

Nutrition Session

Chair: Mark Tucker, YARA



An aerial photograph of a rural landscape. The scene is dominated by vibrant green fields, some of which are divided into smaller plots by stone walls. A small cluster of buildings, likely a village or farmstead, is visible in the middle ground. The terrain is rolling, with hills in the distance under a clear blue sky. The overall atmosphere is bright and sunny, suggesting a clear day.

Measure to Manage: A 3 Step Checking Approach to Crop Nutrient Management

Sarah Kendall, Crop Physiologist, ADAS

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How important are better field-specific, seasonal measurements in guiding & improving crop nutrition management on-farm?

① Start presenting to display the poll results on this slide.

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What can improving nutrition management on-farm achieve most easily?

① Start presenting to display the poll results on this slide.

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NUTRI-CHECK NET

OPTIMISING CROP NUTRITION

SWEDEN

From January 2023 to December 2025
“To maximise site-specific precision in managing
the nutrition of European arable crops”



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ATHENS**

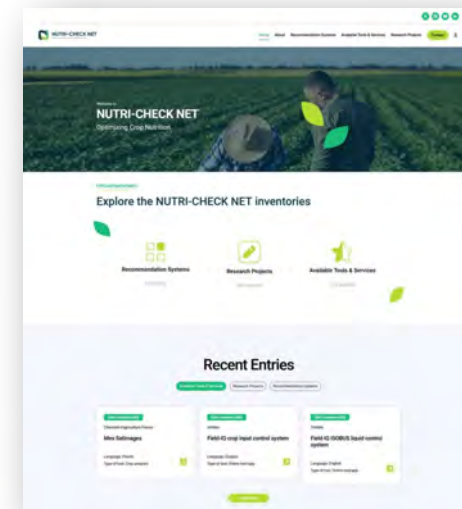
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Capturing & sharing knowledge

- **National Expert Groups**, forming a **Network** to bring together stakeholders for prioritization & co-creation.
- **Surveys** across Europe to identify farmer's needs & motivations to improve crop nutrition management.
- An **inventory** to capture information about **recommendation systems, tools & services** to support decisions along with relevant **research papers & projects**.
- A **custom-built platform** to provide accessibility to gathered information.



Measure to Manage A 3 Step Checking Approach



Quantifying costs & benefits of tools What works on-farm?



NUTRI-CHECK NET
OPTIMISING CROP NUTRITION

- 26 Crop Nutrition Club's, with a total of 200 members, established across the 9 partner countries.
- Workshops with the CNC's identified and verified the main needs of farmers to improve nutrient management and crop nutrition on arable farms.
- 63 crop nutrition decision support tools were selected for evaluation by the CNC's.
- A cost-benefit analysis is currently being conducted on these tools, which will underpin the development of best practices.



3 Step Checking Approach A Toolbox for implementation

1. Recommendations & Planning Tools
2. Tools & Services to guide in-season decisions
3. Harvest assessments of final nutrient sufficiency and soil balances



With Widespread dissemination



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Audience Q&A

① Start presenting to display the audience questions on this slide.



A Danish Approach to Optimising Crop Nutrition in Arable Crops

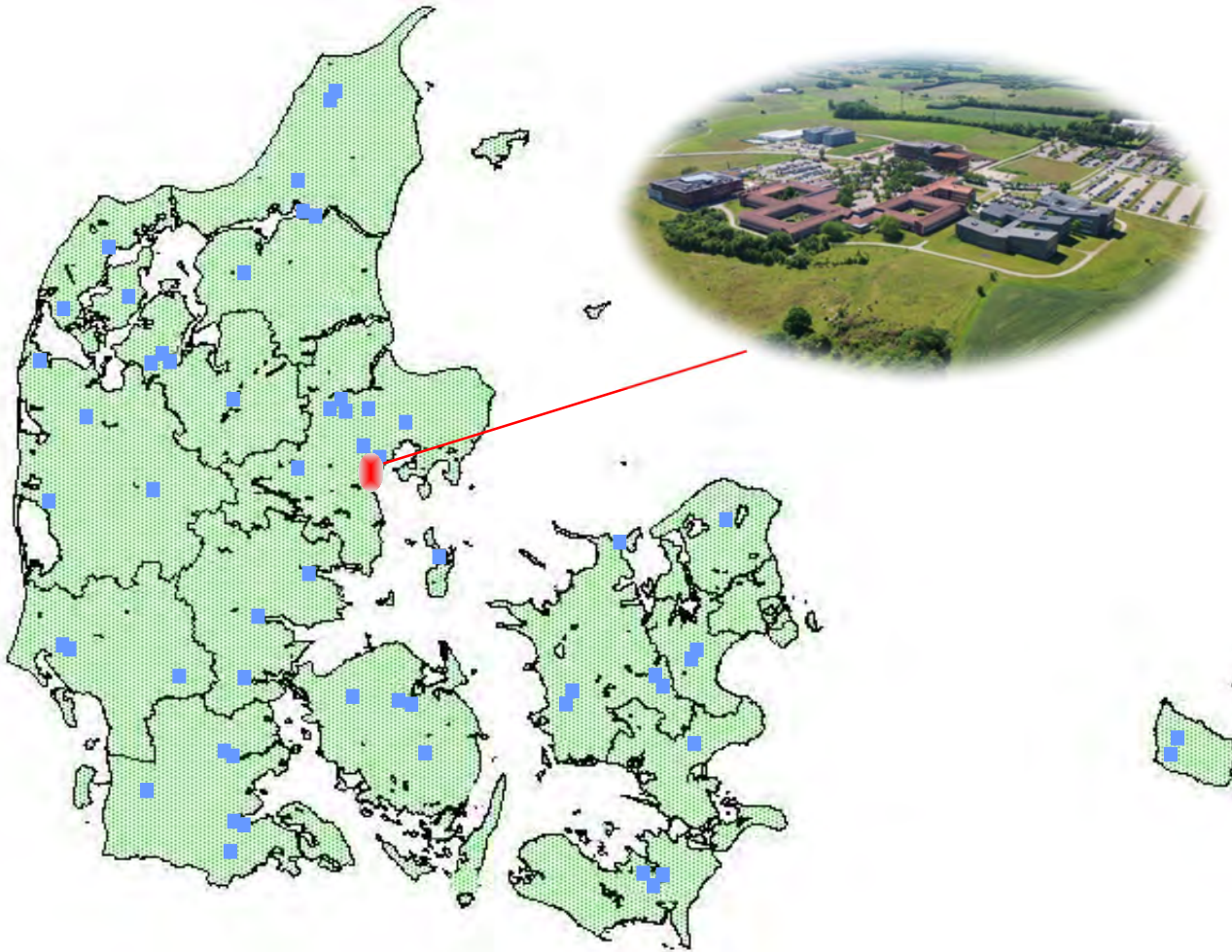
Torkild Birkmose
SEGES Innovation



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What is SEGES Innovation?

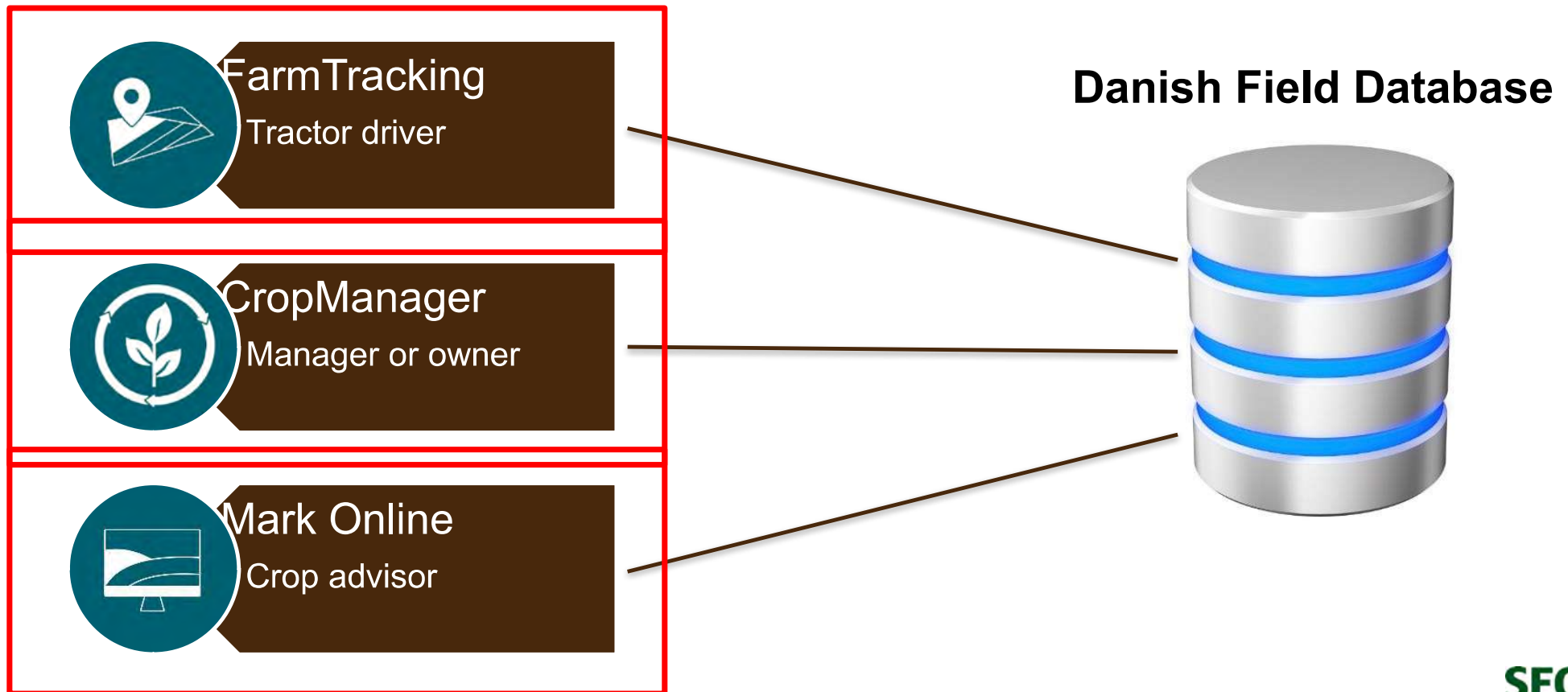


SEGES Innovation is an independent research and innovation company, which works for a sustainable and competitive agriculture and food production.

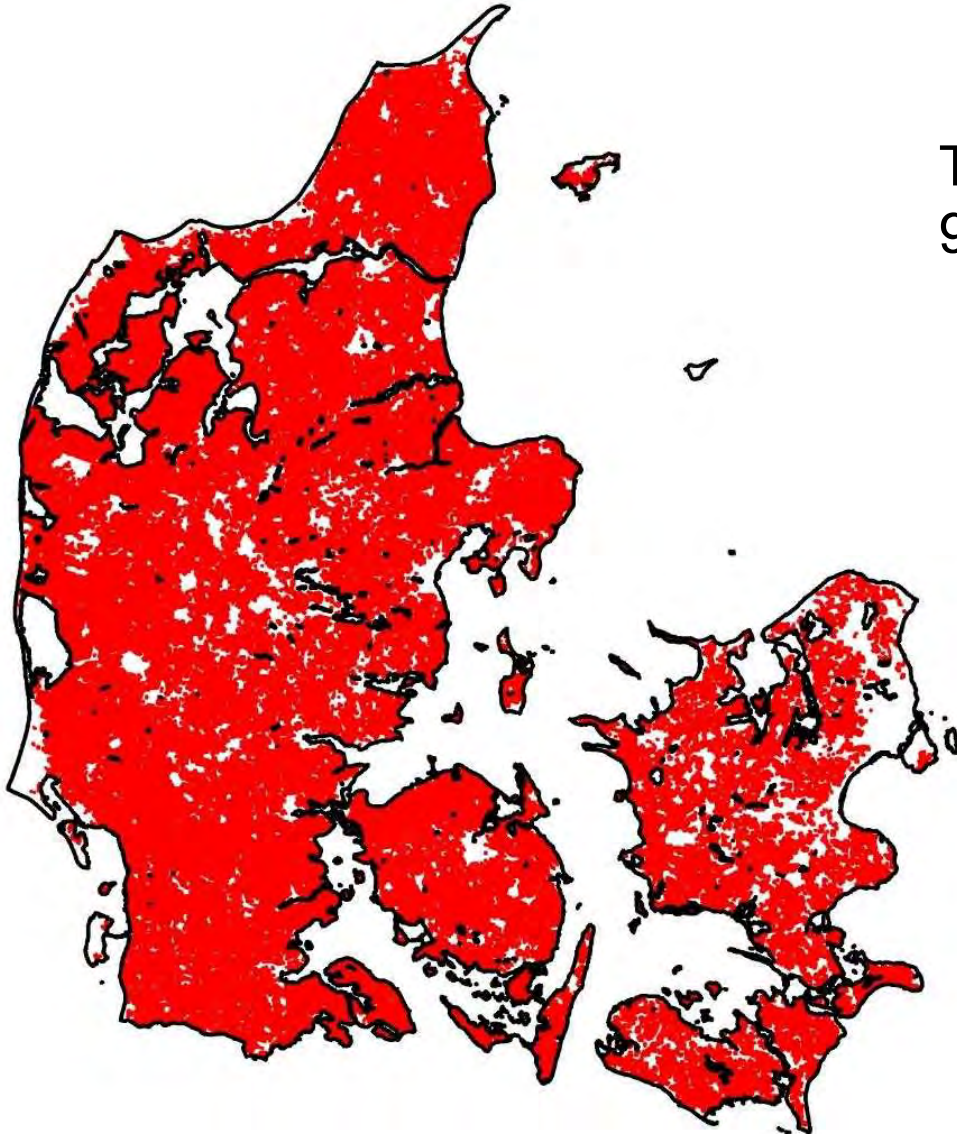
Agenda – how are Danish farmers taking decisions?

- Decision support tools
- Use of satellite images, examples
- Slurry management
- In season measurements
- Grain analysis
- Data management and documentation

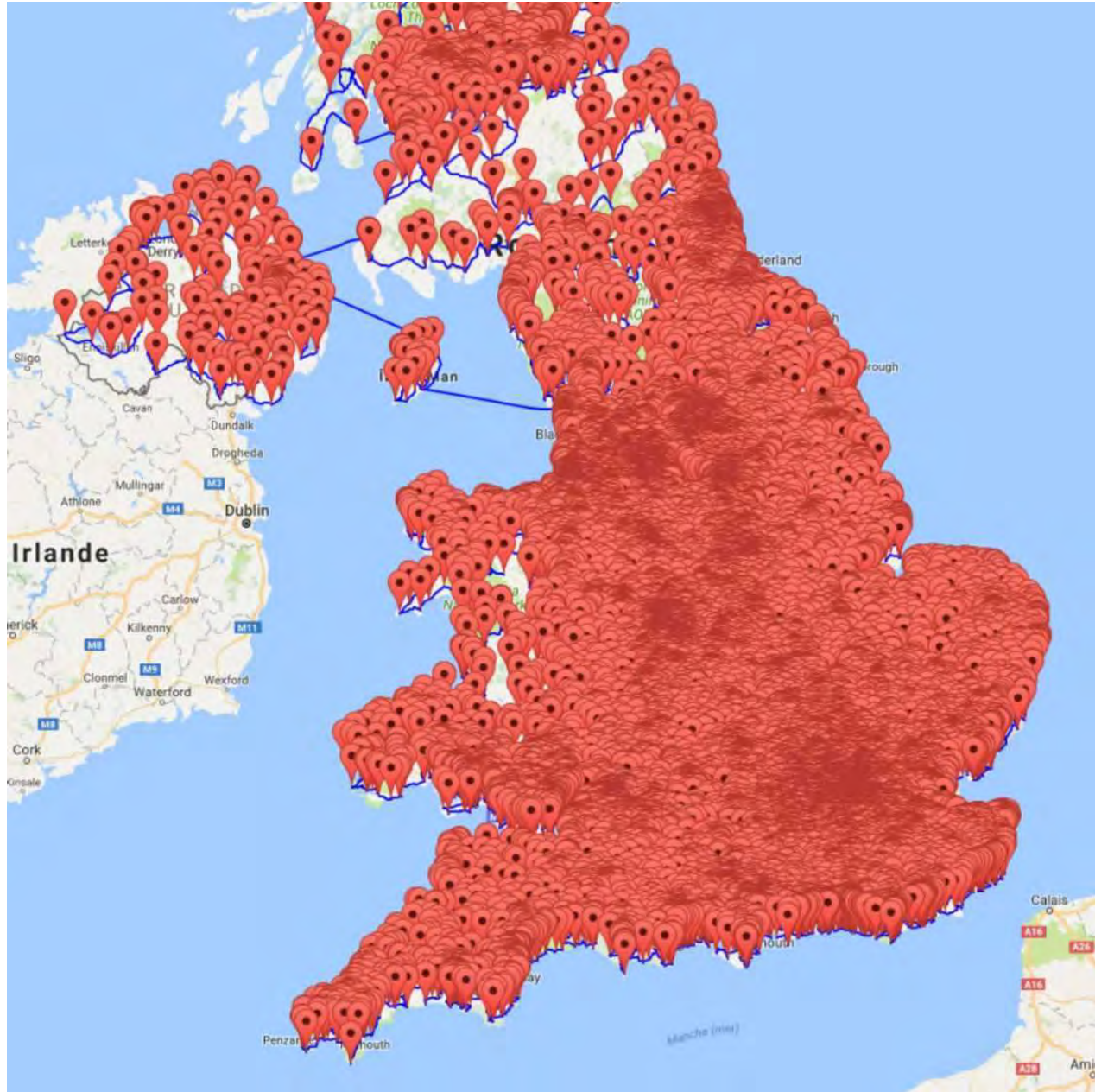
Three decision support tools – one database



Coverage of fields in Danish Field Database



The database contains data for 90 % of all fields in Denmark



CropManager – the farmer's tool

CropManager

Harvest year: 2024 | Display | Biomass | Soil samples | Crops | Hotspots | Edit fields

Field Plan

- Prescription Maps
- Field Analysis
- Prognosis
- Custom Maps
- Hotspots
- Production Cost
- Data connections

© GEO-DK

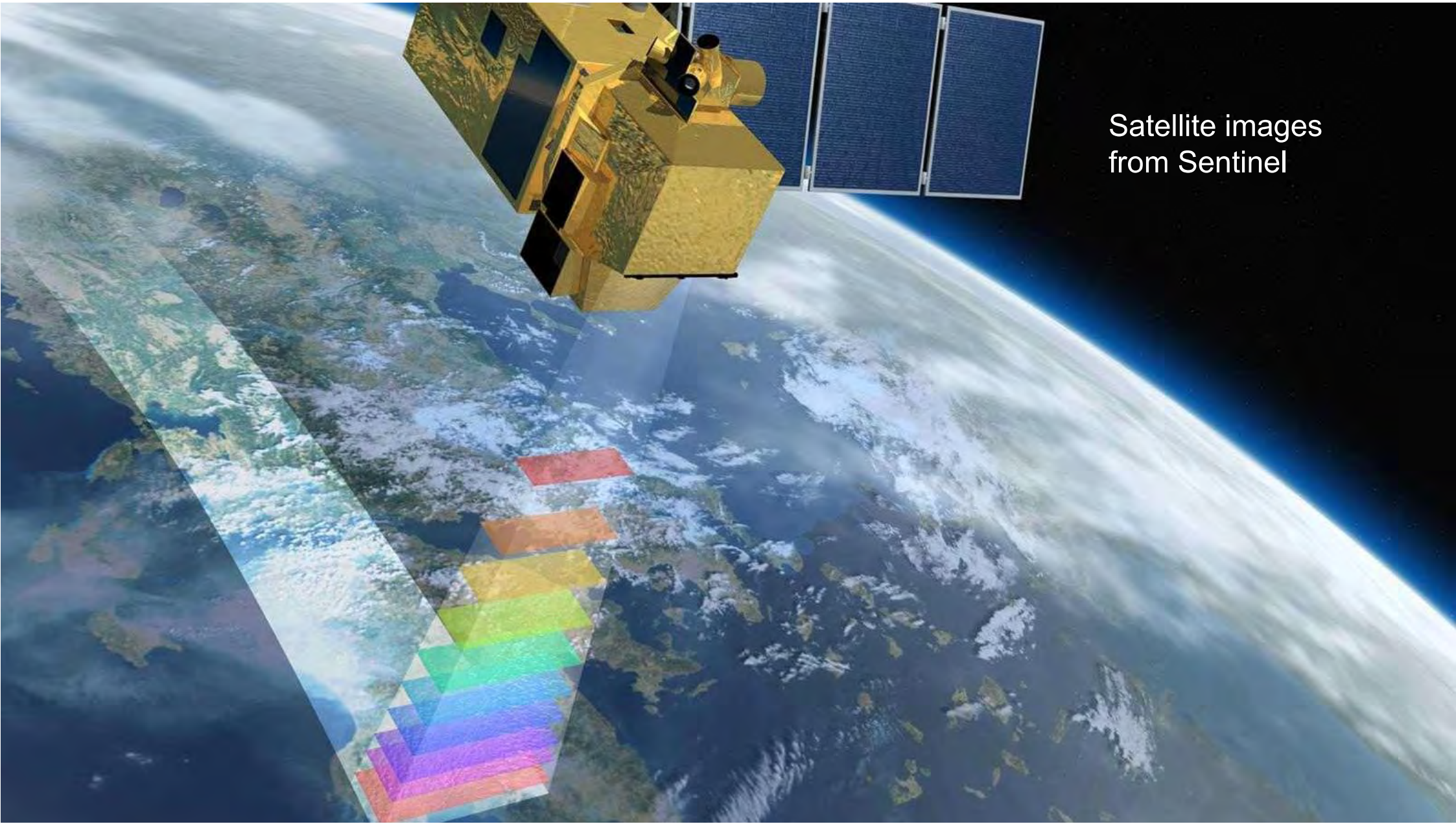
Crops

- § 3-græs u.kvotte, Perm.
- Brak - blomsterbrak
- Brak - slåning (apr/aug-okt)
- Elefantgræs
- Frogræsudlæg
- Græs uden kvotte, permanent
- Græs, ekstensiv, s (1 sl.)
- Kartoffel, stivelse
- Mellemafgr. frogræs
- Målr.e. olieræddike
- Rajgræs, alm.
- Rekreative formål
- Vinterhvede
- Vinterraps
- Vårbyg til malt
- Vårbyg til malt m. græsudlæg

I live here

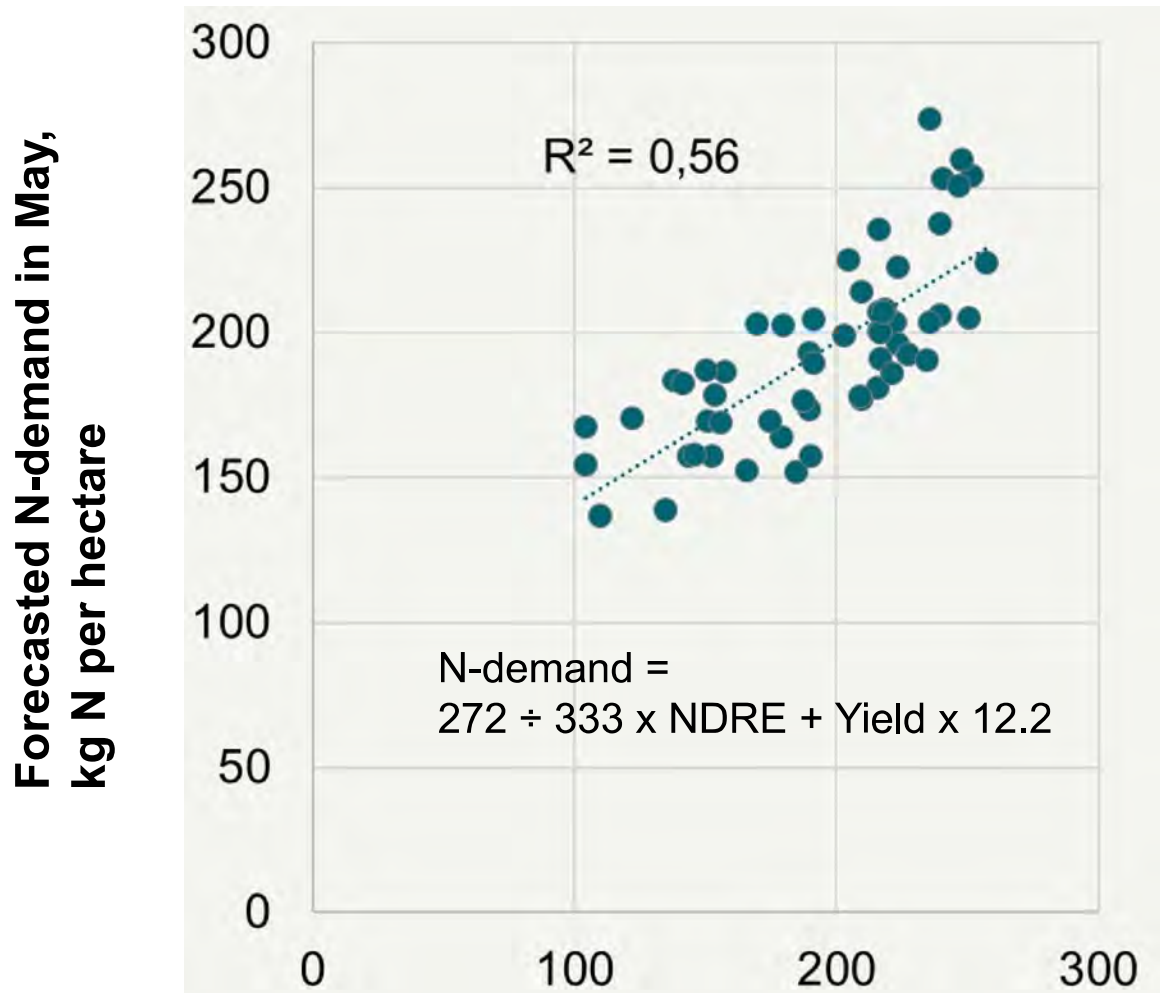
What can the farmer do with CropManager?

- View biomass based on Sentinel images
- View results of soil samples
- Prognosis tools for harvest yield, logging and potato blight
- View risk of Septoria
- View water balance and plan irrigation
- Calculate N-recommendations in winter wheat based on actual biomass
- Prescription maps for:
 - Variable N rate
 - Seeding
 - Plant protection
 - Liming
- And a lot more...



Satellite images
from Sentinel

Forecasted N-demand in May compared to measured in trials



Yield prognosis in winter wheat in CropManager

CropManager

- Field Plan
- Prescription Maps
- Field Analysis
- Prognosis**
- Custom Maps
- Hotspots
- Production Cost
- Data connections

Farm

Customer service

Profile

Notifications

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Expected Yield

Expected Yield INFO

Forecast provided at 01/08/2024

Calculation may deviate from the actual yield and should therefore be considered as indicative.

The prognosis has been updated in 2024, but we would still like your assessment of how good the yield forecast is.

Feel free to leave a comment at udbytter@seges.dk

7.73 tons grain/ha

Total yield for the field **192.93 tons**

Biomass map (NDRE) for winter wheat in May 2024

CropManager

- Field Plan
- Prescription Maps
- Field Analysis**
- Prognosis
- Custom Maps
- Hotspots
- Production Cost
- Data connections

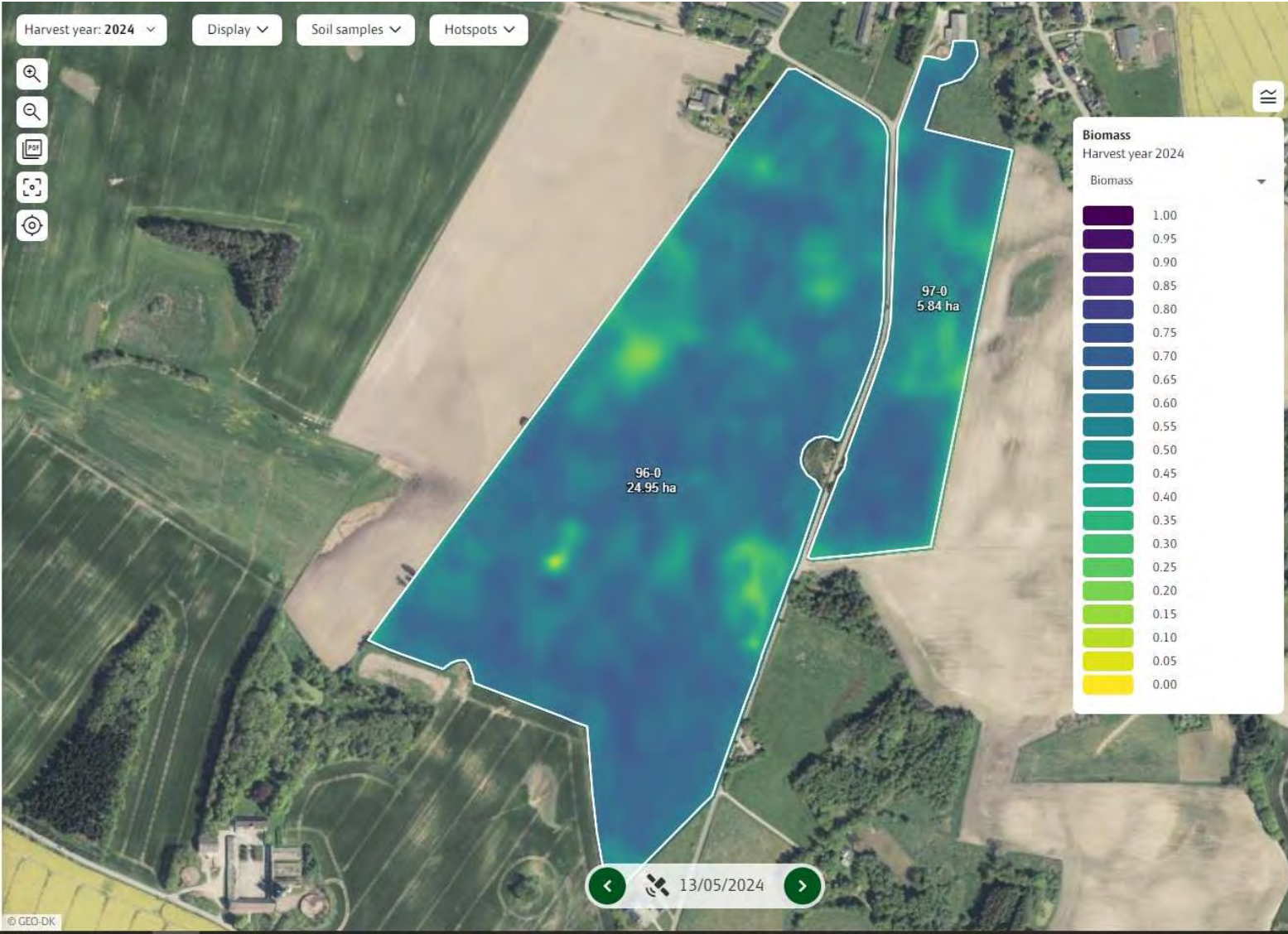
Farm

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Biomass

Select the date you want to see biomass for

AI CLOUDLESS, BETA | STANDARD

Dec 2024

May 2024 Today

SU	MO	TU	WE	TH	FR	SA
			1	2	3	4
			8	9	10	11
5	6	7	14	15	16	17
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

No field selected

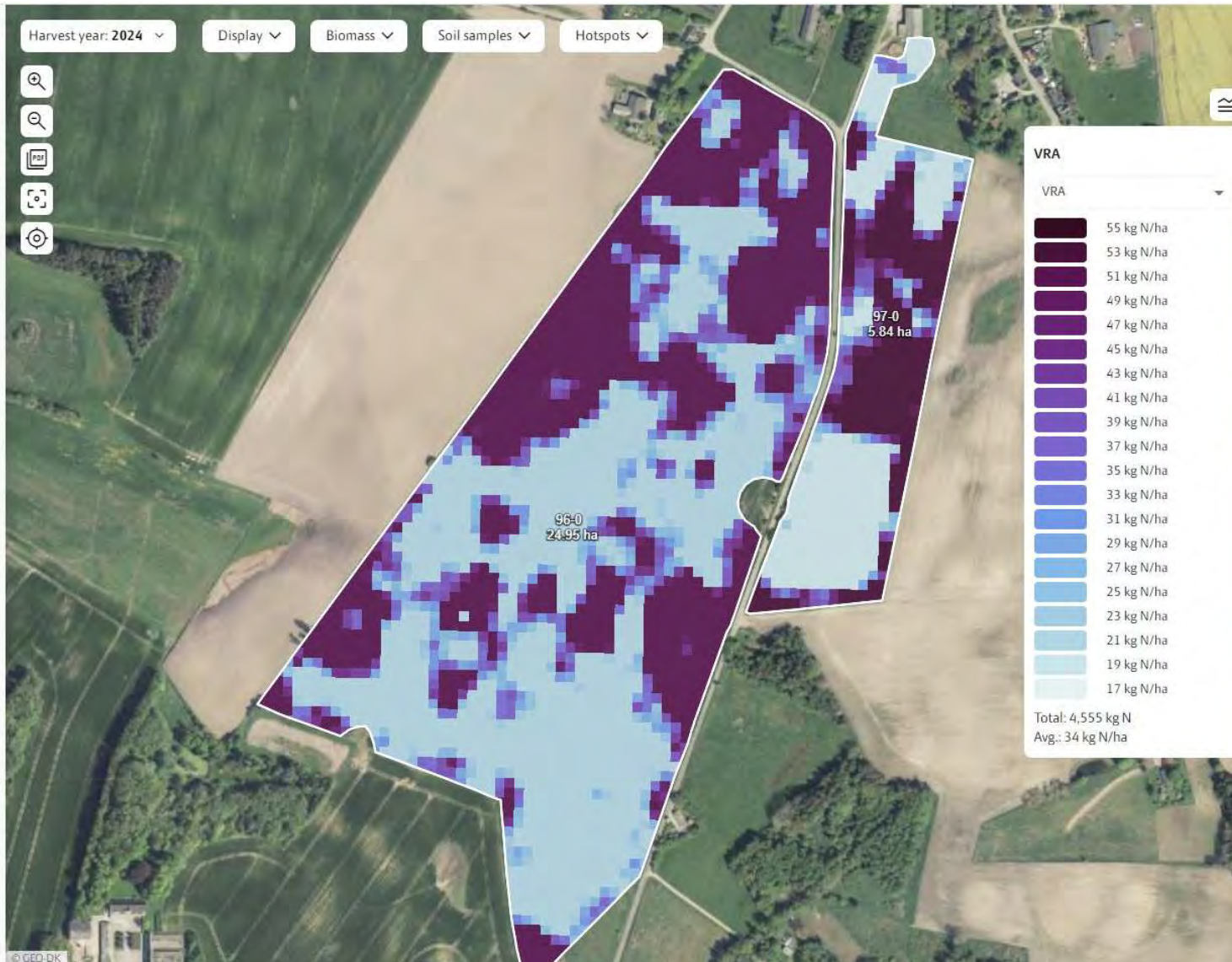
Prescription map based on biomass (NDRE)

CropManager

- Field Plan
- Prescription Maps**
- Field Analysis
- Prognosis
- Custom Maps
- Hotspots
- Production Cost
- Data connections

- Farm
- Customer service
- Profile
- Notifications

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Prescription Maps

Information About Task

Task type: Fertilizer
Date: 10/05/2024
Crop: Vinterhvede
Field: 3-0, 4-0, 4-1, 9-0, 14-0, 47-1, 61-0, 67-0, 80-0, 81-0, 96-0, 97-0, 110-2

NS 27- 4 Mg

Field	Avg. pr. ha.	Total amount
3-0	125 kg	1,318 kg
4-0	125 kg	2,789 kg
4-1	135 kg	276 kg
9-0	135 kg	1,953 kg
14-0	125 kg	961 kg
47-1	125 kg	73 kg
61-0	125 kg	1,016 kg
67-0	125 kg	3,830 kg
80-0	125 kg	242 kg
81-0	125 kg	318 kg
96-0	125 kg	3,120 kg
97-0	130 kg	760 kg
110-2	130 kg	213 kg
Sum		16,870 kg

Prescription Map Model

Field	Model	Biomass	Variation
3-0	Third fertilizat...	13/05/2024	High
4-0	Third fertilizat...	13/05/2024	High
4-1	Third fertilizat...	13/05/2024	Medium high

Download | **Send to machine**

Unique selling points of CropManager

- Connection to Danish Field Database
- Very easy to operate - often “one button click”
- Connected to tractor and machines
- Almost complete coverage of Danish fields
- Developed by SEGES agronomists and IT-developers in corporation

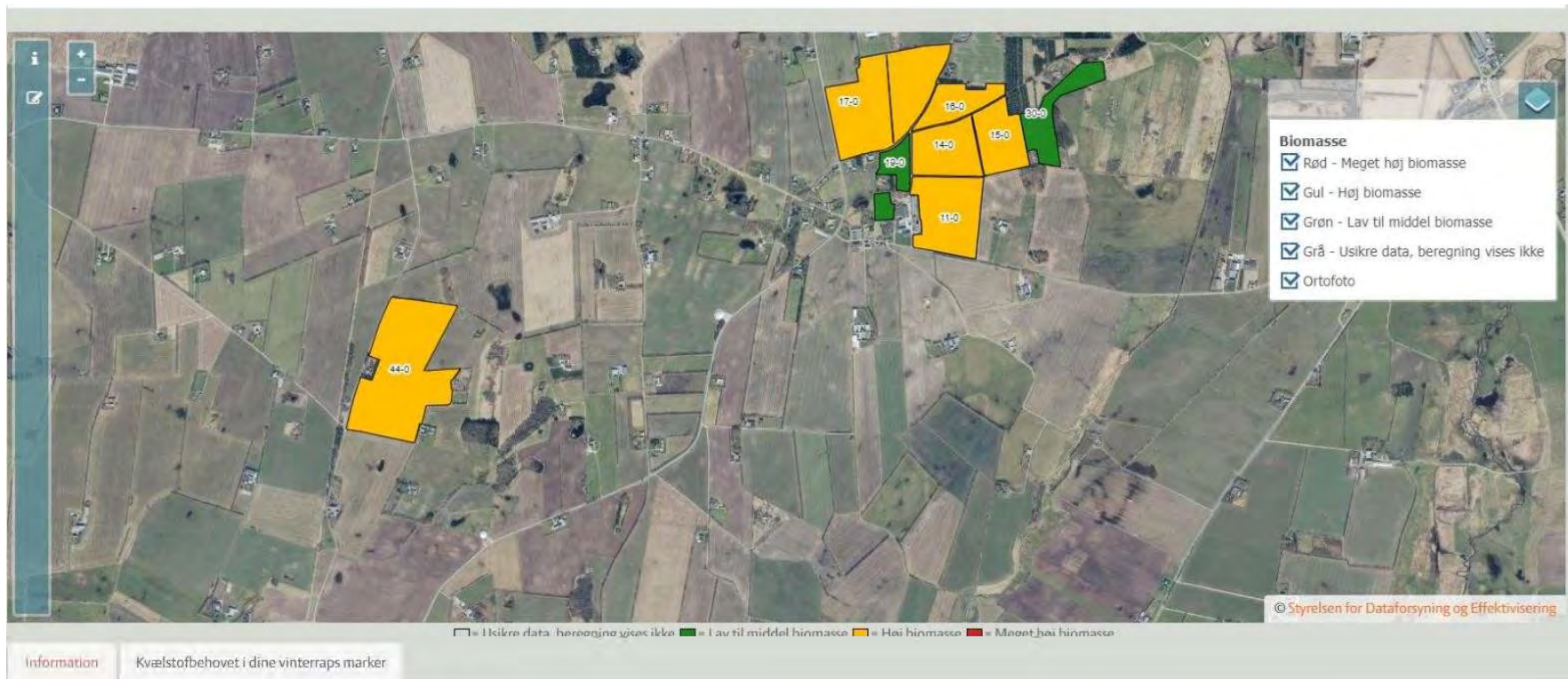
Nitrogen demand in winter oilseed rape in spring



Plant sampling in autumn?



SEGES calculation of N-demand in all OSR-fields in the database





Kvælstofbehovet i dine vinterraps marker

Her kan du se en liste over alle dine rapsmarker, og et forslag til kvælstofbehov i foråret 2024. Kun rapsmarker, som var anført i MarkOnline den 13. januar er med i listen.

Marknr.	Areal, ha	Tildelt handelsgødning efterår, kg N pr. ha	Tildelt husdyrgødning efterår, kg N pr. ha:	Biomassemåling fra satellit, gennemsnit NDRE	Beregnet N behov forår, kg N pr. ha	Farvekode
1-0	22,59	13,5	68,34	0,6	122	Grøn
11-0	10,57	13,5	0	0,62	182	Gul
14-0	7,41	13,5	0	0,64	175	Gul
15-0	6,53	13,5	0	0,62	182	Gul
16-0	4,92	13,5	68,34	0,62	113	Gul

Results shown in Landmand.dk (= "Farmer.dk")


LANDMAND.DK Torkild  


FORSIDE **FORETRUKNE** **NYHEDER**

Kløverandel i græsmarker

Konsulentinformation

Indtast cvr-nummer på den landmand du ønsker at se kløvergæs for:

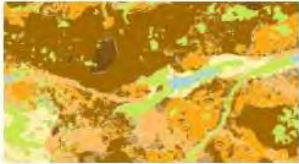





Digitale jordkort 2024

Konsulentinformation


Indtast cvr-nummer på den landmand du ønsker at se jordkort for:






ESGreenTool Report

Samler din virksomheds bæredygtige tiltag i én rapport





 [LÆS MERE](#)

Reducér fosfortab

Konsulentinformation

Indtast cvr-nummer på den landmand, du ønsker at se kort over risiko for fosfortab fra dyrkningsfladen for:







Risikokort: Våde og vandlidende marker

Konsulentinformation

Indtast cvr-nummer på den landmand du ønsker at se risikokort for:

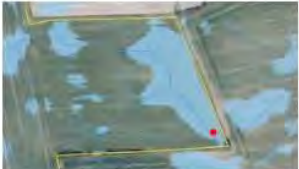





Minivådområder -

Se mulig placering

Indtast cvr-nummer på den ejer du ønsker at se minivådområde for:

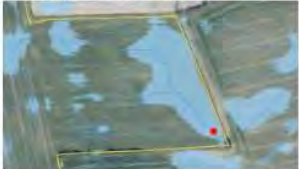





Minivådområder

Se mulig placering


Etabling af minivådområder - Klik her




 [SE KORT](#)

Naturkortet

Indtast cvr-nummer på den ejer du ønsker at se naturkortet for:







Dansk Drænkort

Offentlig adgang

Klik her og få overblik over danske dræn og drænprojekter.







Den grønne trepart-Konsulent

Konsulentinformation


Indtast cvr-nummer på den landmand du ønsker at se information om den grønne trepart for:






Vådområde- og klimaindsatsen i Danmark


Klik her for at se gennemførte projekter og forundersøgelser af vådområde- og lavbundsprojekter i hele Danmark.






Jordejere med tørvejord >20 hektar

Konsulent Information



 [SE KORT](#)

Dansk Drænkort

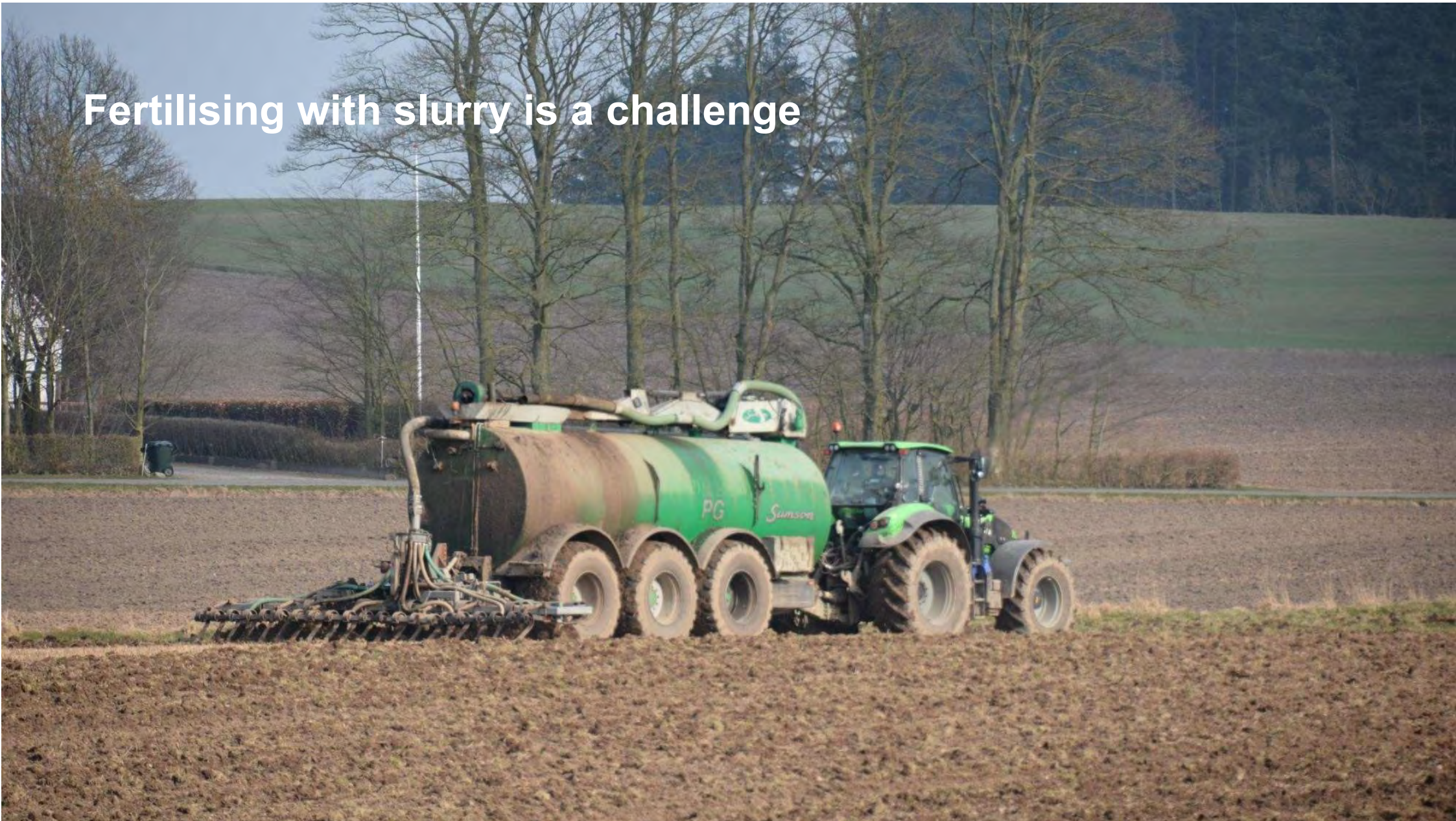
Konsulentadgang

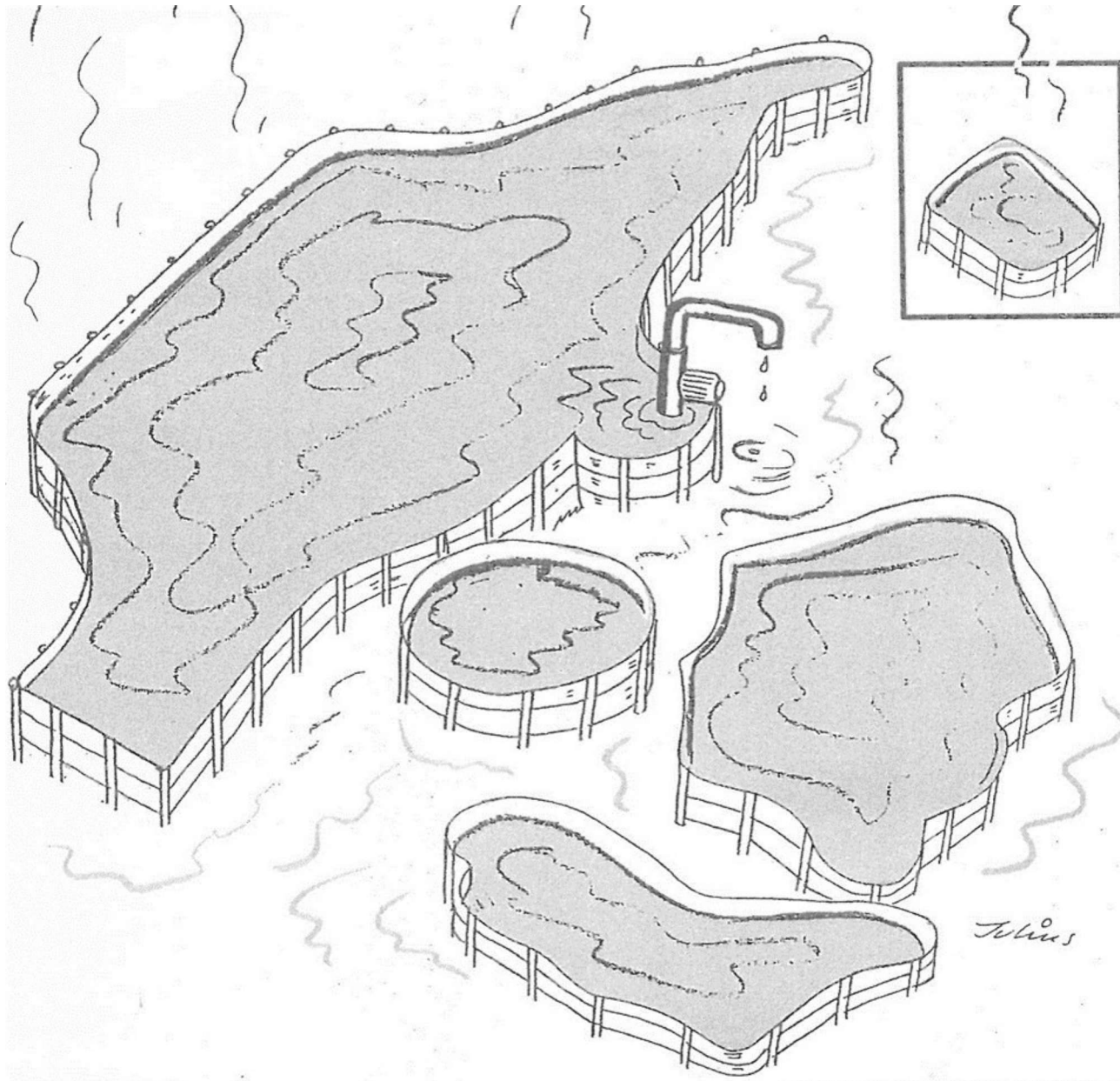
FarmHub

Hold styr på bedriftens beholdninger

ESGreenTool Climate 2

Fertilising with slurry is a challenge





Managing slurry in the fertiliser plan: What is the challenge?

The utilized amount of nitrogen in applied manure is very unprecise!

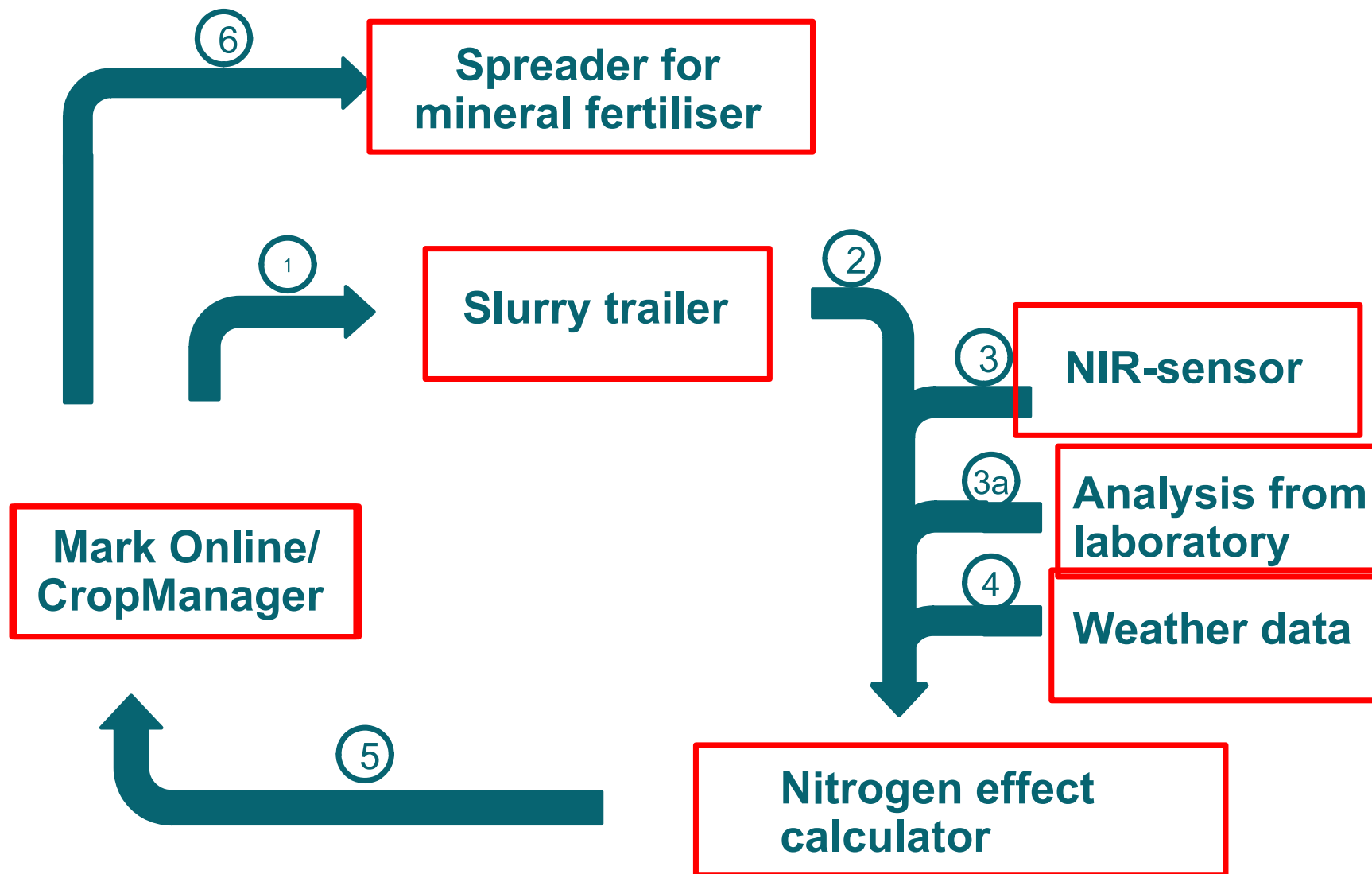
1-0 Vinterhvede Dyrket areal: 9,26 ha Marknavn: Informer
 Sort: Informer Forfrugt: Havre

Dato	Reg	Produkt	Delareal	Mgd/ha	Mgd i alt	N eff.	N	P	K	Mg	S
15-03-2023	<input type="checkbox"/>	NS 24- 6 mg		170 kg	1574 kg		41			1	10
01-04-2023	<input type="checkbox"/>	Slagtesvinegylle, 4,5 kg N/ton <i>Slangeudlagt</i>		32 ton	296,3 ton	58%	83	25	115	10	0
15-05-2023	<input type="checkbox"/>	NS 24- 6 mg		170 kg	1574 kg		41			1	10
		Tilført i alt					165	25	115	12	20

Make an analysis of the manure

Ask the slurry pilot

Calculate in a specific web program



1. Task data from Mark Online
2. As applied data from slurry trailer
3. Slurry data
- 3a. Alternative slurry data from lab
4. Weather data
5. Calculated N-utilization
6. Adjusted application of mineral fertiliser

In season measurements are not used a lot

- N-min samples
- Leaf analysis
- Yara N-Sensor
- Yara N-Tester
- Phosphorus Tester
- Manganese Tester
- Drone images



Grain analyses in Denmark?



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PROGRESS**

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Provides traceability and documentation from the primary production to food companies and consumers





Thank you for your attention...