



D6.10 Training Activities

SEVT

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Topic: LC-GD-6-1-2020: Testing and demonstrating systemic innovations in support of the Farm-to-Fork Strategy

List of Abbreviations & Definitions

Abbreviation	Definition
AI	Artificial Intelligence
AOPs	Agro-ecological and Organic Practices
CDTA	Centro de Demonstración y Transferencia Agraria el mirados
CERTH	Centre for Research and Technology Hellas
SEVT	Federation of Hellenic Food Industries
UTH	University of Thessaly
DSS	Decision Support System
D	Deliverable
DSTs	Digital and Space-based Technologies
IPR	Intellectual Property Rights
IoT	Internet of Things
LCA	Life Cycle Analysis
WP	Work Package

Executive Summary

The present document constitutes the first version of Deliverable D6.10 “Training activities” in the framework of WP6 “Open Science and Innovation Actions”, Task 6.5.

The objectives of the WP6 are:

- Dissemination, communication & exploitation of results and IPR management
- Organization of Training activities, implementation of know-how transfer to industries and end-user involvement
- Communication activities
- Business Plan and Techno-Economic/Environmental Analysis & Roadmap for Market Implementation, and future commercialization of the project results
- Sustainability plan establishment
- PestNu Digital Platform

The purpose of Task 6.5 is to organize the training activities on DST & AOP systemics innovations for vegetable cultivation. These activities will start from the day 1 of the project and according to the proposal they will include:

1. Organization of short-term training internships of CDTA, UTH & Tilamur staff for the optimum operation of the DST & AOP prototypes and practices (visits, several webex by relevant technical partners).
2. Organization of Training Seminars (at UTH, CDTA, Tilamur) to maximize transfer of knowledge and/or expertise to practitioners, governmental institutions, NGOs, industry, citizens from farms etc.
3. Organization of Special Workshops/Webinars focused on Agro-advisory and Business services in 2022, 2023 & 2024. All will be implemented at regional/local level to each participating country, specially designated to reach small and medium-sized farms and to set practical guidelines and technical manuals for training replication.
4. Educational Programmes: Training material (presentations, application notes) will be developed by all partners for each country, to maximize transfer of knowledge to researchers, university students from Agriculture science, young professionals, SMEs, food industries, consumers, citizens of farms. This material will be uploaded in the PestNu digital platform public area to be accessible by the interested stakeholders and will be supported in the 7-languages (Greek, English, Spanish, Italian, Portuguese, Swedish, German) of consortium partners.
5. Digital Training activities: On-line e-learning or training to stakeholders at CERTH facilities using Augmented Reality, Video intelligence and 3D animation. CERTH will modify an existing digital training tool for the needs of PestNu and integrate this on the project digital platform with open access.

The purpose of this document is to present the training activities developed for the first 18 months of the PestNu lifetime. Specifically, this document reports the main achievements in the current reporting period (Month (M)1-M18, 1 October 2021 – 31 March 2023) of the PestNu project for the activities in Task 6.5 of Work Package (WP) 6.

The Deliverable (D) 6.10 “Training Activities” for the period M1-M18 is the first version of the documentation of the Periodic Project Reports. This document will be updated by the second version on month 36 D6.11 “Training Activities” for period M19-M36.

The report is structured as follows:

Section 1 briefly introduces the objectives of the WP6 “Dissemination and Engagement” and of the Task 6.5 “Training Activities”.

Section 2 presents the progress per training category during M1-M18.

Section 3 is a summary of conclusions and next steps.

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1. Introduction

PestNu targets the field-testing and demonstration of DST and AOP having as upper goals the reduction of pesticides and fertilisers use, as well as loss of nutrients. The partnership will deliver novel DST including AI robotic traps for real time pest monitoring; Autonomous mobile robots for pesticide monitoring and 3D spot spraying; Earth Observation missions with robust AgroRadar AI algorithms to map soil/plant nutrients and pest plant inputs using Copernicus data/services; and in-situ and real-time nutrient analysers. All the DST will be interconnected to a user-centric cloud-based Farm Management System, which features a DSS integrated with a blockchain based system for DST data evidence, integrity, and AI models verification and with a cybersecurity platform to prevent cyber-attacks and IoT vulnerabilities.

The final plan is the delivered systemic DST & AOP solutions to be demonstrated and tested in aquaponic and hydroponic greenhouse and open-field vegetable cultivation in:

- Greece (PestNu partner: University of Thessaly/UTH) and
- Spain (PestNu partners: Tilamur and CDTA).

A Pesticide Reduction Program will evaluate the Maximum Residue and the Acceptable Daily Intake levels to ensure vegetable's food safety and LCA activities will be performed. All these systemic approaches will be performed under a strong collaboration among all the Farm to Fork stakeholders and European Commission services.

2. Training Activities

2.1 Overview of the performed training activities during the M1-M18

Considering the training activities presented in section 1.2, the progress per training category during M1-M18, is summarized below:

1. **Short-term trainings among PestNu partners for the optimum operation of the DST & AOP prototypes and practices.**

These trainings were performed either in-person or on-line by the relevant technical partners (i.e., IKH, AgroROBOTICA, Tellab) to end-users (i.e., CDTA, Tilamur, & UTH). However, a series of other trainings were carried out among the partners of PestNu aiming to maximize transfer of knowledge and/or expertise.

Specifically, 6 on-line trainings of ca. 2 h duration and 4 in-person trainings of 1-2 days took place.

The agendas, training materials used and video recordings (on-line) or photos (in-person) have been uploaded to [PestNu google drive share point](#).

A short presentation of each internal training is provided in section 2.2.2 in the present deliverable, in addition they have been also uploaded to the Digital Platform of PestNu in the section “News & Events” and sub-section “News” <https://pestnu.eu/category/news/>.

Moreover, a detailed presentation of each internal training is provided in section 2.2.1 (on-line) & 2.2.2 (in-person) in the present deliverable.

2. **In-person Educational Seminars organised by UTH, CDTA, Tilamur to maximize transfer of knowledge and/or expertise to governmental institutions, NGOs, industry, citizens from farms etc.**

Specifically, 10 educational seminars having as audience students from schools and universities or farmers took place, of which, 5 were organised by UTH, 3 by CDTA, and 2 by Tilamur. Several other educational trainings having as audience national governmental or non-governmental institutions, industry representatives or farmers are planned to take place the next 18 months.

The agendas, photos and in some cases video recordings as well as participants lists are available as proofs for educational seminars performed until M18 (Table 1).

Moreover, a short presentation of each educational seminar is provided in section 2.2.3 in the present deliverable, while they have been also uploaded to the Digital Platform of PestNu in the section “News & Events” and sub-section “News” <https://pestnu.eu/category/news/>.

3. **Training seminar to Spanish stakeholders organised by PestNu technical partners focused on Agro-advisory and Business services.**

On February 23rd 2023, an in-person training seminar was organised by CDTA, Tilamur, Neoalgae, and Fertinagro in CDTA premises (Murcia, Spain) aiming to reach/inform farmers, agricultural cooperatives, agronomists about:

- Organic practices based on nutritional products.
- Guidelines for correct use of biopesticides and biofertilizers to increase their performance.
- Presentation of DST tools via videos provided by technical partners.

The agenda, photos and participants list (in person and on-line) are available as proofs (Table 1).

Moreover, a short presentation is provided in section 2.2.4 in the present deliverable, while it has been also uploaded to the Digital Platform of PestNu in the section “News & Events” and sub-section “News” <https://pestnu.eu/category/news/>.

4. Educational Programmes

Among the objectives of Task 6.5 was to develop Educational Programmes, namely training material by all partners for each country, to maximize transfer of knowledge to researchers, university students from Agriculture science, young professionals, SMEs, food industries, consumers, citizens of farms (section 1.2). The main scope of this activity was to increase the visibility of the existing tools, techniques, practices, products to show in practical way how it can be used in the field. From M1 to M18 there were not concrete results to be transformed into training material, therefore the activity for this objective has been started with the collection of already existing training/tutorial material relevant to project scope from the technical partners in order to increase awareness on DST and AOPs. In **Error! Reference source not found.**3 (section 2.3) are summarised all the training material collected by PestNu partners, which were also and uploaded to the [Digital Platform of PestNu](#).

However, within the next months, the development of specific training material (i.e., presentations, application notes) by all partners for each country is planned. This material will be translated in the 7-languages (Greek, English, Spanish, Italian, Portuguese, Swedish, German) of consortium partners and will be open access to PestNu digital platform.

5. Digital Training activities

An on-line e-learning training was developed using Augmented Reality which is available to *Digital Platform of PestNu* <https://pestnu.eu/augmented-reality-training-tool/>.

More information is provided in section 2.4.

2.2 Performed trainings activities during M1 – M18

In Table 1, below, training activities (short-term among Pest Nu partners, educational seminars and workshops), taking place during M1 – M18 are presented providing all the relative information such as type of activity, date, description of activity, organizer, which was the main audience and number of participants.

Table 1. Summarizing table of training activities performed during M1 – M18. *N/A: Non-applicable.

No	TYPE OF ACTIVITY	DATE	DESCRIPTION OF ACTIVITY	ORGANIZED BY	PESTNU PARTICIPANTS	MAIN AUDIENCE	No OF PARTICIPANTS	PROOFS
1	Educational Seminar	05.05.2022	Polytechnic University of Valencia	Tilamur	FERTINAGRO	University	63	Agenda & Photos
2	Educational Seminar	23.05.2022	Open day for general public	UTH	N/A	Farmers, agriculturists, researchers, academics, and students	65	Agenda & Photos
3	Educational Seminar	13.10.2022	Greek technical school	UTH	N/A	Students	30	Agenda & Photos
4	Educational Seminar	22-23.10.2022	Summer School	UTH	N/A	University	46	Videos, photos, participants list, & agenda
5	Educational Seminar	25.10.2022	Polytechnic University of Valencia	CDTA	N/A	University/ Research centers	30	Agenda & Photos
6	Educational Seminar	26.10.2022	UTH undergraduate students	UTH	N/A	University	87	Photos, agenda, participants list
7	Educational Seminar	28.10.2022	Severo Ochoa primary school students	CDTA	N/A	Students	52	Agenda & Photos
8	Educational Seminar	09.11.2022	Zone College (Netherlands)	Tilamur	N/A	University	24	Agenda & Photos
9	Educational Seminar	29.11.2022	1 st Professional School of Atalanti	UTH	N/A	Students	25	Agenda & Photos

10	Educational Seminar	12.12.2022	Primary school	CDTA	N/A	Students	45	Agenda & Photos
11	Training among PestNu partners (In-person)	15-16.12.2022	Use of the flow cytometer for analyses of algae	RISE	NEOALGAE	N/A	4	Video recording, photos, participants list & agenda
12	Training among PestNu partners (In-person)	12.01.2023	Function of the automated circular economy system for agro-wastewater treatment	STAMTECH	UTH	N/A	12	Video recording, photos, & agenda
13	Training among PestNu partners (On-line)	09.02.2023	Characteristics and use of biostimulants and biofungicide in PestNu	NEOALGAE & FERTINAGRO	CDTA & Tilamur	N/A	8	Video recording, photos, & agenda
14	Training among PestNu partners (On-line)	14.02.2023	AgroRadar On-Line Training for AOPs	AgroINSIDER	CDTA & UTH	N/A	15	Video recording, photos, participant list, & agenda
15	Training among PestNu partners (In-person)	14-15.02.2023	First batch production of PESTNU biostimulant from microalgae biomass	NEOALGAE	UTH	N/A	8	Attendance list, photos, & agenda
16	Training among PestNu partners (On-line)	16.02.2023	Nutrient Analysers	Tellab	Tilamur, UTH & CDTA	N/A	12	Video recording, photos, & agenda
17	Training among PestNu partners (On-line)	17.02.2023	Training for the Robot	IKH	CDTA, UTH & Tilamur	N/A	12	Video recording, photos, & agenda
18	Training seminar to Spanish stakeholders	23.02.2023	Current problems in plant health and	CDTA	NEOALGAE, Tilamur & FERINAGRO	Farmers, Agricultural	77	Participants list, photos, & agenda

	(Hybrid in Murcia, Spain)		PestNu solutions for sustainable and precision agriculture			cooperatives, Agronomists		
19	Training among PestNu partners (On-line)	24.02.2023 & 03.03.2023	Training for SpyFly	AgroROBOTICA	CDTA, Tilamur & UTH	N/A	6	Video recording, photos, & agenda
20	Training among PestNu partners (On-line)	23.03.2023	Rise Flow Cytometer	RISE	UTH & Tilamur	N/A	7	Video recording, photos, & agenda

2.2.1 On-line Short-term Trainings among PestNu partners for the optimum operation of the DST & AOP prototypes and practice

I. FERTINAGRO & NEOALGAE → CDTA & TILAMUR

TITLE: “CHARACTERISTICS AND USE OF BIOSTIMULANTS AND BIOFUNGICIDE IN PESTNU”

Organisers: Neoalgae & Fertinagro

Participants: CDTA & Tilamur

Date: 9th February 2023; Time: 11:00 a.m. – 12:00 p.m. (CET)

Number of participants: 8; Relevant post on [PestNu Digital Platform](#)

Table 2. The agenda of on-line training of Neoalgae & Fertinagro to CDTA & Tilamur.

TIME	ACTIVITY	SPEAKER
11:00 – 11:10	Introduction to biostimulants (what are they, how are they used, advantages and limitations?)	Jesús Fidel Delgado / María Álvarez (Neoalgae)
11:10 – 11:20	Neoalgae biostimulant manufacturing process Neoalgae	Jesús Fidel Delgado / María Álvarez (Neoalgae)
11:20 – 11:35	Fertilization plan (advantages, utility)	Joaquín Llamas (Neoalgae)
11:35 – 11:45	Ecopesticide developed by Fertinagro	Pablo Quirós (Fertinagro)
11:45 – 11:55	Instructions for use biostimulants in the field and aquaponics	Jesús Fidel Delgado / María Álvarez (Neoalgae)
11:55 – 12:00	Instructions for use ecofungicide in the field and in aquaponics	Pablo Quirós (Fertinagro)

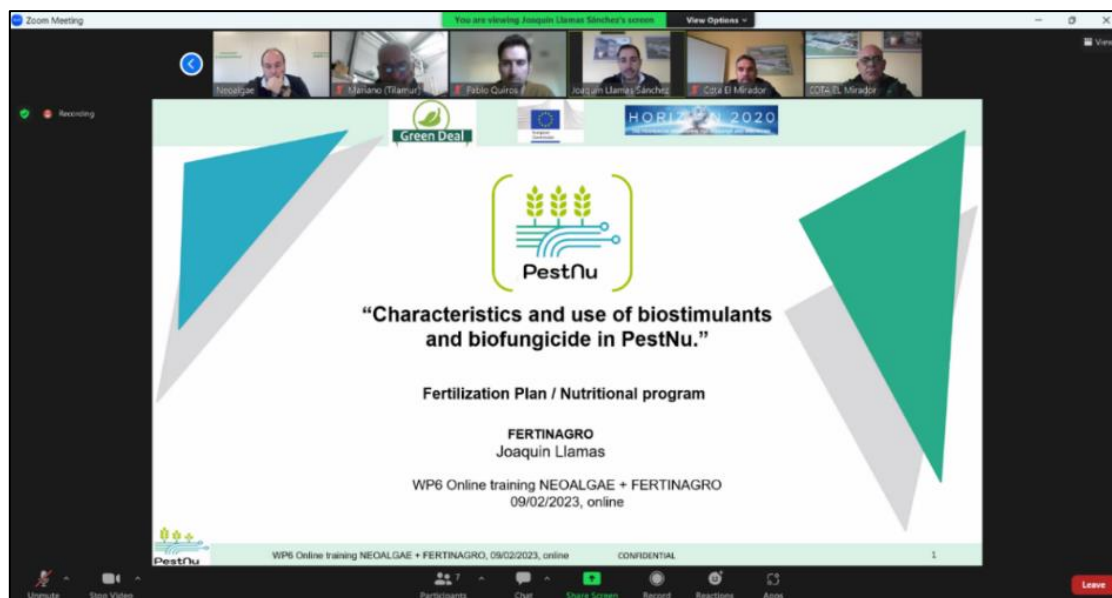


Figure 1. Photo of on-line training of Neoalgae & Fertinagro to CDTA & Tilamur.

II. AgroINSIDER → CDTA & UTH

TITLE: “AGRORADAR TRAINING FOR AOPs”

Organisers: AgroINSIDER

Participants: CDTA & UTH

Date: 14th February 2023; 10:00 a.m. – 12:00 p.m. (CET)

Number of participants: 15; Relevant post on [PestNu Digital Platform](#)

Table 3. The agenda of on-line training of AgroINSIDER to CDTA & UTH.

TIME	ACTIVITY	SPEAKER
10:00 – 10:30	Introduction to satellites and remote sensing. Emphasis will be putted in radar and optical satellites (Sentinel 1 & 2) managed by the European Satellite Agency	Patricia Lourenco (AgroINSIDER)
	Crop monitoring through satellite data: Soil-Water-Plant relationships and anomalies	
10:30 – 11:00	AgroRadar platform: what is it and how to use it?	
	AgroRadar - SmartAG app (to visualize and analyse Crop alerts).	
11:00 – 12:00	Exercise: use plot and farm limit* and we show you how is working, including how to collect evidence records in the field.	

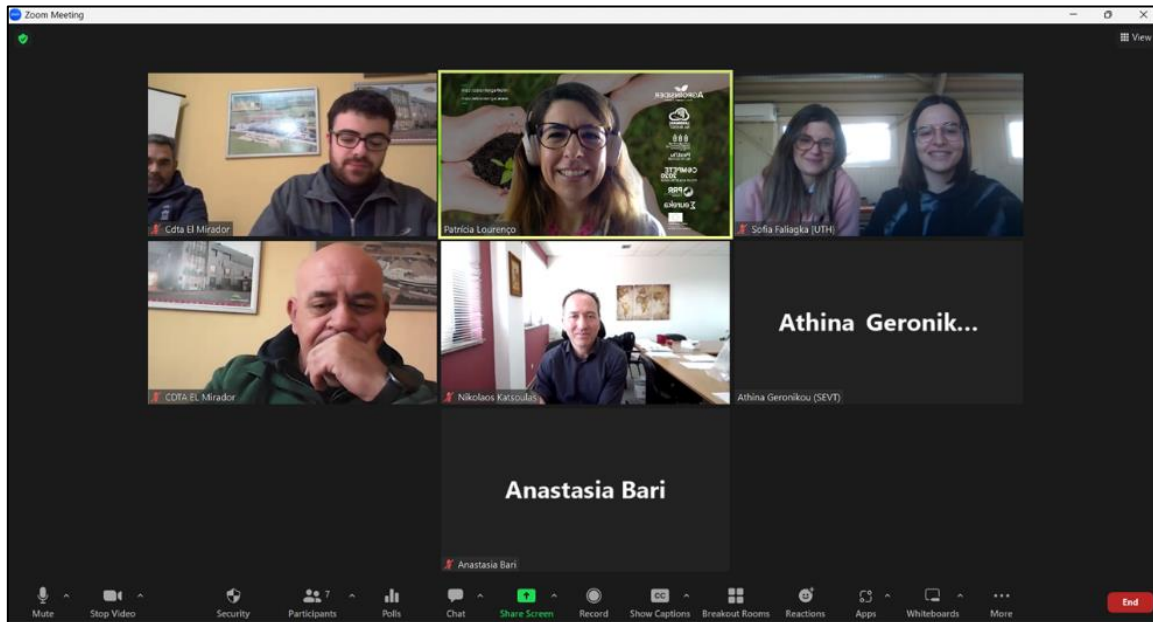


Figure 2. Photo of on-line training of AgroINSIDER to CDTA & UTH.

III. Tellab → Tilmur, CDTA & UTH

TITLE: “NUTRIENT ANALYSES”

Organisers: Tellab

Participants: Tilmur, CDTA & UTH

Date: 16th February 2023; Time: 10:00 a.m. – 11:00 a.m. (CET)

Number of participants: 12; Relevant post on [PestNu Digital Platform](#)

Table 4. The agenda of on-line training of Tellab to Tilmur, CDTA & UTH.

TIME	ACTIVITY	SPEAKER
10:00 – 10:10	Introduction	Meritxell Grau Butinyac (Tellab)
10:10 – 10:25	Theoretical Background	Simon Bluett (Tellab)
10:25 – 10:45	Demonstration of system operation	Valeria Arenas Montaña (Tellab)
10:45 – 11:00	Data outputs	

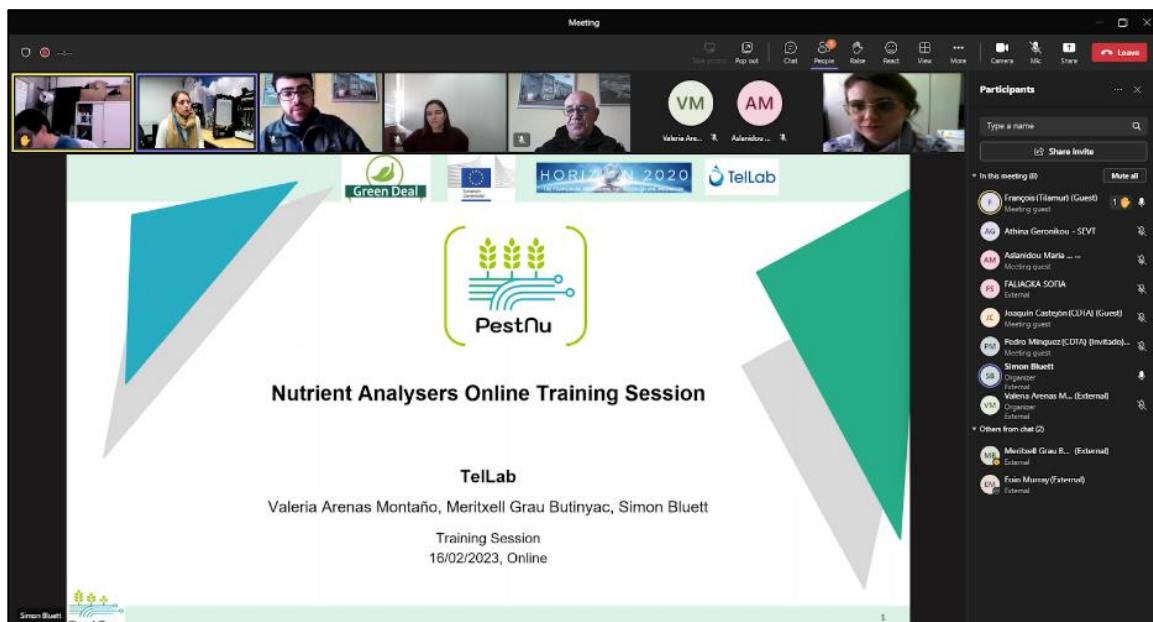


Figure 3. Photo of on-line training of Tellab to Tilmur, CDTA & UTH.

IV. IKH → Tilamur, CDTA & UTH

TITLE: "TRAINING FOR THE ROBOT"

Organisers: IKH

Participants: Tilamur, CDTA & UTH

Date: 17th February 2023; Time: 10:00 a.m. – 11:30 a.m. (CET)

Number of participants: 12; Relevant post on [PestNu Digital Platform](#)

Table 5. The agenda of on-line training of IKH to Tilamur, CDTA & UTH.

TIME	ACTIVITY	SPEAKER
10:00 – 10:15	Introduction and welcome to the participants	Nikos Frangakis (IKH)
10:15 – 10:30	General overview of the robot	
10:30 – 11:30	Demonstration of safety procedures for the robot.	

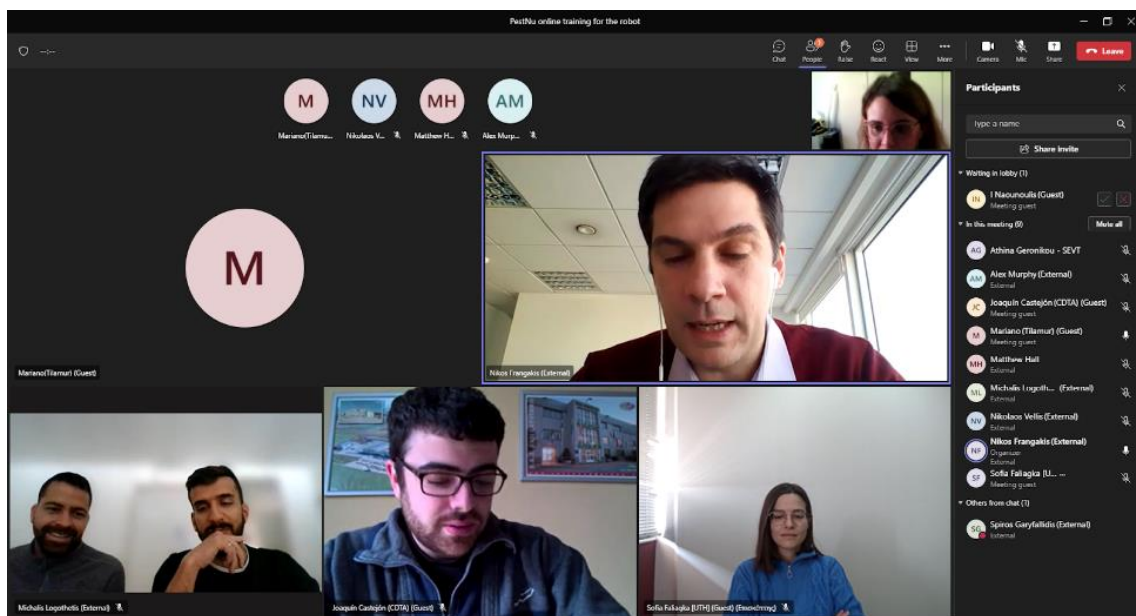


Figure 4. Photo of on-line training of IKH to Tilamur, CDTA & UTH.

V. AgroROBOTICA → Tilamur, CDTA & UTH

TITLE: “TRAINING FOR THE SPYFLY”

Organisers: AgroROBOTICA

Participants: Tilamur, CDTA & UTH

Date: 24th February & 3rd March 2023; Time: 11:00 a.m. – 13:00 a.m. (CET)

Number of participants: 6; Relevant post on [PestNu Digital Platform](#)

Table 6. The agenda of on-line training of AgroROBOTICA to Tilamur, CDTA & UTH.

TIME	ACTIVITY	SPEAKER
11:00 – 11:30	General introduction to SpyFly How to set-up SpyFly	Valerio Goglia (AgroROBOTICA)
11:30 – 12:00	<ul style="list-style-type: none"> • How platform is working • AgroRobotica – Desktop (to visualize and analyse Pest alerts). 	
12:00 – 13:00	<ul style="list-style-type: none"> • Video – First set-up SpyFly • Q&A 	

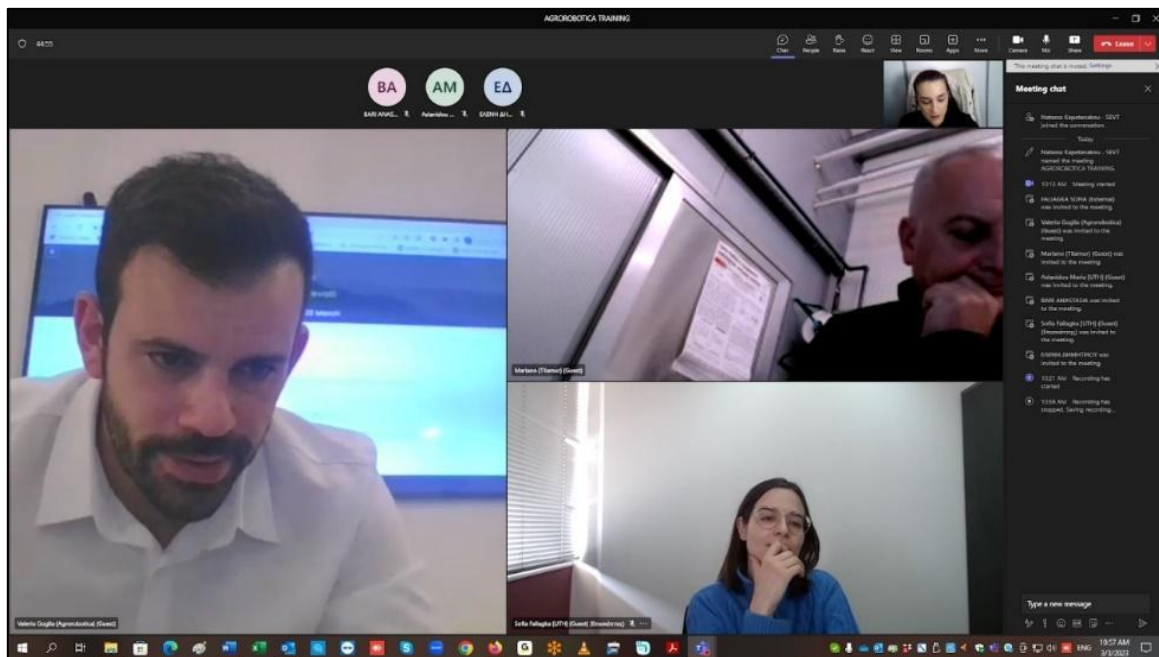


Figure 5. Photo of on-line training of AgroROBOTICA to Tilamur, CDTA & UTH.

VI. RISE → Tilamur & UTH

TITLE: “RISE FLOW CYTOMETER”

Organisers: RISE

Participants: Tilamur & UTH

Date: 23rd March 2023; Time: 13:00 a.m. – 14:00 a.m. (CET)

Number of participants: 7

Table 7. The agenda of on-line training of RISE to Tilamur & UTH.

TIME	ACTIVITY	SPEAKER
13:00 – 14:00	Introduction to flow cytometry (FC) and video-based flow cytometry	Tomas Björnfort & Dag Ilver (RISE)
	FC for analyses of Microalgae & bacteria	
	Overview of RISE FC & access via cloud-server	
	Virtual laboratory visit to see instrument in action	
	Principles for counting of bacteria & algae	
	Principles for phenotypical classification of algae using machine learning and ANN	

FC for analyzing microalgae/cyanobacteria

- Detection based on autofluorescence from chlorophyll
 - Blue illumination results in red fluorescence
- Microalgae in culture – Targeting:
 - Growth
 - Status (size/shape/clusters/intensity/color)
 - Contaminations (other microalgae)
 - Grazers/predators
- Microalgae/Cyanobacteria in nature – Targeting:
 - Growth – early warning (toxic) algae blooming
 - Detection of effluences of nutrients from farming, sewage, & industries
 - Possibly automatic detection of specific (toxic) types using image analysis
 - Health issues - beaches

Participants: GK, FS, T, ED, NK

Figure 6. Photo of on-line training of RISE to Tilamur & UTH.

2.2.2 In-person Short-term trainings between PestNu partners for the optimum operation of the DST & AOP prototypes and practice

I. RISE → NEOALGAE

TITLE: "USE OF THE FLOW CYTOMETER FOR ANALYSES OF ALGAE"

Organisers: RISE

Participants: NEOALGAE

Place: NEOALGAE PREMISES

Date: 15-16th December 2022

Number of participants: 4; Relevant post on [PestNu Digital Platform](#)

Table 8. The agenda of in-person training of RISE to NEOALGAE.

TIME	ACTIVITY	SPEAKER
15-16/12	Presentation of Neoalgae/Tour around the facilities (4h) <ul style="list-style-type: none"> ○ Algae used in different products. ○ Description of different production steps in the production of algae. ○ Technologies of how to improve growth. ○ Sustainability and environment friendly methods. 	David Suarez (Neoalgae) Maria Alvarez (Neoalgae)
	Education of the RISE flow algae measurement system (4h). <ul style="list-style-type: none"> ○ How to set up the system. ○ How to measure in manual/auto mode. ○ System maintenance. 	Tomas Björnfort (RISE) Christian Johannesson (RISE)
	Education of data handling (4h) <ul style="list-style-type: none"> ○ How to read data from the webserver. ○ How to export data/movies to a local PC. ○ How to interpret data and use it to improve production. 	Tomas Björnfort (RISE) Christian Johannesson (RISE)



Figure 7. Photo of in-person training of RISE to NEOALGAE.

II. STAMTECH → NEOALGAE

TITLE: “FUNCTION OF THE AUTOMATED CIRCULAR ECONOMY SYSTEM FOR AGRO-WASTEWATER TREATMENT”

Organisers: STAMTECH

Participants: UTH

Place: UTH PREMISES

Date: 12th January 2023

Number of participants: 12; Relevant post on [PestNu Digital Platform](#)

Table 9. The agenda of in-person training of STAMTECH to UTH.

TIME	ACTIVITY	SPEAKER
ALL DAY	Brief introduction of Pestnu’s project	Giorgia Eranio (STAMTECH)
	The main goal of Microalgae Plant	
	Internal Part Description: <i>The two 700-litre Growing Loops, Recirculation Pumps, Air Pumps, Heat Exchangers, Air Conditioners, Sensors, White LEDs and RGB LEDs.</i>	
	Main Function: <i>General Electrical Panel, Automatic and Manual Controls</i>	



Figure 8. Photo of in-person training of STAMTECH to UTH.

III. NEOALGAE → UTH

TITLE: "FIRST BATCH PRODUCTION OF PESTNU BIOSTIMULANT FROM MICROALGAE BIOMASS"

Organisers: NEOALGAE

Participants: UTH

Date: 14-15th January 2023; Time: 09:00 a.m. – 17:00 a.m. (LOCAL TIME)

Place: UTH PREMISES

Number of participants: 8

Table 10. The agenda of in-person training of NEOALGAE to UTH (14th January – DAY 1).

TIME	PRESENTATION	PARTNER
ALL DAY	Introduction to biostimulants	Victor Casado & David Suarez (NEOALGAE)
	Neoalgae biostimulant manufacturing process	
	Instructions for use biostimulants in the field and aquaponics	
	Training in microalgae cultivation in the cultivation unit installed by STAMTECH <ul style="list-style-type: none"> ○ Resolution of problems and doubts ○ Tips and tricks ○ Next steps 	
	Training in harvesting and decantation step <ul style="list-style-type: none"> ○ Test run ○ Resolution of problems and doubts ○ Tips and tricks ○ Next steps 	
Training in biocatalisis process for bioestimulant production (part 1) <ul style="list-style-type: none"> ○ Process description ○ Test run 		

Table 11. The agenda of in-person training of NEOALGAE to UTH (15th January – DAY 2).

TIME	PRESENTATION	PARTNER
ALL DAY	Training in biocatalisis process for bioestimulant production (part 2) <ul style="list-style-type: none"> ○ Test run ○ Resolution of problems and doubts ○ Tips and tricks ○ Next steps 	Victor Casado & David Suarez (NEOALGAE)
	Doubts and general discussion	



Figure 9. Photo of in-person training of NEOALGAE to UTH.

2.2.3 In-person Educational Seminars organised in the facilities of UTH, CDTA, Tilamur for transfer of knowledge and/or expertise to practitioners, governmental institutions, NGOs, industry, citizens from farms etc

I. Tilamur → Polytechnic University of Valencia

Type of activity: Educational seminar

Organisers: Tilamur

Participants: Polytechnic University of Valencia

Date: 5th May 2022

Number of participants: 63; Relevant post on [PestNu Digital Platform](#)

Table 12. The agenda of educational seminar of Polytechnic University of Valencia at Tilamur premises.

TIME (LOCAL TIME)	PRESENTATION	PARTNER
9:00 – 9:30	Welcome of participants	Mariano Vidal (Tilamur)
9:30 – 10:30	Presentation of PestNu project and visit	
10:30 – 11:00	Visit to operational system of aquaponics plantation and production of the spirulina microalgae.	
11:00 – 12:00	Guided tour through the facilities of Tilamur	



Figure 10. Photo of educational seminar of Polytechnic University of Valencia at Tilamur premises.

II. UTH → Open day for general public

Type of activity: Educational seminar

Organisers: UTH

Participants: Open Day for General Public

Date: 23rd May 2022

Number of participants: 65

Relevant post on [PestNu Digital Platform](#)

Table 13. The agenda of the “Open Day for General Public” that took place to UTH premises.

TIME (LOCAL TIME)	PRESENTATION	PARTNER
09:00 – 11:00	Arrival & Registration	
11:00 – 12:30	Innovation, Green Technologies and Green Entrepreneurship, Presentation of innovative ideas, products and environmentally friendly technologies implemented in the Pilot Greenhouse Park of UTH	Prof. N. Katsoulas (UTH)
12:30 – 13:00	Presentation of the work on the development of a Decision Support System (DSS) implemented in framework of the Organic PLUS Program for control of Botrytis in greenhouse crops.	Post doctoral Researcher Mr. D. Antoniadis (UTH)
13:00 – 14:00	Demonstration of technologies and research products. Presentation of the new techniques used in greenhouse for the production of products in the framework of the circular economy, reducing inputs and increasing it water, fertilizer and energy use efficiency under the PestNu project.	Post doctoral Researcher Mr. D. Antoniadis (UTH)



Figure 11. Photo of the “Open Day for General Public” that took place to UTH premises.

III. UTH → Technical school

Type of activity: Educational seminar

Organisers: UTH

Participants: Professional High School of Velestino

Date: 13th October 2022

Number of participants: 30

Relevant post on [PestNu Digital Platform](#)

Table 14. The agenda of educational seminar of Professional High School of Velestino at UTH premises.

TIME (LOCAL TIME)	PRESENTATION	PARTNER
10:00 – 10:30	Welcome of participants	Prof. N. Katsoulas (UTH)
10:30 – 12:00	Presentation of PestNu project	
12:00 – 13:00	Introduction to the DSTs and AOPs followed in the project	



Figure 12. Photo of educational seminar of Professional High School of Velestino at UTH premises.

IV. UTH → Summer school

Type of activity: Educational seminar

Organisers: UTH

Participants: Summer School

Date: 22nd – 23rd October 2022

Participants: 46; Relevant post on [PestNu Digital Platform](#)

Table 15. The agenda of the summer school that took place at UTH premises (22th October – DAY 1).

OCTOBER 22 ND 2022		
TIME (LOCAL TIME)	PRESENTATION	PARTNER
10:00 – 10:30	Welcome of participants	UTH
10:30 – 12:00	Presentation of PestNu project	UTH
12:00 – 12:15	Coffee break	
12:15 – 13:00	Introduction to the DSTs and AOPs followed in the project	UTH

Table 16. The agenda of the summer school that took place at UTH premises (23rd October – DAY 2).

OCTOBER 23 RD 2022		
TIME (LOCAL TIME)	PRESENTATION	PARTNER
10:00 – 10:30	Welcome of participants	UTH
10:30 – 11:30	Guided tour at UTH greenhouse Park	UTH
11:30 – 12:00	Coffee break	
12:00 – 13:30	Presentation UTH experiments and results in the frame of WP3	UTH



Figure 13. Photo of the summer school that took place at UTH premises.

V. CDTA → Polytechnic University of Valencia

Type of activity: Educational seminar

Organisers: CDTA

Participants: Polytechnic University of Valencia

Date: 25th October 2022

Number of participants: 46; Relevant post on [PestNu Digital Platform](#)

Table 17. The agenda of educational seminar of Polytechnic University of Valencia at CDTA premises.

TIME (LOCAL TIME)	PRESENTATION	PARTNER
10:00 – 10:15	Welcome of participants	Joaquín Castejón (CDTA)
10:15 – 11:00	Guided tour around the facilities – Part 1	
11:00 – 11:30	Presentation of the PestNu project	
11:30 – 12:00	Coffee break	
12:00 – 13:00	Guided tour around the facilities – Part 2	Joaquín Castejón (CDTA)
13:00 – 13:15	Questions and doubts	
End of the visit		



Figure 14. Photo of educational seminar of Polytechnic University of Valencia at CDTA premises.

VI. UTH → Undergraduate & postgraduate students of UTH

Type of activity: Educational seminar

Organisers: UTH

Participants: Undergraduate and postgraduate students of UTH

Date: 26th October 2022

Number of participants: 87

Relevant post on [PestNu Digital Platform](#)

Table 18. The agenda of educational seminar of Polytechnic University of Valencia that took place at UTH premises.

TIME (LOCAL TIME)	PRESENTATION	PARTNER
9:00 – 9:15	Welcome of students	UTH
9:15 – 10:00	Training of students, visit and introduction to the container technologies for the production of biostimulants	UTH
10:00 – 11:00	Training of students, visit of the aquaponic facilities, presentation of project results and introduction to various sensors such as the UVC analyser	UTH
End of 1st group visit		
11:00 – 11:15	Welcome of students	UTH
11:15 – 12:00	Training of students, visit and introduction to the container technologies for the production of biostimulants	UTH
12:00 – 13:00	Training of students, visit of the aquaponic facilities, presentation of project results and introduction to various sensors such as the UVC analyser	UTH
End of 2nd group visit		



Figure 15. Photo of the educational seminar of Polytechnic University of Valencia that took place at UTH premises.

VII.CDTA → Primary school

Type of activity: Educational seminar

Organisers: CDTA

Participants: Severo Ochoa Primary School Students

Date: 26th October 2022

Number of participants: 52

Relevant post on [PestNu Digital Platform](#)

Table 19. The agenda of the educational seminar of Severo Ochoa Primary School at CDTA premises.

TIME (LOCAL TIME)	PRESENTATION	PARTNER
10:00 – 10:15	Welcome of students	Joaquín Castejón (CDTA)
10:15 – 10:30	Guided tour around the facilities – Part 1	
10:30 – 10:45	Brief explanation of the PestNu project	
10:45 – 11:30	Guided tour around the facilities – Part 2	
End of 1st group visit		
11:30 – 11:45	Welcome of students	Joaquín Castejón (CDTA)
11:45 – 12:00	Guided tour around the facilities – Part 1	
12:00 – 12:15	Brief explanation of the PestNu project	
12:15 – 13:00	Guided tour around the facilities – Part 2	
End of 2nd group visit		



Figure 16. Photo of the educational seminar of Severo Ochoa Primary School at CDTA premises.

VIII. Tilamur → Zone College (Netherlands)

Type of activity: Educational seminar

Organisers: Tilamur

Participants: Zone College (Netherlands)

Date: 9th November 2022

Number of participants: 24

Relevant post on [PestNu Digital Platform](#)

Table 20. The agenda of the educational seminar of Zone College at Tilamur premises.

TIME (LOCAL TIME)	PRESENTATION	PARTNER
10:00 – 10:30	Welcome of participants	Mariano Vidal (Tilamur)
10:30 – 12:00	Presentation of PestNu project (Information provided about the development of an aquaponic plant, based on precision agriculture technology)	
12:00 – 13:00	Introduction to the DSTs and AOPs followed in the project	

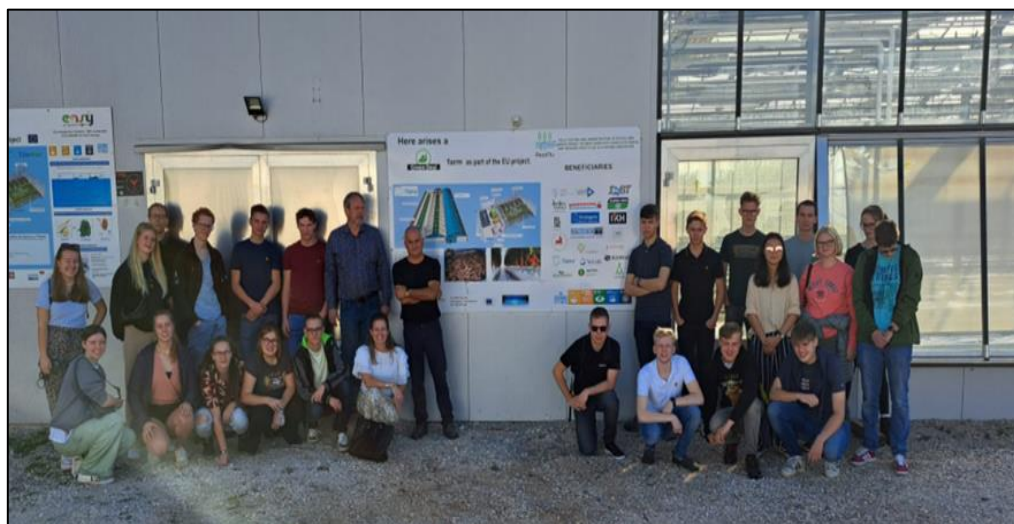


Figure 17. Photo of the educational seminar of Zone College at Tilamur premises.

XV. UTH → 1st Professional School of Atalanti

Type of activity: Educational seminar

Organisers: UTH

Participants: 1st Professional School of Atalanti

Date: 29th November 2022

Number of participants: 25

Relevant post on [PestNu Digital Platform](#)

Table 21. The agenda of the educational seminar of 1st Professional School of Atalanti at UTH premises.

TIME (LOCAL TIME)	PRESENTATION	PARTNER
10:00 – 10:30	Welcome of participants	UTH
10:30 – 12:00	Presentation of PestNu project	UTH
12:00 – 13:00	Introduction to the DSTs and AOPs followed in the project	UTH



Figure 18. Photos from the educational seminar of 1st Professional School of Atalanti at UTH premises.

XV. CDTA → Primary school

Type of activity: Educational seminar

Organisers: CDTA

Participants: Primary school of Councilor of Agriculture of San Javier, Spain

Date: 12th December 2022

Number of participants: 45

Relevant post on [PestNu Digital Platform](#)

Table 22. Agenda of the educational seminar of Primary school of Councilor of Agriculture of San Javier, Spain at CDTA premises.

TIME (LOCAL TIME)	PRESENTATION	PARTNER
10:00 – 10:15	Welcome of students	Joaquín Castejón (CDTA)
10:15 – 10:30	Guided tour around the facilities – Part 1	
10:30 – 10:45	Brief explanation of the PestNu project	
10:45 – 11:30	Guided tour around the facilities – Part 2	
End of 1st group visit		
11:30 – 11:45	Welcome of students	Joaquín Castejón (CDTA)
11:45 – 12:00	Guided tour around the facilities – Part 1	
12:00 – 12:15	Brief explanation of the PestNu project	
12:15 – 13:00	Guided tour around the facilities – Part 2	
End of 2nd group visit		



Figure 19. Photo from the educational seminar of Primary school of Councilor of Agriculture of San Javier, Spain at CDTA premises.

2.2.4 Training Seminar organised by PestNu technical partners focused on Agro-advisory and Business services

TITLE: “CURRENT PROBLEMS IN PLANT HEALTH AND PESTNU SOLUTIONS FOR SUSTAINABLE AND PRECISION AGRICULTURE”

Organizers and co-hosts: CDTA, Neoalgae, Tilamur, Fertinagro

Number of participants: 77

Date: 23rd February 2023

Time: 09:00 a.m. – 12:00 p.m. (LOCAL TIME)

Table 23. Agenda of the Spanish hybrid Workshop organised by CDTA, Neoalgae, Tilamur, Fertinagro.

TIME (LOCAL TIME)	PRESENTATION	PARTNER
9:05 – 9:15	Reception and welcome	Pedro Mínguez CDTA “El Mirador”
9:15 – 9:25	PestNu project presentation	Joaquín Castejón CDTA “El Mirador”
9:25 – 9:45	Current problems and legislation in plant health	Telesforo García Crevillen Head of the Plant Health Service of Agriculture of Murcia
9:45 – 10:00	<ul style="list-style-type: none"> ○ PestNu solutions for sustainable agriculture ○ Nutritional programme for sustainable and quality agriculture ○ Sustainable biostimulants and biofungicides; Characteristics and way of use 	Joaquín Llamas - Fertinagro
10:00 – 10:20		Fidel Delgado - Neoalgae Pablo Quirós - Fertinagro
10.30 – 11:15	Break	
11:15 – 12:00	PestNu videos and discussion - questions	
12:00	Closing of the event	

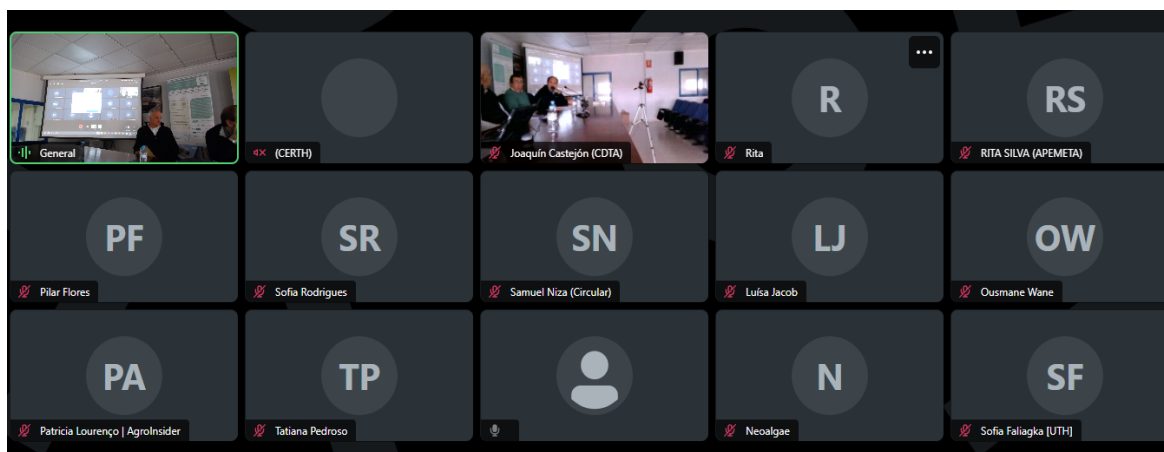


Figure 20. Photo from the on-line participants attending the Spanish Training Seminar organised by CDTA, Neoalgae, Tilamur, Fertinagro



Figure 21[a][b]. Photos from the participants attending physically the Spanish Training Seminar organised by CDTA, Neoalgae, Tilamur, Fertinagro.

2.3 Educational programmes

Among the objectives of Task 6.5 was to develop Educational Programmes, namely training material by all partners for each country, to maximise transfer of knowledge to researchers, university students from Agriculture science, young professionals, SMEs, food industries, consumers, citizens of farms (section 1.2). The main scope of this activity was to increase the visibility of the existing tools, techniques, practices, products to show in practical way how it can be used in the field. From M1 to M18 there were no concrete results to be transformed into training material, therefore the activity for this objective has been started with the collection of already existing training/tutorial material relevant to project scope from the technical partners to increase awareness on DST and AOPs. In Table 3 are summarised all the training material collected by PestNu partners, which were also and uploaded to the [Digital Platform of PestNu](#).

However, within the next months and for the next version of D 6.10, the development of specific training material (presentations, application notes) by all partners for each country is planned. This material will be translated in the 7-languages (Greek, English, Spanish, Italian, Portuguese, Swedish, German) of consortium partners and will be open access to PestNu website.

2.3.1 Requirements for the training/tutorial material

At this phase of the project, the technical partners from WP2 and WP3 were asked to contribute with existing training/tutorial material.

Specific requirements have been set from SEVT in collaboration with CERTH for the selection of the training/tutorial material. The requirements can be summarised to the followings:

- **Type of training/tutorial material:** existing tools, techniques, practices, products
- **Form of training/tutorial material:** videos, video presentations, docs, pdf file, brochures, etc
- **Style of training/tutorial material:** simple and easy understandable language
- **Target group for this training/tutorial material:** mainly farmers
-

What was asked to be avoided:

Technical presentation, papers, etc. which need scientific expertise to be understandable.

2.3.2 Repository of the training material

The training material is in open access, uploaded to the Digital Platform of PestNu in the section “Services” and sub-section “Training Material” <https://pestnu.eu/training-material/>. available to all relevant stakeholders. In Table 2 the repository training material collected from each partner from WP2 & WP3 is presented.

Table 24. Summarising table of the training material collected by PestNu technical partners and uploaded to the [Digital Platform of PestNu](#).

PARTNER	TYPE OF MATERIAL	TITLE	SOURCE
AgroINSIDER	Brochure	AgroINSIDER services	https://pestnu.eu/training-material/
	Video	AgroINSIDER services	
AgroROBOTICA	Video	SpyFly presentation	https://pestnu.eu/training-material/
	Video	SpyFly instructions for use	
FERTINAGRO	PDF file	PestNu Biopesticide	https://pestnu.eu/training-material/
	PDF file	Integrated Fertilisation Programme, english	
	PDF file	Catálogo Fertinagro_ENGLISH_V4_compressed	
IKH	Video	Robot functionality	https://pestnu.eu/training-material/
	Video	Robot functionality	
	Video	PestNu Robot	
NEOALGAE	PDF file	PESTNU_NEOALGAE training material_how to use biostimulant	https://pestnu.eu/training-material/
	PDF file	PESTNU_NEOALGAE training material_what are biostimulant	
	PDF file	SDS-50. PESTNU BIOESTIMULANT	
RISE	PDF file	Video-based flow cytometer: User Guide	https://pestnu.eu/training-material/
SIDROCO	PDF file	SiVi© Tool: A human-interactive visual-based anomaly detection system that is capable of monitoring and promptly detecting several devastating forms of security attacks.	https://pestnu.eu/training-material/
	Video	SiVi© Security monitoring	
	Video	SiVi© Tool: Dashboard	
STAM	Video	MICROBE - Circular Economy and Microalgae: Design and construction of a modular plant, easily adaptable, replicable, and transportable, for the purification of nitrogen and phosphorus from livestock waste with microalgal biomass	https://pestnu.eu/training-material/
	Presentation	Microalgae for the purification of wastewater and production of bio-stimulants	

Tellab	Video	Aquamonitrix wastewater management system: An autonomous real time analyzer for simultaneous nitrate and nitrite in situ	https://pestnu.eu/training-material/
	Video	Aquamonitrix wastewater management system: Refilling eluent and waste disposal	
	Video	Aquamonitrix wastewater management system: Replacing inlet/outlet tubing & filter	
	Video	Aquamonitrix: Promo	
	PDF file	Phosphate Analyser Prototype: A portable ion chromatography (IC) analyser which can determine the concentration of phosphate in both fresh water and wastewater.	
Tilamur	PDF file	How can a farmer use manual traps to control pests in crops	https://pestnu.eu/material-on-best-practices/
	PDF file	How can a farmer take measure nitrate, pH and nitrite in crops	
	PDF file	How can a farmer use biostimulants, biofertilizers, and biopesticides in crops	
	PDF file	How can a farmer use robot in crops	
	WORD file	How can a farmer use manual traps to control pests in crops: Manual for the farmers	
UTH	Video	Aqaponics fertigation model Conference	https://pestnu.eu/training-material/
	Video	Aquaponics system gr	
	Video	FoodOASIS	
	PDF File	Reuse of cucumber drainage nutrient solution in 'secondary' crops in greenhouses: preliminary results	

2.4 Digital training activities

An on-line e-learning training was developed using Augmented Reality which is available to Digital Platform of PestNu. <https://pestnu.eu/augmented-reality-training-tool/>

This [AR Training Tool](#) service was developed by CERTH in the iPRODUCE H2020 project, representing a dynamic alternative to traditional training methods, while also includes a training program that engages PestNu's end-users.

Specifically, the PestNu Augmented Reality Training Tool has the capability to navigate the procedure step by step, following sequences, loops, and conditions included in it. By doing this, it delivers the content that could depend on the capabilities of the platform (for example, the user will be exposed to video, sound, images, 3D models etc.). One of the specific procedures already available is the “3 Dimensions (3D) Printing of agri components and parts” which is a creative way to apply 3D printing in the agriculture industry. This procedure allows farmers, or any citizen interested in farming to learn 3D printing for any component or part they want to print.”

Furthermore, the user has the opportunity to choose the best content that fits his/her personal needs among the contents that can be deployed and delivered in the platform he/she is actually using.

The key features of the PestNu Augmented Reality Training Tool are:

- high scalability on physical Android devices
- large number of presentation modes (e.g., in Augmented Reality, Virtual Reality, Text only, Hybrid, etc.).

3. Conclusions

Overall, the performed **training activities during M1-M18** presented in D6.10 are summarized below:

- Short-term trainings among PestNu partners (from the technical partners to end-users) for the optimum operation of the DST & AOP prototypes and practices were performed either in-person or on-line by the relevant technical partners (i.e., IKH, AgroROBOTICA, Tellab) to end-users (i.e., CDTA, Tilamur, & UTH). However, a series of other trainings were carried out among the partners of PestNu aiming to maximize transfer of knowledge and/or expertise. Specifically, 6 on-line trainings of ca. 2 h duration and 4 in-person trainings of 1-2 days took place during these first 18 months of the project. During these trainings, all partners agreed that the internal trainings must continue during the next months, having as a major goal the in-person training of end-users by the technical partners to ensure the adequate adoption of each delivered system on the field.
- Ten (10) educational seminars having as audience students from schools and universities or farmers took place, of which, 5 were organised by UTH, 3 by CDTA, and 2 by Tilamur. As an overall key-point, the 3 aforementioned partners designated the interest of the involved audience to further participate with a more interactive role to the future educational seminars. Based on that PestNu partnership has planned the conduction of educational masterclasses in the premises of UTH, CDTA, & Tilamur to train research and educational staff/students and young professionals for the delivered new systems aiming to maximization of knowledge and/or expertise transfer.
- On February 23rd 2023, an in-person training seminar was organised by CDTA, Tilamur, Neoalgae, and Fertinagro in CDTA premises (Murcia, Spain) aiming to reach/inform farmers, agricultural cooperatives, agronomists about:
 - Organic practices based on nutritional products.
 - Guidelines for correct use of biopesticides and biofertilizers to increase their performance.
 - Presentation of DST tools via videos provided by technical partners.
- The technical partners (WP2 & WP3) contributed with existing training/tutorial material to create a training material repository. All the training material collected by PestNu partners, which were also and uploaded to the [Digital Platform of PestNu](#).
- Digital Training activities: An on-line e-learning training was developed using Augmented Reality which is available to [Digital Platform of PestNu](#).

The next steps for M19 – M36 will be:

- Continuation of short-term trainings among PestNu partners (from the technical partners to end-users) for the optimum operation of the DST & AOP prototypes and practices aiming to in-person training of end-users by the technical partners to ensure the adequate adoption of each delivered system on the field.
- Conduction of educational masterclasses in the premises of UTH, CDTA, & Tilamur to train research and educational staff/ students and young professionals for the delivered new systems aiming to maximization of knowledge and/or expertise transfer.
- The technical partners (WP2 & WP3) will develop specific training material of the developed systems (i.e., presentations, application notes). This material is planned to be translated in the 7-languages (Greek, English, Spanish, Italian, Portuguese, Swedish, German) and will be available open access to PestNu website.



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