SUTTON BRIDGE
CROP STORAGE RESEARCH

AHDB

Store Airflow Modelling

Development of CFD based modelling tools and retro-fit solutions to provide improved CIPC control in potato storage to meet the new low residual limits and application levels. An Innovate UK funded project ref: 102310

Collaborative project case study

Consortium partners: Crop Systems Limited; Agriculture & Horticulture Development Board (SBCSR); Technology Research Centre Ltd; Branston Limited; FEC Energy Ltd., Stored Crop Conservation Ltd; Aceto Agricultural Chemicals Corporation Ltd; Cranfield University.

Much of the project has involved working in commercial stores to benchmark current performance; this has been produced using empirical data gathered from commercial stores (above, left) but also measurements taken from a 30% scale store (above, right) constructed at SBCSR and used to assess the impact of changes to the air system and box layout.

The data acquired evaluate and validate modifications made as a result of use of a new predictive model for crop storage (example output below) which will boost understanding of how stores perform and aid the development of crop storage solutions.

Project summary

Storage efficiency and losses depend crucially on air flows to distribute treatments and to equilibrate temperature and moisture in the breathing crop, without excessive energy consumption and yield loss through dehydration.

Many current stores are failing in this regard, leading to potential exceedances in CIPC - a crucial sprouting suppressant for the potato storage sector that might be withdrawn as a result - and also to energy and dehydration losses.

The project aim is to develop scientifically-based design tools, using detailed maps of air flow and heat/mass transfer to help modify stores' air handling to optimise airflow and CIPC distribution, particularly within boxes and on tuber surfaces. This will help to optimise sprout control using lower doses of the active substance, meet legislative limits and improve resource efficiency.

This industrially led project combines leading companies in crop storage design and build, store energy use, chemical control and potato handling & packing. Crop storage research input has come from the AHDB's Sutton Bridge Crop Storage Research facility and specialist airflow analysis from Cranfield University's Aeronautics Group. Consortium facilitation and industrial liaison has been led by Crop Systems and AHDB, supported by TRC.

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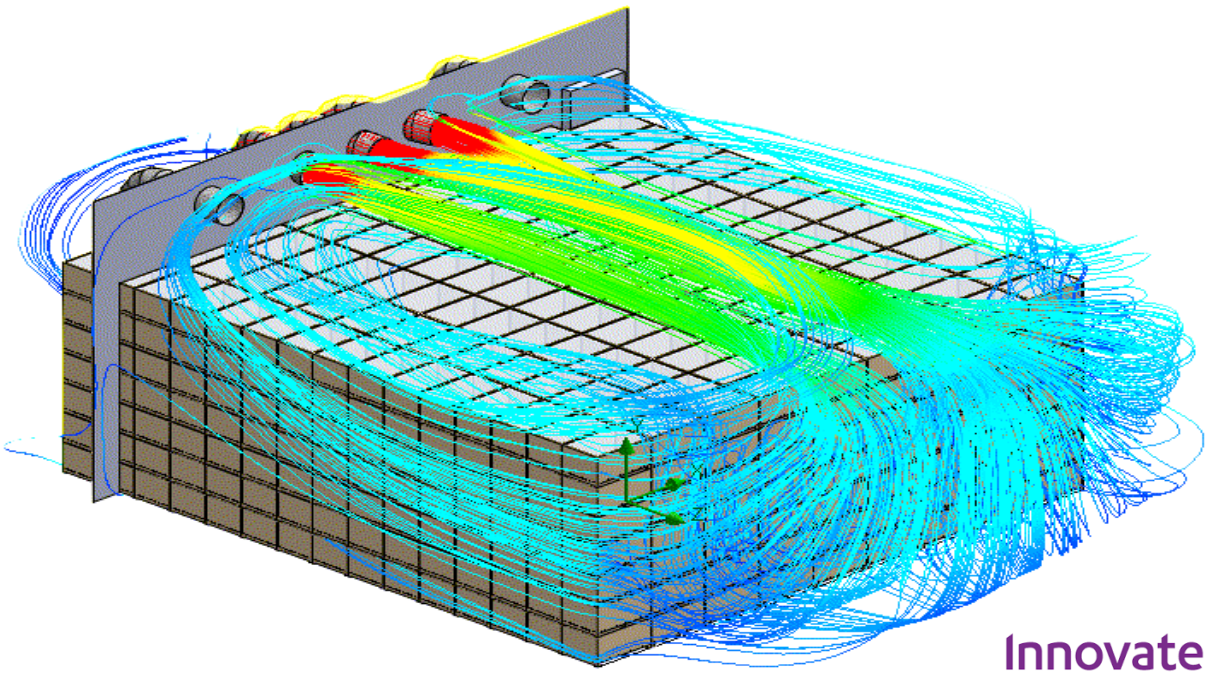

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