RESEARCH IN PROTECTED PLANT PRODUCTION

Plant responses to climate conditions and resource optimisation



AARHUS UNIVERSITY DEPARTMENT OF FOOD SCIENCE

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Research in protected plant production at the Department of Food Science is focused on developing methods to reduce energy, nu-trient and water use during production, and to optimise production and quality by assessing plant responses to environmental stimuli (including 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 is carried out in close collaboration with Danish and international industrial partners.

RESEARCH IN PROTECTED PLANT PRODUCTION

	• • •	Evaluation of genetic resources in relation to temperature and drought tolerance Gene expression analysis in response to environmental stimuli Gene priming response to stimuli
PHYSIOLOGICAL RESPONSES	•	Climate change - plant responses to temperature extremes, warm and chilling winter spells, increased CO ₂ , drought or flood conditions Development and evaluation of methods to assess plant responses to abiotic stress (pho- tosynthesis, stomata conductance, chlorophyll fluorescence, biochemical and molecular methods) Phenotyping for temperature, light and drought tolerance under future CO ₂ conditions
PRODUCTION		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 plant development and energy prices Development of methods to evaluate potted plant quality in storage, transport and at house-hold conditions Securing high plant quality through knowledge exchange from science to the industry Development and evaluation of novel plant material for a more sustainable production
END USERS		

RESEARCH AND GROWTH FACILITIES

STATE OF ART PHOTOSYNTHESIS LAB AND PHENOTYPING FACILITIES, E.G.

- Image and fluorescence analysis equipment
- · Ciras and Walz for leaf gas exchange measurement
- Differential scanning calorimetry (DSC) and temperature test methods
- · In vitro facilities for transformation of plants
- Non-invasive analytical equipment for measuring plant responses
 (drought spotters and chlorophyll fluorescence) to climate conditions
- · Biochemical and molecular analyses of plant constituents

PLANT GROWTH FACILITIES

- 2,200 m² of greenhouses
- 54 m² controlled climate chambers (six uniform chambers)
- 2 multilayer rooms for simulation of vertical farming
- Semifield area for outdoor production test

CONTACT

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