

A blue and orange Plantalyzer machine is positioned in a tomato field. The machine has a vertical silver panel on top and a blue base with orange accents. It is surrounded by rows of tomato plants with green and red fruit. A semi-transparent green banner is overlaid across the middle of the image.

# PLANTALYZER®

The most accurate crop estimation

Powered by:



**royal brinkman**

global specialist in horticulture





# Who we are



Supply chain, service & advice



2021

Turn-over: 246 m€

Employees: 461 FTE

Local offices: 14 countries

## Berg Hortimotive Group

50% (via RB)



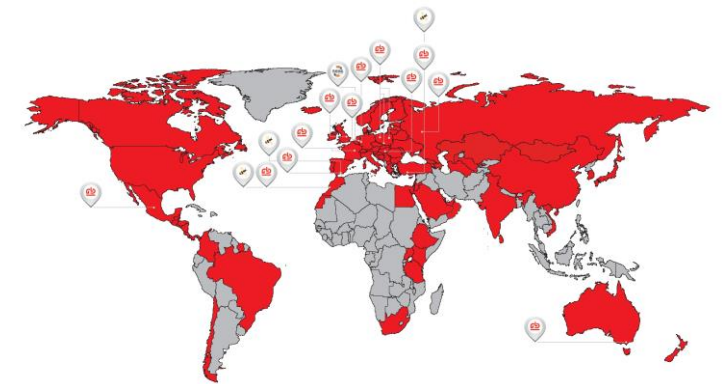
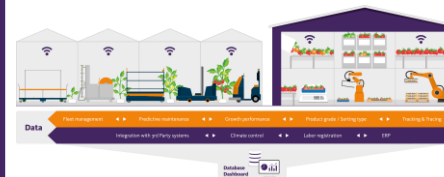
Plant data



Intelligent logistics



Turn-key logistics





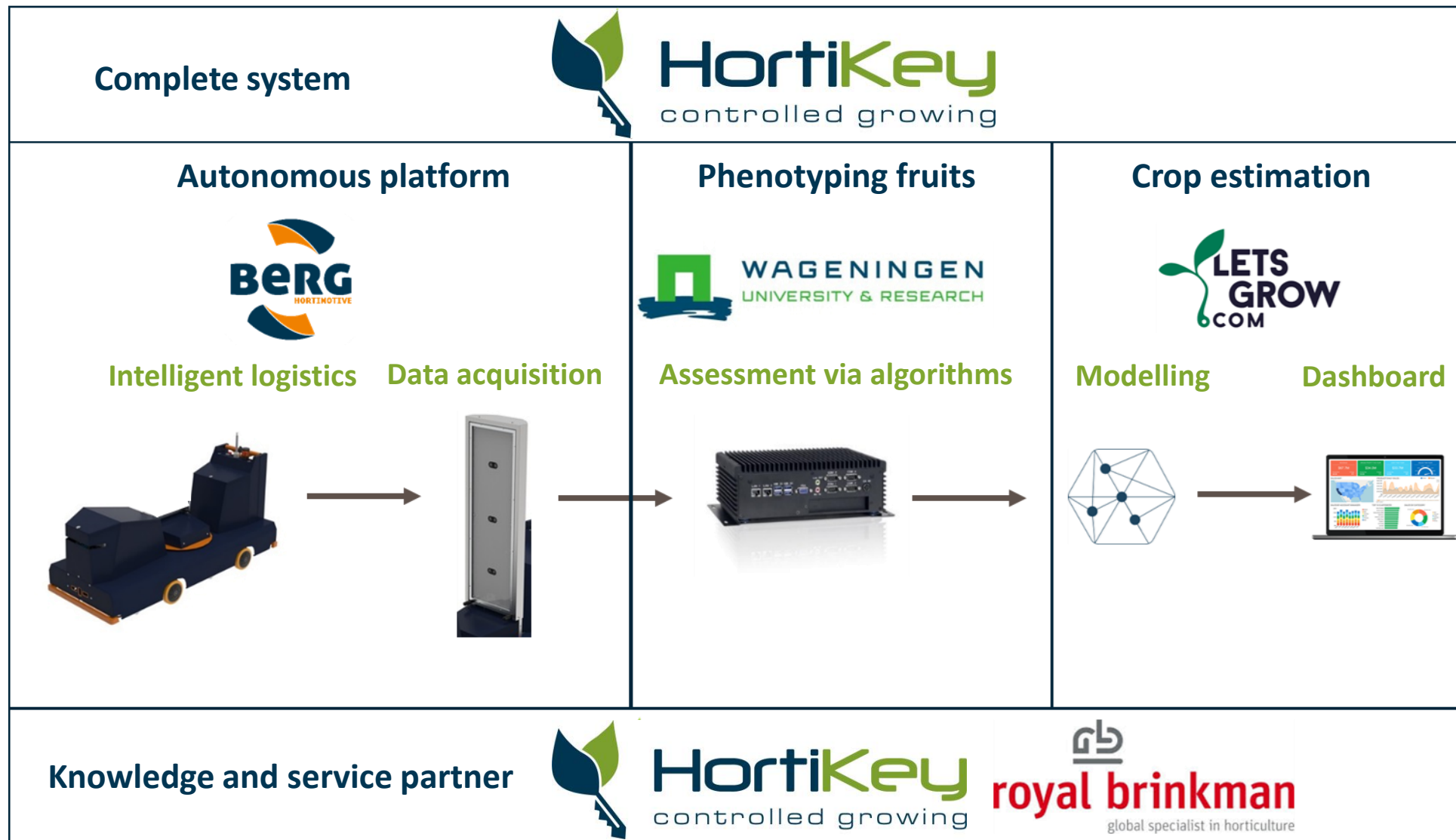
# Daily struggle

- When to harvest?
- How much produce to be harvested?
- Is there enough product to harvest?
- How many employees do I need?
- Is there enough product to sell?





# Merging unique knowledge

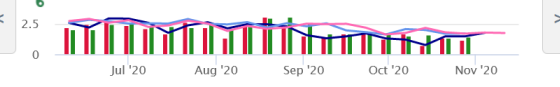




### Prognose

00-00-00

Wed Aug 19, 2020 (34)

Prognose (2020 Oo   1d  Jun 6, 2020 - Dec 6, 2020 

● 3.13 ● 3.08 ● 2.51 ● 2.24 ● - ● 2.13 ■









## Kleurstadia Categorie

Kleurstadia Categorie (2)   5m  Oct 23, 2020 - Nov 6, 2020 

### Plantalyzer

>> Plantalyzer (2020 Oogstprognose)

11/06/2020

Item	30-10-20	31-10-20	1-11-20	2-11-20	3-11-20
 number all color stage - #/m <sup>2</sup> -	6.4	6.2	-	10.2	14.0
 number color stage 01 - #/m <sup>2</sup> -	3.7	3.3	-	5.2	7.7
 number color stage 02 - #/m <sup>2</sup> -	1.7	1.6	-	2.8	-
 number color stage 03 - #/m <sup>2</sup> -	0.5	0.6	-	0.8	-
 number color stage 04 - #/m <sup>2</sup> -	0.3	0.3	-	0	-
 number color stage 05 - #/m <sup>2</sup> -	0.2	0.2	-	-	-
 number color stage 06 - #/m <sup>2</sup> -	0.2	0.1	-	-	-
 number color stage 07 - #/m <sup>2</sup> -	0.2	0.1	-	-	-

### Alle kleurstadia



Alle klei

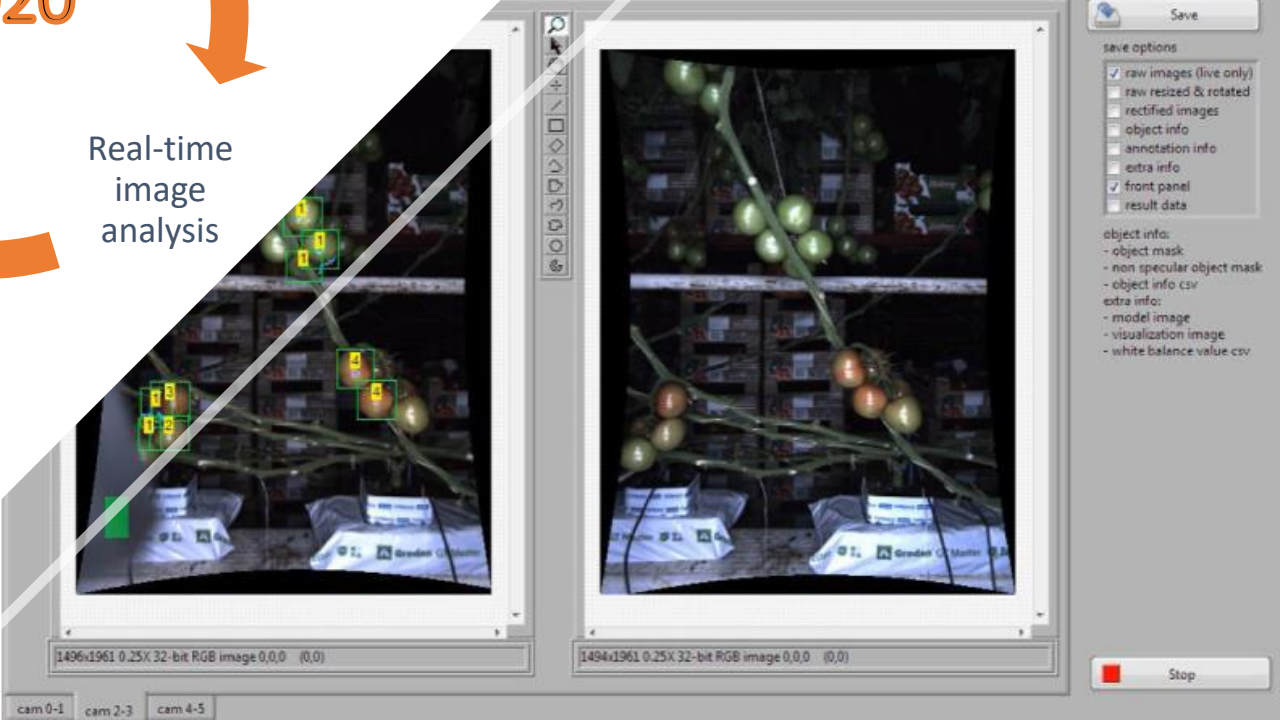
## Automatic crop estimation

## Autonomous gathering of plant images

2020

Automatic  
data transfer

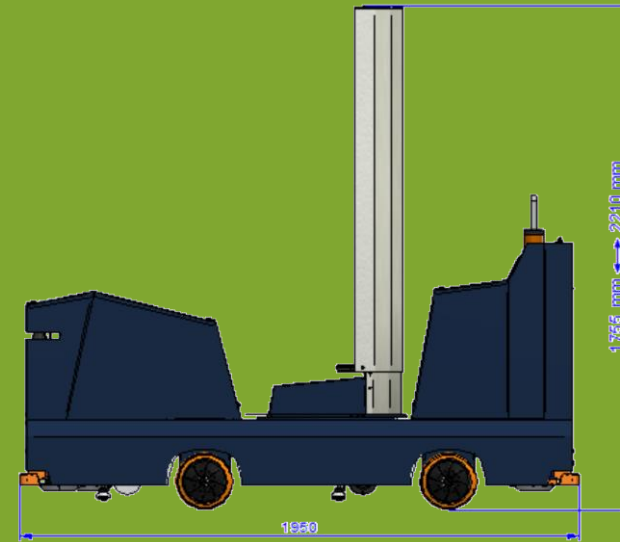
## Real-time image analysis

[illegible]



# Technical specifications

- Industrial PC
- 6 x 1,9MP color cameras
- 4 x LED flash lights
- Dedicated wifi network
- 2D-LiDAR-sensor
- Battery capacity 159Ah
- Manual adjustable vision pole in height: 10 steps over 45cm
- Length 195 cm, width 72 cm, height 221 cm & weight 480 kg







# Crop monitoring



HortiKey  
controlled growing



# Numbers and color stages

## Imaging

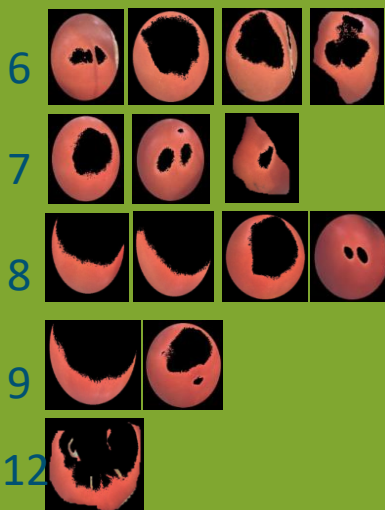
- 2000 m<sup>2</sup>/24h
- >1,4ha/week
- 60 images/meter
- Driving speed 12cm/sec  
432 m/h

## Assessment

- Done locally at the trolley
- 12 color stages
- 0,8s per assessment
- 432 images per minute

## Classifying

- Unique cluster ID
- Each tomato unique ID
- X/Y/Z position mapping
- Color auto correct per image







# BergDrive connected to...





# Prognosis

- Automatic data transmission to LetsGrow.com
- Input for modelling i.a. climate and meteo data
- dashboarding
  - Color stages
  - amounts
  - Data input
  - Prognosis 1, 2, 3, & 4 weeks ahead
  - Heat map







# Benefits

## More grip on pricing:

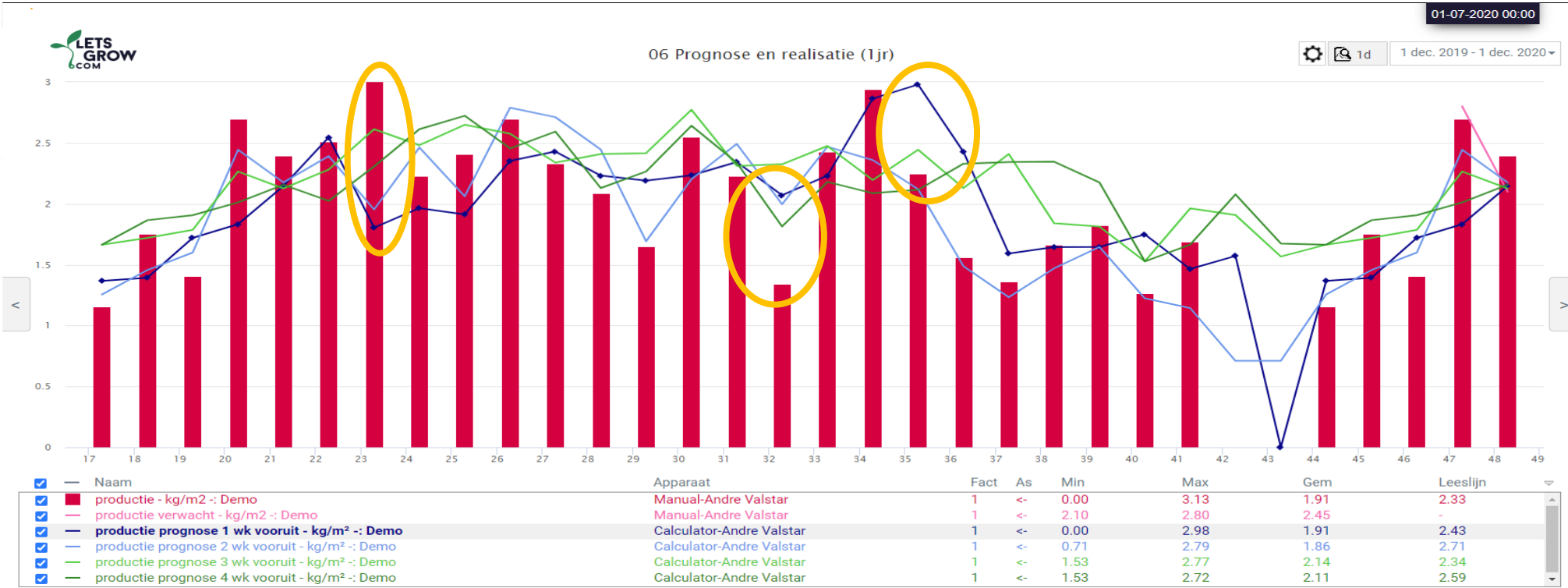
- ✓ **Sales price:** fitting demand and supply with actual stock data;
- ✓ **resources:** planning labor and logistics and other resources;
- ✓ **volume:** more detailed insights in volume enables closing the right deal.

An accurate crop estimation improves delivery reliability and customer satisfaction substantially.





# Gap between manual and by model







# Learnings 2021

- Motion: works in different environments
- Vision: from big TOVs to small cherry tomatoes
  - Development of DeepLearning model



- Partnering TomatoWorld for i.e. Imaging database
- Prognosis: basis model needs to be tuned per tomato segment





A blue and orange Plantalyzer device is shown in the foreground, positioned on a wooden surface. The device has a blue upper section with a black sensor head and a blue lower section with an orange base. The background is a greenhouse filled with tomato plants, some with green and some with red tomatoes. A semi-transparent green banner is overlaid on the image, containing the text "PLANTALYZER® Q&A".

# PLANTALYZER® Q&A