

Linking space to user needs

Downstream innovation in agriculture through Horizon Europe

Space4Agriculture; 4th April 2025

Vasilis Kalogirou and Steffan Schneider, Market, Downstream & Innovation (MDI)





#EUSpace

Exploitation

- Galileo and EGNOS services provision and 24/7 operations – including management, operation, maintenance, improvement, evolution & protection of infrastructure
- GOVSATCOM hub and IRIS² preparation
- Space Surveillance and Tracking Front Desk



Security

- Security Accreditation
- Security Monitoring Center operations (GSMC)
- Governmental Service Provision
- Key contributor in the implementation EU Space Strategy for Security and Defence



Utilization

- Market development, communications, user uptake, applications, innovation
- For Galileo, EGNOS, commercial use of Copernicus, GOVSATCOM, SST, and soon IRIS²



Building the EU Space Downstream ecosystem for Agriculture



- Market intelligence
- Creating, supporting, and scaling up a new generation of SMEs, startups, and innovators in the EU
- Fostering the EU Space Downstream industry competitiveness
- Promoting synergies among different components of the EU Space Programme



Our target: Customer-focused companies that add value and exploit EU Space Programme data & services and deliver actionable information to support digital agriculture



EU Space agricultural applications and market projections

Environmental Monitoring

- Carbon capture & content assessment
- Environmental impact monitoring

Natural Resources Monitoring

- Biomass monitoring
- Crop yield forecasting
- Soil condition monitoring
- Vegetation monitoring

Operations Management

- Asset monitoring
- Automatic steering
- CAP monitoring
- · Farm machinery guidance
- Farm management systems
- Field definition
- Livestock wearables
- Pastureland management
- Precision irrigation
- Variable rate application

THE REPORT OF A REPORT OF A

Weather Services for Agriculture

- Climate services for agriculture
- Weather forecasting for agriculture





Revenue from EO data sales by application



EO application GNSS application



Agriculture Value Chains - EO

EARTH OBSERVATION	DATA PROVIDERS		PLATFORM PROVIDERS	EO PRODUCTS AND SERVICE PROVIDERS	INFORMATION PROVIDERS	END USERS		
	AIRBUS* BLACKSKY CAPELLA SPACE GEOSAT* E-GEOS* EARTH-I* EOS DATA ANALYTICS* VEE*	AWS CLOUDFERRO* GOOGLE CLOUD PLATFORM IBM CLOUD MICROSOFT AZURE T-SYSTEMS*	 ADAM* CLOUDEO* CREODIAS* EARTH-I* EDS CEODE EURODATACUBE* GOOGLE EARTH ENGINE NORTHJO* OPEN DATA CUBE PLANET EXPLORER SENTINEL-HUB* (SINERGISE) TERRADUE* UP42* COPERNICUS DATASPACE ECOSYSTEM* FOOD TEP* WEKEO* 	AGRICOLUS* BASF* CLEVERFARM* DESCARTES LABS DIGIFARM* E-GEOS* EARTH DAILY EOS DATA ANALYTICS FARMSTAR FIELDSENSE* GAF* GEOVILLE* GMV* KAPPAZETA* ONESOIL* PESSL INSTRUMENTS* PLANETEK* SATAGRO* SATALLIGENCE* SENCROP* SINERGISE TALKINGFIELDS* TRIMBLE	FARM MANAGEMENT SERVICES: • 365FARMNET* • AGRIVI* • AGRIVI* • CROPWISE • FARMERP • GRANULAR SECTOR SPECIFIC SERVICES: • GAMAYA* (SOY, SUGAR CANE) • GEO4A* (POTATO)	AGRI-INSURERS AGRICULTURAL CONSULTANTS AGROCHEMICAL MANUFACTURERS AGRONOMISTS COOPERATIVES ENVIRONMENTAL AGENCIES FARMERS FOOD PROCESSORS INTERNATIONAL AGENCIES (E.G. FAO, WFP) PAYING AGENCIES		
	• ICEYE* • MAXAR • PLANET • SATELLOGIC* • UMBRA	FEDERATED INFRASTRUCTURE (E.G. GAIA-X)* SENTINEL COLLABORATIVE GROUND SEGMENT*						
	COPERNICUS SENTINELS* LANDSAT (USGS) METEOSAT (EUMETSAT)* RADARSAT (CSA) RELEVANT EUROPEAN NATIONAL MISSIONS RELEVANT IN-SITU NETWORKS					WINE PRODUCERS		
LEGEND			VITO* VULTUS*					
Commercial Public offeri	offering ng / entities		COPERNICUS CLIMATE CHANGE SERVICE (C3S)* COPERNICUS LAND MONITORING SERVICE (CLMS)*					
User segments								





Agriculture Value Chains - GNSS

GNSS	AUGMENTATION SERVICE PROVIDERS	COMPONENT AND RECEIVER MANUFACTURERS	SYSTEM INTEGRATORS DESIGN CONSULTANCIES TESTING & MAINTENANCE	END USERS
	CNH INDUSTRIAL* DEERE FUGRO* HEMISPHERE (ATLAS) HEXAGON* SWIFT TERIA* TOPCON TRIMBLE U-BLOX* NATIONAL AND REGIONAL RTK NETWORK PROVIDERS	AG LEADER TECHNOLOGY AGJUNCTION ANALOG DEVICES ANTCOM ARAG* AVMAP* BEUING BDSTAR NAVIGATION CAMPBELL SCIENTIFIC CHCNAV CNH INDUSTRIAL* COMNAV TECHNOLOGY DEERE HARXON	AG LEADER TECHNOLOGY AGCO CORP AMAZONEN-WERKE* ARAG* AVMAP* CLAAS KGAA* CHCNAV CNH INDUSTRIAL* DAEDONG INDUSTRIAL DEERE HEXAGON* ISEKI & CO I/CP*	AGRI-INSURERS AGRICULTURAL CONSULTANTS AGROCHEMICAL MANUFACTURERS AGRONOMISTS COOPERATIVES ENVIRONMENTAL AGENCIES FARMERS / CONTRACTORS FOOD PROCESSORS INTERNATIONAL AGENCIES (E.G. FAO, WFP) PAYING AGENCIES WINE PRODUCERS
LEGEND Commercial offering Public offering / entities User segments		HEXAGON* MEINBERG* RAVEN INDUSTRIES SEPTENTRIO* TOPCON CORPORATION TRIMBLE NAVIGATION UNISTRONG GNSS YAGEO	KRONE* KUBOTA CORPORATION MAHINDRA MILLAT TRACTORS SDF GROUP* TONGYANG MOOLSAN YANMAR	



User Consultation Platform

- The **users** as a starting point to inform Programmatic actions and R&I initiatives.
- Inputs into the development of user-centric space data services within the European Union Space Programme
- Farmers, agro-insurers, cooperatives, agronomists, paying agencies, international agencies, agrochemical manufacturers, research centres etc.
- In addition: Ad Hoc agro-industry exchanges



#EUSpace 🔘



Meteorological assimilation from Galileo and drones for agriculture



 Develop a toolchain for soil & atmospheric monitoring, weather forecasting and severe weather / irrigation / crop monitoring advisories, with Galileo, Copernicus and drone data at its core.





Meteorological assimilation from Galileo and drones for agriculture



 MAGDA SYSTEM CONCEPT: Delivery of augmented weather forecasts and irrigation recommendations directly to farmers, enabled by a dedicated dashboard and APIs to interface with already existing Farm Management Systems.











AgriBIT

Artificial intelliGence applied to pRecision farming By the use of GNSS and Integrated Technologies



• Synergies between Global Navigation Satellite System (GNSS) and Earth Observation (EO) for more accurate and continuously available Precision Agriculture services.



Greek Pilot Peach orchards

The pilot in Greece focuses on the full management of peach orchards, benefiting from the capability to overcome the limitation of EO and UAV data which cannot provide accurate results in orchards crops due to tree canopy shape.



Portuguese Pilot Tomatoes

The pilot in Portugal focuses on the detailed management of diseases, speeding up the detection of diseases earlier during the growth period and delivering the ability to apply corrective measures earlier than without the use of GNSS services, i.e. before the harvest.



Italian Pilot Vineyards

The pilot in Italy focuses on the management of 200 ha of vineyards, with a focus on being able to improve automatic guidance, decrease water usage and connect AgriBIT services to other management platforms.







#EUSpace



AgriBIT

Project achievements in a nutshell

- 20-months piloting phase across Europe, validating improvements in agricultural practice
- **Eight precision agriculture services released**, combining expert agricultural knowledge with EO systems, and on-the-ground technologies including advanced sensors and artificial intelligence
- Improved quality of harvest \rightarrow less fertilization & pesticides, better use of water resources









Traceability in agriculture through EU Space



- Transparency, Traceability, and Trust in Local Food Production [SI]
- Enhancing CAP Rules Monitoring and Auditing [ES]
- Transparency and Traceability of **Olive Oil** [ES]
- Traceability and Authenticity of Wine [CY]
- Environmental Sustainability Index of Cotton production/Cultivation [GR]
- Environmental Sustainability Index in Vineyards Cultivation [CY]









#EUSpace

Implementing Smart Farming Applications using EO Data, Soil Sensors & Robotics



- Combining multi-level, multi-technology approaches, SQAT delivers high-resolution soil property maps.
- The SQAT system leverages Copernicus data, autonomous robot-mounted sensors, and innovative in situ analysis tools, to **enhance productivity and reducing costs**.
- Mapping and sampling of **soil at various levels and resolutions**
- Services to be developed: variable rate liming (VRL), variable rate seeding (VRS), variable rate macronutrient fertilisation (VRMF), variable depth tillage (VDT), and a carbon farming monitoring, reporting and verification solution.





Bringing EU Space abroad

- Internationalization of EU Space Programme data and services
- Diagnostic tool that integrates optical, infrared and SAR data
- Locally adapted tool to support sugarcane crop management in Colombia
- Mills and farm managers test new biomass and anomaly products to reduce fertilizers and plan irrigation











Linkages with food security

- **Demonstrating how Copernicus data can be used** to quantify the impact of war in Ukrainian agriculture
- **Collaboration** with JRC and Ukrainian researchers to ensure data consistency with in-situ measurements
- Leveraging the EUSpace4Ukraine industry Network of innovators
- Output: EUSpace4Ukraine <u>White Paper</u> and an interactive <u>StoryMap</u>





Linking space to user needs

Get in touch with us

www.euspa.europa.eu





Apply today and help shape the future of #EUSpace!