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CONSORTIUM



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LIFE SUBSED

Sustainable substrates for agriculture
from dredged remediated marine
sediments: from ports to pots

The Life Subsed project

The Life Subsed project has main objectives:

- Convert a waste, in this case a dredged and reclaimed sediment, into a resource, or into a commercial substrate to be used in agriculture, through the application of sustainable techniques both from an environmental and an economic point of view, in a circular economy perspective. These sediments are the result of dredging the course of rivers and the seabed of ports, a fundamental operation to allow both navigation and the outflow of waterways.
- Reduce the use of peat in the horticultural sector and thus protect peatlands as natural environments that are not easily renewable. Peat bogs occupy about 3% of the earth's surface and are extremely important habitats for both biodiversity and climate regulation. They were formed in wet and swampy areas over thousands of years through a slow process of rotting and decomposition of plant material. Today they are severely threatened on a global scale by the expansion of commercial agriculture and other forms of economic development.



Actions

The following activities were carried out within the LIFE SUBSED project:

- Greenhouse cultivation trials were conducted on the following botanical species: Laurel, Calla Lily, Protea, Basil, Blueberry, Woodland Strawberry, Olive tree and Lemon.
- The parameters required by the fertilizer legislation were determined on the substrates, both at the beginning and at the end of the experiment.
- The sediment already treated during the AGRIPORT project was subjected to an additional landfarming treatment, and was subsequently used for the production of agronomic substrates based on reclaimed sediment.
- Measures related to the agronomic quality of a substrate and therefore to its fertility in terms of nutrients, ability to retain water and enzymatic activity have been carried out.
- Destructive and non-destructive measurements were carried out in order to evaluate the production performance both from a yield and quality point of view through morphological, physiological and, limited to plants for food use, also nutritional measurements.
- The LIFE Subsed project also addressed the legislative and authorization aspects relating to the use of sediments in agriculture. This has involved a comparison with both environmental and fertilizer legislation.
- The procedure to be followed to obtain the End of Waste of a non-dangerous dredged sediment was also defined, that is, the procedure necessary to transform this sediment from "waste" to "vegetal soil".
- A Life Cycle Assessment (LCA analysis) was performed to verify the environmental sustainability of the use of phytoremediation sediment.
- A business plan was also prepared to assess the economic sustainability of the proposed solutions and a questionnaire was disseminated to assess the socio-economic impact of the project and the public's sensitivity towards these issues.
- Four workshops were organized, two in Italy and two in Spain and three technical days aimed at sector technicians, nurserymen, students and researchers.
- In order to disseminate and transfer the results achieved and the experience gained, the consortium has conducted an intensive communication and dissemination campaign, aimed at reaching different targets: from the citizen to the researcher, from the sector associations to the policy maker.

- Specific meetings were also organized with authorities and policy makers, who were presented with the potential of the SUBSED solutions and the need for an update of the regulatory framework that favors the transition towards circular economy measures.



Results and Benefits

Landfarming has improved the agronomic and biological characteristics of the sediment making it more suitable for plant cultivation.

All the substrates in which the sediment was used at the dose of 50%, or less, have reached the characteristics required by the legislation.

The project studied the cultivation of different products divided into different impacts (impact on climate change, impact on water consumption, impact on toxicity and others). The first result that can be found from the environmental impact analysis is that the transformation of dredged sediments as a culture substrate has a much lower environmental impact in absolute terms than the production of peat-based substrate.

The business plan prepared during the LIFE SUBSED project has shown that the proposed solutions can be economically sustainable for the target market analyzed.

Over 300 people took part in the workshops and technical days organized by the consortium as part of the LIFE SUBSED project. Furthermore, the consortium has produced more than 10 scientific articles and others on a local, national and international scale. The consortium has produced over 7000 LIFE SUBSED personalized gadgets and participated in more than 35 national and international events and fairs.