Automation in horticulture

ISO Graft 1100

ISO Cutting and Planting 1800

ISO PlantSampler

ISO Robot Plug Planting machine

- Subjects of today -

- Introduction
- Who is ISO Group and what we do?
- Why and how we automate in horticulture?
- The developments in automation in horticulture
  (focus on the current developments of sticking cuttings
  with robotics)
- The future of automation in horticulture and the use of robotics in greenhouses and nurseries

Raymond van den Berg

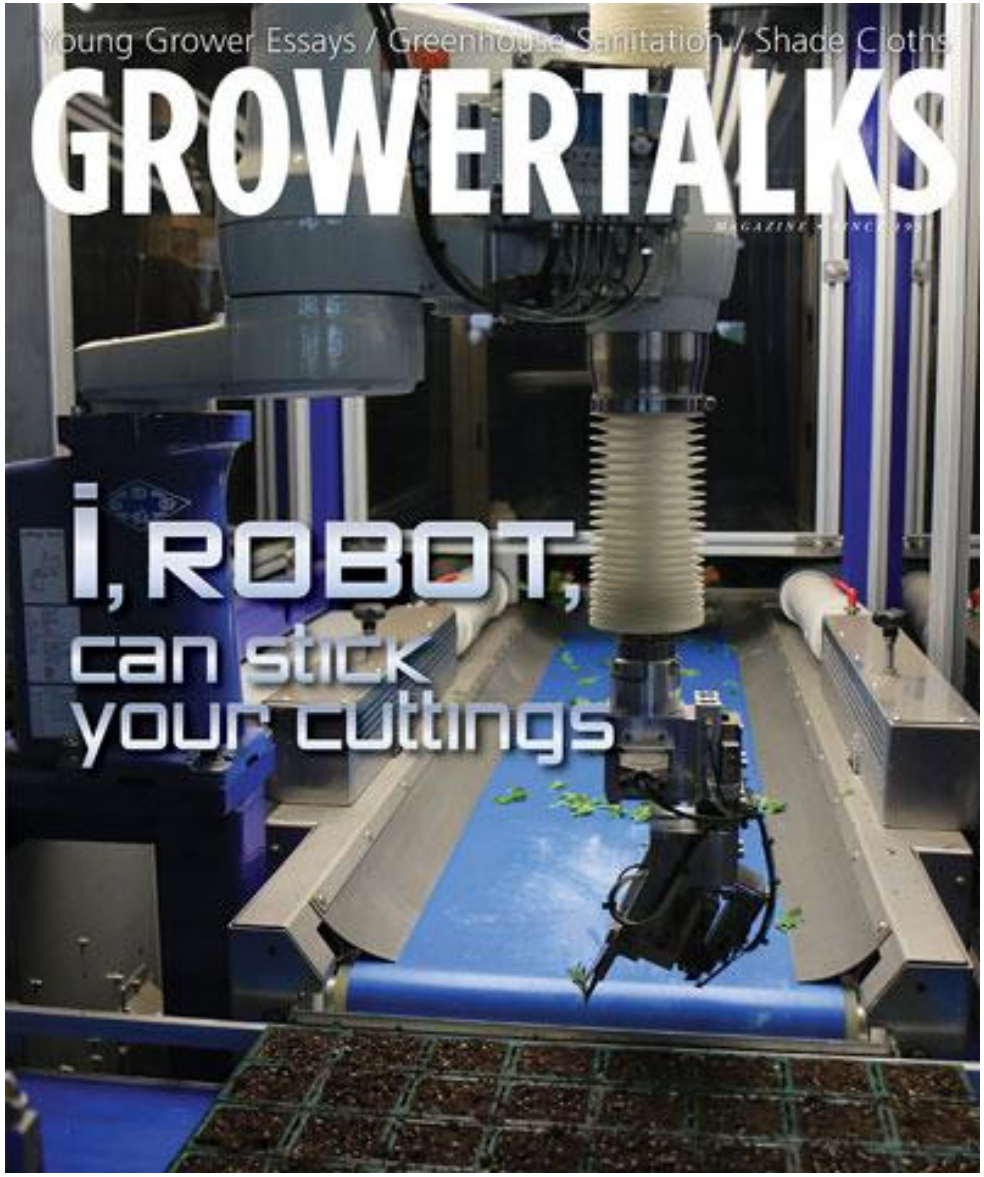
- Product- and Sales manager of ISO Group
- Raised near a greenhouse ((sun and brother) of a bell pepper grower)
- Ing. Business Engineering
- More than 12 year experience in greenhouse automation

- Introduction ISO Group

ISO Group makes industrial technology applicable for the horticultural industry

The focus of ISO Group is to automate difficult and monotonous labor tasks in the greenhouse industry by using

(3D) Vision technology and robotics



- What we do -

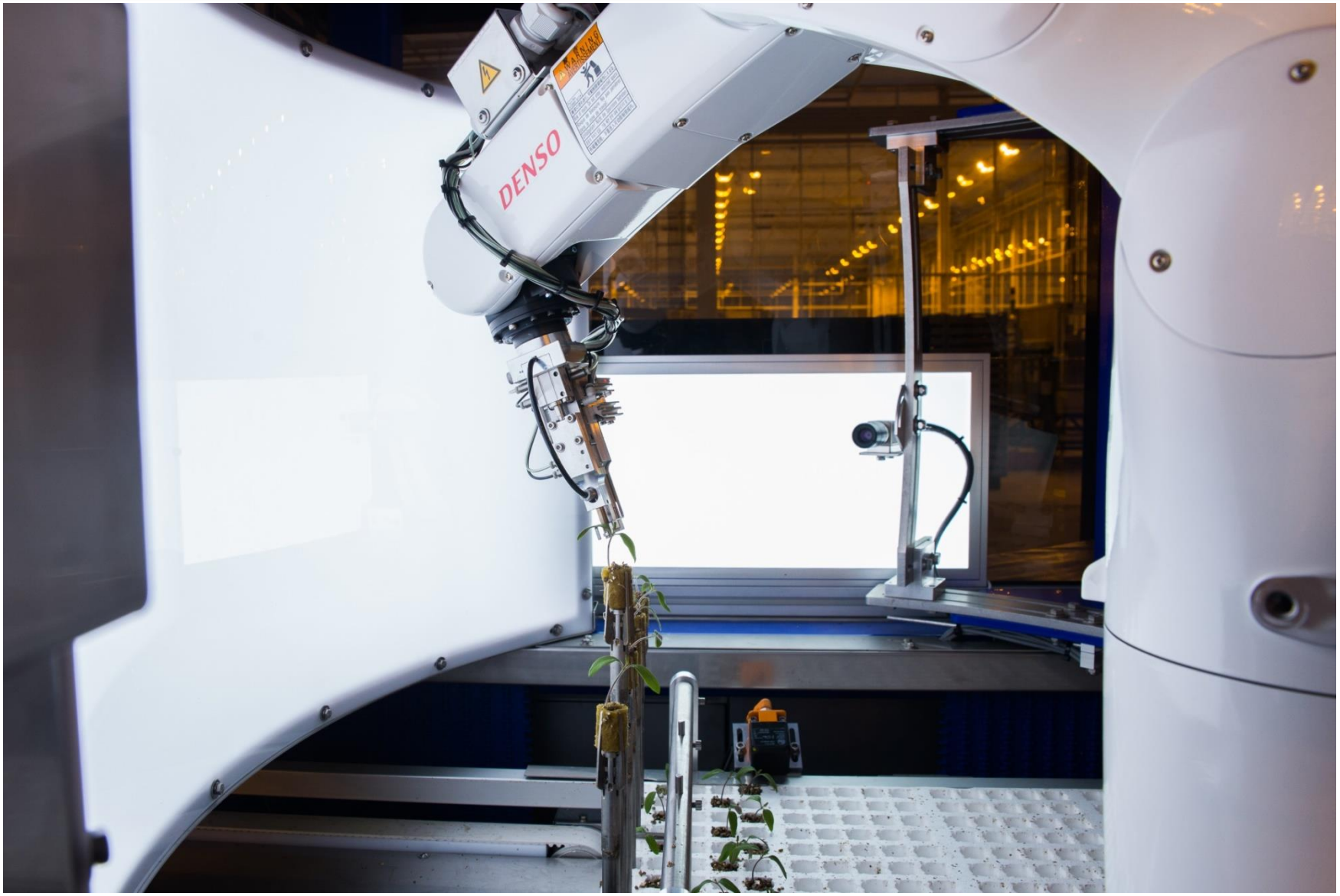
The ISO Group combines:

- Robotics
- Vision software
- 3D technology
- High-end mechanical expertise
- Knowledge of the horticultural industry

- Who are the customers of ISO Group? -

- Seedling companies and breeders

- Who are the customers of ISO Group? -



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Newest development of ISO Group:

The ISO Robot Plug Planting machine
Sticking plant plugs straight into the full ground

RPP_in_Action.mp4

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- Growers of potted plants and annuals

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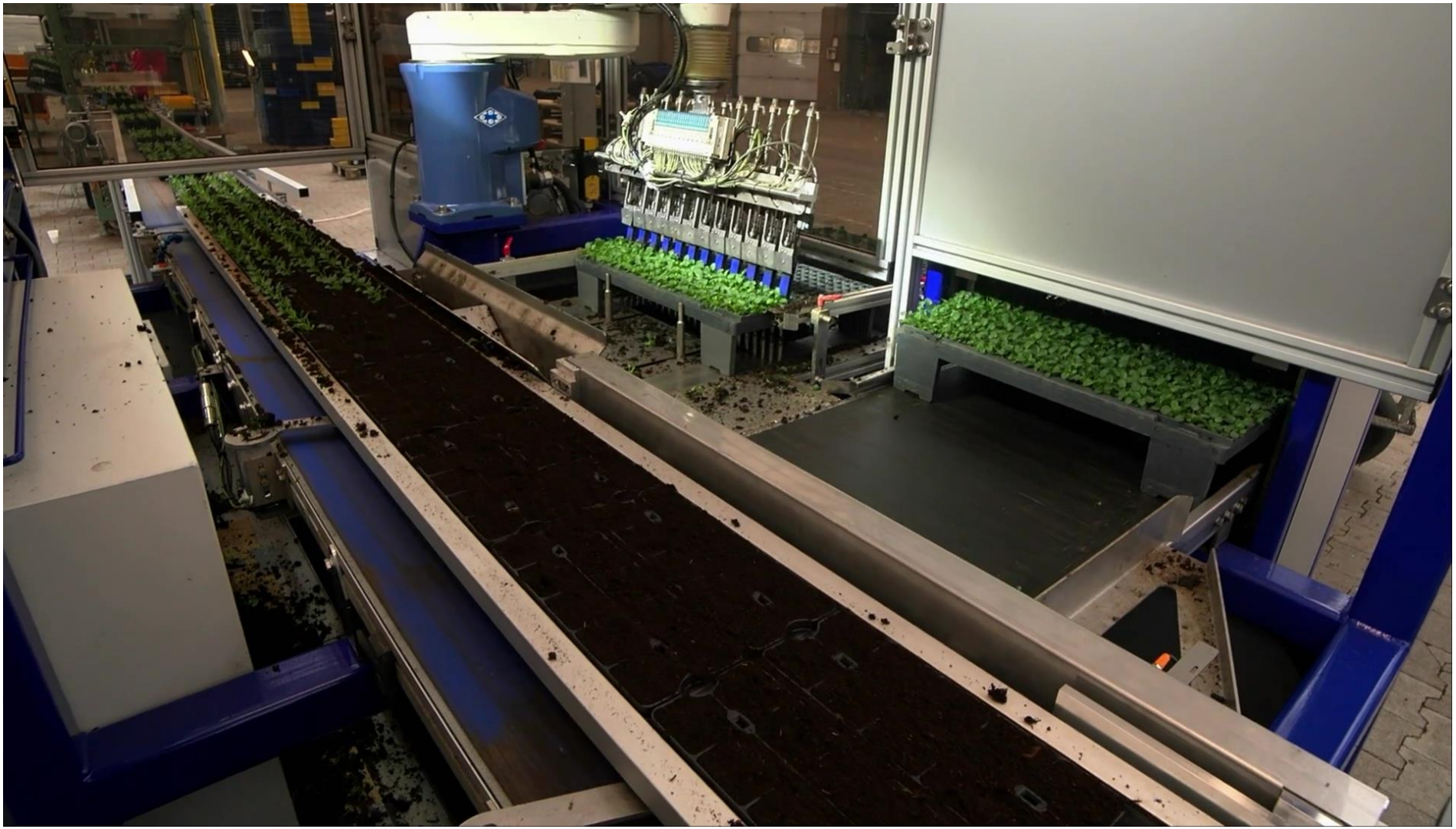

- Who are the customers of ISO Group? -

- The importantance of robotics -

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- Makes planning more easy
- Prevents monotonous work and works more efficient
- Higher productivity and efficiency of the horticultural industry
- Higher quality product
- The use of high-end software with deep learning intelligence makes robots help to get more data of the growing process

The ISO Cutting Planter 2500

GREENHOUSE GROWER℠
MEDAL OF EXCELLENCE
TECHNOLOGY OF THE YEAR

Detail_sticking.mp4

Robotic Sticking Machine at Four Star.mp4

- The ISO Cutting Planter 2500 -

ISO GROUP

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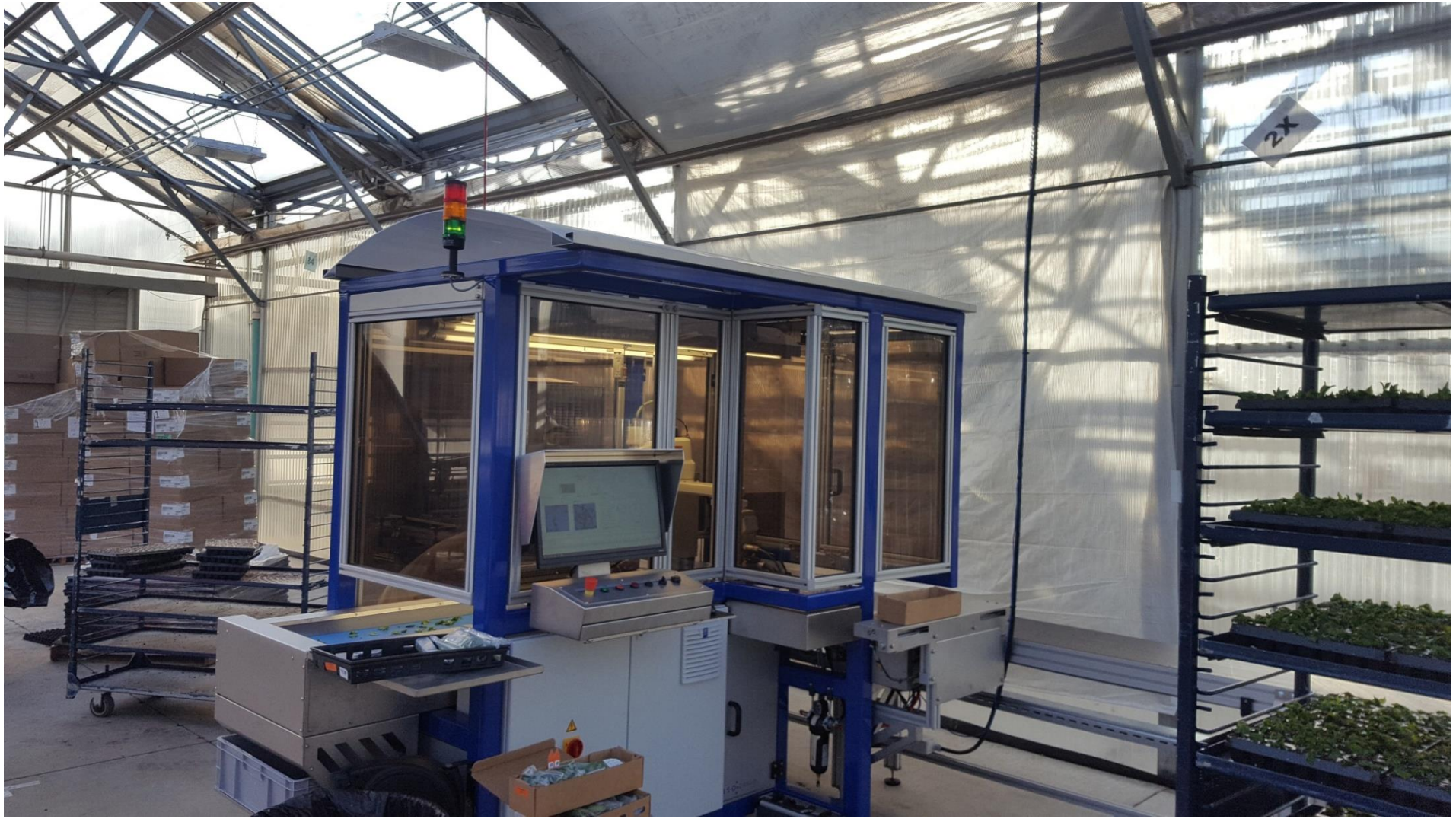

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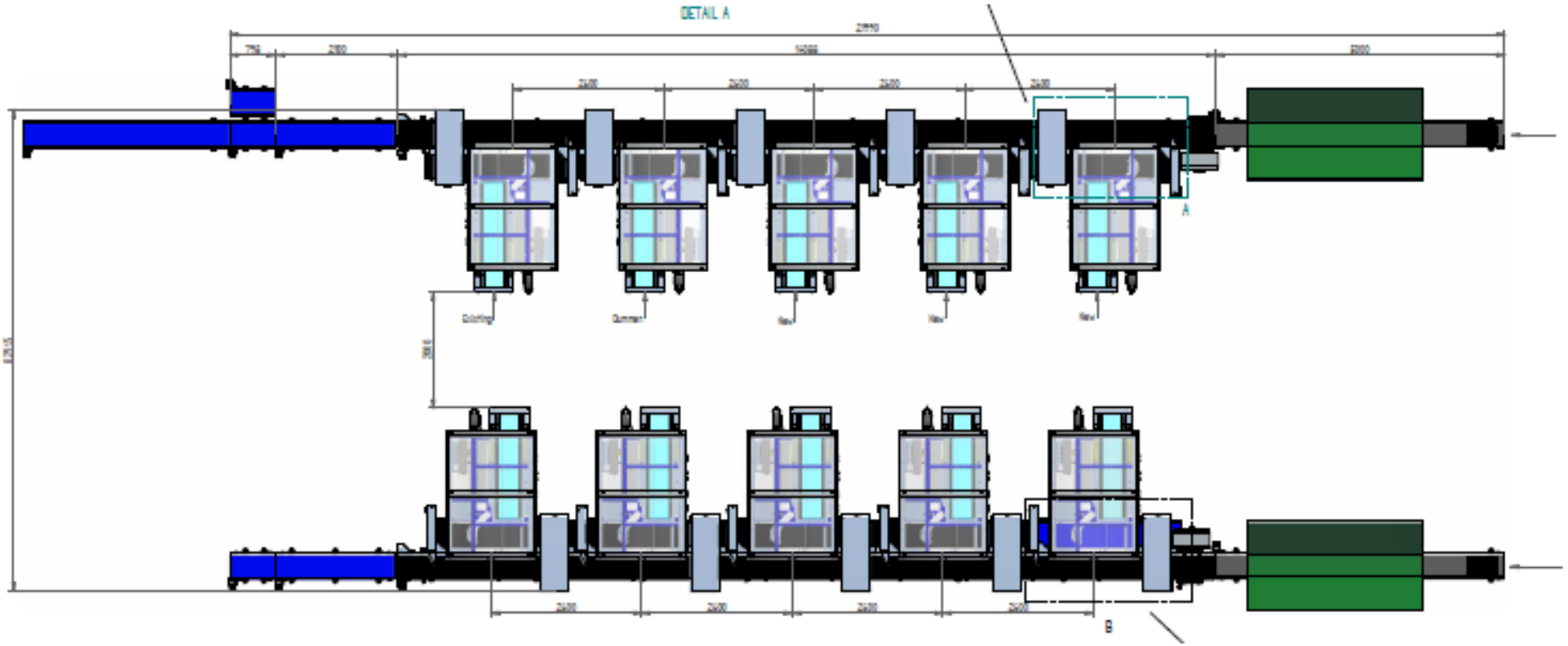
- The ISO Cutting Planter 2500 -



- Recent developments sticking cuttings with robotics -

- Machine more versatile
  - Started with annuals, and now ready for trees and potted plants
- Change in quality of cuttings in the sector
  - ‘ISO Proof’ cuttings
- The ISO machines are not a test anymore
  - But a direct replacement of sticking crews
- Machines are (in some cases) used 24-hours a day
  - It changes how nurseries are used
- Optimalisation of the sticking and growing proces of cuttings
  - Irrigation schedules are changing (sticking in ‘wet’ or ‘dry’ medium/ soil)
  - Sticking smaller cuttings (for beter results and higher speed of sticking)

- Future developments for automation of sticking cuttings with robots -

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- Vision software (new software available 2018)
- New ways of looking at plants (shape, color and other specifications of the plants as a whole)

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- More insight into results per machine / type / operator/ numbers per hour

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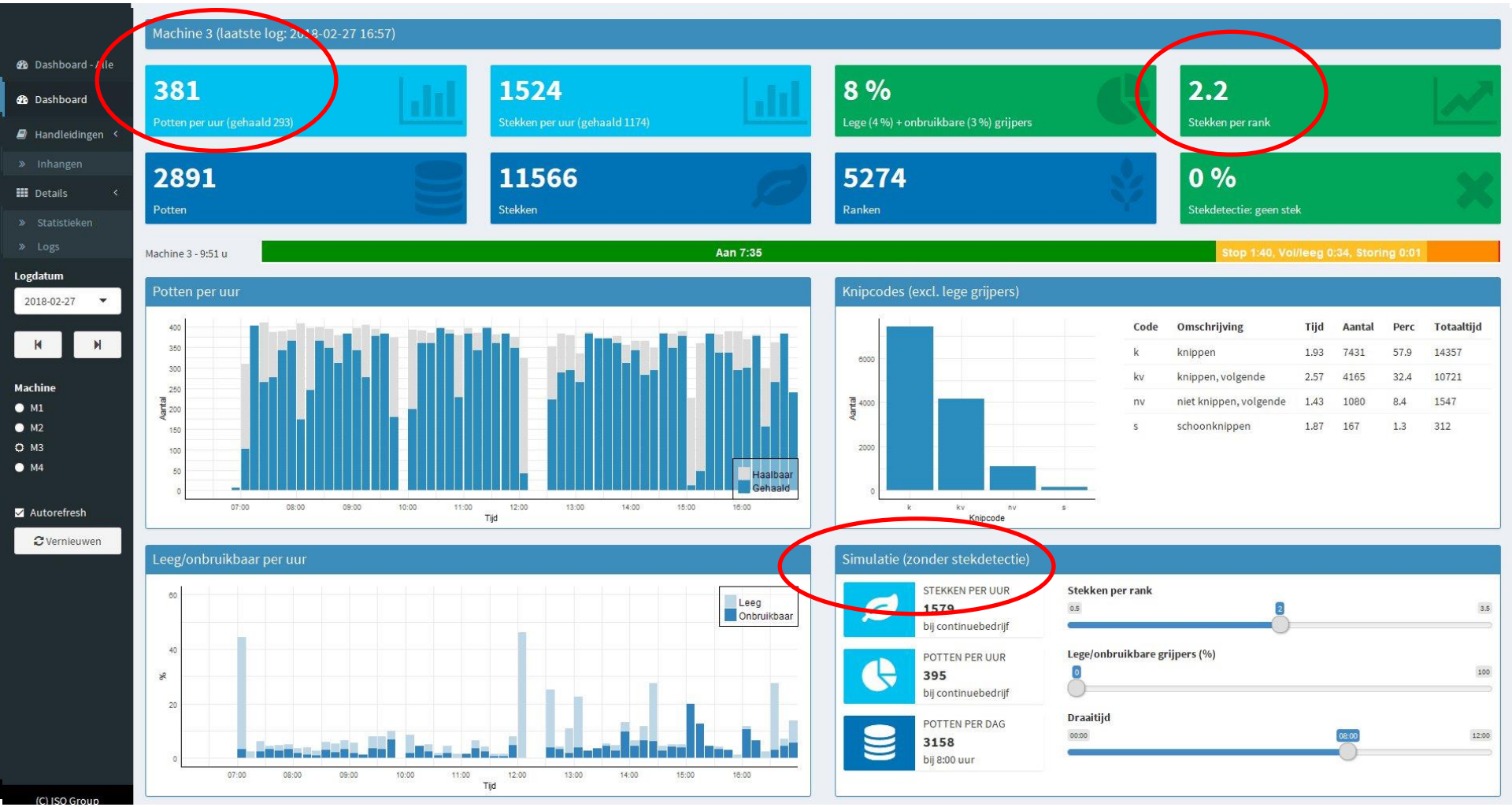

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- Planthandling

- New gripper techniques

More grippers for better planthandling

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- Using robot in 1 machine for multiple tasks

- ISO Cutting and TransPlanter (machine for both sticking and transplanting)

- Future developments for automation of sticking cuttings with robots -

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- Future developments for automation in the greenhouse industry -

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- Future developments for automation in the greenhouse industry -

- Other commitment / expectation of staff and operators

- Not just hands but think along with the process
- Not only in tasks but in the process
- Not only knowledge of plants or technology, but look for the combination

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- Change of thinking about how automation can be used in the most efficient way in your nursery

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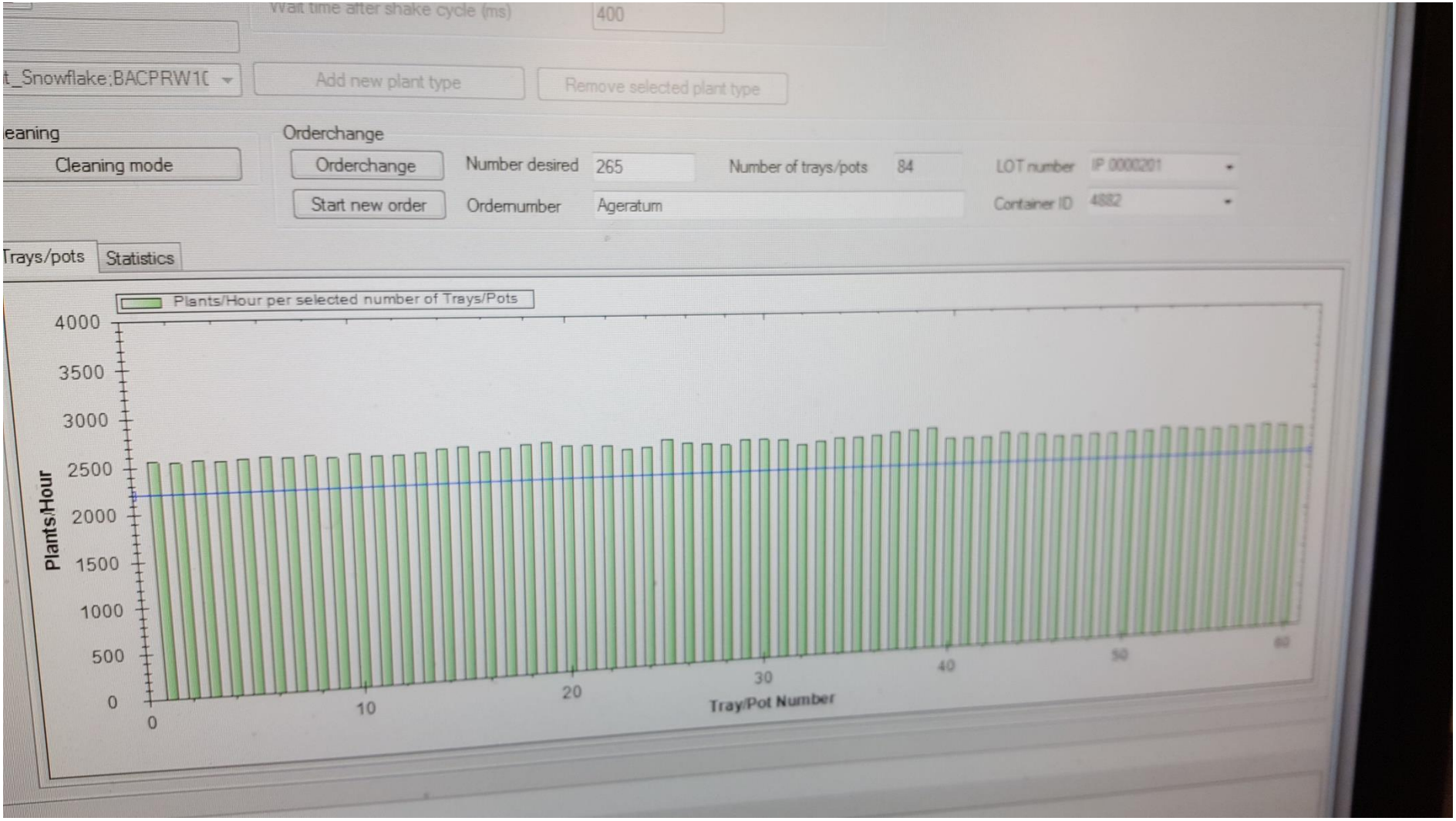

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- Change of thinking about how automation can be used in the most efficient way
- Introduction of deep learning and AI makes a robot smarter

- The use of data becomes more important
- What is it the robot or operator really does (to measure = to know)

- Future developments for automation in the greenhouse industry -

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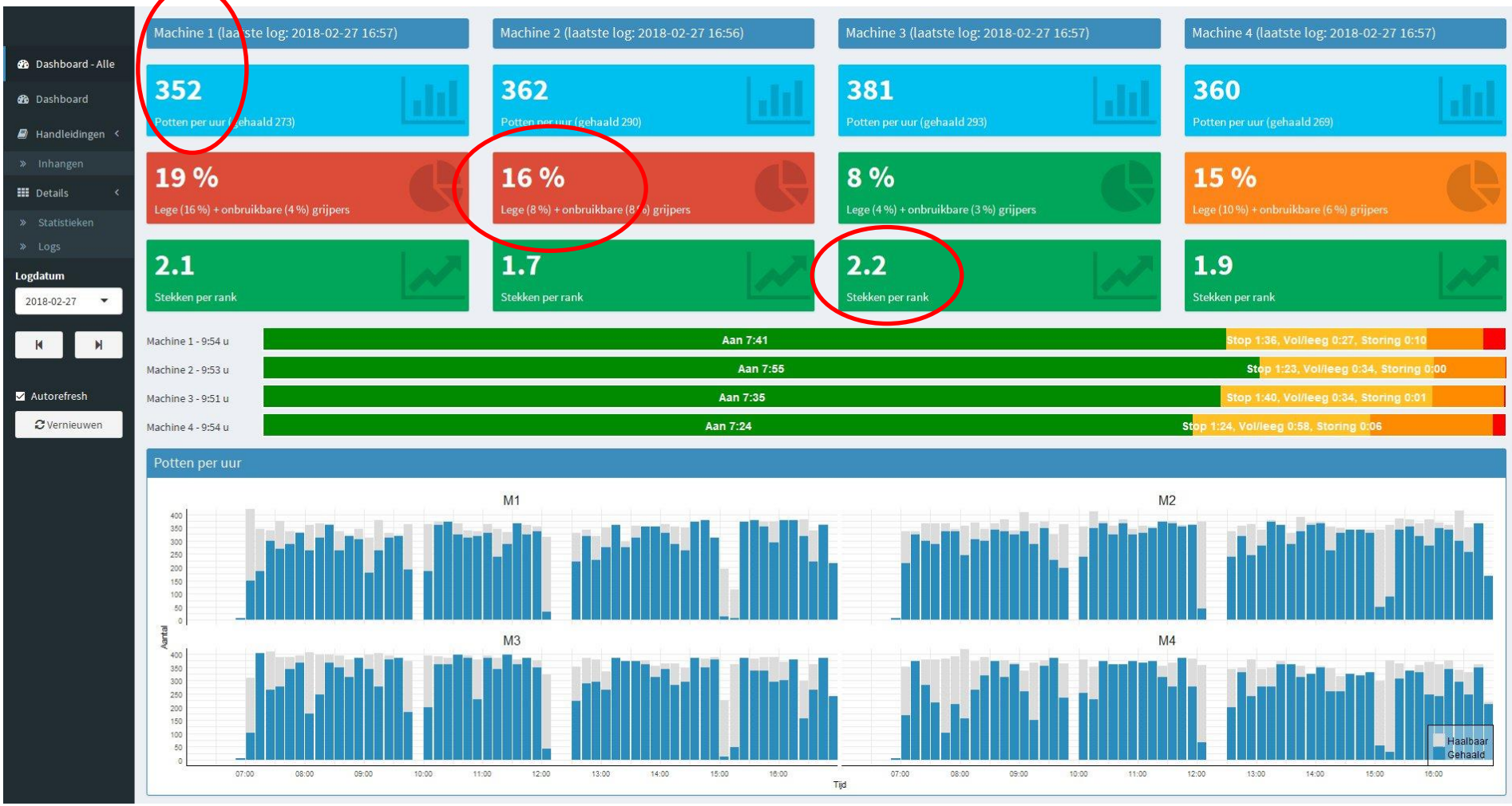

- Future developments for automation in the greenhouse industry -

- Andere inzet/ verwachting van personeel
- Niet louter handjes maar meedenken
- Niet alleen denken in taken maar aan het proces
- Niet alleen kennis van plantjes of techniek, maar zoek de combinatie

- Robots can do more and more, but have to be used correctly
- Change of thinking about how automation can be used in the most efficient way
- Deployment of deep learning and AI makes a robot smarter

- The use of data becomes more important
- What is it the robot or operator really does? (to measure = to know)
- Connect the robot to a software package / for more information about what the robot is doing at what time and what influence this has on growth or further planning of the process or the plant

Automation Turns to Data at Four Star Greenhouse

By: Janeen Wright | Email

February 4, 2018

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1 of 11

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  - Automatic label printing or linking other tasks to the use of the robot

Option automating printing labels

Printing labels after sticking_new.mp4

- Conclusion -

- The use of robots and automation in the horticultural industry will increase
- Challenges are in:
  - Software
  - Handling of the plant
- The further possibilities of 3D technology
- This will mean there will be more asked from future growers and operators on the area of computer knowledge, data and problem recoginition (both in the field of software and mechanical engineering)
- Knowledge of the plant and the growing proces of the plant will always be needed to operate machines in the greenhouse industry

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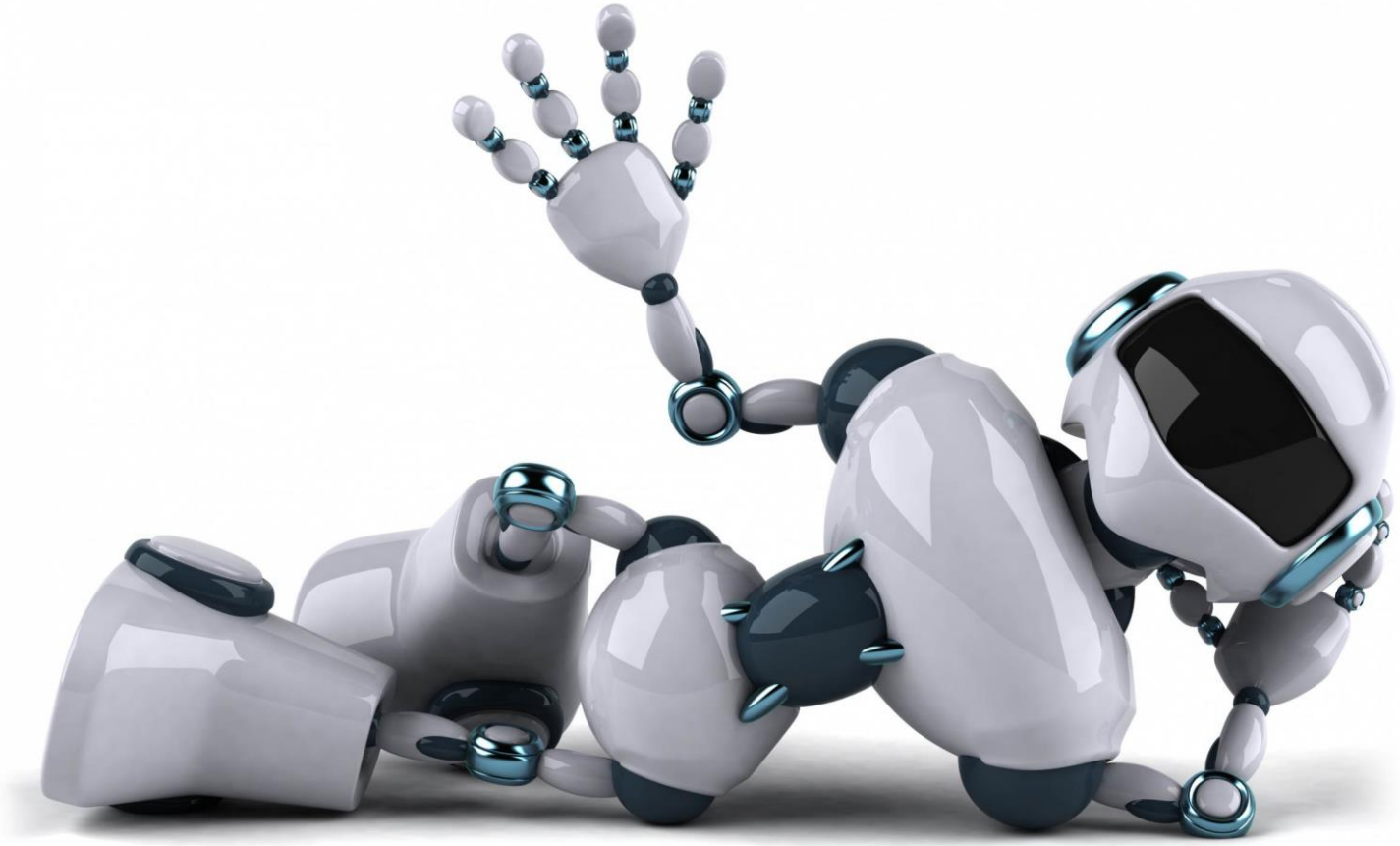
Thank you for your attention