



Adaptive greenhouse

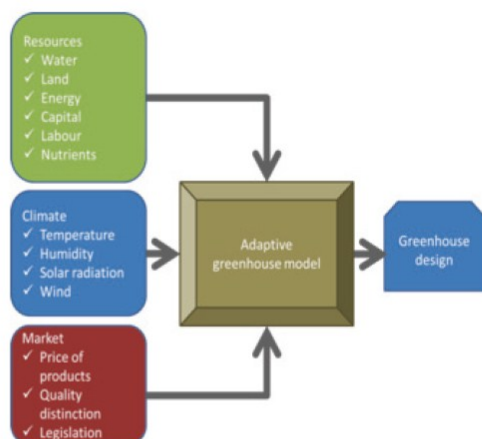
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Wageningen UR Greenhouse horticulture

Goal

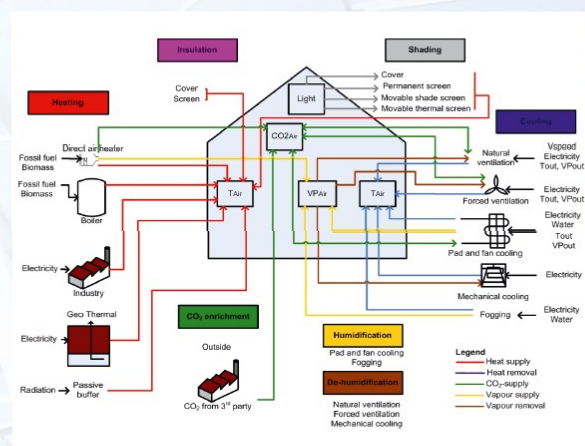
Design greenhouse systems which combine (economic) production efficiency with minimal input of energy, water and nutrients for different regions in the world. Greenhouses come in all sizes and shapes all over the world. The designs have evolved from the resources available in the specific area and economic feasibility. Greenhouse designs change when the overall parameters change. If for example the water quality decreases and additional treatment is needed, the water use efficiency has to increase. Rapid changes need to be addressed on a short term which can be done using the adaptive greenhouse design model.

Approach



Schematic representation of the approach

The goal set by the client (profit, sustainability and /or research) and the specific boundary conditions for the region where the greenhouse is to be built are used as input for the model calculations. The input parameters include climate data, resource information, and market analysis.



This information is used for the technical layout and economical calculations.

The model used consists of a virtual greenhouse model which given the climate and crop production based on the input parameters. This information is used for the economical calculations.

For more information about our research and services:

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Output

The basic result from the calculations show:

- Production over the year
- Resources needed (energy, water, nutrients, labour)
- Economic evaluation
- Sustainability quantification

More details can be provided such as the exact technical specifications, the training needed, application of biological control etc.

For whom?

The work is done for governmental parties addressing food security, food safety, and sustainability and also companies which want to target a new market. Production requires the proper technology given the economic situation and expertise related to this technology. To achieve this, we follow our “adaptive greenhouse production system design” approach which outlines the technology, investments, resources and training needed for a profitable greenhouse production industry.

Greenhouse sites with special functions, like research or demonstration, need additional measures. We have demonstrated this at sites in several countries, e.g. Indonesia, Turkey, Malaysia and the Middle East. We develop optimally tailored sites, using teams which are a balanced combination of local experts, high tech companies and our own top scientists.

Acquiring new technologies and market information is one step, being able to use the technology and the data properly is the next. We have trained numerous scientists and trainers/advisors of growers across the globe in a wide range of competences. Understanding the growth of crops, the hardware and software of the greenhouses and the markets, allows growers to make a maximum profit and enables scientists to exploit the experimental greenhouses to carry out their research in an optimal way.

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