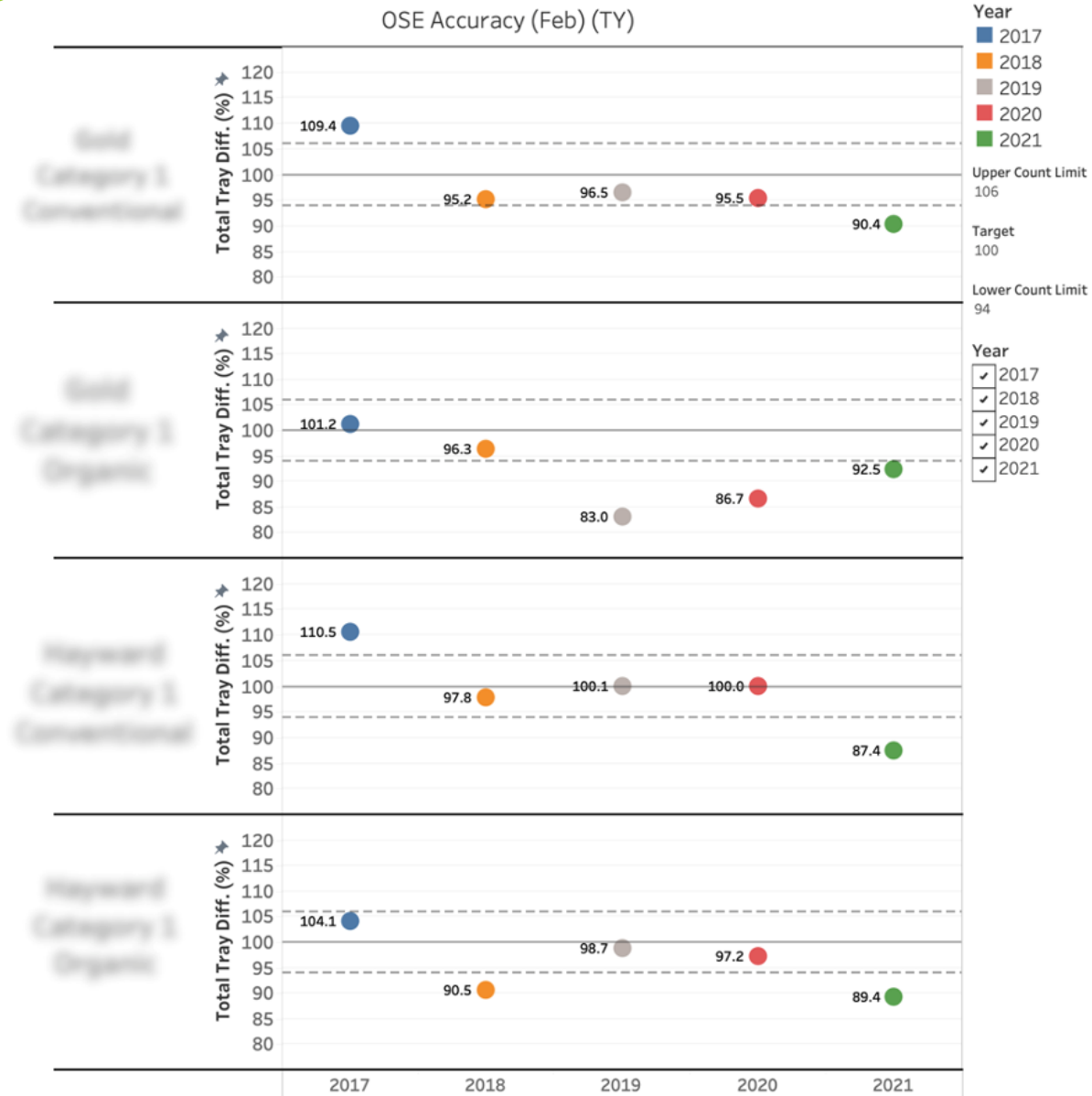


Veraison (end of January)

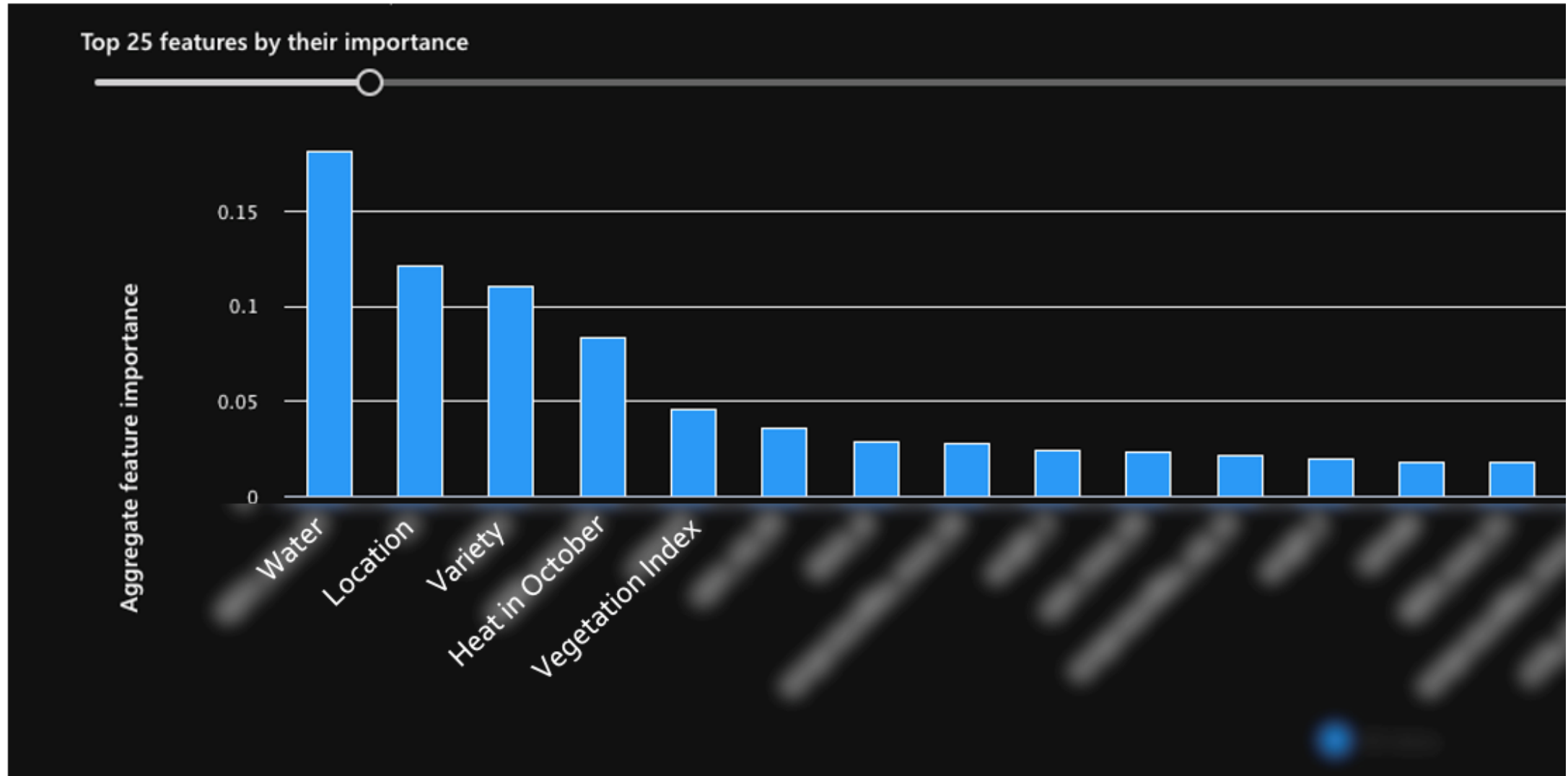


With the right technology this can be run as often as you want as new data emerges – think Climate Change.

Early-stage Research Results for Kiwifruit Harvest



What is driving the model?

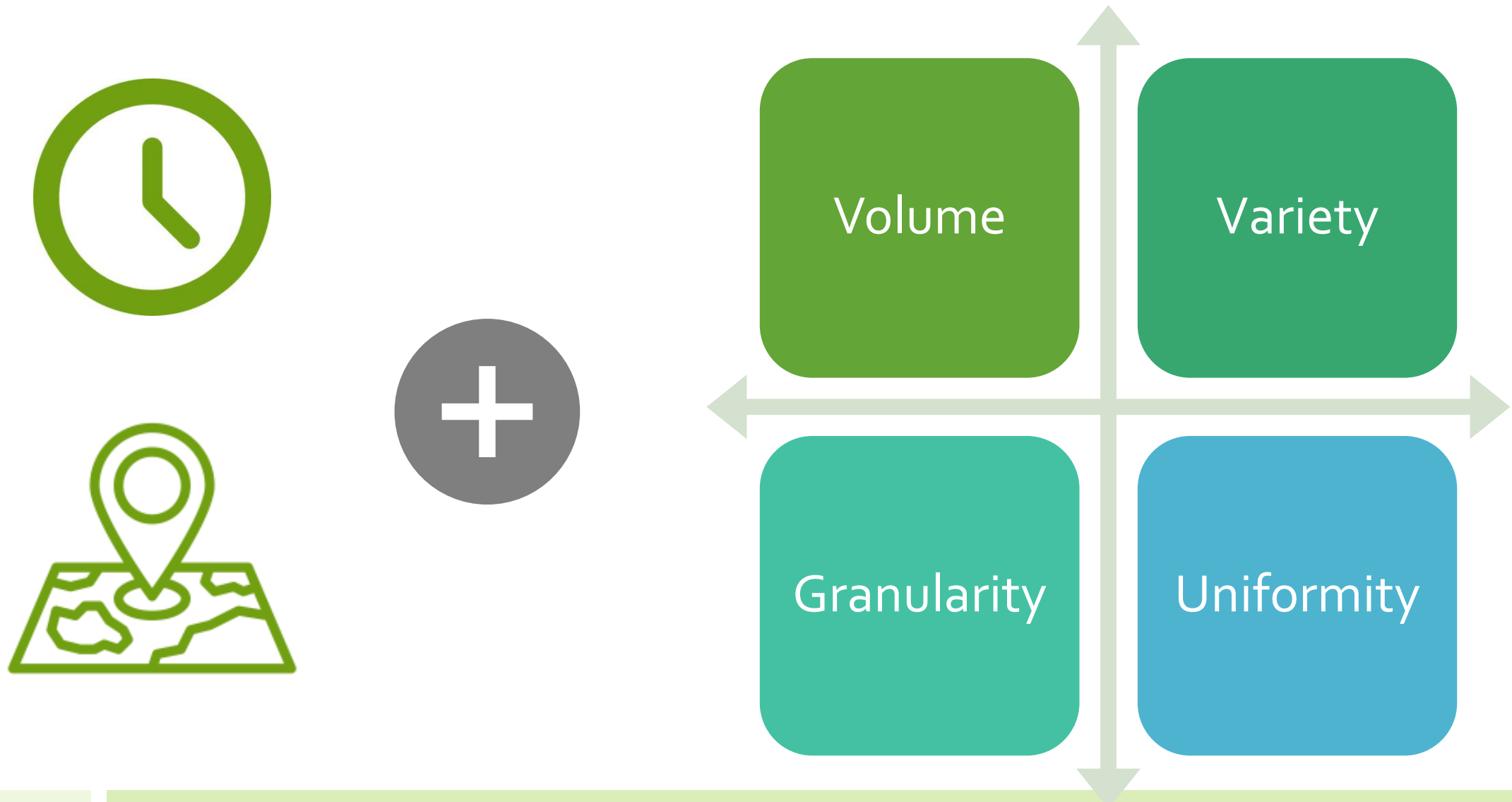




What are the
challenges?



What makes data useful for BI and AI?



Uniformity matters...

Time →

Inputs that matter*	2023	2022	2021	2020	2019	2018	2017	2016
	X	X	X	X	X	X	X	X
	X	X						
	X	X	X	X	X	X	X	
	X	X	X	X				
	X	X	X	X	X			
	X	X	X					
	X	X	X					

This is how much data we really have to work with.

Unfortunately, all this data just "adds noise" to a ML model and makes the model's job harder.

*Hypothetical

We need uniform data to train on...

Time →

Inputs that matter*

	2023	2022	2021	2020	2019	2018	2017	2016			
Harvest Quantity	X	X	X	X	X	X	X	X			
Waste	X	X	Robotics or other Systems Integration								
Weather	X	X	X	X	X	X	X				
Irrigation	X	X	X	X	Systems Integration						
Thinning	X	X	X	X	X	Robotics could be used to fill these gaps.					
Spray	X	X	X								
Pests	X	X	X								

This is how much data we really have to work with.

Unfortunately, all this data just "adds noise" and makes the model's job harder.

*Hypothetical



A future data collection pathway: Robotics

Using robots to deliver spray is a major efficiency
...and why not use that robot to collect stuff you just
would never collect today?

In field observations of growth stages, bud counts,
fruit development and quality, disease.

Reliably collected, time-stamped and geo-tagged?



Data Models are Essential

- Meaning
- Interoperability
- Scalability



So what do you need to bring this together?

- Collect the **right data** and at the **right quality** level in a flexible **platform** that enables you to leverage it
- You need the right **data model**
- You need to be **weather aware** leveraging data over many seasons – this is challenging for most people
- **Delivery Mechanisms** – of insights and action-oriented recommendations to the right hands – in field and the supply chain
- **Capability**: Transformation, Data Analytics and ML

CHALLENGES



**LEGACY
SKILLSET
CHANGE
HISTORY
COST**



You are a community

KEY: LEADERSHIP





Contact

Chris Mendes

+61 438 075 425

chris.mendes@theyield.com

theyield.com

