
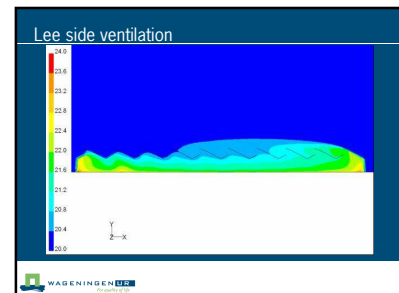
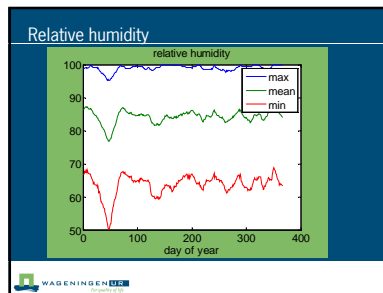


GREENHOUSE DESIGN FOR MALAYSIAN CONDITIONS

Luuk Runia
Dr. Ir. Joke Campen, Anne Elings.



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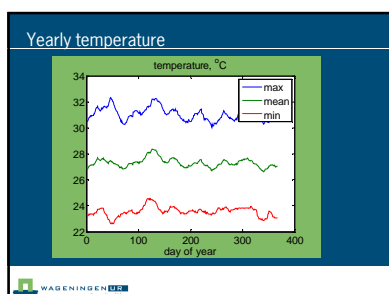
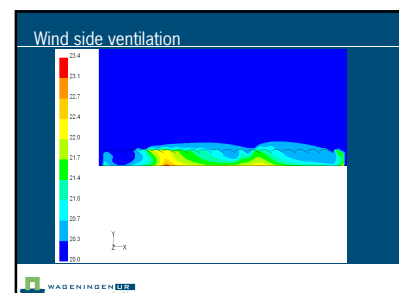
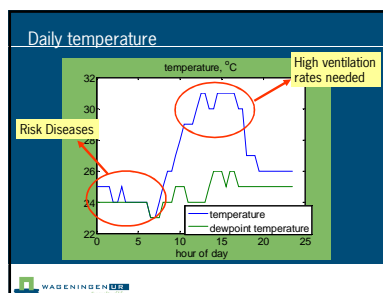


Basics needs of the crop

- Light
- Water
- CO₂
- Nutrients
- Temperature
- Relative humidity

} homogeneous

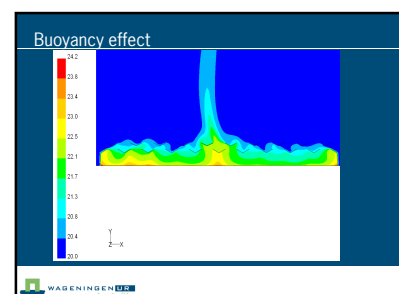
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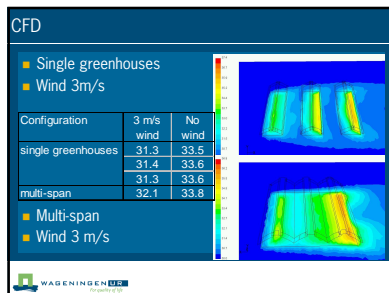


Climate restrains

- Outside temperature is within limits but the greenhouse has to be ventilated extensively
- Evaporative cooling is done by the crop

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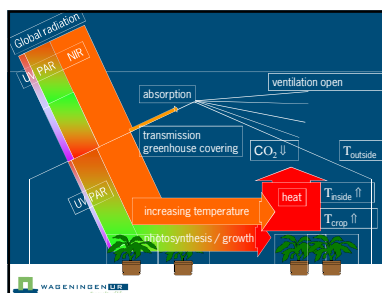
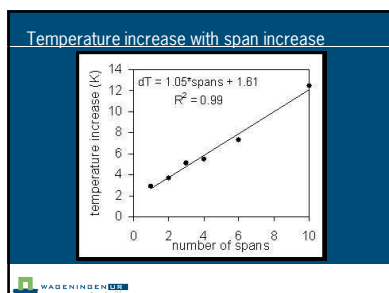
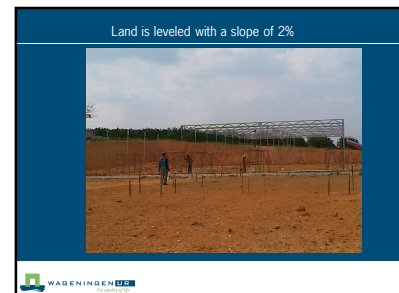


Covering material

Important issues

- Light transmissivity
- Spectral reflectance → keep UV en NIR radiation out
- Haze properties → Making direct radiation diffuse
- Durability
- Wind conditions → Strength of the material

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Effects on temperature

- Greenhouse design
- Crop evaporation
- Wind
- Insect nets
- Absorption of solar radiation (floor and crop)
- Covering material

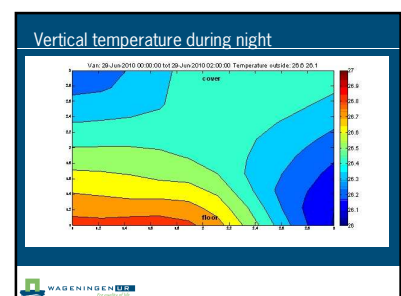
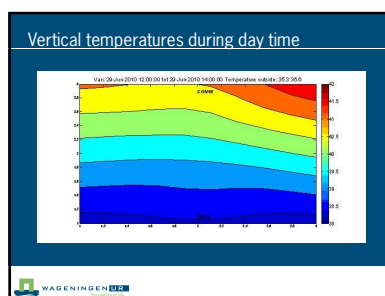
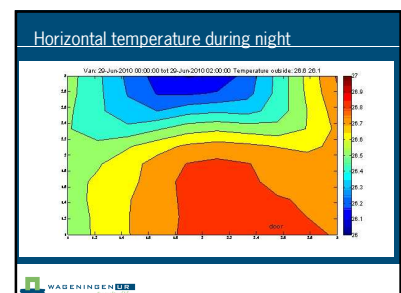
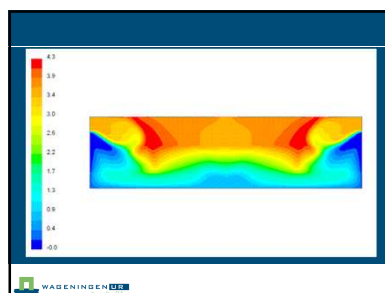
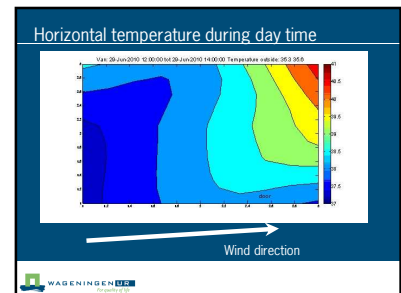
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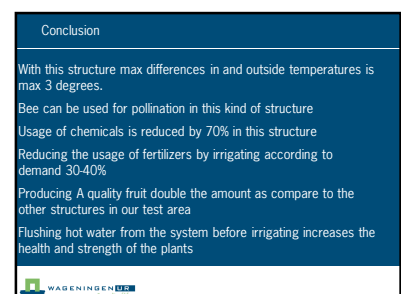
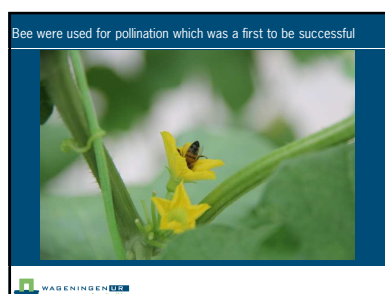
Fertigation and irrigation

- Greenhouse 1:
 - Recirculation
 - Drain meter, tensio meter and at light meter at pump house.
 - Drain water will be in a underground tank a pumped back to pump house to be used and mixed in the next irrigation.
- Greenhouse 2:
 - Tensio meter and light meter only.
 - Minimum drain.
- Greenhouse 3:
 - As greenhouse 2
 - But, before every irrigation the water will be pumped through the system (to flush previous warm irrigation water).

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Project details or info:

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growsys@fm.net.my (local company and builder of the project Malaysia)



THANK YOU

TERIMA KASIH

