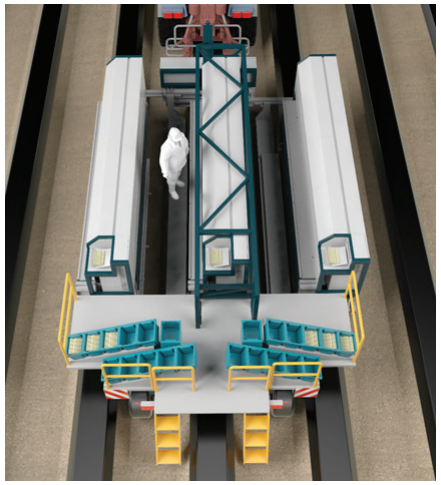
The high tech farm:

Robots to solve the labour crunch & increase productivity

Written by: Astrid Seegers

The Netherlands boasts more than 4,150 companies in the agrifood sector. The number of farmers that are adopting robots in their barns, greenhouses and meadows is growing. Highly innovative companies, university spin-offs and research projects are developing robots for next generation farming. They are challenged by a labour crunch and need for efficiency, and fueled byworld-class research institutes or innovation and public-private partnerships.



Cerescon Artist Impression 3 Rijige Machine

Autonomous feeding: High tech for happy and healthy cows

The Innovado is an example of how innovation contributes to the innovative characteristics of the sector. Dutch company Schuitemaker and the University of Twente have developed an autonomous feeding machine. The autonomous machine does not just save a lot of time and energy. The main benefits are created by data-analytics. Innovado is linked to a feed management program. The precise measurement of feeding material, in combination with the needs of the live cattle, increase milk production significantly.

The Innovado moves unassisted. The path of the machine inside the barn is set out by way of transponders; outside the barn it is controlled by means of RTK-GPS. The machine has sensors for continuously scanning the surrounding area. SiS Scanners of the Innovado will detect any foreign objects in the path in a timely manner and, if this happens, immediately stop the machine. The Innovado can be implemented in just about any type of barn. The only adjustment to an existing barn is the installation of a set of transponders.

Cerescon Artist Impression 3 Rijige Machine

Automatic selective asparagus harvesting: Robots mining the white gold

Harvesting white asparagus, also referred to by the Dutch as white gold, is an increasingly expensive activity. The Dutch high-tech start-up Cerescon is introducing the world's first automatic selective asparagus harvester. It is developed in close cooperation with Dutch and German asparagus growers. Obtaining the necessary thousands of seasonal workers is challenging and larger asparagus growers are almost forced to move their businesses to low-wage countries.

The machine has a capacity of 90 acres and works three rows at a time, thereby replacing 60 to 75 manual harvesters. It halves harvesting costs in comparison to manual harvesting. The Cerescon asparagus harvesting machine integrates all the necessary functions: motion detection, harvesting, plastic handling and sand bed restoration. The machine is expected to harvest a better quality of asparagus (less damage, less discoloration) and increase the yield for growers. The machine consists of a detection module that detects asparagus underground, a robot that removes the asparagus from the ground and a sand bed restoration module. Cerescon has equipped the machine with a self-developed and patented detection method based on sensor technology. It detects asparagus underground before the white gold emerges from the soil and discolors. The robot cuts the asparagus underground and places it in a container. Immediately after harvesting, the sand bed is restored in order to maintain the quality of the asparagus all season.

'This selective harvester is the start of a new era in agriculture and horticulture,' says Ad Vermeer, CTO of Cerescon. 'Low grade seasonal work can be replaced by high-quality jobs and in addition to asparagus, there are many other crops that need to be harvested selectively. There are still many opportunities for cross-overs in high-tech and agro.'

Cerescon Aspergeoogstmachine1

Cerescon Aspergeoogstmachine1

Autonomous egg collection: Smart solution for egg hunt

Chickens lay most of their eggs in their nests, but some end up on the floor, as result of deviating animal preferences. As these eggs have lower quality and induce additional floor laying, their (manual) collection is therefore both necessary and time-consuming. In response to this need for undesired labour, Wageningen researchers in the Netherlands have developed an autonomous robot that can move through the poultry house freely. The aim of the robot, named the PoultryBot, is to identify and collect these floor eggs, thereby saving poultry farmers thousands of euros per year. It is also equipped with a device that can measure the poultry house climate or look after sick animals.

The company uses a path planner to search the house, in such a way that the chance of finding floor eggs is maximised. This path planner provides waypoints to the robot, which then drives from waypoint to waypoint. At the same time, a special camera is used to detect the eggs. If an egg is found, its position is stored and an action is planned to collect the egg. The robot is continuously aware of its position in the house. Using the special collection mechanism, a bended helical spring, it is sufficient to stop in front of the egg, lower the mechanism and push it over the egg. At that time, the egg will move into the device, and can be handled further by the robot.

'What we have presented so far, is a proof-of-concept.' says Bastiaan Vroegindeweij, PhD candidate of Wageningen University's Farm Technology Group, who was the main researcher involved in the project, 'This is sufficient to make clear that the idea and approach are valid and can work, but does not mean that we have a fully functional robot yet.' Currently, his startup company Livestock Robotis is continuing the development of this robot. Given there is sufficient money available for this development, they plan to have a fully functional prototype in the coming years, to be able to enter the market.

Cerescon aspergeoogstmachine 1 rij
Ad Vermeer & Thérèse van Vinken

Cerescon aspergeoogstmachine 1 rij
Ad Vermeer & Thérèse van Vinken

PoultryBot

The Holland Innovation Network

The Netherlands enjoys a strong position for the development of robotic solutions, because of a strong eco-system of four technological universities and innovative companies and multinationals. Collaborative innovation is key; robotic solutions should be developed in collaboration with the entire supply chain. This open approach to research and innovation, combined with an excellent business infrastructure and a highly-educated, dynamic workforce makes the Netherlands an ideal location for high tech business expansion and acceleration.

The Holland Innovation Network at the Netherlands Embassy in Singapore focusses on innovation, technology and science collaborations between Southeast Asia and the Netherlands. By organizing seminars and workshops the team informs and inspires about topics such as policy innovation, autonomous driving and robotics. The Holland Innovation Network writes articles to inform Dutch government agencies, knowledge institutes and companies about developments in Southeast Asia. To explore collaborations and business opportunities on smart industry and robotics R&D in the Netherlands, contact Ms Astrid Seegers, Advisor for Innovation, Technology and Science via sin-ia@minbuza.nl.

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