Top down (aerial UAV)

- Flight planning & image overlap
- Timing of flight
- Camera & indices
- Spatial correction
- Ground control points
- Projection

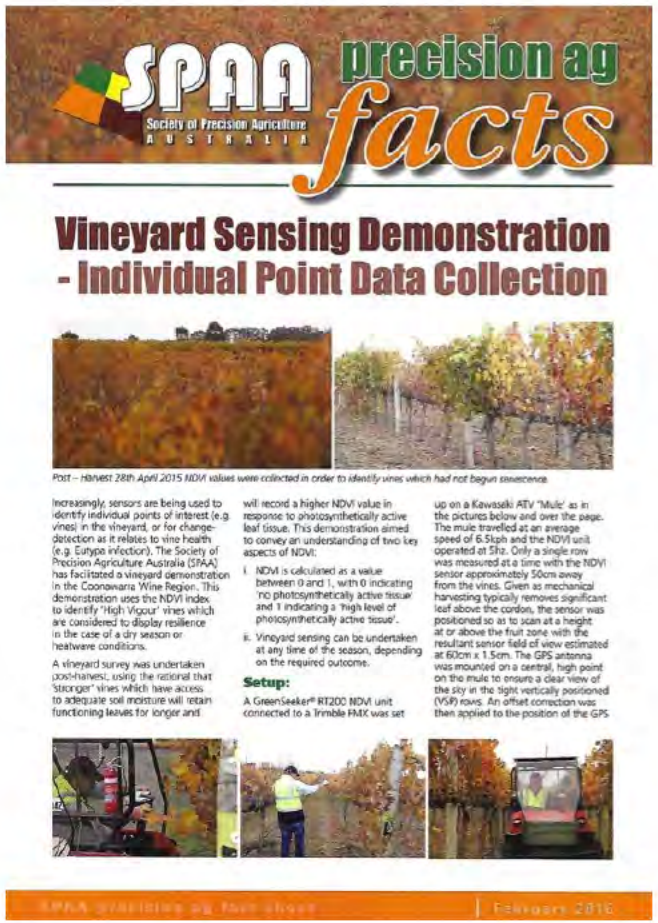
Side on…

- Setup
- Travel speed (GPS/Sensor frequency vs m/sec)
- NDVI – targeted at canopy
- GoPro – sky as background
- Stability
- Height of cover crop

Additional resources:

- SPAA fact sheet
- Image capture guide (Bitwise)
- Video 1
- Video 2

Resources:



SPAA precision ag facts

Society of Precision Agriculture AUSTRALIA

Vineyard Sensing Demonstration - Individual Point Data Collection

Post – Harvest 28th April 2015 NDVI values were collected in order to identify vines which had not begun senescence.

Increasingly, sensors are being used to identify individual points of interest (e.g. vines) in the vineyard, or for change-detection as it relates to vine health (e.g. Eutypa infection). The Society of Precision Agriculture Australia (SPAA) has facilitated a vineyard demonstration in the Coonawarra Wine Region. This demonstration uses the NDVI index to identify 'High Vigour' vines which are considered to display resilience in the case of a dry season or heatwave conditions.

A vineyard survey was undertaken post-harvest, using the rational that 'Stronger' vines which have access to adequate soil moisture will retain functioning leaves for longer and will record a higher NDVI value in response to photosynthetically active leaf tissue. This demonstration aimed to convey an understanding of two key aspects of NDVI:

i. NDVI is calculated as a value between 0 and 1, with 0 indicating 'no photosynthetically active tissue' and 1 indicating a 'high level of photosynthetically active tissue'.

ii. Vineyard sensing can be undertaken at any time of the season, depending on the required outcome.

Setup:

A GreenSeeker® RT200 NDVI unit connected to a Trimble FMX was set up on a Kawasaki ATV 'Mule' as in the pictures below and over the page. The mule travelled at an average speed of 6.5kph and the NDVI unit operated at 5hz. Only a single row was measured at a time with the NDVI sensor approximately 50cm away from the vines. Given as mechanical harvesting typically removes significant leaf above the cordon, the sensor was positioned so as to scan at a height at or above the fruit zone with the resultant sensor field of view estimated at 60cm x 1.5cm. The GPS antenna was mounted on a central, high point on the mule to ensure a clear view of the sky in the tight vertically positioned (V&P) rows. An offset correction was then applied to the position of the GPS

SPAA Sharing ag fact sheet | February 2016

GoPro Imagery Capture Guide - Wine Grapes

- Video 1
- Video 2

Examples

- Vineyard Mapping for multiple use cases
  - SWA property map
  - Communication
  - Consistency
  - Piece – rate payments
  - Automation
- Looking for outliers
  - Gaps
  - Virus
- Canopy Size

Assessment of canopy size using UAV-based point cloud analysis to detect the severity and spatial distribution of canopy decline

Jingyun Ouyang, Roberta De Bei, Cassandra Collins ✉

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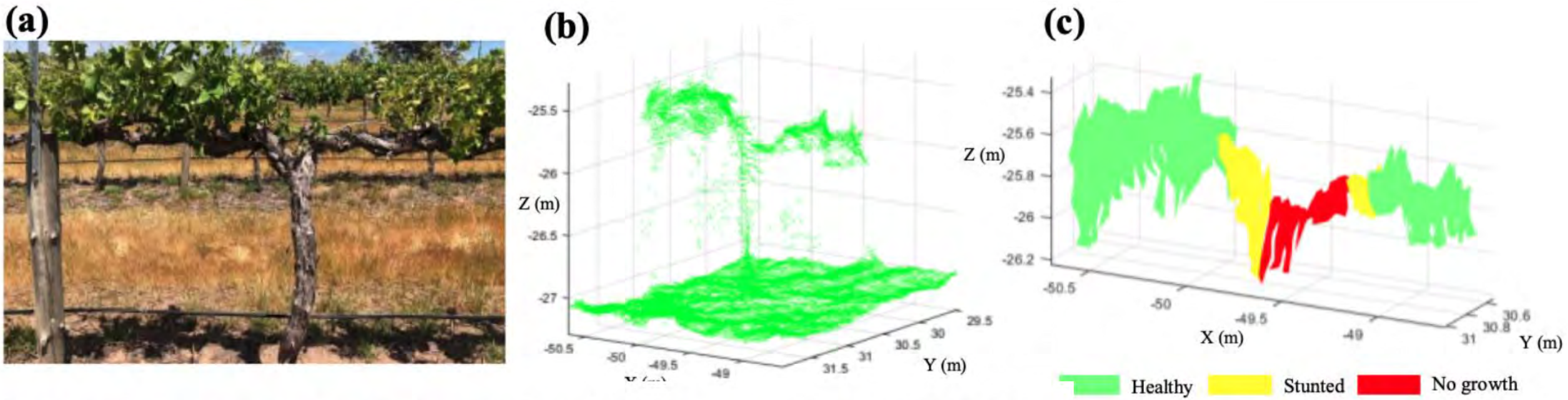
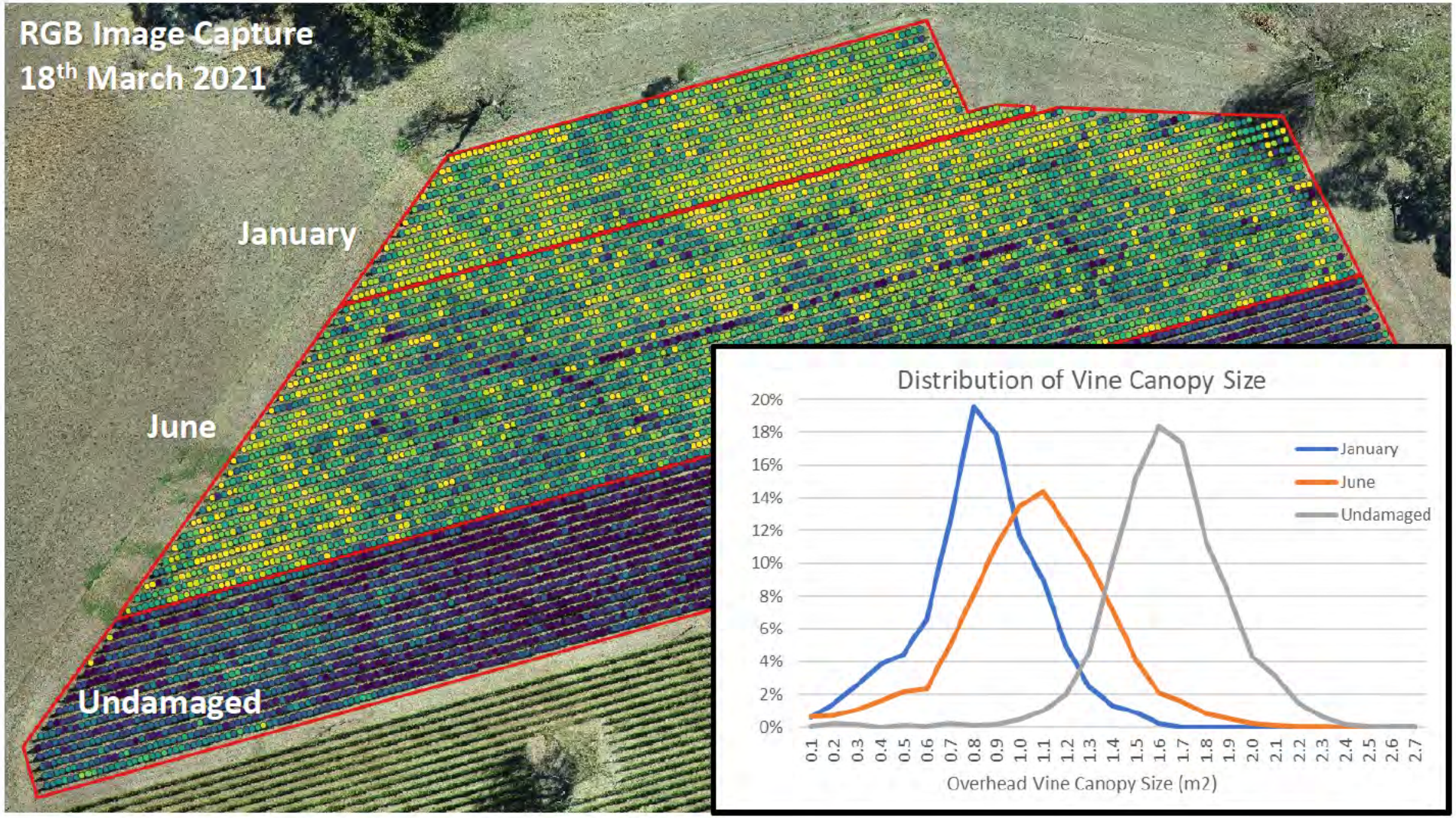


(a) the grapevine cordons were found to contain both healthy canopy, stunted growth and no growth sections; (b) corresponding single grapevine point cloud selected from the vineyard point cloud; (c) canopy points selected from the vine point cloud and divided into sections (0.05 m in length). For all canopy sections, k-means clustering was used to generate labels of "healthy", "stunted" and "no growth" (colour coded). In this study, any stunted canopy or no growth sections longer than 0.2 m on a target grapevine were recorded. Point coordinates are for illustration only, not the actual geographic coordinates.



Shaun the Sheep Movie 2015, Aardman Animations


Penley Estate
Block 16
Block 7
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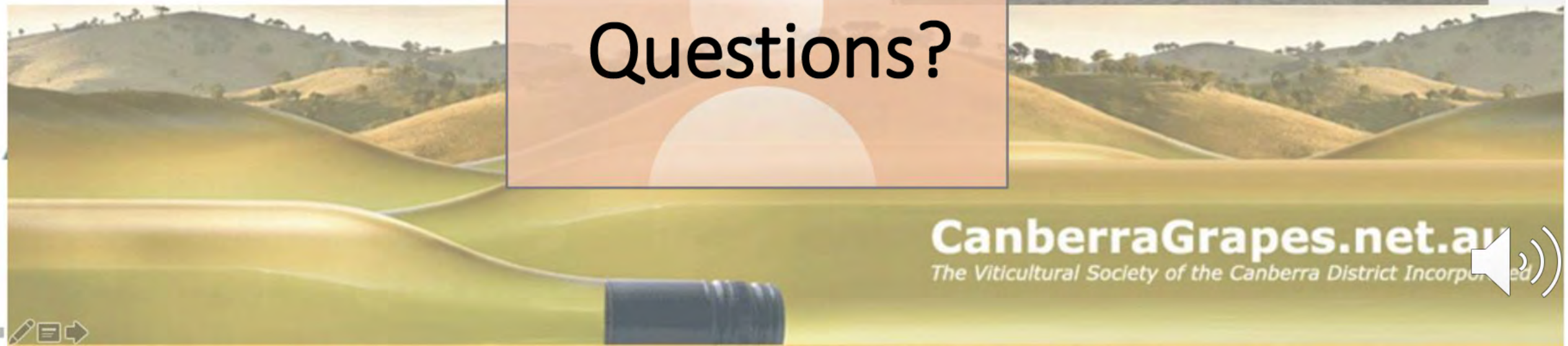
AgriFutures®
Australia

AgriFutures Australia Producer Technology Uptake Program allows VSCD to trial vineyard mapping with a DJI Phantom 4 drone with Multispectral camera

This project is supported by funding from AgriFutures Australia.

Questions?



What’s next?

- 29th September Canberra: (Budburst)
  - Bitwise data collection demonstration (concept and value of regular data collection)
  - Include Fiona Turner BitWise (via Zoom or local rep)
  - RTK Rover Demo
  - Introduce Efficient Vineyard and aim to include Terry Bates from Cornell (via Zoom or pre – recorded)

- On-line workshop - October 2024 – troubleshooting dormancy mapping

What's next?

- 24th November (Flowering) & 23rd February (Veraison):
  - Both hands on workshops explaining the critical aspects of quality data collection for optimum results.
  - GoPro data collection & side on NDVI
  - Bitwise to GreenView & NDVI to EV

- On-line workshop – December 2023 - troubleshooting budburst mapping and side-one NDVI

- On-line workshop – March 2024 - troubleshooting veraison drone mapping and yield estimation, its data analysis and presentation

- On-line workshop – May 2024 - Project Summary and Findings

- June/July - End of Project Seminar