Hungarian Use Case: Cultivating in Lands with Low Organic Matter

Main Challenges

The area was an abandoned orchard on semi-arid, sandy soil with low and declining groundwater, poor nutrient content, and limited retention capability—conditions that hinder agricultural productivity.

Solution within MarginUP!

Cultivating herbaceous and woody biomass crops to be transformed into substrate for oyster mushroom farming. After use, the spent substrate is processed in a biogas plant to produce heat and electricity for mushroom cultivation, with by-products reused as fertiliser.

Biomass crops: Virginia mallow (*Sida hermaphrodita*) and Perennial rye (*Secale cereanum*)

Key Information:

Location: Southern Great Plain, Hungary

Area: 1 hectare

Climate: Semi-deserted

Bio-based products: Oyster mushrooms, oyster mushroom substrate, biogas, fertiliser

Benefits:

- Biodiversity enhancement
- Improved soil quality and productivity
- Circular use of biomass
- Water optimised production
- Replication potential
- New regional business models

Crops of Virginia mallow (Sida hermaphrodita) at the use case location. Photo: MarginUp! Consoritum

Stakeholders Engaged

- Farmers
- Agricultural and agroforestry experts
- Bio-based businesses
- Research and innovation organisations
- Local and regional institutions
- Decision makers
- Potential customers

Interest Groups

- Farmers in Mediterranean and drought-prone regions
- Livestock farmers
- Bioenergy and biogas producers
- Biodiversity monitoring and ecosystem services experts
- Policymakers supporting sustainable agriculture and land restoration

Expected Results

- Develop a circular value chain around biomass crops and oyster mushrooms farming in conformity with legal and policy criteria.
- Develop a new raw material recipe for oyster mushroom substrate, envisaging the production of bio-products such as biogas and fertiliser.

Project's Timeline

2023:

- Soil preparation. Seedlings were planted, and irrigation and mechanical weed control took place.

2024 – 2025:

- Harvesting, irrigating and mechanical weed control.

2025:

- Assess crops impact on main biodiversity indicators.
- Validate harvesting and storage technology.
- Engage local farmers through outreach.
- Implement ageing tests to analyse feeding capacities for dairy cows.
- Observe the possible value chains.

2026:

- Start using the biomass as a mushroom substrate.
- Analyse the production possibilities of Secale cereanum.

Replication Potential

High replication potential in water-scarce, desertification-prone areas, especially where farming is economically impacted—particularly relevant for Southern Europe.

Oyster mushroom farming. Photo: MarginUp! Consoritum

About MarginUp!

The project is developing sustainable and circular value chains to produce bioproducts and biofuels from natural raw materials grown on marginal lands. By introducing climate resilient and biodiversity-friendly non-food crops on marginal and low-productivity lands, MarginUp! will increase farming system resilience, enhance biodiversity, and promote stakeholder participation.

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