

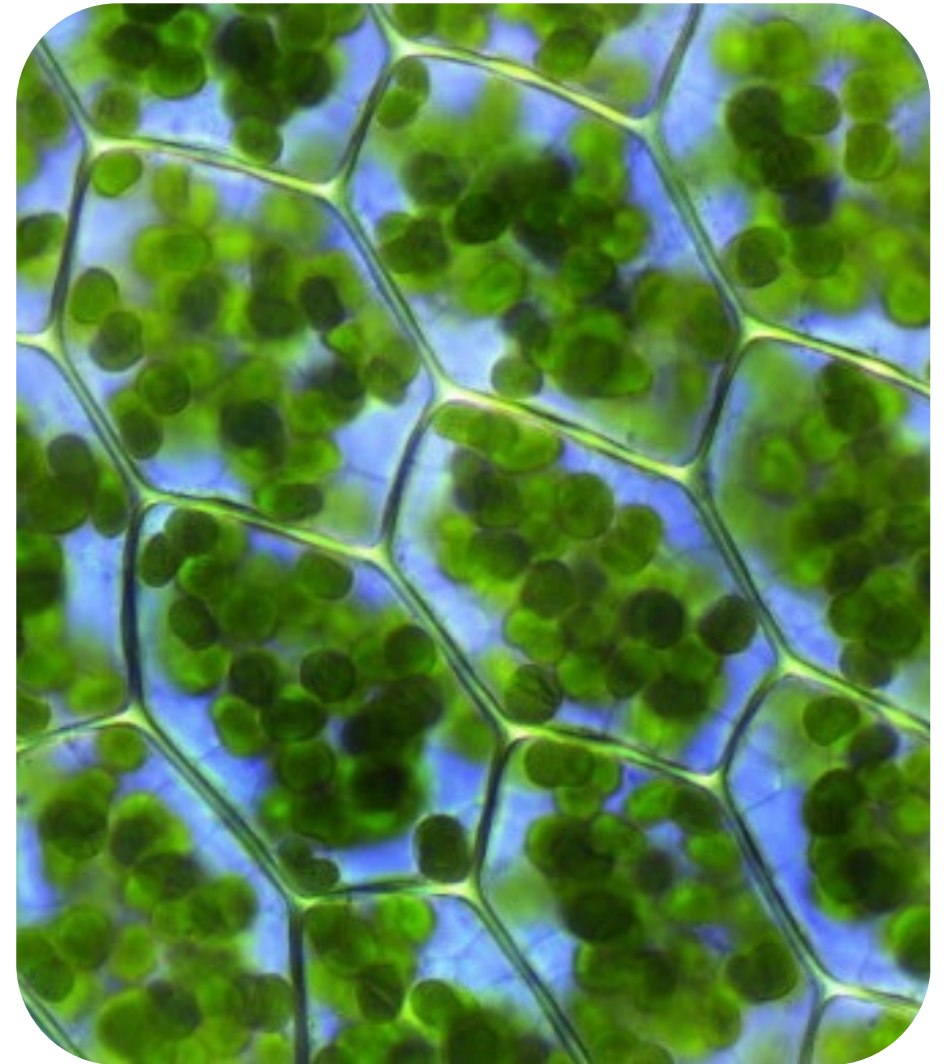


**Boosting crop resilience  
with optimized calcium uptake**



# Role Calcium in a plant

- Up taken in waterflow, storage in vacuole
- Still underestimated element in fertigation
- Built in cell walls:
  - strengthen cell structure = resilience
  - increase firmness and longevity fruits
- Plays an important role in mitosis
- Immobile after uptake
- Passively up taken by xylem via evaporation
- Uptake is challenging



# Sources of calcium



Lime substrate / soil



Water



Fertilizers



# Fertilization efficiency

**Water quality**

**Antagonism**

**Synergism**

**pH**

**Ballast salts**



## Water quality

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### Know your water

- Rainwater
- Surface water
- Well water
- Reversed osmosis
- Tap water

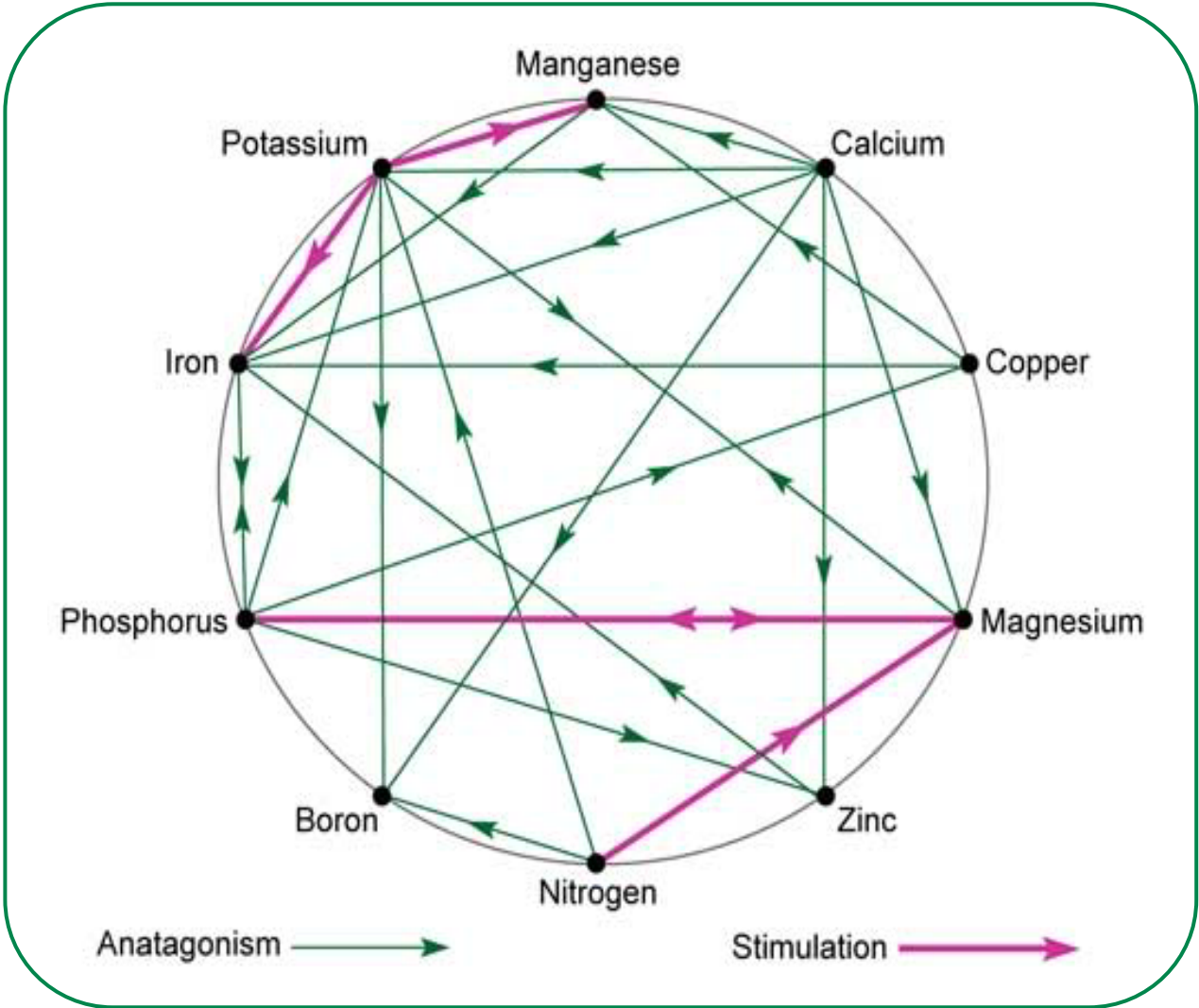
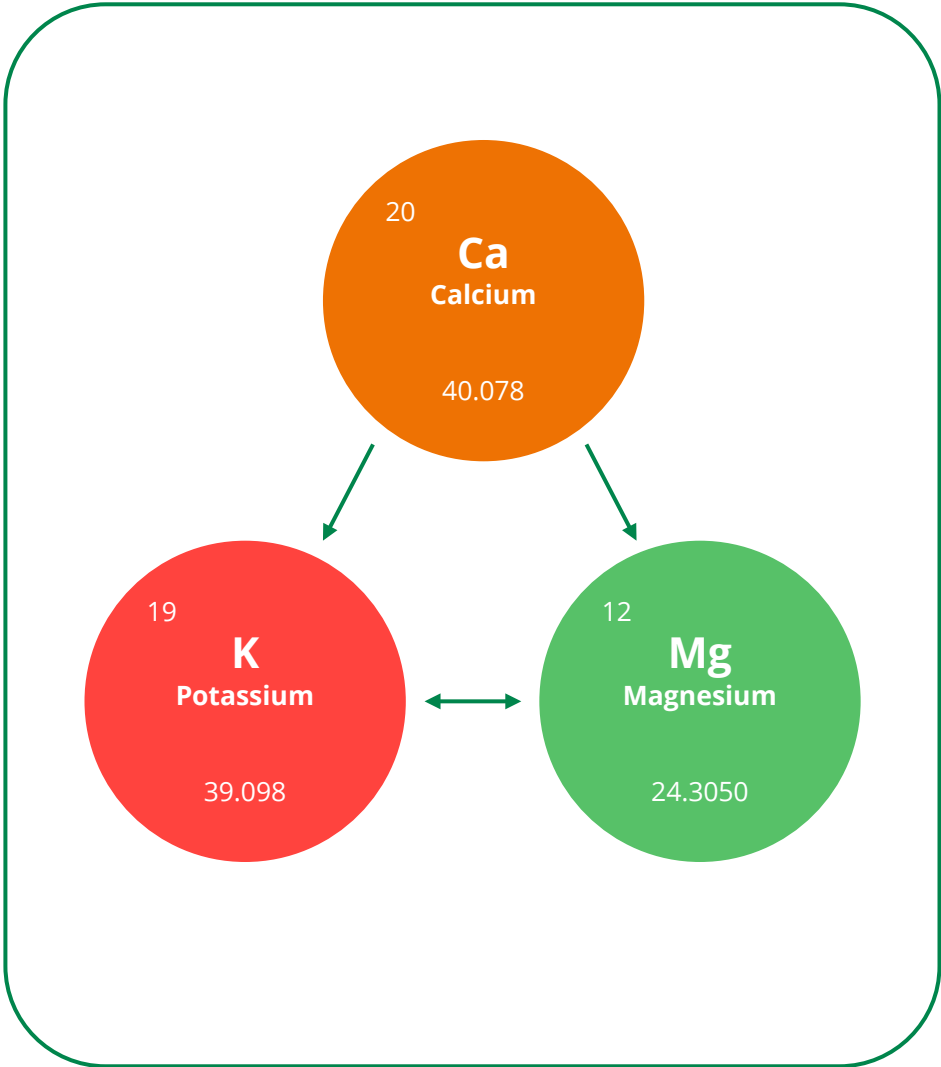
# Water quality

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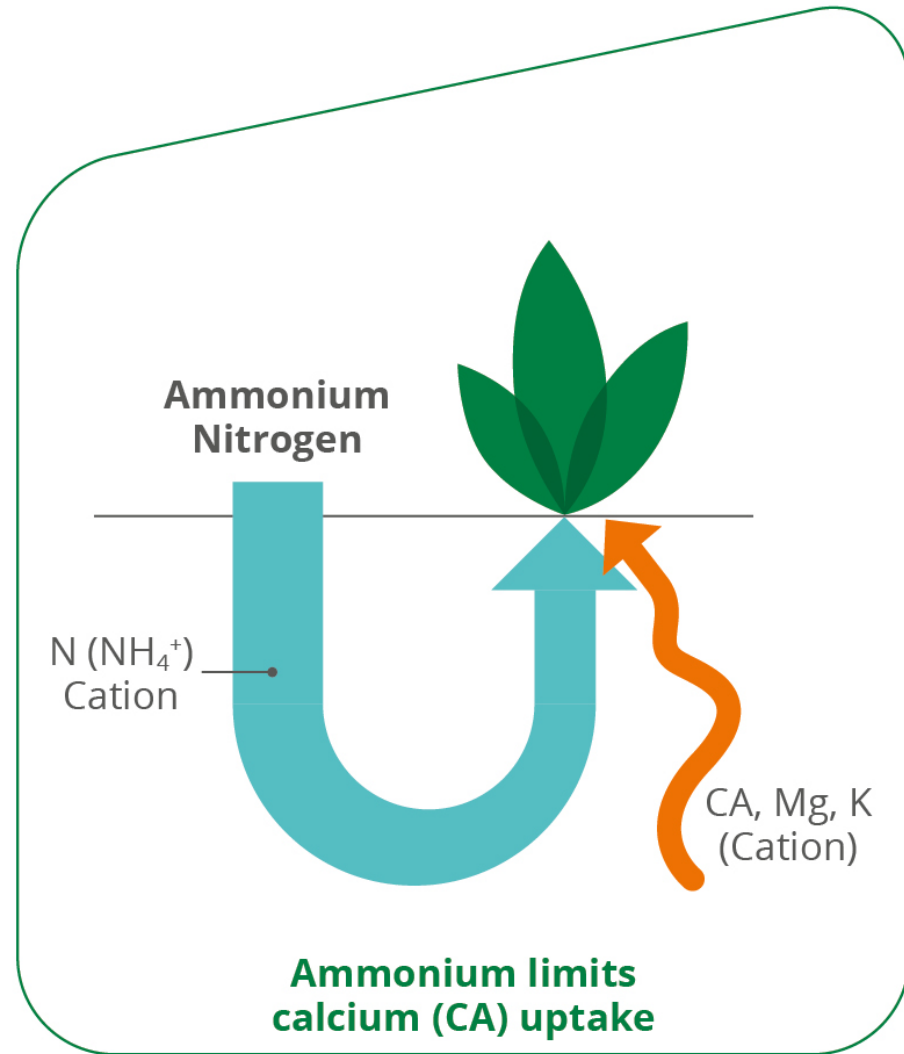
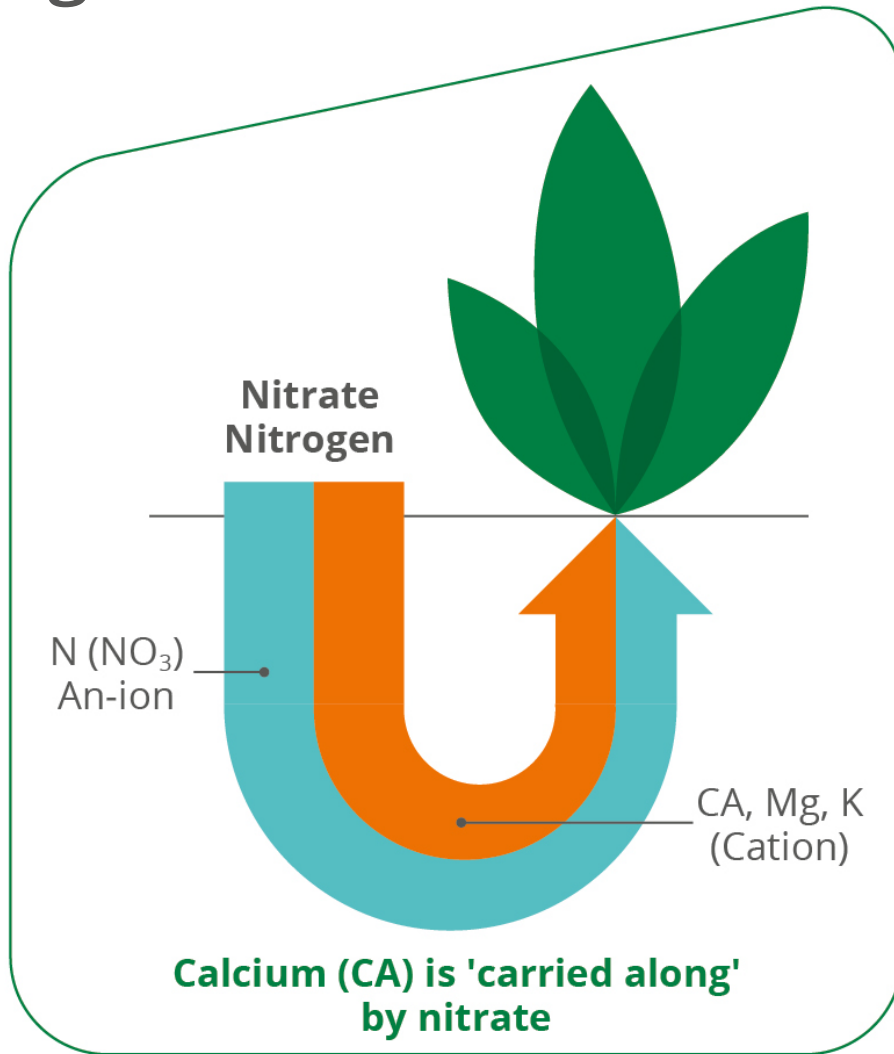
- Type of water: rain-, source, well, surface water
- pH
- EC
- Water hardness ( $\text{HCO}_3$ )
- Element content
- Ballast salts (Na, Cl)
- Availability Calcium
- Trace elements content
- Iron content (not soluble)



# Antagonism



# Synergism





# pH impact

- Influence
  - Substrate
  - Solubility fertilizers
- Choice of chelate types



Chelaatvorm	Werkzaam vanaf pH .. tot ..
Fe EDDHMA	3.0 - 11
Fe EDDHA	3.0 - 10
<b>Fe DTPA</b>	<b>1.5 - 7.5</b>
Fe HEDTA	1.5 - 7.0
FE EDTA	1.5 - 6.5
Mn EDTA	3.0 - 10
Zn EDTA	2.0 - 10
Cu EDTA	1.5 - 10
Ca EDTA	5.0 - 10
Mg EDTA	6.0 - 10

# Ballast salts

- Sodium , Chloride en Sulphate



# Calcium in fertilizers

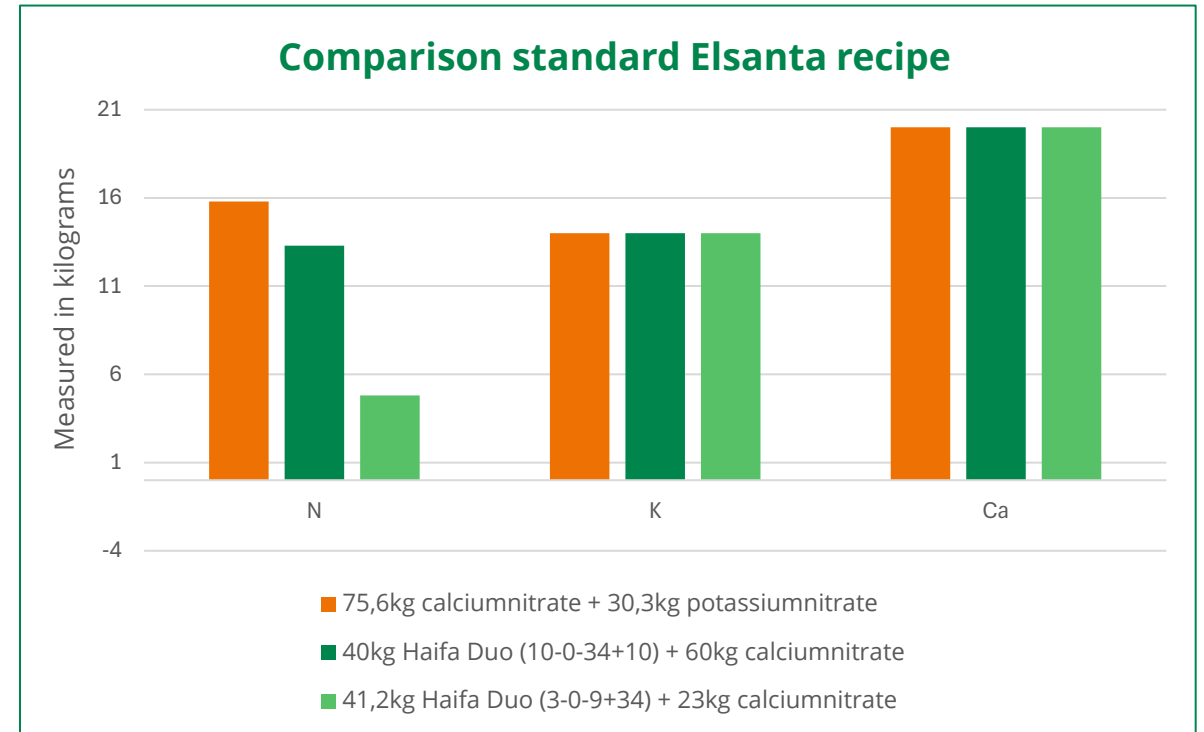
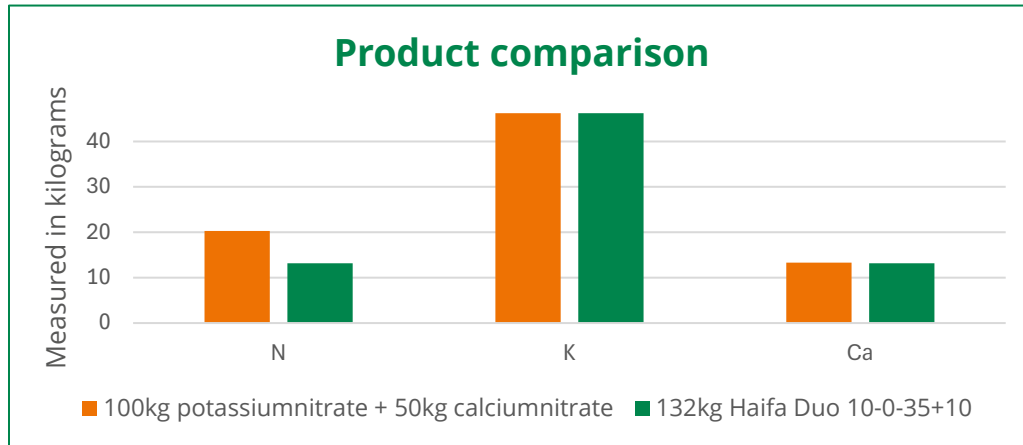
- Calcium nitrate
- Calcium chloride
- NPK formulas with Ca

17	<b>Cl</b> Chlorine	Chloride is a ballast salt, especially in recirculated systems
35.4527		

7	<b>N</b> Nitrogen	Excess of nitrogen gives a higher susceptibility for pests and diseases
14.007		

# Developments fertilizers

2 formulas: **10-0-35+10 CaO**  
**3-0-9+34 CaO**

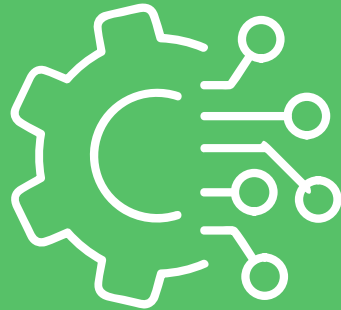


**Nitrate can be reduced  
with 15-70%**

# Boosting crop resilience by calcium uptake through



Knowledge



Innovation



Learning & Development



Thank you

