

# Smart Farming in Practice

Learn to use benefits!

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Worldwide Expertise for Food & Flowers

# What is Delphy ?

- ✦ Private advisory service / consultancy for farmers
- ✦ Over 200 employees, 150 Netherlands
- ✦ 90% independent consultancy optimal plant production; technical, financial, management, legislation limits
- ✦ Benefits of the farmer main objective: improve profitability
- ✦ Advisors visit farms and fields every week during growing season, exchange information
- ✦ 10% advice in projects, funded by governments environmental issues to be improved by farmer
- ✦ Practical research, on demand of farmers



# Smart Farming

- ✦ Improve yields
- ✦ Optimize inputs
  
- ✦ Using crop or soil sensing data
- ✦ Use actual weather and climate data
- ✦ Agronomic knowledge optimal crop growth
- ✦ Precision steering GPS
- ✦ Automatic machine control



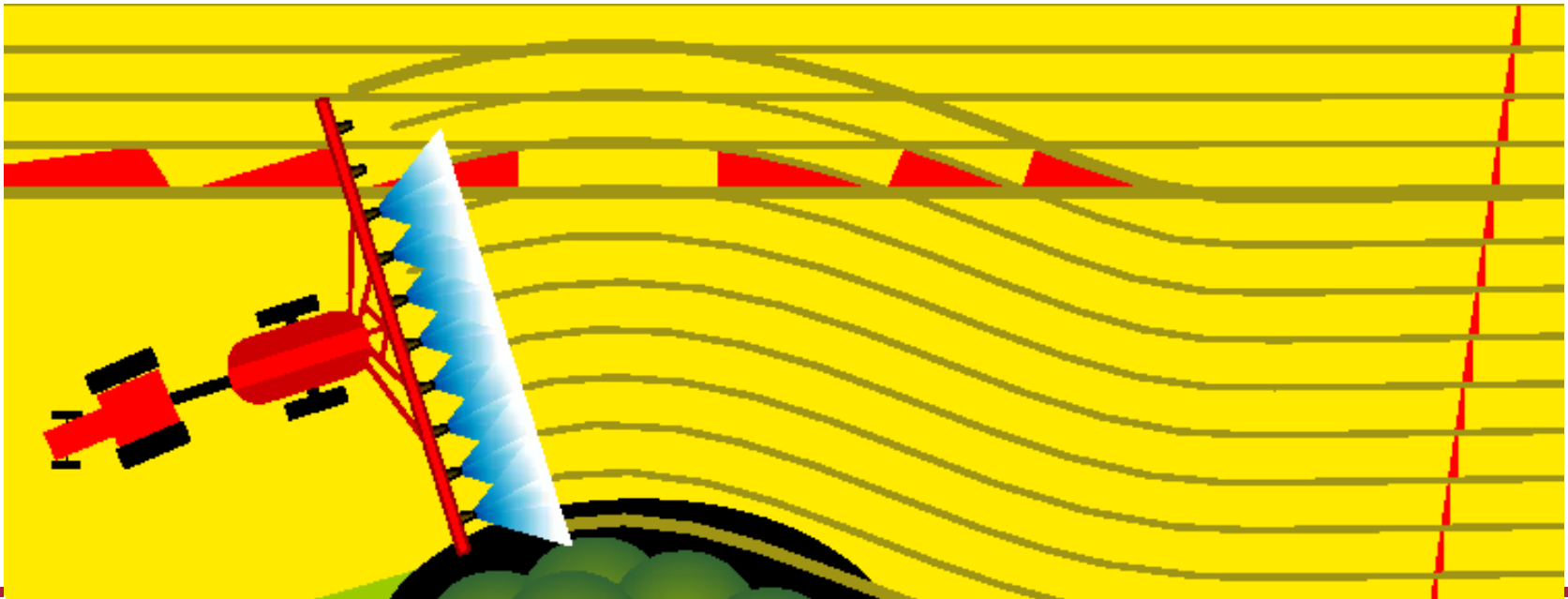
# Precision farming

- ✦ RTK-GPS auto steer
- ✦ High accuracy, reliable, widely accepted
- ✦ Improved cultivation quality,
- ✦ Reduced labour straining



# Improve seeding, spraying, spreading

- ✦ Is used on more than 80% new sprayers
- ✦ No overlap and not outside field
- ✦ Less damage to crop, safe environment



# GPS precision seeding

- ✦ RTK GPS autosteer
- ✦ Automatic shutoff elements: no overlap
- ✦ Check seeding: missing seeds, double,...





# Close mechanical weed control

- ✦ 2 cm beside the crop rows
- ✦ Saves much time on hand weeding





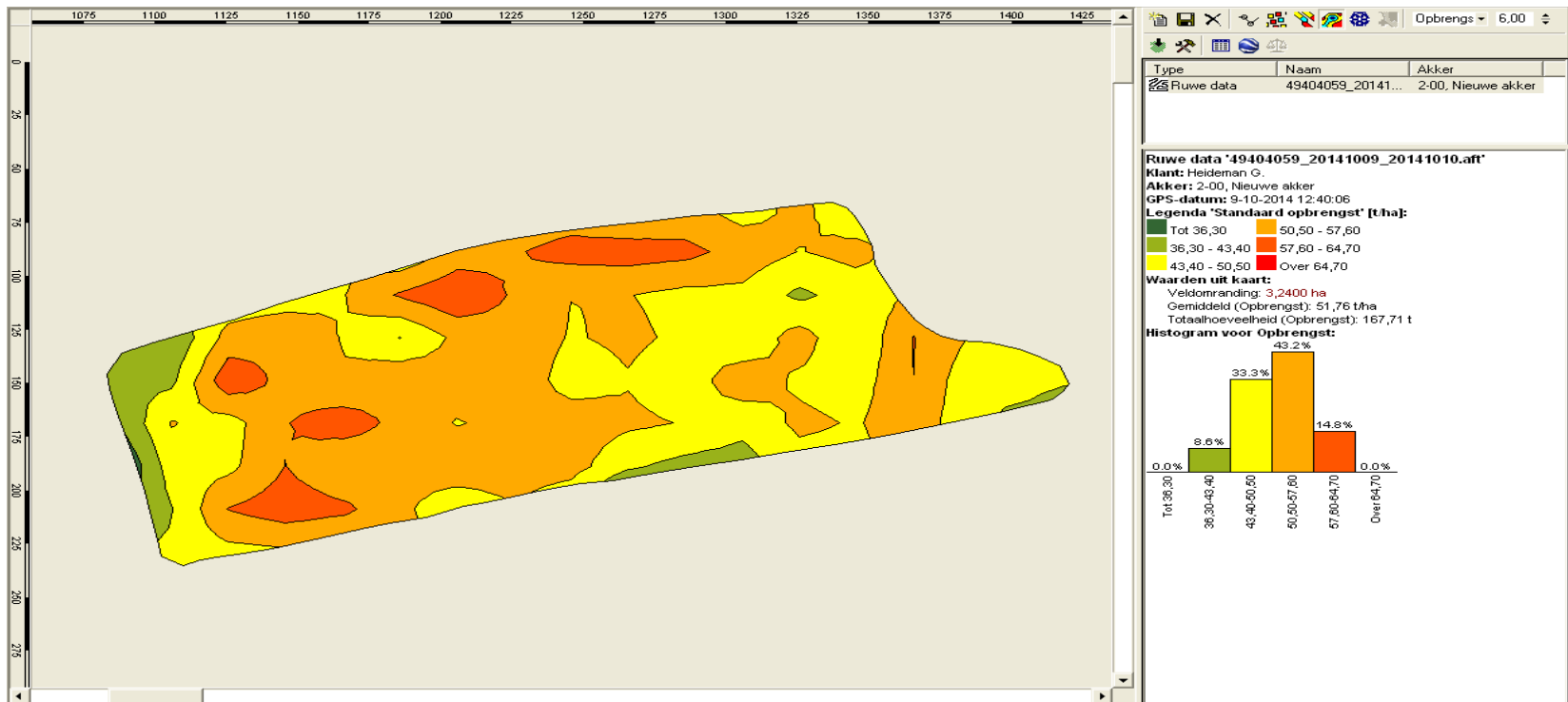
# Yield measurement

- ✦ Compare Field , Zones
- ✦ Combines, potato harvester, ..



# Zones

- ✦ Analyse differences
- ✦ Map for spot soil inspection or sampling



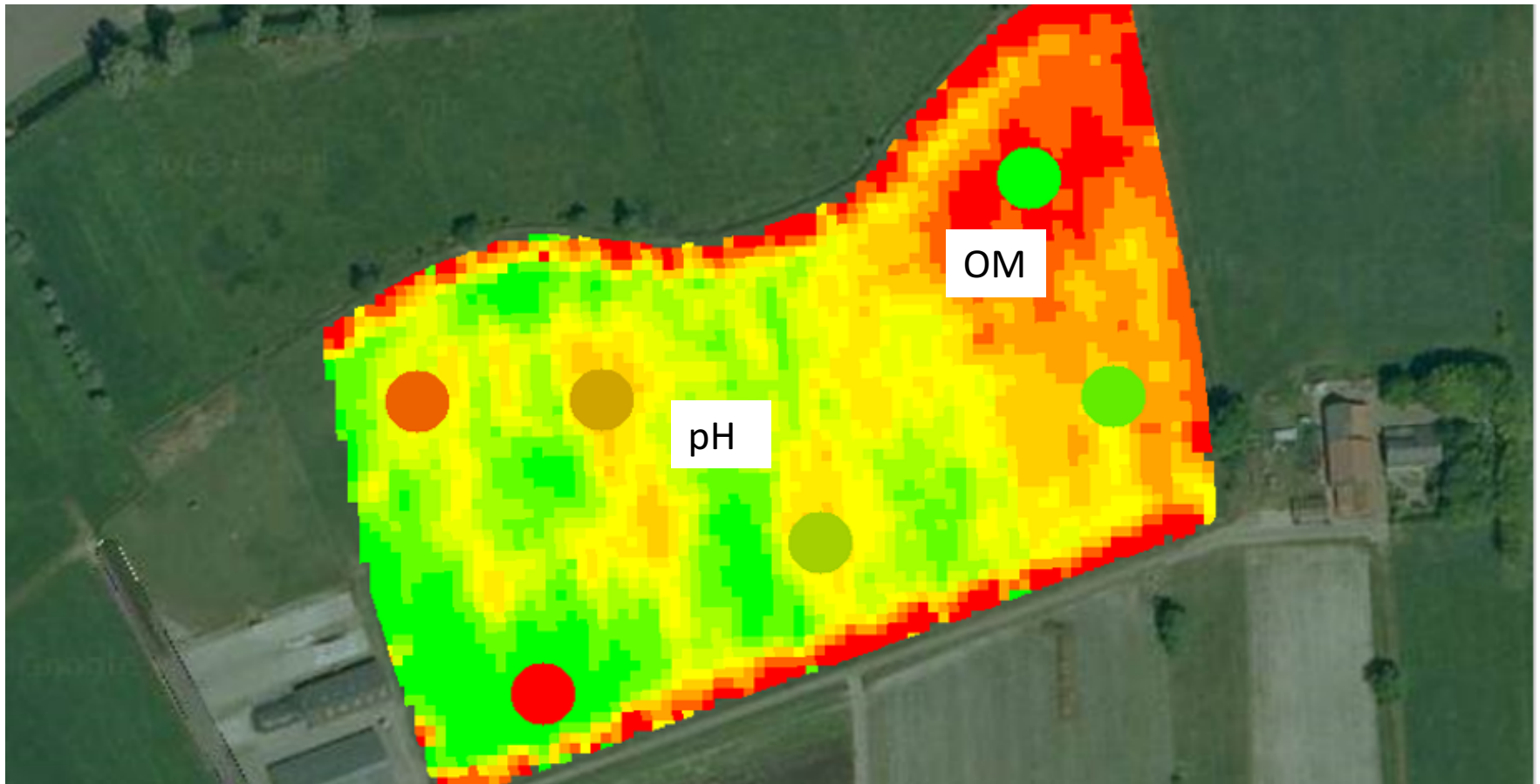


# Soilscanning zones

- ✦ Organic matter
- ✦ pH
- ✦ EC, (lutum and moisture)
- ✦ Combined with calibrating soil analyses



# Zone specific treatments





# Precision fertilizing vegetables

- ✦ Row sensing
- ✦ Online adjustment of dosages N, K, Mg, Ca
- ✦ Equal crop size





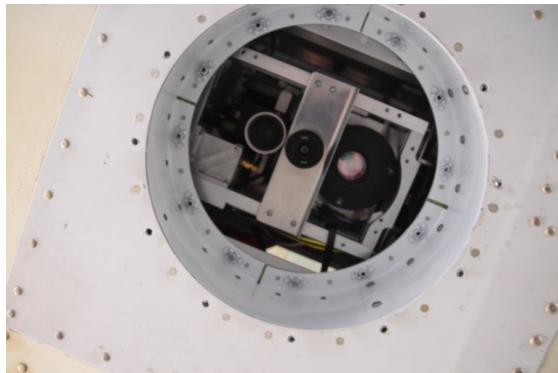
# Drone sensing crops



Quick, easy, cheap overview

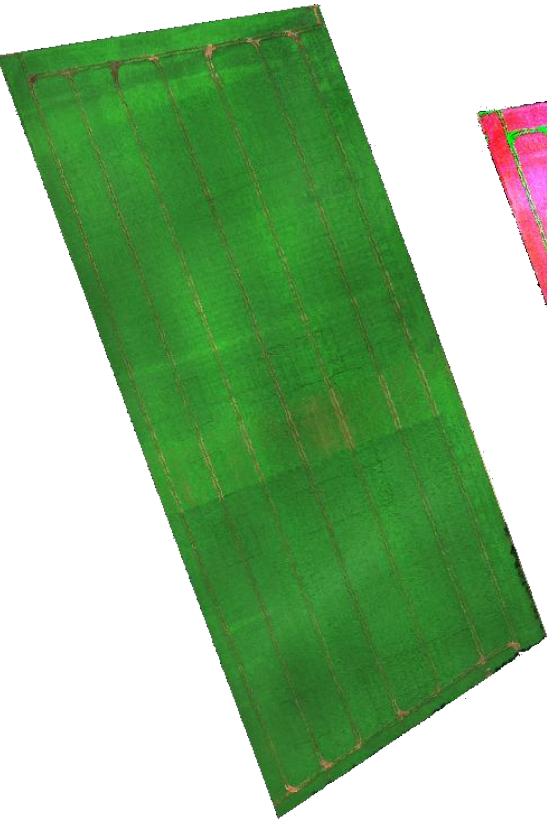


# Scanning systems whole field

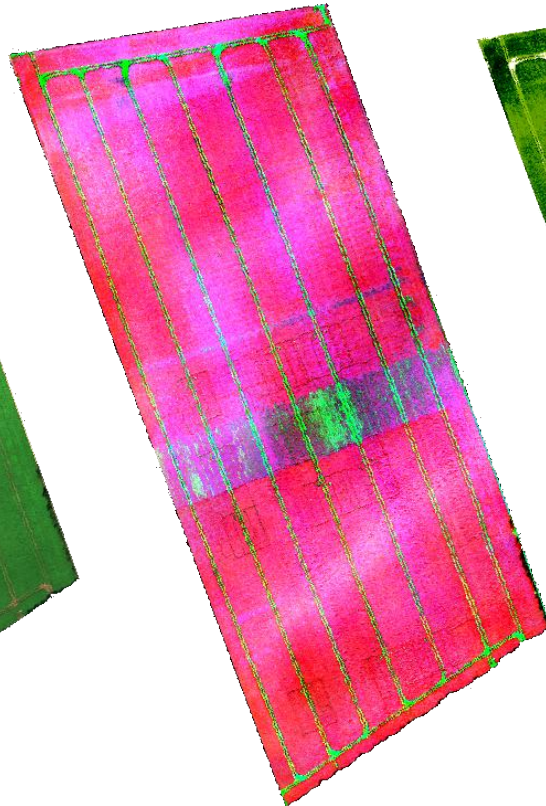


High resolution spectral

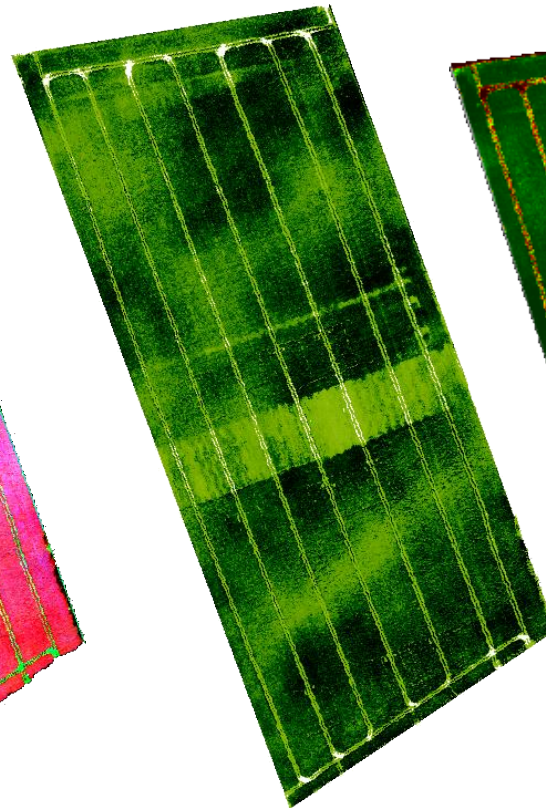
# Spectral Sensing potato field



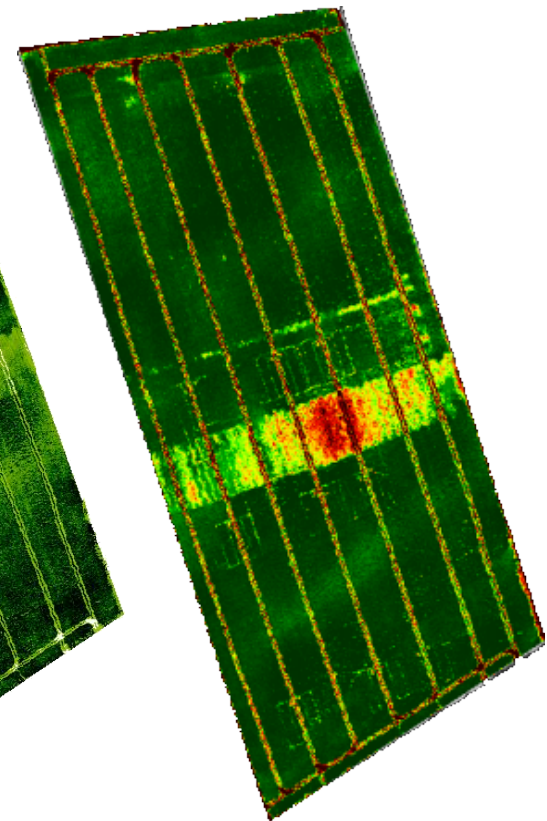
rgb visible  
colors



NIR near infrared



NDVI



WDVI



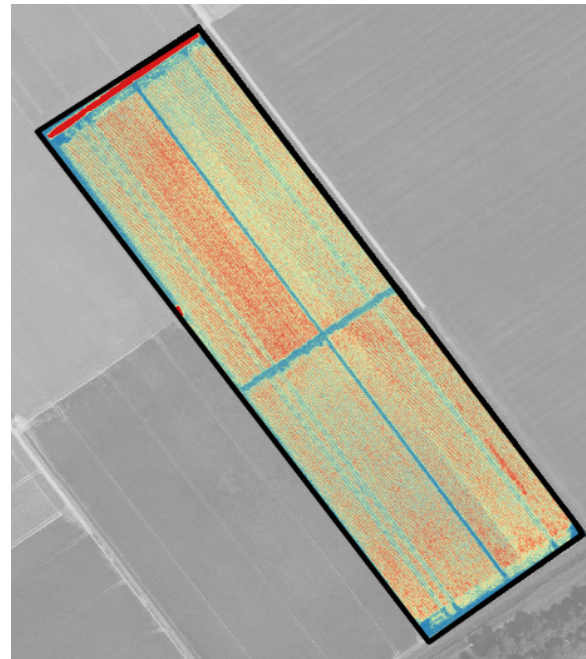
# Drone/airborne data

**RGB photo**



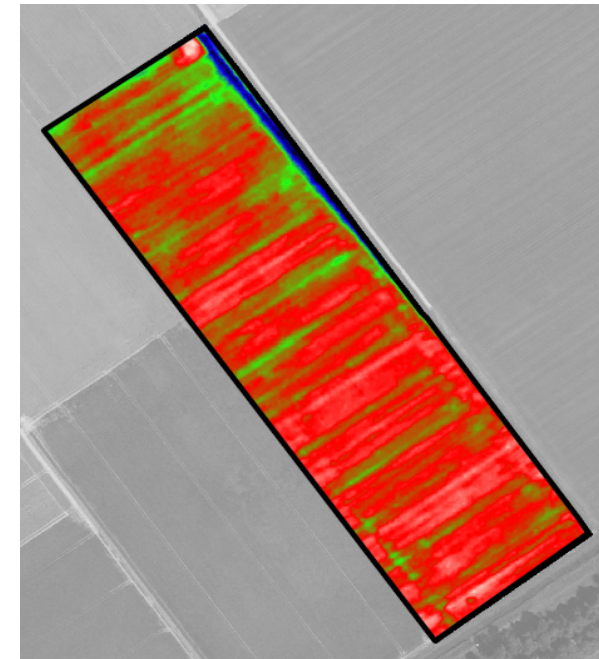
**Visual**

**Spectral**



**Biomass**

**Temperature**

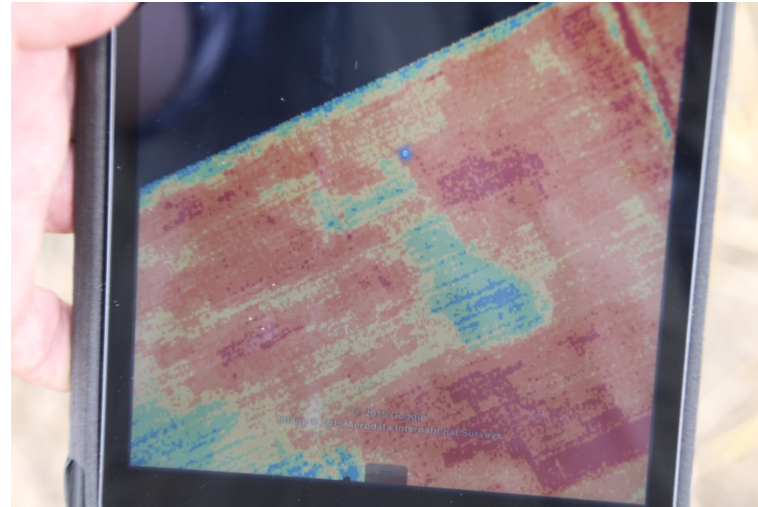
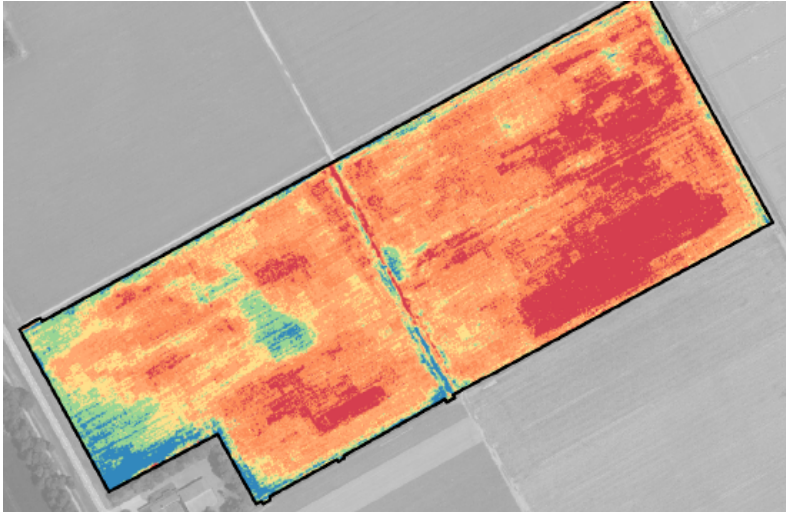


**Drainage**

Recognise problems and locations



# Zone recognition – field inspection - action

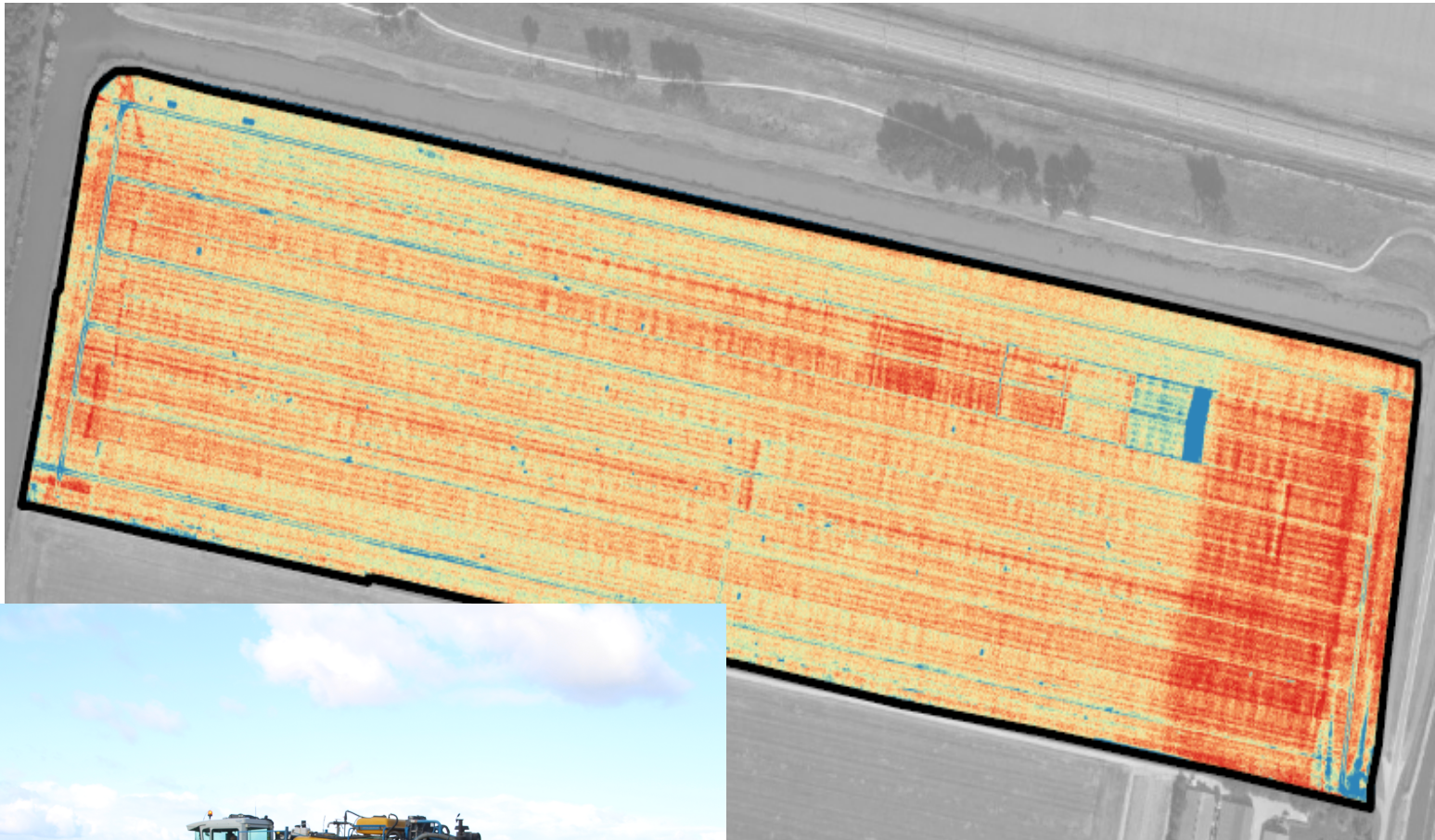


Navigation  
app  
Locus





# Spectral image: show machine failures



Beam movements  
spraying fertilizer

# Weather and soil data

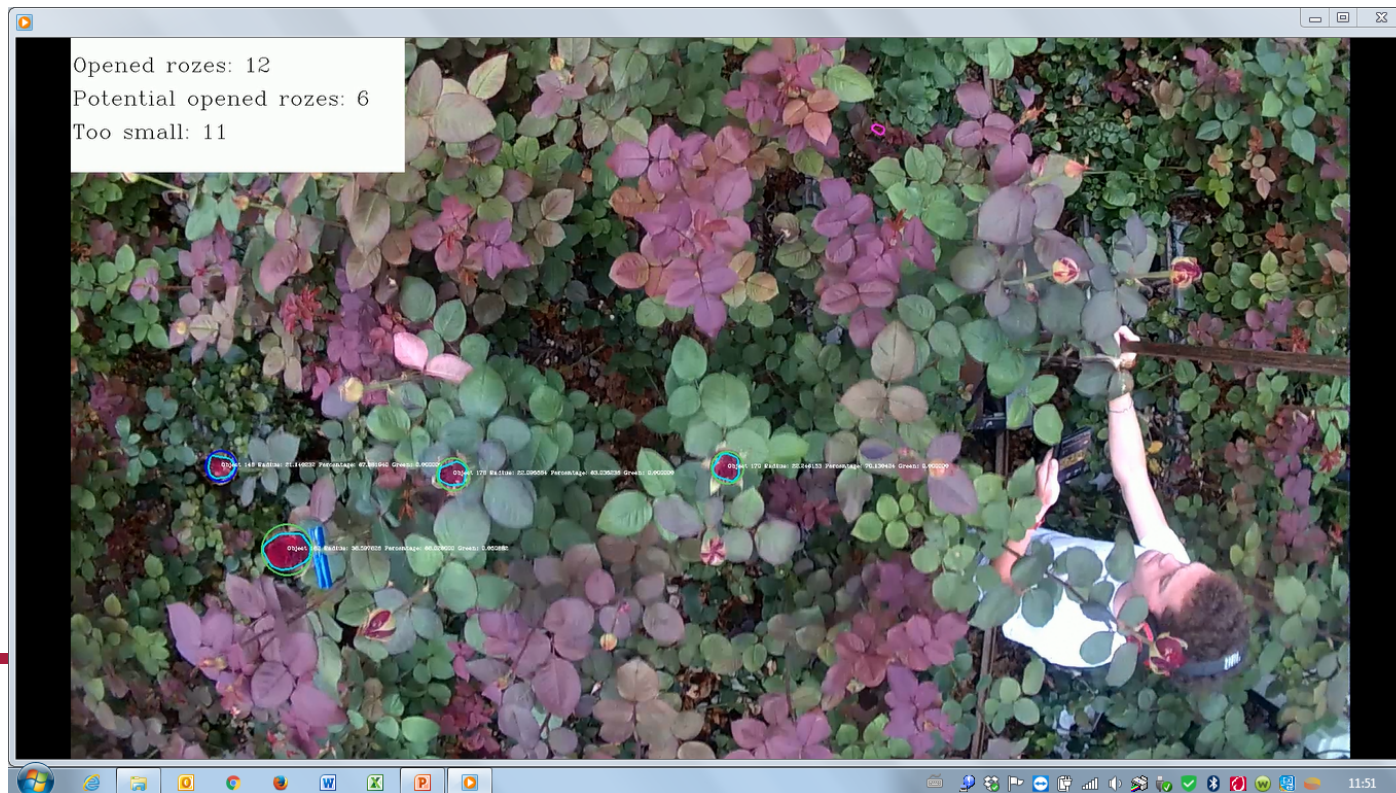


- ✦ Optimizing moment of application cpp or water
- ✦ Weather: humidity & temp
- ✦ Soil : moisture
- ✦ Lora network: cheap
- ✦ Sensors low cost
- ✦ Data transmission: low cost (IoT)



# Counting roses for cutting

- ✦ High resolution video
- ✦ Counting / analysing software
- ✦ Numbers of flowers harvest today, tomorrow



# Counting fruits in the orchard



- ✦ Number of fruits per tree
- ✦ Variable dosage of chemicals fruit pruning
- ✦ Yield prediction
- ✦ Robot tractor: automatic guidance

# Conclusions

- ✦ RTK/GPS steering systems tractors and machines adapted quickly
- ✦ Farmers needs to see results visual right away
- ✦ Soil scanning and soil analyses based liming and spreading compost used often
- ✦ Smart farming technology reliable available
- ✦ Soil, moisture, humidity: much data, hard to analyse: needs training and quick tools
- ✦ Smart farming great potential: yields, quality of products, storage quality,
- ✦ Important for sustainable market position



# Thanks for attention



## Questions?

## Information



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