Marlborough Health & Safety Forum

Marlborough Health & Safety Forum
Discussion on Autonomous Vehicle Safety

Road Map for Today's Discussion

1. Snapshot of N.Z. Vineyard Robotics with a Lean Into Safety
2. Cloudy Bay Vineyards Robotics
3. Current & Future Safety

   - Cloudy Bay Vineyards Systems

   - Legislation or lack there of

4. A Worldwide View – why NZ is leading the way
5. Question Time

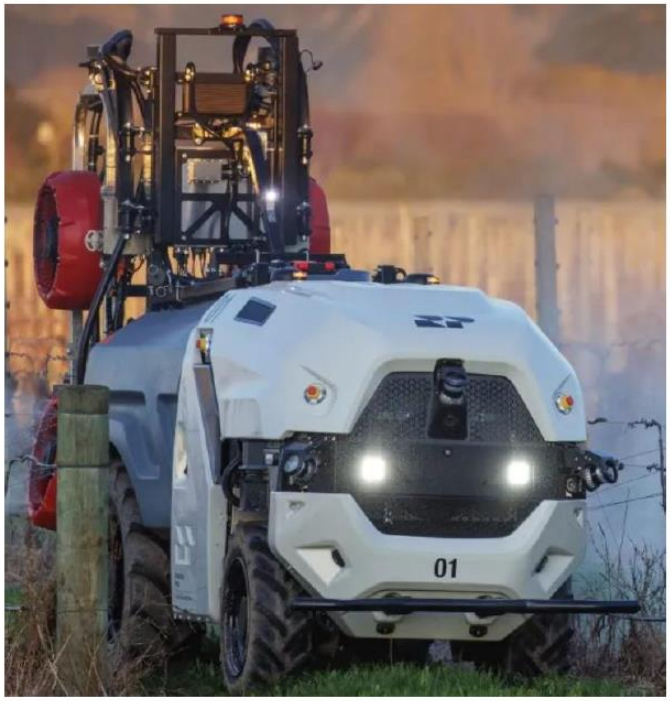
Snapshot of N.Z. Vineyard Robotics with a Lean Into Safety

autonabit

- NZ Company
- 100% Electric
- Main focus on bird scaring and data capture
- Run time up to 100km
- Smaller is safer
- No cameras, radar or LiDar

https://autonabit.nz/

Robotics Plus



- NZ Company
- Hybrid Platform
- Main focus on spraying but modular architecture means you can rotate multiple tools and attachments
- Current Model = Prospr
- Cameras & LiDar
- In row so limit escape area

https://www.roboticsplus.co.nz/products/ground-vehicles/unmanned-ground-vehicle/

OXIN

- NZ Company
- Diesel
- Main focus on, mowing, mulching, trimming, defoliating, desuckering, skirting, weedspraying, canopy spraying, data capture and towing.
- Run time unaffected due to power source
- Camera, Radar and Lidar

https://www.oxin.nz/

BURRO

- American Company
- 100% Electric
- Main focus on moving product around vineyards and nurseries. Branching out into mowing and other areas
- 13kms run – changeable batteries?
- Multiple Models
- Computer vision – Camera?
- Smaller is safer

Available in NZ

https://burro.ai/

https://www.agriautomation.co.nz/

Cloudy Bay Vineyards Robotics and Safety

AUTONOMOUS TRACTOR
STORY
CLOUDY BAY
NEW ZEALAND

CLOUDY BAY
NEW ZEALAND

Born out of Curiosity

2019 – 2020 Combination of challenges coming together to require a new solutions:

- Fatigue Management
- Zero herbicide ambitions
- Next to zero unemployment rate in Marlborough and protecting the staff we do have
- Increasing cost of plant and equipment operations without increase in task efficiency. 2-3 implements running on a tractor at one time had become achievable.

Can we do something to meet these challenges?

V1 – Scrap Steel an old compressor engine

A lot questions

- Can we do it?
- What resources are we going to need?
- Who pays?
- Why continue?
- What will be our manufacturing philosophy?

V2 – The Learnings

- Bigger is better
  - Financial
  - Size
  - Suppliers
- Fail Faster
  - Easy to say. Hard to do.

V3 – Safety

Overrow vs in-row

- escape

Health and Safety

NZ is in a great place with Health and Safety at Work Act 2015 & Work Safe Guidelines

Current Controls (CBV)

- Exclusions Zones (including GeoFence)
- Lidar
- Radar
- Cameras
- e stops
- Bumper Stops
- Remote Control Stops

Exclusion Zones

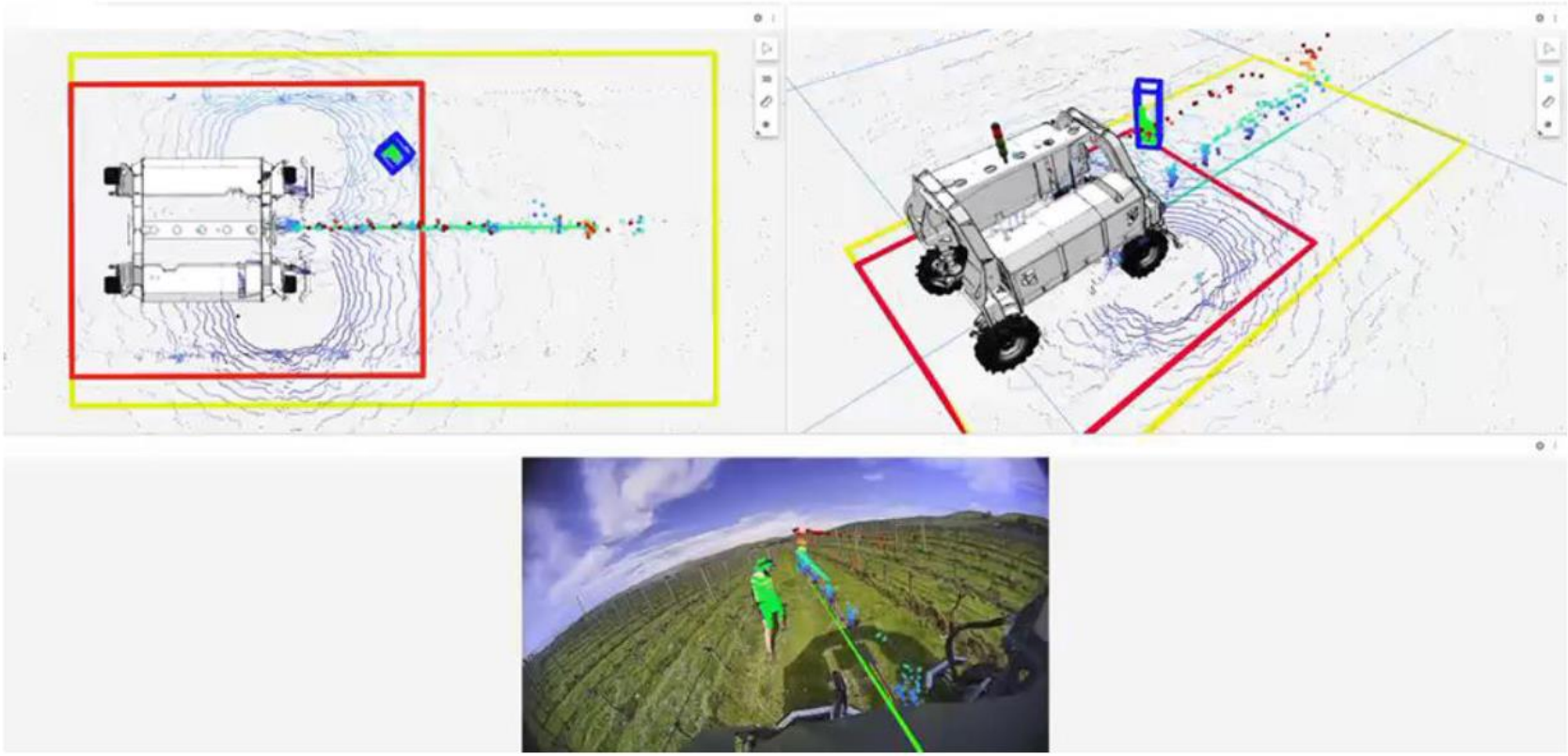
Murray FABER 4/02 10:58 am

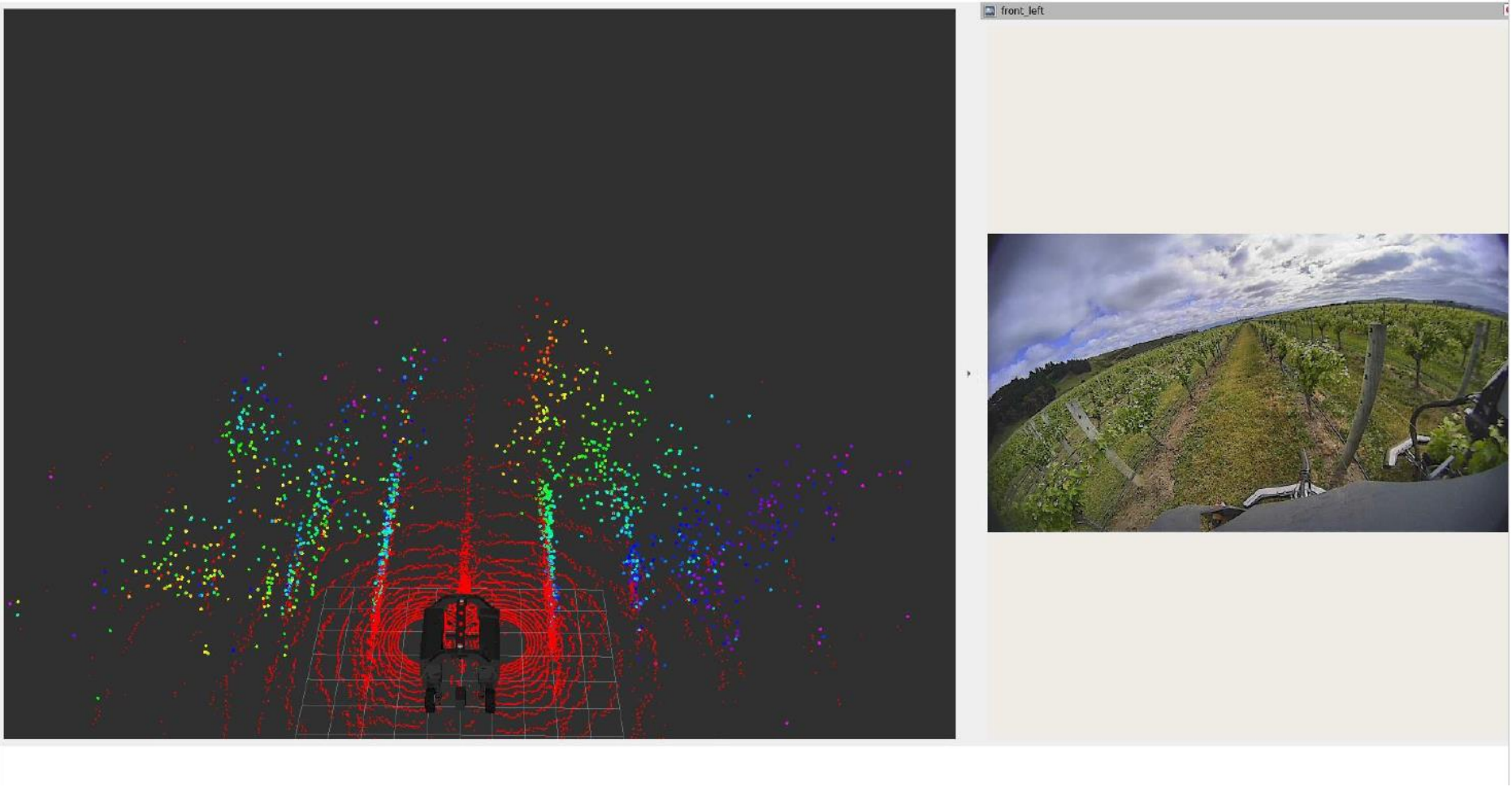
MF

Exclusion Zone: V3 Autonomous tractor is currently undervine mowing in Mustang Chardonnay. Currently in row 72 heading West.
The exclusion zone is for rows 72-94 please keep out of this area.
Cheers

E stops

Camera Detection




front_left

CB_Cloudy_bay... | CB AgriRobot | CB Telemetry | CB Telemetry Graphs | CB Row guidance

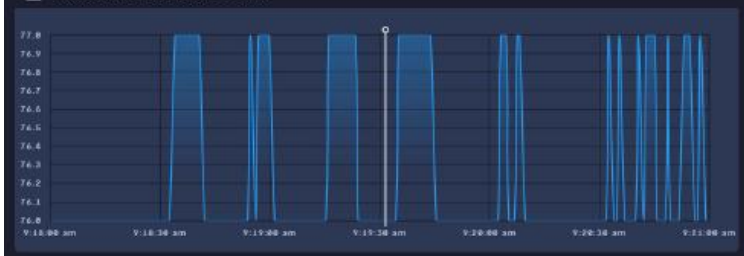
Localization

SEEK

Camera front right

Camera rear left

Temperature of engine coolant



Speed of engine

tractor.ecu.trans_press

Hydraulic oil temperature

System voltage

Driver Aids vs Autonomous

- Lower cost of entry

  https://braun-vpa.com/en/

  https://www.agriautomation.co.nz/

- Can be retrofitted to current fleet
- May require an operator in the seat

Some H&S advantages or concerns?

- complacency

FENDT

JOHN DEERE

Removing the Operator All Together?

Otago Daily Times

Dunedin 11 | 5 Tuesday, **15 October 2024** Send us news & phc

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Friday, **22 January 2021**

One dead after tractor rolls on vineyard near Alexandra

H&S Fatigue Management

2019
Jan 14
3:30pm
Less than
10km/hr
NuPoint

Vineyard Suitability

Hill vs Flat
- a changing landscape

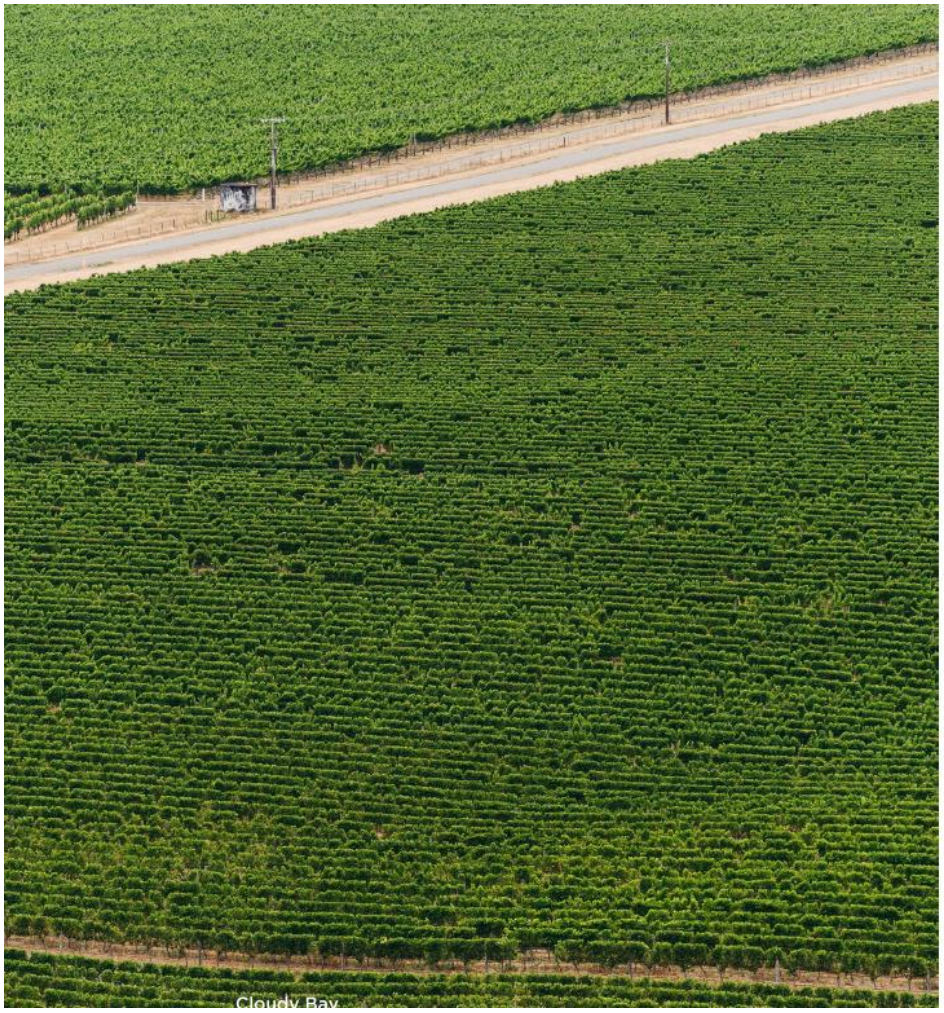
Side Slope vs Terracing
- no over correcting

Square vs Tapered blocks
- a false flag

Small vs Large
- road transport

Open Access vs Fenced
- keeping people away

Here Come the Drones?



Safety and Brain Dump

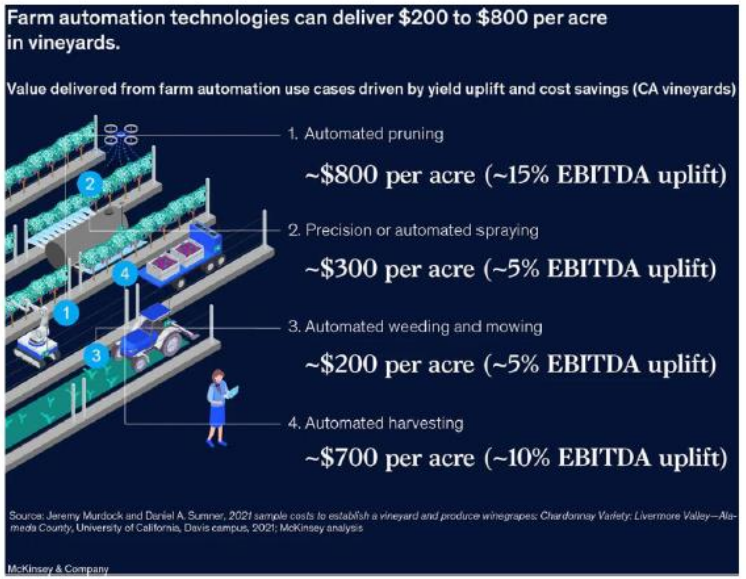
- People – workforce of the future?
- Power – Electric or Hydrogen? (V4 will have a Stage V engine)
- Implements
- Legislation
- ISO 18497
- Fire Safety

CLOUDY BAY
NEW ZEALAND

The Larger World of Vineyard Robotics

Main Source – World Economic Forum

The rise of autonomous farms: How technology is revolutionizing agriculture – July 4, 2023



- American Company
- 100% Electric
- Main focus on replicating traditional tractor tasks
- Run time up to 8hrs
- Multiple models available for varying crops

Available in NZ

https://www.monarchtractor.com/mk-v-electric-tractor

https://www.tvnz.co.nz/shows/country-calendar/episodes/s2023-e32

MONARCH.

- French Company
- 100% Electric
- Main focus on mechanical undervine management
- Run time up to 8hrs
- Multiple models available for varying crops
- Currently unknown if and when available in NZ

https://www.naio-technologies.com/en/home/

ViTiBOT

- French Company
- CLASS New Holland have a commercial interest
- 100% Electrical
- Main focus on undervine weed control and trimming
- Run time +/- 10 Hours
- 2 Models Available
- Not currently known to be available in NZ

https://vitibot.fr/?lang=en

Blue River Technology

Our mission is to create intelligent machinery that solves monumental challenges for our customers.

Robot Makers GmbH

Bringing intelligence to proven mobile machines | Assistance systems | (Partially) autonomous functions and systems

Automation Machinery Manufacturing · Kaiserslautern, Rheinland-Pfalz · 711 followers · 2-10 employees

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Smart Robots for Smart Farming

Farming · Toulouse, Occitanie · 7K followers · 11-50 employees

AgXeed

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Farming · Grubbenvorst, Limburg · 15K followers · 51-200 employees

FarmWise

Reliable Ag Computer Vision

Automation Machinery Manufacturing · Santa Clara, California · 26K followers · 51-200 employees

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