



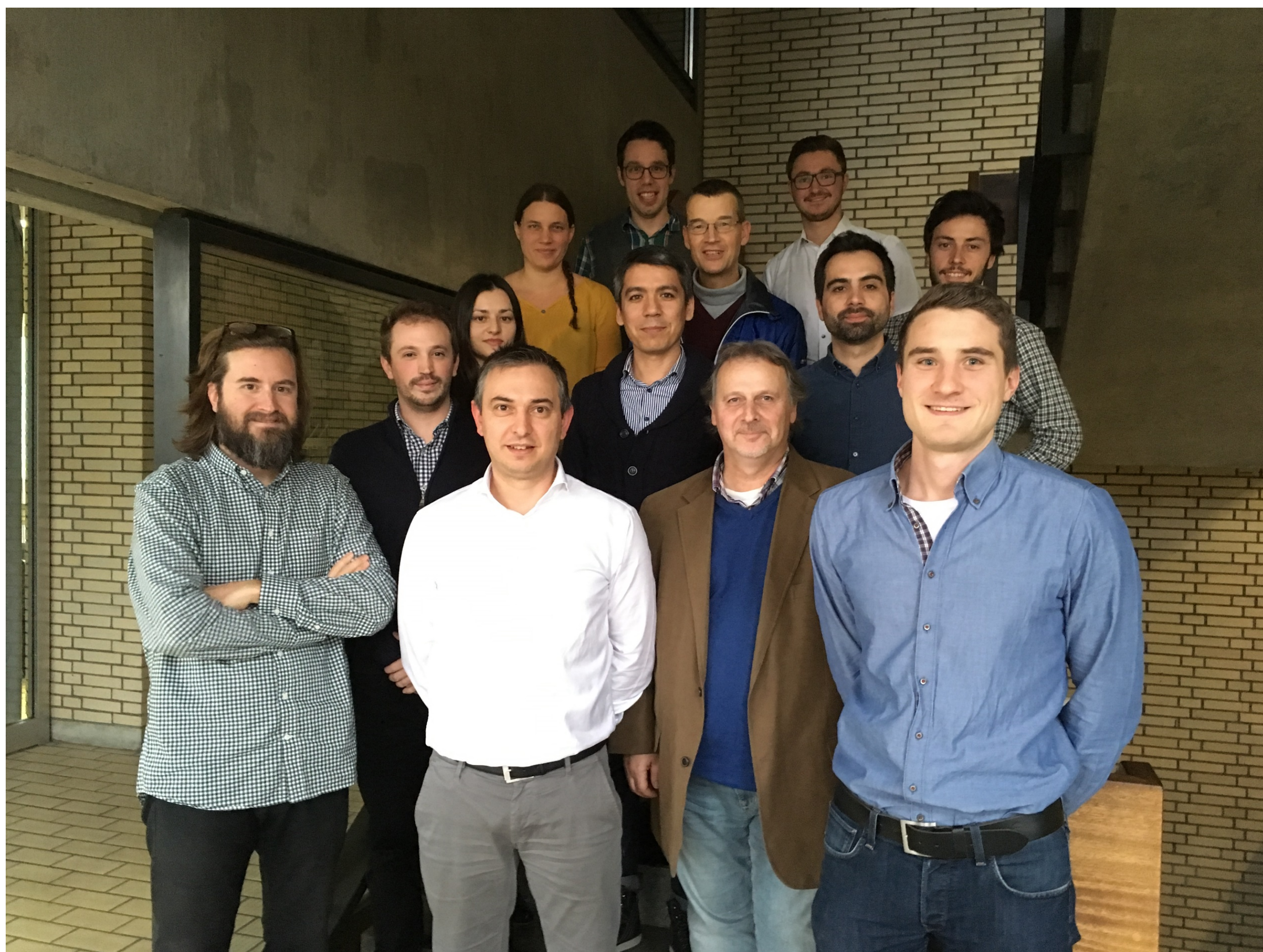
## Decision Support for Optimized Site-Specific Fertilization based on Multi-Source Data and Standardized Tools

### Dear Reader!

Welcome to the first newsletter of the iFAROS project. This newsletter is aimed to provide you with an overview of the project, its progress as well as to inform on future plans and activities.

### Kick-off meeting

Officially, the project started on the 1st of September, 2018. The kick-off meeting took place at the University of Hohenheim in Stuttgart in November 2018. Productive discussions defined future plans and directions of the collaborative activities.



### State of the art

The expected growth in population increases the demand for agricultural production. Due to the problems of climate change and depletion of natural resources, farming faces the need to apply sustainable practices with a minimal environmental impact. To address this challenge, many disciplines are working toward developing proper technologies.

In recent years, technologies and tools used for precision agriculture (PA) are widely combined with Cloud Computing, Internet of Things (IoT), Big Data, and Unmanned Aerial Vehicles (UAV) with the aim to revolutionize farming and food production. Researches from all over the world are collaborating towards the creating of innovative information and communication technologies (ICT) directed to meet the societal challenges of Sustainable Development Goals, in particular, resource use efficiency and food security.

The iFAROS Project is working towards reducing input use and improving its efficiency across Europe. This will be performed by:

- organizing easy access to farm-related knowledge
- developing innovative field technologies to overcome current technical barriers
- delivering web apps for site-tailored input management, presented on locally optimized ICT service platforms

### Project's goal

The overarching aim of the iFAROS project is to sustain and increase agronomic productivity and environmental performance for small European farmers by exploiting multi-source data to optimize fertilization in wheat cultivation. Thus, the project will envisage an effective demonstration of how the use of remote sensing with UAV and the utilization of agricultural data from the whole-field operations are combined to reach higher yields with lower inputs, hence protecting the environment while offering to the farmer a financial benefit.

### Technical objectives

#### Objective 1

To develop a novel cloud-based application, acting as an intelligent middleware with data analytics capabilities

#### Objective 2

To realize better decision-support algorithms for farm management and operations

#### Objective 3

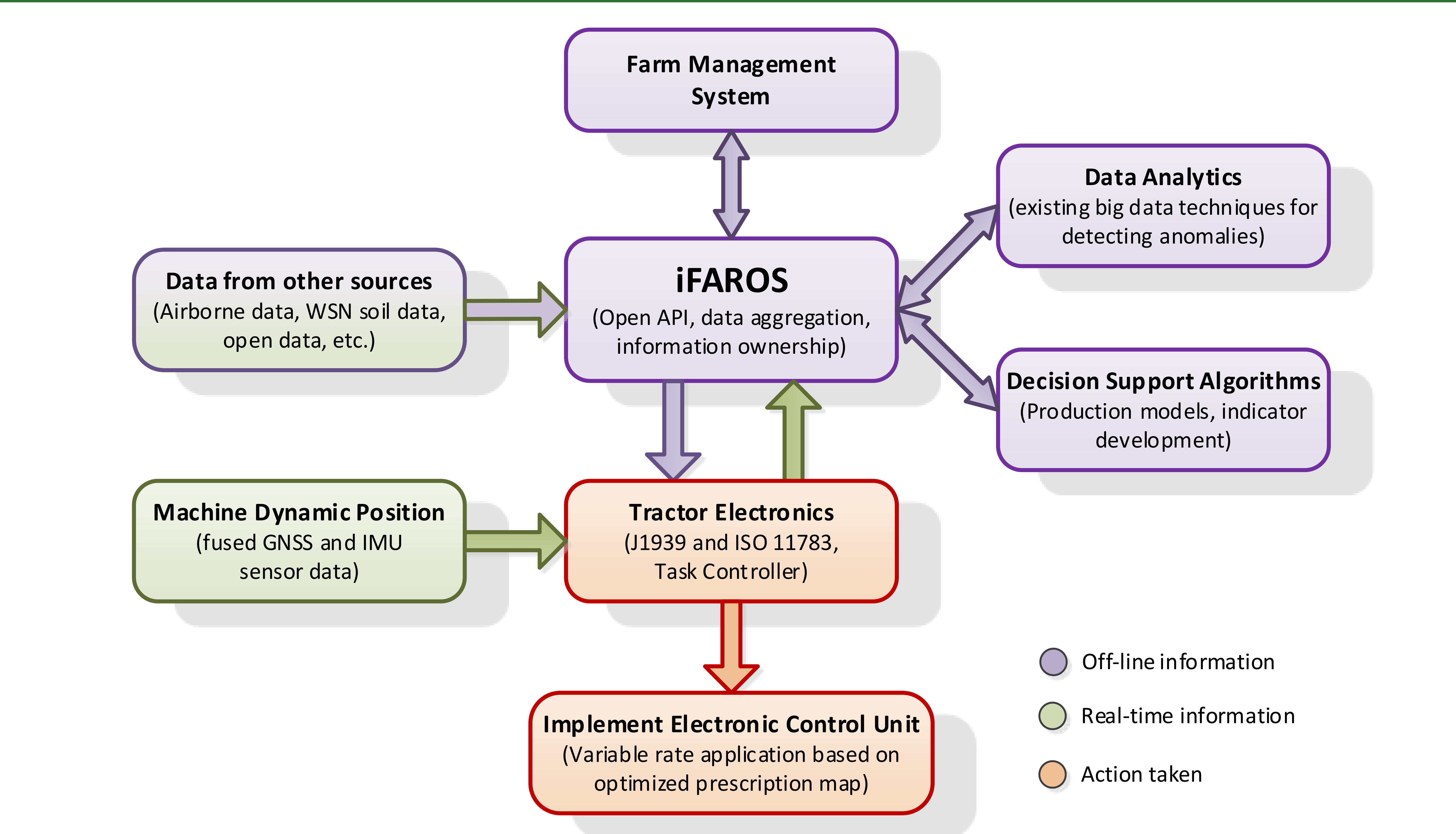
To develop an advanced FMS for applying and exploiting objectives (1) and (2) in an easy-to-understand manner, also for small farmers

#### Objective 4

To apply the produced site-specific management fertilizer application map in an automated way by utilizing ISO 11783



## Conceptual framework



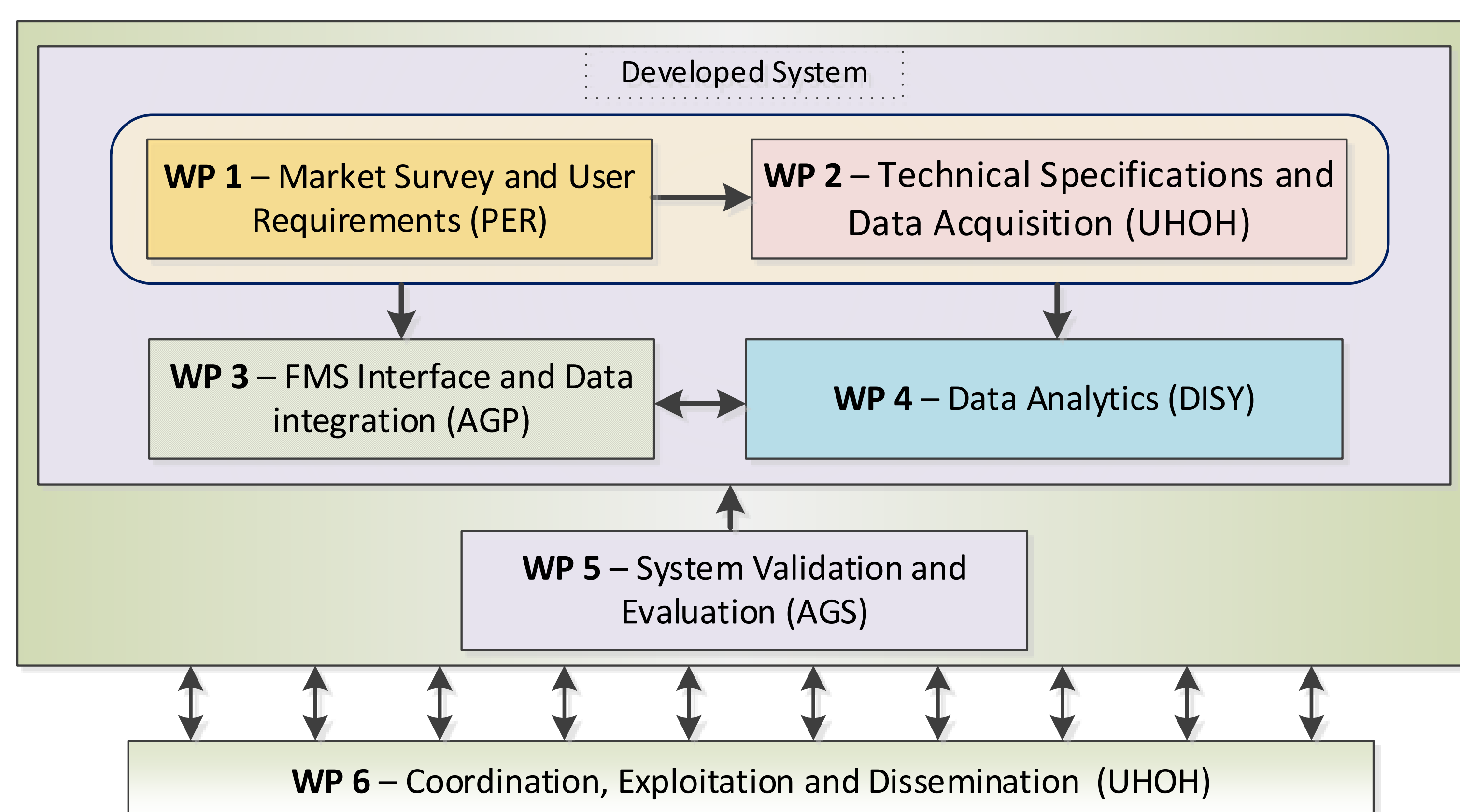
A multispectral camera (Parrot Sequoia+) with an irradiance sensor are attached to a drone (Matrice 100, DJI) to collect airborne data, in terms of multi-band images (green, red, red-edge and NIR). To optimize N fertilization, in terms of reaching higher yields with lower inputs, N needs of crop fields are defined based on the combination of historical data, field data and airborne acquired data.

The developed hardware allows the connection of the FMS with the ISOBUS Task Controller for the site-specific prescription map to be applied by the Electronic Control Unit (ECU) of the fertilizer spreader. The prescription map will be generated and sent to the machine after a thorough analysis of all obtained data.



a – Acquisition of airborne data, b – NDVI map, c – VRA prescription map, d – Utilised Amazone ZA-V spreader, e – Implemented VRA prescription map on VT

## Work packages



Gantt Chart with person month distribution	Person Months					1st Year				2nd Year				3rd Year			
	UOH	PER	AGP	DISY	AGS	O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11	O12
WP 1 Market Survey & User Requirements	3	2	4	1	-	▲	▲										
WP 2 Technical Spec. & Data Acquisition	9	8	-	-	5		■	▲		▲	▲						
WP 3 FMS Interface & Data Integration	3	3	15	1	-	▲					▲		▲	▲			
WP 4 Data Analytics	-	6	7	9	2					▲	▲			▲		▲	
WP 5 System Validation & Evaluation	12	2	6	-	6							▲		▲			▲
WP 6 Coordination, Expl. & Dissemination	9	1	4	1	1						▲						▲
▲ Deliverables, ◆ Milestones Total:	36	22	36	12	14		MS1 ◆			MS2 ◆			MS3 ◆			MS4 ◆	



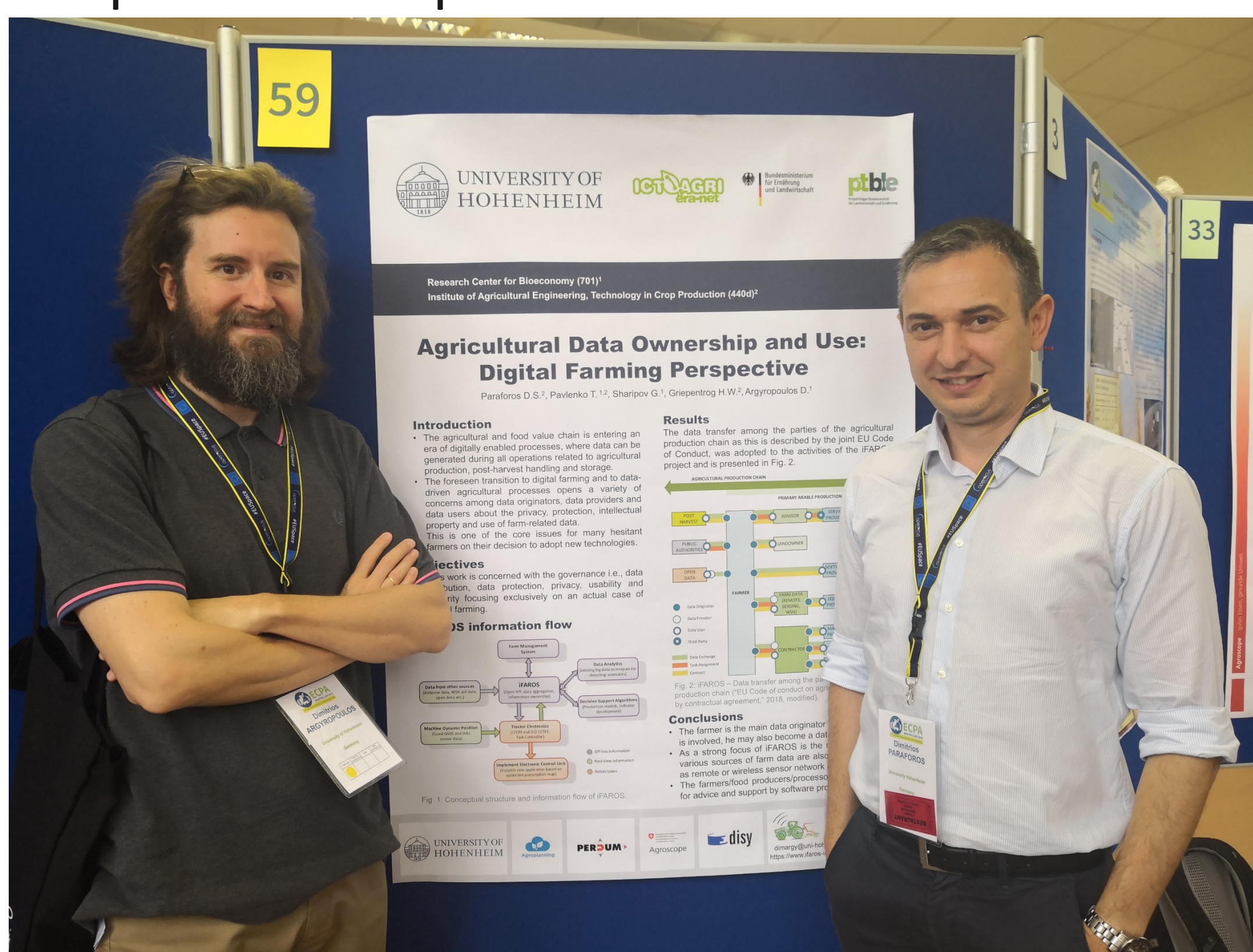
## Expected impact

1. Develop eco-innovative technology for increasing the inputs use efficiency.
2. Increase semantic interoperability in order to contextualize the acquired farming-related multi-source data.
3. Improve agricultural activity logging and offer easier cross-compliance reporting.
4. Provide ownership framework for all actors along the data value chain.
5. Ensure generated knowledge is transferred to European farmers.

## Events 2019

### ECPA conference, 8-11 July, 2019, Montpellier, France

The project partners participated in the ECPA 2019 in Montpellier having in total four oral presentations and taking part in the poster sessions with two contributions. In the scope of iFAROS project a poster on Agricultural Data Ownership and Use: Digital Farming Perspective was presented.



### 1st annual meeting, 22 October, 2019, Lokeren, Belgium

The 1st annual meeting of the consortium took place on the 22nd of October, 2019 at the premises of Perdum NV in Belgium. The project partners discussed the current status of the project, shared the results of ongoing experiments and decided on the next steps and activities.

## PARTNERS:



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## Events 2019

### Agritechnica Fair, 10-16 November, 2019, Hannover, Germany

The University of Hohenheim had its stand at Agritechnica that is the world's largest agricultural technology trade fair. The iFAROS poster and roll-up were presented.

Furthermore, in cooperation with other partners, the University organized a workshop on 'Modern Technologies in Agriculture: Adoption on Farms and Problems of Data Sharing' that took place during the fair, on the 12th of November, 2019. The workshop was based on two current projects: EIT-Food project 'Focus on Farmers' and ICT-AGRI era-net project 'iFAROS' and was focused on the challenges in the adoption of modern technologies on European farms and issues associated with agricultural data sharing.

## Funding

The iFAROS project is funded by ICT-AGRI under the call Farm Management Systems for Precision Farming and is financially supported by the ministries of participating countries:

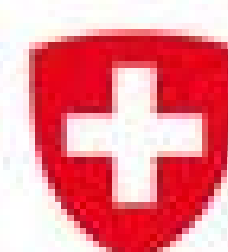
- The German Federal Ministry of Food and Agriculture (BMEL)
- Flanders Innovation & Entrepreneurship, Belgium
- The Federal Office for Agriculture (FOAG), Switzerland
- Technological Corporation of Andalusia, Spain.



Bundesministerium  
für Ernährung  
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