

MOBILE RESEARCH FACILITY FOR FRUIT, VEGETABLES AND FLOWERS

# Assessment on location

**The condition of vegetables, fruit and flowers can be assessed anywhere in the world in *Cool – Research on the Move*, a mobile research facility full of high-tech apparatus. That helps producers and transporters to store and transport their produce under optimal conditions.**

TEXT AND PHOTO HANS WOLKERS

**T**he quality of vegetables, fruit and flowers sometimes suffers badly from a sea voyage: avocados go brown, while mangos or melons fail to ripen properly and remain hard and tasteless. Even in the producer country itself, fresh products do not always reach the consumer in good condition, sometimes for lack of knowledge about appropriate methods of transport and storage.

The *Cool – Research on the Move* concept helps producers and transporters to store and transport the harvest under optimal conditions. This mobile research unit, developed by Wageningen Food & Biobased Research and technology company Fotein, consists of a shipping container equipped with lots of built-in high-tech equipment. This includes 10 climate compartments in which researchers can separately regulate temperature, humidity and concentrations of oxygen and carbon dioxide. This enables them to test the influence of these factors on product quality during storage and transportation. That knowledge can help reduce food losses and boost export potential.

## SIMULATING TRANSPORT

Production of vegetables, fruit and flowers has risen sharply in emerging economies in Asia, Africa and the Americas. This has led in turn to rising demand for the expertise and technology required to guarantee the quality and shelf life of these perishable goods. To meet this demand, Wageningen and Fotein put their

heads together one and a half years ago to develop the *Cool – Research on the Move* concept. The research container can be shipped to anywhere in the world. 'All the steps in the supply chain, from harvest to storage and then transport to the buyer, influence the quality of fresh products in the shop,' says Peter Ravensbergen, Business Developer at Wageningen Food & Biobased Research. 'With the *Cool - Research on the Move* unit, you can optimize product quality at every point.' It takes four days, for instance, to transport tomatoes from Mexico to the US by truck. By selecting the fruit to be harvested for colour, and thus for ripeness, and then simulating the transport in the container under a variety of environmental conditions, the exporter sees what state the harvest is in when it eventually reaches the customer. The transport conditions can then be adjusted. 'For example, the exporter could decide whether the truck should be cooled,' explains Ravensbergen. 'That way, local researchers learn to manipulate the transport conditions so that the product arrives at exactly the right stage of ripeness.'

## TRAINING RESEARCHERS

'Wageningen Food & Biobased Research has more than 80 years' experience in research on storage conditions for fruit and vegetables,' says Ravensbergen. 'We share that knowledge by training and supervising local researchers who are going to work in a *Cool - Research on*



All sorts of high-tech equipment is built in to the research container.

the Move unit that has been bought or leased, so that they can carry out research and apply their findings.' Those researchers can then explain the effects of cooling to local entrepreneurs, or determine the optimal conditions for stimulating ripening during transportation – or for slowing it down. That kind of simulation on location gives an insight into the optimal degree of ripeness in avocados at harvest, so they can withstand the long sea voyage from South America. The producer can bear this in mind when timing the harvest. That has a positive impact on the quality of the product when it reaches a foreign buyer. It does require some investment, but Ravensbergen says that can be recouped within a couple of years by charging higher prices for a better quality product.

### EN ROUTE TO THE CUSTOMER

For the time being, the first demo model of the research container is on display next to Phenomea, the Wageningen Food & Biobased Research building that was opened on the campus in October. But eventually, the idea is that the container will go to a client in a country such as China, India or Mexico. In Phenomea,

researchers develop new techniques for quality control of fresh products. The technology they develop can then be built in to the Cool - Research on the Move unit. 'Because we are continuously working on the development of new sensors and robots, there are more and more, and increasingly sophisticated methods of quality control available,' says Ravensbergen. 'We have developed non-destructive sugar measurements for fruit, for example, in which the reflection of infrared light reveals something about the sugar content of the product. So we don't have to cut open the fruit.' Additionally, combinations of sensors and 3D cameras can be used to assess a product for hardness, colour, shape and weight. Ravensbergen and his colleagues also look for biomarkers for quality: biological components of the product which correlate strongly with quality. Researchers might for example measure particular aroma components in order to estimate the ripeness of a product. ■

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