

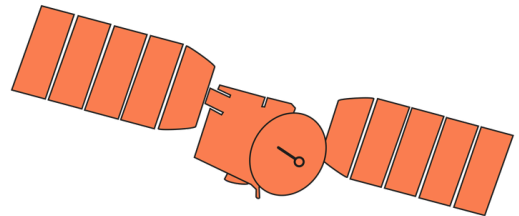
CROP *Auditing*

**Growing the Future
From Above**

Website - Conteúdo

Website - URL



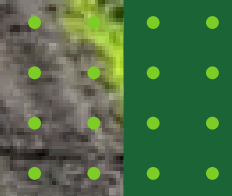


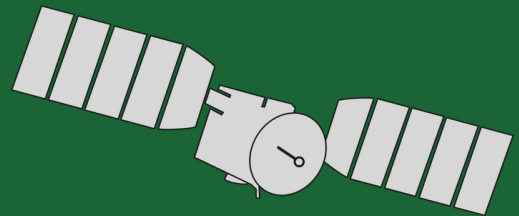
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- Our Team
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TEAM MEMBERS



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Filipe Ferrão



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Maria Henriques



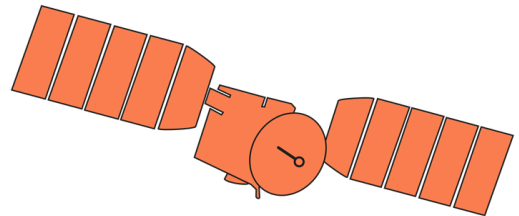
110164

David Freire



110234

Gonçalo Martins

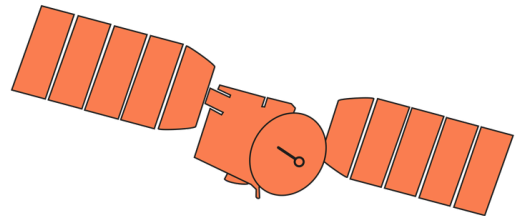


PROJECT'S SCIENTIFIC ADVISOR AND MENTOR



- **Scientific Advisor:**
 - Luis Caldas de Oliveira (lco@tecnico.ulisboa.pt)
- **Coordinator:**
 - Luis Caldas de Oliveira (lco@tecnico.ulisboa.pt)
- **Mentor:**
 - Tiago Morais (tiago.morais@virtuacrop.com)





PROBLEM DEFINITION



Problem

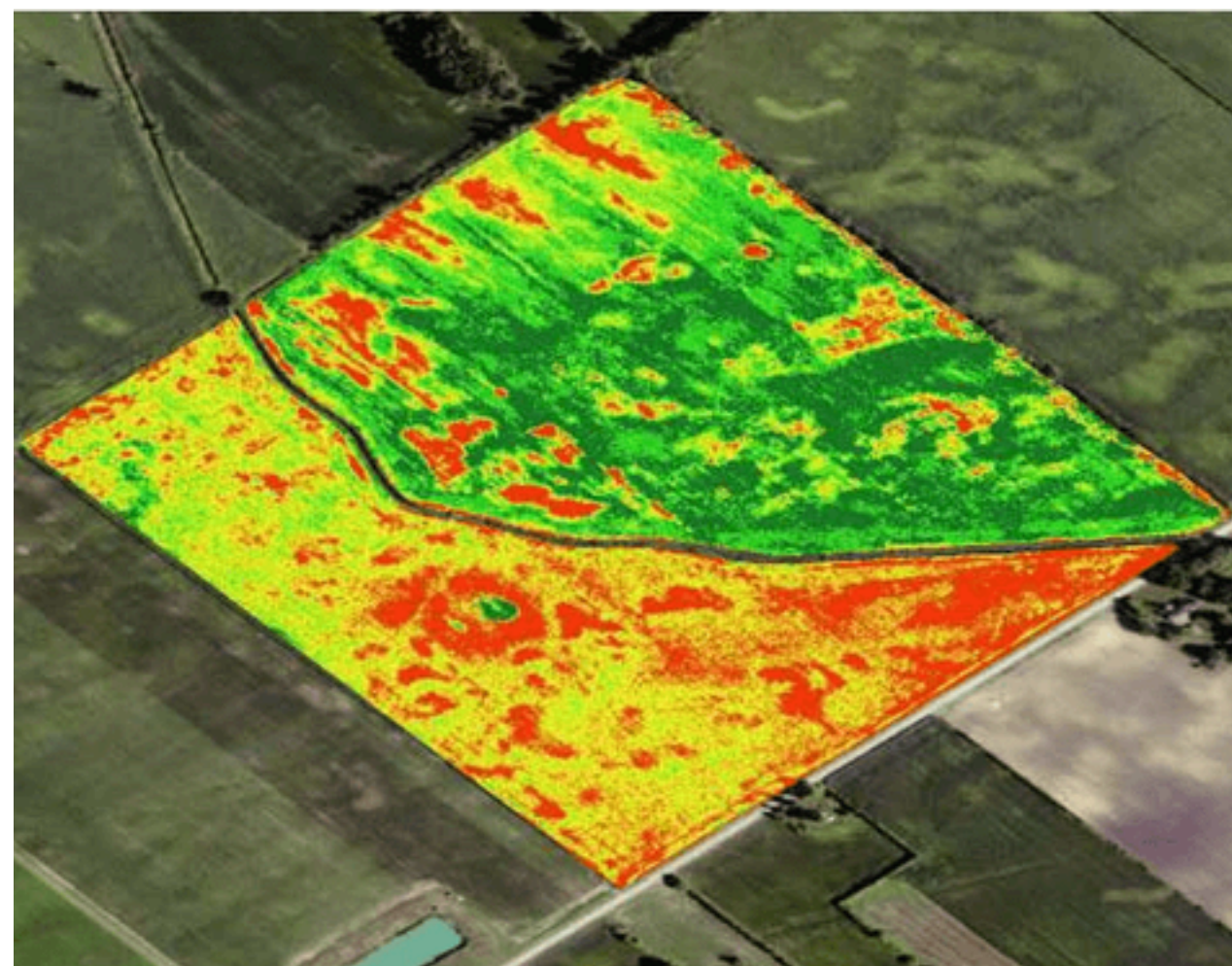
Traditional auditing of large-scale plantations relies on manual surveys, which is slow, costly, and inaccurate, making it hard to verify the area of each crop and monitor its growth, essential information for insurance companies.

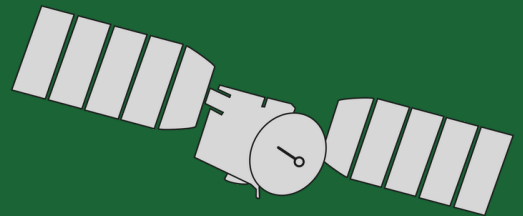
Challenge

Ensuring accurate, fast and efficient auditing of large crop areas with limited ground verification.

Solution

Use satellite imagery combined with statistical analysis and machine learning models to automatically determine area of each crop and monitor its growth.





SOLUTION BENEFICIARIES



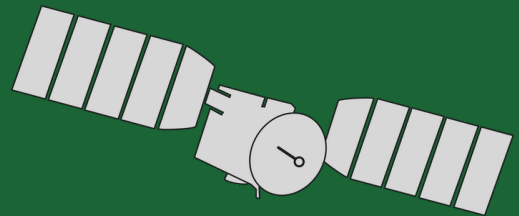
Farmers

- Reduced disputes over declared areas
- Improved access to financing
- Easier demonstration of compliance with agriculture programs

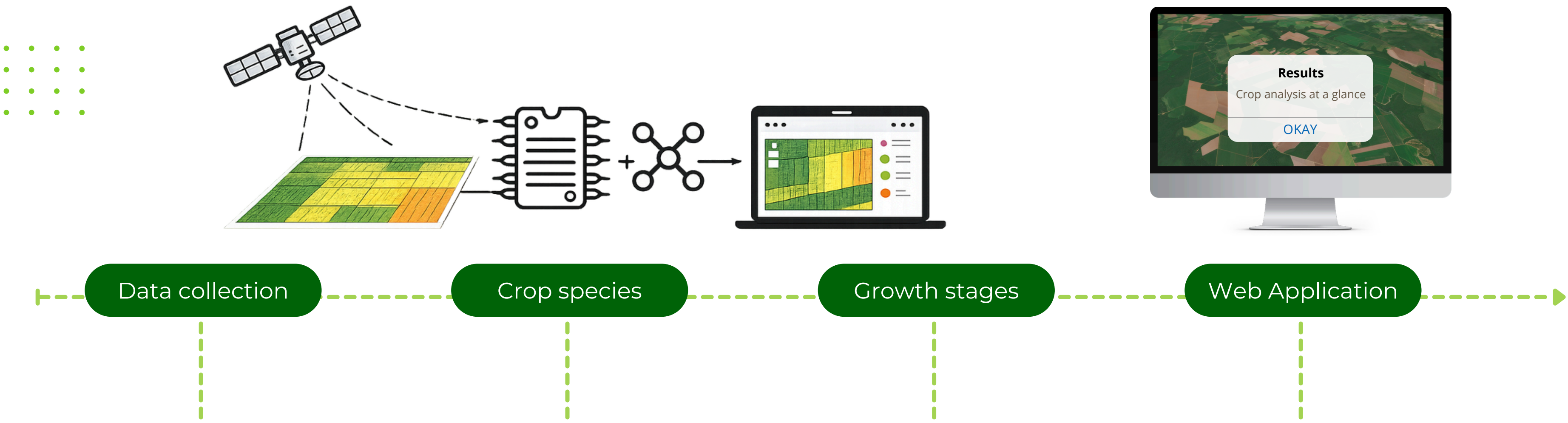


Insurance Companies & Financial Institutions

- Simpler and cheaper audits
- Clear record of crop growth
- Easier fraud detection



TECHNOLOGICAL SOLUTION

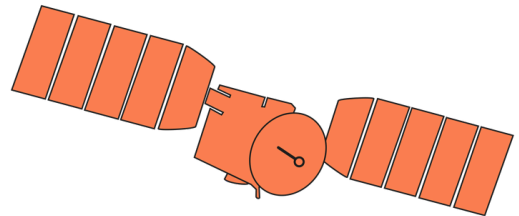


High-resolution satellite imagery from Sentinel-2

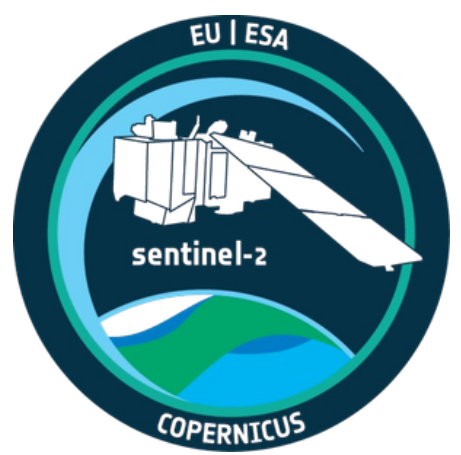
Machine learning models and statistical analysis to identify the areas of each crop

Statistical analysis and Machine learning models to determine growth stage of each crop

User-friendly interface for automated analysis of plantations



COMPETITORS AND PREVIOUS WORK



ESA

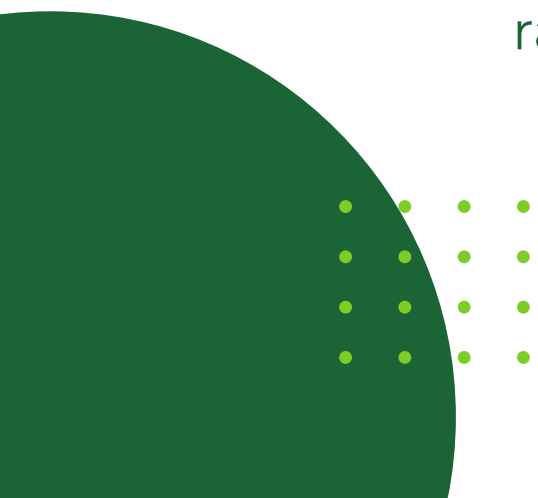
The European Space Agency provides open-access satellite imagery through the Copernicus Programme, which enables scientific research in a wide range of areas, such as this one.

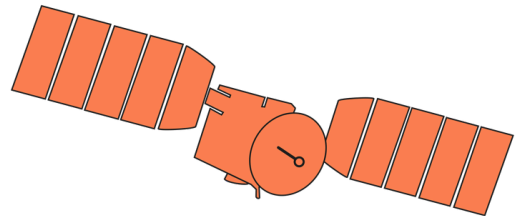
IFAP

IFAP's Surface Monitoring System (SVS) uses Copernicus Programme's imagery to validate compliance for government aids, which demonstrates the practical viability of satellite based agricultural verification at an institutional level.

EOS

EOS provides a crop monitoring system which manages agricultural risks, provides insights on crop health, and determines the area of each crop, with the aim of optimizing resources and farming operations.





SOLUTION REQUIREMENTS

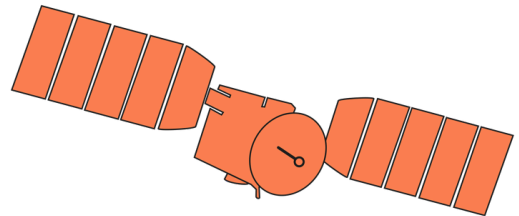


Accuracy

Our solution must guarantee accurate results, which are essential for insurance companies and financial institutions.



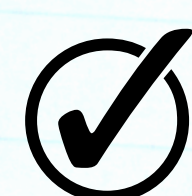
Speed and Ease of use

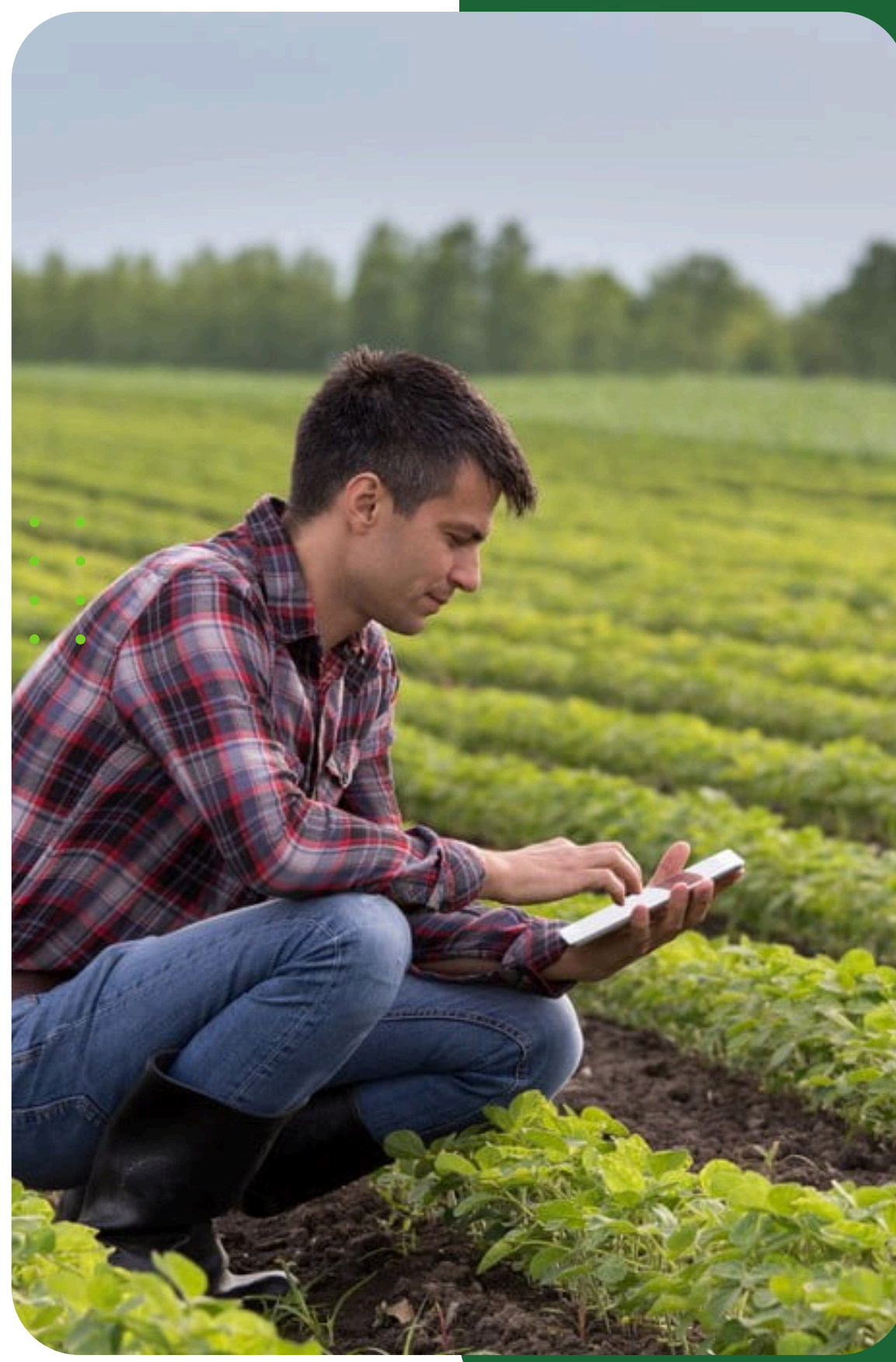
Our solution must be fast and user-friendly, to ensure a seamless experience for our clients and to speed-up the auditing process.

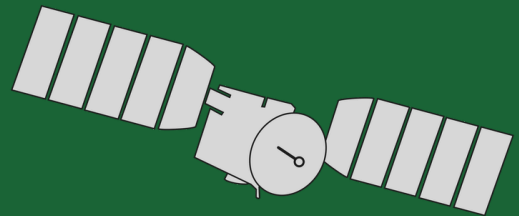


TECHNICAL CHALLENGES



-  **Accuracy**
Achieving high precision identification of crop species, their area, and their respective growth stages.
-  **Data management**
Correctly perform statistical analysis and machine learning training of large volumes of satellite data.
-  **Speed**
Ensuring fast crop analysis results.





OUR PARTNERS



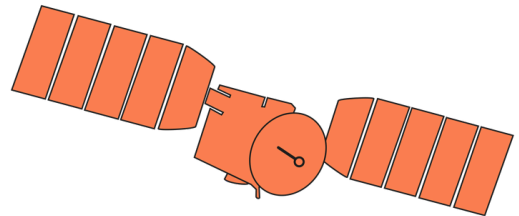
Besquare



VirtuaCrop



**Instituto Superior
Técnico**



TESTING AND VALIDATION METRICS

We will compare the predicted crop area, crop type, and growth stage with verified data collected on the ground.



Accuracy

Speed



We will measure the average processing time required to analyse a predefined agricultural area.

We will monitor system resource usage while processing large satellite datasets to ensure the solution remains scalable and cost-effective.



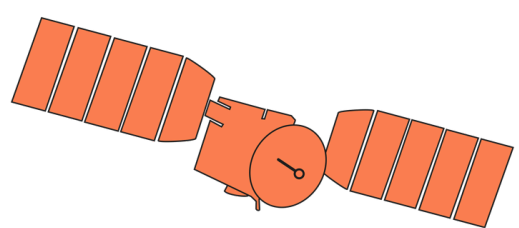
Efficiency

Ease of use



We will conduct usability tests with potential users and we will ask them to complete satisfaction surveys.





TASKS



Data Collection



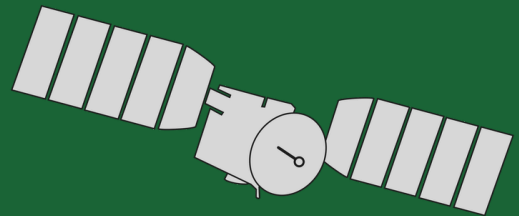
Crop vs Terrain Identification
Crop Species Identification
Growth Stage Identification



Web App
Website
Blog



Interviews
Pitch Deck
Poster
Video



DIVISION OF WORK AMONG TEAM MEMBERS

Filipe Ferrão

Growth Stage Identification*

Crop vs Terrain Identification

Web App

Website*

Poster

Rodrigo Barreiros

Crop vs Terrain Identification*

Crop Species Identification

Web App*

Pitch Deck

Communication

Tiago Rei

Crop Species Identification*

Data Collection

Growth Stage Identification

Communication*

Blog

Maria Henriques

Crop Species Identification

Data Collection

Web App

Blog* / Poster*

Video

David Freire

Growth Stage Identification

Data Collection

Video*

Pitch Deck*

Interviews

Gonçalo Martins

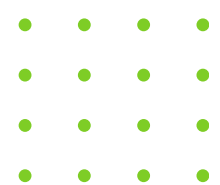
Data Collection*

Growth Stage Identification

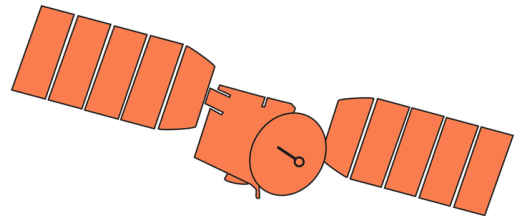
Interviews*

Pitch Deck

Website



*Responsible

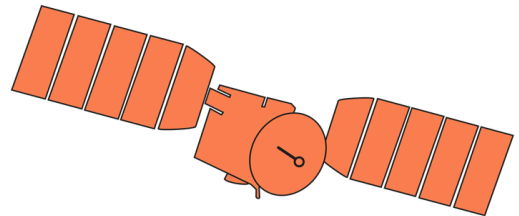


SCHEDULE - P3 E P4

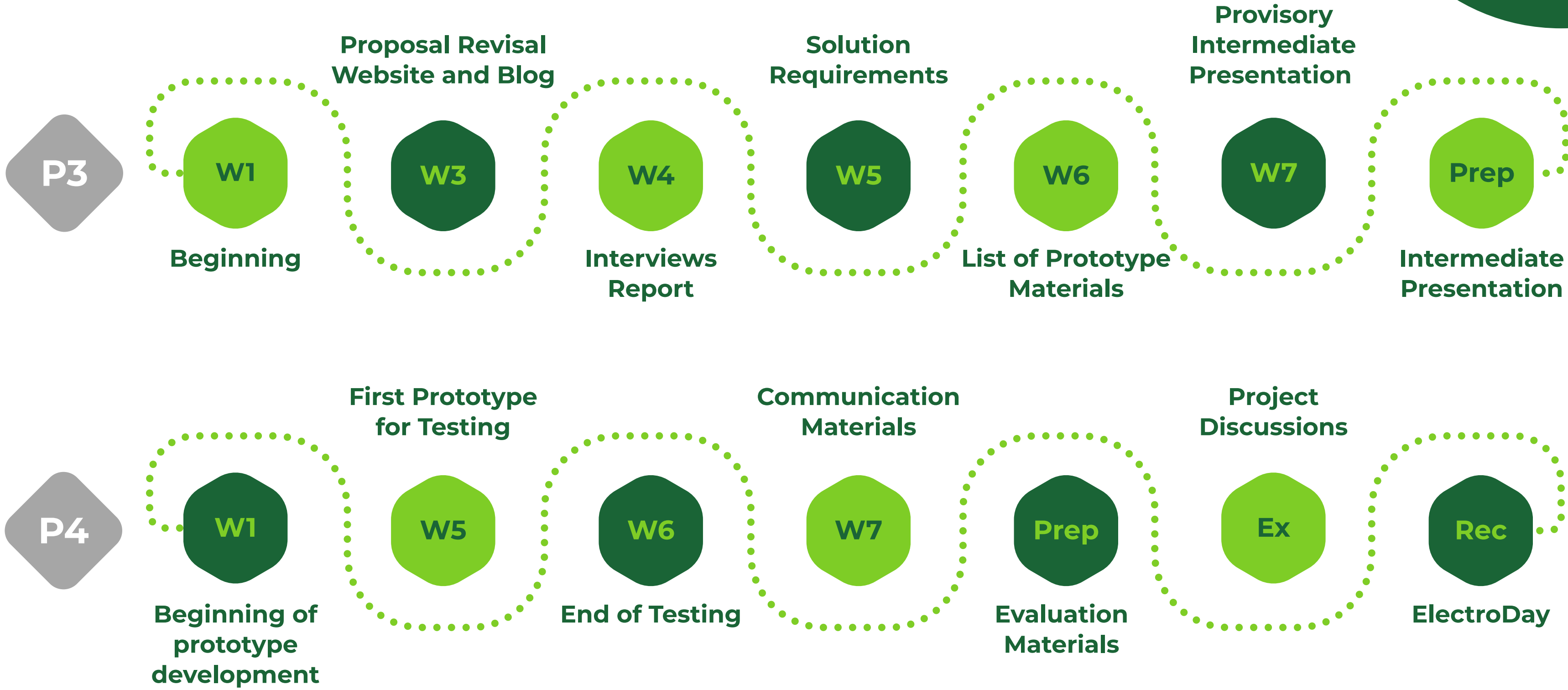


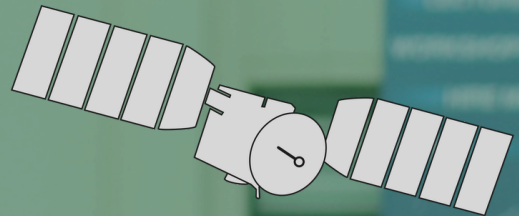
PROJECT WEEK	Q1															Q2																			
	JANUARY					FEBRUARY					MARCH					APRIL				MAY				JUNE											
	2	9	16	23	30	6	13	20	18	25	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23								
									1	2	3	4	5	6	7	PREP	EXAM	1	2	3	4	5	6	7	PREP	EXAM	PREP-REC	EXAM-REC							
	Interview Report and Initial Research																																		
Communication materials																Website Development and data updates																			
																Blog launch and updates																			
																Data Collection																			
Project's data materials update																Crop vs Terrain Identification																			
																Crop Species Identification																			
																Development and Implementation of experimental validation methods																			
																Growth Stage Identification																			
																Web app Development																			
																Testing of experimental validation methods																			
Technical work: Identification of crop/terrain, crop species and growth stage																					EletroCap Pitch Deck and Final Report														
																										Testing Crop Auditing Software									
																										Data integration in Web app									
																										Compare experimental and software data									
																										Crop Analysis Video									
Project Performance																										Poster									
																										Final Interviews									
																															Electroday				

PROJECT END



PROJECT'S DEADLINES





Thank You!

