



RESEARCH IN PROTECTED **PLANT PRODUCTION**

Plant responses to climate conditions and resource optimisation



AARHUS UNIVERSITY

Research in protected plant production at the Department of Food Science is focused on developing methods to reduce energy, nutrient and water use during production, and to optimise production and postharvest quality by assessing plant responses to abiotic stresses.

Identifying plant physiological responses to climate change effects, such as temperature extremes, drought and flood conditions, and ensuring the sustainable use of resources in protected plant production systems are key areas of research. In addition, plant breeding methods and exploiting and evaluating genetic resources are also essential parts of the research.

Research is both basic and strategic and is carried out in close collaboration with Danish and international industrial partners.

RESEARCH IN PROTECTED PLANT PRODUCTION

Genes

- Evaluation of genetic resources in relation to temperature and drought tolerance
- Phenotyping for temperature, light and drought tolerance
- Development of plant breeding methods (mutations, chromosome doubling, embryo rescue, genetic transformation)
- International testing of plant varieties for the EU Community Plant Variety Office

Production

- Climate change - plant responses to temperature extremes, warm winter spells, increased CO₂, drought or flood conditions
- Development and evaluation of methods to assess plant responses to abiotic stress (photosynthesis, stomata conductance, chlorophyll fluorescence, electrolyte leakage, biochemical and molecular methods)
- Non-invasive methods to monitor plant growth (Plant Eye)

Energy

- Climate control - plant responses to dynamic use of temperature and light, and improved management of humidity to reduce energy input
- Resource optimisation - development of dynamic light strategies and novel lighting systems in relation to energy prices
- Optimisation of cold storage conditions for plant materials to increase flexibility during production, transport and sale

Consumers

- Development of methods to evaluate postharvest quality of plants
- Securing high product quality at the end user through knowledge exchange from science to the industry
- Development and evaluation of novel plant material

RESEARCH AND GROWTH FACILITIES

- Image and fluorescence analysis equipment
- Differential scanning calorimetry (DSC) and temperature test methods
- *In vitro* facilities for transformation of plants
- Non-invasive analytical equipment for measuring plant responses (3-D plant growth, photosynthesis, stomata conductance, chlorophyll fluorescence), and biochemical and molecular analysis
- 3,500 m² of greenhouses
- State-of-the-art climate chambers

CONTACT

Department of Food Science
food@au.dk

Aarhus University
Kirstinebjergvej 10
DK-5792 Aarslev, Denmark

Head of Department
Michelle Williams
Tel.: +45 8715 6000

www.food.au.dk
