

isUP-AgrO

WORK PACKAGE: 3

DELIVERABLE: D3.2 – Knowledge Transfer vs. 1

Date: 31/07/2025



Funded by
the European Union

The project isUP-AgrO (number 101159644) is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.

WORK PACKAGE	3
TASK	Task 3.2: Crop ecophysiology and abiotic stresses research techniques Task 3.3: Smart crops irrigation technologies and strategies
DUE DATE	M13
SUBMISSION DATE	31/07/2025 (M13)
DELIVERABLE LEAD	Universidade da Madeira (UMa)
DISSEMINATION LEVEL	PU
DOCUMENT NATURE	<input type="checkbox"/> R-Report <input checked="" type="checkbox"/> O-Others
AUTHORS	Carla Ragonezi

Revision history

REVISION	DATE	AUTHOR	ORGANISATION	DESCRIPTION
V.0	15/06/2025	Carla Ragonezi	UMa	Table of Contents
V.1	18/07/2025	Carla Gouveia	UMa	Draft
V.2	24/07/2025	Carla Gouveia and Sónia Alves	UMa	Complete Draft
V.3	25/07/2025	Ana Branco	SAT	Review
V.4	30/07/2025	Carla Ragonezi	UMa	Final

Table Of Contents

1. Executive Summary	4
2. Introduction.....	5
3. Knowledge transfer	5
3.1. Staff Exchange: Crop ecophysiology and abiotic stresses research techniques (Task 3.2)	5
3.1.1. Lessons Learned.....	8
3.2. Staff Exchange: Smart crops irrigation technologies and strategies (Task 3.3).....	8
3.2.1. Lessons Learned.....	10
3.3. Conclusion.....	10
3.3.1. Next steps	10

1. Executive Summary

This Deliverable outlines the transfer of the knowledge to the ISOplexis Center team – through Presentation Meetings, organized within the framework of WP3 of the isUP-AgrO project.

Two staff exchanges, consisted of a two-week scheduling of activities, were held in Institute for Natural Resources and Agrobiolology (IRNAS) in Seville (Spain): the first staff exchange for “Crop ecophysiology and abiotic stresses research techniques” (Task 3.2) was divided in two phases: the first was from **9 to 20 September 2024**, with **3 ISOplexis participants**, and the second was from **24 March to 04 April 2025**, also with **3 ISOplexis participants**. The second staff exchange for “Smart crops irrigation technologies and strategies” (Task 3.3) was from **23 June to 04 July 2025**, with **2 ISOplexis participants**. The staff exchange trainers comprised a multidisciplinary team from IRNAS, throughout the ECOVER group, led by Enrique Fernández.

After the staff exchanges held at IRNAS are finished, the eight staff exchange participants from ISOplexis took part in **knowledge transfer activities** with the ISOplexis Center team. These activities included **three expositive presentations** with an overview of the staff exchanges program, a summary of the individual activities featuring images from the key activities developed, and discussions about the outcomes of the two staff exchanges.

These successful staff exchange significantly increased participants' scientific and technical expertise, strengthened collaborative networks among the IRNAS team, and laid a solid foundation for the effective implementation of the actual research project (WP6).

2. Introduction

The isUP-AgrO project aims to establish ISOPlaxis as a center of excellence in agriculture through strategic Twinning with leading research institutes from Italy and Spain, supported by an innovation expert to enhance research management practices and promote sustainable progress.

Within this context, Work Package 3 – Staff Exchange – aims to promote staff exchange and hands-on training to strengthen ISOPlaxis staff with knowledge and skills in agrosystems, agrodiversity, and bioresources for sustainable food production and resource management. After the staff exchanges are held, the participants are engaged in knowledge transfer activities with the ISOPlaxis Center team.

3. Knowledge transfer

As part of this initiative, expositive presentations were organized by the ISOPlaxis participants from both staff exchange's inserted on Task 3.2 and Task 3.3 held at IRNAS in Seville (Spain). The knowledge transfer sessions were successfully organized and disseminated throughout the ISOPlaxis team, to bring to the largest number of the team elements the knowledge acquired in the staff exchanges.

3.1. Staff Exchange: Crop ecophysiology and abiotic stresses research techniques (Task 3.2)

The knowledge transfer related to crop ecophysiology and research techniques for abiotic stresses (Task 3.2) occurred in two separate sessions. Figures 1 and 2 showcase photos from both knowledge transfer sessions.

The knowledge transfer activities included expository presentations that provided an overview of the staff exchange program from Task 3.2. These presentations featured summaries of individual activities, accompanied by images highlighting key developments. Additionally, discussions were held regarding the outcomes of the staff exchange.

The presentation of knowledge transfer was disseminated on different media channels, comprising:

- isUP-AgrO Website:

<https://isupagro.web.uma.pt/en/apresentacao-das-atividades-de-formacao-da-2-a-edicao-do-staff-exchange/>

<https://isupagro.web.uma.pt/en/apresentacao-das-atividades-de-formacao-do-staff-exchange-tecnologias-e-estrategias-inteligentes-de-irrigacao-de-culturas/>

- Social media by LinkedIn:

https://www.linkedin.com/posts/isup-agro_agriculturalresearch-sustainableagriculture-activity-7335050457519734784-TSju?utm_source=share&utm_medium=member_desktop&rcm=ACoAACg_KxIBoX5qXLNNOSj2ZCU8P7UTOZAdiEc

The **first knowledge transfer session took place on October 17, 2024**. During this session, the ISOPlaxis team members who participated in the first edition of the staff exchange - from September 9 to September 20, 2024 - shared their insights with the rest of the team.

ISOPLEXIS TEAM who participated in the 1st edition of the knowledge transfer session related to Task 3.2:

Main speakers:

- **Fabrcio Macedo**, Invited Researcher at ISOPlexis with a **PhD degree in Agronomy**. Acts as: Remote sensing and Agroclimatologist. Skills and expertise: remote sensing and vegetation indices, biomass estimation, agricultural productivity, agroclimatology, genetic diversity, sustainability and ecological modeling, and geotechnologies applied to agriculture and natural resources.
- **Gregório Freitas**, Senior Technician at ISOPlexis with a **bachelor's degree in biology**. Acts as: Crop Supervisor/Evaluator. Skills and expertise: prospecting, inventory, georeferencing, characterization/agronomic evaluation of the germplasm collection, based on specific descriptors.
- **Sofia Valente**, Research Fellow at ISOPlexis with a **master's degree in applied Biochemistry**. Acts as: Environmental Microbiologist specializing in Soil Biochemistry and Microbial Ecology. Skills and expertise: environmental biochemistry; microbiological activity, physico-chemical, and enzymatic activities of the soil; soil diversity and microbiota.

Participants:

ISOPlexis Research Fellows, Senior Technicians, Invited Researchers, Professional Interns.

Main topics discussed within this knowledge transfer:

- Themes related to:
 - Field and lab deep phenotyping techniques.
 - Crop quality evaluation techniques.
- Summary of the activities featuring images from the key activities developed related to:
 - Greenhouse experiments to study the impact of different ozone concentrations on crop transpiration.
 - Laboratory of plant hydraulics for measuring residual nocturnal stomatal conductance, leaf turgor pressure, Scholander chamber, among others.
 - Field trips to La Hampa research station and to Orán commercial orchard with the sensors and techniques used for crop monitoring and data collection.
- Discussion session included:
 - Topics related with the interaction of environmental factors – climate, nutrients, and water – with crop physiological processes, including soil physics, plant ecophysiology, and water management in agriculture.
 - The testing of new low-cost sensors, data loggers, and systems for data transmission and processing.

The **second knowledge transfer session was held on May 09, 2025**. During this session, the ISOPlexis team members who participated in the second edition of the staff exchange, which occurred from 24 March to 04 April 2025, presented their learnings to the ISOPlexis team.

ISOPLEXIS TEAM who participated in the 2nd edition of the knowledge transfer session related with Task 3.2:

Main speakers:

- **Carla Gouveia**, isUP-AgrO Invited Researcher at ISOPlexis with a **PhD degree in Biological Sciences**. Acts as: Plant Physiology and Food Analysis Researcher focusing on Crop Nutritional Value and Stress Adaptation. Skills and expertise: agricultural plant science, food analysis, food composition, nutritional assessment, plant abiotic stress tolerance, plant biochemistry, plant environmental stress physiology, and plant physiology.

- **Gregório Freitas**, Senior Technician at ISOplexis with a **bachelor's degree in Biology**. Acts as: Crop Supervisor/Evaluator. Skills and expertise: prospecting, inventory, georeferencing, characterization/agronomic evaluation of the germplasm collection, based on specific descriptors.
- **Miguel Carvalho**, Full Professor with Aggregation in Biochemistry and Biotechnology at the Faculty of Life Sciences at the University of Madeira. Acts as: **Coordinator of ISOplexis**. Skills and expertise: coordinates the Agriculture, Food, and Biochemistry Regional Priority Domain Platform; research activities including agriculture, biochemistry, and biotechnology.

Participants:

ISOplexis Research Fellows, Senior Technicians, Invited Researchers, Professional Interns

Main topics discussed within this knowledge transfer:

- Themes related to:
 - Field and lab deep phenotyping techniques.
 - Crop quality evaluation techniques.
- Summary of the activities featuring images from the key activities developed related to:
 - Greenhouse experiments regarding leaf sensors dendrometers and thermocouples.
 - Laboratory of plant hydraulics for psicrometer, Scholander chamber, micro-lysimeters, among others.
 - Field trips to La Hampa research station for weather station data logger calibration, to Orán commercial orchard for the caudalimeter system irrigation demonstration, and to Doñana National Park for the *Pinus* and *Juniperus* tree mortality experiments.
- Discussion session included:
 - Topics related with the interaction of environmental factors – climate, nutrients, and water – with crop physiological processes, including soil physics, plant ecophysiology, and water management in agriculture.
 - The testing of new low-cost sensors, data loggers, and systems for data transmission and processing, and strategies to apply it in WP6 – Research Project.



Figure 1. Knowledge transfer presentation for the training activities of the first edition of Task 3.2 staff exchange program.



Figure 2. Knowledge transfer presentation for the training activities of the second edition of Task 3.2 staff exchange program.

3.1.1. Lessons Learned

The main lessons learned within this first knowledge transfer sessions were the significance of follow-up to reinforce learning, as well as the benefit of creating a collaborative environment that encourages knowledge sharing.

We would like to highlight the advantages of the presentations to facilitate understanding, and the need for tailored training approaches to address diverse expertise levels among participants.

It was particularly important for the entire team to acquire new skills in plant turgor pressure and environmental *in situ* monitoring, which will significantly contribute to the project's success.

3.2. Staff Exchange: Smart crops irrigation technologies and strategies (Task 3.3)

A knowledge transfer session on smart crop irrigation technologies and strategies was held on July 17, 2025, for the ISOPlexis team. During the session, members of ISOPlexis who participated in the staff exchange program (held from June 23 to July 4, 2025, under Task 3.3) presented an overview of their activities. Their presentations included summaries of individual contributions, supported by images showcasing key developments. The session also featured discussions on the outcomes and insights gained from the staff exchange. Figure 3 highlights photos from the knowledge transfer session.

ISOPLEXIS TEAM who participated in the 2nd edition of the knowledge transfer session related with Task 3.3:

Main speakers:

- **Humberto Nóbrega**, Senior Technician at ISOPlexis with a **bachelor's degree in biology**. Acts as: Curator of the Germplasm Collection of the ISOPlexis Seed Bank of the University of Madeira. Skills and expertise: management of the genebank documentation systems (ISOPex and

ISOplexis GRIN-Global); phenotyping of genetic resources; evaluation of the germplasm collection, based on specific descriptors; analysis and statistical treatment of data.

- **Nuno Nunes**, isUP-AgrO Invited Researcher at ISOplexis with a **PhD degree in Biological Sciences**. Acts as: Research Scientist specializing in Antioxidant Activity and Biorefinery Applications. Skills and expertise: antioxidant evaluation, nutraceutical analysis, bioactivity assessment, biorefinery.

Participants:

ISOplexis Research Fellows, Senior Technicians, Invited Researchers, Professional Interns

Main topics discussed within this knowledge transfer:

- Themes related to:
 - Fundamentals of irrigation.
 - Irrigation strategies.
 - Irrigation scheduling methods.
- Summary of the activities featuring images from the key activities developed related to:
 - Greenhouse experiments with leaf sensors dendrometers, thermocouples and CaviCam 2.0.
 - Laboratory of plant hydraulics for psicometer, Scholander chamber, among others.
 - Field trips to La Hampa research station and to Orán commercial orchard with the sensors and techniques used for data collection, with sensor recalibration techniques and calculation in real time of the irrigation scheduling for the coming week at these two sites.
- Discussion session included:
 - Topics such as the crop ecophysiology and water stress management, addressing methods and strategies for plant water use management.



Figure 3. Knowledge transfer presentation for the training activities of the Task 3.3 staff exchange program.

3.2.1. Lessons Learned

Overall, one of the key lessons is that these knowledge transfer activities are essential for maximizing capacity building, fostering innovation, and ensuring the long-term, sustainable impact of the project.

It was particularly important for the entire team to acquire new skills in irrigation scheduling and estimate irrigation water needs, which will significantly contribute to the project's success.

Another valuable lesson learned from the previous session is the importance of storing presentations and related materials in a shared, accessible folder. This ensures that future team members and technicians can easily access the resources, facilitating continuous learning and seamless knowledge transfer over time.

3.3. Conclusion

The knowledge transfer activities, which included expository presentations that provided an overview of the knowledge acquired within the staff exchange, allowed more ISOPlexis researchers to gain new capabilities.

This process not only enhanced the skills and expertise of the team members but also expanded the overall impact of the project by fostering greater collaboration, innovation, and dissemination of key insights across the organization.

3.3.1. Next steps

The next steps in the knowledge transfer process will be aligned with the upcoming 3rd and 4th staff exchanges. These include **Task 3.4: Metabolomics and Omics Tools**, scheduled for February 2026, and **Task 3.5: Valorization of Products and By-Products**, scheduled for June 2026, and both led by the UNIPR partner.

The ISOPlexis team members who will participate in the training sessions in Parma, Italy, will, upon their return, organize internal dissemination activities to share the knowledge acquired during the staff exchanges with the broader ISOPlexis team.

