



WatchItGrow

Monitoring Crops from Space

Sven Gilliams - VITO

Some numbers



Independent research
company
We De-risk Innovation



Revenues 2018 (kEUR)

Business Revenues	68.090
Research and Development	50.300
Grants	55.351
Financing Reference Tasks	11.970
Total	185.711



ENERGY



CHEMISTRY



MATERIALS



HEALTH



LAND USE

LAND - WATER - AIR

INSIGHT INTO
OUR EARTH

MANAGING RESOURCES BETTER
THANKS TO ADVANCED
ENVIRONMENTAL MONITORING

WE offer solutions WORLDWIDE



SEE THE BIGGER PICTURE

Monitoring (remote sensing)

Platforms



UAV



AIRBORN

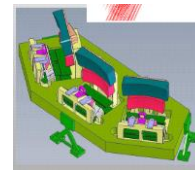
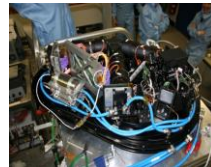
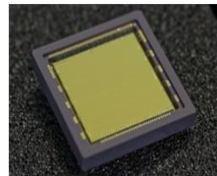


HALE UAV

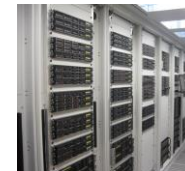
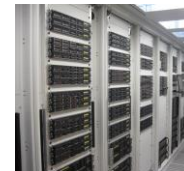
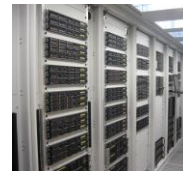
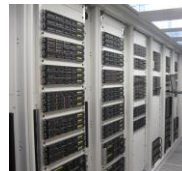
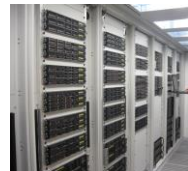


SATELLITE

Sensors



Value Added Services & Information Products



Markets



Agriculture



Landuse &
Biodiversity



Climate



Water &
Coast



Infrastructure



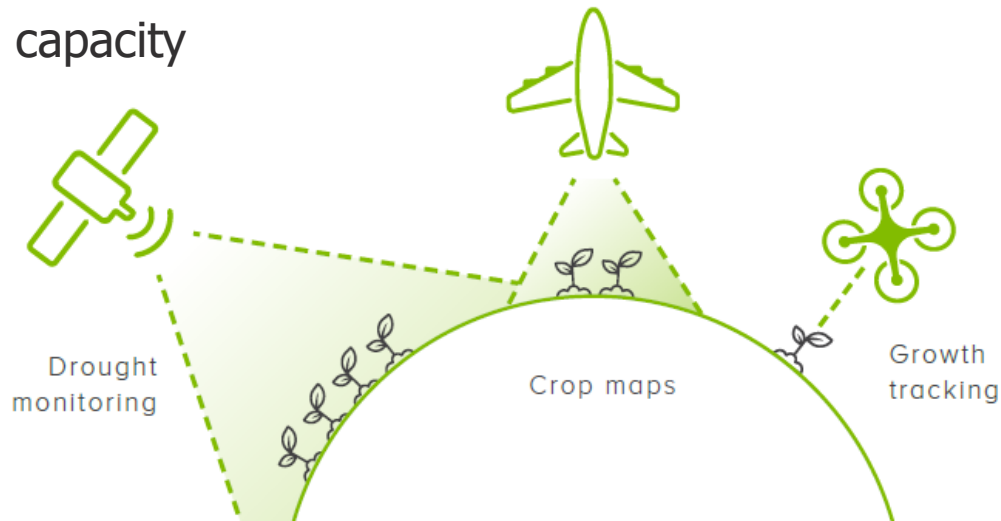
Security



Towards #ZeroHunger From Global to local Monitoring



- Knowledge! What? Where? When? ...
- Sustainable production increase
- Yields Monitoring & Crop Growth
- Frequent observations & continuity
- Assure capacity





Copernicus the game changer!

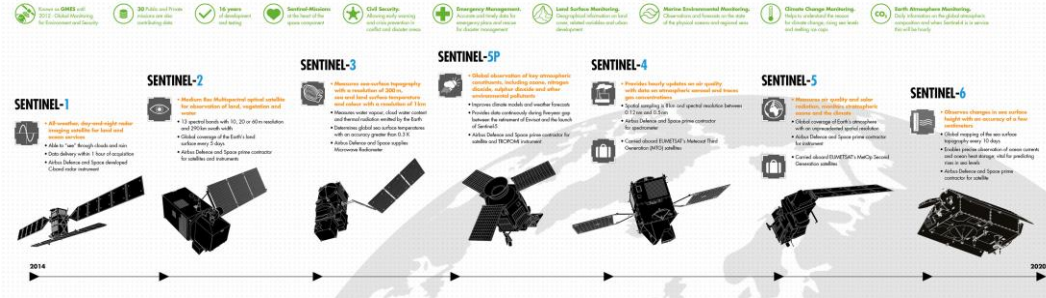


land.copernicus.eu/global

remotesensing.vito.be

COPERNICUS AND ITS SENTINELS

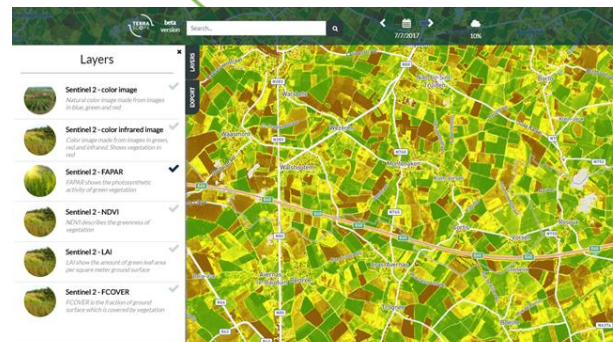
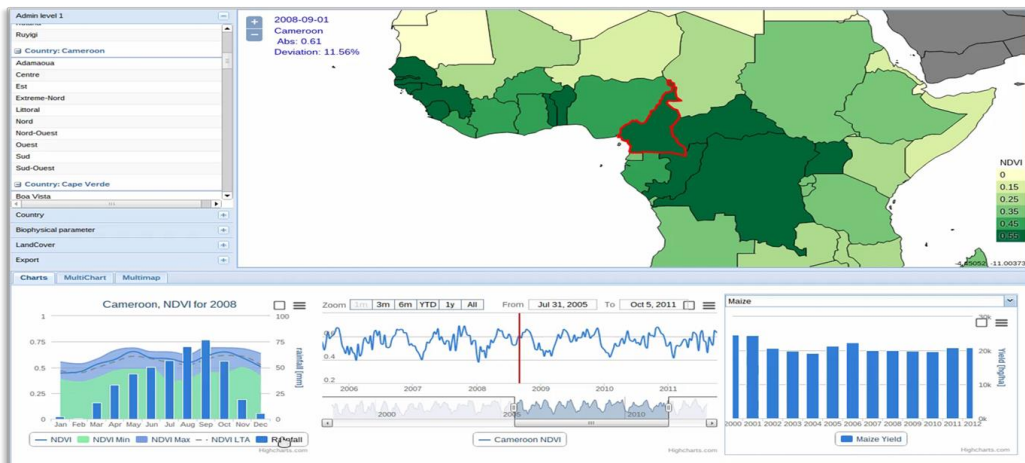
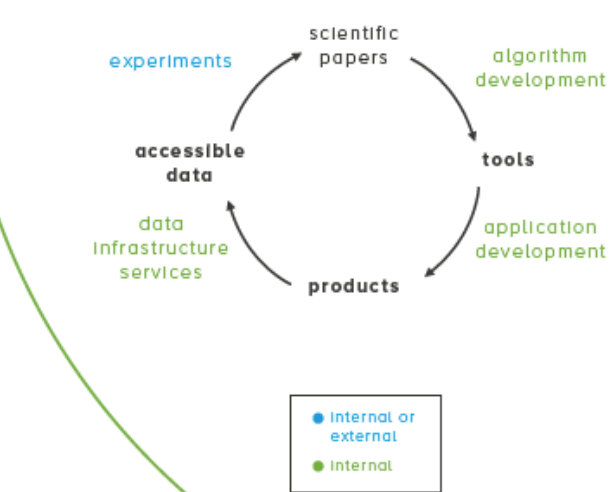
European Earth Observation Programme Copernicus: observing our planet for a safer world





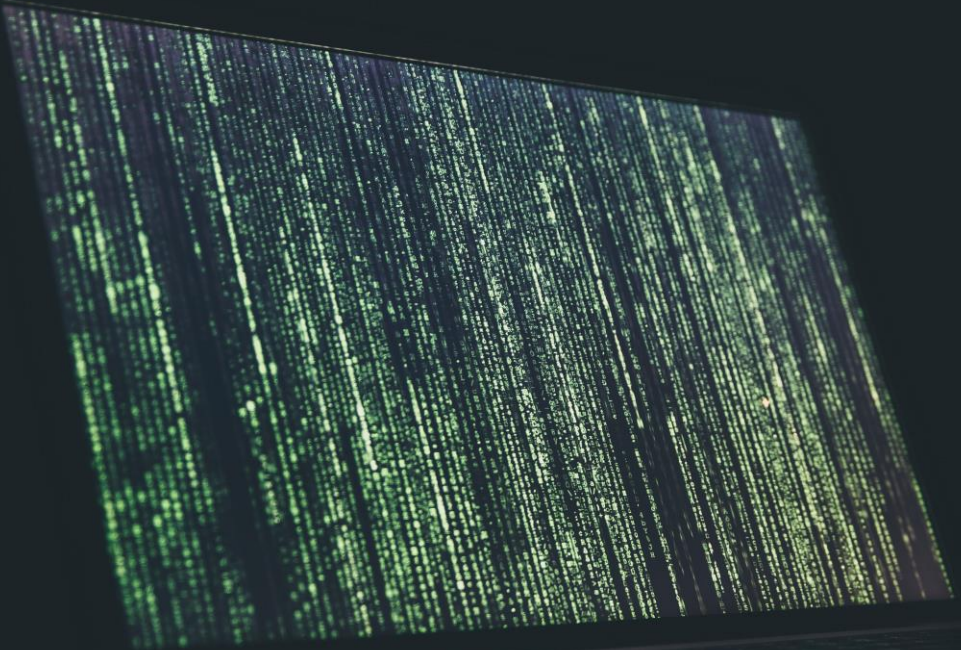
Multi-mission data fusion

- Data fusion
- Image processing
- Cloud detection
- Time Series integration
- Explore & Viewer
- Consistent Time Series of RS data

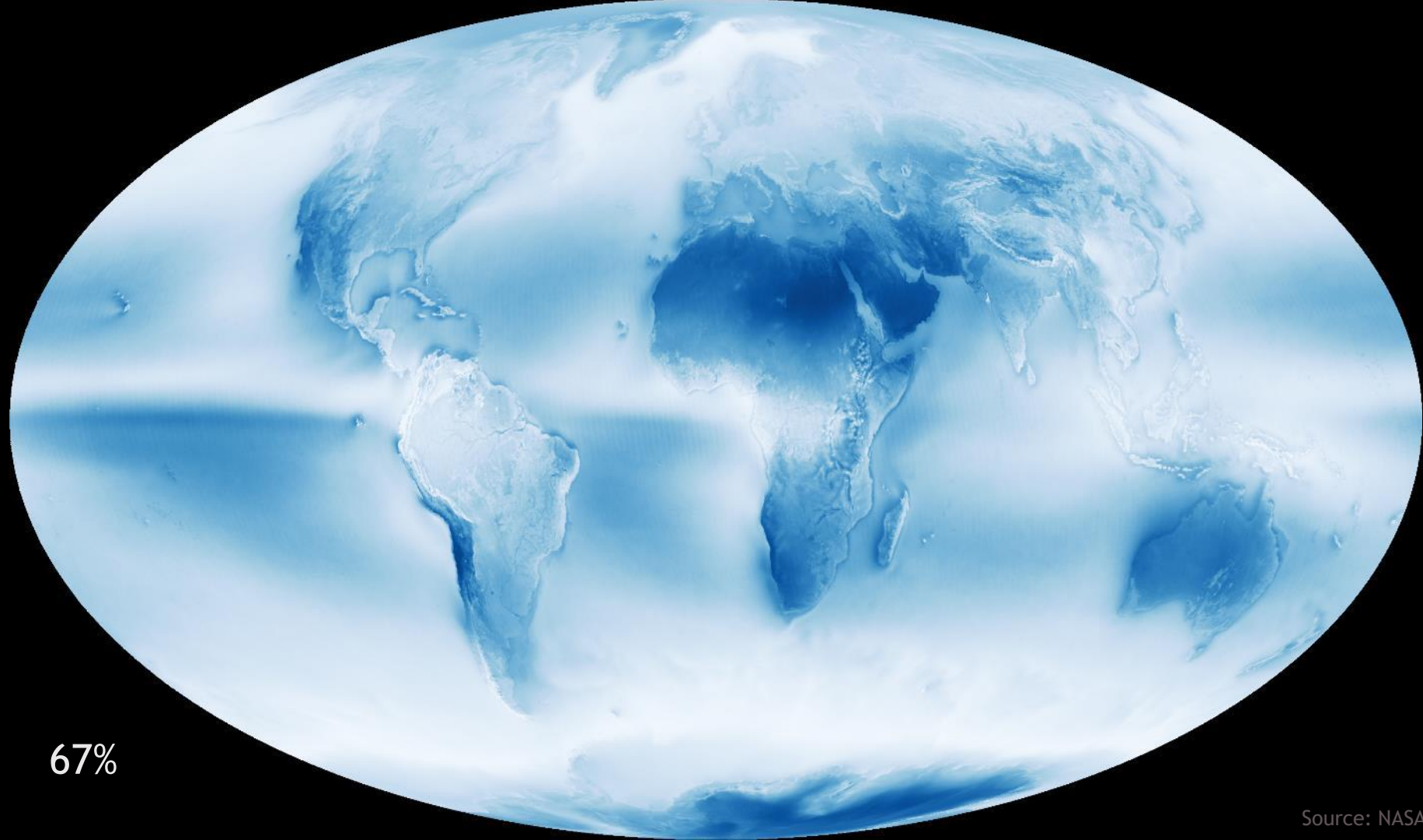


SATELLITE DATA





OBTAIN
ANALYSIS
READY
DATA



67%

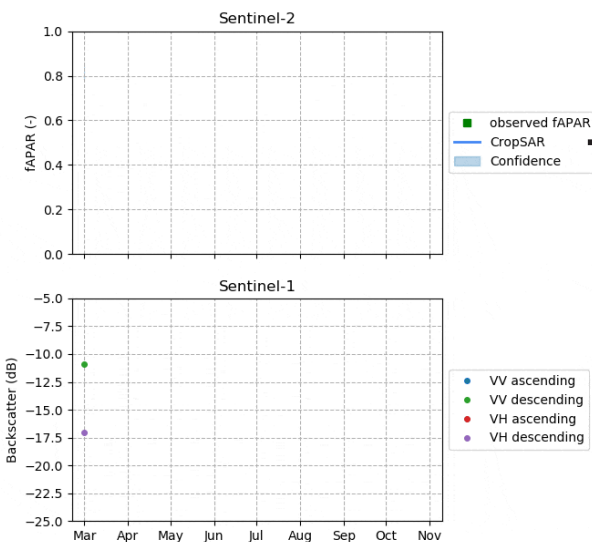
Source: NASA



Sensor Fusion for consistent Time Series -> CropSAR

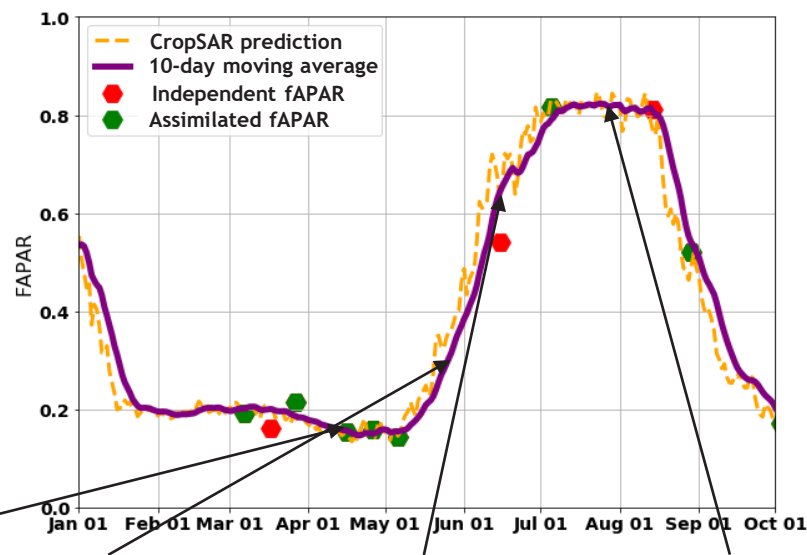


Sentinel-2 **uninterrupted**



Sentinel-2
interrupted

Sentinel-1
uninterrupted



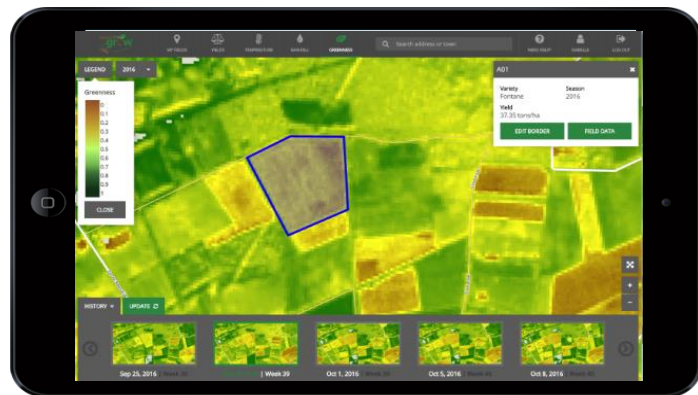
<https://blog.vito.be/remotesensing/cropsar2019>





WatchITgrow

Satellite based crop management tool



Users :

- ✓ agro-industry
- ✓ Insurance
- ✓ Farmers
- ✓ Farmers associations
- ✓ consultants

Data :

- ✓ Satellite images
- ✓ Biofysical parameters - time series
- ✓ Weather data
- ✓ Soil data
- ✓ IoT data
- ✓ User data
- ✓ Store your own field data (e.g. treatments, yield samples,...)

WatchItgrow functionalities



• Sentinel-2:

- 10m pixels
- Since August 2015
- Every 3-5 days
- Free data – Copernicus program
- Worldwide available



Monitor your fields throughout the season

Emergence →

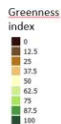
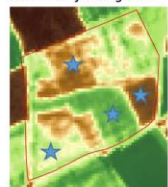


Senescence →



Check your fields for heterogeneity

Sentinel-2 of 20 Aug 2016



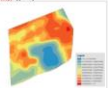
- useful for field selection (historical data)
- improved sampling (per zone)
- Precision agriculture use (2019 onwards):
variable rate applications

- ✓ fertilization
- ✓ irrigation
- ✓ hail killing
- ✓ ...

Electrical conductivity (EC)



Acidity (pH)

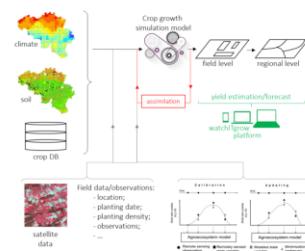


Reference data from soil scans (source: CRA-W)



Yield forecast

- Based on combination of yield models
- For 3 varieties: Fontane, Bintje, Nicola
- Per field, municipality, province, region
- From July onwards
- **FOR FARMERS ONLY**
- From 2019 onwards



Management tool



Field dashboard

Field data

Crop data

Field actions

Application maps

Statistics

Attachments

MY FIELDS

PRINT

DATA SHARING

DELETE

Field data

Edit field data

Field name

DEMO field

Surface

15.43 HA

Warnings

No warnings detected for this field.

[View logs](#)

Greenness



Yield



Data sharing

This field is not shared with other users.

Field history

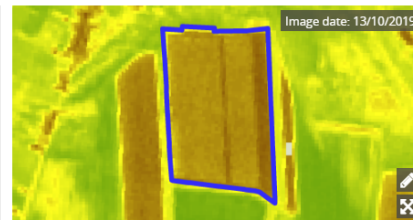
2018 - Vezelvias (bestemd voor vezelproductie) [View more](#)

Bonus progress

Missing data

Complete field data

+ FIELD ACTIONS



+ APPLICATION MAP

STATISTICS

Crop data

Edit crop data

Type

Consumption Potatoes

Variety

Bintje

Planting date

19/04/2019

Harvest date

Development stage

No development stages entered for this field.

Damages

No damages registered for this field.

+ OBSERVATIONS

Task list

★ Bonus: Fill in harvest

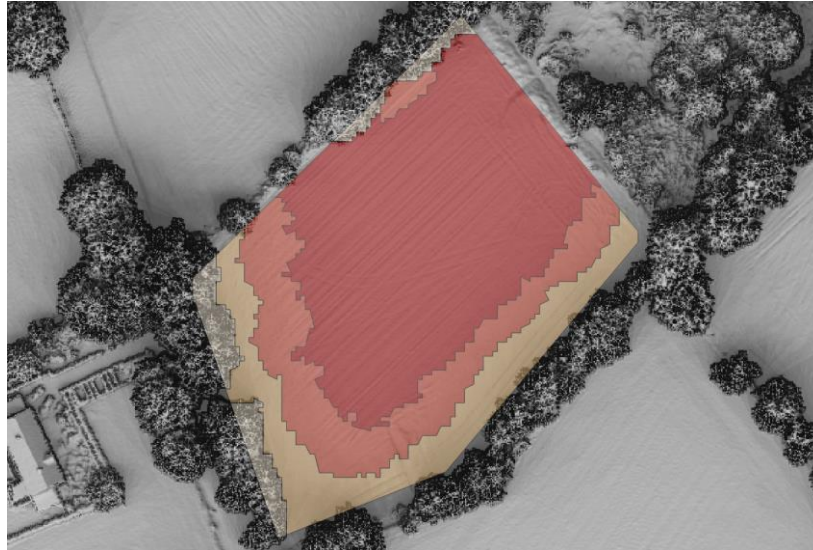
★ Bonus: Fill in irrigation

★ Bonus: Fill in crop protection



Variabel Rate Planting map

- What?
 - Exportable map indicating (gradations of) shadow zones
- Why?
 - Variable planting
 - Green zones



Info

☐ Shadow, distance:

☐ Half shadow, planting distance:

☐ In the sun, planting distance:

[DOWNLOAD SHAPEFILE](#)



Variable Rate Irrigation Map

← MAPS

FIELD: Aardappelen 1

Application Maps - Create new map

Step 1
Choose map type

Step 2
Fill in data

Step 3
Select distribution

Step 4
Save & export

Dosages for different zones:

Normal dose: 158 mm **CALCULATE**

worse crop condition

189.6 mm

average

158 mm

better crop condition

126.4 mm

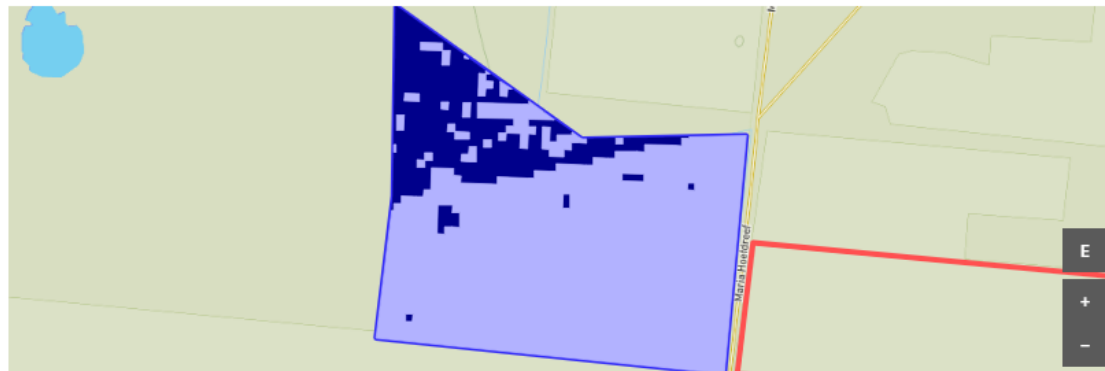
Total Irrigation dose

27092.802 m³

Application map date:

17/6/2019

☒ Streets ☐ Soil ☐ Elevation ☐ Satellite ☐ Greenness ☒ Irrigation map





Variable Rate Fertilisation Map

← MAPS

FIELD: POTENTIAL - KVE 2019

Application Maps - Create new map

Step 1
Choose map type

Step 2
Fill in data

Step 3
Select distribution

Step 4
Save & export

Dosages for different zones:

Total dose

0.75

tons/ha

AUTO
DOSAGE

Distribution strategy

Make bad areas better

< 85%

0.9

tons/ha

85% - 95%

0.825

tons/ha

95% - 105%

0.75

tons/ha

105% - 115%

0.675

tons/ha

> 115%

0.6

tons/ha

Total product dose

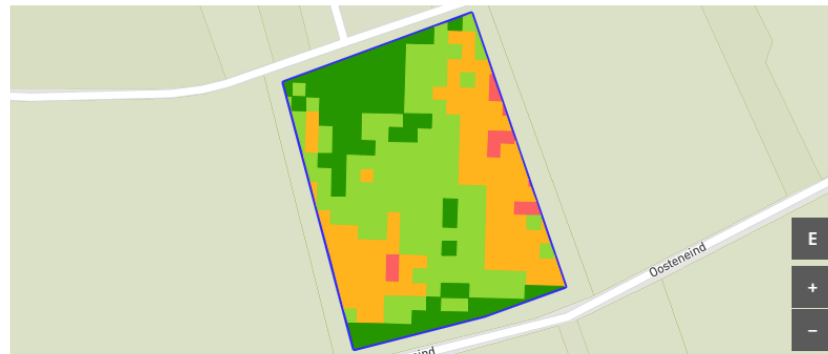
2.288

tons

Application map date:

13/5/2019

☒ Streets ☐ Soil ☐ Elevation ☐ Satellite ☐ Greenness ☒ Fertilizing map



← PREVIOUS

NEXT →



Variable Rate Haulm Killing Map

← MAPS

FIELD: POTENTIAL - KVE 2019

Application Maps - Create new map

Step 1

Choose map type

Step 2

Fill in data

Step 3

Select distribution

Step 4

Save & export

Dosages for different zones:

Normal (max)
dose

100

l/ha

CALCULATE

Haulm died

20

l/ha

Haulm predominantly yellow

40

l/ha

Haulm yellowish green

60

l/ha

Haulm predominantly green

80

l/ha

Haulm completely green

100

l/ha

Total product dose

148.907

l

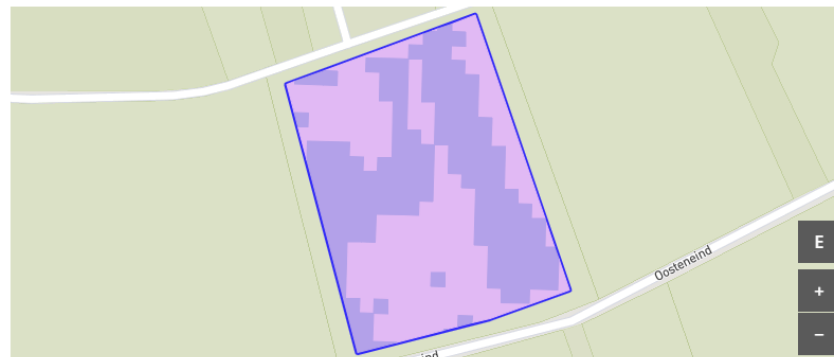
Application map date:

4/8/2019

×



☒ Streets ☐ Soil ☐ Elevation ☐ Satellite ☐ Greenness ☒ Haulm killing map

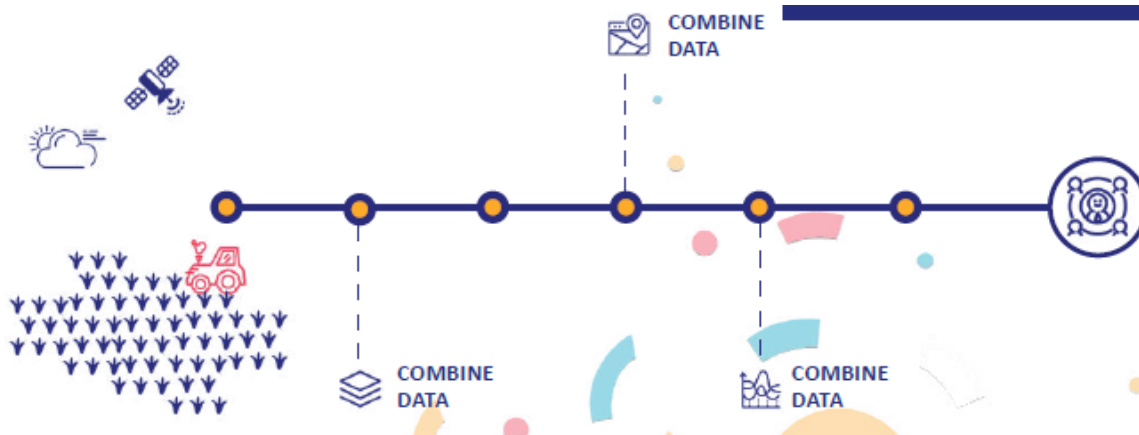


← PREVIOUS

NEXT →

What is next?

- Co design -> user centric approach



Moving away
from a
data-centric
approach to a
user-driven era

SHOWCASES



Pilots

GLOBAL

GEOGLAM
support

POLICY

CAP
monitoring

SECURITY

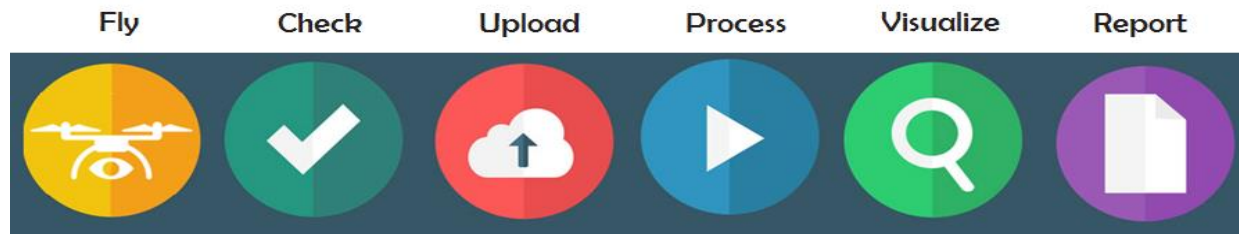
AGRICULTURE
insurance

INDUSTRY

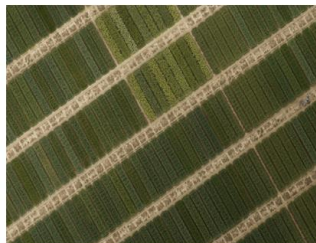
SUSTAINABLE
increase



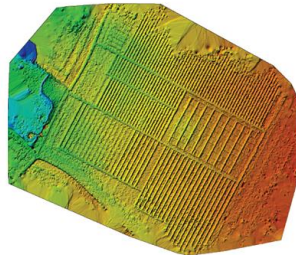
MAPEO – Crop monitoring



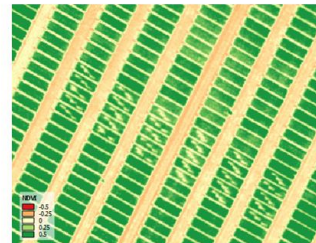
Orthomosaic



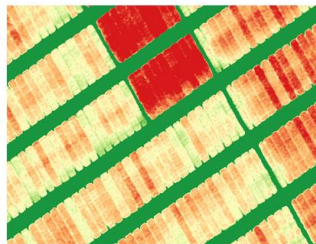
DEM



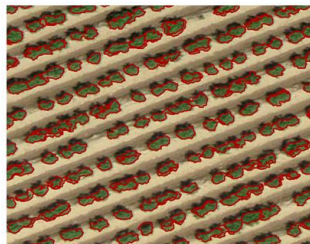
NDVI



Crop height



Crop count



Crop cover



THANK YOU

remotesensing.vito.be

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