

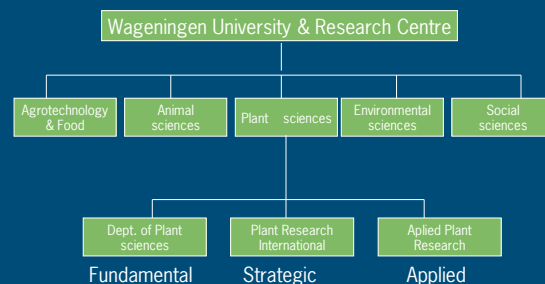
## Soilless Cultivation Nursery Stock

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Randwijk



## Organization chart



## Nursery stock in the Netherlands

- About 16.000 ha
- 1.000 ha pot / containers
- 15.000 ha open field production
- > 600 m € production value
- > 60 % exported of which 90% to Western Europe

## Nursery stock production centres



## Challenges of the nursery stock

- (Chain) Quality
- Labour
- Pests and Diseases
- Environmental legislation
- Economics
- Optimizing and controlled growth



## Research themes PPO

- Quality production
- Propagation and breeding
- Crop protection, soils and fertilization
- Sustainable farming and networks
- Economics and management
- Chain, logistics



## Water quality

- European legislation

Groundwater	Nitrate content < 50 mg NO <sub>3</sub> /l
Surface water	N and P content
	Crop protection chemicals

## Project

- Government      environment – water quality
- Growers            profitability, labour, soil related problems, ....., environment
- Research           matching different aims

### Gutter system



### Advantages

- Product quality
- Labour and logistics
- Closed systems, no leaching
- Almost no herbicides
- Automation of work
- Profit (more plants per meter)
- Broadening of assortment



### Project

- Testing the (moving) system
- Testing Recycling
- Substrates, Gutter material and form
- Plant- and root quality
- New machines for planting and harvesting
- Monitoring moisture content, EC and Temp.
- Economic and environmental evaluation



### Labour: spreading and quality



## Film planten

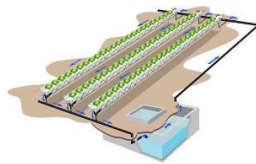


## AIRPOT



## Water and nutrients

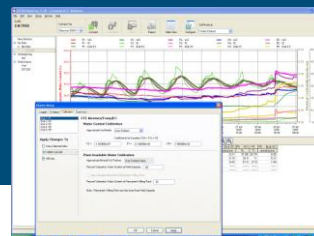
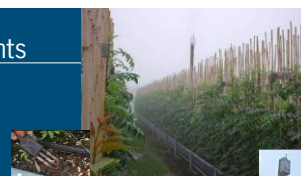
- Closed system
- Recycling of water and nutrients
- Overdrain possible



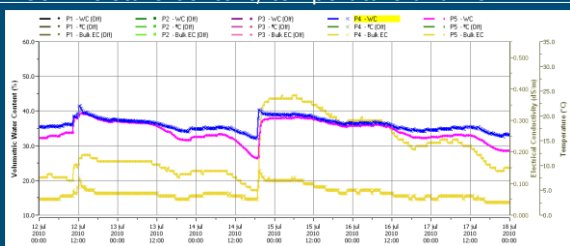
## Soil moisture and nutrients

Decagon 5TE  
Catec system

Start: controlled release  
fertilizes  
Season: fertigation



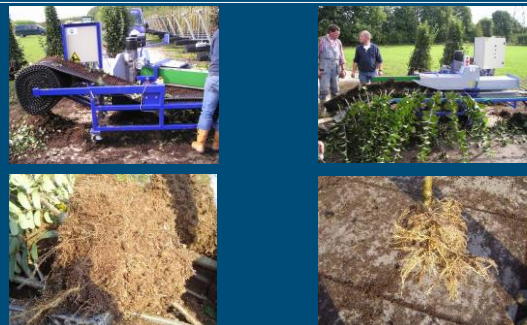
### Soil moisture content, temperature and EC



Start bijmesten maandag 12 juli, met een EC van 1.1 totaal. (osmosol 614 R), heb daarna, toen het iets koeler werd (donderdag 15) even 1,5 EC gegeven, met dus minder water, waarna ik hem maandag weer teruggezet heb naar 1,1.



### Harvesting and plant quality



### Film rooien

### Overview environmental points (MBP) 2010

	Mbp waterleven		Mbp bodemleven		Mbp grondwater		Mbp totaal	
	referentie	goot 2010	referentie	Goot 2010	referentie	Goot 2010	referentie	Goot 2010
Insecticiden	51	69	8	11	314	153	373	233
Fungiciden	5	5	49	10	300	2	354	17
Herbiciden	886	453	401	178	1466	208	2753	839
<b>totaal</b>	<b>942</b>	<b>527</b>	<b>458</b>	<b>199</b>	<b>2080</b>	<b>364</b>	<b>3479</b>	<b>1089</b>



### Reduction 2010 compared with reference

- Herbicides - 70%
- Fungicides - 95%
- Insecticides - 38% (3 x Decis)
- Total environmental impact 69% lower



### Links: ondergoot voor opvang drainagewater



### Conclusions

- Good growth
- Good plant quality
- Shortening of production period
- Loss of plants 4 – 8 %
- Gutter system has potential
- Lot of interest (5 growers!)
- Big environmental gains



### Next stage in the chain





Thank you for your attention

Het project wordt gefinancierd door het Innovatieprogramma  
Kaderrichtlijn Water van het ministerie van Verkeer en Waterstaat

