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Webinar: Gain control of Scope 3: building resilient low-carbon crop supply chains.

December 2nd | 15:00-16:00 CET | Webinar

Get in touch!

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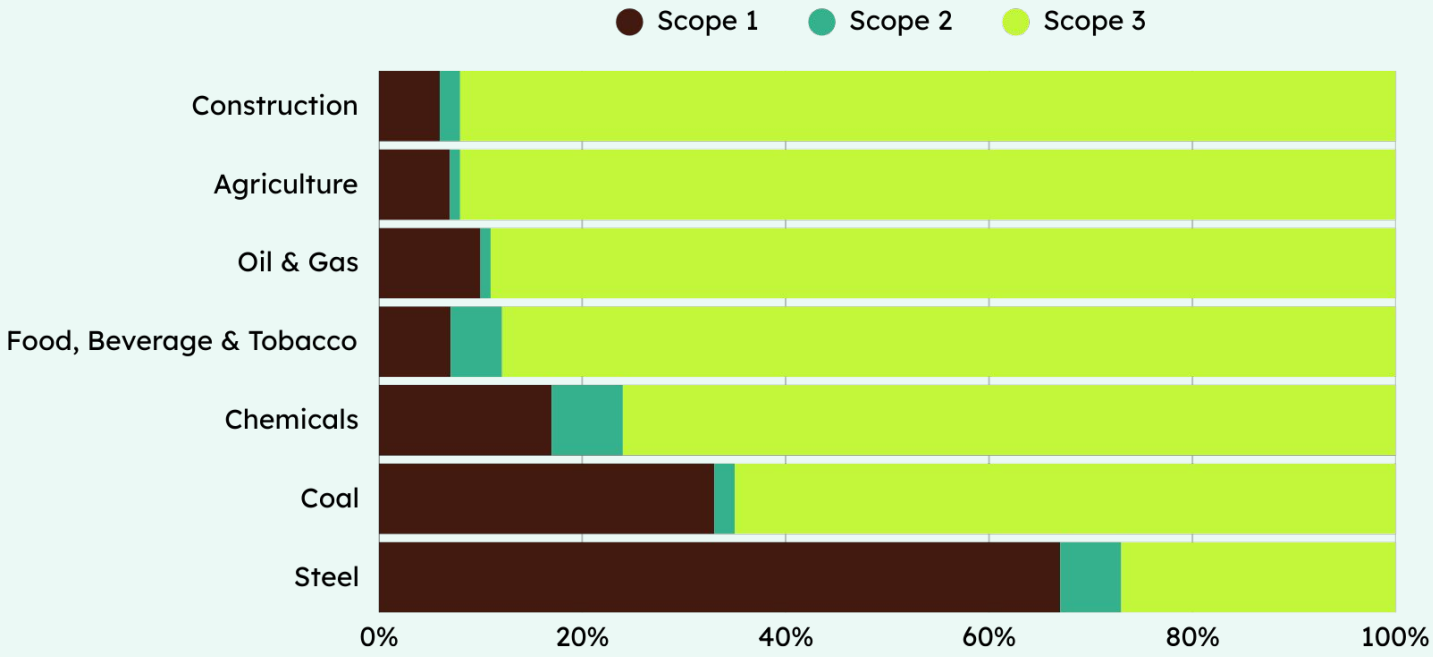
What is Scope 3?

Scope 3 emissions are the indirect greenhouse gas emissions that occur across a company's entire value chain, both upstream and downstream, from activities the company doesn't directly control.

Why is scope 3 relevant?

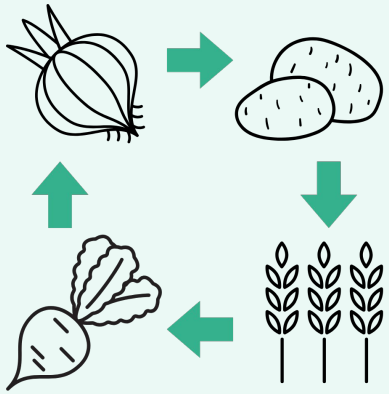


Arable farming in the Netherlands

2025

Crop	Cultivated area (ha)	Yield per ha (tons)	Total yield (tons)
Wheat	112.380	10,2	1.146.553
Barley	25.186	7,9	279.107
Potato	164.418	48	7.900.233
Sugar beets	80.013	90	7.201.197
Onions	33.183	52,1	1.727.259

Source: CBS



Agrifirm is a farmer’s cooperative - we make impact

Agrifirm

Plant-Based Solutions (PBS)

- ±120 farm advisors
- Crop advice
- Buying and selling of wheat and barley
- Focus on innovations
- Software platform

Impact

Scope

- the Netherlands
- ±8000 farmers
- PBS = arable, fruits, full field vegetables, fodder and flower bulbs

Yield

Adding value

- Knowledge partner
- Crop cultivation plan
- Our innovations solve real issues:

- **Balansbemesting**: Improving nitrogen use efficiency

- **Total Blight Approach** Reducing environmental impact

Sustainability

“Turning KPI’s into action”

- Regenerative approach:
  - Climate
  - Biodiversity
  - Water quality
  - Soil Health

- Carbon footprint reduction: partner with Proba

- Alignment with SBTI and SAI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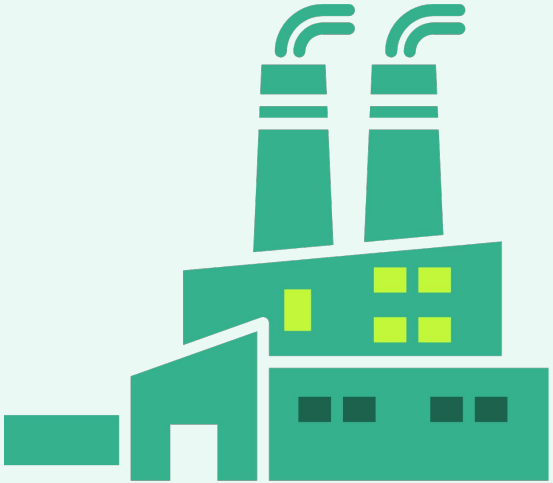
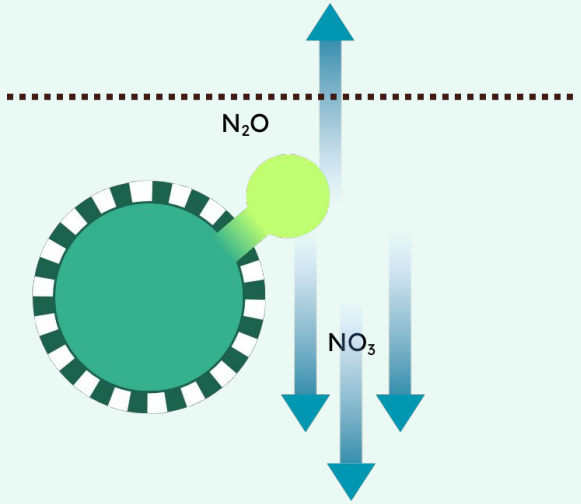
GHG emissions from arable agriculture

Carbon footprint of nitrogen fertilizers

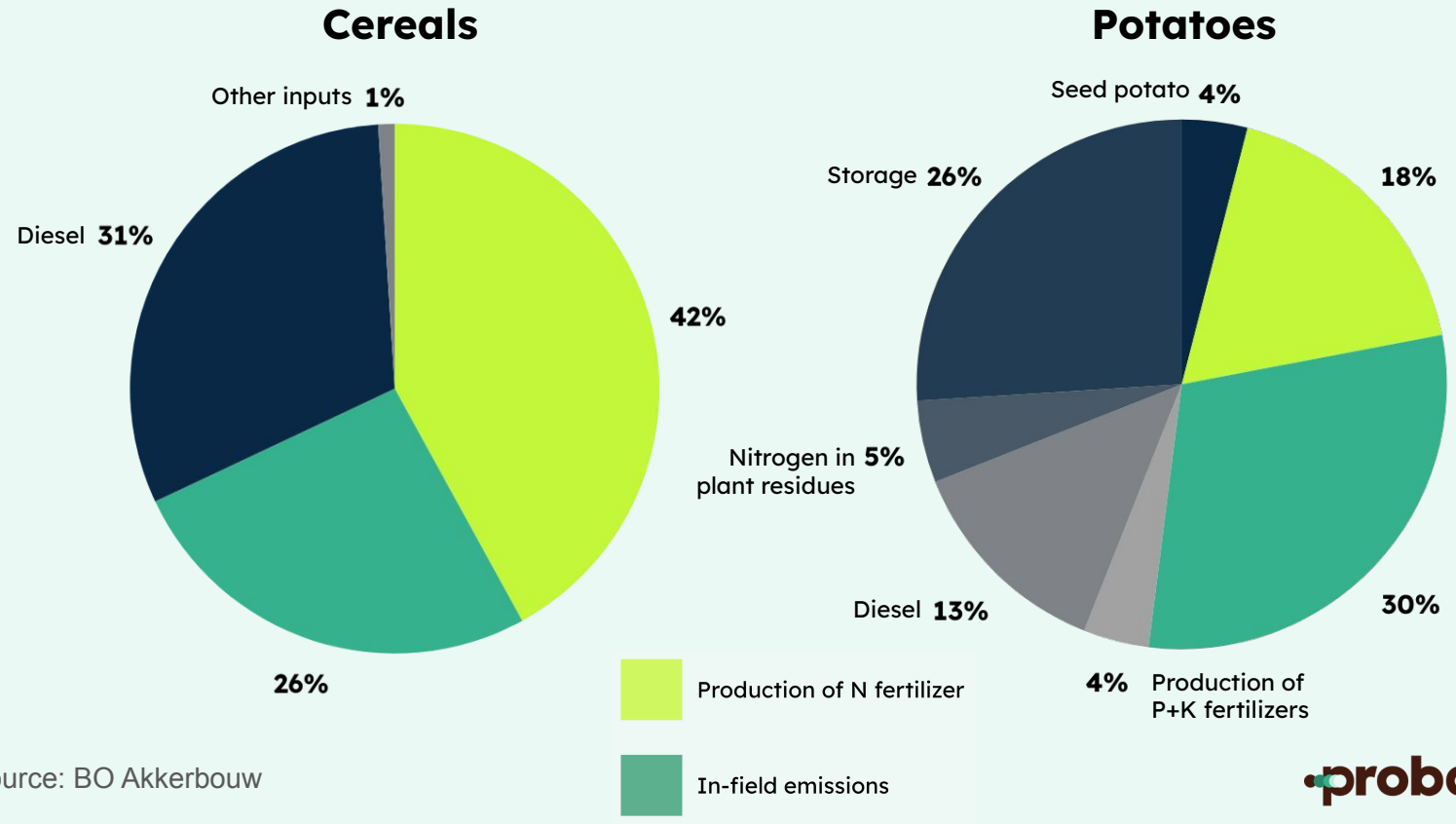
Production of nitrogen fertilizers



In-field emissions from nitrogen fertilizers



CO_2 footprint of crops – fertilizers have a big impact



Source: BO Akkerbouw

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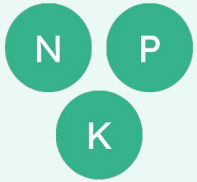
Mitigation strategies: Improving Nutrient Use Efficiency

4R nutrient stewardship



Right source

Matches fertilizer type to crop needs

Right time

Matches fertilizer amount to crop needs

Right rate

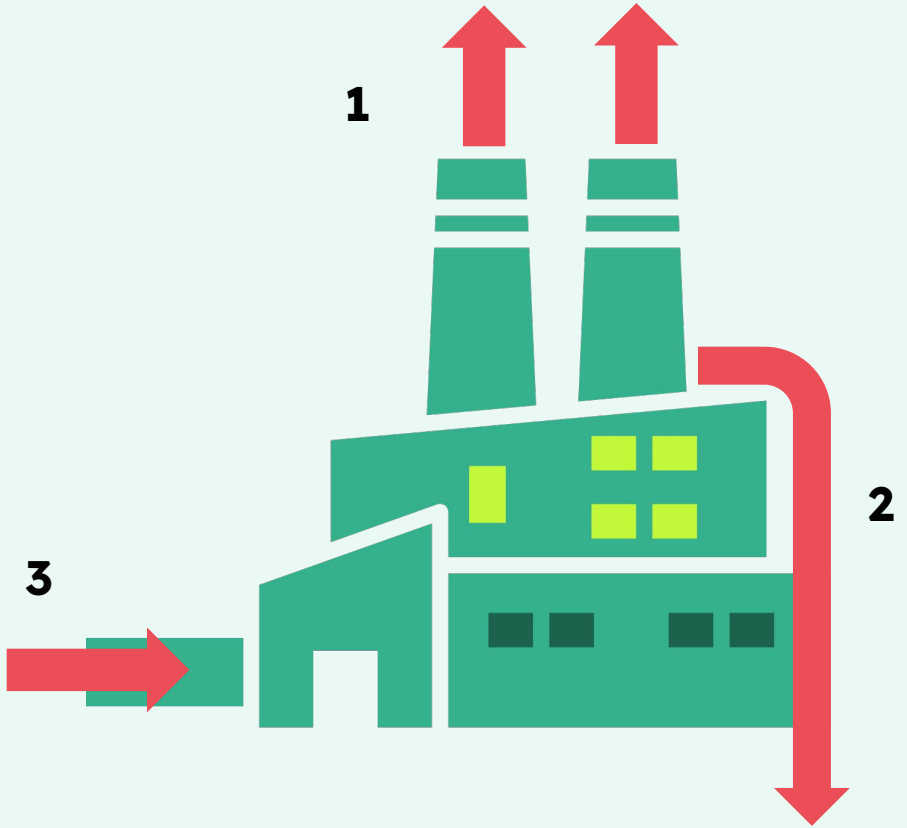
Makes nutrients available when crops need them

Right place

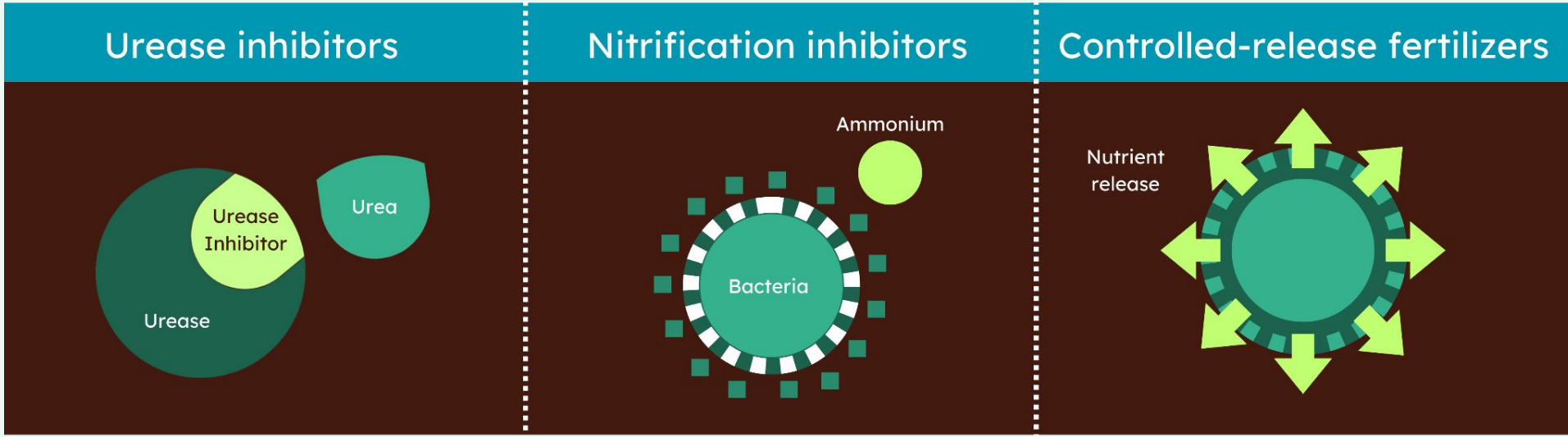
Keep nutrients where crops can use them

Mitigation strategies: Reducing fertilizer PCF

1. Reducing N_2O emissions during production
2. Capture and long term storage of CO_2
3. Replacing fossil natural gas inputs with biomethane or green electricity



Mitigation strategies: Reducing in-field emissions



Interventions to reduce

Production emissions	Transport	In field emissions		
98% Low carbon fertilizers		**30-70%** Stabilizers	**30-60%** Controlled Release Fertilizers (CRF)	**5-50%** Nitrogen Use Efficiency (NUE)
30%	**10%**	**60%**		

What do mitigation strategies look like on the field

What do farmers want?

- No abrupt changes to their current practices
- Interventions that are risk-free for them - no yield loss
- Proven interventions
- Not too much hassle around audits
- Financial motivation to implement changes

What do food companies want?

- Supply security
- Scalable and cost efficient projects
- Assurance
- No negative effect on crop yield and quality
- Co-benefits, e.g. Regenerative practices (SAI)
- SBTi compliance

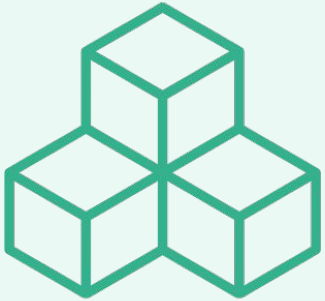
How do we bridge the gap between farmer and food company?

1) Research and selection -> proven interventions per crop / soil type
2) Onboarding farmers
3) From intervention to cultivation / fertilization plan
4) Follow-up during season with evaluation after harvest
5) Data exchange with Proba
6) Validation and Verification

Trial results from testing several fertilizers. Outlined boxes are positive results - fertilizer intervention works!

Project results

Proba's role



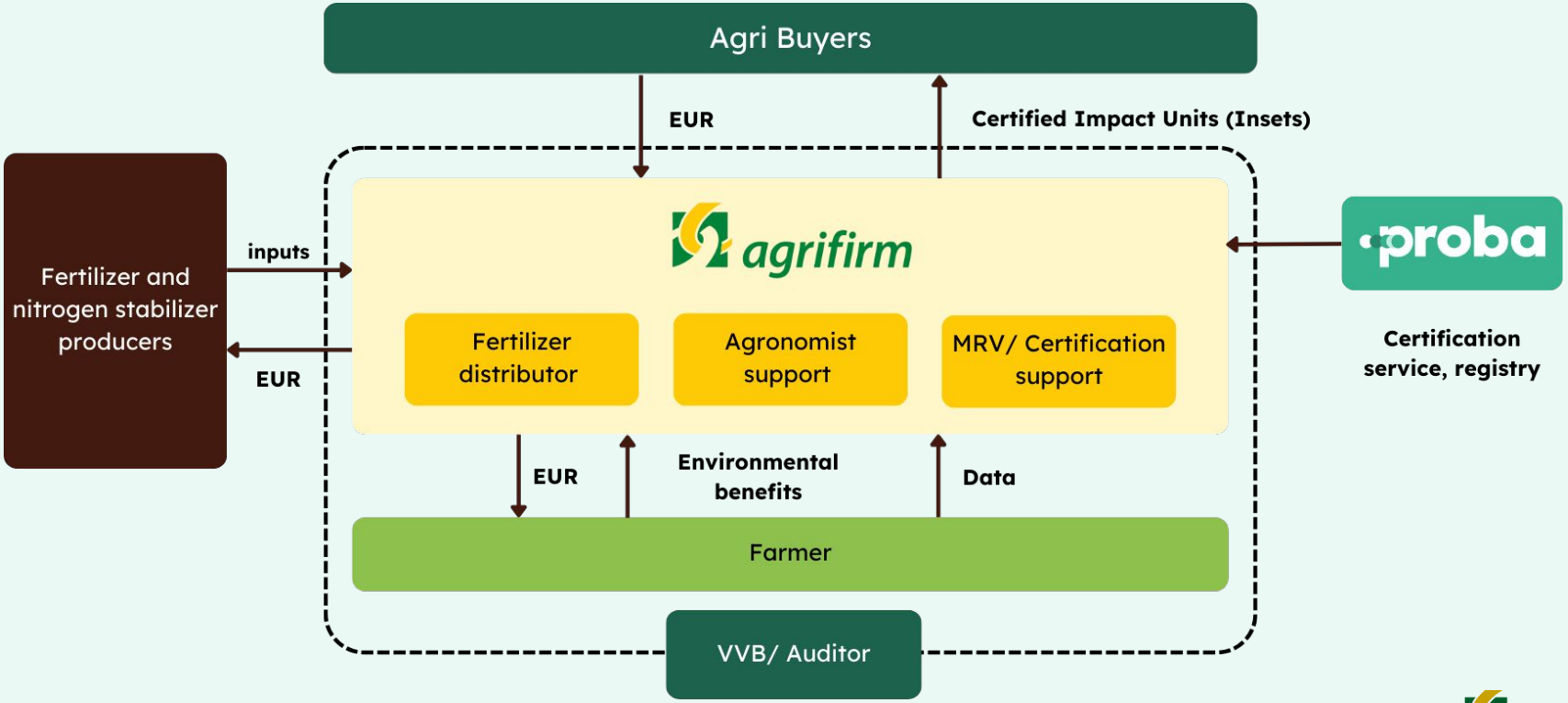
Feasibility and scenario modeling

Quantification

Certification

- Issuing Impact Units to
- Transfer of units to food companies
- Claiming for scope 3 reporting

Different project stakeholders



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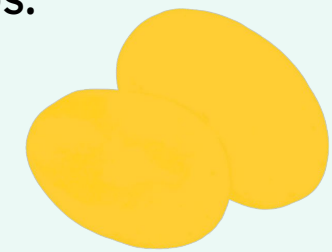
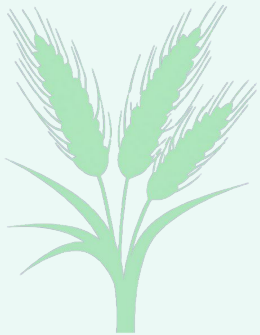
Low carbon crops project

Crops:



Potatoes



Barley

Wheat

Target: lower crop footprint by reducing fertilizer related emissions

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Identifying the interventions

Intervention	Rate impact	Production	In-field	Methodology
Switch to low-carbon N stabilized (SDCD) CAN24S from conventional CAN24S	Not affected	X	X	PM.0004
Switch to low-carbon CAN27 from conventional CAN27	Not affected	X		PM.0002
Use of N stabilizer (DMPP) with slurry	Not affected		X	PM.0004
Switch to foliar application from CAN27	Decreased	X	X	PM.0002
Switch to CRF and CAN27 from CAN27 and NK	Decreased	X	X	PM.0005
Switch to low-carbon fuel (HVO100) from higher emission fuel (B7)	Not affected	X		CDM
Decrease fuel usage due to less tractor fertilization rounds	Decreased	X		PM.0005

Example scenario for winter wheat

Baseline

Fertilizers	N rate (kg N / ha)	Emissions [kg CO2e / ha]
CAN27 (conventional)	131,0	661
CAN24 + S (conventional)	114,0	928
Total	**245,0**	**1.588**

Total fertilizer emissions:

- **1.588 kg CO_2e / ha**
- **185 kg CO_2e / ton of wheat**

Intervention	Rate impact	Production	In-field
CAN27 → Low carbon CAN27 + Foliar nitrogen	-12%	-65%	-27%
CAN24-S → Low-carbon CAN24-S + NIs	-	-66%	-70%

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Results for winter wheat: 49% CO_2e reduction

Fertilizers	N rate (kg N / ha)	Emissions [kg CO2e / ha]
Low carbon CAN27	91,0	266
Low carbon CAN24 + S + NIs	114,0	506
Foliar nitrogen	10,0	39
Total	**215,0**	**812**

Total fertilizer emissions:

- **812 kg CO_2e / ha**
- **94 kg CO_2e / ton of wheat**

Emission reductions:

- **777 kg CO_2e / ha**
  - In-field: 211 kg
  - Fertilizer PCF: 297 kg
- **90 kg CO_2e / ton of wheat**
- **49%**

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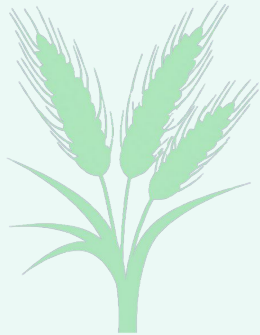
Example scenario for barley



Baseline

Fertilizers	N rate (kg N / ha)	Emissions [kg CO2e / ha]
Cattle slurry	130,0	465
Total	**130,0**	**465**

Total fertilizer emissions:

- **465 kg CO_2e / ha**
- **77 kg CO_2e / ton of barley**

Intervention	Rate impact	Production	In-field
Slurry → Slurry + NIs	-8%	+∞%	-41%

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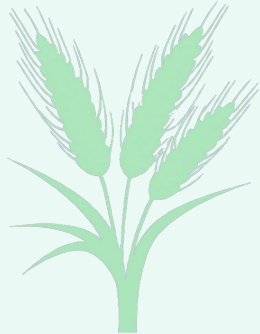
Results for barley: 40% CO_2e reduction



Fertilizers	N rate (kg N / ha)	Emissions [kg CO2e / ha]
Cattle slurry + NIs	120,0	280
Total	**120,0**	**280**

Total fertilizer emissions:

- **280 kg CO_2e / ha**
- **47 kg CO_2e / ton of barley**

Emission reductions:

- **185 kg CO_2e / ha**
  - In-field: 190 kg
  - Fertilizer PCF: -4 kg
- **31 kg CO_2e / ton of wheat**
- **40%**

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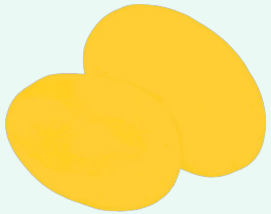
Example scenario for potatoes



Baseline

Fertilizers	N rate (kg N / ha)	Emissions [kg CO2e / ha]
CAN27 (conventional)	174,0	1.468
Cattle slurry	166,7*	1.071
Total	**340,7**	**2.539**

Total emissions:

- **2.539 kg CO_2e / ha**
- **56 kg CO_2e / ton of potato**

Intervention	Rate impact	Production	In-field
CAN27 → CRF	-9%	-21%*	-28%

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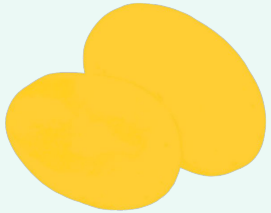
Results for potatoes: 14% CO_2e reduction



Fertilizers	N rate (kg N / ha)	Emissions [kg CO2e / ha]
CRF blend	145,0	1.101
Cattle slurry	166,7	1.071
Total	**311,7**	**2.172**

Total emissions:

- **2.172 kg CO_2e / ha**
- **48 kg CO_2e / ton of potato**

Emission reductions:

- **367 kg CO_2e / ha**
  - In-field: 296 kg
  - Fertilizer PCF: 130 kg
- **8 kg CO_2e / ton of potato**
- **14%**

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Initial results

- (Harvest) data for the 2025 pilot is currently flowing in
- Approx 1.000 tCO_2e reduced (fertilizer emissions only)
- 10-65% reduction of fertilizer related emissions for potatoes, barley and winter wheat

Get in touch!

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