strategic product innovation

Marcel Vroom – project owner @ npk
Research project for a rose-nursery AI-robot

EIP project: designing for sustainable agriculture (2024 – 2026)
‘Mildew detection by an autonomous sensor system using AI‘

Boven het maaiveld – Robotica toegepast: van idee tot praktijk – Ede, 30. October 2025

Innovation that matters.

At npk, we craft breakthrough products that set brands apart.

Since 1978 we've fused design, technology and strategy to help global leaders create lasting impact.

Former Shell – Amsterdam City tower | design & engineering of 360 rotating top restaurant by npk


npk
ASML
Heineken
PHILIPS
DELL
Haier
SIEMENS
Miele
KraftHeinz
Canon
LG
Unilever
Nikon
covestro
Kimberly-Clark
revvity
BIOTRONIK
GRUNDIG
ATOMIC
MERCK
SKIL

From Heineken beer bottles to cutting-edge cleanroom technology.

Celebrating over 35 years of successful collaboration between ASML and npk design.

Saint-Gobain Cultilene CARA MET
Sensor to view in real-time moisture content, EC and Temperature (MET)

Octalarm-Touch
Alarm detector for monitoring critical technical processes, like in horticulture

Technolution
Sense2Grow climate sensor

Condifood
Improve food quality and safety with their hyperspectral imaging technology
.

From sustainable solutions for KraftHeinz to cutting-edge agricultural innovation.

H2arvester—farming sunlight with solar power and green hydrogen, without losing productivity.

H2ARVESTER

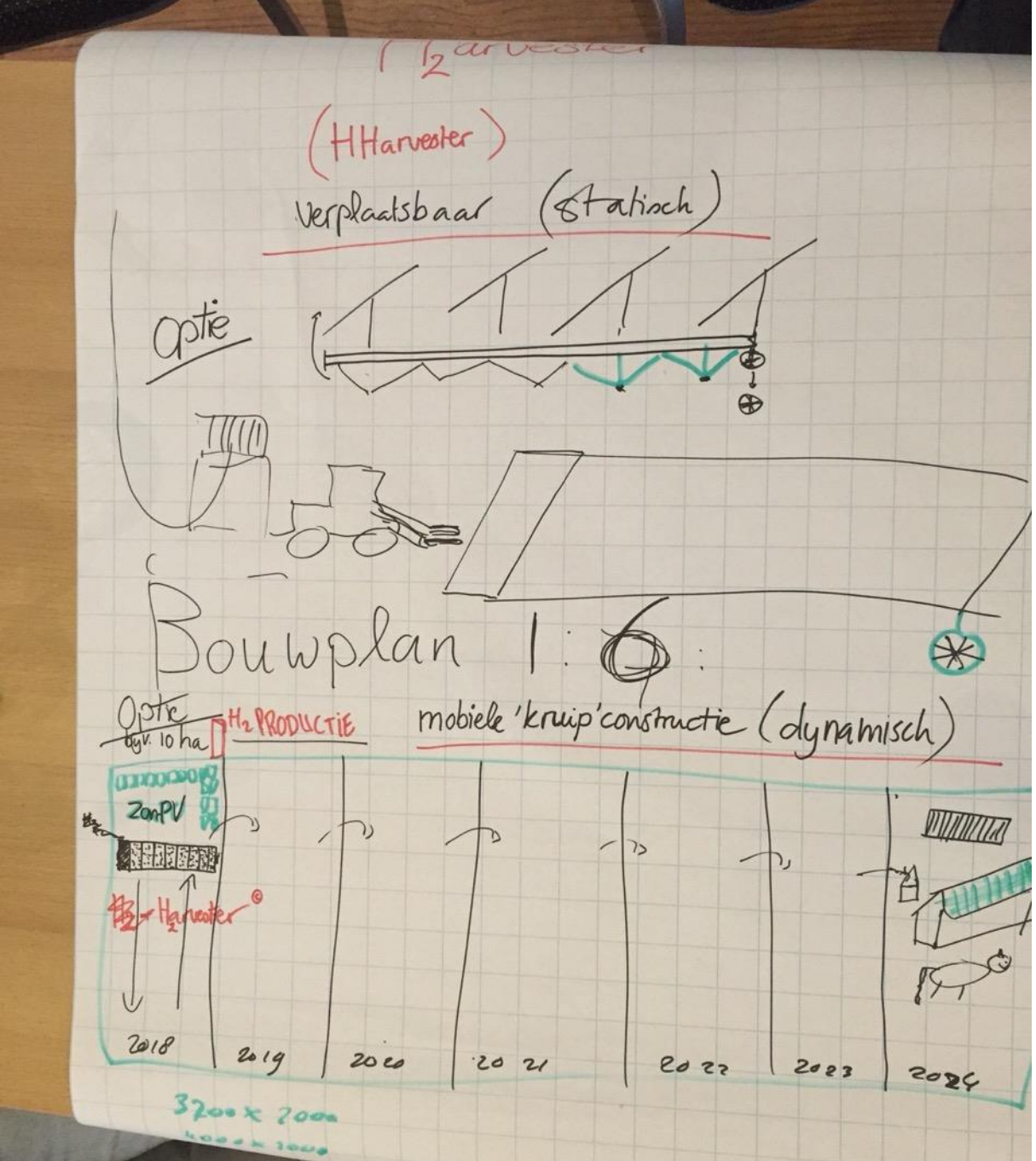
Mobile solar panels on agricultural land while maintaining agricultural production (agri-PV)

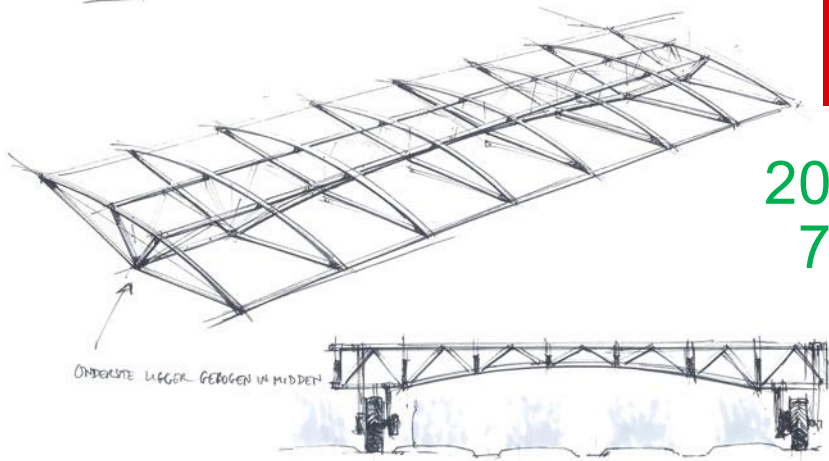
Generating sustainable energy on agricultural land and producing hydrogen on the farm

LTO noord

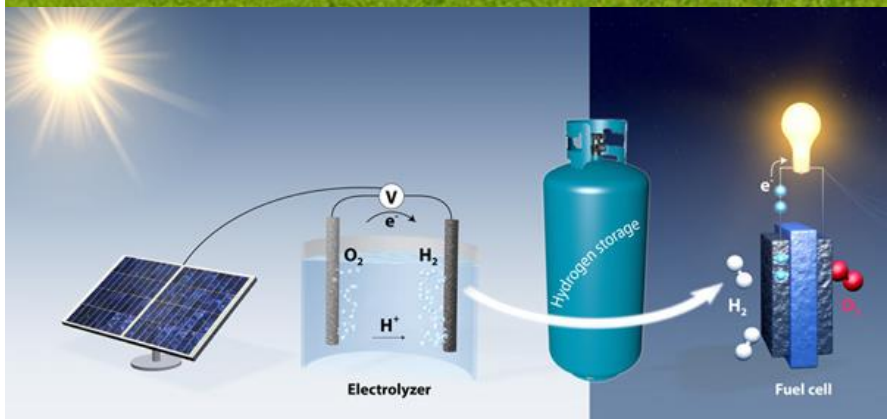
npk | design

L'orèl Consultancy


(HHarvester)
Verplaatsbaar (statisch)
optie
Bouwplan 1:6:
Optie
dyn. 10 ha
H2 PRODUCTIE
mobiele 'kruip'constructie (dynamisch)
ZonPV
2018
2019
2020
2021
2022
2023
2024
3200 x 2000


ONDERSTE LIGGER GEBOGEN IN MIDDEN

2017


V
e⁻
O2
H2
H+
Electrolyzer
Hydrogen storage
e⁻
H2
O2
Fuel cell

H2ARVESTER

2022

WORLD FIRA FEB. 6 - 8 2024

AGRI TECHNICA THE WORLD'S NO. 2023
12 – 18 NOVEMBER | HANOVER, GERMANY
PREVIEW DAYS 12/13 NOVEMBER

+sensor platform
+crop monitoring
+soil monitoring
+seeding & weeding
+drip irrigation
+arable farm & tree nursery
+fossil-free farming

ROSIE: an AI-driven, autonomous platform to out-design fungicides in rose cultivation.

CropKit — empowering small-scale farmers with accessible, adaptive technologies to support autonomy, resilience, and ecological stewardship

AI-powered disease detection for a future without fungicides: Recognizing powdery and downy mildew in Laxa seedlings, using sensor data from a self-driving sensor car and the use of biostimulants..

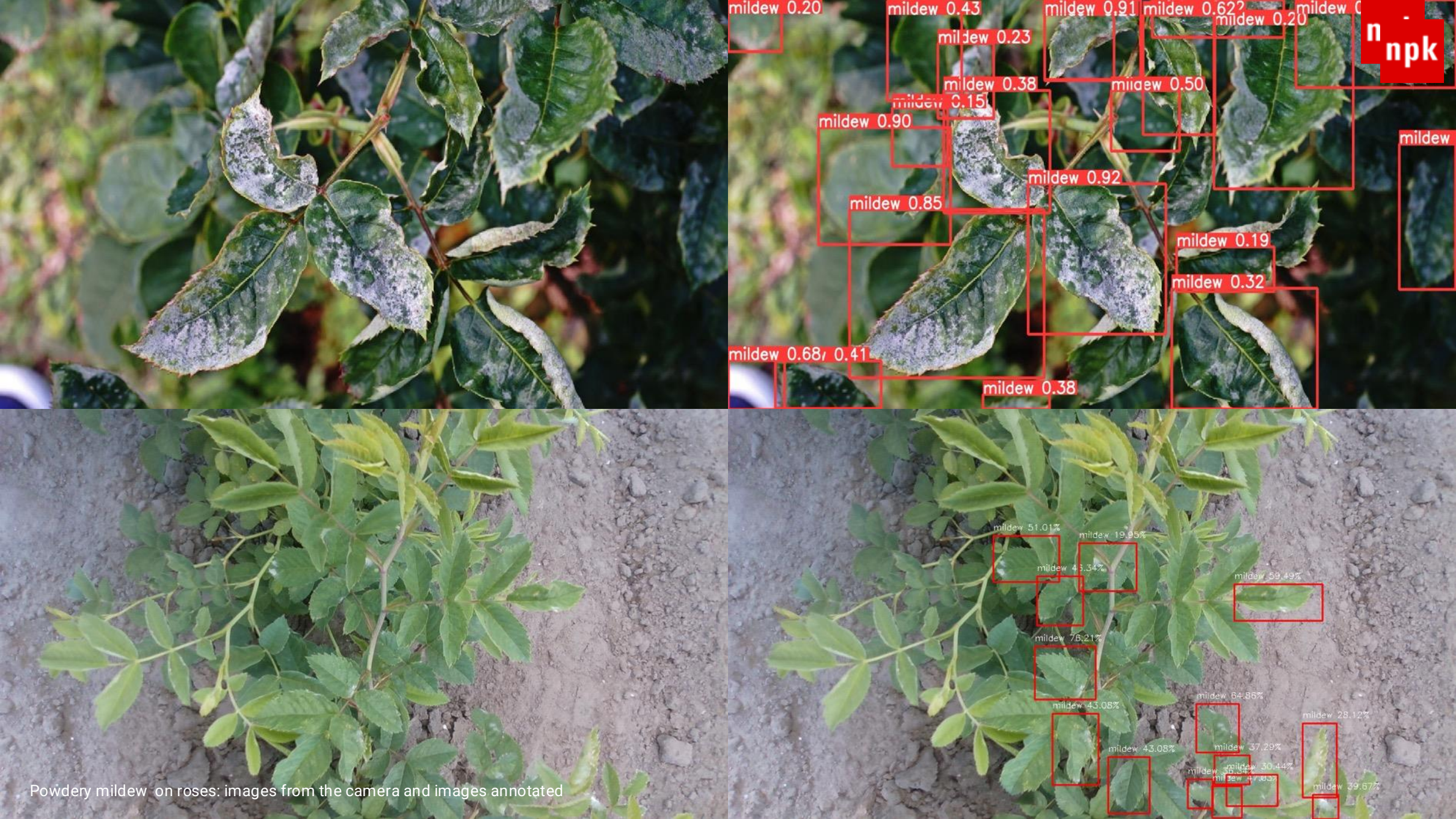
Year 1

Year 2

Laxa seedlings

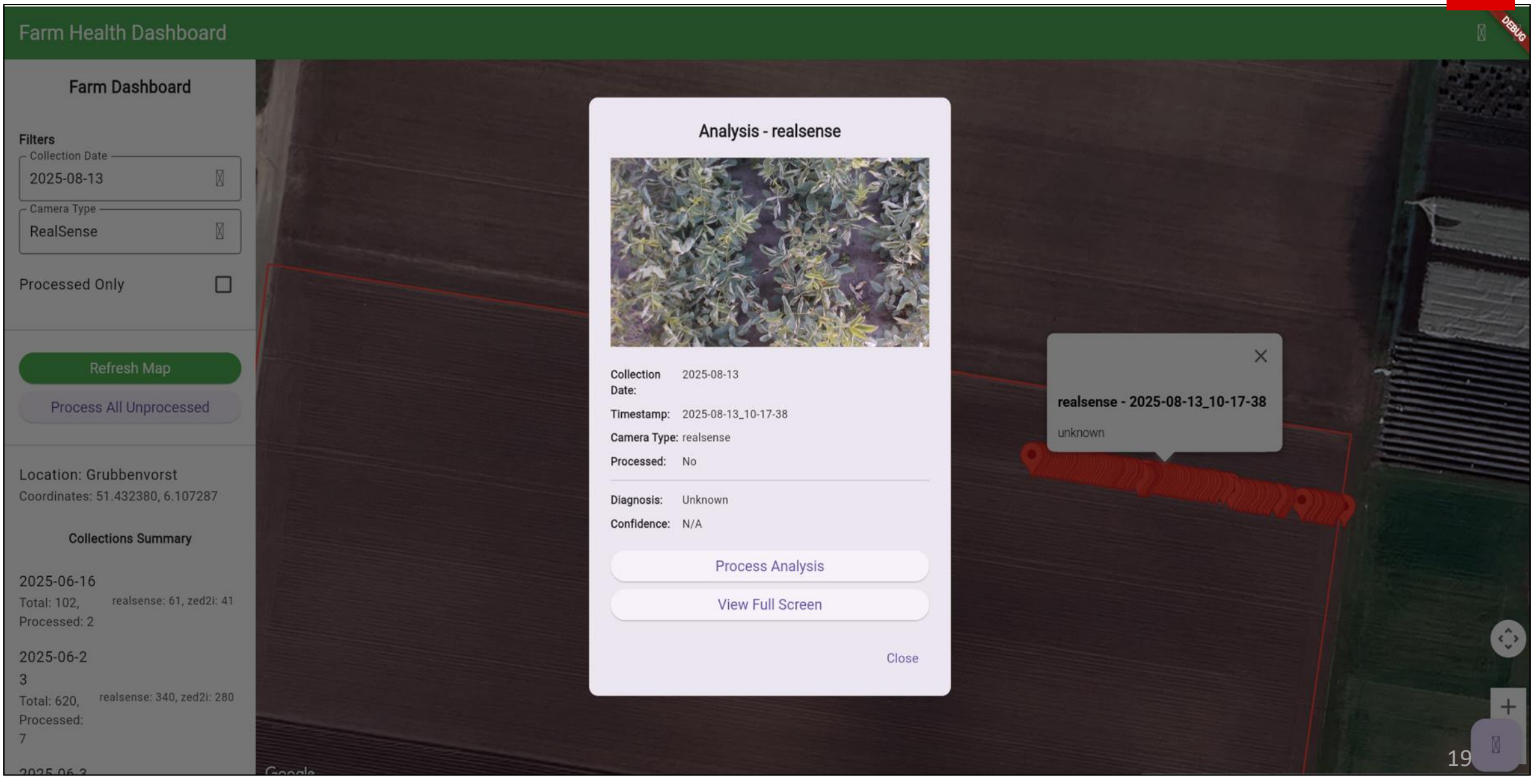
Roos cultivar

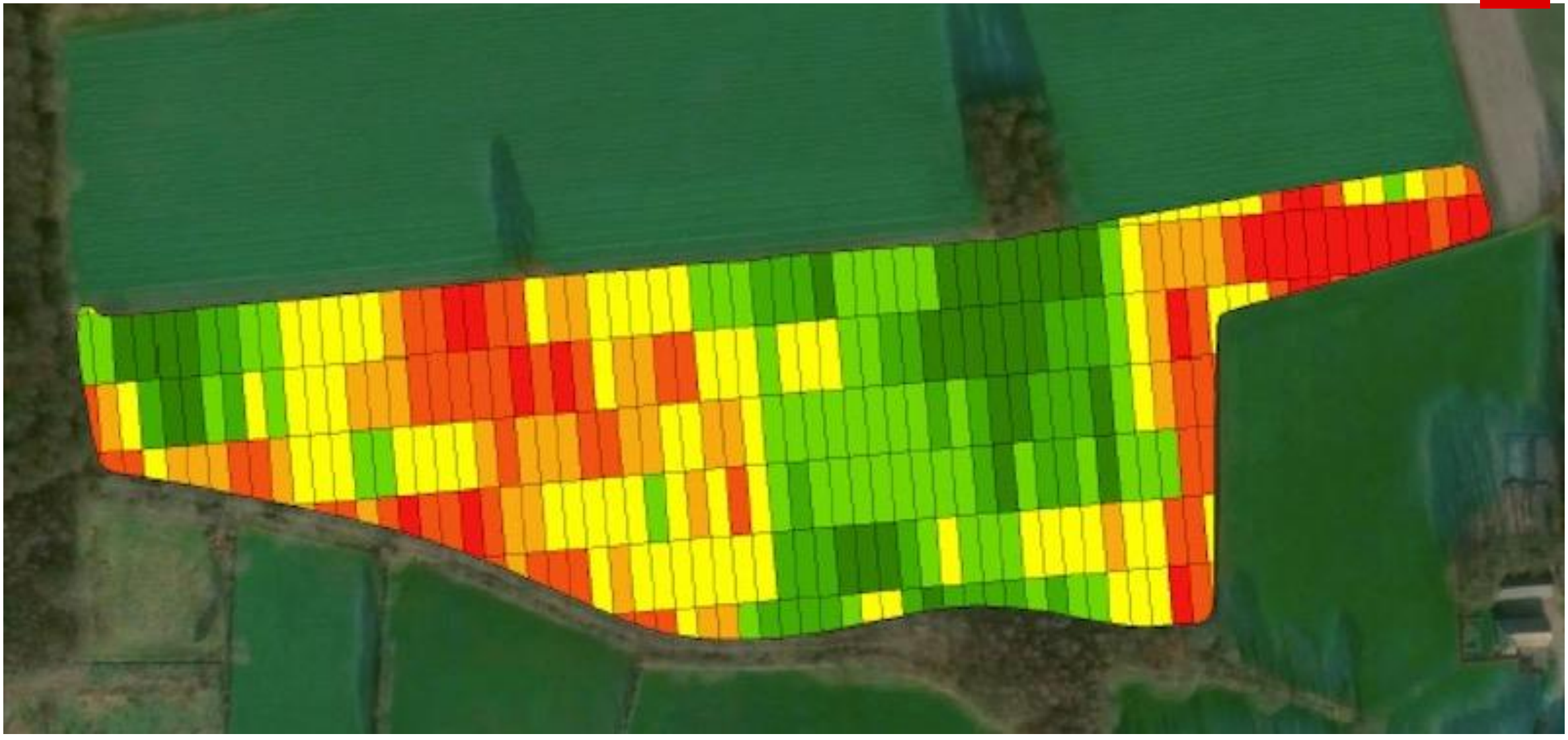
Laxa



Powdery mildew on roses: images from the camera and images annotated

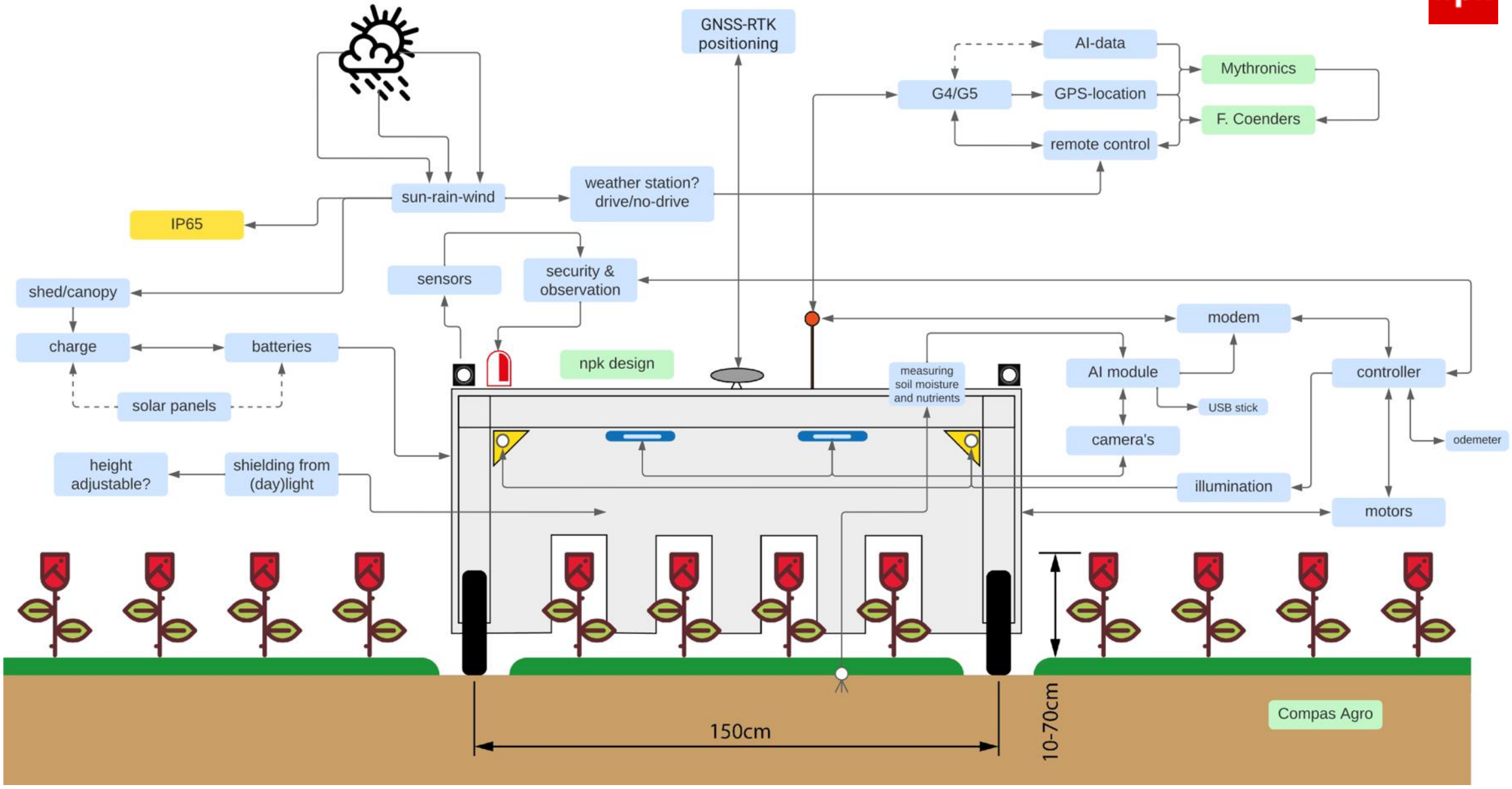

Farm Health Dashboard
DEBUG
Farm Dashboard
Filters
Collection Date
All Collections
Camera Type
RealSense
Processed Only
Refresh Map
Process All Unprocessed
Location: Grubbenvorst
Coordinates: 51.432380, 6.107287
Collections Summary
2025-06-16
Total: 102, Processed: 2
realsense: 61, zed2i: 41
2025-06-23
Total: 620, Processed: 7
realsense: 340, zed2i: 280
2025-06-3
Google

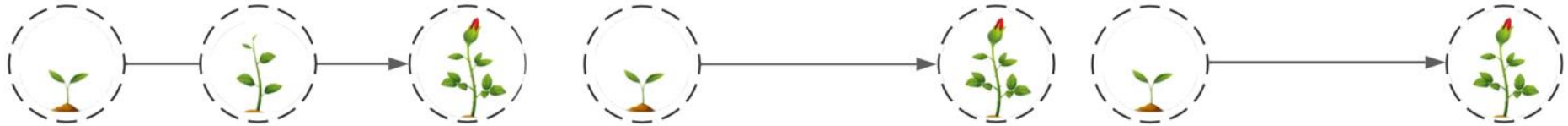

Farm Health Dashboard
Farm Dashboard
Filters
Collection Date
2025-08-13
Camera Type
RealSense
Processed Only
Refresh Map
Process All Unprocessed
Location: Grubbenvorst
Coordinates: 51.432380, 6.107287
Collections Summary
2025-06-16
Total: 102, realsense: 61, zed2i: 41
Processed: 2
2025-06-23
Total: 620, realsense: 340, zed2i: 280
Processed: 7
Analysis - realsense
Collection Date: 2025-08-13
Timestamp: 2025-08-13_10-17-38
Camera Type: realsense
Processed: No
Diagnosis: Unknown
Confidence: N/A
Process Analysis
View Full Screen
Close
realsense - 2025-08-13_10-17-38
unknown
Google



Example of a heatmap for the grower

Bringing vision to reality.


GNSS-RTK positioning
AI-data
Mythronics
G4/G5
GPS-location
F. Coenders
remote control
sun-rain-wind
weather station? drive/no-drive
IP65
sensors
security & observation
shed/canopy
charge
batteries
solar panels
npk design
modem
measuring soil moisture and nutrients
AI module
controller
USB stick
camera's
odemeter
height adjustable?
shielding from (day)light
illumination
motors
150cm
10-70cm
Compas Agro

	1	2	3	4
Phase and duration	2024 (May, June)	2024 (July - October)	2025 (May - October)	2026 (May - October)
	Seedlings planted	Test runs	Year 2	Year 3
Vegetation phase				
Main topic	Pre Testing	AI Training	Functional Testing	Experiment monitoring, final validation
Vehicle Mobility Status	Static	Semi-mobile (manual, no steering)	(semi) autonomous	Autonomous
AI System Status	Definition of image requirements	Image gathering for teaching AI system	Taught, testing, optimisation and finalisation	Fully operational, in demonstration for monitoring
Vehicle Status	Mounting base for cameras and lights	Moving base for cameras, lights and shading, functional model	Base for cameras, lights and shade on autonomous ready base module	Base for cameras, lights and shade on autonomous ready base module
Environment	Lab Environment (Photostudio npk)	Greenhouse / test field	Test field / real field	Real field
npk design	Base preparation	First functional tests with movable base	Integration of results onto autonomous platform	Optimisation and validation of integrated autonomous platform
Mythronics	Definition of lights and cameras	Image gathering for AI training / AI training / dev. of App	Demonstration and optimisation of AI based mildew detection	Demonstration and optimisation of AI based mildew detection
Compas Agro		Application for image gathering	Application for testing and optimisation	Conducting bio-input testing, application of vehicle for testing, optimisation and validation

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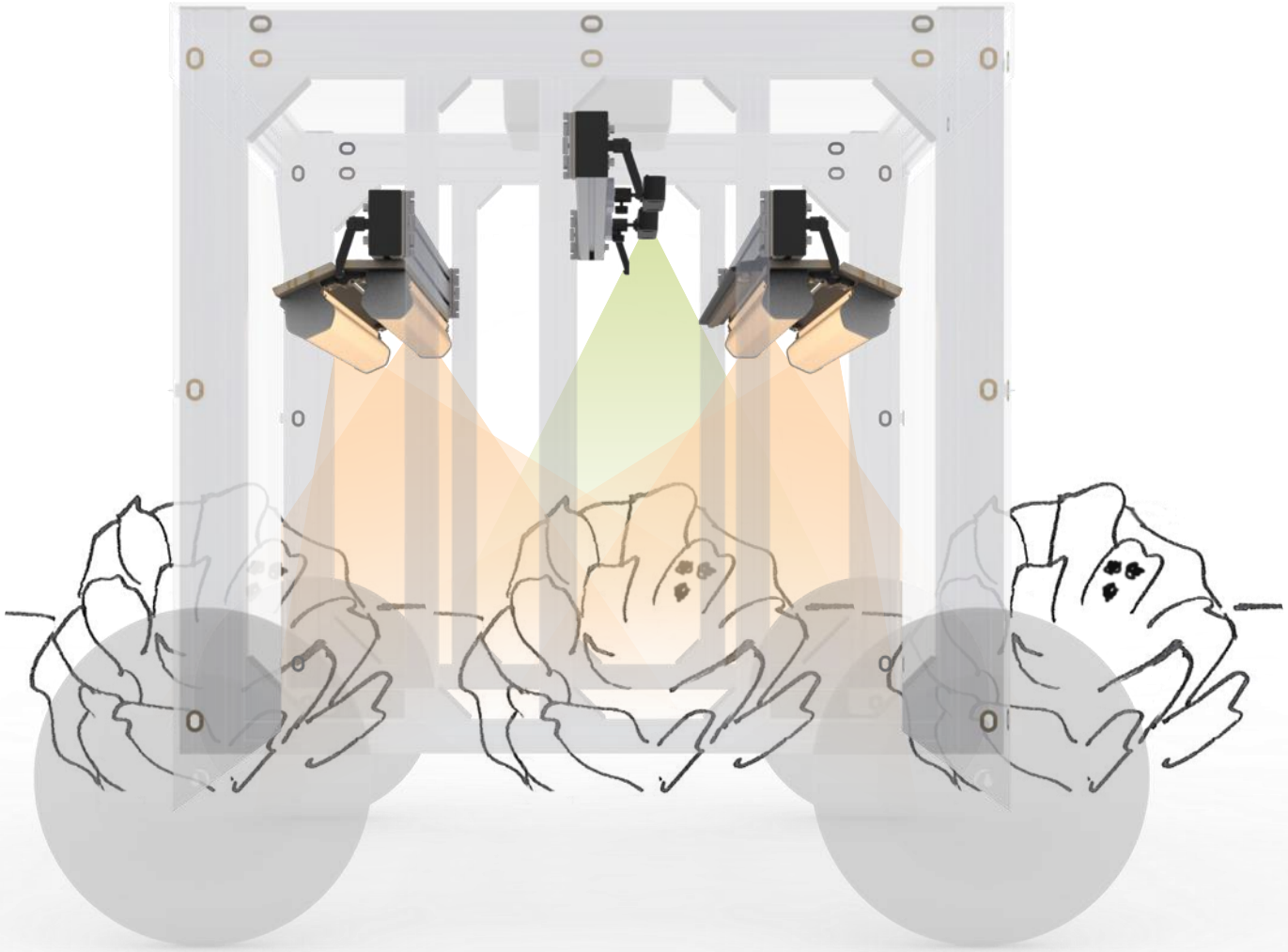
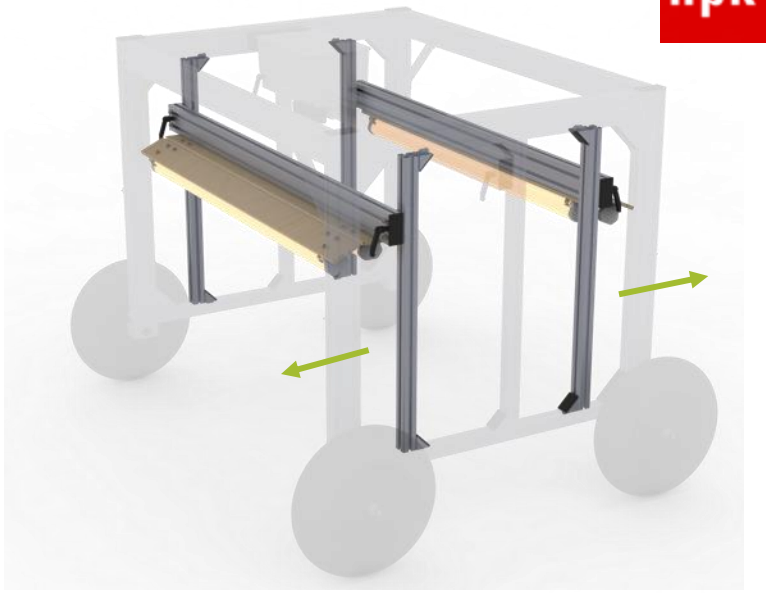
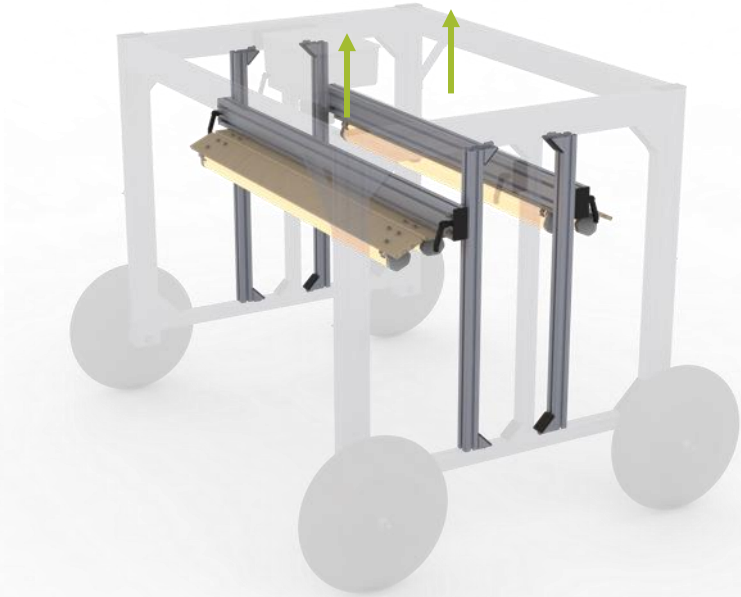
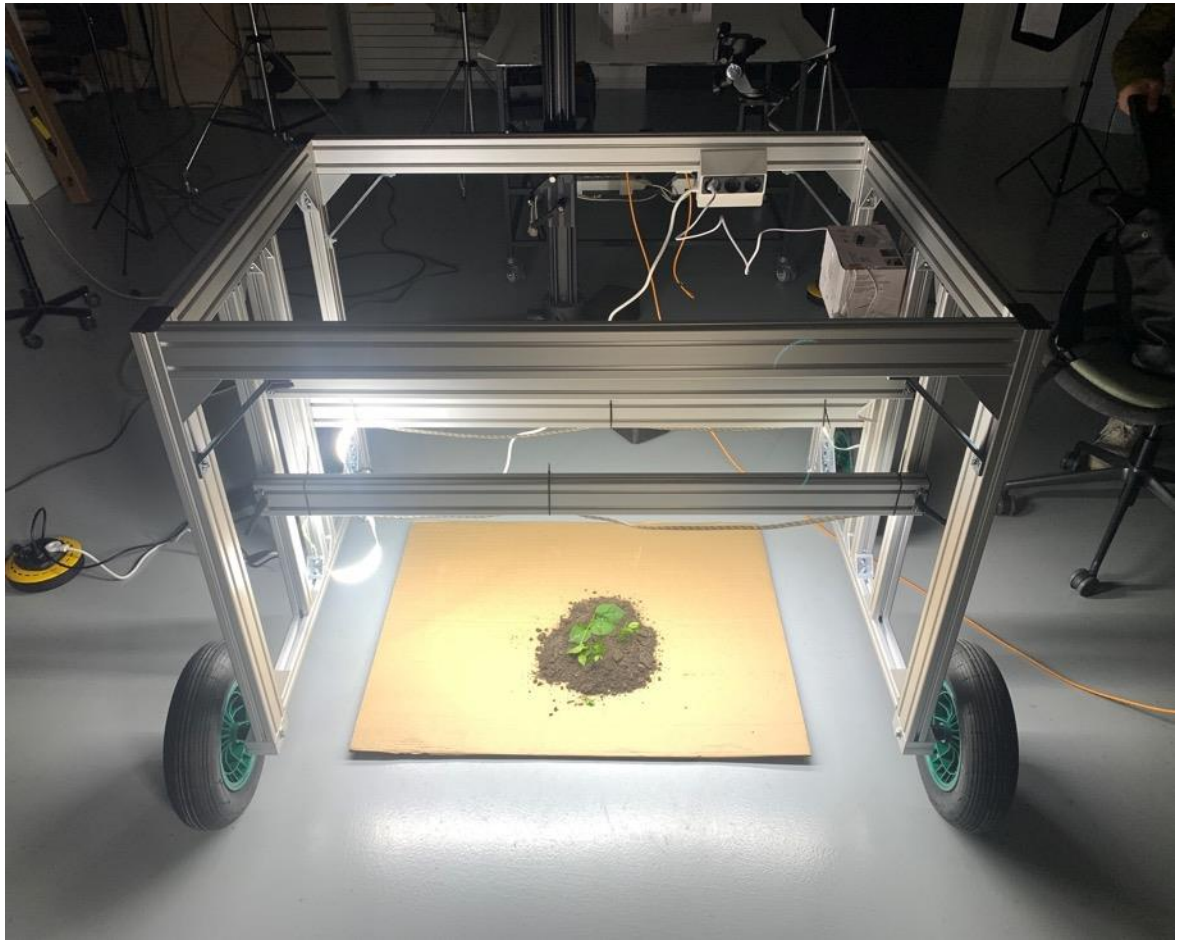


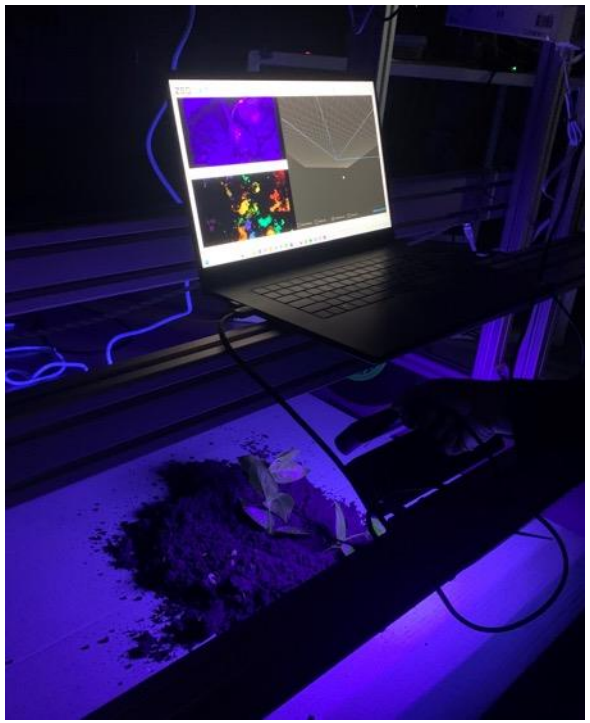




Light and camera setup— ROSIE

Build to learn — Unlocking insights through prototyping.





Light and camera setup — Experimental testing — ROSIE

	1	2	3	4
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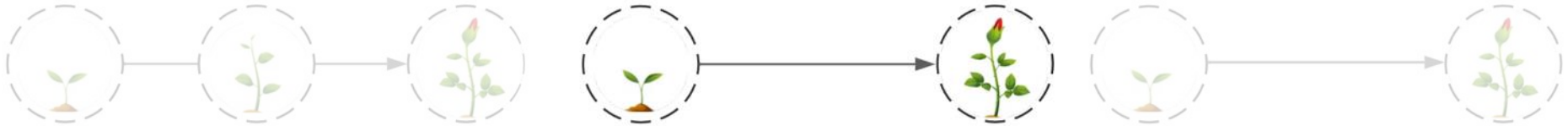
Let's provide shading!

Project ROSIE — Year 1 Buildup — Schematics: without and with shading system

Project ROSIE— Year 1 Testing: on test fields of Compas Agro (Venlo) and on the rose nursery of Frank Coenders Rose nursery (Grubbenvorst)

Phase and duration	1 2024 (May, June)	2 2024 (July - October)	3 2025 (May - October)	4 2026 (May - October)
	Seedlings planted	Test runs	Year 2	Year 3
Vegetation phase				
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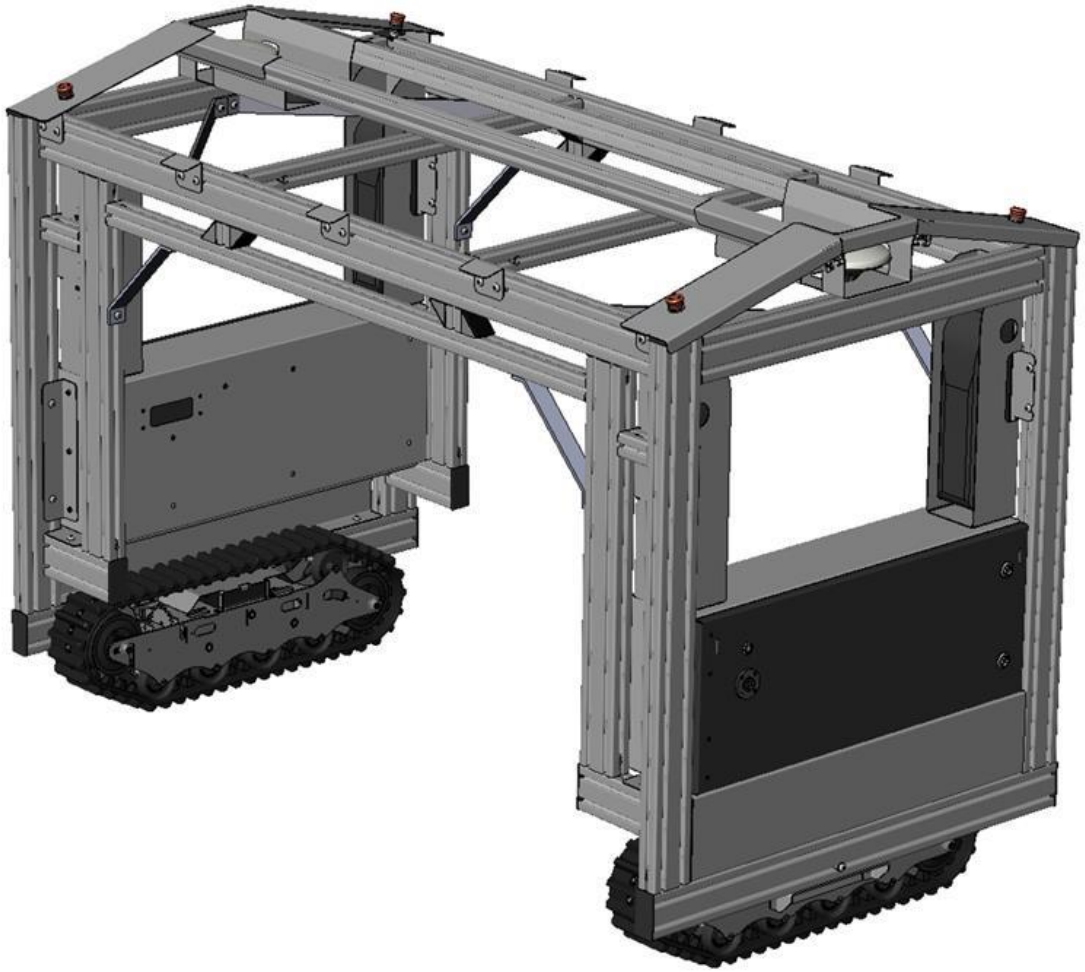
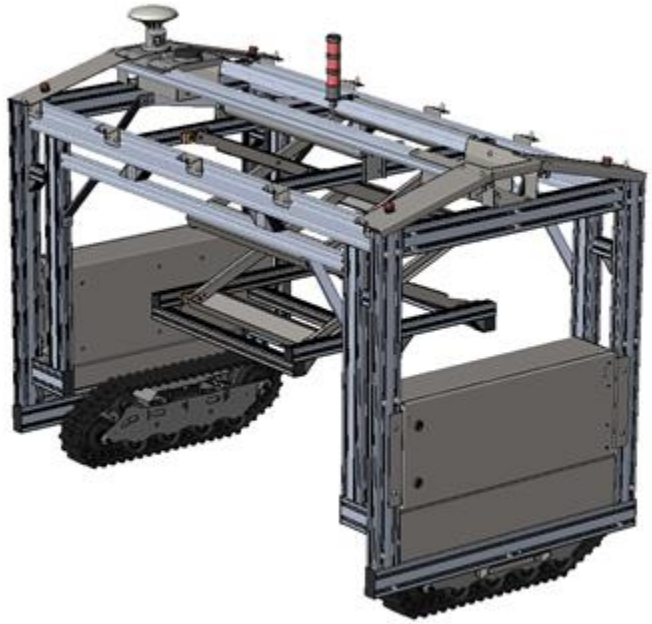
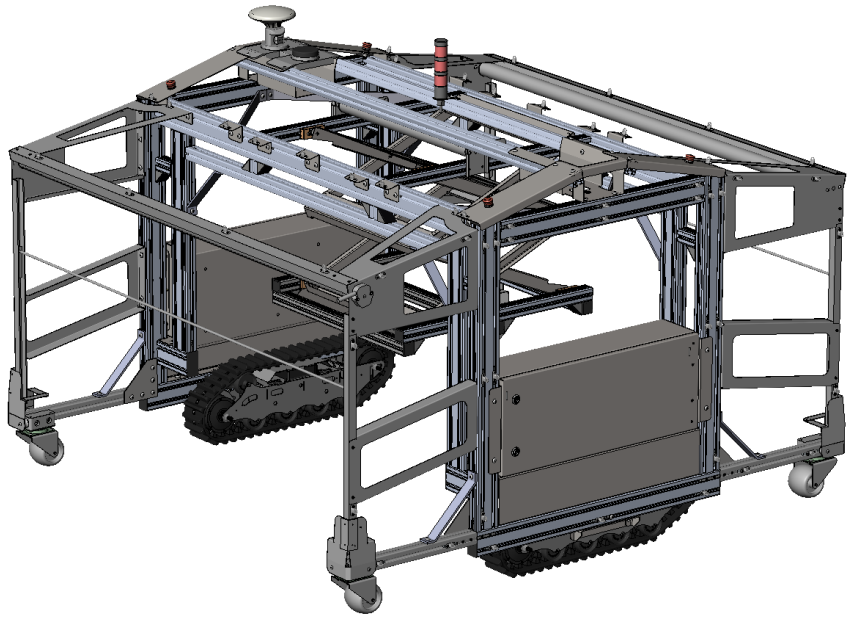
Let‘s make it drive-able!

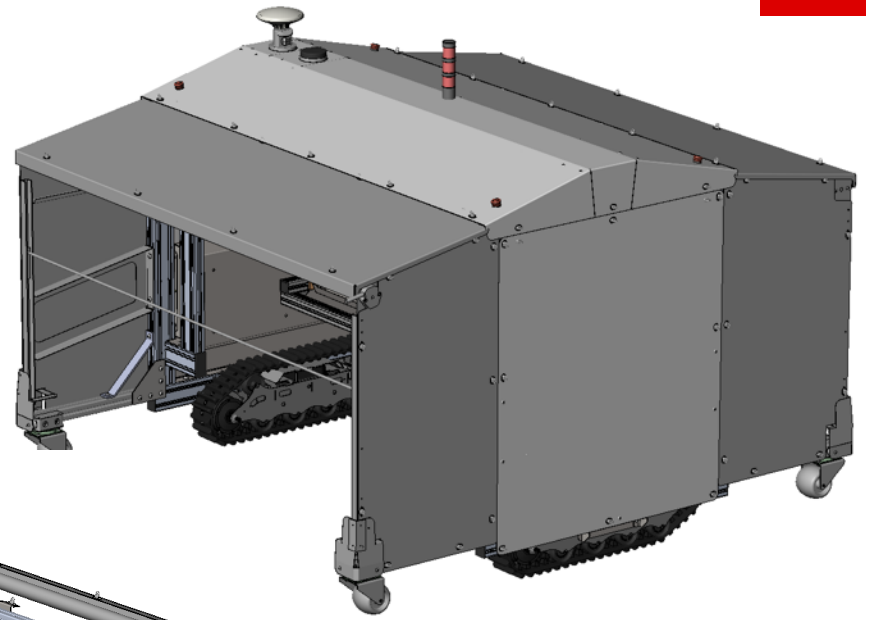


Project ROSIE — 2025 development: from manual operation to

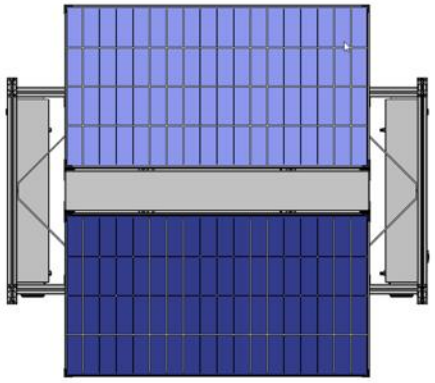
Project ROSIE — Chassis Design

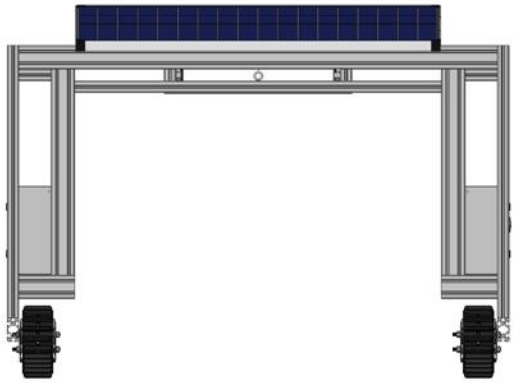


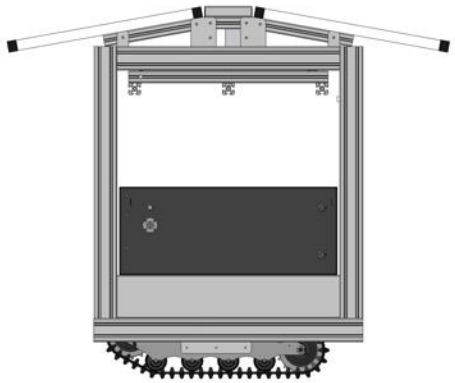


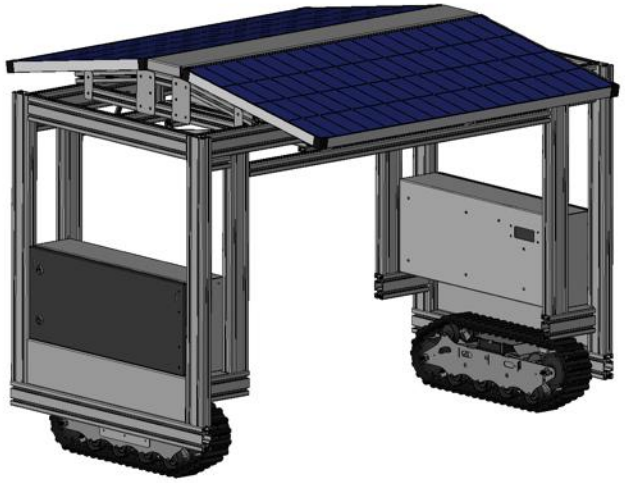


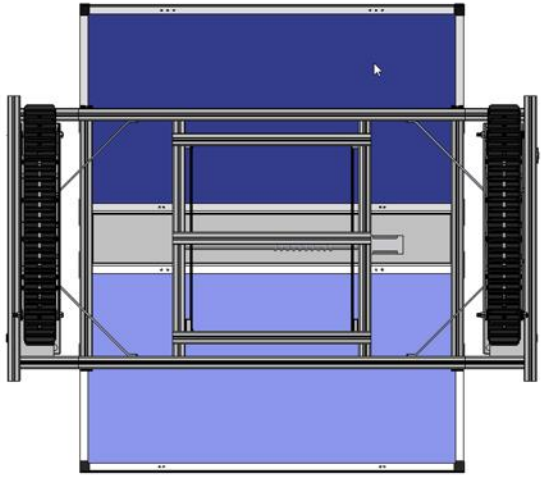
Let‘s make it autonomous drive-able!











Project ROSIE — 2025

The road forward – what‘s next?

1. Meeldauw bij rozen
2. Roest op prei
3. Bestrijding van knolcyperus
4. Plaagdetectie bij boomkwekerij

What can we help you with right now?

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strategic product innovation