



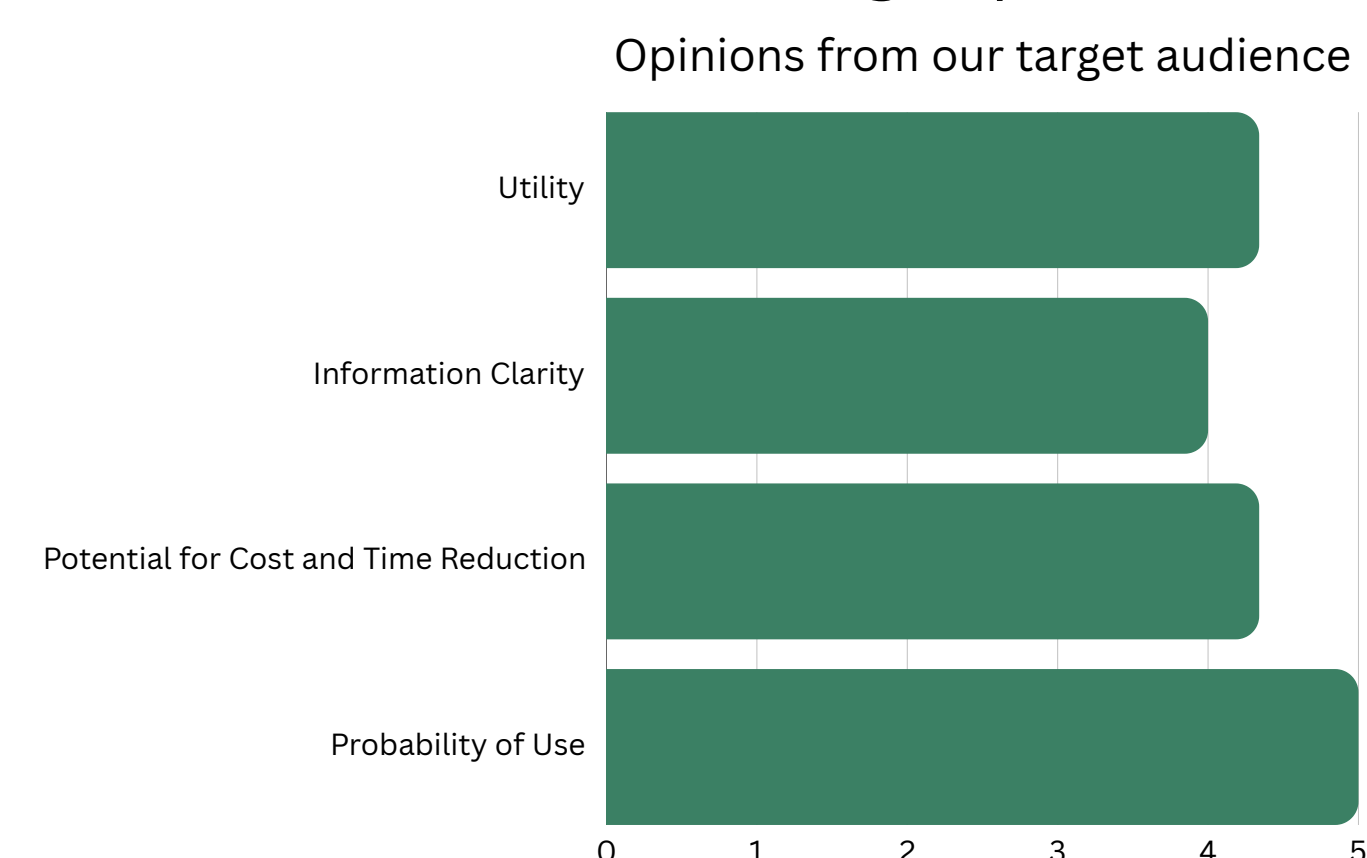
Problem

- Traditional crop auditing relies on manual field inspections;
- Audits are slow, costly, and difficult to scale;
- Accurate information on crop type, area, and growth stage is essential;
- Insurance companies/financial institutions require reliable agricultural data.



Benefits

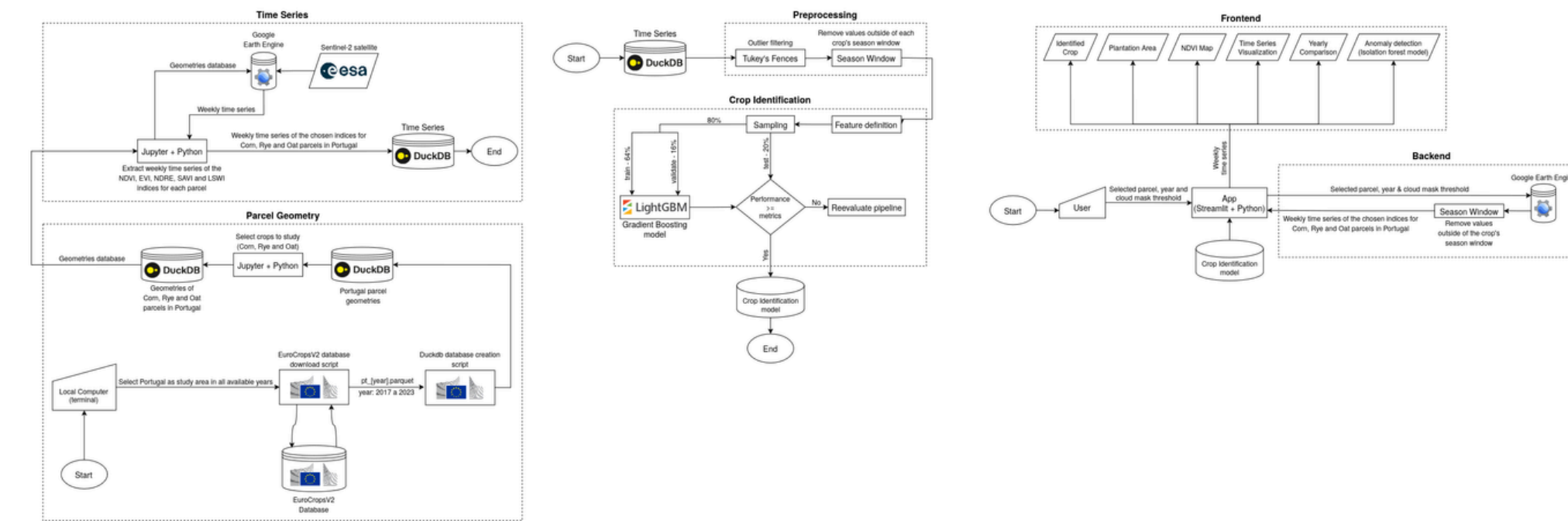
- Our solution has several benefits, which have been validated by our beneficiaries in the graph below.



Solution

- Identifies crop species, cultivated areas, and analyses performance across an agricultural field.

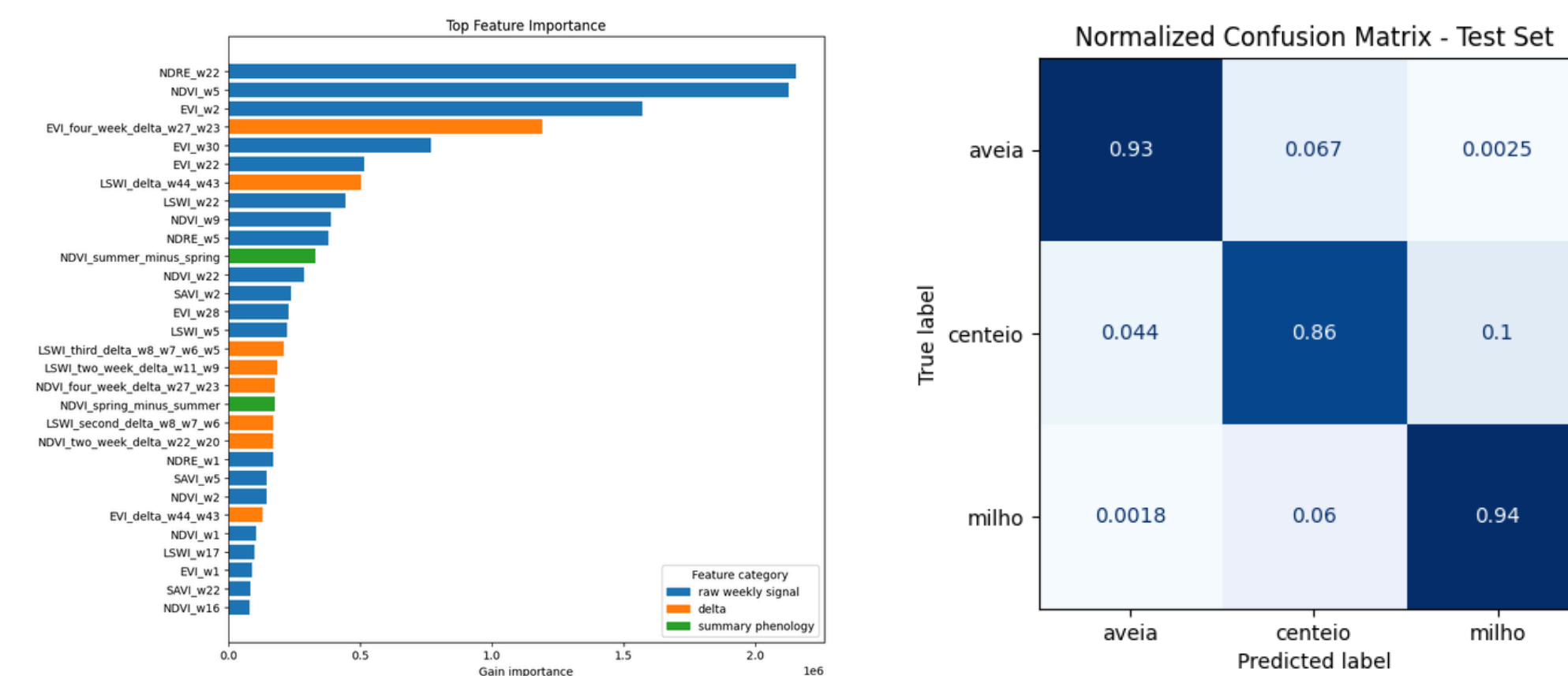
Our data workflow



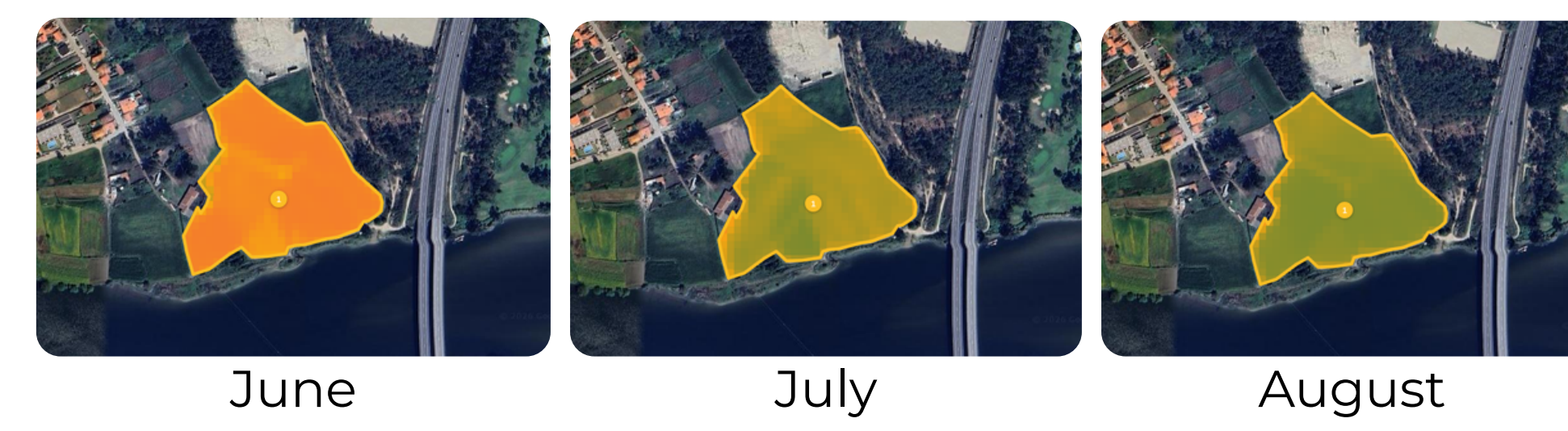
- Uses Sentinel-2 satellite imagery for agricultural monitoring;
- Applies machine learning for crop classification (LightGBM model).

Our most important features

- The model achieved strong overall performance;
- Model training was performed on a reduced dataset, so performance is expected to improve with full-scale training.



Results



- HeatMap representation for easy visualization of planted area;
- Can easily detect underperforming parts of the plantation;
- Allows the user to select specific plots identifying the correct type of crop;
- The user can choose how selective the data is, moving the cloud threshold slider;
- The more cloud coverage the user allows, the more data the model receives, but it might lose some accuracy.



Beneficiaries

Farmers

- Easy access to the planted crops without needing to be on-site;
- Monitoring crop growth and detecting anomalies;
- Easier demonstration of compliance with agriculture programs.

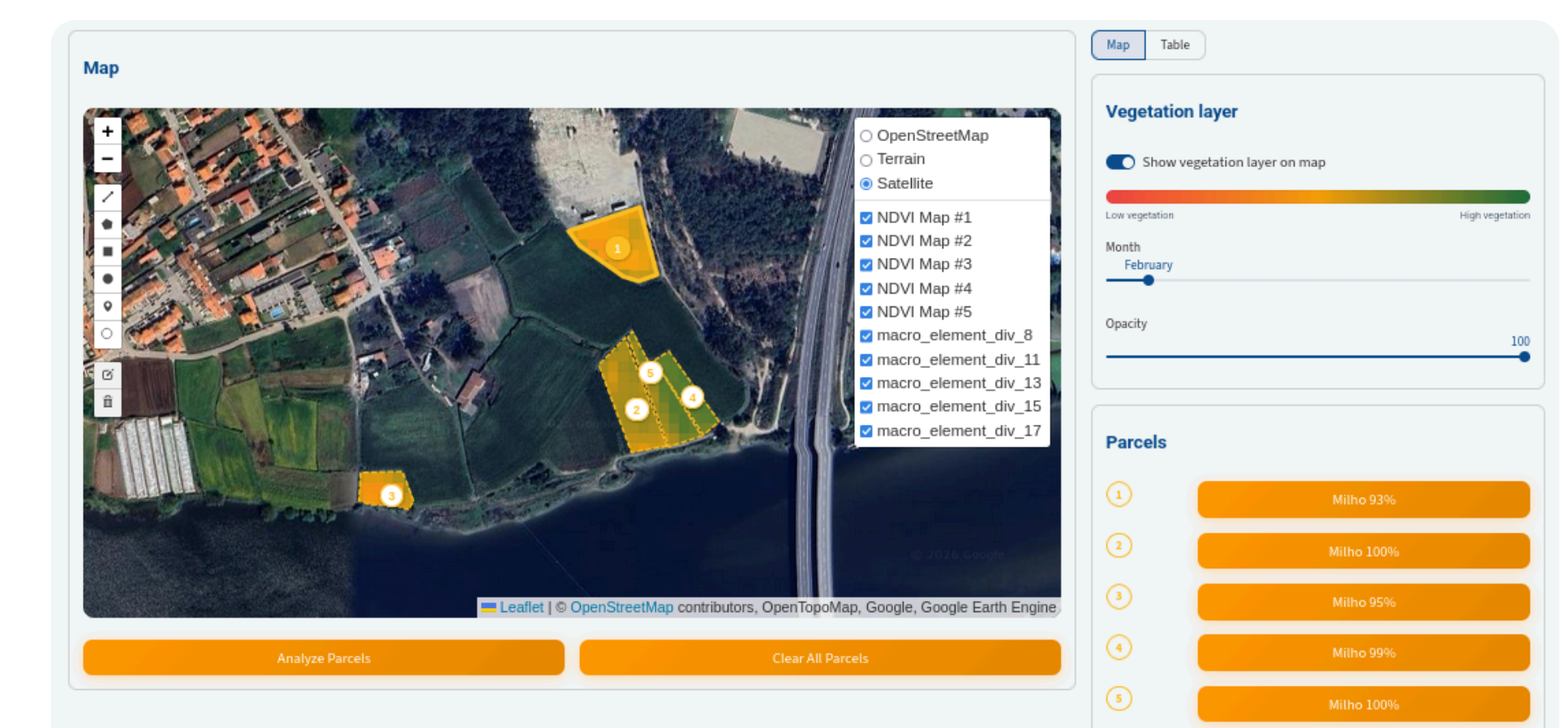
Insurance Companies & Financial Institutions

- Simpler and cheaper audit processes;
- Clear record of crop growth stage;
- Easier fraud detection.

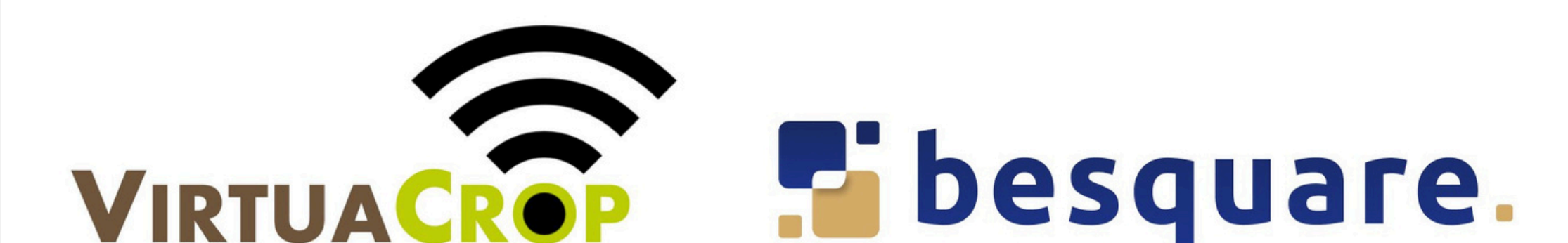
Parcel Table

Parcel #	Predicted Crop	Confidence (%)	Area (ha)	Satellite Coverage (%)
1	Milho	93.5%	0.35	94.3%
2	Milho	95.6%	0.35	94.3%
3	Milho	94.7%	0.16	92.9%
4	Milho	99.5%	0.16	94.3%
5	Milho	99.9%	0.24	94.3%

Coverage = observed Sentinel-2 weeks within the plantation-harvest window for each crop type.



Acknowledgements



Check out our website!



Dyanne Freire



Filipe Ferrão



Gonçalo Martins



Maria Henriques



Rodrigo Barreiros



Tiago Rei

