



WAGENINGEN UR

For quality of life

Water saving greenhouse in Saudi Arabia

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Introduction

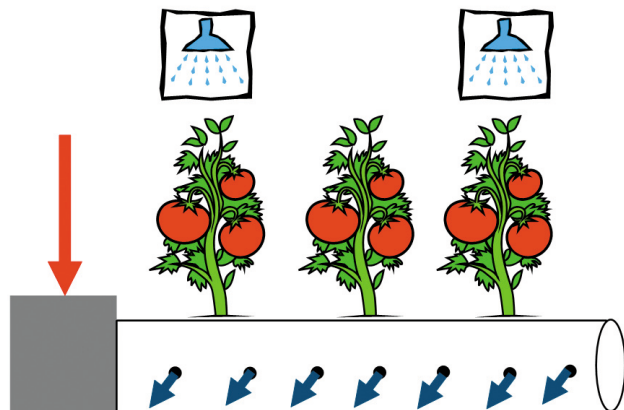
Water shortage is a enormous problem in Saudi Arabia. Horticulture currently consumes a lot of water for evaporative cooling which is pumped for deep water resources. These water resources are getting scarce and the quality of the water is minimal as can be seen in the picture below showing the pad wall on which the water is sprayed. Cooling is essential for crop production due to the extreme climate.



Photo of a pad wall in a greenhouse in Saudi Arabia covered with salt

Alternative method for cooling

Wageningen UR participated in a mission with industry to evaluate the problem and to look at the possibilities of a closed greenhouse.



Schematic overview of a closed greenhouse.

In a closed greenhouse the air is conditioned by means of a chiller. Hence no air is exchange with the outside so no water loss. Also the carbon dioxide levels can be raised which increases production.



Commercial closed greenhouse in The Netherlands

Outcome of the mission

- A closed greenhouse can save more than 90% of water compared the traditional greenhouse with pad and fan
- Production can be increased by more than 40% if carbon dioxide enrichment is applied.
- Energy consumption is eight times higher than the traditional greenhouse.
- The selection of a greenhouse covering material is very important (NIR reflection, insulation, haze properties)
- The economical feasibility of a closed greenhouse is yet to be evaluated.