



Strube develops phenoTest for in-lab measurement of germinating capacity and vigor

Sugar beet: 4D-phenotyping to replace visual assessment

Strube develops phenoTest for in-lab measurement of germinating capacity and vigor

Söllingen, 16 February 2016 – Plant breeding company Strube, in cooperation with the Fraunhofer Institute for non-destructive testing, has developed a high-throughput germination test for sugar beet seeds. The phenoTest is based on automated in-lab 4D-phenotyping of germinating seeds and resulting seedlings.

Unlike the conventional visual ISTA germination test, Strube's phenoTest classifies plants on the basis of objective measurements and is therefore standardised. The actual measurement of seedlings provides information on germinating capacity and power and, additionally, on the homogeneity of a seed lot. Moreover, the results are documented not only as measurement values but also as 3D-images of each individual plant.

The phenoTest uses 3D-computer tomography to scan closed germination boxes several times during the germination process; the plants and their organs, radicle, hypocotyl and cotyledons, are recognised automatically and their length, volume and growth direction measured.

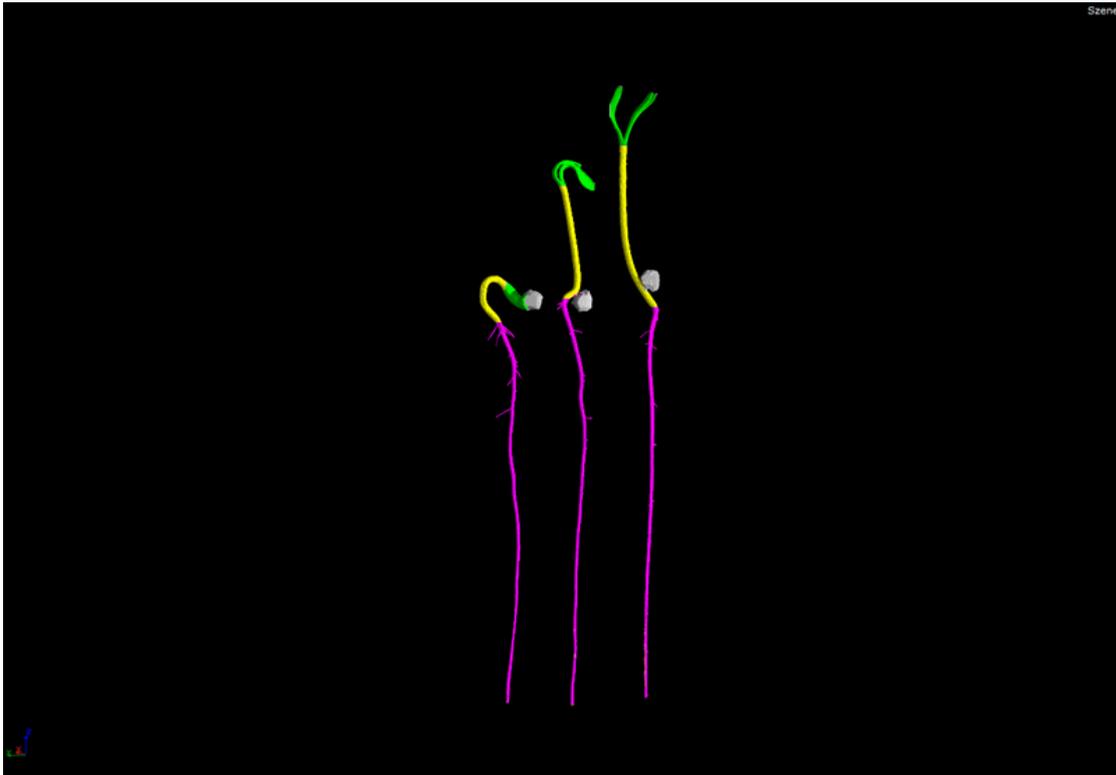
An algorithm classifies the seedlings into "normal", "abnormal" (with an indication of the type and degree of abnormality) and "not germinated". It also provides measurement data on their phenotypic characteristics, which describe the quality of the individual plants. This quality has a crucial influence on germinating power in the field and on the stress tolerance of emerging plants.

A CT scan takes less than three minutes and can be performed any number of times during the germination process. The plants and their organs are measured in three-dimensions and over time, i.e. a fourth dimension is added. 4D-phenotyping generates measurement values which do not only describe germinating capacity but also the speed and dynamics of the germination process.

Seed batches with similar germinating capacity but different germinating power and genetic features can now be differentiated for the first time by using objective measurements. Thus, the influence of seed priming, pelleting, treatment, ageing etc. also becomes quantifiable.

With the fully automated phenoTest, Strube resolutely continues on the path of digitalising all seed and plant analyses and seed processing in order to guarantee top seed quality.





4D-phenotyping not only describes germinating capacity, but also uses actual measurements to describe the speed and dynamics of the germination process.

About Strube

Strube is a medium-sized family-owned company known for its successful plant breeding, top quality seed production and marketing, excellent customer service and exceptional technologies. Since 1877, Strube has been managed by the same family, now its fifth generation, and currently employs around 390 people; an internationally recognised seed company that has preserved its agricultural roots. Sugar beet, cereals, sunflower, sweet maize and garden peas constitute the current range of crops. Strube is active in over 35 countries with 180 varieties. For further information, please visit our home page at: www.strube.net