Test and validation

2025WP3_Munc_003
Status: Completed

Business case

Problem Owner:
Munckhof Fruit Tech Innovators

Involved:
Wageningen Research
Munckhof Fruit Tech Innovators
RIWO Engineering

Evaluation Report – Apple-Picking Robot

Economic testing and validation of the apple-picking robot and shuttle vehicle + bin-changing system, 2025 harvest season.

Broad knowledge question

Fruit production is facing increasing labour shortages and rising costs. This raises the question of how robotics, AI and automated logistics can make both the picking process and field operations more efficient, reliable and sustainable.

Approach

Apple-picking robot: technical tests in the orchard → results entered into an economic calculation model to determine the cost per kilogram picked.

Bin-changing system & shuttle vehicle: no full technical validation; instead, a parameterised model was developed that allows growers to calculate the effects for their own situation.

Objective

The objective is to calculate the economic impact of the technical performance of the apple-picking robot and determine the cost per kilogram picked, and to compare this with last year.For the bin-changing system and shuttle vehicle, the objective is to develop a flexible calculation model that allows growers to assess the logistical and economic effects for their own business.

Results and reflection

The apple-picking robot performs better than last year: the higher picking speed reduces the cost per kilogram picked, although the robot is still more expensive than manual picking. This means that further improvements in speed and the use of additional arms are necessary.For the bin-changing system and shuttle vehicle, the new calculation model shows that logistical benefits are possible, but the results remain indicative and are highly dependent on the specific circumstances of the grower's business.

Link to the evaluation report: https://doi.org/10.18174/720180

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Document information

Document title	Evaluation Report – Apple-Picking Robot, Economic Testing and Validation
Project title	NXTGEN Agrifood
Project URL	IP1: Open Field Cultivation- NXTGEN Hightech
Document URL	https://doi.org/10.18174/720012
Project coordinator	Hennie van der Veen – Rusticus (WUR)
Work package	IP1 Open Field Cultivation
Work package lead	Natalie Hotrum
Funding organisation	Stichting Wageningen Research
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Keywords	Apple picking robot

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