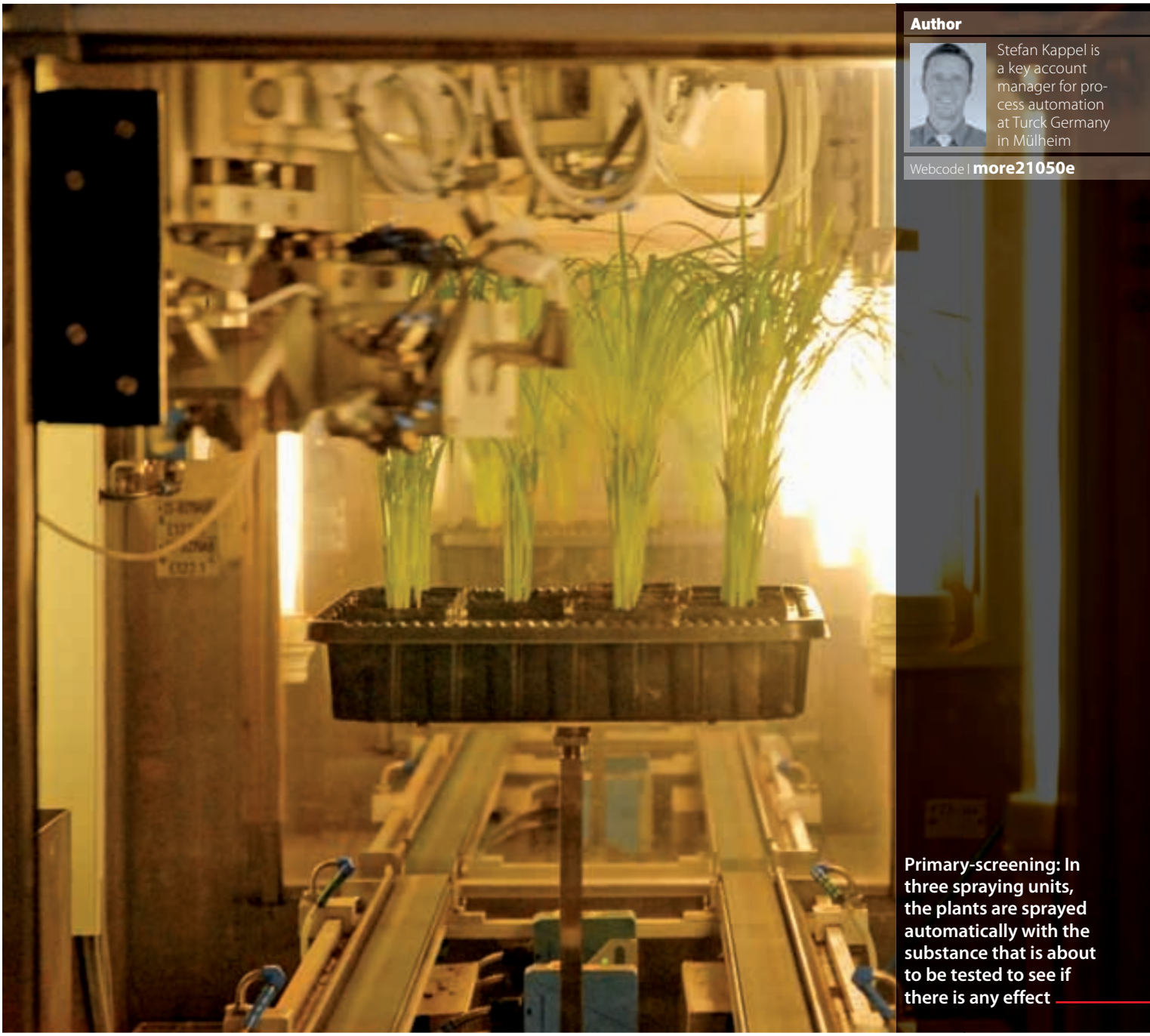

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Webcode | **more21050e**

Primary-screening: In three spraying units, the plants are sprayed automatically with the substance that is about to be tested to see if there is any effect

User www.bayercropscience.de **Integrator** www.tectrion.de

Efficiently Control

Bayer CropScience tests new active components with RFID-support from Turck

In their research laboratories in Monheim, Germany, scientists at Bayer CropScience are continuously looking for new active components with the help of new and modern machines. After a lengthy process, these active components are developed into efficient agricultural pesticides for worldwide use.

One of the first steps in this process is called primary-screening. During this process, the newly developed substances are tested for their effectiveness by apply-

Quick read

Scientists from Bayer CropScience AG test new active components for their suitability as agricultural pesticides by spraying them onto plants in an automated system. The RFID-system, BL ident, from Turck guarantees transparency and the clear identification of each plant.

After the plant pots leave the spray units, all the relevant data is written onto the RFID tag in the middle of the plant pot

After the plants have passed through the current program, the data can be read on the display

ing them onto plants automatically. Depending on the effect of the application, further research is conducted in the laboratory, then in the greenhouse and finally outdoors.

Fully automatic primary-screening

Bayer CropScience developed a fully automatic spraying line for the primary-screening process that manages more than 25,000 spraying operations every year. During each application cycle, three plant sets are sprayed with three different test components simultaneously. The plant sets contain the host plants for eight plant diseases. "During the primary-screening process, we spray up to 100 new substances in different concentrations onto the plants on a daily basis," says Bernd Schulten, operating engineer at Bayer CropScience. "To not lose the general view and the control, we use soft-

BCS engineer Bernd Schulten sees the current status of the machine at a glance

ware support for our tests. We get the test series designs from the data processing service center. We import them here, execute them and send back the results," says Schulten.

The most important factor during this process is the clear identification of the plant sets and the correlation to the substances applied to them. Originally, barcode-stickers were used, but the machines were recently updated with contact-free RFID-technology. "In cooperation with the industrial supplier Tectrion, who maintains and updates all our machines in Monheim, we updated our machines with a third spraying booth and the whole system with a new SPS. Previously, only single machine processes, like the spray booth, conveyor and pipette machines, could exchange signals, but now we can control and monitor everything via SPS," Schulten explains. "In this context we wanted to get rid of the barcode-stickers, because they were not ideal for the wavy design of the plant pots and the environmental conditions they were exposed to. Also, the printer was high-maintenance."

During the search for the ideal RFID-solution, the technical project-team considered various different systems and providers. In the end, the decision was made in favor of the BL ident RFID system from Turck. "We wanted an RFID system that is easy to handle, robust and cost-saving in comparison to other products. We found all this with the system from Turck," Schulten comments.

Easy handling with CoDeSys

For Volker Bachmann, a specialist for controls in the Robotik department at Tectrion, BL ident has another unbeatable advantage: "Turck's RFID-System is programmable with CoDeSys and therefore creates the flexibility to outsource complex actions to the controls on-site. That is how we unburden the computer that controls the test procedure."

During the change to RFID, the technicians from Tetricon had to equip about 1,000 plant pots with a tag that was glued to the center of the pot. Each tag has a memory space of 128 Byte and contains all the information regarding the specific plant. "Originally, we considered saving only the ID-Number on the tag, but that wouldn't ensure enough flexibility. Now, where all the information is saved on the tag, the machine can work self-sufficient and every single plant pot is identifiable, even without a central computer," says Bachmann.

A Turck Q80 combined read/write RFID head writes and reads the data directly after the plant pots have left the spraying units. Another read/write head is located at the spot where the plant pots leave the machine. If the machine fails or the pots have to be identified for some other reason, Bayer employees can read the current status of the pots with a handheld RFID reader. The read/write heads send RFID signals to the BL20 modular remote I/O system. With the help of a special RFID disc, the data is collected and transferred to a gateway that carries out the local RFID communication, so that only reference data has to be sent to the main computer via Modbus TCP.

"Working with the system from Turck was very comfortable," Bachmann adds. "It was not difficult to program and I could rely on established standards, like Ethernet, so that we could integrate the system into the machine easily. Because of the modular concept, we also could set up everything exactly as we wanted to." ■

Dietmar Kleist, laboratory assistant for biology, is able to read the data from each plant pot with a handheld-reader, if needed

"Turck's RFID-System is programmable with CoDeSys and therefore creates the flexibility to outsource complex actions to the controls on-site. That is how we unburden the computer that controls the test procedure."

Volker Bachmann, Tectrion

The BL20 gateway is programmable with CoDeSys and carries out the RFID communication