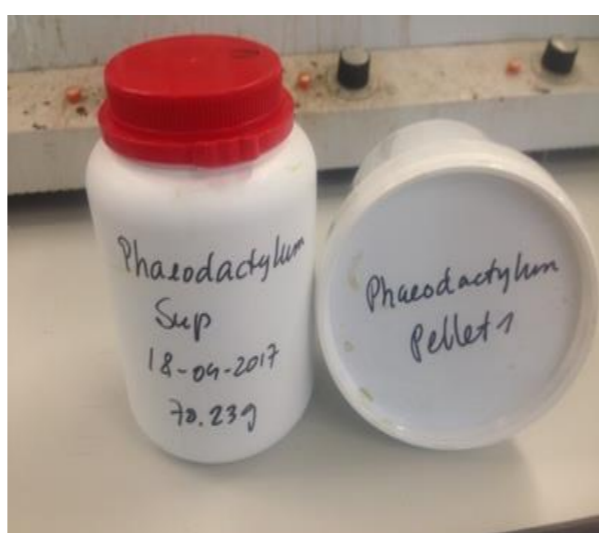


# Phaeodactylum stimulates growth by increased NO<sup>3-</sup> use efficiency

## Methodology Test Phaeodactylum

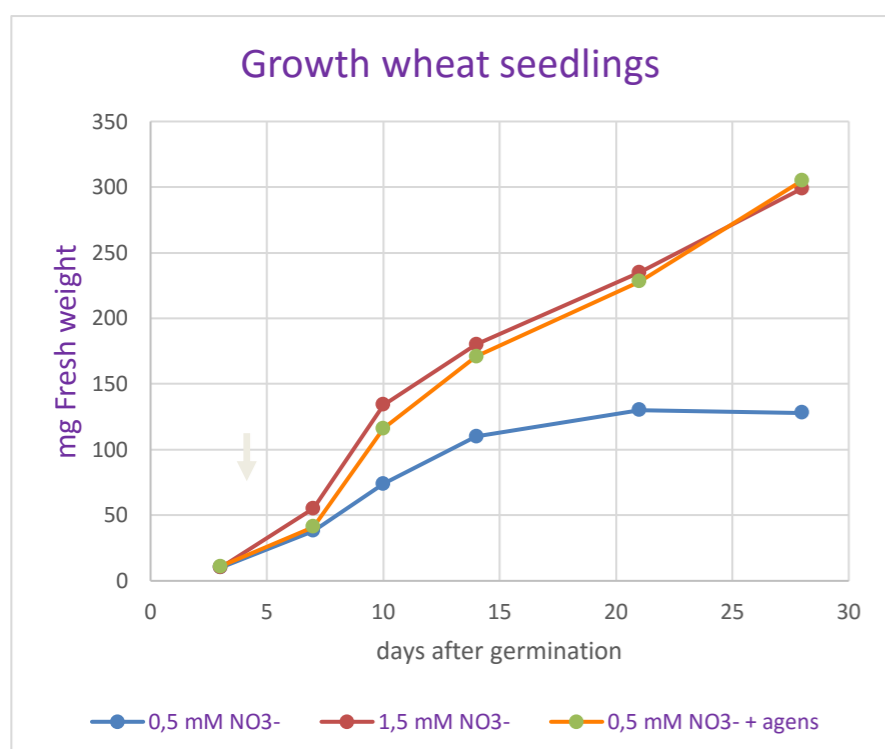
- Supernatans extracts were added after bacterie-filtering to
  - Wheat seedlings in nutrition solution,
  - And in NO<sup>3-</sup> concentration range
  - Sometimes enriched with N<sup>15</sup>-isotope
- Plants were analysed for growth, nitrate uptake and nitrate reductase activity
  - N<sub>15</sub> incorporation
  - Protein analysis (Bradford and total N)
  - NiRu in vivo analysis
  - Root length measurement by (Geotron, Model WLMI)



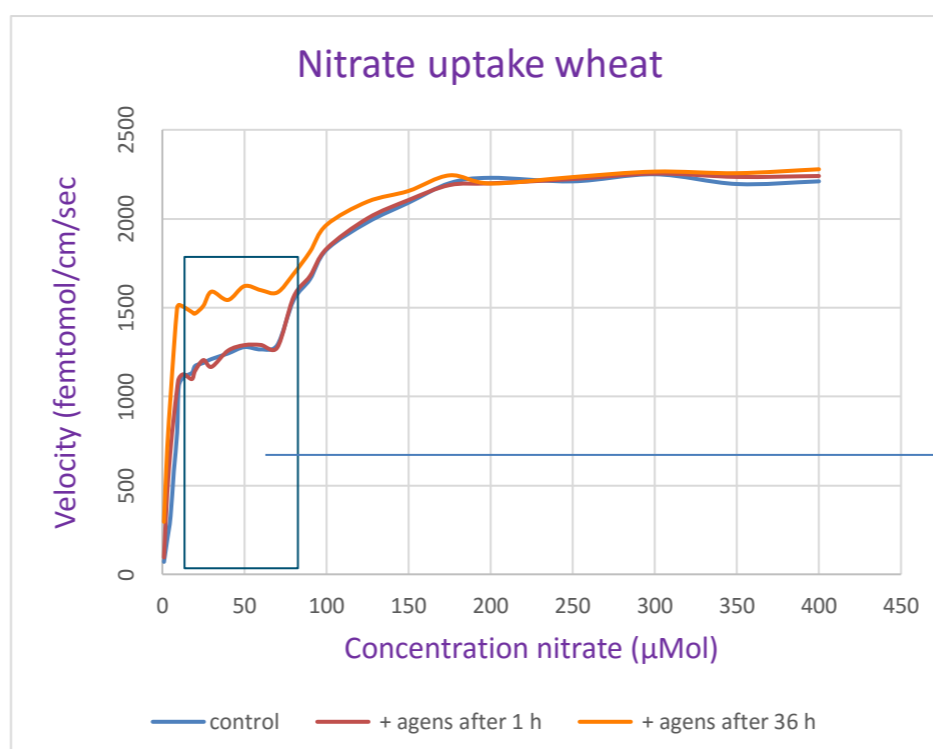
## Phaeodactylum

- No increased growth rate
- No increased expansion rate of leaves
- No delayed senescence
- No increased branching
- But higher N-efficiency
  - More biomass per unit
  - Improved uptake
  - Put out deeper N in medium

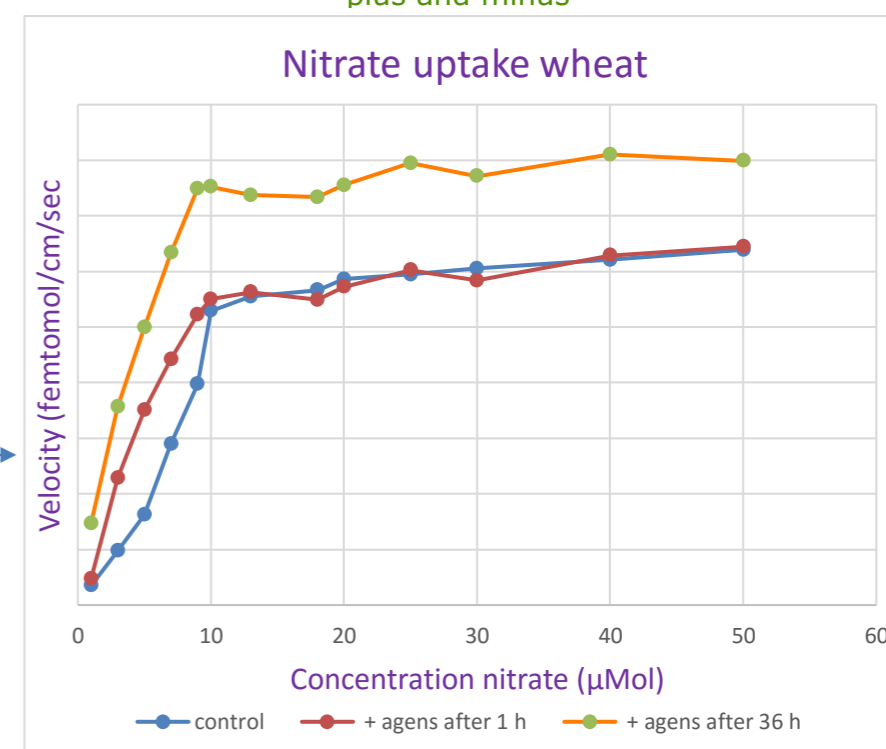
Growth of wheat seedlings plus and minus Phaeodactylum, batch 2



Uptake experiments-1



Uptake experiments-2: focus on system 1 plus and minus



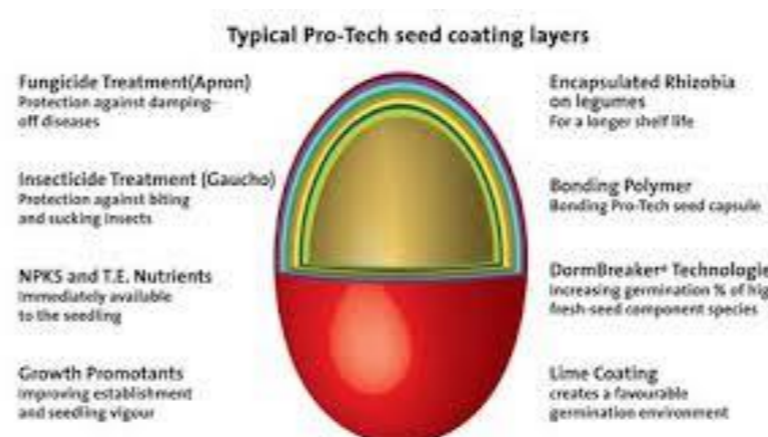
## Effects explained

- Nitrate uptake is biphasic; high and low affinity system
  - Shifts in Km (=affinity index) in system-1; within 1 hour, probably due to change of configuration of carrier
  - Shifts in Vmax after 36 h, change via protein synthesis
- Nitrate reductase activity unchanged; but Km 25% lower

## Business application

### • Phaeodactylum:

- Seed coating
- Grass breeders for "sport grass reinforcement"
- Slow release sources



**Dosage:**  
0,2-1,0 FD gr equivalents (per unit 100 ml)  
**Estimated additional costs:**  
0,3-1,75 €ct (per unit 100 ml)

Please contact me for business ideas, cooperation projects, feasibility studies

[daan.kuiper@cropeye.com](mailto:daan.kuiper@cropeye.com)  
+31651216159



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 613588