

Precision Orchard Management

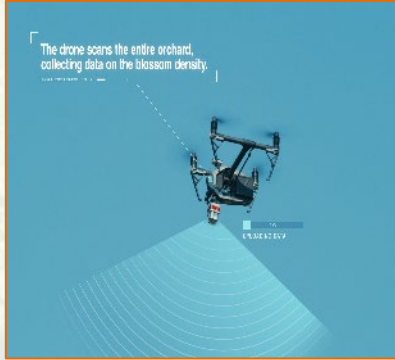
Ross Gansz –LaGasse Ag

Lyons, NY

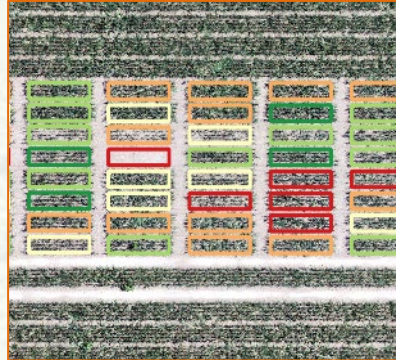


Crop Intelligence at Tree level

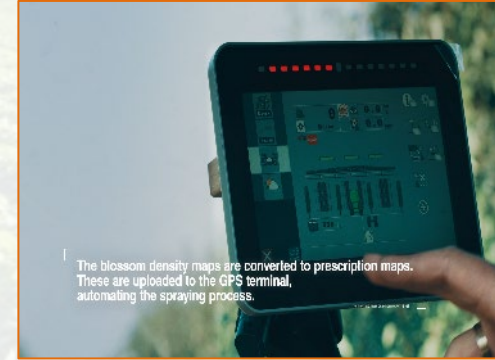
From monitoring to managing



COLLECT



MODEL



INTERPRETATION



EXECUTE

ANALYSIS

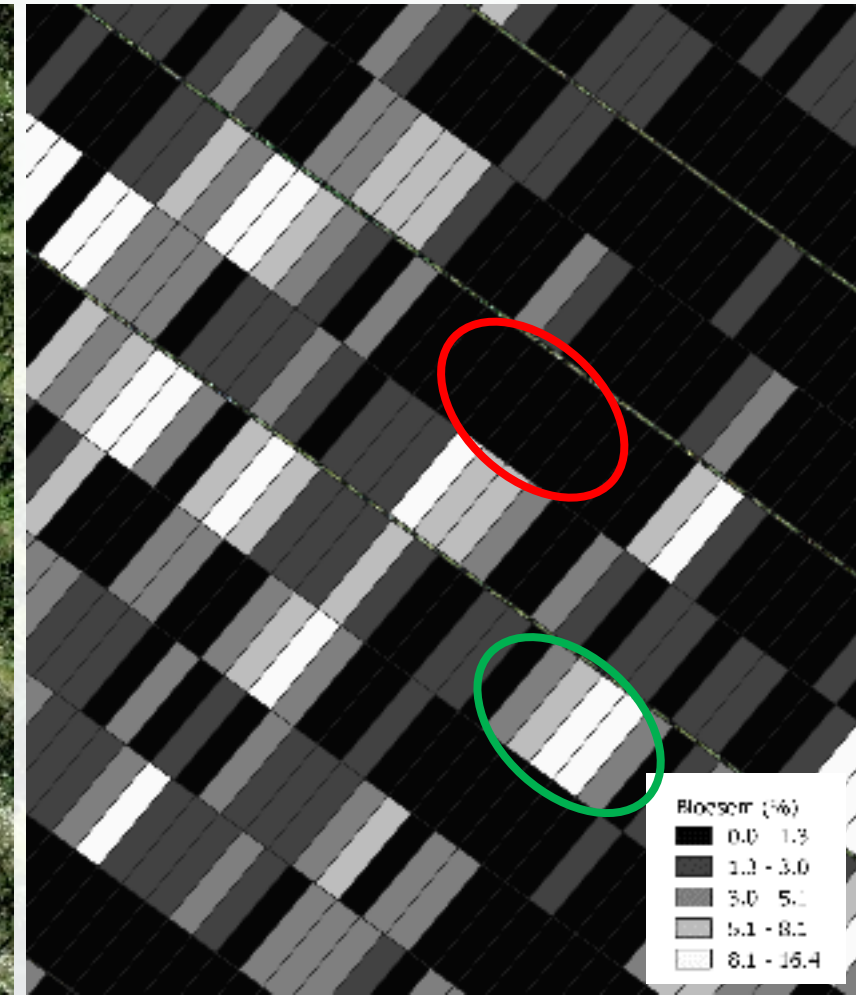
Blossom / Vigor mapping

Applications:

- Thinning
- Setting
- Growth regulation
- Pest management
- Fertilization

Benefits:

- Targeted thinning
- Targeted fertilization
- Decreased labor
- Increased yield
- Homogenous Orchard



Blossom thinning & Apogee application



SPRAYING ON TREE LEVEL

IE. BLOSSOM THINNING ON GPS / DATA MAPS

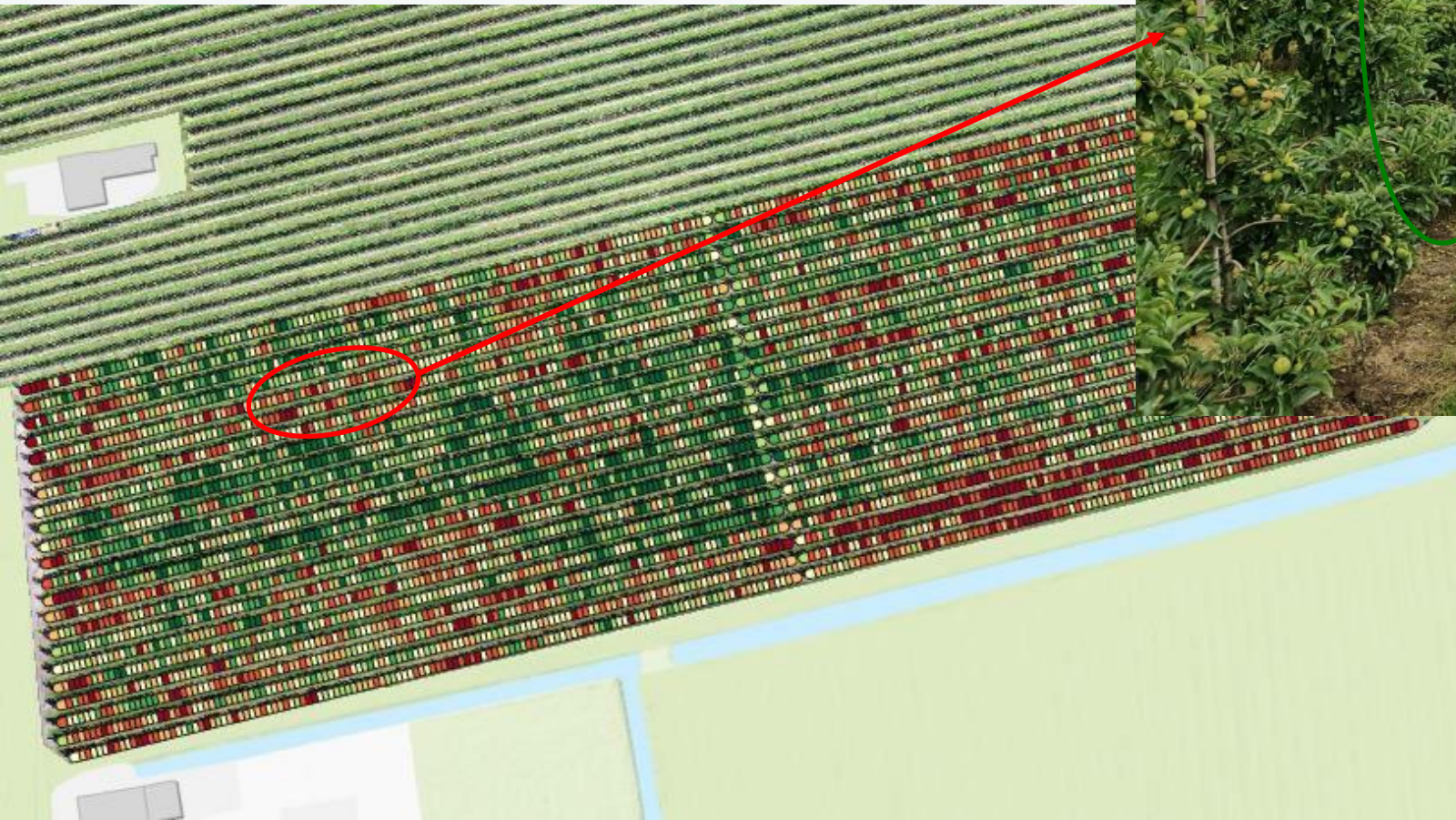


Validation precision thinning

- Validation of precision thinning (ATS & Maxcell) by (Netherlands):
 - Yield increase per tree: 65%
 - Yield increase of 2.47 ton/acre apples
 - Average price of Gala: .25/lb
 - **Financial benefit: \$1,225 / acre**

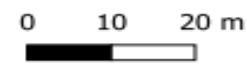
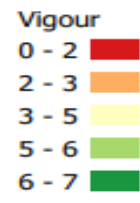
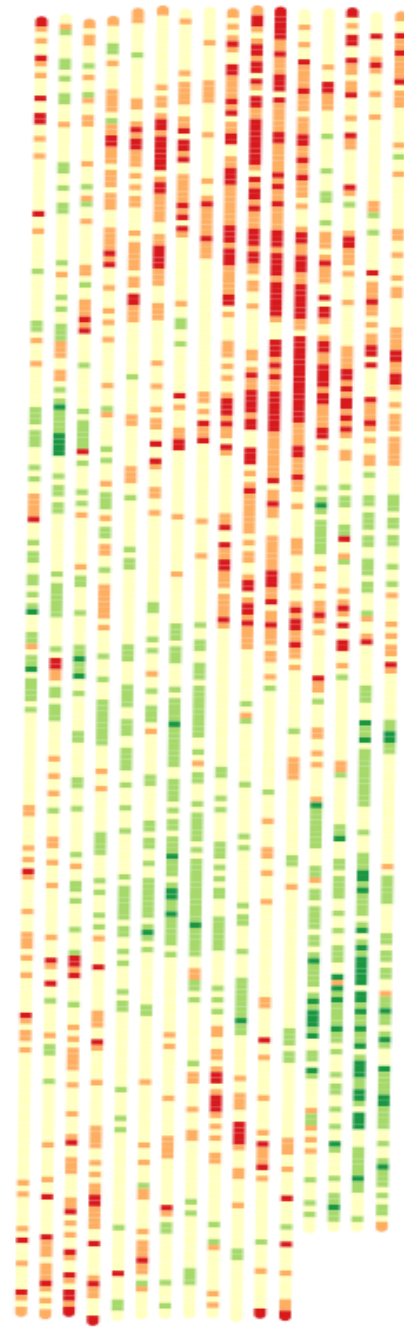


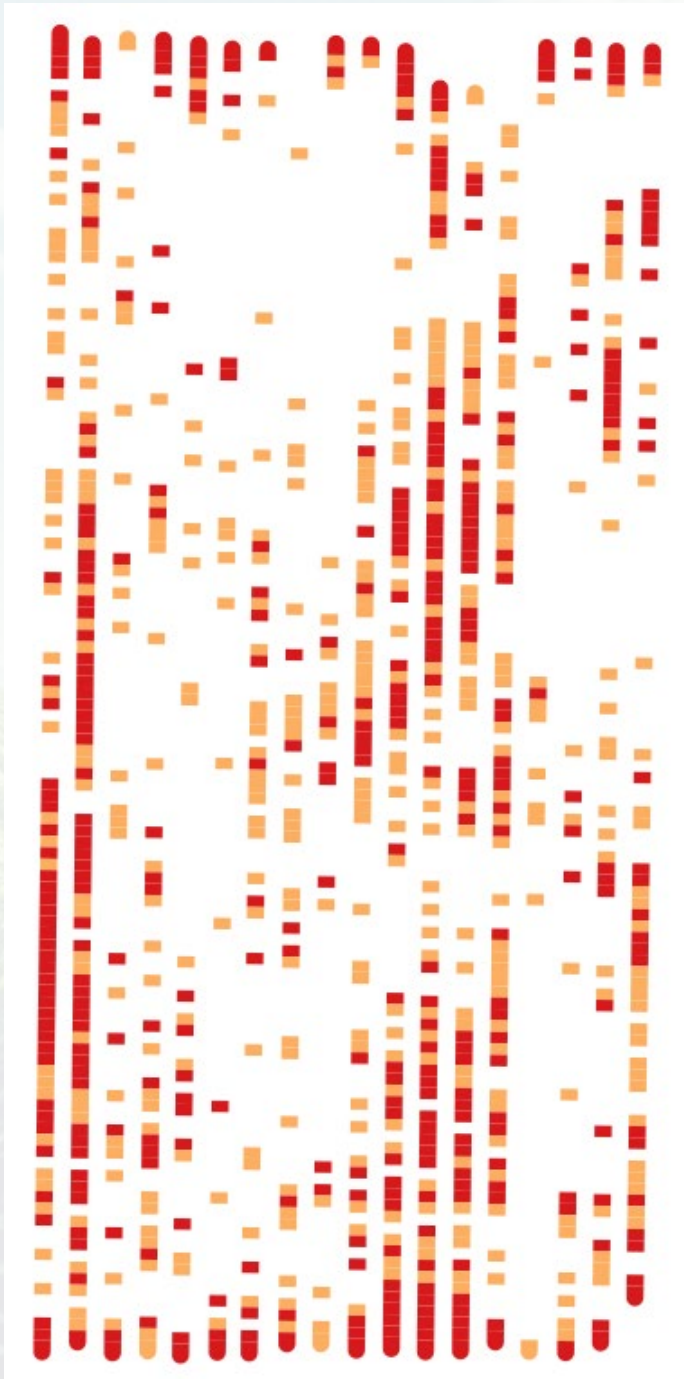
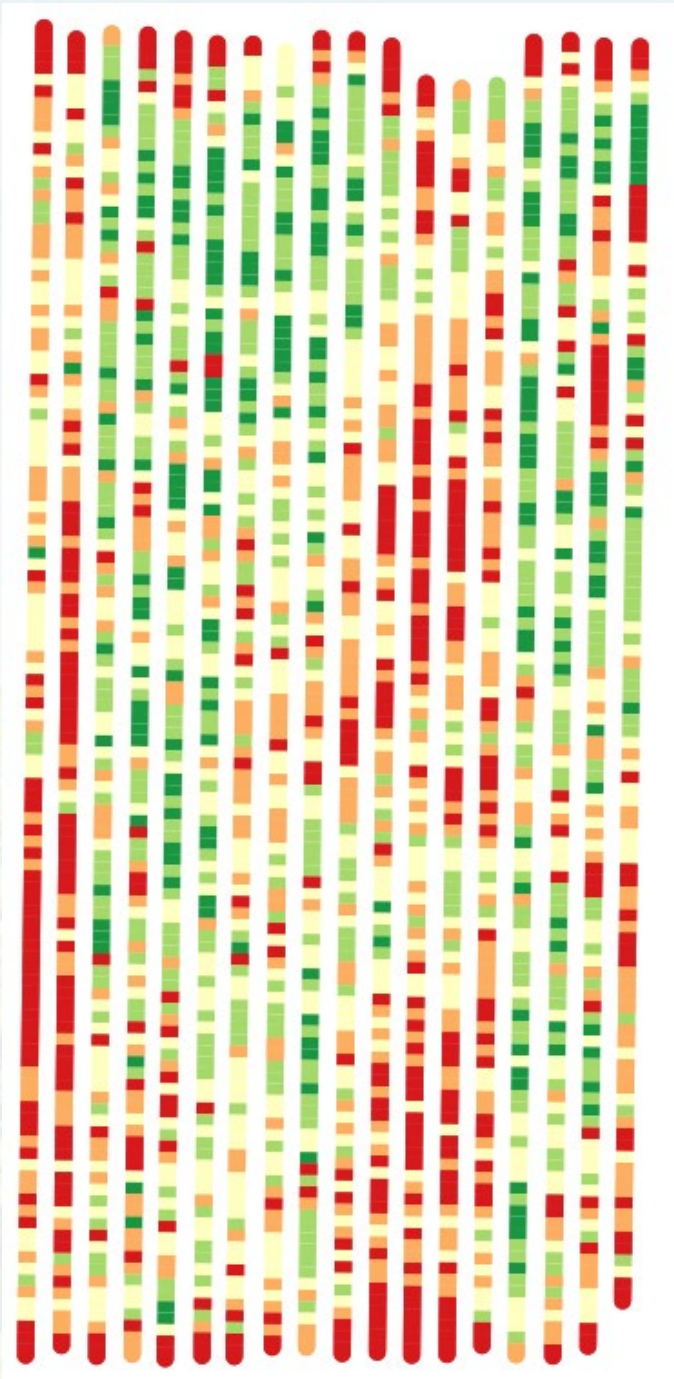
Vigour mapping



Results

More homogeneous orchard
Reduced shoot length variation





Only treat trees with low
vigour: 40%

Saving on inputs
Maximizing outputs

Apogee Application in action Michigan



Automated Root Pruning from Vigor Map

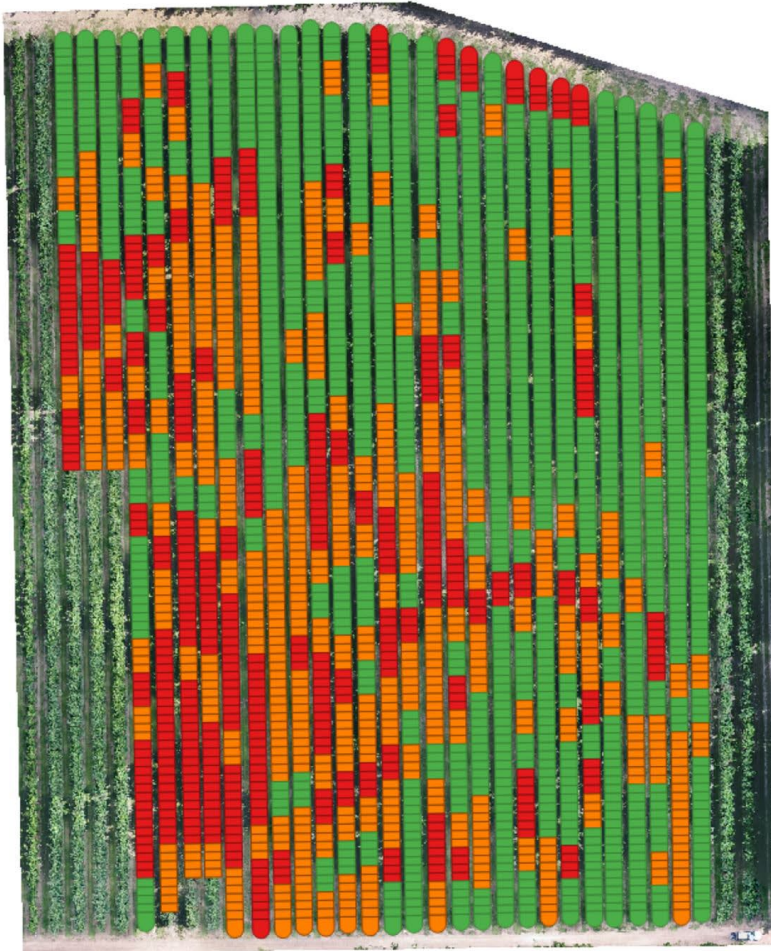


Fertilizer spreader



Also on a zonal level

Vigour map



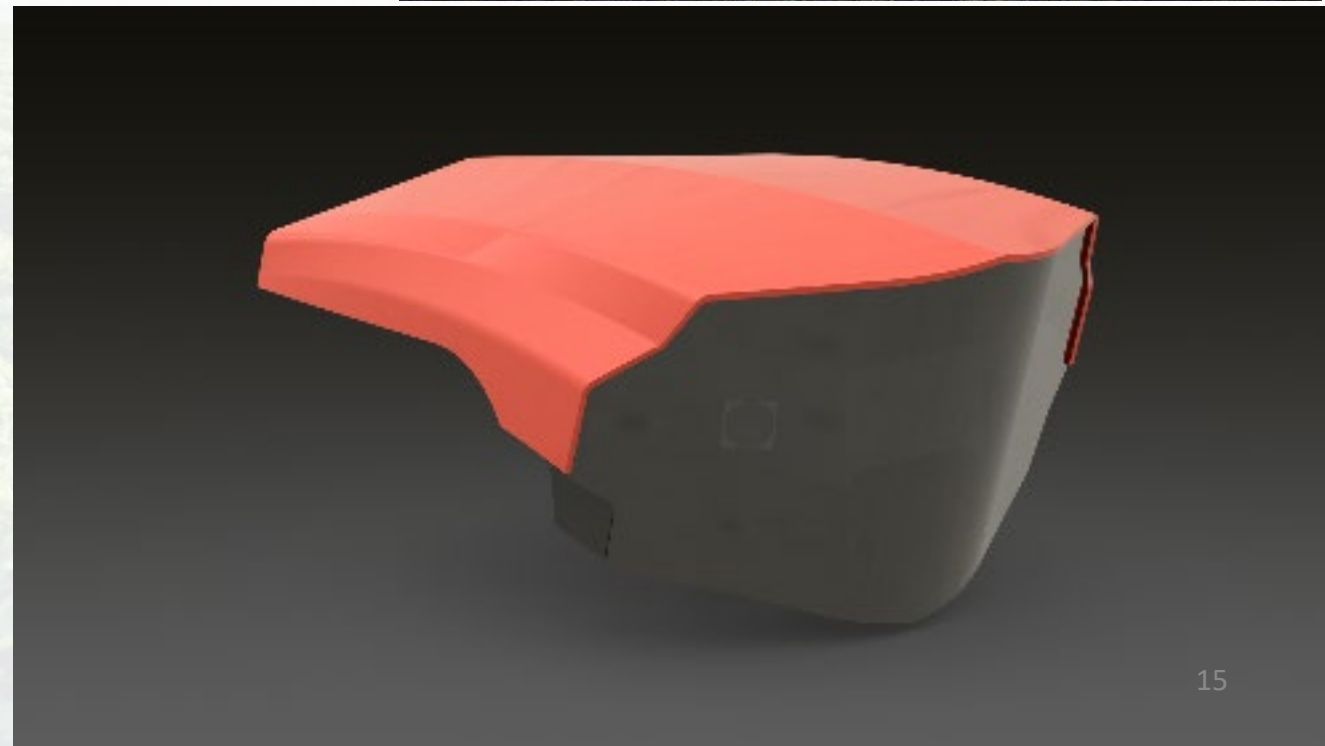
Fertilizer taskmap





What is being worked on for the next steps

Tractor mounted sensors



CURRENT INNOVATIONS IN PRECISION FARMING

Next level Precision farming

➤ Pulse Width Modulation (PWM)

Variable pressure and volume for each spray nozzle



➤ Camara - scanner

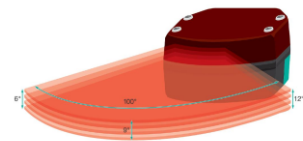
Contour and leaf-mass detection

R2300 Tolerance

Tolerance: Pilot light to Measurement Laser center

Pilotlight IR Laserspot

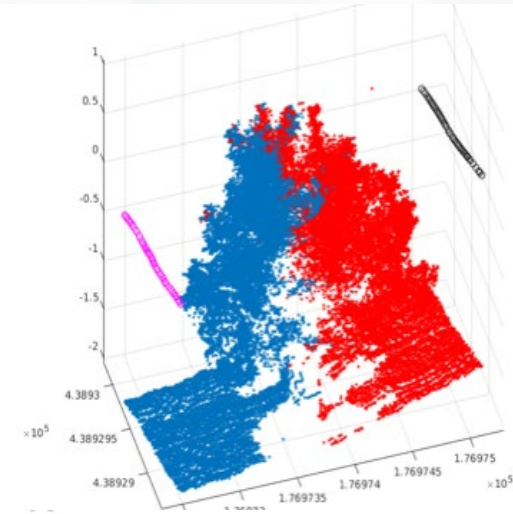
Max. $\pm 5\text{mrad}$
Max. $\pm 0.287^\circ$



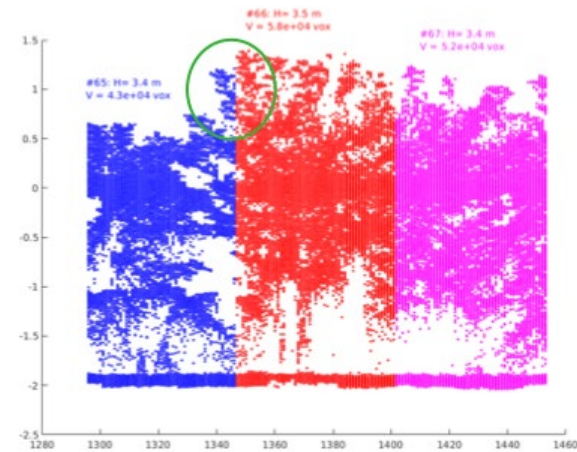
TOP LEFT: R2300 Tolerance

TOP RIGHT: R2300 Tolerance

PEPPER+FUCHS

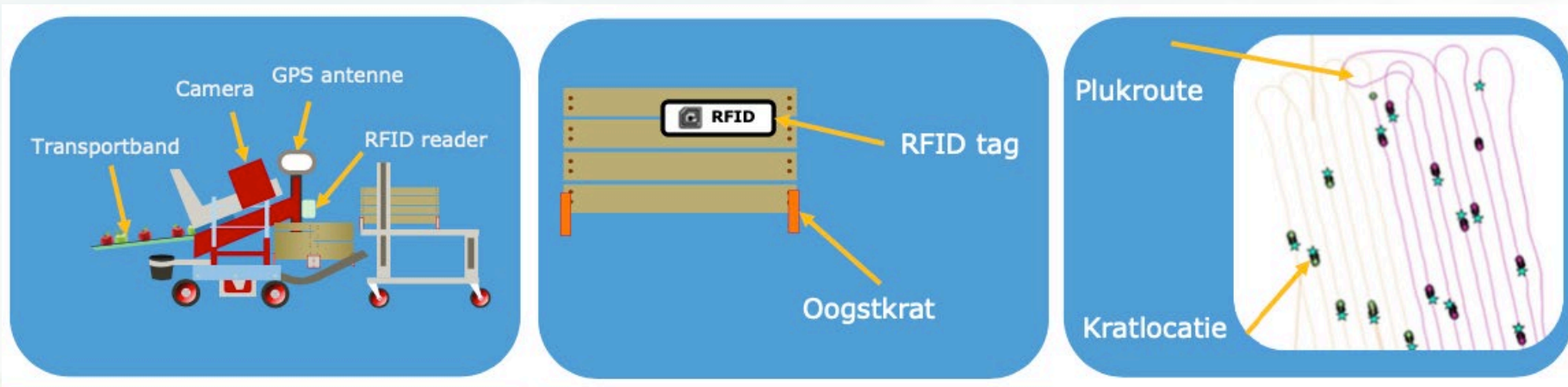


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Source: Wageningen Universiteit

HARVEST REGISTRATION



Pluk-O-Trak records:

- hours picking performance
- time box change
- man-hours

Option: Camera system for size and number detection

Track and Trace per box

Option: RFID or Bar code

- Position empty / full box
 - Weight per box
- Option: Content of box (size, number and color)

Harvest registration per group trees;

Ipad in forklift > parcel map

- Position full boxes
- Empty boxes

Thank you!



Questions?