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Condense

Enrich your land without chemicals!

LIFE10 ENV/GR/596

THE CONDENSE MANAGING SYSTEM: PRODUCTION OF NOVEL FERTILIZERS FROM MANURE AND OLIVE MILL WASTEWATER

Duration of the Project: 01/09/2011 – 30/06/2015

AIM OF THE PROJECT

THE DEMONSTRATION OF A MANURE AND OLIVE MILL WASTEWATER MANAGEMENT SYSTEM WHICH TRANSFORMS THESE WASTES INTO A NUTRIENT RICH END PRODUCT (HIGH CONCENTRATION OF NITROGEN , PHOSPHORUS AND POTASSIUM) THAT CAN BE SAFELY USED IN AGRICULTURE AND HORTICULTURE INSTEAD OF THE USE OF CHEMICAL FERTILISATION

LOCATION OF THE PROJECT

REGION OF WESTERN GREECE - REGIONAL UNIT OF ILIA

Coordinating Beneficiary:

Development Company of Western Greece S.A.

Associated Beneficiaries:

TEI of Crete

Technical University of Crete

UNIVERSITY OF LEEDS

REGION OF WESTERN GREECE
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PROJECTS ACTIONS OBJECTIVES

Action 1. Project Management

The main target and expected result of **Action 1** is the **proper, on time and within budget accomplishment of the objectives and actions of the project**. Timely and high quality reporting to the Commission is the main indicator of success. Aim of project management is:

- **To ensure** that the project is carried out according to plan on schedule and within budget.
- **To ensure** effective coordination and communication among project partners.
- **To ensure** optimal communication with the European Commission on technical, administrative and financial progress of the project.

Action 2. Developing the Pilot Unit

Determine the exact technical characteristics of all the required components (constructions and equipment) of the pilot scale unit.

Proceed in the public tenders, acquisition, installation, construction and testing of these components.

Deliver the pilot unit ready and operational for initiating the new managing system.

Record data and information which will be useful in the completion of other Actions of the project.

Action 3. Testing, Evaluating & Fine Tuning the Management System

Test the basic components, initial knowledge and assumptions of the new manure and OMW managing system.

Evaluate the new managing system regarding the technical components (meaning the operation of the pilot unit) and the end product (physicochemical).

Fine tune the managing system by doing all the required changes which will allow the maximisation of its operational capability, with the minimum cost and environmental impact.

Record data and information which will be useful in the completion of other Actions of the project.

Action 4. Agricultural trials of the End Product

Evaluate the effect of the end product in various cultivations in controlled environment both in Southern and Northern Europe.

Evaluate the effect of the end product in various cultivations in real commercial cultivations in the demonstration area.

Record the end users (farmers)n approach towards the new product as well as the agricultural consumables outlets owners / operators

Record data and information which will be useful in the completion of other Actions of the project.

Action 5. Environmental & Economical Evaluation of the Managing system

Evaluate the environmental foot print of the CONDENSE Managing System and the New Product, through Life Cycle Analysis.

Evaluate the economical characteristics of the CONDENSE Managing System and the New Product, through Cost Benefit Analysis

Evaluate techno-economically a local full scale realisation of the CONDENSE Managing System, aiming in determining the proper pattern to full scale application

Action 6. Developing a series of Dissemination assisting Manuals of the Condense Managing System

Compose and Publish all the relevant Manuals that will help disseminate the CONDENSE managing system:

- Scale up Manual
- Design Manual
- Managing Manual
- Promotion Manual
- Farmers' Manual

Action 7. Dissemination of Results

Disseminate to the general public.

Disseminate to persons and organisations related to wastes production and management, fertilisers production and distribution, and of course potential end users.

Disseminate to the academia world wide the novel approach implemented here and the knowledge and experience acquired regarding a variety of issues as for example the environmental benefit, the effect in the cultivations, the quality characteristics of the end product etc.

Action 8. Networking with other projects

Develop and implement a networking creating scheme aiming in maximising the potential effect of the CONDENSE project through its interference with other National, European or International projects.

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BACKGROUND

Modern agriculture practice is based on chemical fertilization. Farmers, that apply all the proper managing schemes and quality assurance guidelines and those who don't, use fertilisers (properly or not) in order to achieve an economically viable production.

Millions of tons of these chemicals contain nutrients such as Nitrogen, Phosphorus and Potassium that are produced, transferred and applied all over the globe. At the same time more than seven billion people in the planet are feed (adequately or partly, depending of the area and the state) due to the application of these fertilisers. **Inadequate provision of nutrients to the cultivations will result to a worldwide famine.**

Up to recently, the **main environmental issue** with chemical fertilisation was the **local effect** of the (excess) use, such as the leaking to the groundwater (degradation of water quality) and the eutrophycation of rivers, lakes and seas. In the last 10 to 15 years another parameter for observation has been added, that of **carbon footprint and global climate change**. For example a ton of Nitrogen to be captured (from the air) into a fertiliser, requires at least one (some increase that to 1.5 t) ton of diesel, or respected quantity of any fuel of similar energy capacity. If we add in this amount the energy required for transporting and applying the fertiliser then the overall carbon foot print is increased considerably. And as it was mentioned earlier millions of tons are needed per year. Only the 1,000,000 olive trees located in the Perfection of Ilia, consume – through the fertilisers added to them – more than 600 tons of Nitrogen alone.

As such any methodology that would allow the provision of nitrogen to plants with reduced carbon foot print (in comparison with the existing methodology or in absolute terms), the proposed process should be considered an improvement and an answer to this environmental problem.

However, the abundance of nitrogen in the atmosphere and the natural / biological nitrogen cycle, reduce the availability problem to that of energy management and balance. As long as we can "produce" energy we will be able to "produce" nitrogen containing fertilisers. The case is not the same with phosphorus, because **Phosphorus and Potassium are both MINERALS**, and as all minerals in the planet their **availability is limited**. Both these substances do not have a natural / biological cycle, which bring them back in the original state from which chemical industry captures them to use them as chemical fertilisers. Dead tissue releases phosphorus and potassium in water,

which then ends up in the final water receiving body (the sea in most cases) and are considered LOST.

Estimations on Phosphorus and Potassium availability cannot be made with accuracy; however there are some data indicating that by the **end of this century both will be limited**. In the area of Ilia, the olive trees require also about 600 tons of phosphorus and potassium per year. Only in Greece it is estimated that there are more than 20,000,000 olive trees, which are fertilized chemically every year.

The carbon footprint of Phosphorus and Potassium fertilization (from the mineral to the bag and then to the plan) is extremely large, estimated 25% larger than that of Nitrogen.

Concluding all the above, major environmental problems of nitrogen and phosphorus chemical fertilisers' production, as they take place now, are the following:

- **Increased energy consumption** for capturing / excavation, production, packaging, transferring and application, resulting to a **negative carbon foot print** (global climate change issue).
- **Continuous utilisation of mineral Phosphorus and Potassium**, resulting to an estimated adequacy problem by the turn of the century.
- **Local environmental problems**, mainly related with leaking of these nutrients in water receiving bodies and the degradation of water quality and eutrophycation.

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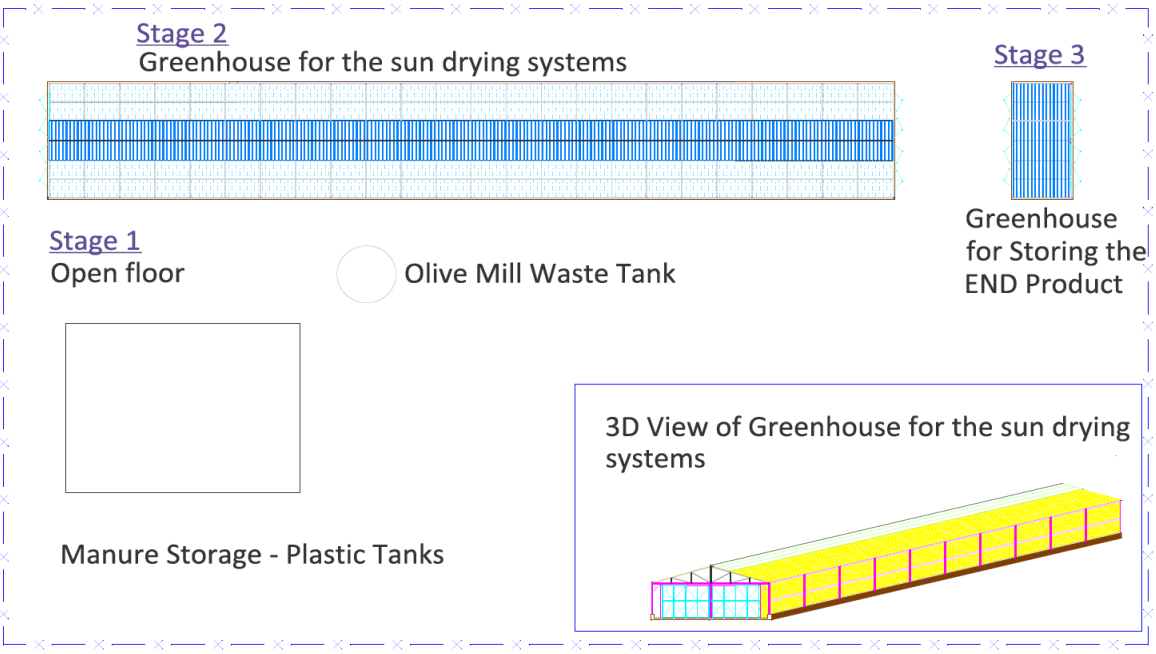
INFRASTRUCTURES OF THE PILOT UNIT:



EQUIPMENT:

- - Sun drying system
- - Self powered turner
- - A small - medium size front loader
- - A small - medium size rotating/ vibrating screen
- - A high performance grinder

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