

Field labs bring entrepreneurs and researchers together To a more sustainable future

The Netherlands has always played a pioneering role in livestock and arable farming innovations. There is currently a lot of interest in our country for 'climate-smart' solutions, with closed-loop agriculture being an excellent example.

"Closed-loop agriculture is an answer to the challenges facing the farming industry, such as greenhouse gas emissions and restoring biodiversity," says Rik Eweg. In January he set up a new research group at the Van Hall Larenstein University of Applied Sciences in Velp, called 'Area-based transitions to closed-loop agriculture'. He asserts that closed-loop agriculture, which explicitly includes livestock farming, requires new business and earning models, organisational structures and rules. "It's about a system change throughout the chain, from farmer to consumer. Based on practice-oriented research, we develop, use and monitor processes and methods that can contribute towards realizing this goal."

"Innovations are only successful if we develop them together"

The exact meaning of closed-loop agriculture is something that is still proving difficult to define internationally. "There is no univocal definition," Eweg explains. "The term is interpreted differently in various parts of the world." He distinguishes three important aspects that underlie what is meant by closed-loop agriculture in the Netherlands. "The first is that it must increase biodiversity. Not just in the soil, but in the entire ecosystem. Secondly, it needs to have a positive environmental impact, for example through lower greenhouse gas emissions and less use of pesticides. Thirdly, it should close as many flows as possible." This means that the residual flows from one chain become the raw materials for another chain. For example, food leftovers can be used as animal feed and the artificial fertilizer can be replaced by animal manure.

Fair

"Closed-loop farming must lead to a fair earning model, for both people and animals," Eweg goes on. "In other words, a good income for farmers and enough attention to animal welfare." A change is needed in various areas to ensure successful implementation. "It's crucial that, in terms of policy, the focus should be much more on objectives instead of on measures. If we look at the methods and techniques, innovations to the business systems are also needed, such as separated livestock housing systems. New efforts need to be made to increase specialist knowledge and awareness in relation to competences and skills. And economically, too, an organizational change is needed to create a better earning model."

The Ministry of Agriculture, Nature and Fisheries recognizes the importance of closed-loop agriculture. Three green universities will be working closely with the government with research and knowledge on closed-loop farming. The research group of Van Hall Larenstein University of Applied Sciences, commissioned for four years, is linked to experimentation regions designated by

the Ministry in the Achterhoek, Twente and Northern Netherlands. Projects are being initiated in so-called living labs, where students, researchers, (agricultural) entrepreneurs and other stakeholders work closely together in an area-specific way to give shape to closed-loop agriculture. The research also involves students from a number of green vocational schools. The purpose of the field labs is to learn and innovate together towards an economically, ecologically and socially responsible food system. The living labs are in continuous development. All knowledge that is gained is immediately linked to experiments.

Transition

"In our research group, we focus on the transition to circular agriculture," Eweg explains. "How do you change the existing system into a new, functioning and better system? There is already a great deal of knowledge in the Netherlands about soil quality, nutrients and the like. We are now investigating how we can apply all this knowledge to facilitate a system change that will benefit both the regions and the businesses that are involved. It is action-oriented research. The idea behind it is that innovations are only successful if we develop them together." The starting point is to build up long-term relationships with business owners in order to understand what challenges they are up against. "Because of the four-year term, we are trying to link up with existing initiatives wherever possible. That way we hope to achieve the best results."



Rik Eweg



Over time, we believe it's possible to export the developments and experiments relating to closed-loop agriculture. The national government wants Dutch agriculture to play a key role in the global transition towards a circular bio-based society, with the ultimate goal of achieving all climate and biodiversity targets. "The Dutch findings cannot be translated one-to-one to situations in other countries," says Eweg. "But we can use the knowledge and innovations we have developed here elsewhere." The university of applied sciences is part of a European project with green universities in Bulgaria, Finland, Greece and Slovakia, and cooperates with a college in India and has been involved in a number of agricultural missions. "We are seeing that our views on climate resilience and more sustainable farming are also appreciated at an international level."

Switch

It's difficult to predict what agriculture in the Netherlands will look like in the future. "Closed-loop farming is by no means a blueprint for the future, but a type of agriculture and an economic model that we want to move towards," says Eweg. "It has earned the explicit attention of many institutes and organizations. The switch is a process of many small steps. We need to appreciate every step in the right direction. The idea is that changes within the government and businesses take place based on the vision that closed-loop agriculture is essential for a sustainable future and, in time, will lead to a better and sustainable system."