

Substrate systems chrysanthemum

Systems and production, two crop cycles



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Background

- Environmental policy
 - Emission must be zero on 2027
- Soil-based cultivation
 - less pesticides and fertilizers to surface waters
- Soil-based cultivation Netherland: 1300 ha
 - Chrysanthemum: 485 ha (162 farmers)
 - 250 kg N + 25 kg P / Ha / year

Project goal

1. Develop Substrate Bed as an alternative to soil-based cultivation in chrysanthemums.
2. Emission-free production systems

Finance

- Financed by:
 - Ministry of Transport, Public works and Water management. (KRW-subsidie)
 - Product board horticulture
 - Ministry of LNV



Partners



Waterschap
Rivierenland



Hoogheemraadschap van Delfland



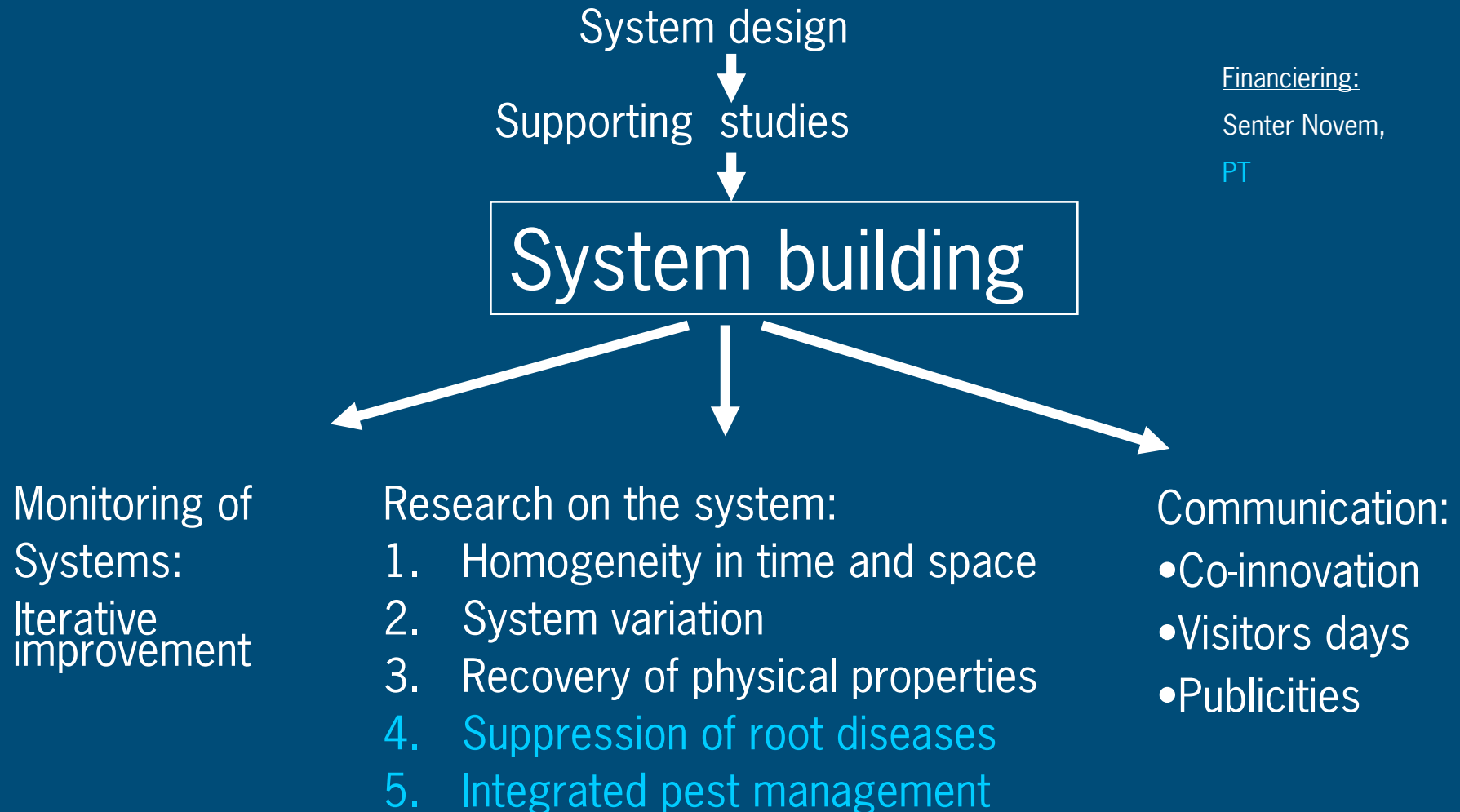
hoogheemraadschap
Hollands
Noorderkwartier



WAAR WATER WERKT



Projectplan Substrate bed



System design

System requirements (users, experts, stakeholders)

- No emission
- Profitable
- Adaptable in current practise
- Meeting plant physiological demands
 - Uniformity on each plant position
 - Control of rhizosphere
 - Restore of physical properties of substrate after growth cycles
- Preventing of root diseases

Systems concepts

11 different system concepts were developed

- Deep soil bed (1)
- Sand bed (2)
- Peat bed (3)
- Clay grain bed (2)
- Thin mat (2)
- Cassette system (1)

Systems selected for testing

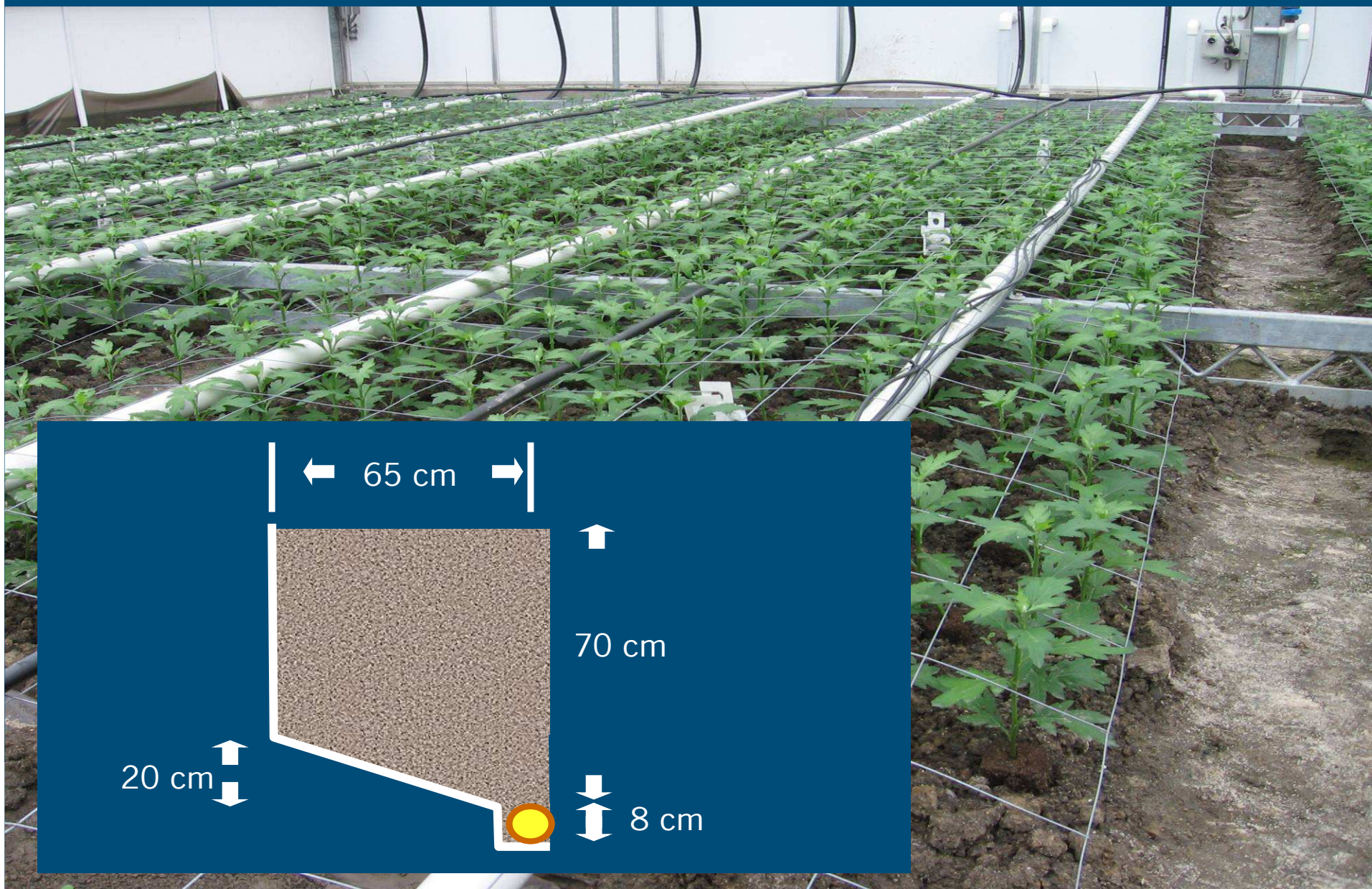
1. Deep soil bed
2. Sand bed
3. Peat bed
4. Lily crate
5. Cassette bed
6. Cassette box



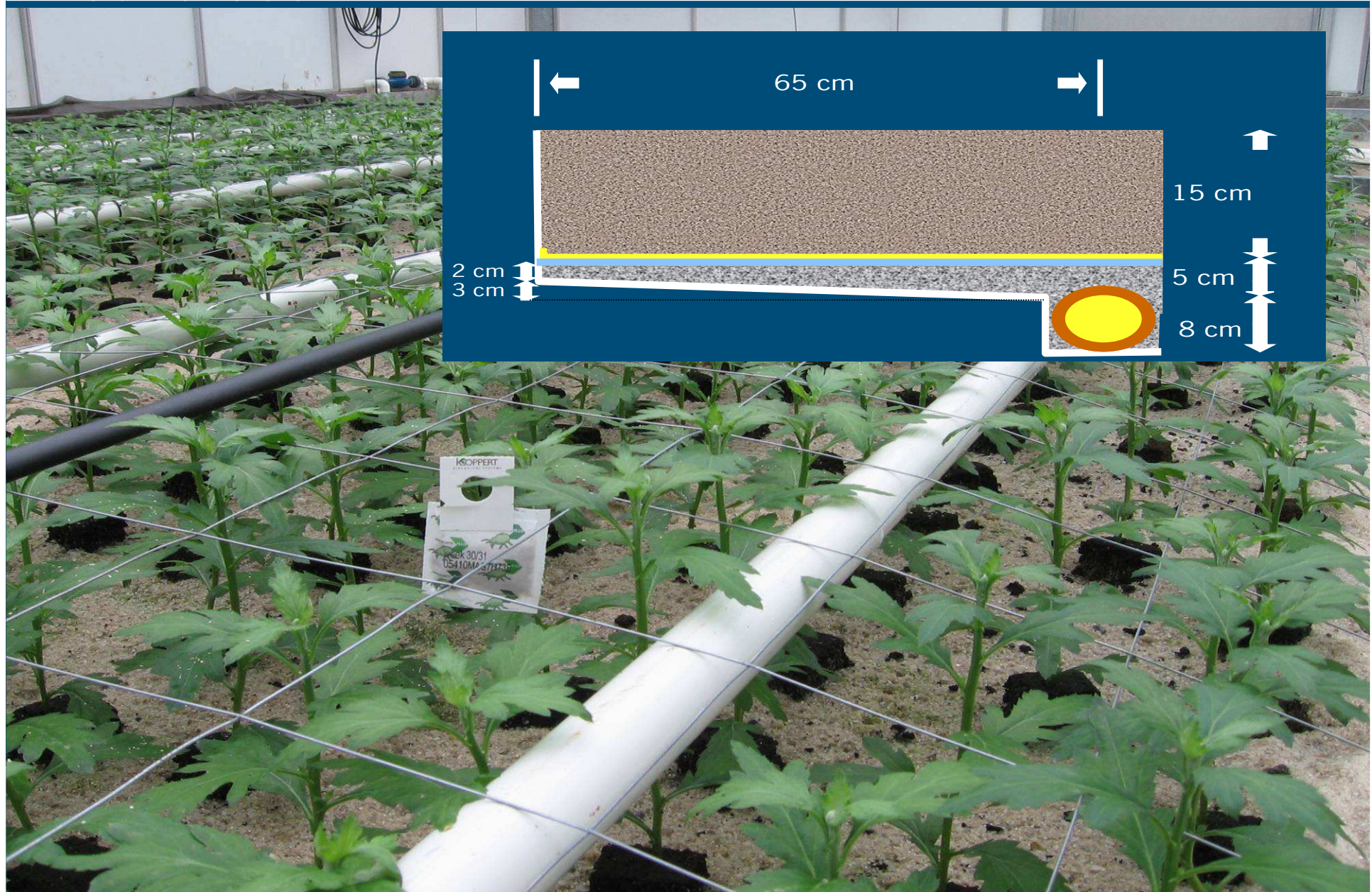
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For quality of life

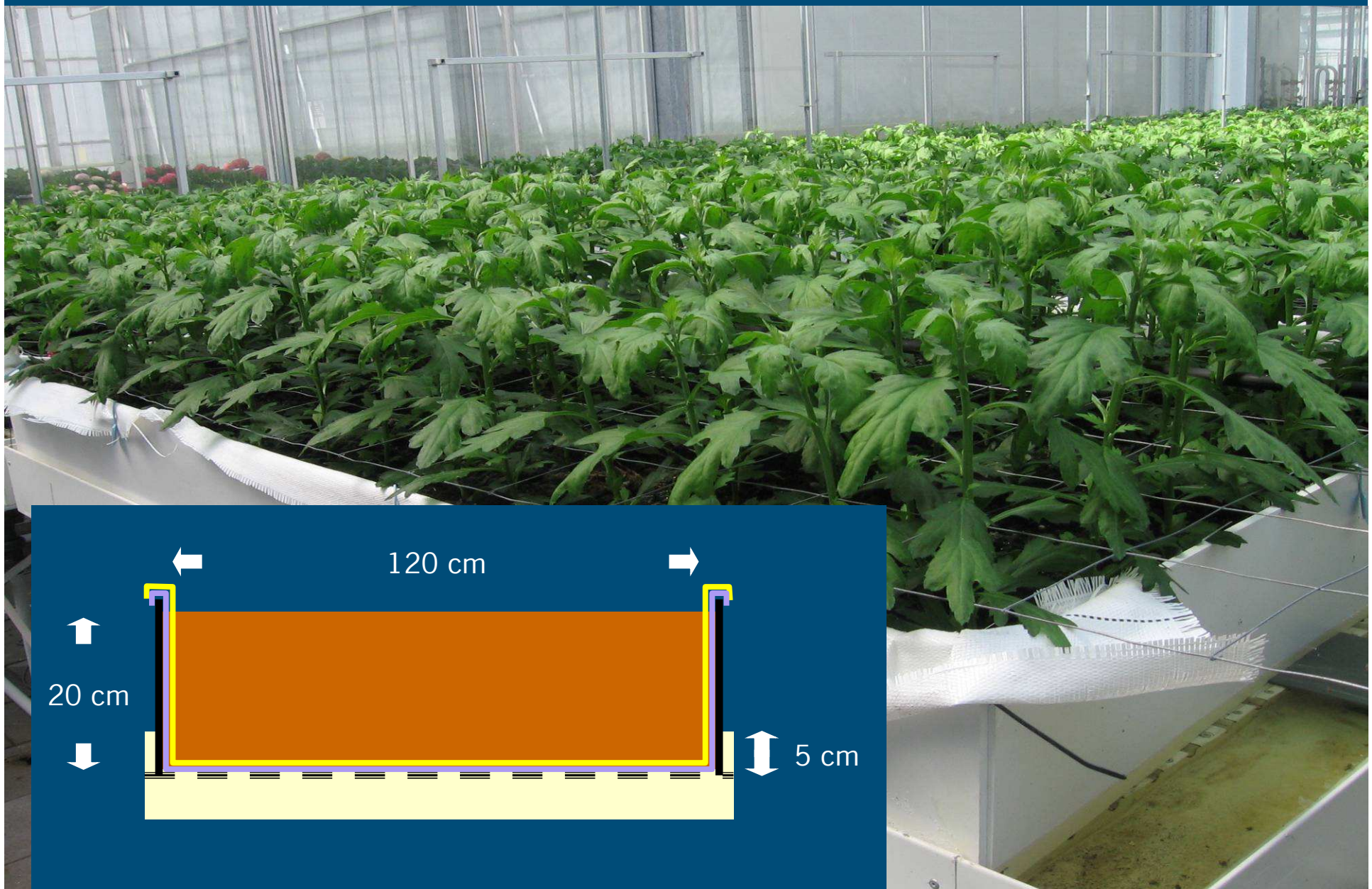
Deep soil bed



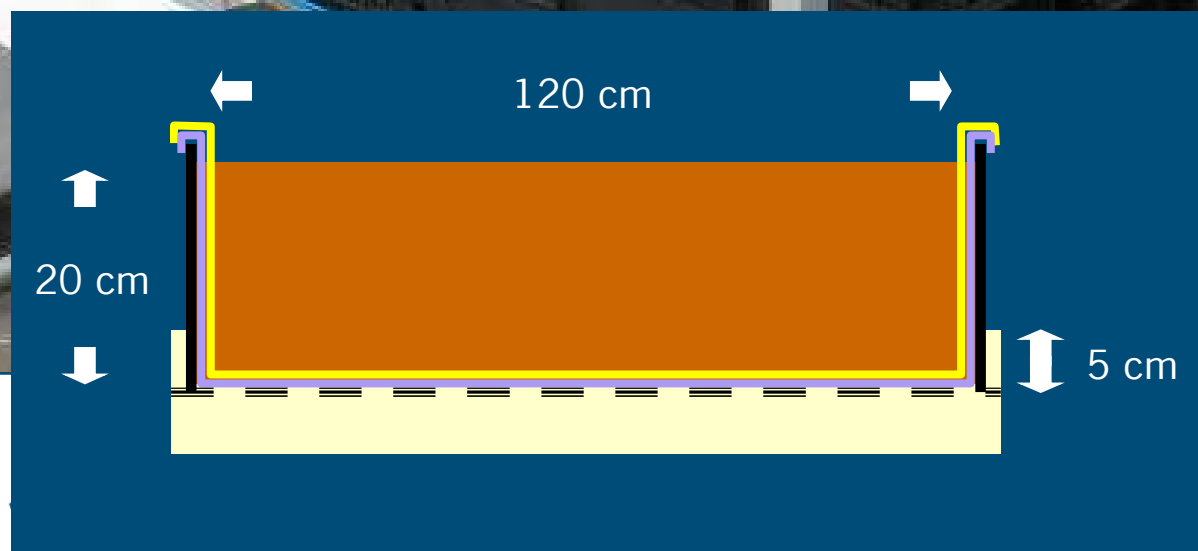
Sand bed



Peat bed



Lily crate



Cassette bed



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Cassette box



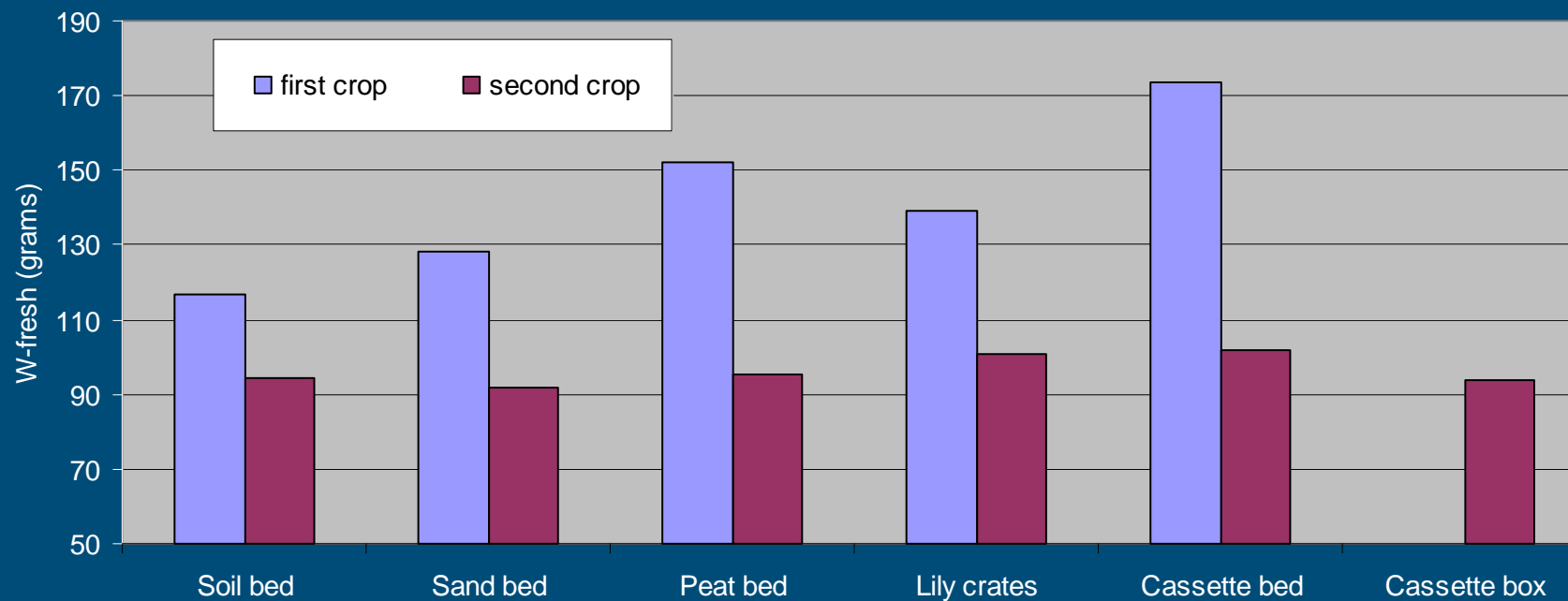
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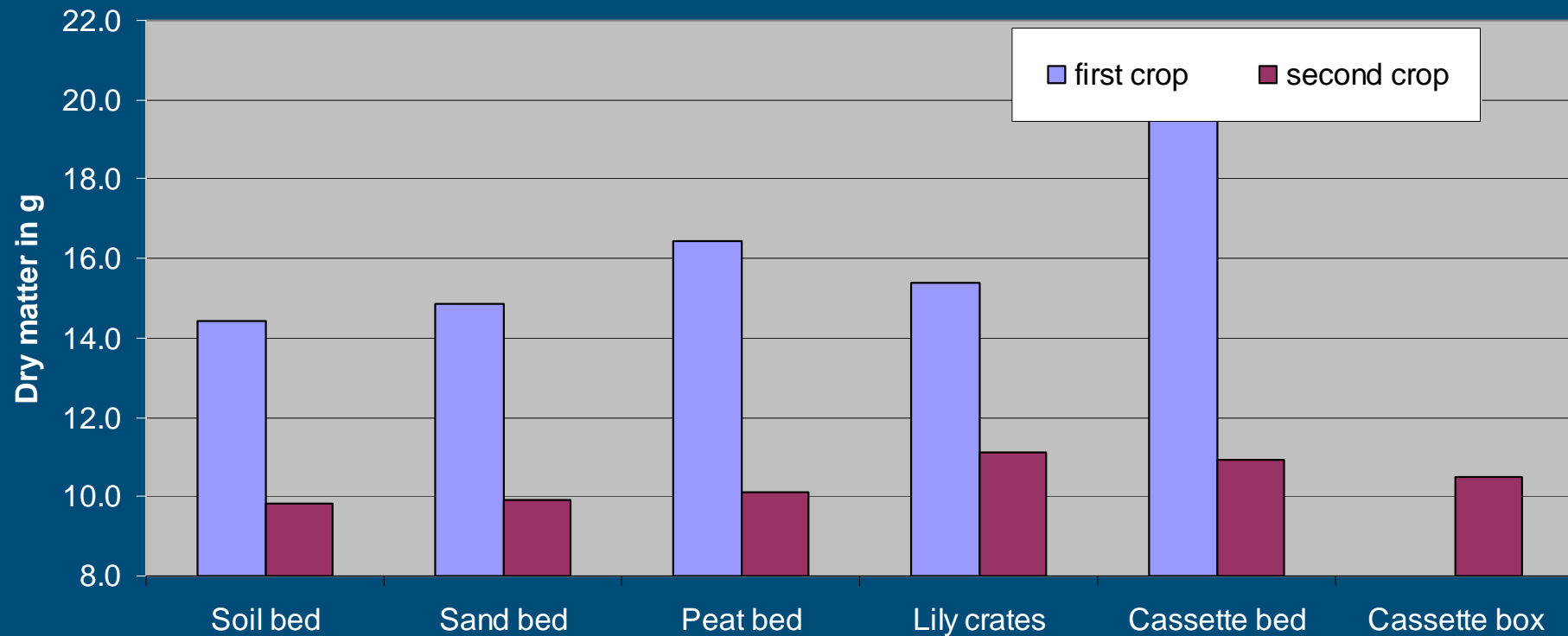
Details of first and second crop

	First crop		Second crop	
Systems	Peatbed Lily crates cassettebed	Deep soil bed Sand bed	Peatbed Lily crates Cassettebed Cassettebox	Deep soil bed Sand bed
Plant method	Direct sticking	Press pots	Direct sticking	Press pots
Planting date	14 July	9 July	26 October	
Plant density	55		50	
Number of long days	21	13	20	14
Duration of cultivation	72	81	75	85

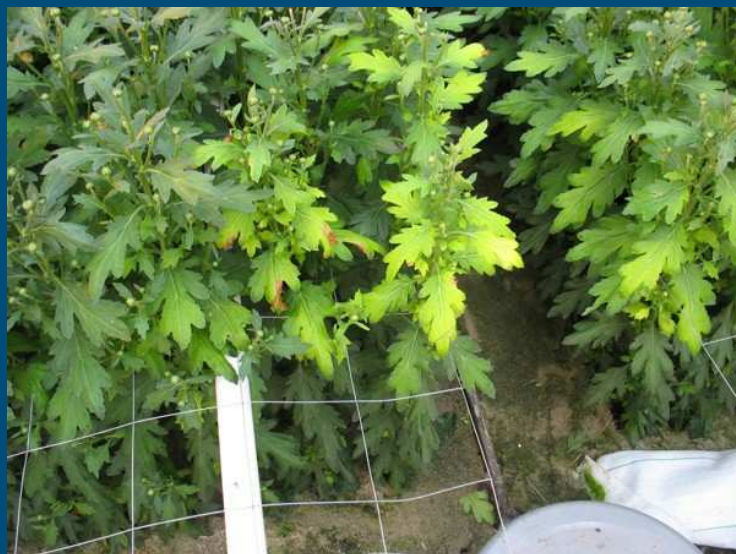
Results- fresh weight



Results – Dry matter



Sandbed



First crop
EC = 2.4



Second crop
EC = 2.8

Roots

Lily crates



Cassette bed

Roots Cassettebox



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WORTELS: zanbed (l) grondbed (r)



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Conclusion

- Direct sticking grows faster (> 4 days) than the press pots
- Starting on sand beds is faster than in soil (> 3 days)
- Deep soil bed gave a good production probably comparable with soil-based cultivation
- Sand bed had higher production and react fast on change in EC and pH (steering of EC and pH possible)

Conclusion

- Peat bed had 10 % higher production compare to deep soil bed in the first crop but the production was only 3% higher in the second crop.
- Because of the large volume substrate in the Peat bed it was difficult steering EC and pH
- Cassette bed 15 % higher production with 5 days longer cropping time
- Cassettebox had good potentials, plant length and fresh weight was comparable to the other direct sticking systems

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Innovaties vóór en mét de glastuinbouw

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