Degree day sum
41 °C

Light use efficiency
0 g/kWh

Risk of grey mold
10 %

Photosynthesis sum

Photosynthesis activity
0.95 g/m²
leaf area

Temperature
24.3 °C

DIGITAL TWIN GREENHOUSE™

"GROWERS TOOLBOX" FOR OPTIMIZATION OF PRODUCTION, ENERGY-EFFICIENT CLIMATE CONTROL AND PLANT GROWTH.
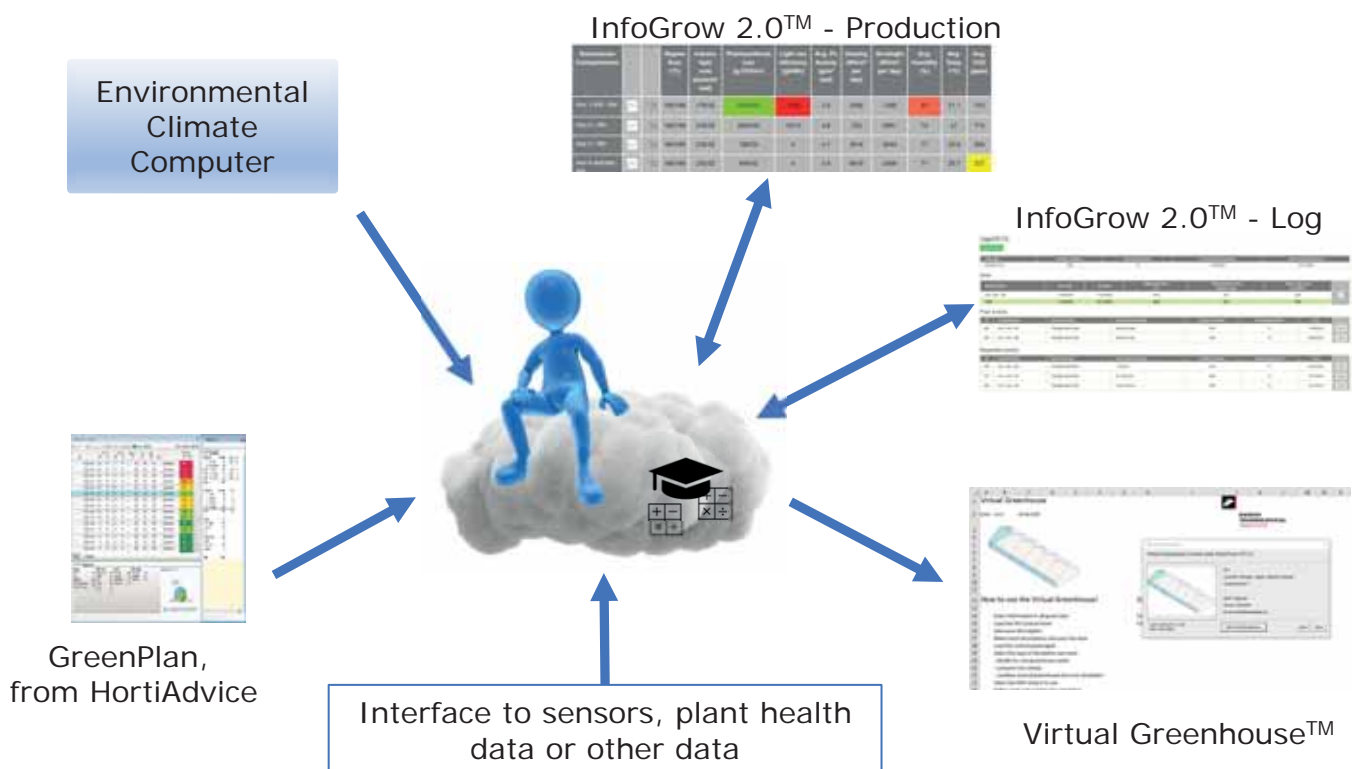
DANISH TECHNOLOGICAL INSTITUTE

The **Digital Twin Greenhouse™** is a new software system for the greenhouse industry. It simulates a complete digital twin of the physical greenhouse, combining plant growth and climate management in relation to the use of energy. It comes in two versions; a real-time tactical decision support system for greenhouse managers, and a strategic simulation tool directed towards technology providers.

The **Digital Twin Greenhouse**™ is the result of a thorough scientifically based research portfolio performed in many countries, which is combined in this user-friendly application by the Danish Technological Institute.

Digital Twin Greenhouse - Overview

InfoGrow 2.0™ - Production

Environmental Climate Computer

InfoGrow 2.0™ - Log

GreenPlan, from HortiAdvice

Interface to sensors, plant health data or other data

Virtual Greenhouse™

InfoGrow 2.0 Production & log		**Virtual Greenhouse**
Know your production even better • Plant climate, photo-synthesis and use of energy in all departments • Optimize, production, use of energy, risk for diseases • Fast overview of challenges in all your departments	**Active greenhouse log** • Register what happens in your greenhouse and lean from it. • Make report on use of pesticides, production timing • Make value out of your existing passive logs	**Analyze your production** • Simulate changes in climate strategy • Simulate changes in hardware, e.g. lighting • Analyze data from InfoGrow for use of energy, production, disease risk etc.

InfoGrow 2.0™ is an online tactical tool for the greenhouse manager:

- presents real-time information about plant growth, production time, and climate in relation to energy use
- use data from the climate computer together with sensors in an advanced modeling system.
- data are summarized for the entire greenhouse complex, showing deviations from relevant key point parameters, and in details for individual departments or specific decision support parameters.
- flexible and customized log-system for event registration and reporting, e.g. application of biological or chemical pest, product quality or development or production parameters as transfer to another department.
- InfoGrow 2.0™ is a unique online tool that enables the grower to follow and optimize the production in relation to the use of resources.

Virtual Greenhouse™ is a simulation and climate analysis tool visualizing energy efficient investments or identifying situations in the climate that needs your attention:

- based on the same models as in InfoGrow 2.0™, the tool simulates plant growth, energy use and other defined parameters throughout the year.
- test the pros and cons of new investments in greenhouse construction and technology, such as artificial lighting, screens, covering, etc.
- test the energy efficiency of changes in the climate control strategy
- implement data directly from the climate computer or use standard climate data for more than 2000 locations around the world.
- technology providers can use the Virtual Greenhouse™ to present the benefit of investing in their new technologies.

Danish Technological Institute

Danish Technological Institute is a leading research and technology company. We have 110 years of history, more than 10.000 clients and export to more than 65 countries.

We help our customers convert the newest knowledge and technology into value. We are experts in production, materials, life science, business, energy technology, meat research and more.

Center for Plant Technology

The Center for Plant Technology keep the plant in focus. Our expertise concerns optimizing growth, production and utilization of plants and plant-based bio-resources. We work with optimized plant production, plant breeding and biotechnology, high value bio compounds, plant health and diseases as well as cultivation technology for plants and algae. We offer everything from development of novel plants in our biotechnological service laboratory to field trials, where we test new varieties.

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