Swedish Use Case:
Agriculture in Cold Climates

Key Information:

Location: Öjebyn Agro Park near the town of Piteå and a farm near the town of Skellefteå, Norrbotten and Västerbotten counties, Sweden

Area: 15 hectares

Climate: Cold

Bio-based products: Animal feed, biogas, biodiesel

Benefits:

- Biodiversity enhancement
- Replication potential
- Circular use of biomass
- New regional business models

Main Challenges

Focuses on the northern regions of Västerbotten and Norrbotten, where cold and short vegetation periods challenge agriculture. Climate conditions limit crop options, while remote farms complicate logistics and cooperation. A declining, ageing population reduces labor and strains rural services.

Solution within MarginUP!

Developing a value chain for spring turnip rape, a crop well-suited to cold climates. The harvested oil is processed into biodiesel, the press cake is used as animal feed, and the glycerol by-product is evaluated for biogas production. This circular model boosts land efficiency, soil health, and regional self-sufficiency.

Turnip rape in summer. Photo: HS

Stakeholders Engaged

- Research institutes and universities
- Technology providers
- Bio-based businesses
- Farmers, beekeepers and rural entrepreneurs
- Industry partners
- Public sector organisations

Interest Groups

- Cold-climate farmers across Europe
- Renewable energy developers (biodiesel, biogas, etc.)
- Feed and fertiliser producers
- Local cooperatives
- Circular agriculture advocates
- Regional development agencies in remote areas

Replication Potential

With its adaptable, decentralized model, this circular system can be replicated in cold or marginal regions where access to large processing facilities is limited. It boosts rural resilience and self-sufficiency in energy and agriculture.

Project's Timeline

2023:

- First cultivation and oil press installed in Pitea.

2024:

- Cultivation expanded, 1150 litres of oil produced, and first biodiesel batches completed.

2025:

- Cultivation (15 ha) and 4000 litres of oil produced. Biodiesel production (3000 litres) to be tested in trucks and farm machinery, and press cake as feed (2000 kg tested) and glycerol for biogas trials.

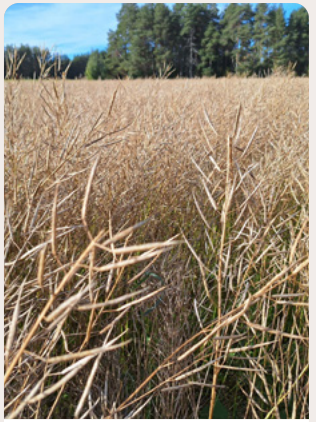
2026:

- Full system to be demonstrated in Ojebyn.

Expected Results

- Develop an upscaled value chain for turnip rape providing new alternatives for the agricultural sector in north Sweden.
- Identify suitable practices to use turnip rape as an environmentally sustainable oil crop that can diversify crop rotation at northern latitudes.
- Demonstrate and optimize the production of biodiesel from turnip rape.

Turnip rape oil and press cake. Photo: RISE



Turnip rape ready to be harvested. Photo: RISE

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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