

Agricultural Use of Beneficial Microorganisms in the Aspect of
Environmental Protection Project

2020-1-FR01-KA202-079874

Training Methodology and Training Programme

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by the
Erasmus+ Programme
of the European Union



FUNICE

DOCUMENT INFO

PROJECT	FUNICE – Agricultural use of beneficial microorganisms in the aspect of environmental protection.
IO1 - ACTIVITY	TRAINING METHODOLOGY
IO1 - ACTIVITY	TRAINING PROGRAMME





Co-funded by the
Erasmus+ Programme
of the European Union

INDEX

1. FUNICE PROJECT	3
2. PARTNERSHIP	5
3. ACTIVITIES	6
4. DESCRIPTION OF THE INTELLECTUAL OUTPUTS	7
5. EUROPEAN QUALIFICATION FRAMEWORK (EQF)	12
6. FORMAT OF THE TRAINING MODULES	13
7. ADAPTATION OF THE LANGUAGE	14
8. SELECTION OF PICTURES	15
9. ACTIVITIES & EVALUATION OF THE MODULES	15
10. TESTING THE PRODUCTS OF FUNICE PROJECT	16
11. QUALITY ASSESSMENT OF FUNICE PROJECT	17
12. DISSEMINATION OF FUNICE PROJECT	18
13. TIMELINE OF RELEVANT ACTIVITIES OF FUNICE PROJECT	20
14. TRAINING PROGRAMME	21





1. FUNICE PROJECT

Under field conditions plants interact with a diversity of microorganisms, however, both conventional and organic agriculture already affected the soil microbiome leading to decrease of soil quality, nutritional value of crops and creating necessity to use a range of chemicals such as fertilizers and pesticides to avoid spread of unwanted pathogenic microbes.

These substances affect not only the plant microbial foes but also the friendly ones that help the plant to establish homeostasis and to reach the nutritional quality of products that support the health of the consumers. XXI century brings us new possibilities to develop novel methods to rebuild soil and plant microbiota, however, this aim needs the increase of the food producer's understanding and knowledge.

While most people already accept that our health depends on our body microbiota it is still poorly understood that plant development devoid of associating microbes is simply an artefact of the laboratory conditions. The “come back” of plant security microbes is possible through the bioaugmentation strategy allowing microbes to create optimal conditions for promoting specific crop growth under harsh conditions and will allow reducing the use of water, fertilizers, and pesticides. This would mean the reduction of costs for the farmers, better resistance of plants to





common episodes of drought due to global changes, reduction of N₂O emission and fertilizer run-off.

The most common and potent plant inhabitants are endophytes that include fungi and bacteria hiding within plant tissues. While they are present within plants no visible symptoms can be noticed but they are able to produce growth hormones, antioxidants and enzymes (such as ACC) capable to attenuate stress factors such as drought, salinity, toxic metal pollution, extreme temperatures, high CO₂ etc.

Properly selected endophytes can be a potent tool against pathogens and abiotic factors. In addition, endophytic microbes can stimulate the development of arbuscular mycorrhizae that is the most important interface between a plant and soil. Mycorrhizal fungi grow intraradical but also form extraradical hyphal net helping plant roots to increase the absorption of nutrients, particularly phosphorus and nitrogen, and helping to alleviate drought stress by increasing water access and creating proper soil structure to attenuate erosion. Providing well selected microbial consortia and appropriate agricultural practices has greater potential than a single strain.

The reduction in intensive use of fertilizers and pesticides can allow for maintaining environment and human health while the cost of cultivation can be importantly decreased. The endophytes can be still important and maintained if the fungicides are used while mycorrhizal fungi resist only selected fungicides such as penicuron or azoxystrobin.

Thus, it is important to provide the farmers and policymakers with the protocols concerning the use of chemical substances in case of problems with pathogens. For endophytes the best source of strains are within close relatives of cultivars that still exist in nature. The Polish group already have several strains of endophytic fungi specific to wheat varieties cultivated in the area. Mycorrhizal



Co-funded by the
Erasmus+ Programme
of the European Union

fungi from the region are also kept in the pot cultures but within the project we will rather teach farmers how to obtain the inoculum themselves –this again needs special training and workshops available for farmers.

The project addresses local communities that are involved in ecological production of food and will help to optimize organic agriculture, ensuring sustainability and lower concentration of pesticides used. Shortage of information to the farmers, and lack of application technology are prevalent. Development of the microbial products is hindered due to the lack of understanding not only among farmers but also policymakers and often among school teachers educating future farmers.

The strategy is to bridge the gap between research and farmers, to embed academic knowledge into the policy process from the beginning. International cooperation will help to exchange experiences in solving problems and will stimulate sharing the microbial strains that can be of importance under

changing climate. The guidelines, protocols and leaflets prepared for farmers and basic knowledge concerning the subject will be shared and adopted in each country participating in local language. Each partner will prepare and maintain the demonstration field experiment that will be monitored and will be used during summer school and open days for farmers.

The project has a duration of 24 months, starting at 01.12.2020 and ending on 30.11.2022.

2. PARTNERSHIP





Co-funded by the
Erasmus+ Programme
of the European Union

The partnership is composed by 7 partner institutions from 4 countries, as follows:

	ORGANIZATION	COUNTRY
1.	Association de Développement Rural International du Bas Ségala (ADRIBS)	France
2.	Karesi Belediyesi (KB)	Turkey
3.	Stowarzyszenie ARID (ARID)	Poland
4.	Instytut Hodowli i Aklimatyzacji Roślin Państwowy Instytut Badawczy Zakład Doświadczalny Grodkowice (IHAR)	Poland
5.	Balıkesir University (BAUN)	Turkey
6.	FUNDACION UNIVERSITAT JAUME I-EMPRESA(FUE-UJI)	Spain
7.	GROWTH COOP S.COOP.AND (Growth)	Spain

3. ACTIVITIES

NO.	WORKING PACKAGE	ACTIVITIES/OUTPUTS
1.	MANAGEMENT	→ M1.1. Signed Contractual documents (by M2) → M1.2. Delivered Project Interim (by M12)





		→ M1.3. Delivered Final Reports (by M24)
2.	QUALITY	→ M2.1. Quality Strategy and Evaluation Instruments (M2) → M2.2. Interim Evaluation Report (M12) → M2.3. Final Evaluation Report (M24)
3.	DISSEMINATION	→ M3.1 Dissemination plan (M1 first draft – finalized in M24) → M3.2 Production & distribution of dissemination materials (M6) → M3.3 Organisation of end-user's workshops at national level (M24)
4.	INTELLECTUAL OUTPUTS	→ M4.1 IO 1 (M6) → M4.2 IO 2 (M13) → M4.3 IO 3 (M18) → M4.4 IO 4 (M24)
5.	PILOTING	→ M5.1. Pilot testing (M13)
6.	MULTIPLIER EVENTS	→ M6.1. Multiplier events in all project countries (M24)



4. DESCRIPTION OF THE INTELLECTUAL OUTPUTS

As stated in the application, four products are foreseen to be developed within the FUNICE Project:

OUTPUT 1 – FUNICE Training Methodology and Training Programme

The training methodology of the FUNICE project will be the first intellectual output and will have a significant impact on the other intellectual outputs developed in the project. This output requires expert knowledge and a scientific approach, it also requires theoretical and practical knowledge. Therefore, although Growth (ES) is the partner responsible for this Intellectual Output with the support of the University of Alicante, we must highlight that all project partners will contribute strongly to this output.

The training methodology will be integrated with training programme into one document. This document will be used by all partners for elaboration further outputs. Training methodology will describe in details with professional way whole activity of the project and detailed ways of implementation. The programme will be adjusted to the relevant EQF level which will correspond with the education level of project's beneficiaries.

Elaboration of this intellectual output will start at the very beginning of the project. Partner Growth will prepare frames of the elaboration of **the training methodology O1/A1** - The methodology will be the first and very important output because it will determine the further projects activities. The Growth (ES) is a leader of this output; however, all partners will take part during work on this result. The training methodology will cover following chapters:

- o *Chapter 1*, Introduction which will explains in details the subject of the training methodology, how the training activities will be developed, and presents didactical and methodological structures.



- o *Chapter 2*, Selection of the participants, description of the procedures for the identification of the participants. It will describe how the participants should be chosen, how will look the
- o

target audience and other relevant specifications. Trainees' characteristics, competences and skills will be also specified.

- o *Chapter 3*, Modules, gives more details about the structure of the training, topics of the modules and learning specifications.
- o *Chapter 4*, Materials, presents the typologies of materials and documentation which will be used and achieved during the training course.
- o The different criteria to evaluate the course results through the training activities will be described in *Chapter 5*, Success indicators.

O1/A2 - Training programme - this output will be leaded by FUE-UJI nevertheless all partners will cooperate in preparation of this product. This product will be prepared according to the requirements of the EQF system. This aspect will be devoted for elaboration for Growth (ES) and FUE-UJI (ES).

This product will be available as a part of the training system for virtual preparation. For that issue will be responsible FUE-UJI (ES). There will be implemented cross checking during preparation of this product to ensure high quality. Following partners will do this task: ARID (PL), IHAR (PL) and Growth (ES).

Realization of the O1/A2 will be split into following parts:

- o 1. Selecting the information necessary for the enhanced training of useful microorganisms.
- o 2. Time adjustment in reference to the lesson units and learning outcomes.



Co-funded by the
Erasmus+ Programme
of the European Union

- o 3. Cooperation between partners working on programme and those responsible for the preparation of EQF standards.

OUTPUT 2 – specialized, innovative training content of micoryza and pilot testing

This intellectual output will be the core part of the project. It will be divided into 4 phases:

- o **O2/A1:** Elaboration of the training modules by relevant partners.
- o
- o **O2/A2:** Cross-checking internal evaluation to check and assure highest possible quality according to EQF.
- o **O2/A3:** Implementation of the elaborated training content into the virtual reality.
- o **O2/A4:** Pilot testing with the selected groups of stakeholders.

This output will be realized by all partners with relevant periods of time with assuring highest possible quality. This output will be innovative because of the topic of the training content - it will be first such course directed to beneficiaries to teach them how to implement into the practice the idea of micoryza. This output will have significant impact for target group because of the fact, that they will gain skills and competences to implement new method into the practice reducing usage of the chemicals and protecting environment. Pilot testing should be conducted with the people who are the advisors of the farms, pesticides distributors, skilled agricultural engineers and technicians.

As mentioned above this output will be divided into few phases:





1. First phase (O2/A1) will rely on the essential elaboration of the **training content**. The exact explanation of the methodological and technical aspects of the training modules will be written in the training methodology and also will be discussed during the 2-nd meeting of the consortium.

There will be 5 modules to elaborate in this phase:

- o **M0** - Introduction - elaboration IHAR and ARID (PL)
- o **M1** - What is micoryza and its features - elaboration IHAR (PL)
- o **M2** - Practical aspects and advantages of using micoryza - elaboration BAUN (TR) and KB (TR)
- o **M3** - The micoryza producing methods - elaboration FUE-UJI (ES) and Growth (ES)
- o **M4** - How to utilize correctly micoryza in the plant production - elaboration IHAR (PL) and ADRIBS (FR)

2. After elaboration of above modules there will be implemented **Second phase - cross checking (O2/A2)**. During the 3-rd meeting there will be decided the division of the partners who will check relevant module using template prepared by quality responsible partner, FUE-UJI. The goal of the cross checking is to check if the training content is elaborated on the right level of quality and if it

is prepared in the correct way to understand by target group. After this phase there will be executed workshop (multiplier event) to present training content to the potential beneficiaries and evaluate it by the direct users for the first time.

3. Third phase (O2/A3) will be preparation of the elaborated training content for **implementation into the OER**. This phase will lead FUE-UJI (ES)) with cooperation of Growth



(ES). After that phase we will go to the last activities in this output which will be pilot testing (O2/A4). The pilot testing will be executed in the second part of the project and for that task will be responsible KB (TR) which will prepare relevant methodology and programme of the pilot testing. The pilot testing will be done in each partners country. Basing on the feedback from participants of the pilot testing there will be implemented necessary corrections in the training content and training system. After that phase there will be elaborated O4 - handbook.

4. Fourth phase (O2/A4) will develop a Pilot testing with the selected groups of stakeholders. This phase will offer a great amount of information that will be incorporated as feedback and for any improvements that might need to be made in order to generate a successful content.

OUTPUT 3 – Open Education Resources (OER)

The Open Education Resources will be a complex system composed to efficient implementation, dissemination and exploitation of the project and its results toward the target groups and wider audience. This system will consist of the few tools: website of the project that will integrate the learning platform with free access so that users will be able to get into the site and download any material for the course or any material that is of interest for them, without the need of creating a

user or a password (this issue will be discussed during the 2-nd meeting) and intranet - internal platform for project partners. Demonstrations should be done to have better learning outputs.

This OER will be elaborated from the very beginning of the project and will be improved and updated till the end of the project. It will be available at least 2 years after project completion. For this task will be responsible KB (TR).



Co-funded by the
Erasmus+ Programme
of the European Union

This IO 3 will be another, integral intellectual output of the whole project. This output will be prepared by KB (TR) nevertheless all partners will contribute. The first activity (O3/A1) of this output will be preparation of the internal virtual space for fluent communication and storage of the documents - intranet. For that purpose, there will be chosen one of the systems available free of charge. As a second part (O3/A2) of this output but elaborated at the beginning of the project will be website. This tool will be based on the Content Management System (CMS) and will contain information about the project, activities, news and information about partners. As an integral part (O3/A3), a learning platform will be integrated within the website and will have available all training contents prepared in an interactive way. Access to OER will be open and free of charge. All partners will participate in elaboration and improvement of this output. All partners will participate in elaboration and improvement of this output.

OUTPUT 4 – Specialised Handbook of micoryza utilisation

As the last intellectual output there will be elaborated specialized handbook. This handbook will be elaborated on the base of the evaluated and corrected training content. It will be available in all partners languages and English in printed version (100 pieces/partner) and in electronic version on the memory sticks. The handbook will be prepared in printed version because project aim is to implement the knowledge in to practice as much as possible. That's why handbook will be directed to these beneficiaries, who are not very familiar with new virtual technologies and they are also

interested in the project topic. Moreover, this practical printed handbook farmer can take with him during the daily work and, in case of necessity check the information necessary for particular work.





Co-funded by the
Erasmus+ Programme
of the European Union

This handbook will be prepared in the easy-to-understand language and in modern shape. For this output will be responsible ARID (PL) however all partners will contribute. This output will be divided into 3 phases:

- o O4/A1- Preparation of the design and templates for common shape – ARID (PL).
- o O4/A2 - Elaboration of the book content - all partners.
- o O4/A3 - Standardisation and printing of the handbooks - all partners.

This handbook will be distributed during the second multiplier events in all partner countries. Brochures, handouts should be placed where farmers spent time such as pesticides distributors, bazaars. Also, giveaways such as caps or t-shirts describing the purpose of the project can be given to the farmers.

5. EUROPEAN QUALIFICATION FRAMEWORK (EQF)

The EQF - European Qualification Framework - is a common frame of reference that relates the qualification systems of the countries to each other and serves as a conversion mechanism to improve the interpretation and understanding of the qualifications of different countries and systems in Europe. Facilitating transparency, the possibility of comparison and the transferability of professional qualifications between the various member states.

In the FUNICE project the EQF will be followed to develop the Training Material for Level 3 and Level 4.

	Knowledge	Skills	Competences
--	-----------	--------	-------------





Level 3	Knowledge of facts, principles, processes and general concepts, in a field of work or study.	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information.	Take responsibility for completion of tasks in work or study. Adapt own behaviour to circumstances in solving problems.
Level 4	Factual and theoretical knowledge in broad contexts within a field of work or study.	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study.	Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change. Supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities.



6. FORMAT OF THE TRAINING MODULES

The transfer of innovations from FUNICE project are based on the transfer of the training resources - power point, word format, website, training methodology, handbooks, etc. All materials will be produced by the partners in collaboration and will be delivered by the common creative license of FUNICE Project.

The volume of the training materials content should be comparable to the one of the FUNICE project, which means that upper limit of **the 10 pages for the word document and 30 slides for the ppt**. In due time there will be instructions and other specifications for the correct development of the materials, *such as font type and size and the type of document that we will be using such as ppt or word*. Also it is important for providing attractiveness include materials should contain interactive illustrations & images & schemes.

Taking into consideration the Application form the training materials will be developed both in national language of partners and in English language then teaching materials will be integrated and implemented within the learning platform. Trainers can have meetings with small number of farmers in some places in order to give detailed information.

7. ADAPTATION OF THE LANGUAGE

Taking into account that although FUNICE project is aimed mainly for the farmers, who want to improve their farms by using ecological protection of their plants and who want to produce organic products, the project will have contact with many other stakeholders that are considered





Co-funded by the
Erasmus+ Programme
of the European Union

part of the target group such as project partners, farmers, students and academics in agricultural higher education, local communities, VET Schools, universities, environmental organizations, public bodies and the general public.

Due to this, it is important to adapt the language of the training material to the different target groups, in order to be:

- o A coherent and simple language in the writing.
- o Adaptation of vocabulary to different target groups, always simple and clear.
- o Direct and concise language.
- o Respect the formality of the material without neglecting the previous points.
- o Simple, making use of analogies.
- o Concrete, using specific language and details.
- o Credentialed, relying on authorities or testable ideas.

8. SELECTION OF PICTURES





Co-funded by the
Erasmus+ Programme
of the European Union

An important aspect to take into account when developing the training material of FUNICE project is the selection of images and photographs that will be used in the development of the modules.

All the images have to follow the next points:

- o Images with good quality: looking for a balance between image quality and image weight.
- o Images according to the topic and/or module.
- o Images with FREE USE, and also, it's important to mention the source of the picture.
- o Images adapted to the target groups and the level of knowledge.

9. ACTIVITIES & EVALUATION OF THE MODULES

At the end of each module there will be 3 activities to test if the knowledge was acquired or not. These activities will be developed by each partner who is in charge of the module; the template of these activities will be developed by IHAR (PL). According to the Evaluation of the modules, in the learning platform attendees will find an Evaluation Questionnaire of 5 questions to test if they are prepared well for the topic. This Evaluation Questionnaire will be adapted to the correspondent EQF level of the Intellectual Output.

Two approaches are followed to ensure the quality of the project's activities and results. First, the internal monitoring will ensure that all management processes contribute to the project's objectives. The quality of the management is defined by indicators (for detailed description see below), the target achievement is the responsibility of the coordinator ADRIBS (FR).





Second, an internal evaluation will ensure the overall quality of activities and project results related to the intellectual outputs. This role will be performed by IHAR (PL) as the organization is experienced in managing projects e.g., under the umbrella of Erasmus+. Two staff members of FUE-UJI (ES) will be responsible for the evaluation of results and management processes of each of the

intellectual outputs. The staff is experienced in project management, the preparation of learning materials, and the development of reports and recommendations for improvements. Their first task will be to develop a self-evaluating strategy, which will be discussed, agreed by with partners during the kick-off meeting. This ensures a shared understanding of partners for quality and evaluation criteria as well as the used benchmarks.

The evaluation activities are scheduled at critical stages of the development of the intellectual outputs. This allows the monitoring of the progress of the project as well as the quality of products. It also allows the implementation of corrective measures, if necessary, on time to ensure the overall success of the project. The project foresees three quality evaluation, which will be done at the transnational project meetings M2 to M5. The content will be:

- o Q1: project handbook guidelines and concept of ‘Agricultural use of beneficial microorganisms in the aspect of environmental protection’
- o Q2: content of ‘Training system on FUNICE project’, content of ‘Working material for utilisation of micoryza in agriculture’
- o Q3: translations of ‘Training system on FUNICE project’, content of ‘Working material for utilisation of micoryza in agriculture’,



- o Q4: Multiplier events (E1 to E12), adaptation of Training system on Agricultural use of beneficial microorganisms in the aspect of environmental protection', when required.

10. TESTING THE PRODUCTS OF FUNICE PROJECT

This training will be focused on testing and practically use essential content of the intellectual outputs. The training will be executed in a professional and methodological way with local professionals and experts. During this training staff of the project partners will learn how to implement in the practice knowledge from IO2, IO3 and also IO4. All materials will be tested in practice and staff of partners will prepare for the implementation in their own countries. This training will consist of theoretical part and practical workshops in host country.

During this training the farmers will learn how to develop microbial products as the project will give them the necessary information and cover the basic needs regarding organic farming and therefore will help them to optimize their farming, ensuring sustainability and lower concentration of pesticides on a daily basis. This training will support farmers and experts with valuable information about the development of microbial products and will cover theoretical parts and practical workshops during the project life. Besides experts, master students, local people dealing with farming can participate in this process. Showing the implementation process and demonstrations should be necessary in this part to make the process clearer.

11. QUALITY ASSESSMENT OF FUNICE PROJECT





FUNICE Project will have elaborated and implemented Quality Assessment Manual which will be internal document for partnership to keep highest quality both management and results of the project. This document will also describe the way of monitoring whole process of the project implementation. The QAM will be prepared by very experienced in this matter partner FUE-UJI (ES) and QAM will cover all aspects related to ensure highest possible quality both essential and technical parts of the project. QAM will describe in details all monitoring and correcting activities and reports in relation to the quality.

The major steps of any quality assurance process are universal and apply to FUNICE project which require internal monitoring of the quality of the products and project. The proper project implementation and achievement of high-quality project results will be monitored and evaluated as on-going activities in the course of the project implementation. First and foremost, FUE-UJI (ES) will to create a quality control tool and defines the plans for the quality assurance process. The list includes quality objectives, defining the tests and verification activities, process evaluation,

scheduling all activities, documenting and tracking etc. The next step of this process is to generate the testing procedures, checklists and related activities to explain the way in which quality control will be performed. The next step of quality assurance process is to self-evaluate the capacity of the partners' team members to perform the evaluation processes as specified in the quality control plan. The quality control activities and results will be reviewed by the management of the project and their partners on regular intervals.

The QAM will consist of the following parts:

- o Quality Plan Steps and Principles.
- o Project Overview.





Co-funded by the
Erasmus+ Programme
of the European Union

- o Project Quality and Evaluation.
- o Quality Assessment Method.
- o Quality Plan Processes.
- o Quality Standards.
- o Quality Tools.
- o Initial Quality Monitoring.
- o Checklist for Quality Assessment activities.

12. DISSEMINATION OF FUNICE PROJECT

Dissemination will be carried out throughout the whole project. Dissemination workshops will be developed in partners' countries and final international conference will be held in Granada (Spain). Results of the project will be disseminated among participants of the project and potential interested beneficiaries. The dissemination material will be distributed during *agricultural fairs, exhibitions, etc.* There are few big national and **international agricultural fairs** and events in each participants country (e.g., Polagra in Poland), which is excellent place to distributed results of the project among stakeholders.

The major tools and strategies for dissemination will be as follows:

- o Continuous information of all target groups and potential users through means of conferences, workshops with focus groups, clustering activities, press releases, research articles, presentations at European exhibitions, conferences and events related





to online learning, agriculture, livestock farming, environmental sustainability regional development, organic farming, etc.

- o A professional corporate design with a user-friendly design, use of professional tools to make the site easily searchable and visible via the internet, professional design for presentation templates and all project print products.
- o A usable and publishable final handbook.
- o Accessing the website can be hard for some of the farmers, therefore the farmers, technical experts can participate to the establishment process of the system.

The FUNICE's general dissemination goals are:

- Reach as many as possible relevant beneficiaries of the project: farmers, at local, regional and national level, local, regional and national authorities related to the agriculture issues, organizations and associations promoting ecology, experts, universities and all the people interested in the topic.
- Support the project results dissemination at regional, national and European level, producing policy recommendations and promoting the training content and the handbook among beneficiaries.
- Prepare the ground for the translating of project results into policy making by approaching the policy makers through planned (providing project learnings and tools to the policy makers) and opportunist advocacy strategies (interviews, policy paper presentations, lobby meetings in collaboration with relevant stakeholders, etc.).
- Concretely engage target groups in project activities, namely contributing to the discussion





- and constructing of the main project outputs, and participating in project events (actively, directly, and indirectly);
- Create and to raise awareness, at external level (all target groups), for the works, results and outputs of the project, focusing the project's crossed thematic approach.

13. TIMELINE OF RELEVANT ACTIVITIES OF FUNICE PROJECT

Name of the activity	Date	Description
Kick Off Meeting (Tayrac - France)	12-2020	→ Starting point of the project.
IO1 – Training Methodology and Training Programme	12-2020	→ Development of the Intellectual Output 1 both O1/A1 & O1/A2.
IO3 – Open Education Resources (OER)	01-2021	→ Intellectual Output divided in three different parts O2/A1 + O2/A2 + O2/A3
Second Transnational Meeting (Kraków - Poland)	05-2021	→ Exchange meeting for the partnership. Ongoing activities.
IO2- Specialised, innovative training content of micoryza and pilot testing	06-2021	→ Development of a complex system composed to efficient implementation, dissemination and exploitation of the project



		and its results toward the target groups and wider audience.
Third Transnational Meeting (Balıkesir - Turkey)	11-2021	→ Exchange meeting for the partnership. Ongoing activities.
Fourth Transnational Meeting (Castellon - Spain)	05-2022	→ Exchange meeting for the partnership. Ongoing activities.
IO4- Specialised Handbook of micoryza and pilot testing	06-2022	→ Development of the fourth Intellectual Output which is a handbook for specific target.
Final Transnational Meeting (Granada - Spain)	11-2022	→ Last meeting of the partnership. Formal closure of the project.
Multiplier Event France	11-2022	→ Workshop for beneficiaries.
Multiplier Event Turkey	11-2022	→ Workshop for beneficiaries.
Multiplier Event Spain	11-2022	→ Workshop for beneficiaries.
Multiplier Event Poland	11-2022	→ Workshop for beneficiaries.

14. TRAINING PROGRAMME



Co-funded by the
Erasmus+ Programme
of the European Union

The Programme is the content that will be developed by all the partners in **IO 2-Specialized, innovative training content of micoryza and pilot testing.**

The proposed structure for the training program has been defined after contributions, comments, and suggestions through brainstorming of different partners and agricultural experts involved in the project. The evolution of the contents follows a logical order, first introducing the main concepts and the problem to solve and then focusing on every aspect of the mycorrhiza. Finally, when the main concepts have been exposed, this training methodology will cover practical aspects.

We only have reached a second-level division in this proposal but depending on the length of the KPI to generate; we will consider having a three-level subdivision. We also have gathered proposals about three level sections in this stage. The following will be the structure of the different training modules:

M0 – Introduction to fertilizers

M0.1 – Manures and Fertilizers

Definition, agronomic importance of fertilization, conventional products used, fertilizers and chemical fertilizers.

M0.2 – Soil and its importance in Agriculture

The soil as a base for the crops, nutrient reservoir and relationship with watering.

M0.3 – Nutrients in Agriculture. Macro and Microelements (manures and synthetic fertilizers)





Co-funded by the
Erasmus+ Programme
of the European Union

Nutrient requirement of crops, FU (fertilizer unit), differences between micro and macro nutrients and how this nutrition is covered by traditional fertilization.

M0.4 – Cost of fertilization

*Breakdown of the cost of fertilization, purchase, application, machinery, labour, etc.
Reproduce the mycorrhiza to decrease the cost and increase the demand of the farmers*

M0.5 – Environmental related impacts. Problems of current synthetic fertilizers

Environmental impacts of traditional fertilization: chemical fertilizers production, application, waste and residues, eutrophication, etc.

M1 - Mycorrhiza and its features

M1.1 – Biofertilizers

Definition of biofertilizer, practical uses and classification of mycorrhiza within the group of biofertilizers.

M1.2 – Mycorrhiza

What is it? How does it act? How is it identified, quality, etc. What is its difference from other types?

M1.3 - General advantages of the existence and use of micorryza

M1.4 – Production and Commerce of Mycorrhiza in Europe





Production and consumption data, how it is presented, limitations to its spread, etc.

Different companies' works related to this issue should be considered.

M2 - Practical aspects and advantages of using mycorrhiza

M2.1 – Agroecological Production in Europe

Overview of organic production in Europe. Current use of mycorrhiza in certified productions.

M2.2 – Benefits to the soil

Soil improvement, compared to chemical fertilizer. Increase tolerance to soil salinity, contribute to control soil erosion, taking time to see the benefits.

M2.3 – Benefits to the plants

Crop improvement, compared to chemical fertilizer, more vigorous and healthy plants, enhance flowering and fruiting taking time to see the benefits.

M2.4 – Benefits to the environment

Comparison of environmental impact of chemical fertilizer and mycorrhiza.

M2.5 – Economic Benefits

Economic balance sheet, cost savings, comparative production.

M3 - The mycorrhiza producing methods

M3.1. Substrate-based production systems

M3.2. Substrate-free cultivation systems



M3.3. In vitro production systems

M4 - How to utilize mycorrhiza correctly in the plant production

M4.1 – Agronomical Procedure. Practical Aspects.

How is it applied, how is a crop managed with mycorrhiza, are there any special needs?

Relationship with other cultivation practices.

M4.2 – Best practices.

Development of a good practice manual for use on crops. Demonstrations should be common.

This training content will be developed following the EQF 3-4 standards Level 3: Knowledge of facts, principles, processes, and general concepts in a specific field of work or study. Level 4: Factual and theoretical knowledge in broad contexts in a specific field of work or study.

Moreover, it would be interesting to have a typical structure for all the chapters to develop a more coherent final product. Therefore, the chapter could be structured in an introductory part explaining what the Module will work on and a summary of the content learned (2 or 3 sentences) at the end of the Module.

It would also be interesting to include a practical part by the end of each Module with some exercises regarding the Module's learning outcomes. These exercises could be more interactive using resources that allow teachers to compose Gamification activities such as Kahoot or Quizlet. These tools also can add a message once the question is answered, explaining which one is the right solution and why. The exercises could be integrated into the modules through a QR code that takes the trainee to the project's website or platform, where the links to the quizzes are uploaded.



Co-funded by the
Erasmus+ Programme
of the European Union

For the practical part there should also be a micro teaching part for the farmers how they implement the process. They can record themselves. As the most important part is the implementation part, they would like to see the benefit of the method. They can upload it to the system and the trainers can check t

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

