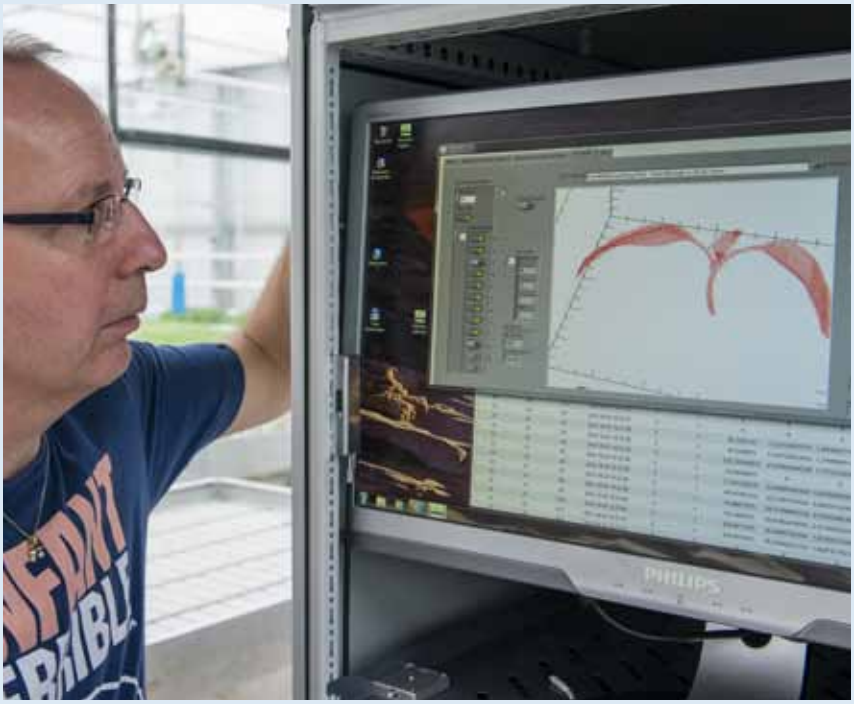
Fast *and* accurate



A sorting machine for seedlings developed by Wageningen UR works better than the naked human eye. The gains in quality and cost effectiveness are considerable.

TEXT AND PHOTOGRAPHY HANS WOLKERS

'With the Marvin we stand out for our better seed quality'

Assessing and sorting seedlings for size and quality is not an easy task. It requires a lot of expertise and a sharp eye. Highly trained assessors can see at a glance how a plant scores on quality criteria such as the thickness and length of the stem and the size and colour of the leaves. 'Even though the assessors are highly expert, selection could be improved,' says Rick van de Zedde, computer vision engineer at Food & Biobased Research Wageningen UR. 'It came out that horticulturalists, nursery owners and plant breeders felt the need for a sorting machine that was better able to combine quality and standardization with a big capacity. A consortium of nursery and breeding companies and the branch organization Plantum initiated and funded the development of such a machine, with Van de Zedde as project leader.

3D IMAGE

The Marvin sorting machine from Flier systems Ltd meets all the criteria. The machine delivers the goods promptly and precisely, sorting almost 20,000 plants per hour. Food & Biobased Research developed the software for it. Ten cameras take photos of the plant, each one from a different angle. The software rapidly creates a 3D image of the plant. 'This gives you a very good idea of the plant mass,' says Van de Zedde. 'For a plant breeder, that is a reliable characteristic to select for.'

Vegetable breeding company Enza Zaden was the first company to purchase the Marvin six months ago. This company supplies plant breeders with high quality seeds. 'With the Marvin we can assess seedlings better and faster,' says Meindert Klooster, senior seed technology researcher at Enza Zaden. 'This makes the seedlings more homogenous, which is very important to the client.'

MONITORING

Enza Zaden is also using the Marvin for breeding research purposes. The machine plays a role, for example, in the selection for seed and plant quality. Researchers can monitor the growth and development of individual seedlings over time, using the 3D image. The machine also very rapidly registers the observable characteristics of the plants, or phenotype. 'We are now also using the machine to ascertain the relation between hereditary characteristics, the genotype, and the phenotype, in bell peppers and tomatoes,' says Klooster.
The Marvin does the work of at least 20 people. This means plant breeders recoup their investment of two to three hundred thousand euros within a couple of years. But the biggest gain for Enza Zaden is in quality. Klooster: 'With the Marvin we stand out for our better seed quality.' ■

A film about the machine can be seen at http://greenvision.wur.nl/