Case study linked to the theme of the Focus Group on soil salinisation

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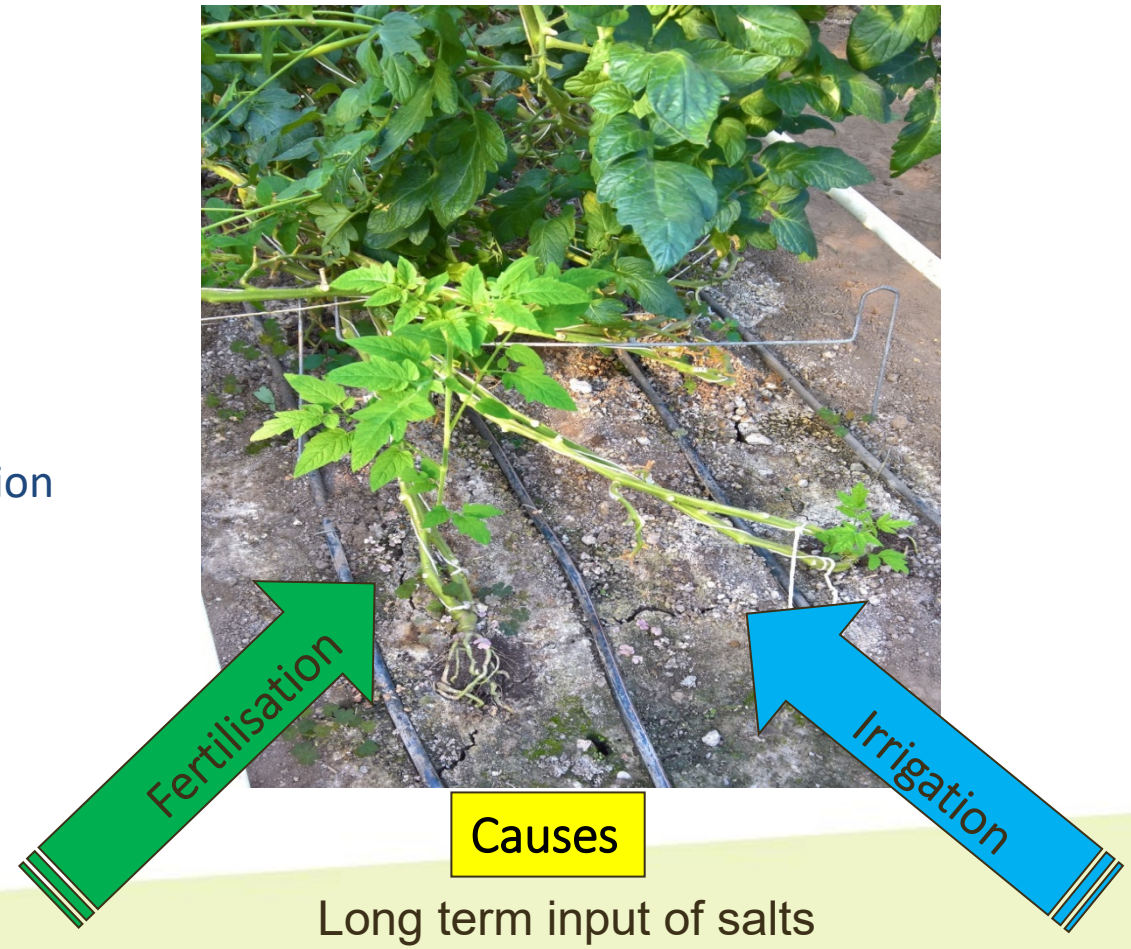
Operational Group: Desalinisation of greenhouse soils by halophytes

How do salts get into greenhouses?

After approximately 30 seasons: 4.8 dS/m (saturation extract)



Long term input of salts

Problem: Cultivation of salt susceptible vegetables

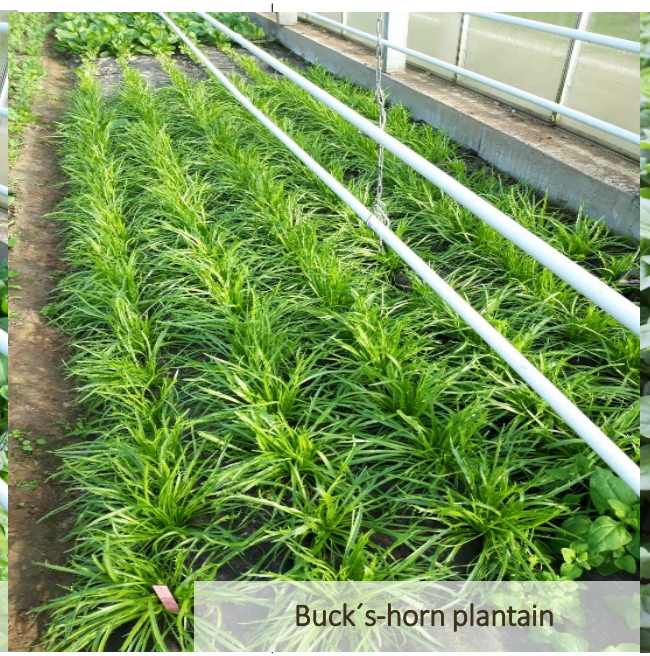
Pictures: Tim Große Lengerich

- In contrast to most „big“ crops (wheat, barley, maize, rice) just minor research efforts on salt resistance of vegetables.
- Threshold values (EC) for salt susceptibility of most vegetables from 50-60 years ago

Desalinisation with marketable halophytes: A possibility to reduce soil salt contents?


Mesembryanthemum


Chard

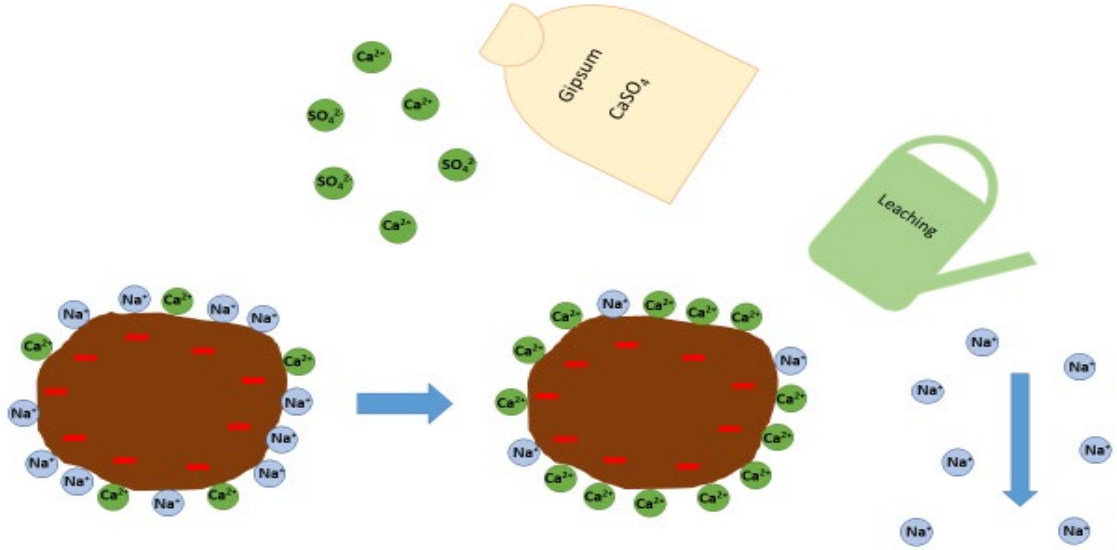

Buck´s-horn plantain


New Zealand spinach

Not sufficient enough

Proposals for greenhouseses with high salinity

- Leaching
- Avoiding drought stress
- Cultivation of
  salt resistant genotypes
- „Exchange“ of soil



In the long run:

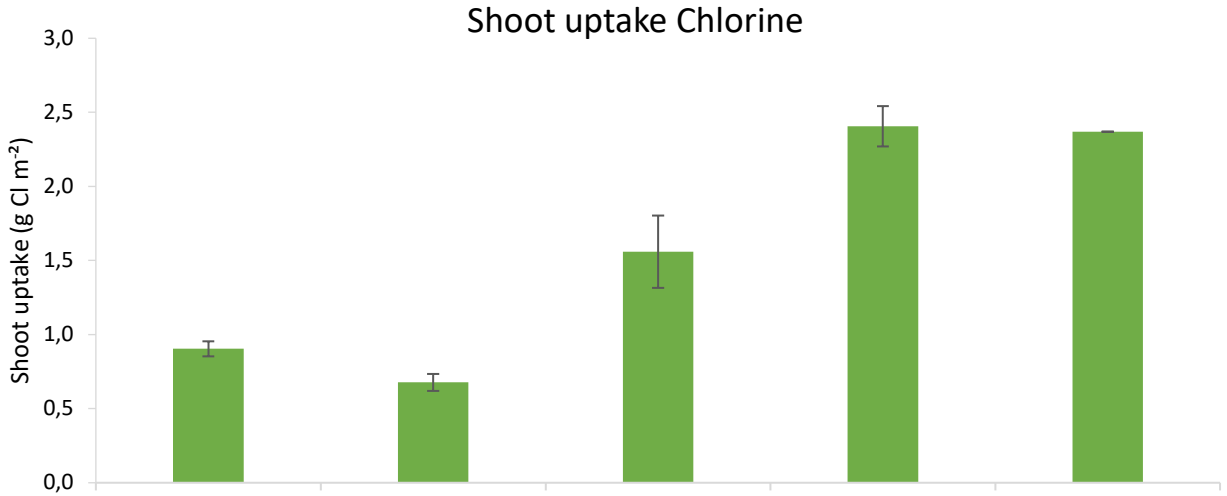
- Low EC irrigation water (rain water)
- Low EC organic fertilizers

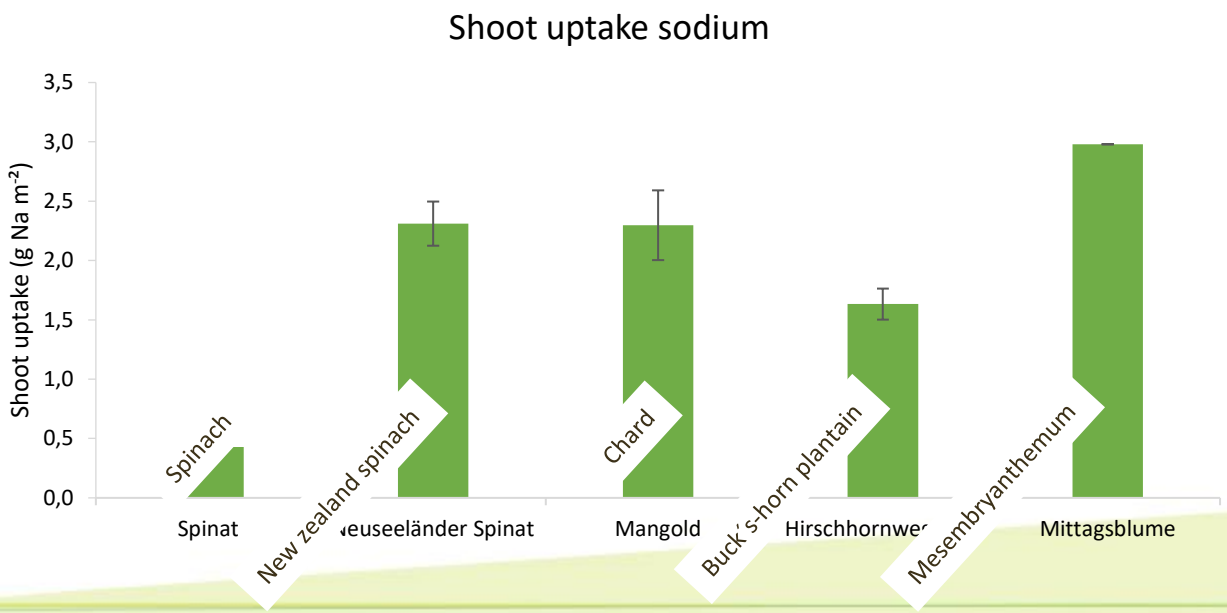
Outcomes of the OG

- Knowledge of gardeners about soil salinity has to be increased
- Cultivation of halophytes in greenhouses not sufficient for desalinisation
- Expansive investments in irrigation water treatment or rain water reservoirs often nessesary
- Halophytes are interesting "new" marketbale vegetables

Thank you for your attention!

First results: 1st cultivation





x 4-5 harvests

Salt inputs after one season of tomato cultivation:

Chlorine: 14 g m^{-2}

Sodium: 54 g m^{-2}

Uptake of salts during winter cultivation is not sufficient enough.

How do salts get into greenhouses?

	Sodium (Na)	Chlorine (Cl)	
Fertilisation with sugar beet vinasse	23.2	3.8	g m^{-2}
Irrigation (from well)	32.2	59.7	g m^{-2}
Sum of input	**55.5**	**63.5**	**g m^{-2}**
Tomatoes (15,6 kg/m^2)	0.53	8.54	g m^{-2}
Side shoots	0.01	0.90	g m^{-2}
Defoliated leaves	0.21	29.14	g m^{-2}
Pinching residues	0.01	0.90	g m^{-2}
Tomato plant (end of season)	0.85	10.48	g m^{-2}
Sum of exports	**1.60**	**49.95**	**g m^{-2}**
Total amount after one season	**53.90**	**13.55**	**g m^{-2}**

Values from literature (very variable)

After approximately 30 seasons: 4.8 dS/m (saturation extract)

EIP-AGRI seminar
Healthy soils for Europe: sustainable management through knowledge and practice
Online – 13-14 April 2021

All information of the seminar is available on
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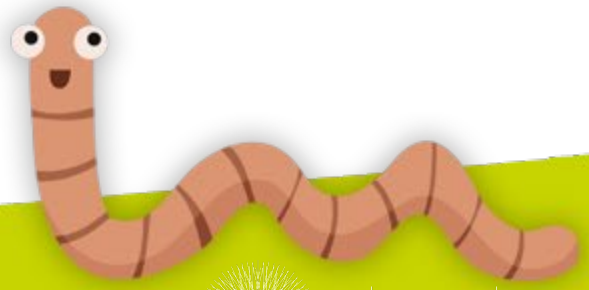
On the event webpage
https://ec.europa.eu/eip/agriculture/en/event/eip-agri-seminar-healthy-soils-europe-sustainable



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