Hoe om te gaan met oplopend Na ?

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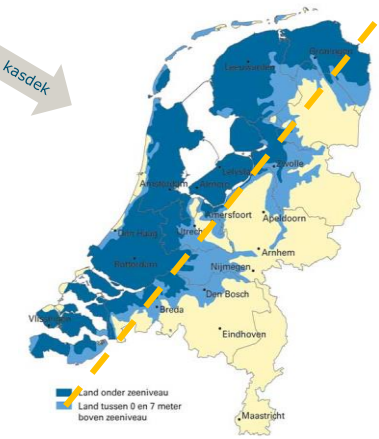
TOPSECTOR Glastuinbouw Nederland morgen groeit vandaag ELEKTRAVON-HAKET YARA

Probleem

Zoutbelasting

Na depositie (droog/nat) op kasdek

Zeewater intrusie



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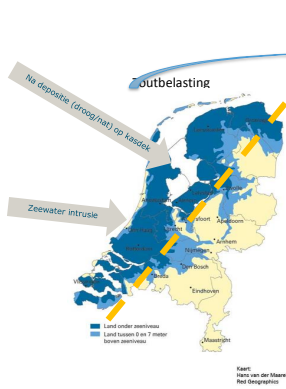
Kaart: Hans van der Maarel Red Geographics

ELEKTRAVON-HAKET YARA

2

Probleem



Hemelwater opvang

Meststoffen

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ELEKTRAVON-HAKET

YARA

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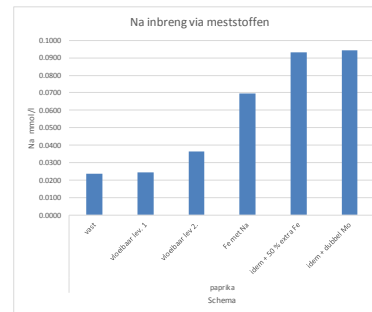
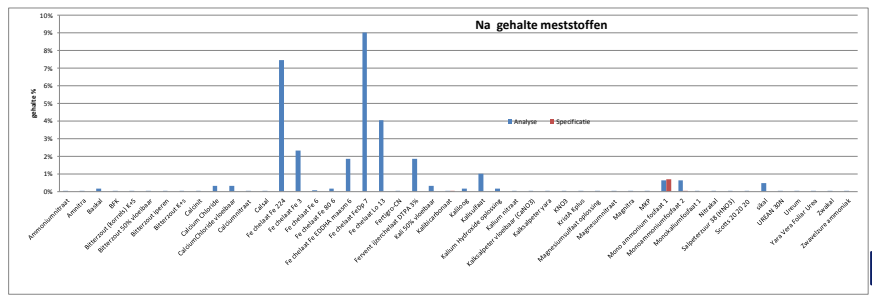
Waar komt het vandaan I ? meststoffen





YARA

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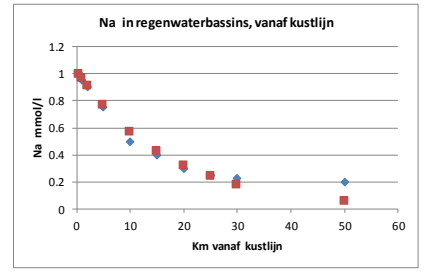
Waar komt het vandaan II ?
Het uitgangswater

Bron	EC mS/cm	Na mmol/l
Bronwater Westland	> 5	> 50 mmol/l
Bronwater Horst	0.8	0.45
Leidingwater (Evides)	1.2	1.8
RO (bron, Westl) teler 1	0.09	0.1
Teler 2	0.15	0.23
Regenwater (Nldwk	0.13	0.21
Regenwater(Bleiswk)	0.08	0.07



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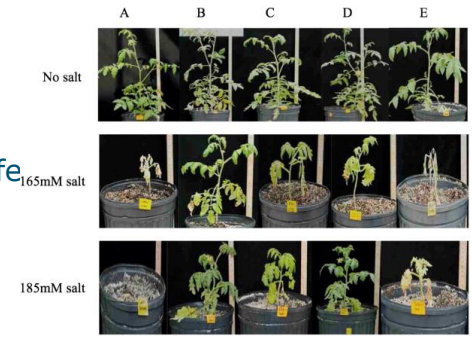
5

Na problematiek

- Zoutstress (salinity)
  - Osmotische stress
  - Specifiek Na / Cl effe
  - Sodicity

Een ander voorbeeld van een probleem door hoog Na is het optreden van bladnecrose, zoals hier bij cymbidium



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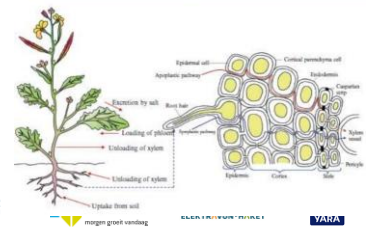
Hoe gaat de plant om met hoog Na

- 1. Zout-effect is vnl osmotische stress;
  - specifiek effect weinig bekend
- 2. Opname barriere:
  - Plant laat geen Na toe in wortel
- 3. Actieve uitscheiding
  - Plant verwijdert actief Na en scheidt het weer uit
- 4. Neutralisatie
  - Plant slaat het op (veilige plaatsen)

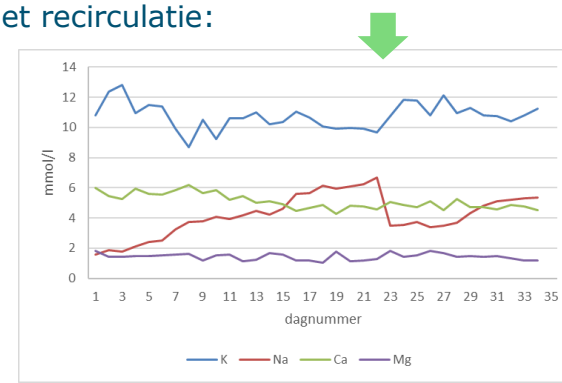


Specifieke zout effecten

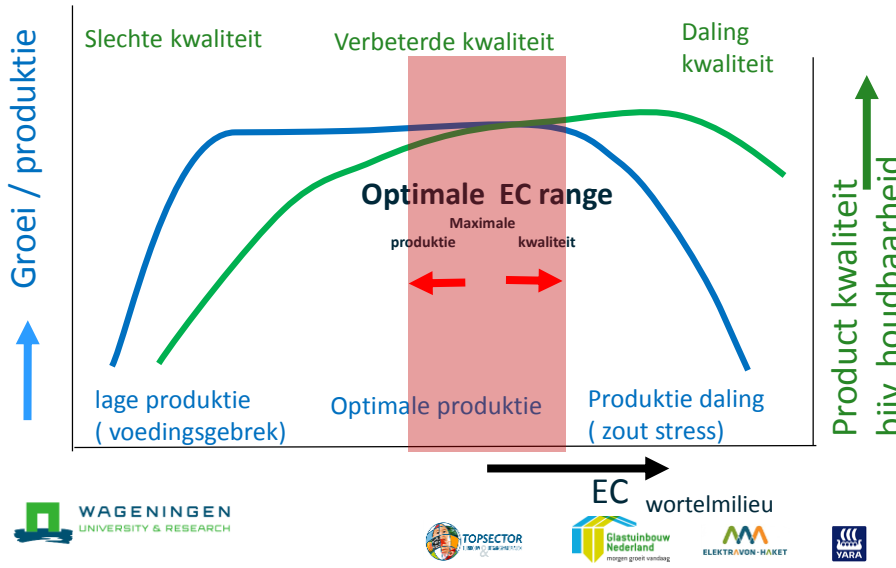
- Na kan toxisch werken
  - Na vergiftiging
  - Na antagonisme : Ca, K, Mg

Spui moment

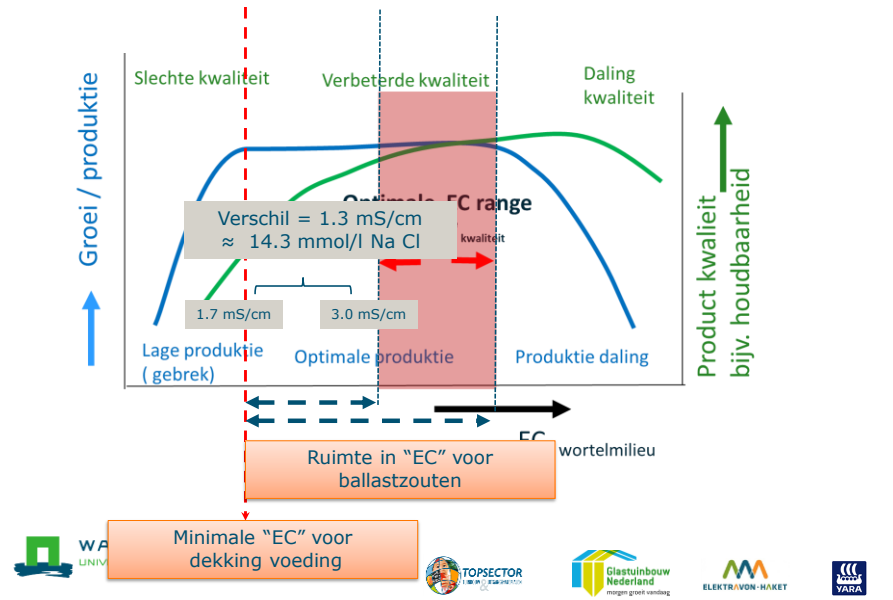
- Bij substraatteelt met recirculatie: Outputting voeding



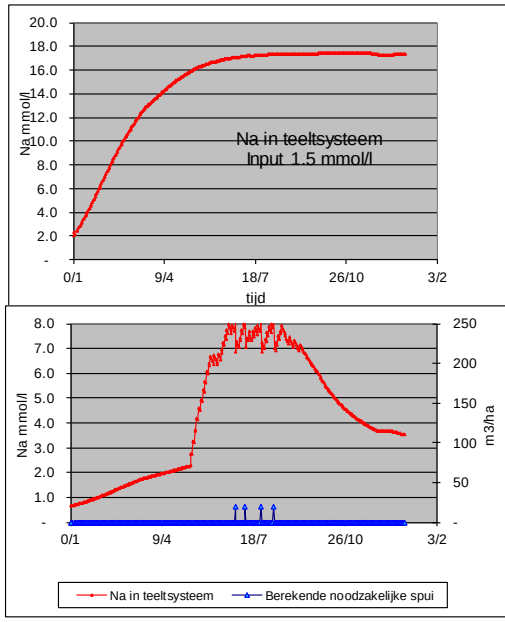
Effect van EC



Wat bepaalt de Na grenswaarde ?

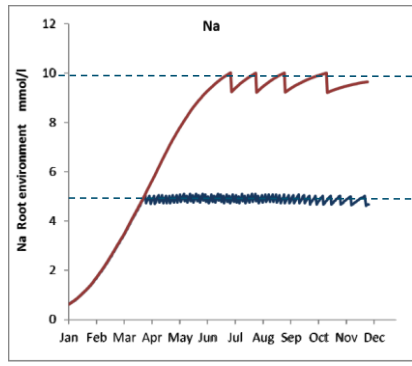


Na accumulatie in teeltsysteem



Effect van verhoging Na wortelmilieu

- Spui wordt sterk beperkt

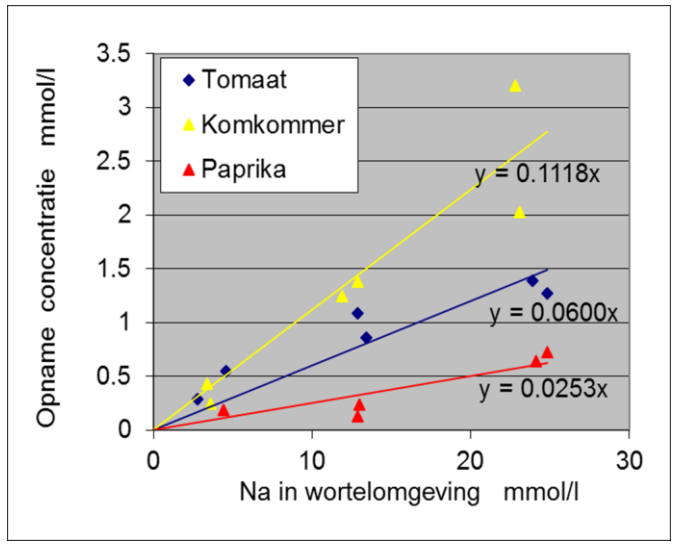


Na grens 10 mmol/l
(40 m3/ha spui

Na grens 5 mmol/l
(530 m3/ha spui)

Effect van Na grens in de drain op noodzaak tot spui

Na accumulatie in teeltsysteem

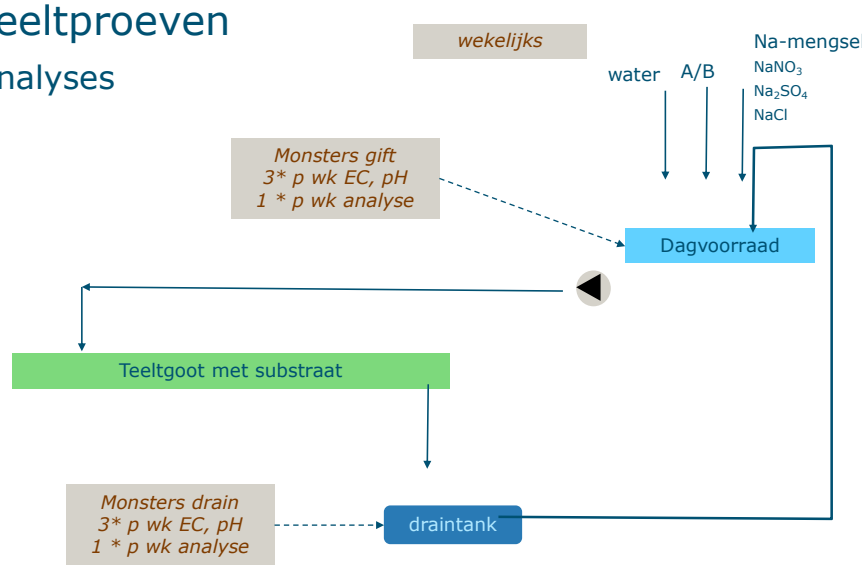


Onderzoek 2017/2018 en 2019- 2022 vraagstelling

- Wat is maximale grens voor Na in drain ?
- Is er sprake van gewenning door de plant ?
  - verschil tussen verhoging continu of alleen in zomer
  - maakt het uit of Na geleidelijk of abrupt stijgt

Teeltproeven

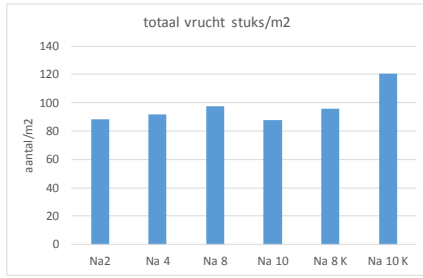
Analyses

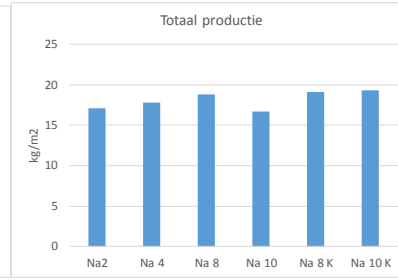


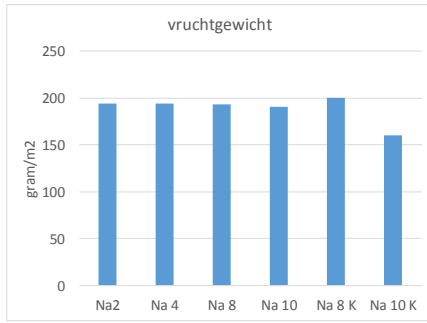
Teeltproeven

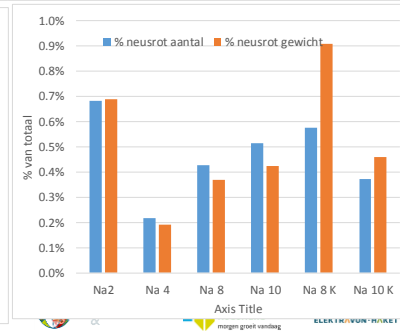
Behandeling	EC	Na	K	Ca	Mg	K/Ca	K/Mg
	Mmol/l						
A	3.8	5	8.0	9.5	2.8	0.84	2.87
B	3.8	10	6.8	8.0	2.4	0.84	2.87
C	3.8	15	5.5	6.6	1.9	0.84	2.87
D	3.8	20	4.3	5.1	1.5	0.84	2.87
E	3.8	15	4.5	7.1	1.9	0.64	2.33
F	3.8	15	3.5	7.6	1.9	0.46	1.84

Teeltpoef paprika









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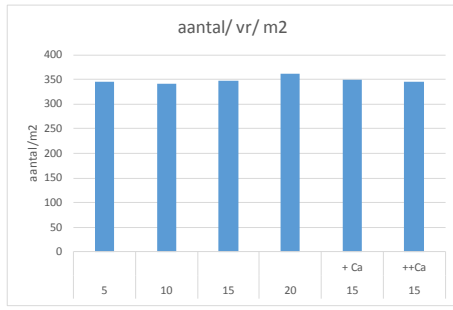
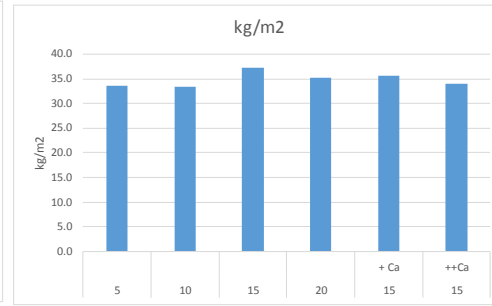
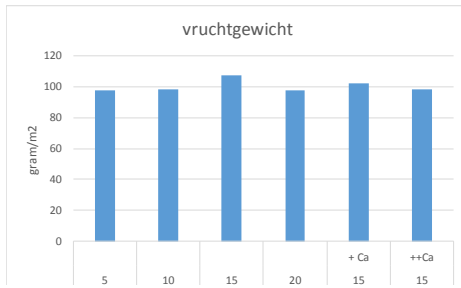
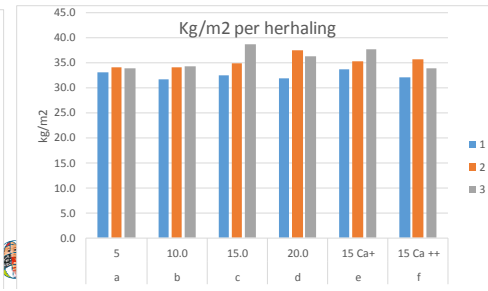
Teeltproef tomaat (t/m week 35)

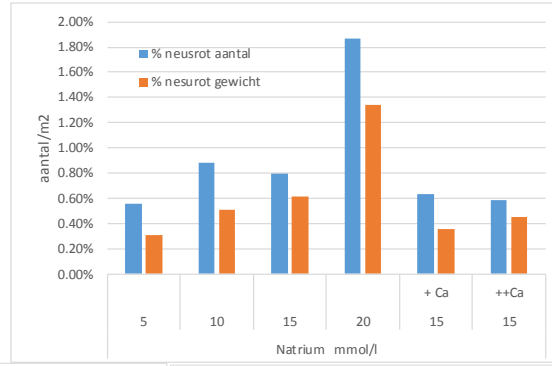


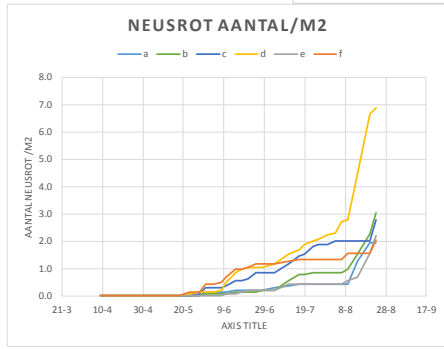


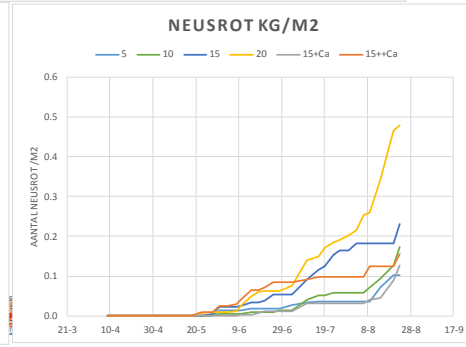




Neusrot







2019 Teeltproef tomaat (WUR- Bleiswijk)

Behandeling	EC	Na	K	Ca	Mg	K/Ca	K/Mg
	Mmol/l						
A (referentie)	3.8	5	8.0	9.5	2.8	0.84	2.87
B vanaf 1/3	3.8	15	5.5	6.6	1.9	0.84	2.87
C vanaf 1/3	3.8	20	4.3	5.1	1.5	0.84	2.87
D vanaf 1/6	3.8	15	8.0	9.5	2.8	0.84	2.87
E vanaf 1/6	3.8	20	5.5	6.6	1.9	0.84	2.87
F vanaf 1/6	3.8	25	4.3	5.1	1.5	0.84	2.87

Proef

- Na als streefwaarde voor de drain.
- Opbouw Na vanaf eind Februari Geleidelijk
- Drainhergebruik, streven is 30 %
- Wekelijks analyse en bijstellen gift

Start week 1 (7 januari _ (zaaidatum wk 48)
Ras Livento (RZ 72-397)

Teeltproef tomaat (YARA)

Behandeling	EC	Na	K	Ca	Mg	K/Ca	K/Mg
			Mmol/l				
A (referentie)	3.8	< 5	8.0	9.5	2.8	0.84	2.87
B van 1/6 in 4 weken	3.8	20	8.0	9.5	2.8	0.84	2.87
C van 1/6 in 2 weken	3.8	20	5.5	6.6	1.9	0.84	2.87
D vanaf 1/6 in één week	3.8	20	4.3	5.1	1.5	0.84	2.87

Start week 1 (4 januari _ (zaaidatum wk 48)

Proefopzet gerbera

Behandeling	EC	Na	K	Ca	Mg	K/Ca	K/Mg
	Mmol/l						
A (referentie)	3.0	0	5.5	8.3	4.0	0.7	1.4
B van 15/4	3.0	5	4.6	6.9	3.3	0.7	1.4
C van 15/4	3.0	10	3.7	5.5	2.7	0.7	1.4
D van 15/4	3.0	15	2.8	4.1	2.0	0.7	1.4
E van 1/6	3.0	15	2.8	4.1	2.0	0.7	1.4
F van 1/7	3.0	15	2.8	4.1	2.0	0.7	1.4

Vragen ?