



## QCAP at Fruit Logistica

**Eager to speak to end users of their detector, QCAP researchers presented their work at a stand at Fruit Logistica – the leading trade fair for the global fresh produce market.**

Held at the beginning of February in Messe Berlin, Fruit Logistica welcomed more than 3,000 exhibitors and almost 80,000 visitors. The event covers the full spectrum of fresh fruit and vegetables. Over the years, Fruit Logistica has grown into a meeting platform for producers from all over the world who want to network, are looking for knowledge or want to invest in new technology.

Unfortunately, this year's Fruit Logistica was overshadowed by the coronavirus outbreak: the trade fair received significantly fewer Chinese visitors, and its Chinese exhibitors played less of a prominent role than they

usually do. Nevertheless, we managed to meet various stakeholders from the EU and US to discuss the development and application of the QCAP system. They told us that they recognise the importance of gas measurement and how it can definitely play a role in reducing storage losses.

Reflecting on the exhibition, we can safely say that there is an increased need for a complete and accurate gas measurement in CA storage cells, especially when it comes to measuring ethylene and ethanol. As more and more products are being stored under DCA conditions, being able to measure these gases is becoming an increasingly important aspect.



# Effective teamwork between QCAP partners is essential



QCAP unites seven partners and five associate partners around one goal: to create a monitoring system for fruit and vegetables in storage areas. The success of this project depends on effective teamwork. As the project leader, associate professor Dr Frans Harren (Radboud University, Nijmegen) is tasked with monitoring the progress of the project, working in close consultation with the partners to ensure the project objectives are achieved. How do you make sure everyone carries out their tasks? And how do you ensure everything is well-timed? He shares some details about his work.

Frans Harren

*“We managed to set out the prerequisites for the system early on thanks to some effective liaising among the companies, research institutes and the partners who ultimately have to produce the system”*

## Why did you start this project?

“My group specialises in developing gas detectors that can measure very small quantities of gases in complex mixtures. We measure these gases using lasers. At a European meeting I was attending, CSEM (Neuchâtel, Switzerland) put me in contact with NKT Photonics (Copenhagen, Denmark), who specialise in supercontinuum laser sources that are capable of measuring a large number of different gases at the same time. As we already had experience with applications of photonics in agri and food, our first thought was how we could use the laser to monitor fruit and vegetables. Given the huge volumes of produce in Europe, we can achieve a significant impact in the region both economically and in terms of sustainability.”

## Are you satisfied with the progress of the project?

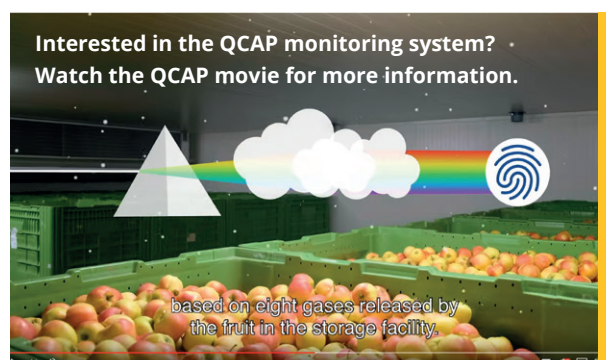
“It’s generally going very well. NKT Photonics was able to deliver the new laser very quickly, which got us off to a flying start. We managed to clearly set out the prerequisites for the system early on thanks to some effective liaising among the companies, research institutes and the partners who ultimately have to produce the system. Two prototypes of the monitoring system have now been completed and are currently performing measurements on apples, blueberries and potatoes in York and Cranfield. The first prototype, completed just last year, has already produced some fantastic measurement results on pears in Controlled Atmosphere (CA) storage in Leuven.”

## Have there been any hiccups?

“We underestimated how long it would take to develop a sensor for the new laser – more specifically, the sensor’s individual components: the gas treatment system, the software and the electronics. We also needed more time to test the system properly. This delay obviously affects all other parts of the project, so a good bit of teamwork between all partners is essential. I’m glad to see that everyone is trying to be as flexible as possible. We’ve also received a six-month extension from our grant provider, Interreg.”

## What do you think the future holds?

“In order to implement the monitoring system, we need to develop a commercial prototype. As Radboud University, we applied for an EU grant together with NKT Photonics, SenseAir (the gas sensor manufacturer) and Storex (QCAP partner), who produces CA preservation equipment. I hope the monitoring system will be commercially available for different fruits and vegetables in 2023.”



## CAMA conference postponed

**The QCAP partners will present the latest research results and the potential of innovative interactive storage technology for the international postharvest community at the next XIIIth International Controlled and Modified Atmosphere Research Conference (CAMA). Unfortunately it is not yet clear when this meeting will take place, due to the Corona crisis.**

The conference will be organised by the staff of the MeBioS Postharvest group of KU Leuven and the Flanders Centre of Postharvest Technology, a partner in the QCAP-project, in close collaboration with the International Society for Horticultural Science (ISHS). During this 4-days event, ample opportunities are provided for presenting fundamental and applied research and technical innovations, as well as discussions with international experts from

academia and industry, exhibiting products and services, participating in social events and joining technical tours. With the theme 'Fast Forward to a Fresh Future' the conference will create a unique exchange forum for discussing recent progress in scientific knowledge and industrial development of controlled and modified atmosphere technology for fruit and vegetables.



## QCAP sensor prototype put to the test to measure potato volatiles



Picture 1: the first prototype arrives in Cranfield

**The first prototype safely arrived at Cranfield University end 2019. After a small problem trying to fit it into the elevator (picture 1), "Team Cranfield" is now doing some trials to verify the results obtained during the project.**

The sensor is used for measurements in two different rooms. In each room, the team has simulated bad conditions for potatoes storage, which are promoting two different undesirable defects on the crop: early sprouting in one room and fungal rots in the other. Maria and Fernando, QCAP researchers at Cranfield University, have been following the progress of the defects in both rooms. Once the test is finished, they will be able to assess whether the identified volatile biomarkers are really and accurately giving us a timely indication that can be used by storage managers to identify and manage potato storage problems.



Picture 2: CropTec Show 2020

Cranfield University has also actively promoted the research results and showcased the great capabilities of the technology developed in the project at industrial events in the UK. One example is the CropTec Show 2020 (picture 2). Keep your eyes open! They will soon organise an open day for end users where they will show the technology and give insight into the capabilities of the sensor.



QCAP presents the system at multiple events for growers. Here we inform our end users in Friedrichshafen, Germany.

## Meet Dirk Köpcke, Head of Fruit Quality and the Fruit Storage Department at Chamber of Agriculture in Lower Saxony, Jork Fruit Growing Research Station

### What is your expertise?

"I specialise in fruit quality and fruit storage, which essentially involves everything related to the quality of fruit on the tree and after harvest. This also includes fertilisation, irrigation and drainage, harvest date forecasts and – of course – storage and post-storage of fruit."

### Why do you participate in the QCAP project?

"Northern Germany produces and stores large quantities of apples and blueberries. Ensuring the best possible storage conditions reduces losses due to water loss, rot or physiological diseases. Until now, we've only been measuring and controlling the O<sub>2</sub>/CO<sub>2</sub> concentration in the warehouse. Being able to continuously measure aroma volatiles in the warehouse, which is the QCAP project's aim, will offer us new opportunities to further optimise storage and avoid losses."



Dirk Köpcke

### What is your most important challenge in this project?

"The sensor must not only be able to measure various aroma volatiles; the system must also be practical and economical for warehouses. In addition, there is a lack of knowledge about which aroma volatiles can serve as indicators for which diseases."

### Contact

Radboud University  
Heyendaalseweg 135  
6525 AJ Nijmegen  
The Netherlands

Frans Harren  
f.harren@science.ru.nl  
+31 24 365 21 28  
www.nweurope.eu/qcap