

# AgriBIT

# NEWSLETTER

So you don't miss a single thing



## ALL FOR YOU!

Welcome to the 5th and last edition of the AgriBIT Newsletter! Our collective efforts are now visibly transforming the fields, heralding a future where precision agriculture flourishes. From the development of advanced tools and systems to the integration of cutting-edge technologies, we are excited to share our solutions for the challenges of modern farming.

Warm regards,  
AgriBIT Team

**9** PRECISION  
AGRICULTURE SERVICES

**3** GNSS  
ENABLERS

**1** GNSS  
RECEIVER

**1** CUSTOM  
SENSOR NODE

**1** CROSS PLATFORM  
VISUALIZATION

**and much,  
MUCH MORE!**

# SMART FARMING

## For sustainability

AgriBIT enhances the agricultural supply chain by optimising the utilisation of resources like fertilizers, pesticides, and water, concurrently expanding crop diversity within limited land areas.

With its advanced analytics and real-time monitoring capabilities, AgriBIT provides farmers with precise data to make informed decisions, thereby reducing waste and improving yield quality. This not only supports sustainable farming practices but also contributes to increased food security.

## For end-users

AgriBIT offers a comprehensive range of services on a unified platform, enhancing the experience for both farmers and service advisors through the seamless integration of diverse precision agriculture services. This integration is made possible by leveraging data obtained from field sensors and the Copernicus Open Data, establishing a business-to-business-to-consumer (B2B2C) model where services flow from the provider to the service advisor and ultimately to the farmer.

## ON THE FIELDS

### Italian vineyards

Management of vineyards with a focus on being able to improve automatic guidance, decrease water usage and connect AgriBIT services to other management platforms.



### Portuguese tomatoes fields

Use GNSS services to speed up the early detection of pests and diseases during the growth period and deliver the ability to apply early corrective measures.



### Greek Orchards

Full management of peach orchards with UAV Data, benefiting from the capability to overcome the limitation of medium-resolution satellite EO which cannot provide accurate results in orchards crops due to tree canopy shape.



## PRECISION AGRICULTURE SERVICES

### Climate and weather services

This service offers a wide array of weather measurements at regular intervals, collected through specialised on-site hardware that operates independently with its own power source and connectivity.

### Tillage scheduling service

Designed to provide farmers with valuable insights into the optimal conditions for conducting tillage operations without harming the soil structure. This service also offers recommended actions to assist farmers in their agricultural practices.

### Irrigation scheduling service

Assists farmers to decide on the optimal irrigation interval and water amount in order to cover crop needs, save water, while preserving natural resources.

### Crop growth monitoring

It delivers a range of vegetation indices derived from Earth Observation data, sourced from satellite sensors or Unmanned Aerial Vehicle imagery. These indices are specifically tailored for field and tree crops, providing valuable insights into their growth and health.

### Guidance

It utilises high-precision EGNSS services to enhance route optimization and provide guidance to autonomous vehicles.

### Prescription mapping

It delivers fertilization advice maps and supports Variable Rate Application (VRA). This service ensures that each section of the field receives the precise amount of nutrients required, optimizing both crop yield and resource efficiency.

### Pest and Disease Alerts

Provides alerts about the possibility of pest attacks and disease outbreaks to crops, assisting farmers to take the necessary measures at the appropriate time to limit preventive interventions and reduce production costs.

### Yield estimation and Seasonal Yield Prediction

These services furnish essential insights into yield estimations and seasonal yield forecasts for cultivated crops.

### Route planning for UAS/UAV

The algorithm allows farmers to utilize unmanned vehicles (UAV & UGV) for safe and efficient navigation, crop monitoring, and actuation tasks across different crop types. It optimizes drone flight paths to achieve detailed 3D models, high-resolution images for mapping, and data suitable for Deep Learning analysis to detect pest infestations or plant health problems.





## GNSS ENABLERS

### Boundary extraction

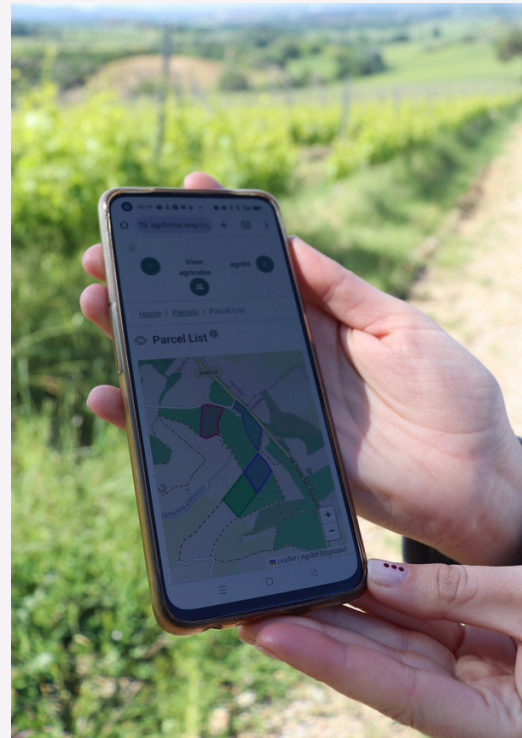
It enables the development of precise and tailored virtual crop mappings by incorporating automated machine guidance services and accurate agricultural maps that encompass geospatial data pertinent to key farming metrics.

### Route planning for UGV/UGS

This service offers guidance on navigating a field by considering its boundaries, the spacing between cultivation rows, their orientation, and an initial reference point. It provides recommendations on the sequence and orientation of traversal, allowing users the flexibility to adjust these parameters during operation.

### Data acquisition

Data acquisition is a collection from various sensors and devices, using mainly GNSS technologies for geo-referencing like: Soil moisture, Temperature, Humidity, Rainfall, Wind speed, Wind direction, Gust speed, Light intensity, UV power, Air pressure.





## GNSS RECEIVER

The AgriBIT GNSS receiver is embedded into weather stations and UAV to provide a precision positioning of 1,5 cm thanks to the embedding of easy deployable customized PPP-RTK augmentation service.



## CUSTOM SENSOR NODE

Custom sensor nodes have been deployed on AgriBIT test fields to collect several environmental and weather data. They have been designed to measure precise (at 1ppm resolution) concentrations such as air pollutants as CO, NO, NO<sub>2</sub>, SO<sub>2</sub>, 4H<sub>2</sub>S, and O<sub>3</sub>, arbitrarily selected from over 70 supported sensor types.

Additionally, the AgriBIT platform has been geared to capture over 13 more parameters from the Copernicus CAMS service, including PM<sub>1</sub>/PM<sub>2.5</sub>/PM<sub>10</sub>, along with weather parameters like ambient temperature, humidity, pressure, wind gusts, UV index, and pollution levels, out of more than 100 parameters available from EU Earth Observation services.

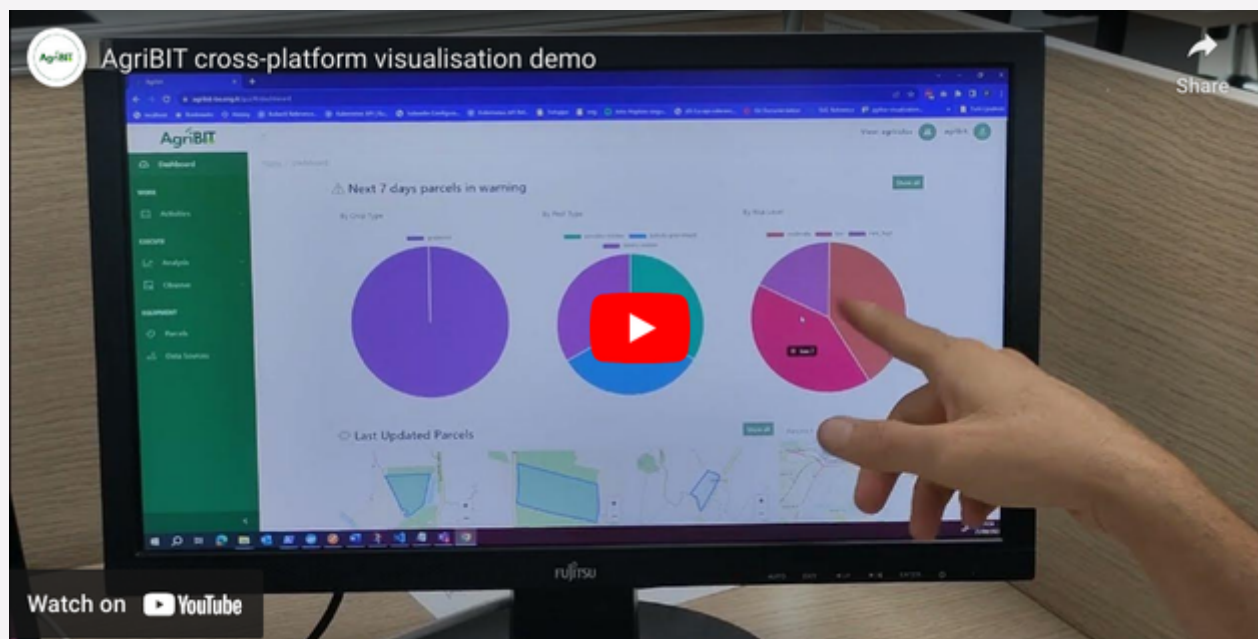
The AgriBIT platform takes advantage of publicly available climate and pollution data offered by various Open Data repositories, collecting data from in-situ sensors contributed freely to the community by individuals and organisations, complementing the already extensive range of sensor types available in the AgriBIT platform for each of its fields with even more data useful for conducting knowledge-aware agricultural operations.



## CROSS-PLATFORM VISUALISATION

Serves as the primary interface for diverse end-users, enabling them to engage comprehensively with AgriBIT services. It encompasses the AgriBIT Services Platform, empowering users to interact with advanced features, integrate functionalities, and facilitate data collection for third-party utilization. This platform provides access to data from on-site services and sensors as well as data generated by the AgriBIT Mobile Application.

Check the demo here: <https://youtu.be/o9OE8We9qIU?si=igQrywMkSNefTep1>



## AGRIBIT COMMUNITY PLATFORM

The AgriBIT CP facilitates interaction and collaboration among a broad spectrum of stakeholders, promoting engagement both individually and with the platform services. This collaborative platform is designed to support knowledge sharing and access to all AgriBIT's services. It provides the IT community with collaborative services and development support for utilizing related components. Self-register as an external user into the AgriBIT community platform to view the customers, fields, services, and analytics! Once registered, you can also join the Cross-Platform Visualization. Join us! <https://agribit-khub.eng.it/>





# LEARN MORE

on youtube

## SMART FARMING: MAPPING THE ROAD AHEAD



## TESTING OUR PRECISION AGRICULTURE SERVICES!



## WHO ARE WE? AND WHAT DO WE DO FOR AGRIBIT?

Click in the logos to find out!

