

NETHERLANDS

Farm's performance, restructuring & modernisation

Location

Wageningen

Programming period

2014 – 2020

Priority

P2 – Competitiveness

Measure

M16 - Cooperation

Funding (EUR)

Total budget 1 193 775

EAFRD 470 089

National/Reg. 470 089

Private 228 597

Other 25 000

Project duration

2018 – 2021

Project promoter

SmartCrops B.V.

Contact

jason.kiem@insectocycle.nl

Website

www.feedbackfarm.nl

<https://ec.europa.eu/eip/agriculture/en/find-connect/projects/feed-back-farm-proeftuin-voor-het-lokaal>

An EIP-AGRI Operational Group project on the use of insects for adding value to organic residues from agriculture.

Summary

The cultivation of insects can have a significant contribution in making agriculture more sustainable. In the current food production chain, many organic residues are released. Insects can convert them into new nutrients to feed animals and plants, thus creating a closed production cycle.



An EIP-AGRI Operational Group converted a disused building into a test facility. There it researches the valorisation of organic residues from land-based agriculture with the use of insects. The larvae of Black Soldier Flies (BSF) are used as an "intermediary" to convert low-value nutrients from the organic residues into high-quality proteins and fats, which will serve as food for fish farming - and in a subsequent stage also for chickens and pigs. The excretions of the fish are in turn used for fertilizing vegetables that are grown under controlled conditions (also called aquaponics).

Results

An agricultural building in disuse has been repurposed to host the insect breeding facility.

This process will minimise the transportation costs for removing whey from the dairy farms.

Great interest is already experienced from farmers who follow up the project to learn about insect farming and aquaponics.

Lessons & Recommendations

- ❑ Agricultural waste streams for the re-production of black soldier flies, like whey and leftover animal feed, can be found in the whole of the Netherlands and Europe.

Context

The province of Zuid-Holland has the ambition that 80% of its basic food supply will be produced by the province itself in 2036. Part of achieving this ambition requires that raw materials are used much more efficiently. Closing cycles is considered both provincially and nationally as the new standard in the entire production chain. To achieve this, it is important that farmers can experiment with new techniques and business models.

Insect cultivation is one of the new forms of cultivation that can contribute to making agriculture more sustainable. Insects are an essential link in the biological processes on earth. Waste produced by animals and plants is converted by insects into new nutrients for animals and plants. In the current food production chain, many residual flows are released that can be converted into new nutrients with the help of insects. This process is fast as 1 gram of eggs from the black soldier fly can process 100 kilograms of residual flows in 2 weeks and yield 20 kilograms of harvestable larvae. This can contribute to the protein transition.

This example shows that insects have the potential to become a source of sustainable, high-quality proteins in the future. Insects can also be used to process low-value organic residues into high-quality products. In this way the nutrient cycle can be closed, and the food chain can become circular. In addition, there is an increasing number of agricultural buildings that are no longer in use in the Netherlands. The cultivation of insects could take place in these buildings.

Objectives

The objectives of the Operational Group are to:

- Develop closed production cycles - The larvae of Black Soldier Flies are used as an 'intermediary' to convert low-value nutrients from the organic residual streams into high-quality proteins and fats that will serve as food for fish farming. The excretions of the fish are in turn used for fertilizing vegetables that are grown under controlled conditions (also called aquaponics).
- Establish a Collaboration with Food Family in Zuid-Holland and the cheese and dairy farm of Jan Kuiper with around 250 cows. This farm is used as the try-out location.
- Promote the use of vacant agricultural buildings for the cultivation of insects.

Activities

The concept of circular food production systems will be set up and tested at the Kuiper dairy farm according to the following steps, several of which are already completed:

September 2018 - December 2018: Prepared a barn to be used as the test site.

January 2019 - May 2019: Final design, outsourcing and construction of the testing ground.

June 2019 - August 2019: Commissioning of the system and creating a balance between the subsystems.

July 2019 - March 2021: Consult relevant parties regarding the system.

April 2021 - June 2021: Analysing results, drawing conclusions and preparing the final report.

July 2021 - August 2021: Presentation of the results and follow-up strategy.

The main tasks that the Operational Group is set to address include:

- Explore whether the recovery of nutrients from whey, farm feed residues and catering waste through black soldier flies is efficient enough. Investigate the efficiency of aquaponics using BSF for the growth of fish and plants.
- Map out the costs of the concept and assess whether it is economically profitable.
- Assess the environmental impact of the concept and if this could be done by means of a Life Cycle Analysis.
- Investigate how potential users view the Feed Back Farm concept. Ensuring the acceptance of the concept is necessary to be able to roll it out on a large scale.
- Identify potential clusters and form networks of potential cluster parties. Find out more about farmers' attitudes towards cluster formation.
- Identify possible business cases for the Feed Back Farm concept. This will enable interested parties to have an idea of how the concept would look like as a commercial venture.
- Explore the possible total contribution of the Feed Back Farm Concept to sustainable agriculture.
- Understand the barriers that need to be overcome to enable the Feed Back Farm concept to scale up and identify the concrete steps that need to be taken to turn the concept into practice.

Feed Back Farm - using insects for adding value to organic waste streams

The partners in this Operational Group are:

- Jason Kiem (InsectoCycle) - Project leader
- Seppe Salari (InsectoCycle) - Entomologist
- Jesse Turkstra (InsectoCycle) - Technology
- Jan Kuiper (Kuiper Cheese and Dairy Farm) - Delivery of residual flows and guided tours
- Dinus Herrewijnen (Wellant College) - Aquaponics expert

Main results

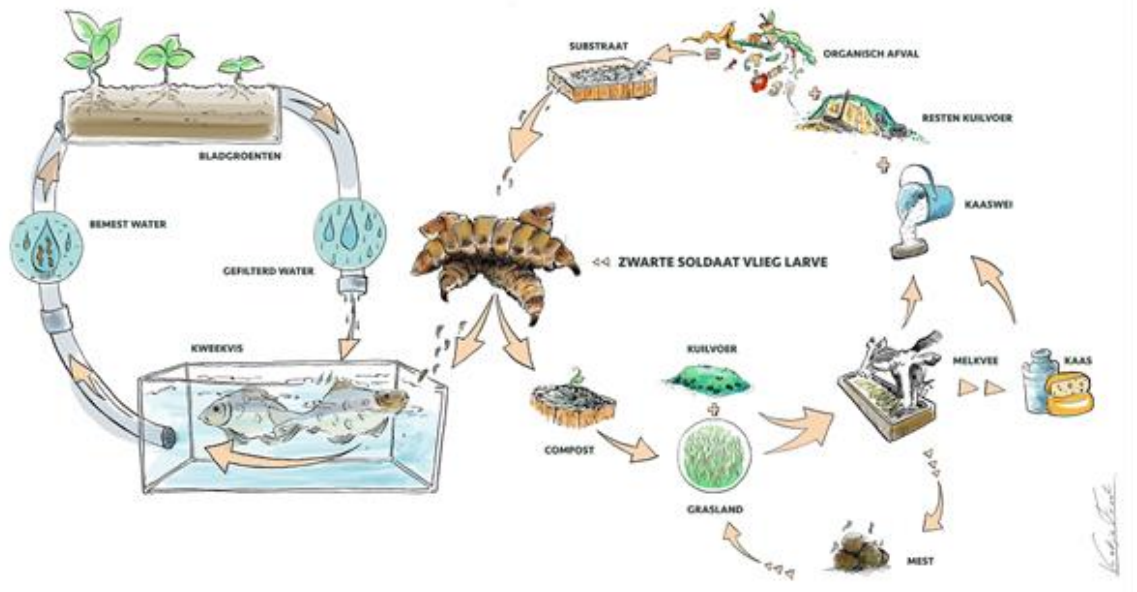
An agricultural building has been repurposed to host the insect breeding facility, instead of being vacant.

This process will minimise the transportation costs for removing whey from the dairy farms.

Great interest is already experienced from farmers who follow up the project to learn about insect farming and aquaponics.

Key lessons

Agricultural waste streams for the re-production of black soldier flies, like whey and leftover animal feed, can be found in the whole of the Netherlands and Europe.



Additional sources of information

n/a