# Crop classification in the context of ScaleAgData project

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SCALEAGDATA
MAKING DATA COUNT

THIS PROJECT HAS RECEIVED FUNDING FROM THE HORIZON EUROPE PROGRAM UNDER GRANT AGREEMENT NO 101086355

Water productivity

Crop management

Yield monitoring

Soil health

Grasslands

Dairy

The project aims to understand and refine how complex farm-level data streams are governed, organized, and managed.
It also focuses on technologies to scale local farm data into larger regional datasets for agri-environmental monitoring and production management.

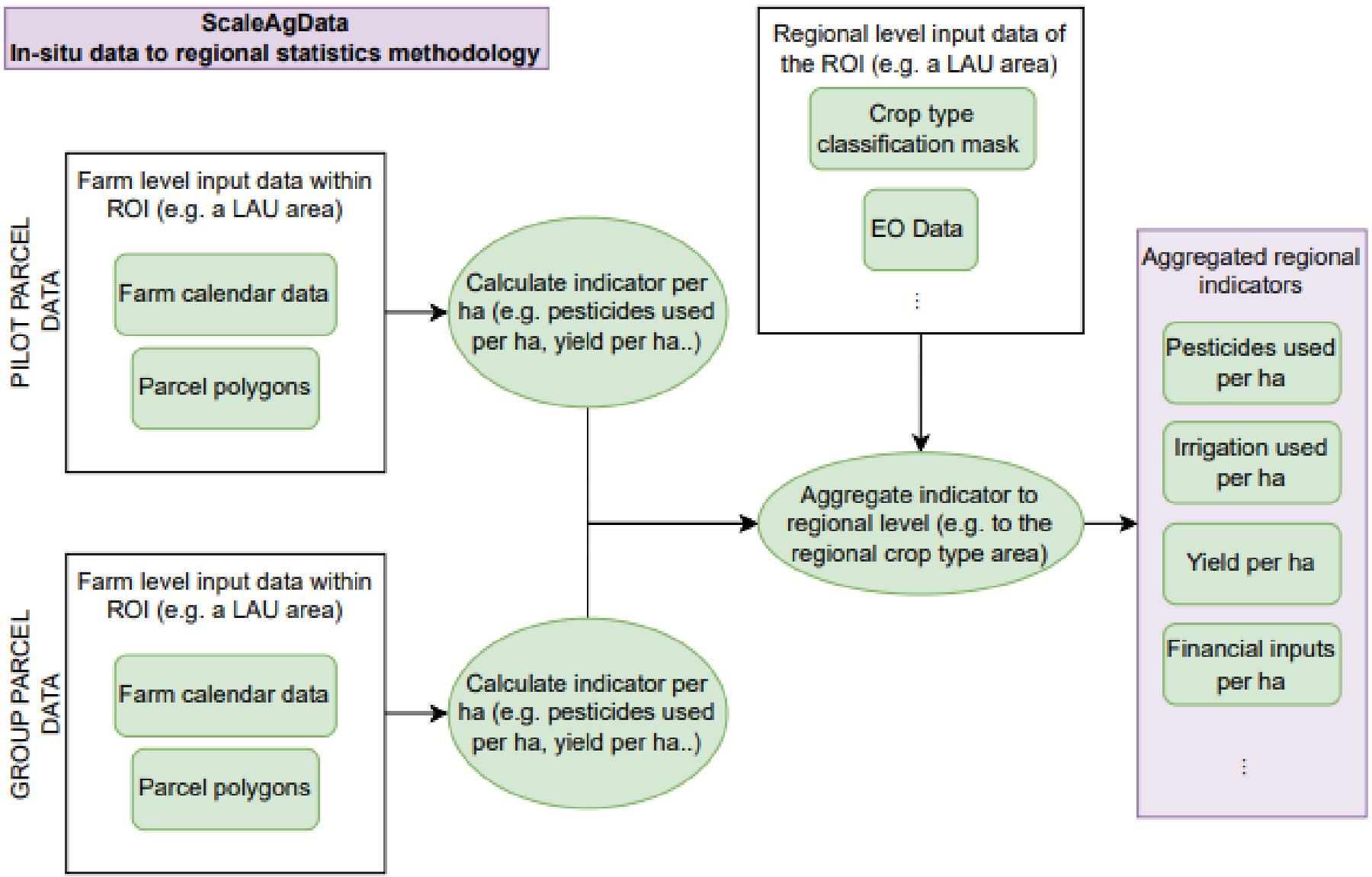
**Six (6) Research and Innovation Labs** will **develop, test and showcase** how integrating near real-time (NRT) sensor data can provide improved monitoring capabilities.

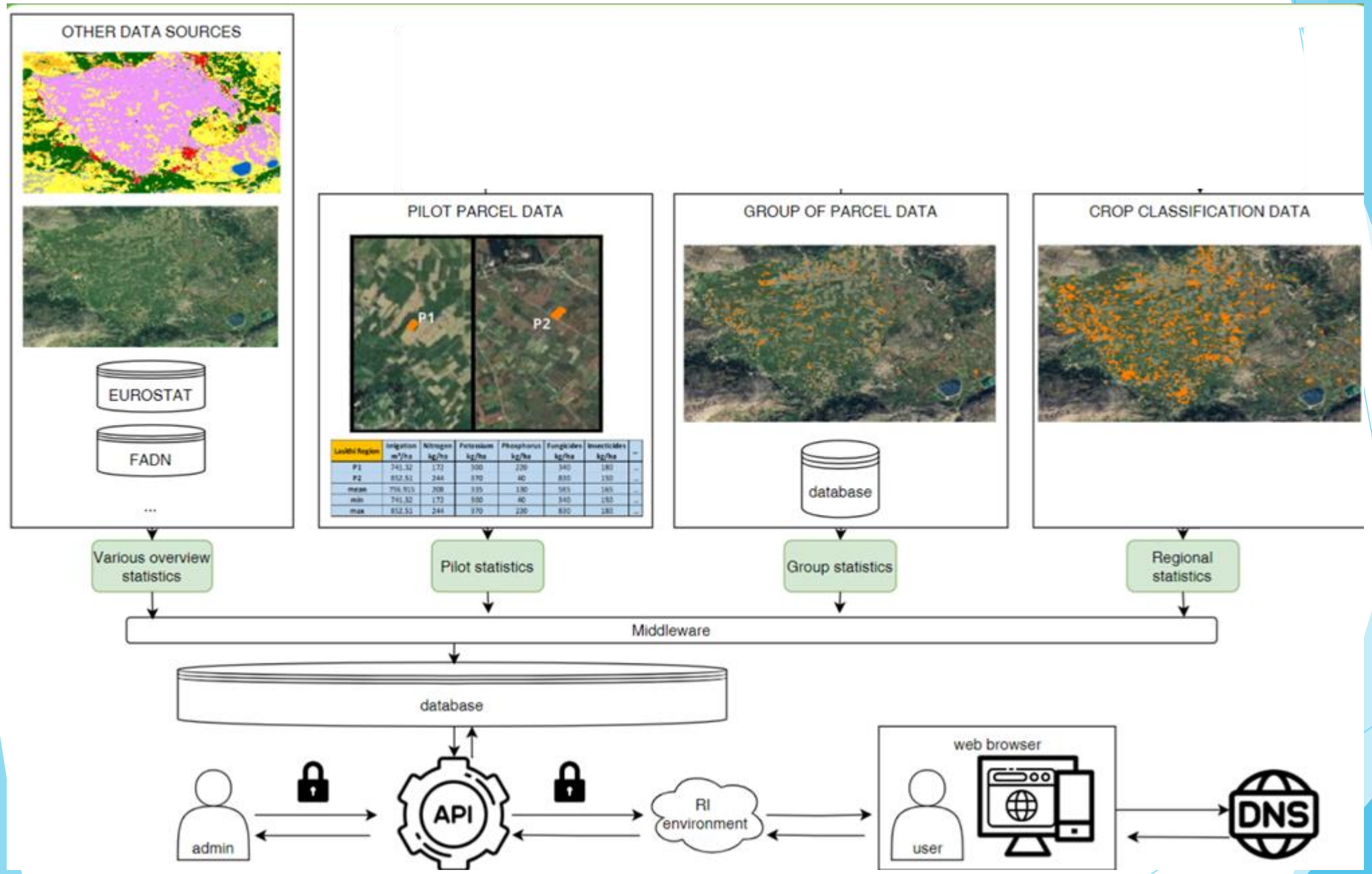
These RILabs will **drive innovation**, covering

- different biogeographical zones of Europe
- the 4 dimensions of environment: soil, water, air, living organisms (crops & livestock)
- available sensor data & products

- Crop management LAB
  - will create a mechanism and a governance plan for collecting IoT and farm log data at the crop level and aggregating them at a regional level to support policy makers in making decisions
  - User-friendly navigation from municipal overviews down to individual parcels
  - Role-based insights for **farmers, agronomists and policymakers**
  - Aggregated metrics for compliance with CAP (Common Agricultural Policy)

- From local to regional ->> crop type classification is necessary


ScaleAgData
In-situ data to regional statistics methodology
PILOT PARCEL DATA
Farm level input data within ROI (e.g. a LAU area)
Farm calendar data
Parcel polygons
GROUP PARCEL DATA
Farm level input data within ROI (e.g. a LAU area)
Farm calendar data
Parcel polygons
Calculate indicator per ha (e.g. pesticides used per ha, yield per ha..)
Calculate indicator per ha (e.g. pesticides used per ha, yield per ha..)
Regional level input data of the ROI (e.g. a LAU area)
Crop type classification mask
EO Data
Aggregate indicator to regional level (e.g. to the regional crop type area)
Aggregated regional indicators
Pesticides used per ha
Irrigation used per ha
Yield per ha
Financial inputs per ha


OTHER DATA SOURCES
EUROSTAT
FADN
...
PILOT PARCEL DATA
P1
P2
GROUP OF PARCEL DATA
database
CROP CLASSIFICATION DATA
Various overview statistics
Pilot statistics
Group statistics
Regional statistics
Middleware
database
admin
API
RI environment
web browser
user
DNS

L1

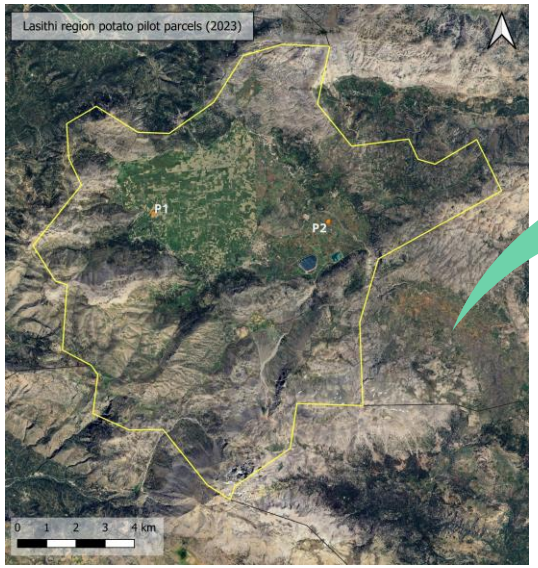
Pilot parcels

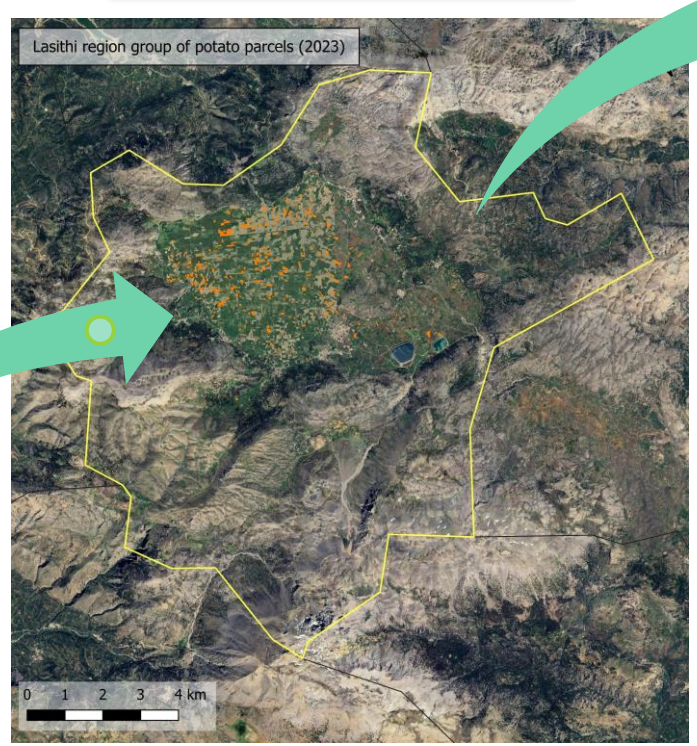
L2

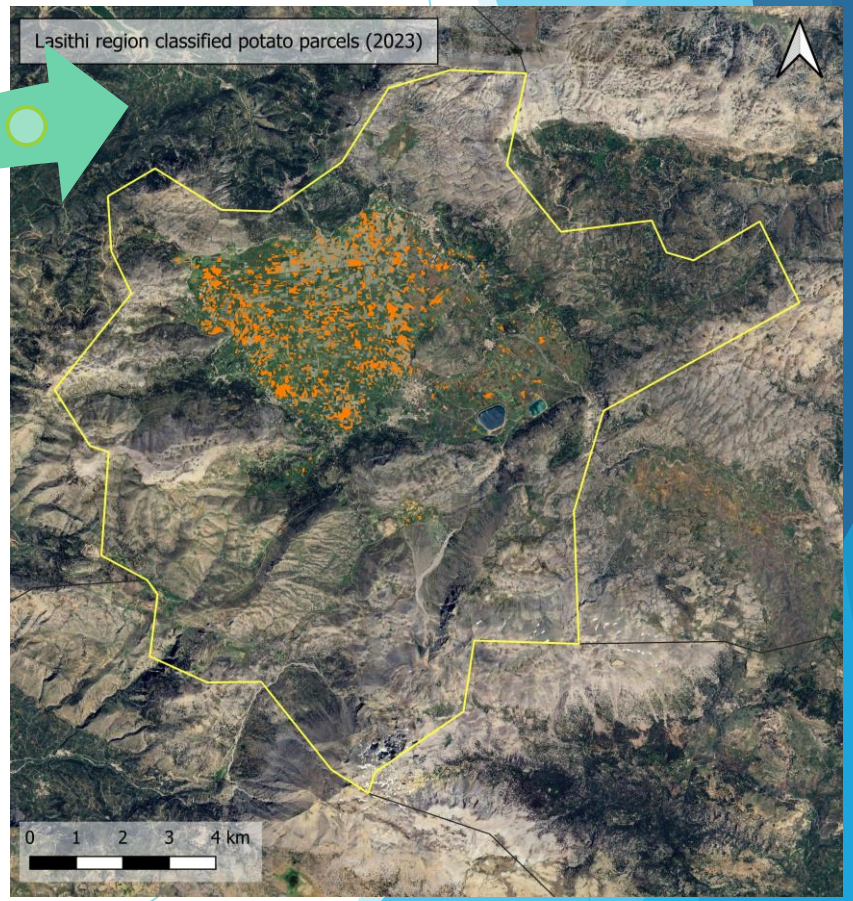
Group of parcels with crop of interest (can be used as control parcels)

L3

Areas within the administrative region where the crop of interest is cultivated



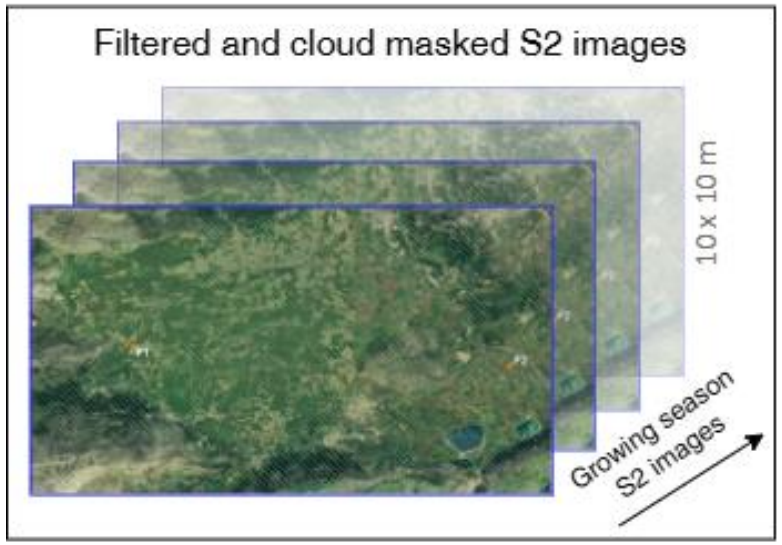
ML Classification algorithm:
**Support Vector Machine (SVM) with a Radial Basis Function (RBF) kernel**

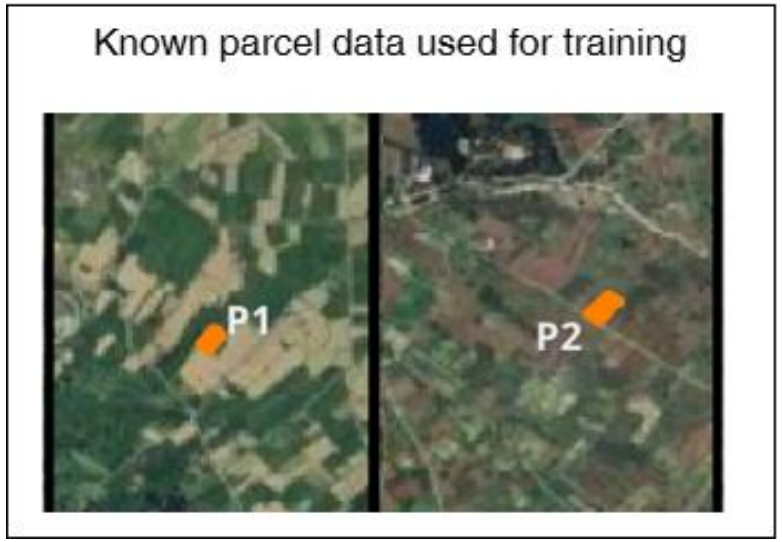
To train the classifier and produce the crop classification we used the following data:

**Parcel data**
- Polygon geometries
- Crop type
- Growing season start
- Growing season end

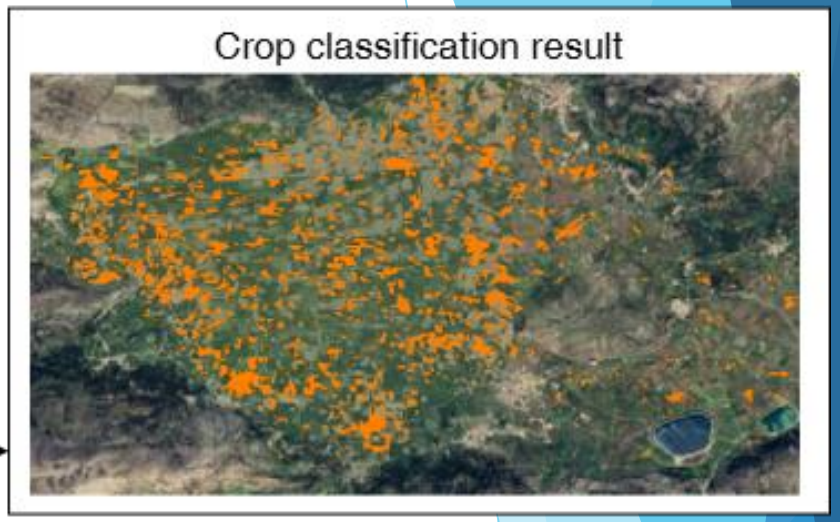
**EO data**
- Filtered Cloud masked Sentinel-2 images over the growing period
- Selected bands: 'B2', 'B3', 'B4', 'B5', ‘B6’

**Other data**
- Local Administrative Unit (LAU) regional boundary
- Land use data (for identifying water, bare land, forest, urban area etc.)




**Crop classification engine**



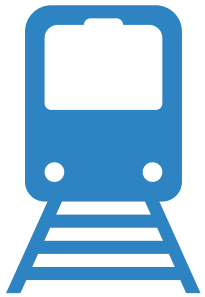

Parameters: Gamma set to 0.6 and cost set to 10.

## Considerations

Very initial proof of concept

Currently working on validating the methodology on large scale data set (whole municipality of Lasithi, Crete) for potato crops

Accuracy may differ depending on the area size and croptype



## Improvements for future work

To train on multiple croptypes within the area of interest

To include in the workflow the phenological stages (leaf development, flowering, etc.) information of the crop

To investigate additional AI/ML methods and algorithms

# Thank you!

More info

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