Virtual Greenhouse[™]

Simulate changes before they are applied Detailed analyses of plant production, climate, and energy

Virtual Greenhouse™



Simulate changes before they are applied

Energy savings can be achieved by optimizing the climate set points in the climate computer, but even larger savings are possible if new equipment, such as energy curtains, LED lamps or fans are installed. In the Virtual Greenhouse the energy savings of installing new equipment are simulated, and documented.

- Simulate the effect of different equipment in your own greenhouse environment on energy consumption, climate, climate set points, and plant production.
- Document the effects on energy consumption, plant climate, and plant production in a report

Import your climate data from InfoGrow 2.0[™] and analyze the production performance in detail. **Test changes you might want to implement.** Analyze your data and find energy hot spots with very high use of energy and test different solutions to avoid them.

	Unit	HPS	I ED	Difference	Percent
Greenhouse area	m ⁻²	10,400	10,400	0	0.0
Total use of energy	MWh Year⁻¹	4,937	4,854	-83	-1.7
Energy for heating	MWh Year ⁻¹	2,663	3,262	599	22.5
Energy for artificial light	MWh Year⁻¹	2,274	1,592	-682	-30.0
Energy removed by water vapor (ventilation etc)	MWh Year ⁻¹	-197	-119	77	-39.4
Net Photosynthesis	g m ⁻²	1,071	1,011	-60	-5.6
Light Use Efficency	mg CO2 J ⁻¹	0.0149	0.0149	0.0000	0.1
Total energy used to produce 1 kg dry plant material	MW kg ⁻¹	426	450	25	5.9
Heating energy used to produce 1 kg dry plant material	MW kg ⁻¹	239	310	71	29.8
Light energy used to produce 1 kg dry plant material	MW kg⁻¹	204	151	53	-25.8

Above: Main results from simulation

Right: Use of energy for HPS and LED lighting.



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Overview



1. INPUT 2. SIMULATION Define the physical of your **Define the climate strategy** physical greenhouse setup (Temperature, humidity, artificial (Geography, size, screens, covering, light, CO2, screens, etc.) lighting, CO2, heat pipes, etc.) Weather data **Data from production** Virtual Greenhouse simulates (Use weather data for more (Use data from your own than 2100 locations or use your and compare how your defined production own weather data) greenhouse setup will perform.

3. RESULTS

Energy consumption

Heat / Light

Plant production Photosynthesis Hourly data

Climate and production

Resource efficiency

Energy use*

Compared to production

4. RESULTS

Strategic decisions

What happens if you change climate strategy or hardware setup?

6. CALCULATED PARAMETERS

Analyze your production

Find situations where it is possible to change strategy and optimize production or resource efficiency.



Crop:	Photosynthesis, transpiration, and canopy temperature.
Energy:	Energy for heating and artificial lighting
Climate:	Temperature, Humidity, Light, and CO2 at plant height in thegreenhouse
Efficiency:	Light Use Efficiency, Energy use efficiency



Our activities are performed in all the aspects of the crop production, as well as in finance, management, technology, and subsidy schemes, in order for the producers to get the best possible basis for decisions regarding the production and development of their company. The advice is offered both as individual advice as well as collective.

The Company itself or in collaboration with other organizations participate in research and development projects within the horticultural industry. These projects will comply with generally recognized international standards for good research practice.

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