Høsttidspunkt i typesorter af majs

Martin Mikkelsen

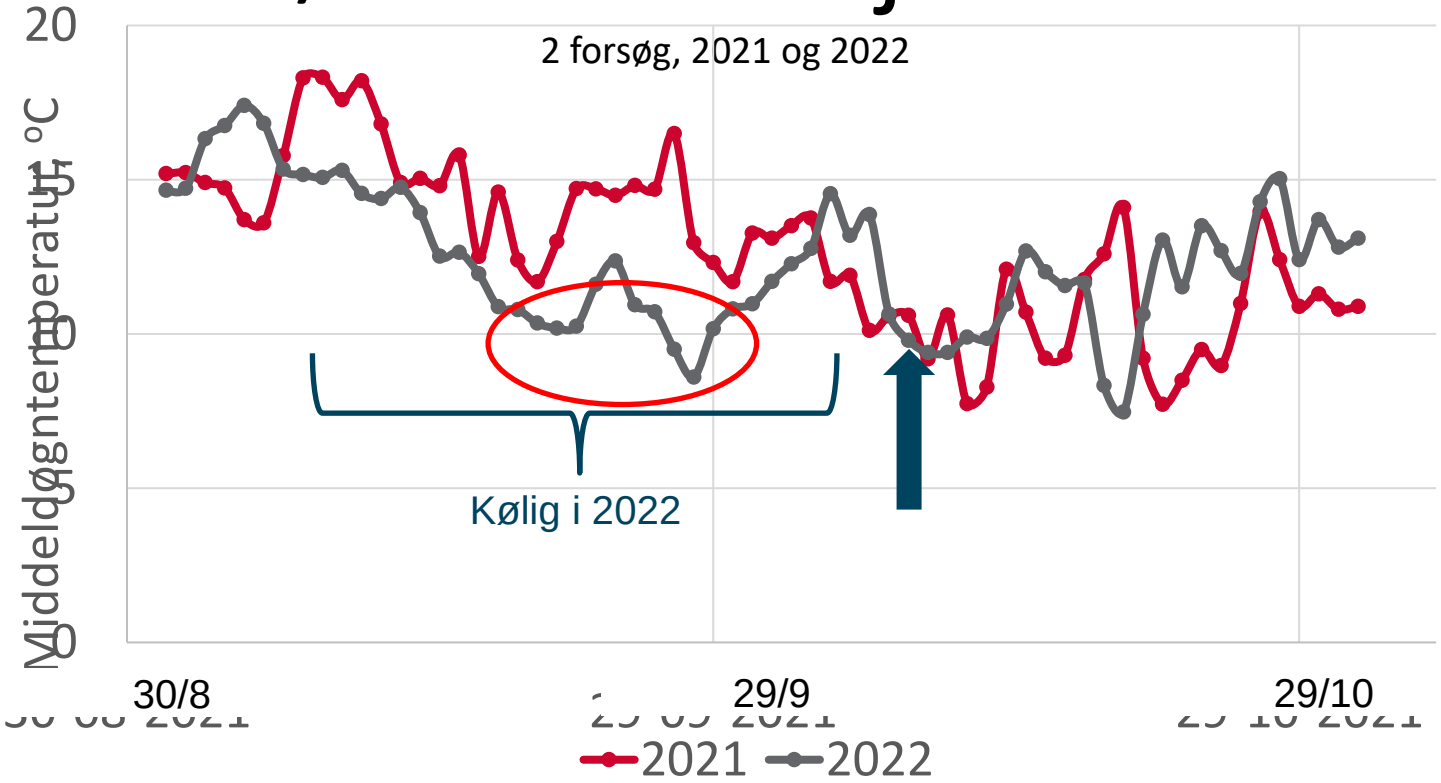
10. januar 2024

STØTTET AF
Promilleafgiftsfonden for landbrug
SEGES INNOVATION

Indhold

- Høsttid i 8 typer af majssorter
  - Tørstofindhold
  - Udbytte
  - Stivelse
  - FK NDF
  - NEL_{20}
  - Grøn bladmasse
- Prognose for høsttidspunkt

Høsttid i 8 majssorter



Kilde: DMI

8 typer af sorter

- Cito KWS
- Debalto
- Wizard
- Prospect
- Sandias
- Function
- Papageno
- LG31211

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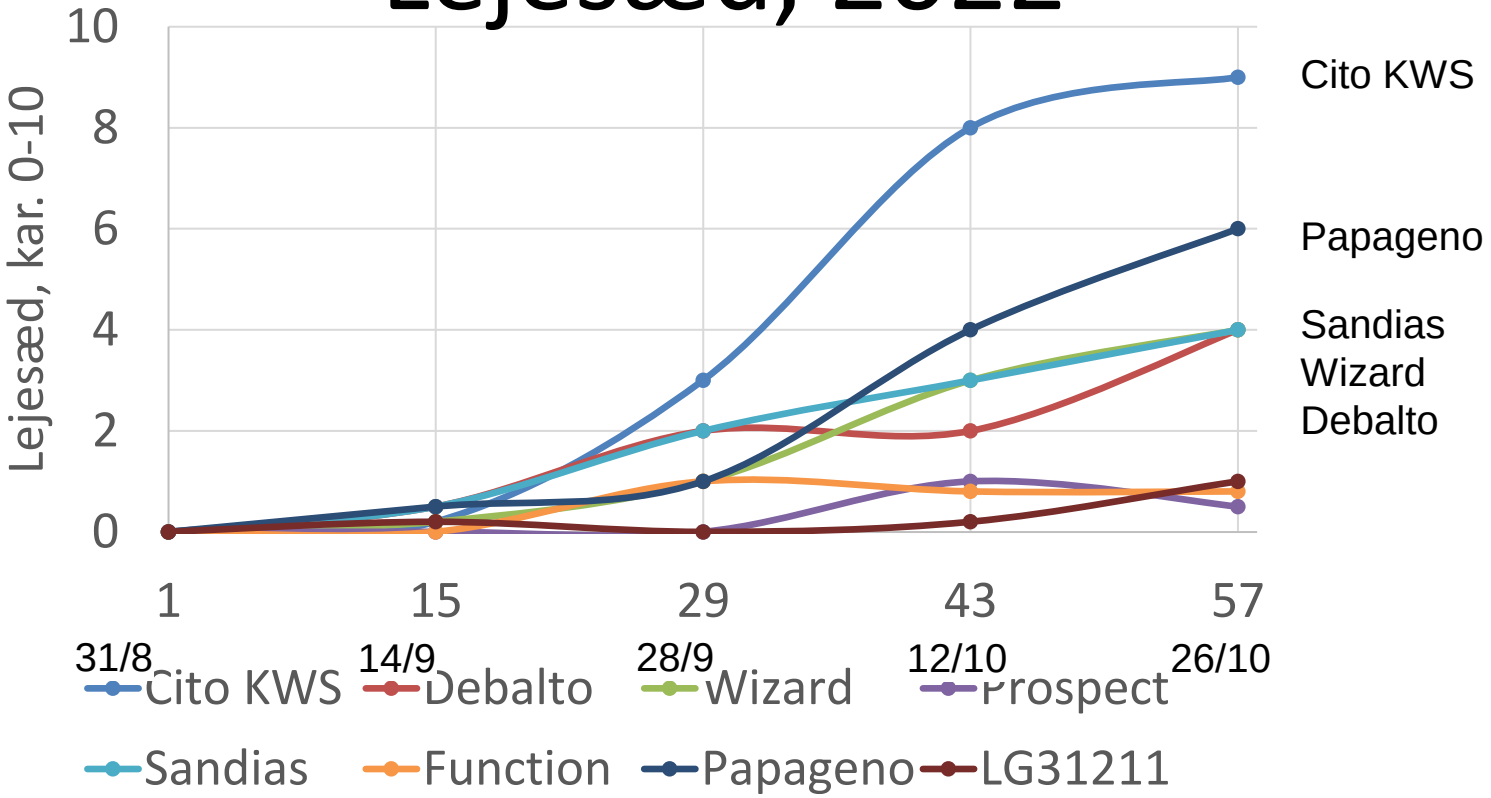
Dry down

Mellemtyper mellem dry down og stay green typer

5 høsttidspunkter

- Omkring 1/9 - slutningen af oktober
- 2 uger i mellem

Lejesæd, 2022



Cito KWS

Papageno

Sandias
Wizard
Debalto

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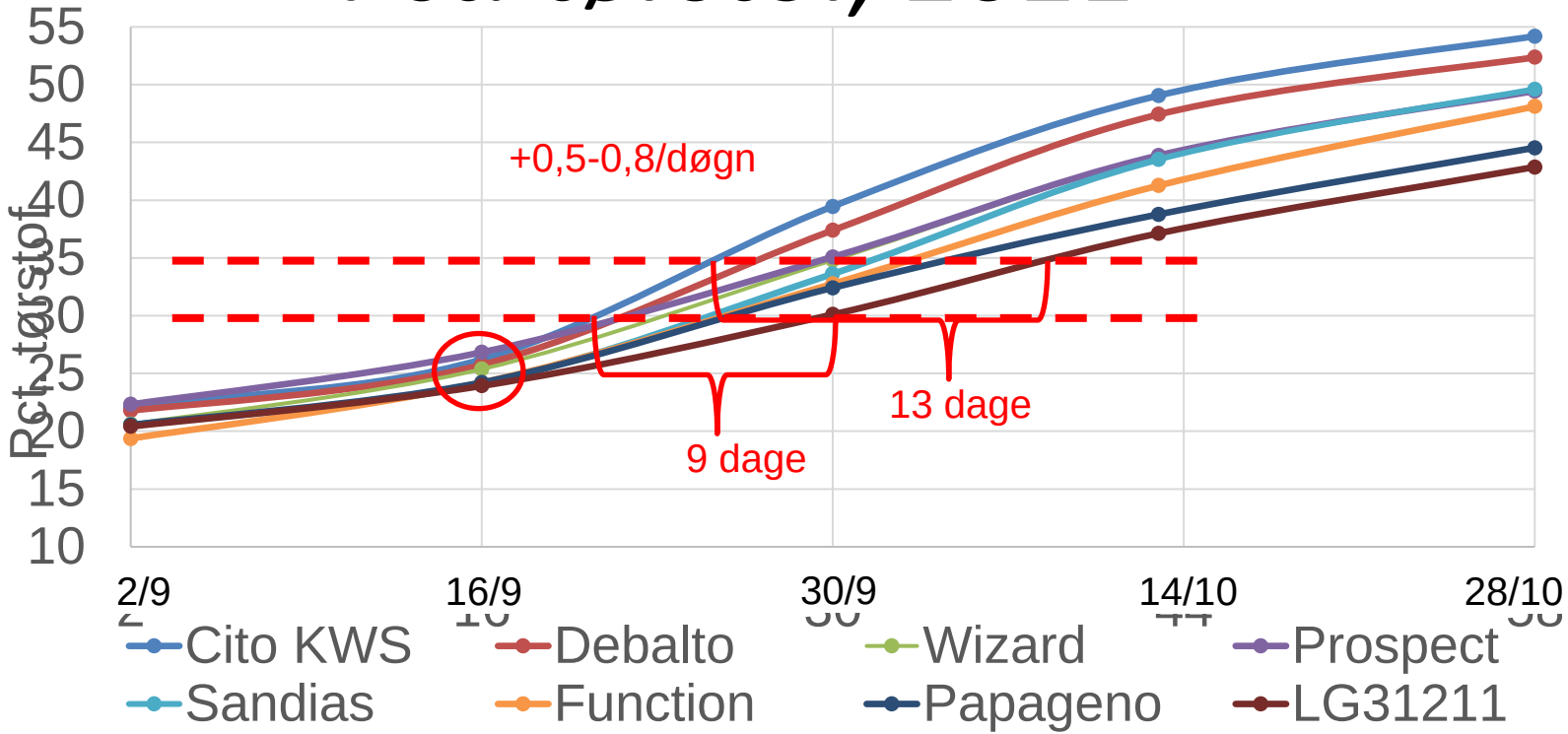
Pct. tørstof, 2021



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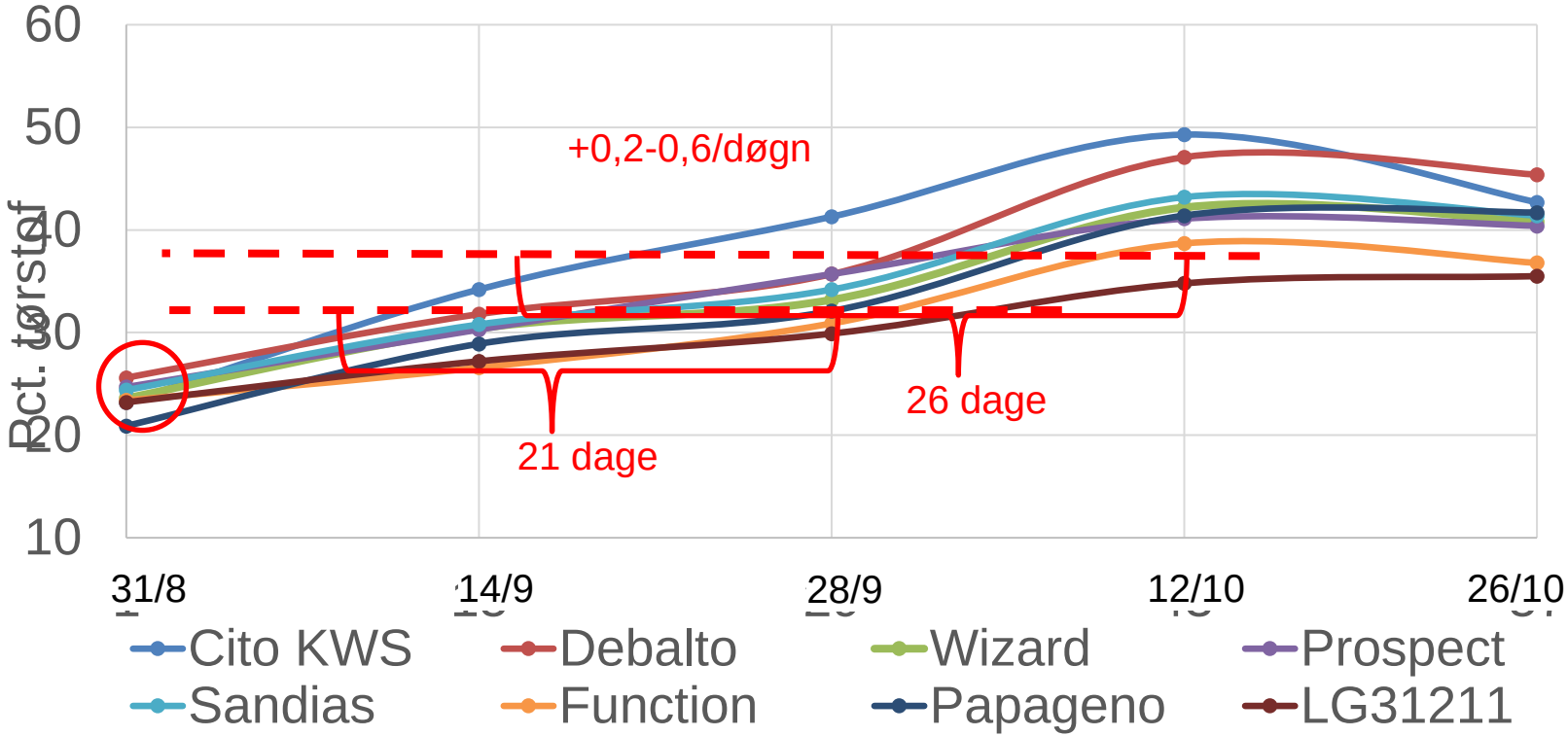
Pct. tørstof, 2022

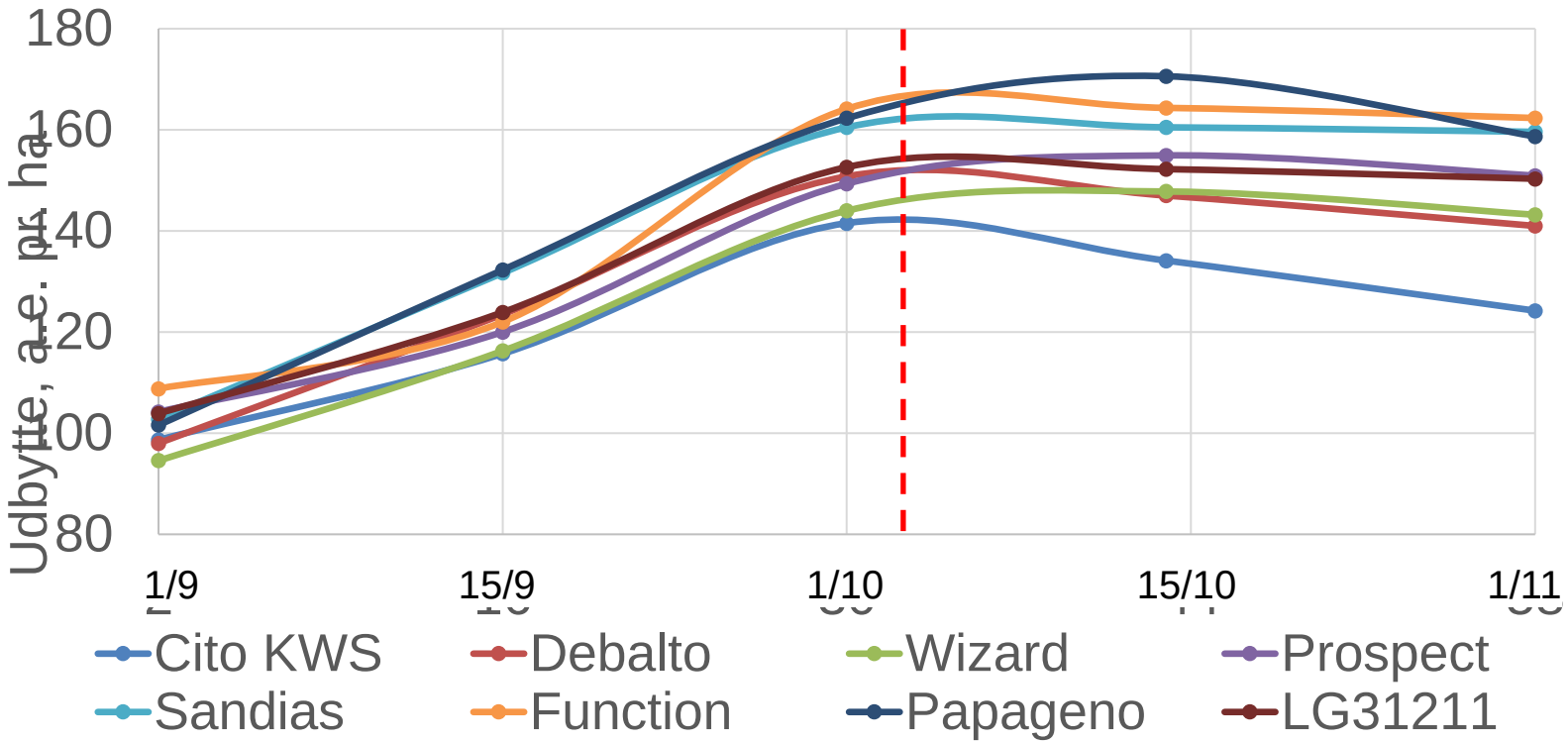


Landsforsøgene 2022, s. 418

Pct. tørstof

- Kun lille forskel ved 25 % tørstof – 2-4 procentpoint
- Derefter større og større forskel
- Under varme forhold er tørstofprocenten dagligt steget med 0,5-0,8 – mest i de tidligste sorter
- Under kølige forhold er tørstofprocenten dagligt steget med 0,2-0,6 – mest i de tidligste sorter
- Dobbelt så stor sikkerhed for at få meget tidlige sorter moden i et køligt år

Udbytte a.e., 2021



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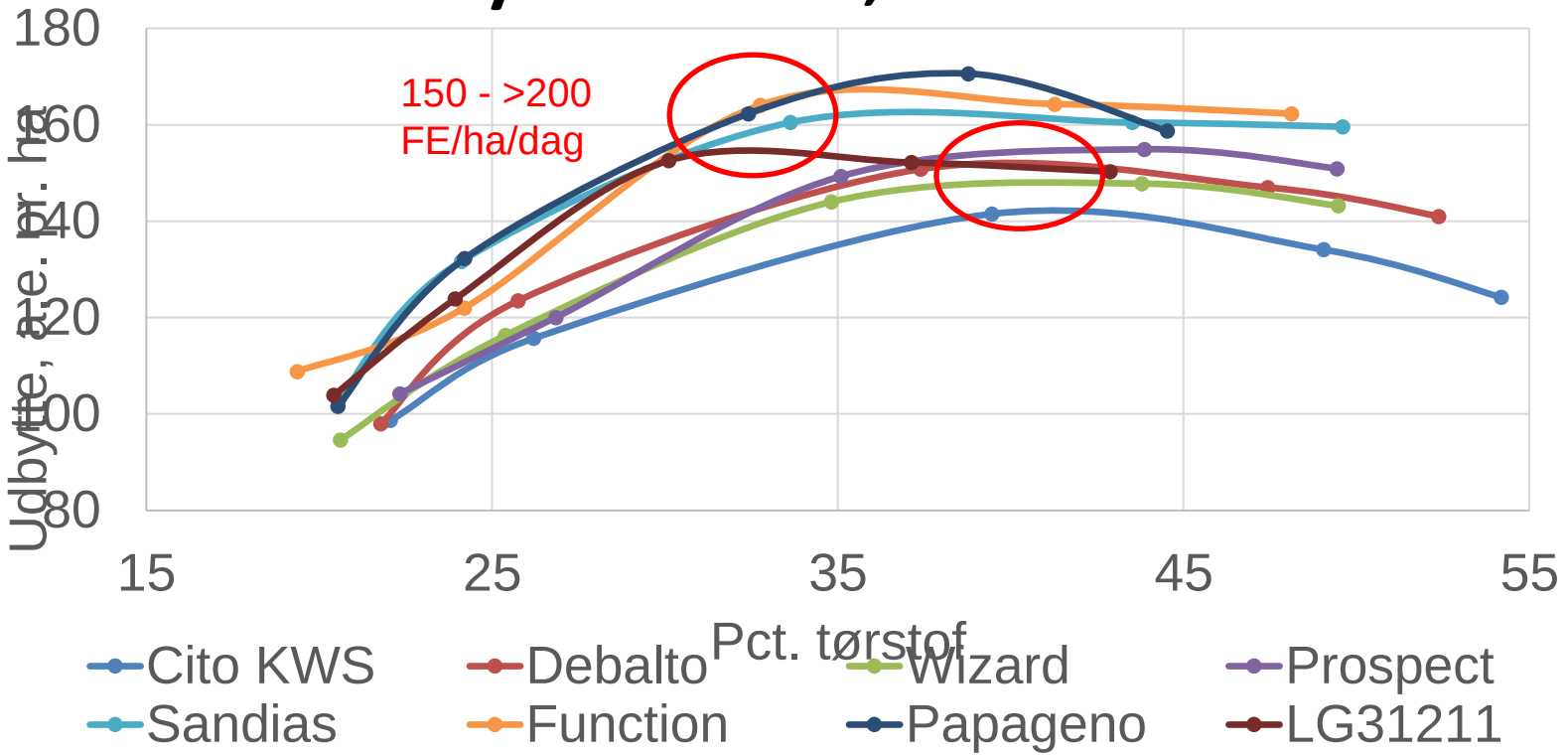
Udbytte a.e., 2021



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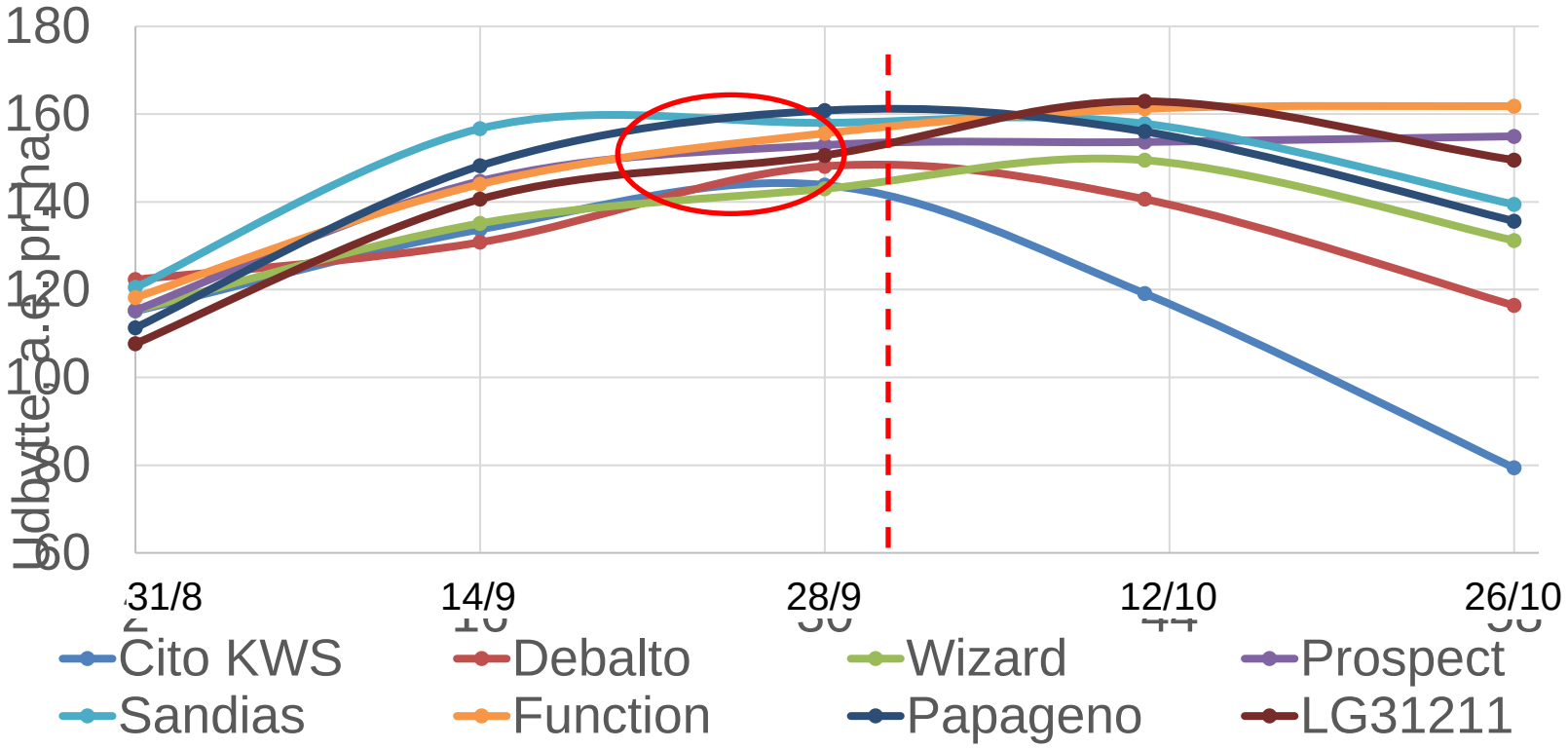

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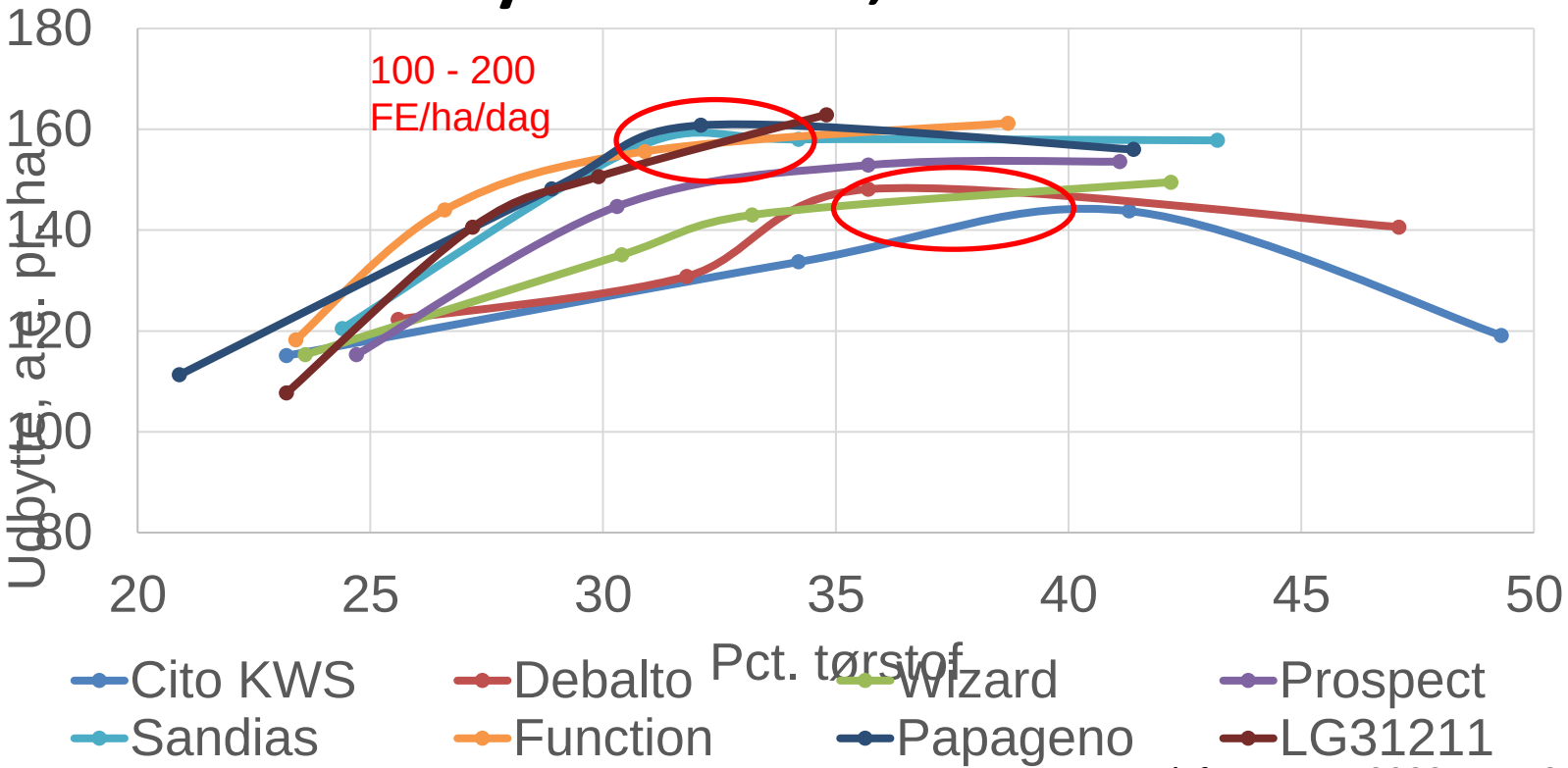

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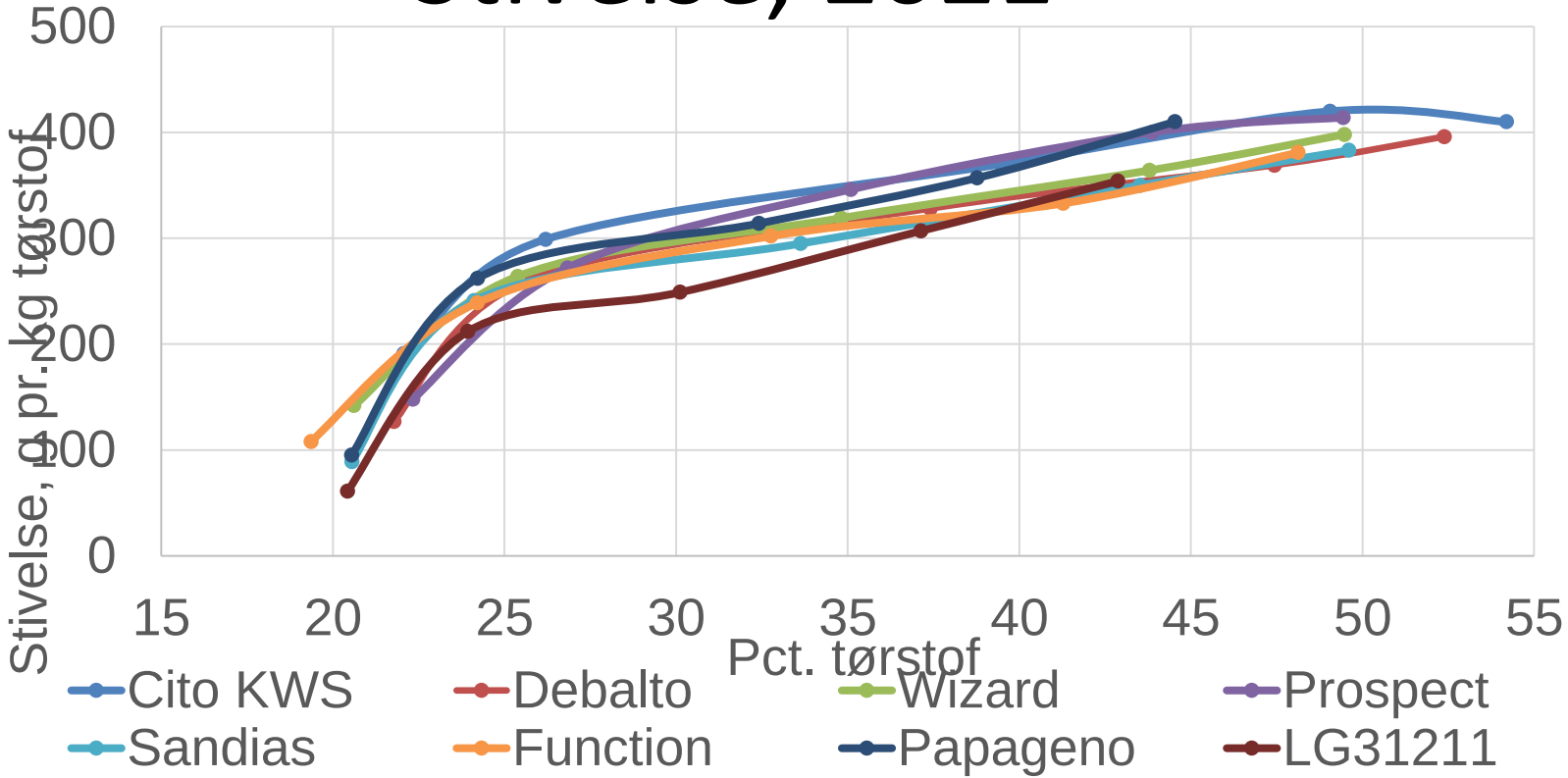
Udbytte

- Topper ved middeldøgntemperaturen 10 ^{o}C
- Topper ved 35-40 pct. tørstof, hvis middeldøgntemperaturen er over 10 ^{o}C
- >200 FE pr. ha pr. dag op til 30 pct. tørstof under lune forhold
- Lejesæd koster udbytte

Stivelse, 2021



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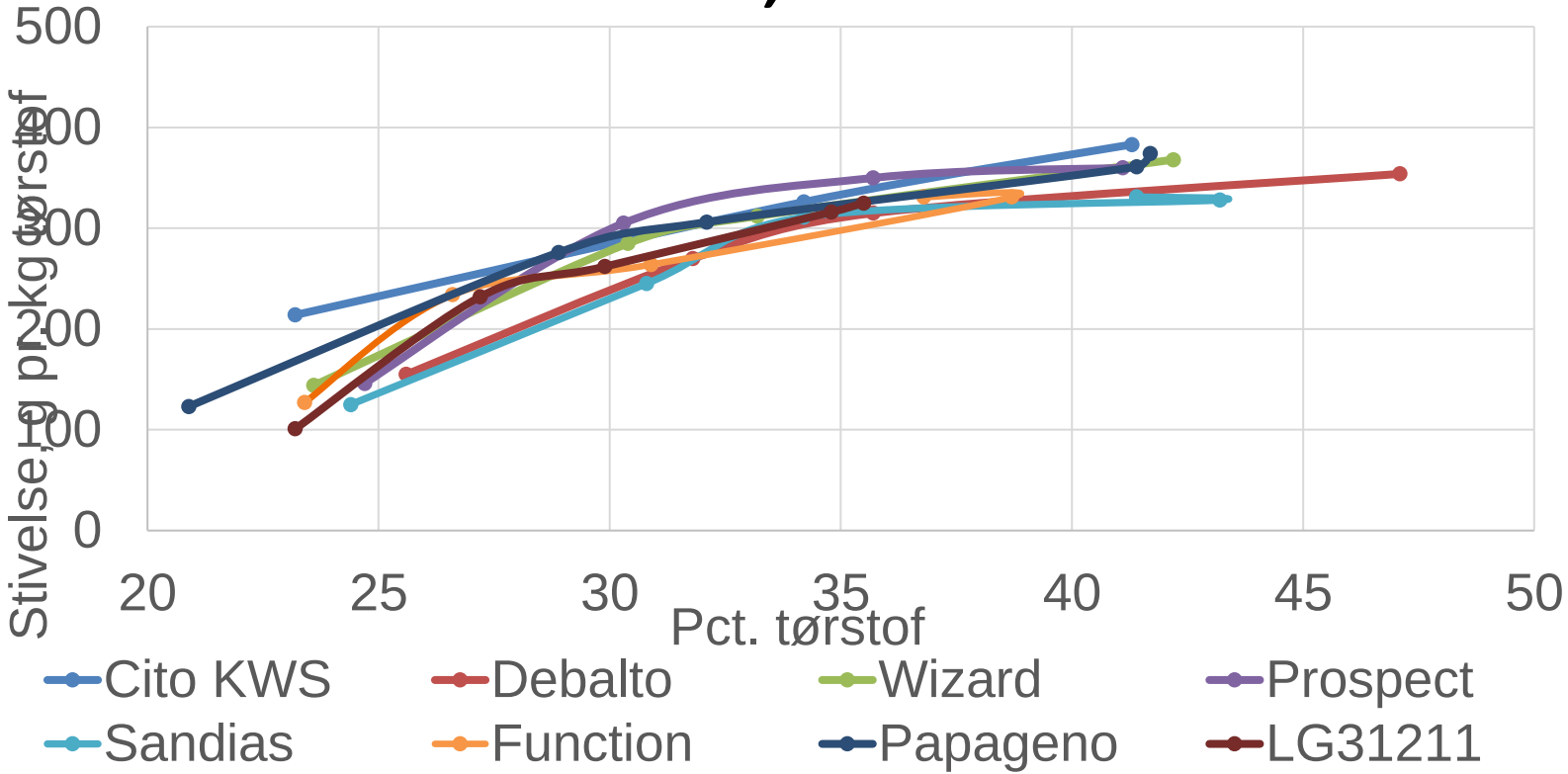

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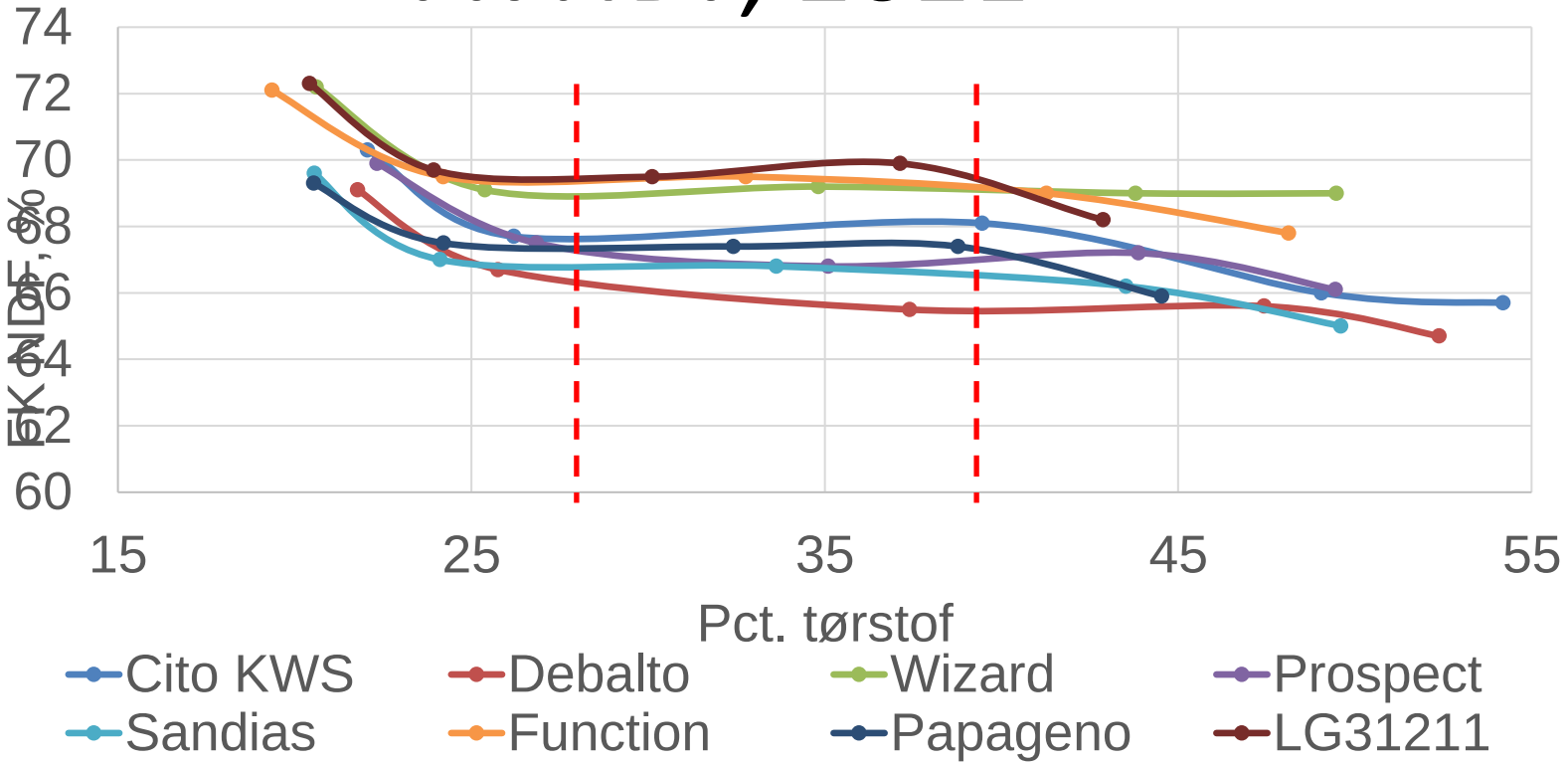
FK NDF, 2021



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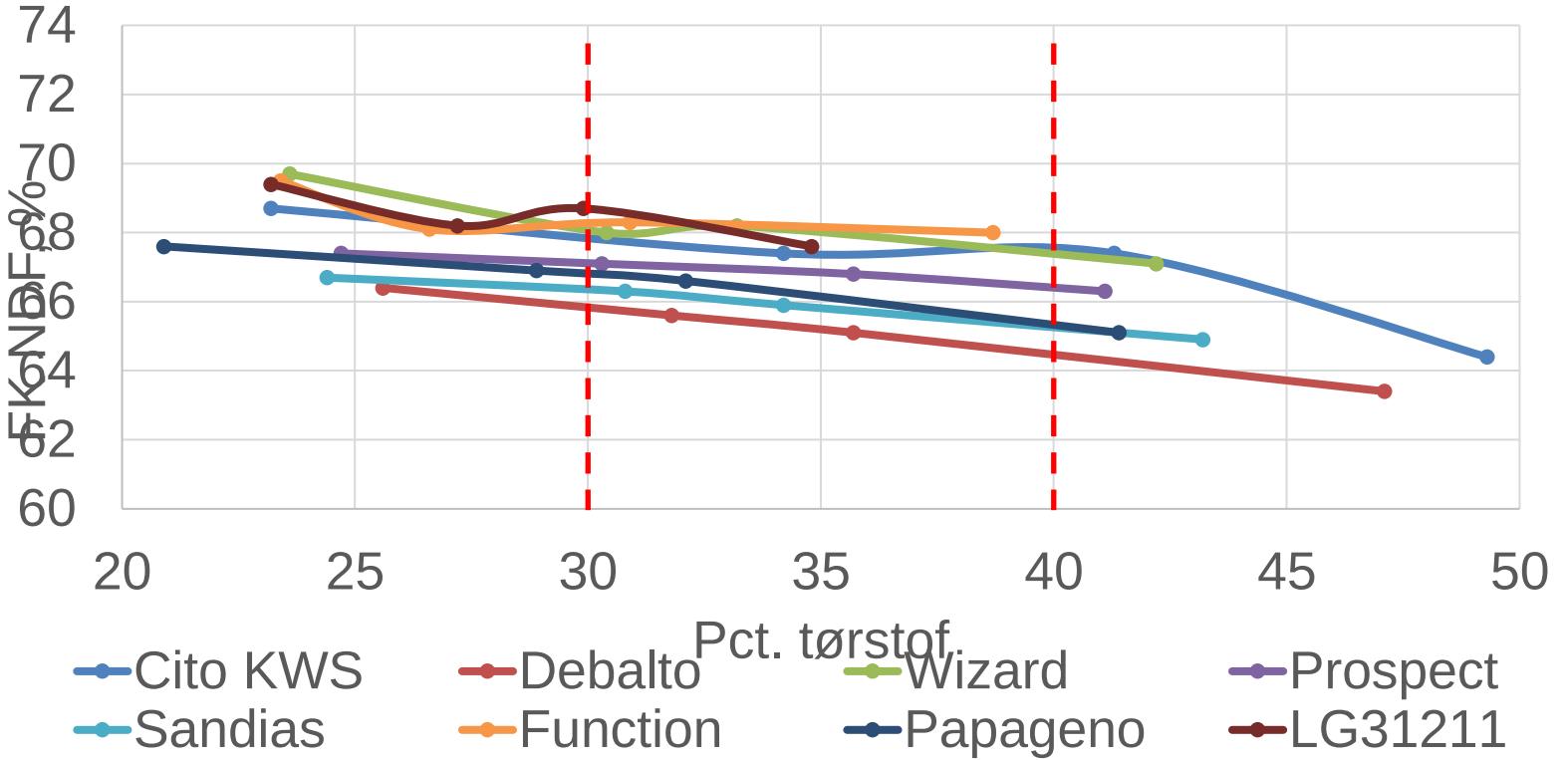
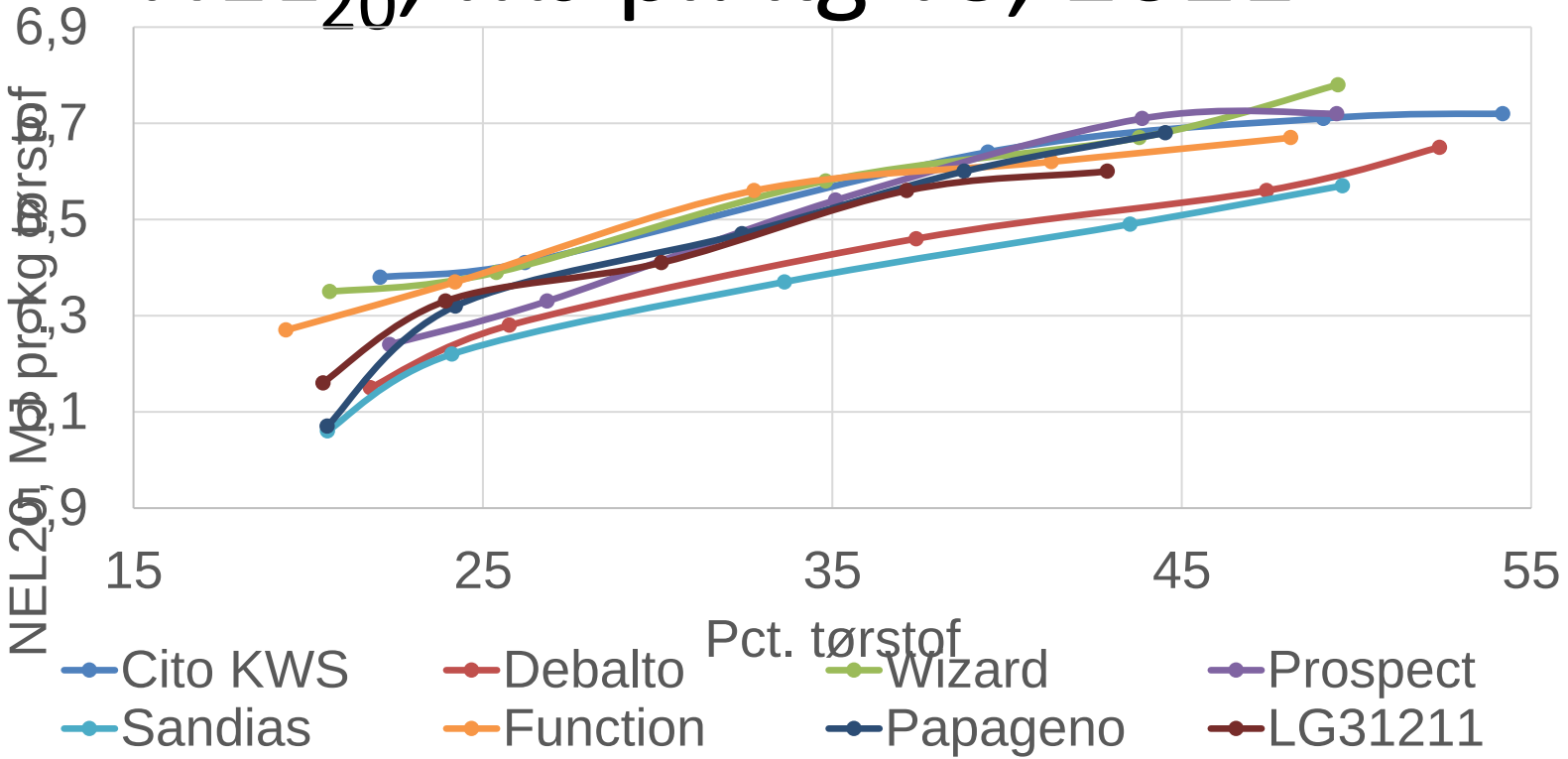


Landsforsøgene 2022, s. 418

NEL_{20}, MJ pr. kg TS, 2021



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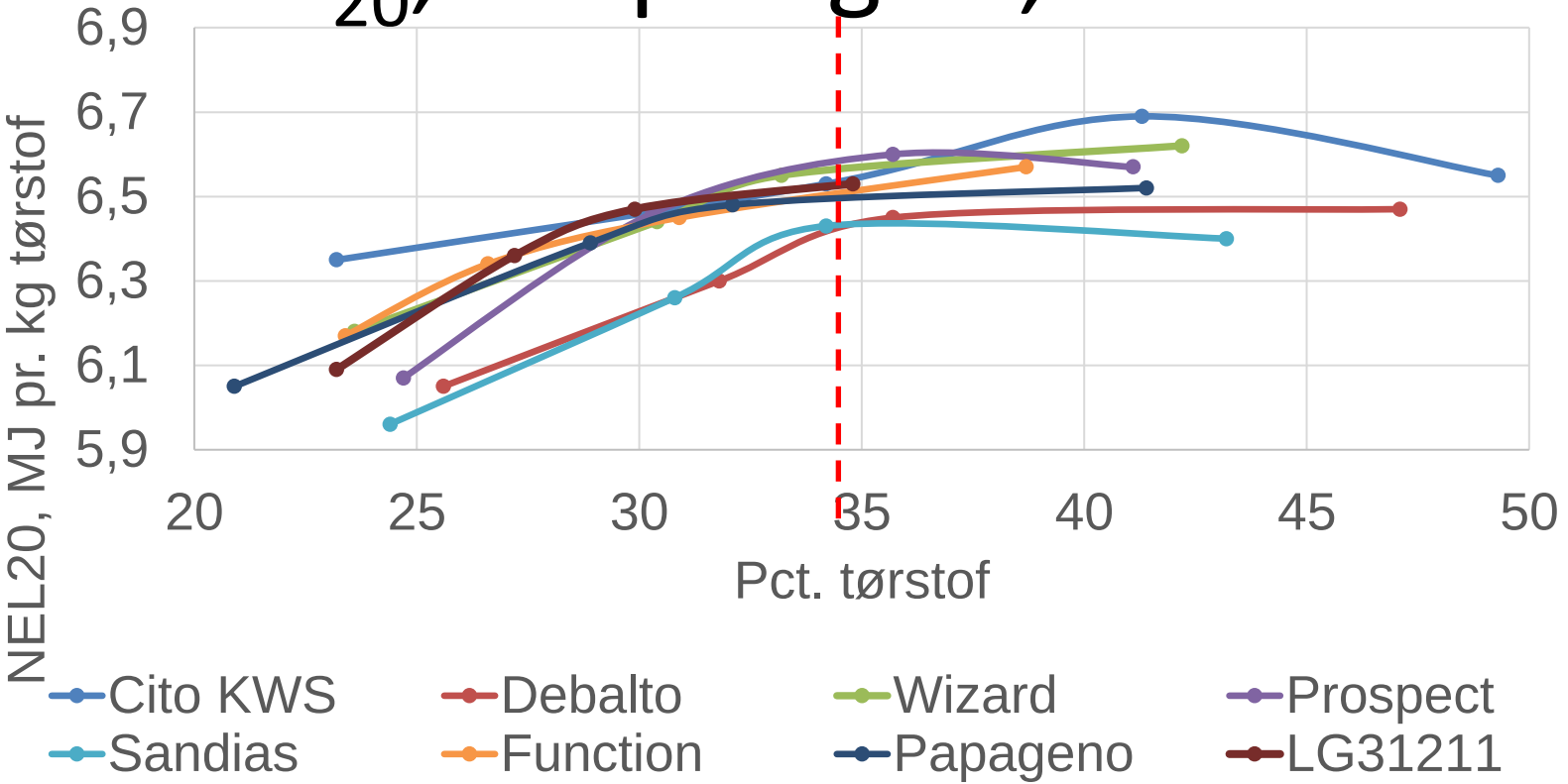
NEL_{20}, MJ pr. kg TS, 2022



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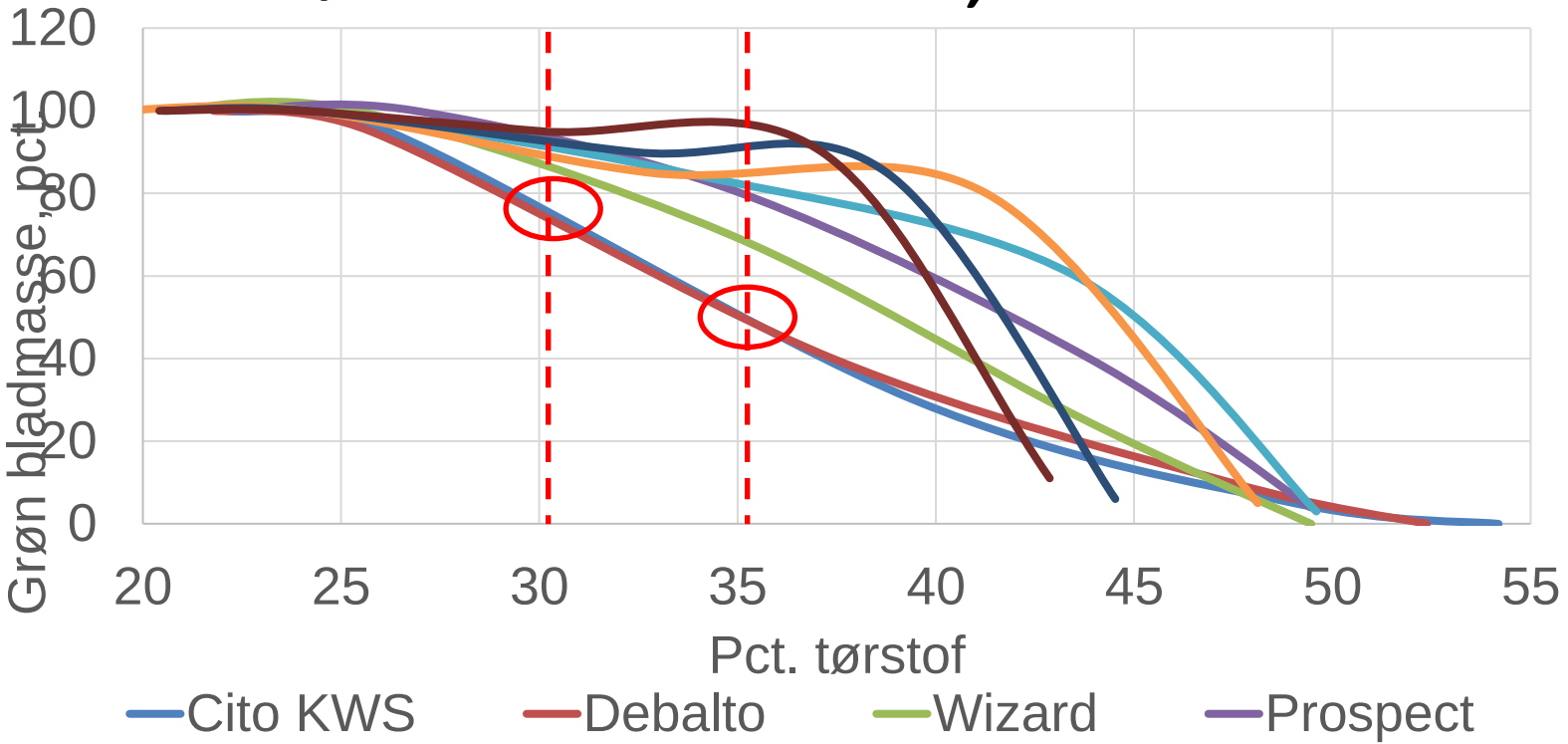
Grøn bladmasse, 2021



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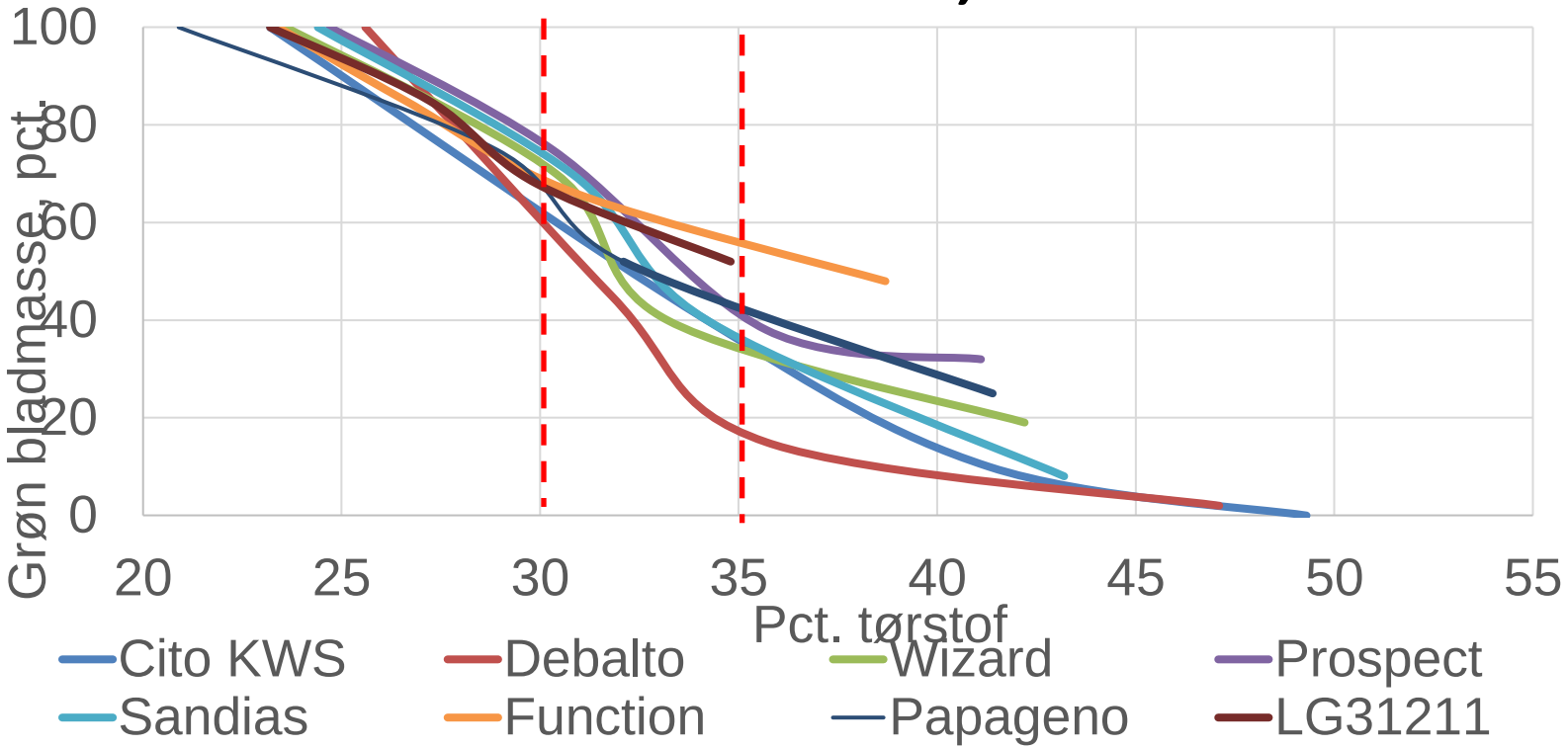


Landsforsøgene 2022, s. 418

Høst af majs

- Før lejesæd
- Middeldøgntemperaturen mindst 10 °C

35-40 % TS contra 30-35 % TS – og middeldøgntemperatur >10 °C

- Udbytte
- NEL20, MJ pr. kg TS
- Stivelse
- uændret eller lidt lavere FK NDF
- Grøn bladmasse – især dry down typer
- Stabilitet af ensilage i lageret ved opfodring
- Foderoptagelse og mælkeydelse

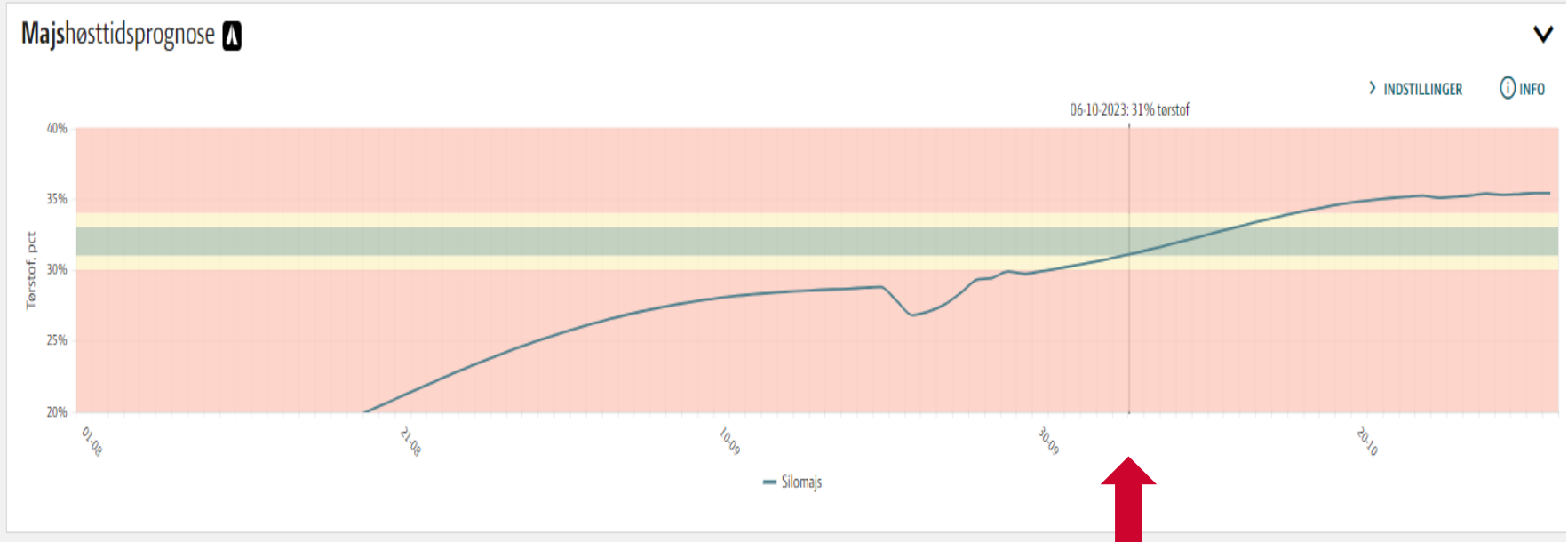
Anbefalet høsttidspunkt

- 30-34 pct. tørstof
- 30-32 pct. tørstof ved stor majsandel i foderrationen
- 33-34 pct. tørstof ved stor græsandel i foderrationen

Majs-høsttidsprognose – Cropmanager.dk

- Statistisk model baseret på
  - klimadata og 19.339 observationer for tørstofindhold 1992-2016
  - Forskel i sorters tørstofprocent ved høst i sortsforsøgene seneste 2 år
- Input
  - Postnr.
  - Sort
  - Sådato
  - Pct. tørstof i planteprøve fra aktuel mark
- Kontrolleres og justeres årligt på grundlag af planteprøver

Majs-høsttidsprognose –



Aktuel dato

Tak for opmærksomheden

Digital agriculture

The best harvest date will be not a coincidence!

An agricultural cooperative and an international Seed Company

4th largest seed company worldwide

No.4 Seed company worldwide

2022/23

More than

€2,451 billion revenue (IFRS 11)

&

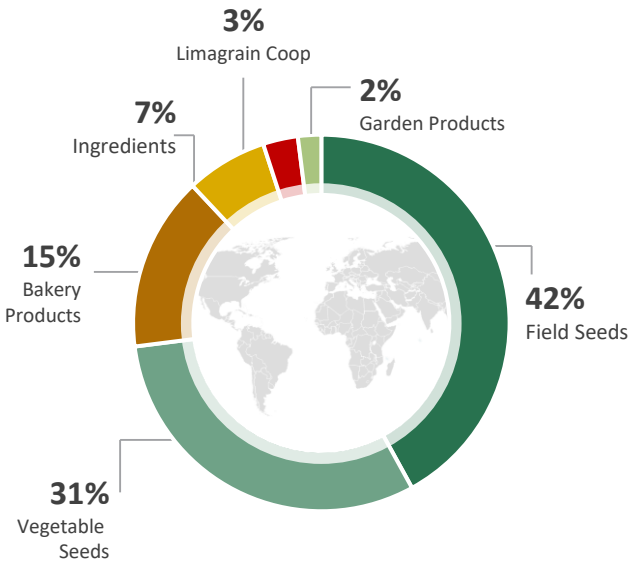
€775 million from strategic partnerships(1)

Subsidiaries in **53** countries

1,300 farmer members

9,539 employees from **84** nationalities

Distribution of sales by activities (IFRS11)



(1) Strategic partnerships for which Limagrain holds more than 30% shareholding

A seed centric approach

To maximize crop performance and provide added value to farmers

NEW HIGH ADDED-VALUE PROJECTS

Digital Agriculture & Services

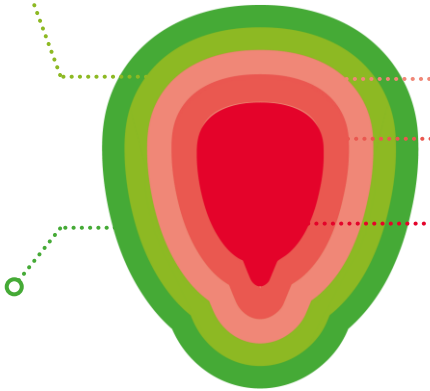
Optimising performance through new digital tools and services

agrility

Treatment & Techno Seeds

Improving the expression of genetic potential thanks to integrated seed treatment

starcover active+



Seed quality

Producing high-quality seeds through high-performance agronomic and industrial processes

Traits

Identification of traits of interest and introgression into elite germplasm

Genetics

Benefit from access to a broad range of generic resources, an international network of research staff and stations, and state of the art technologies

AT THE CORE OF OUR BUSINESS

Limagrain Europe

Leader in animal nutrition - From field to feed

Diet audit

Appropriate hybrids for each diet

Milk+ Diagnosis of the cattle needs

Recommendation / Choice

Product segmentation

Milk+ Catalogue Demo Fields

Sowing

Estimation of Sowing date

agrility.VEGETATION

Monitoring crop development
➔Early identification of problems (pests, weeds, etc.)

Harvesting

Estimation of Harvest date

LAB Forage Quality Analyser

agrility.HARVEST

agrility.YIELD

Real-time estimation of the optimal harvest date & plan harvest
➔Optimize storage and limit silo losses

Silo quality monitoring

Silo Diagnostic

LAB Forage Quality Analyser

Feeding and ROI

Better profitability

Feeding trials Proofs

€

Real-time yield estimation well before harvest
➔Anticipation of purchases

agrility in few figures

A platform that reveal the full potential of the fields

Digital Agriculture Platform

4 services available

- VEGETATION
- DENSITY
- YIELD
- HARVEST

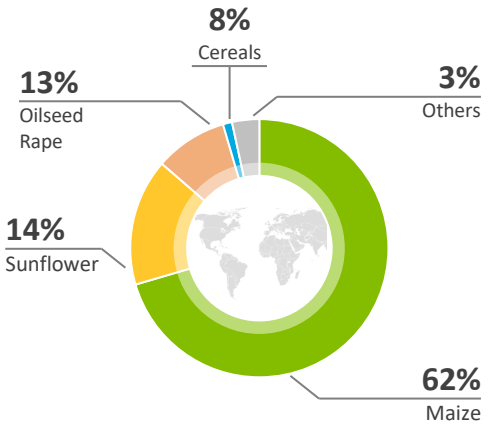
Used in **21** countries

High resolution satellite imagery

Soil data

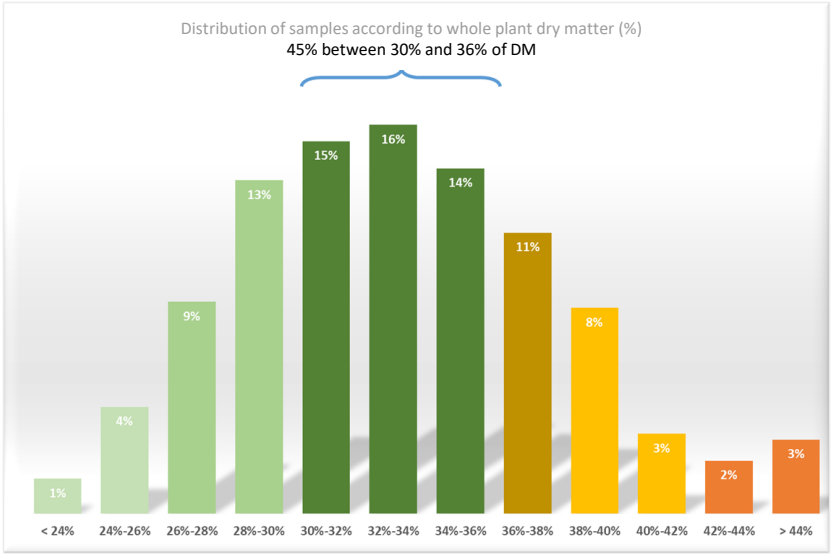
Historical and real-time **weather data**

350 Kha in 22/23



One in two farmers harvest at the wrong maturity

Strong impact on quality and profitabilty



Source LG: 1655 samples- year 2021 in FR

- 45% of samples within the recommended harvest window (30-36% MS)
- 55% who don't harvest at the right maturity

- Impact of bad DM:
  - DM>35%
    - Difficulty compacting the silo
    - Difficulty of conservation
    - Penalized organic digestibility
  - DM < 30%
    - Loss in the silo in the form of juice

agrility.HARVEST a result of 5 years investment

2019
Start development Harvest service

2021
2 years
Modelisation and calibration with NIRS

2022
Pilot in 2 countries

2023
Deployment in 10 countries

A dedicated with data scientists combining data from diverse sources and advance analytics to enable predictive modeling (machine learning) to provide actionable insights to farmers

Key components to create your harvest prescription

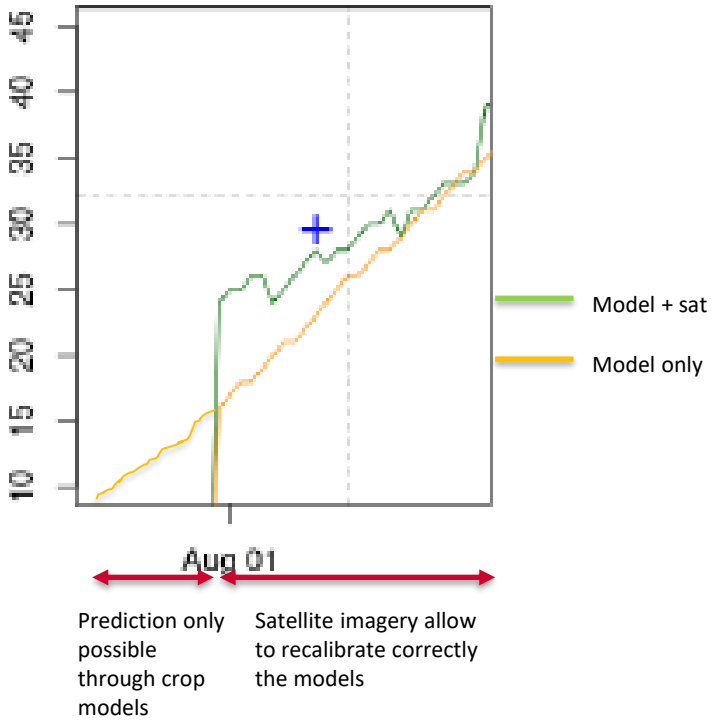
Science combined with new technologies

Field data	Weather data	Variety knowledge	Agronomic models	Satellite images	Service delivery
					Email report **Platform**
• Field boundaries • Crop and Variety Name • Irrigation • Sowing date and seedrate • Pre-filled soil characteristics	• Daily data to calculate daily GDD and DM • Historical data to predict climatic scenario	• More than 800 dry matter data from farmer fields • Multi year data • Maturity	• Predict the evolution of crop stages and DM • An ecophysiological model	• Leaves DM correction • Specific index taking into account Biomass and Water Status	

Satellite imagery and models to obtain the best prediction

A complete system based on 2 models to secure the prediction during the season

- Interest of the combination:
  - Crop model: can give an idea of the optimal date really early on the season
  - Satellite imagery: will allow to be more precise on the last 3 weeks before the harvest → increase the accuracy of the prediction of 15-20%



Continous improvement of calibration till 2020

Average deviation: 2,5 to 3 % DM

- More than 800 dry matter data from farmer fields
- Learning machine system
- 72 000 points in Europe (real or virtual)

	Average deviation 4 %DM		Average deviation 3 %DM		Average deviation 3 %DM		
Country	2020		2021		2022		Farmer Feedback
	Samples	Average deviation	Samples	Average deviation	Samples	Average deviation	
DE	24	2.8	108	2.5	19	2.1	
SK	NA	NA	9	3.6	26	2.2	
CZ	21	5.5	34	1.5	116	2.3	
FR	14	5.5	116	2.5	27	3	
PL	5	4	110	2.6	6	3	
.....							

Customer voice- User case

EILYPS (FR) – Independant advisor

- Partnerships started in 2022, specialist in sales of services for cattle

- Evolution till 2022:
  - 2022: Pilot : 50 farmers, 1300 Ha
  - 2023: 3 départements : 500 farmers, 13000 Ha
  - 2024: Long term agreement

- Testimonies with high level of satisfaction of farmer (more than 90% of renewal) and advisors

Easy way from data capture to results delivery

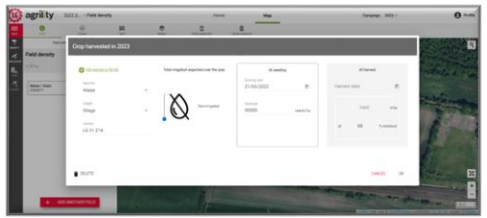
A precise « field » diagnosis

Early service delivery
One month before harvest

Field boundaries

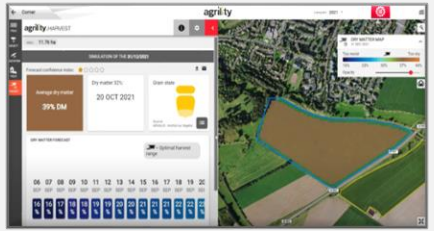
5 field data

- Crop
- Variety
- Irrigation
- sowing date
- Seedrate
- Pre-filled soil characteristic data (rooting depth, granulometry, composition)



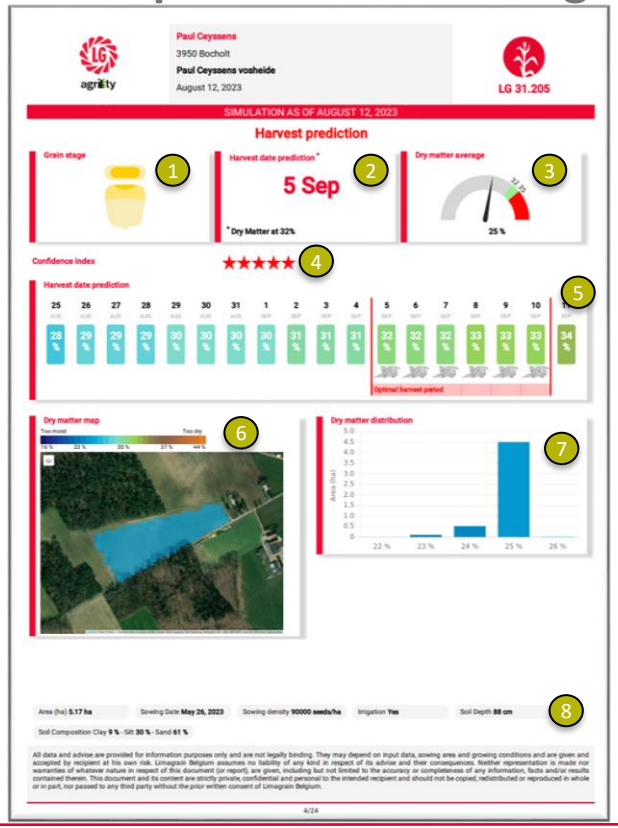
Email report

DAILY UPDATE ON PLATFORM



Harvest report in PDF

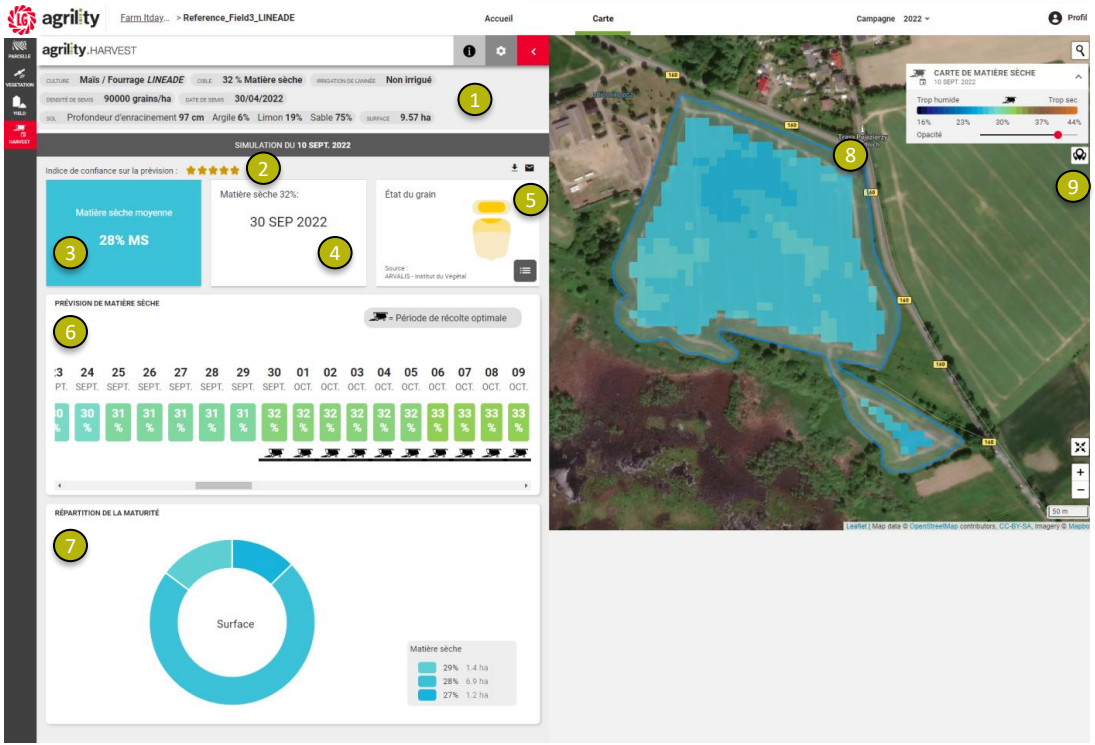
A simple overview for a global analysis



1. Estimated grain stage
2. Estimated harvest time at 32% DM
3. Updated average dry matter of crop (to date)
4. Confidence index that reflects the precision of harvest estimation
5. Estimated harvest agenda
6. Dry matter map
7. Distribution of each zone with different dry matter value in the field
8. Crop information

Follow-up during the season

A full picture at field level with simple criteria



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7. Distribution of each zone with different dry matter value in the field
8. Dry matter map (resolution of 10x10 m)
9. Overview of the dry matter of all the fields in the farm

Key messages

- Multi-year experience with diverse climatic scenario
- High silage expertise
- Deep and mature agronomic modelisation
- High precision prediction from 1 month before harvest (2,5-3% DM)
- High farmer satisfaction with recognized added value across Europe

Limagrain Field Seeds

Limagrain

Limagrain Europe

Biopôle Clermont-Limagne – Rue Henri Mondor - 63360 Saint-Beauzire - FRANCE

Tél. : +33 (0)4 15 40 03 00

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www.limagrain-europe.com

Limagrain Field Seeds

Limagrain

Høsttidspunkt i typesorter af majs

Martin Mikkelsen

10. januar 2024

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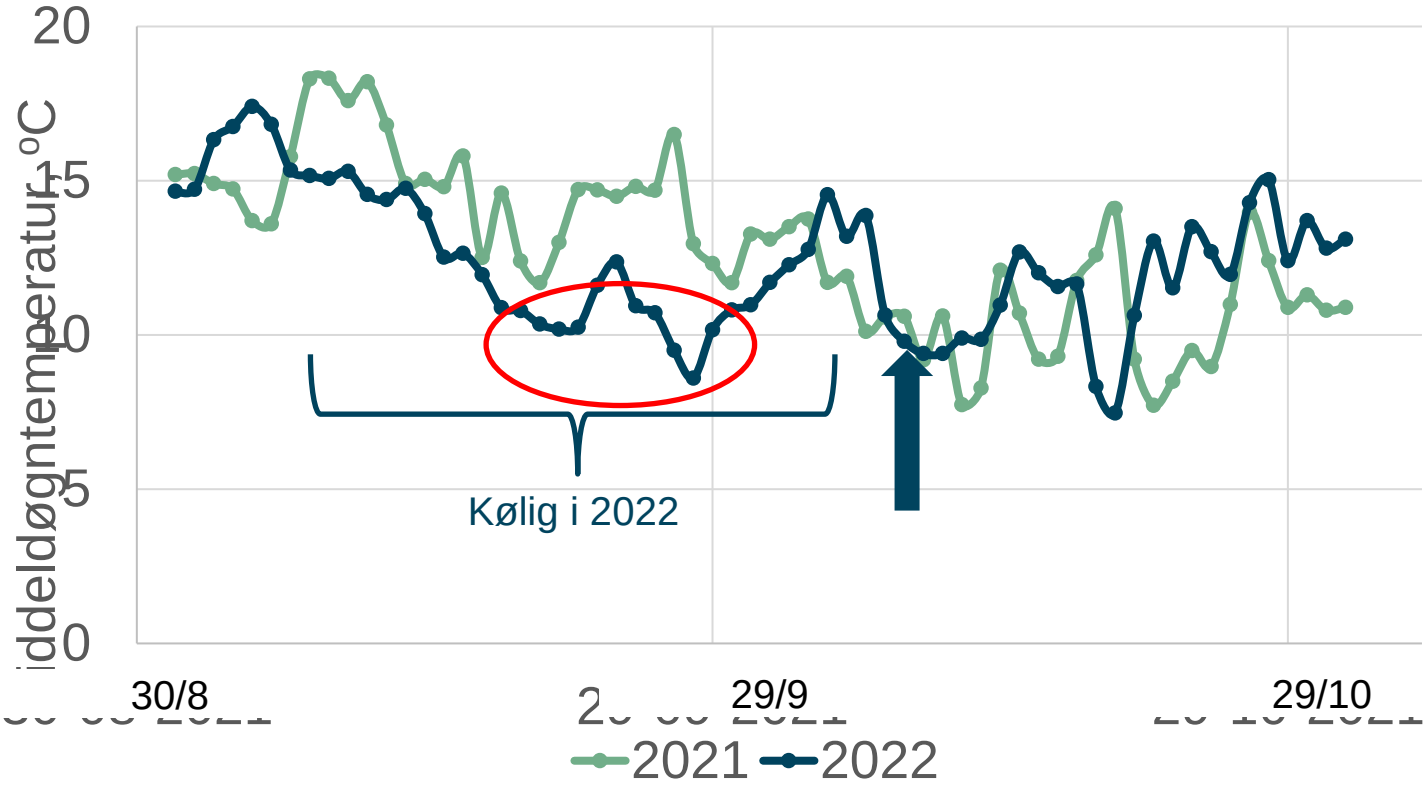
Høsttid i 8 majssorter

2 forsøg, 2021 og 2022



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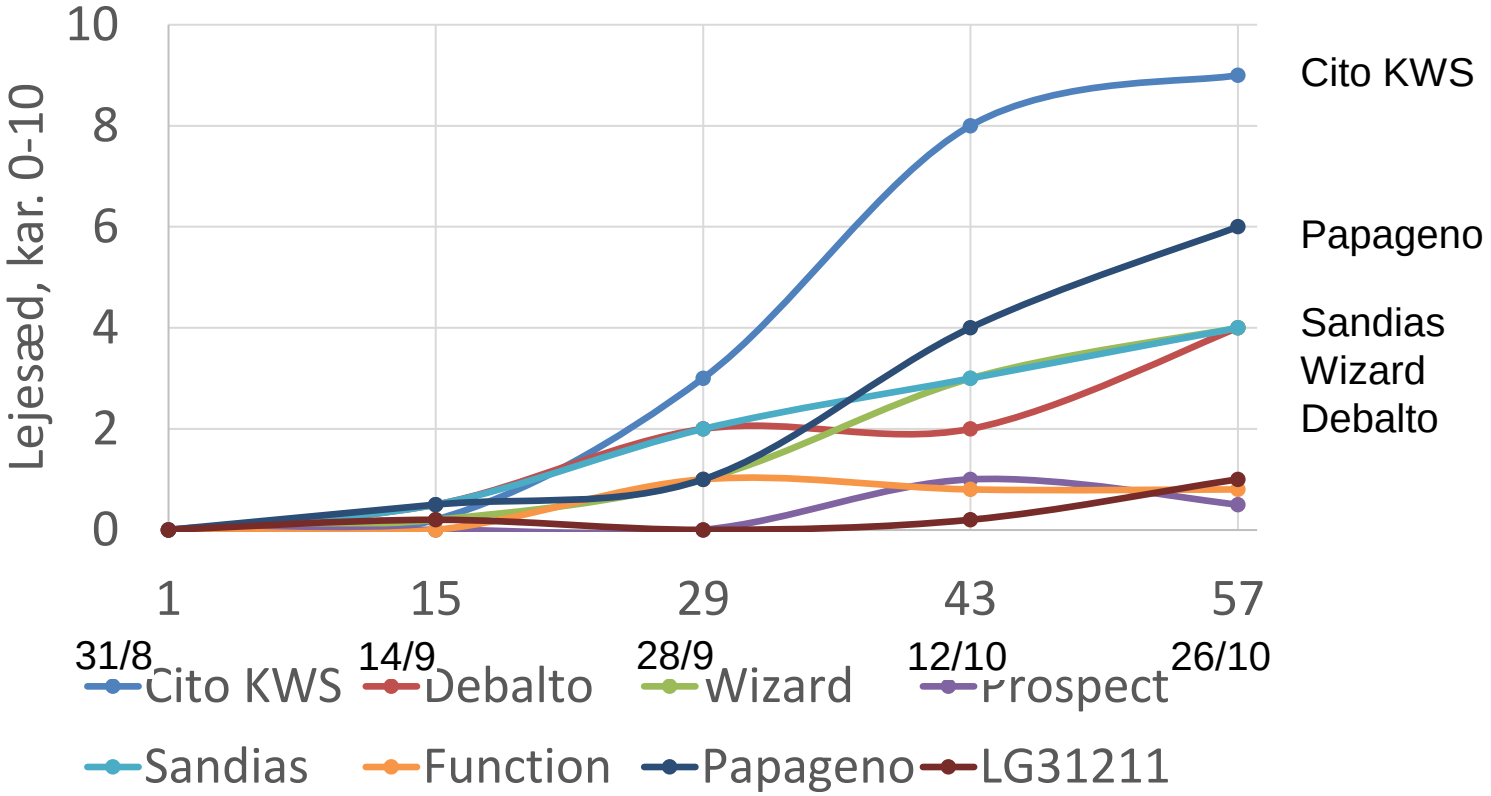

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SEGES INNOVATION

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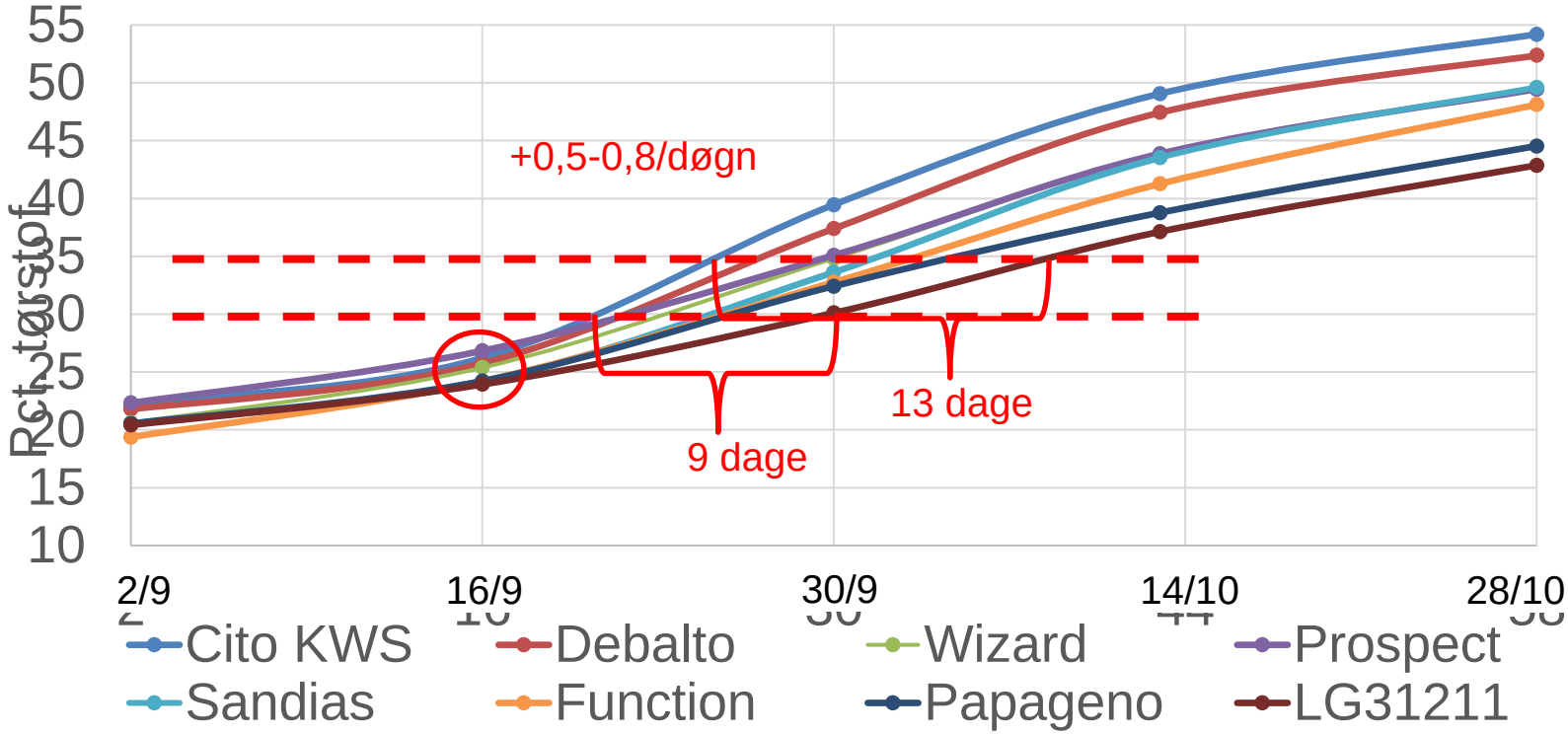

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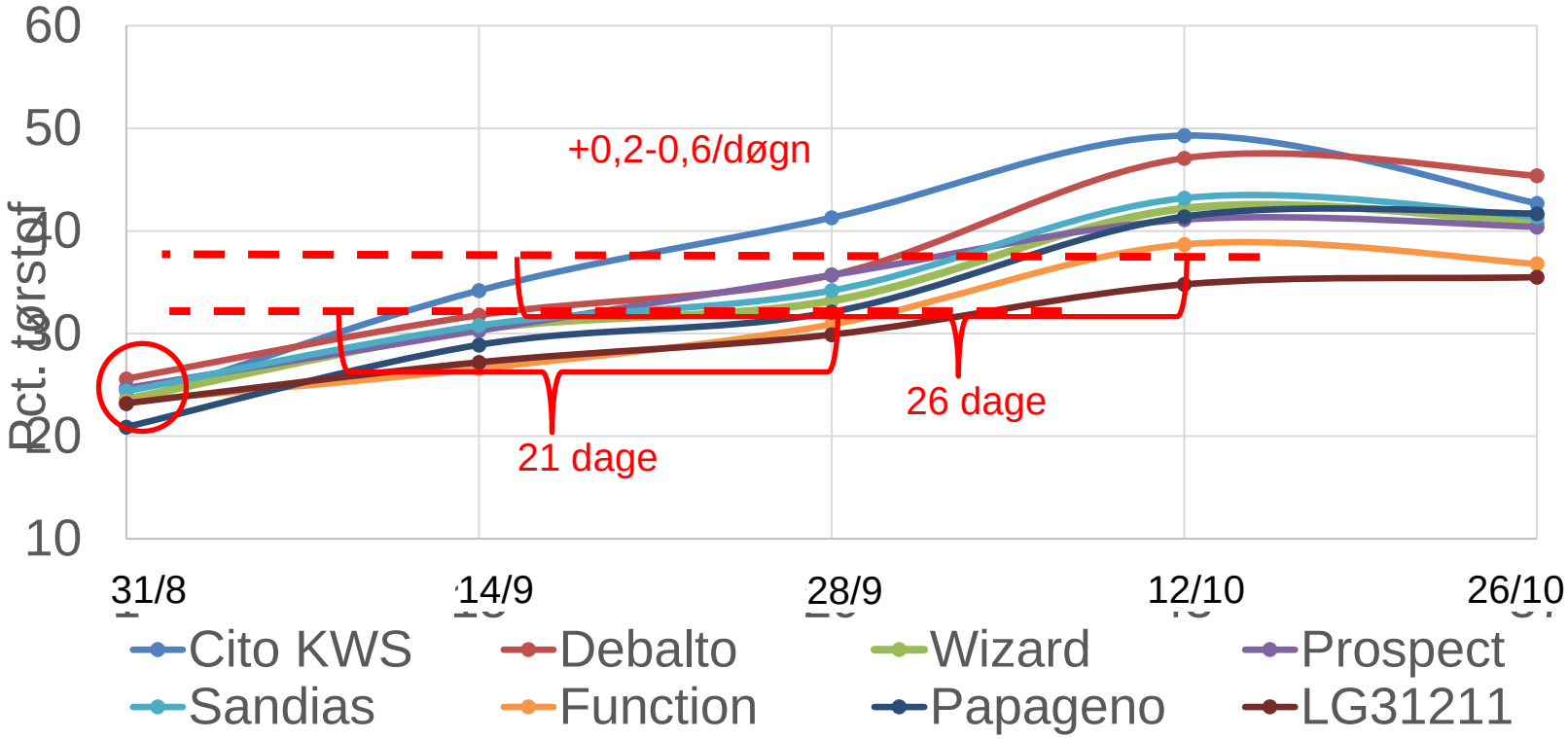

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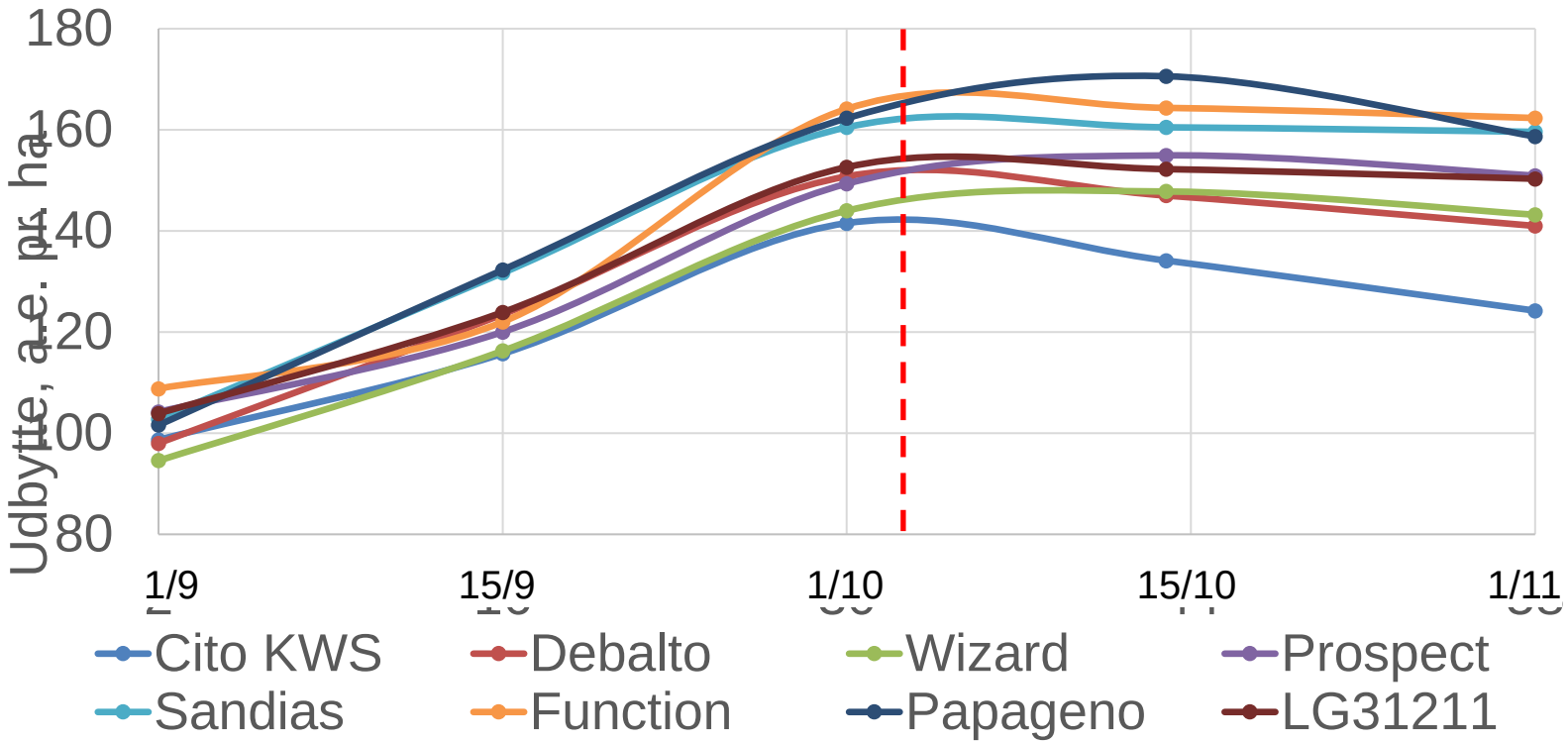
- Under varme forhold er tørstofprocenten dagligt steget med 0,5-0,8 – mest i de tidligste sorter
- Under kølige forhold er tørstofprocenten dagligt steget med 0,2-0,6 – mest i de tidligste sorter
- Dobbelt så stor sikkerhed for at få meget tidlige sorter moden i et køligt år

SEGES INNOVATION

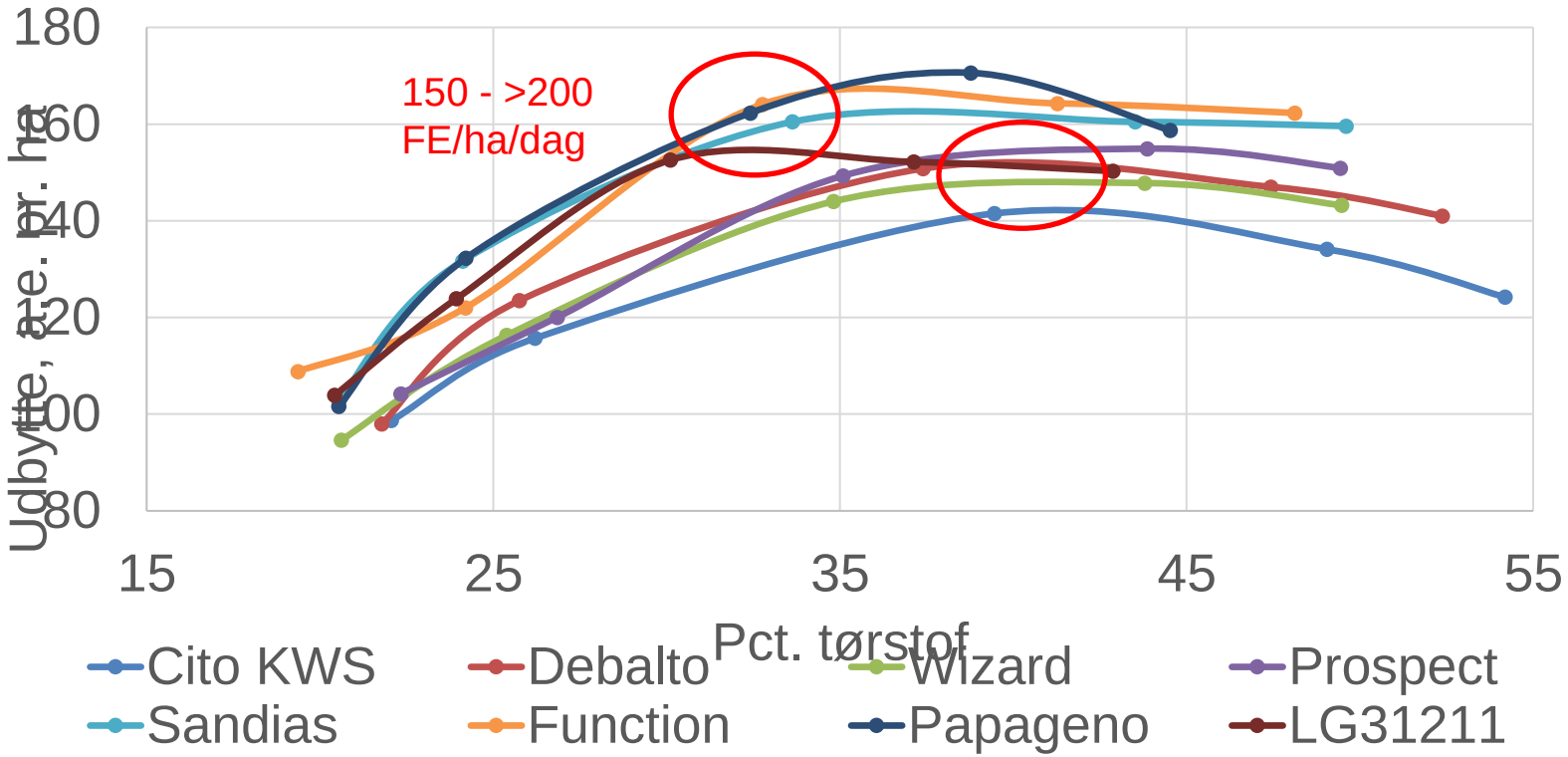
Udbytte a.e., 2021



Landsforsøgene 2021, s. 437

SEGES INNOVATION

Udbytte a.e., 2021



Landsforsøgene 2022, s. 418

SEGES INNOVATION

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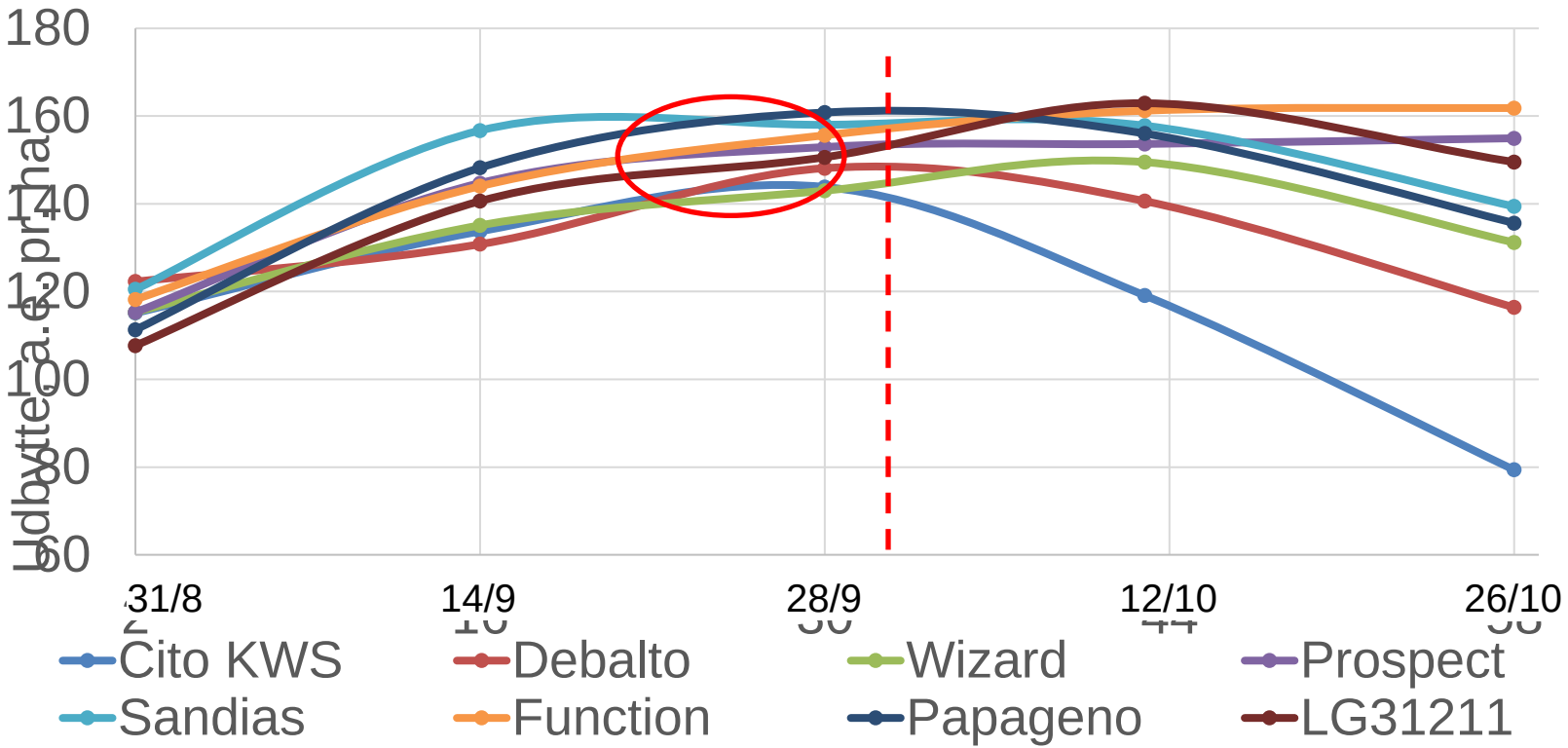

Landsforsøgene 2022, s. 418

SEGES INNOVATION

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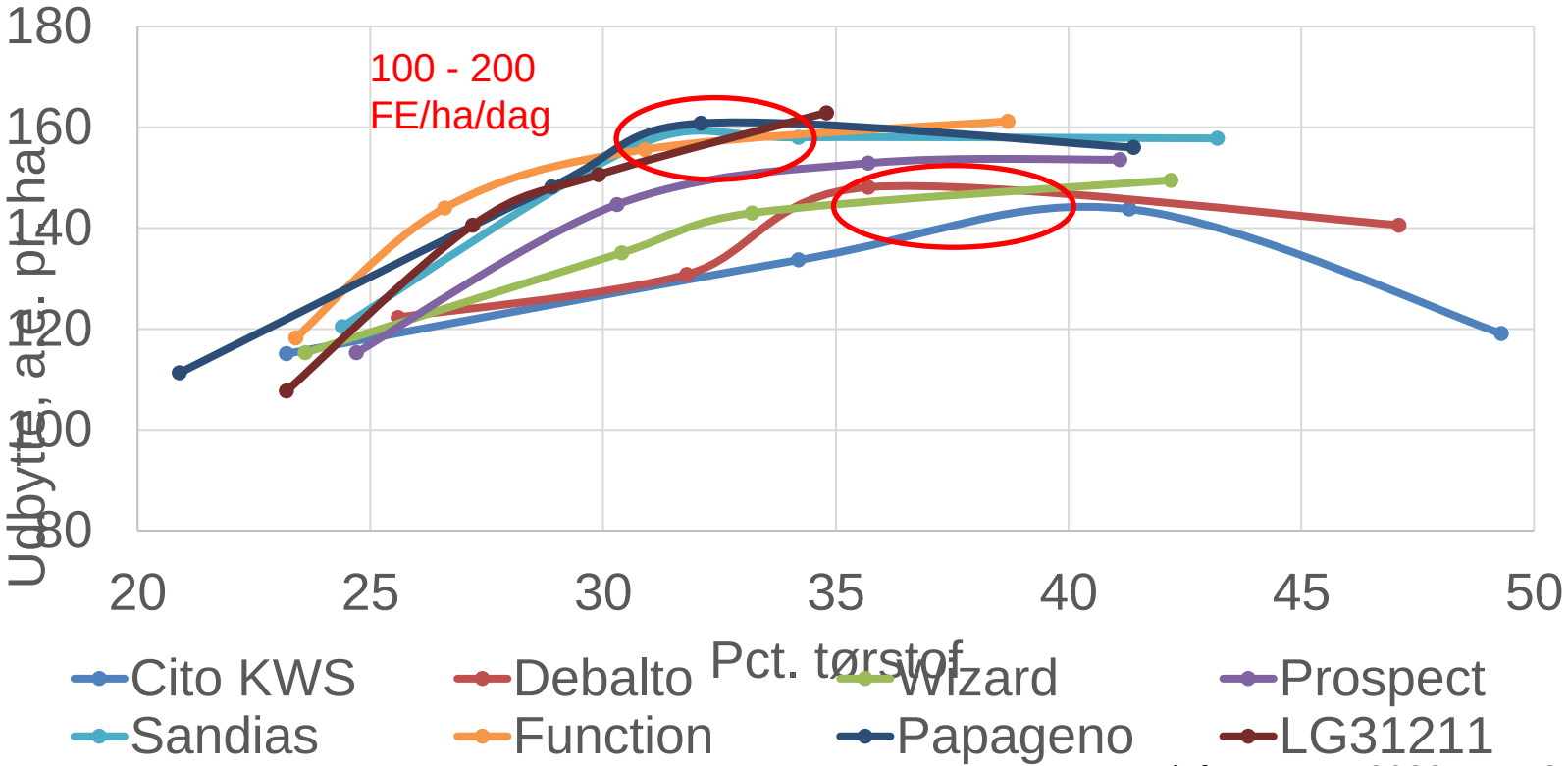

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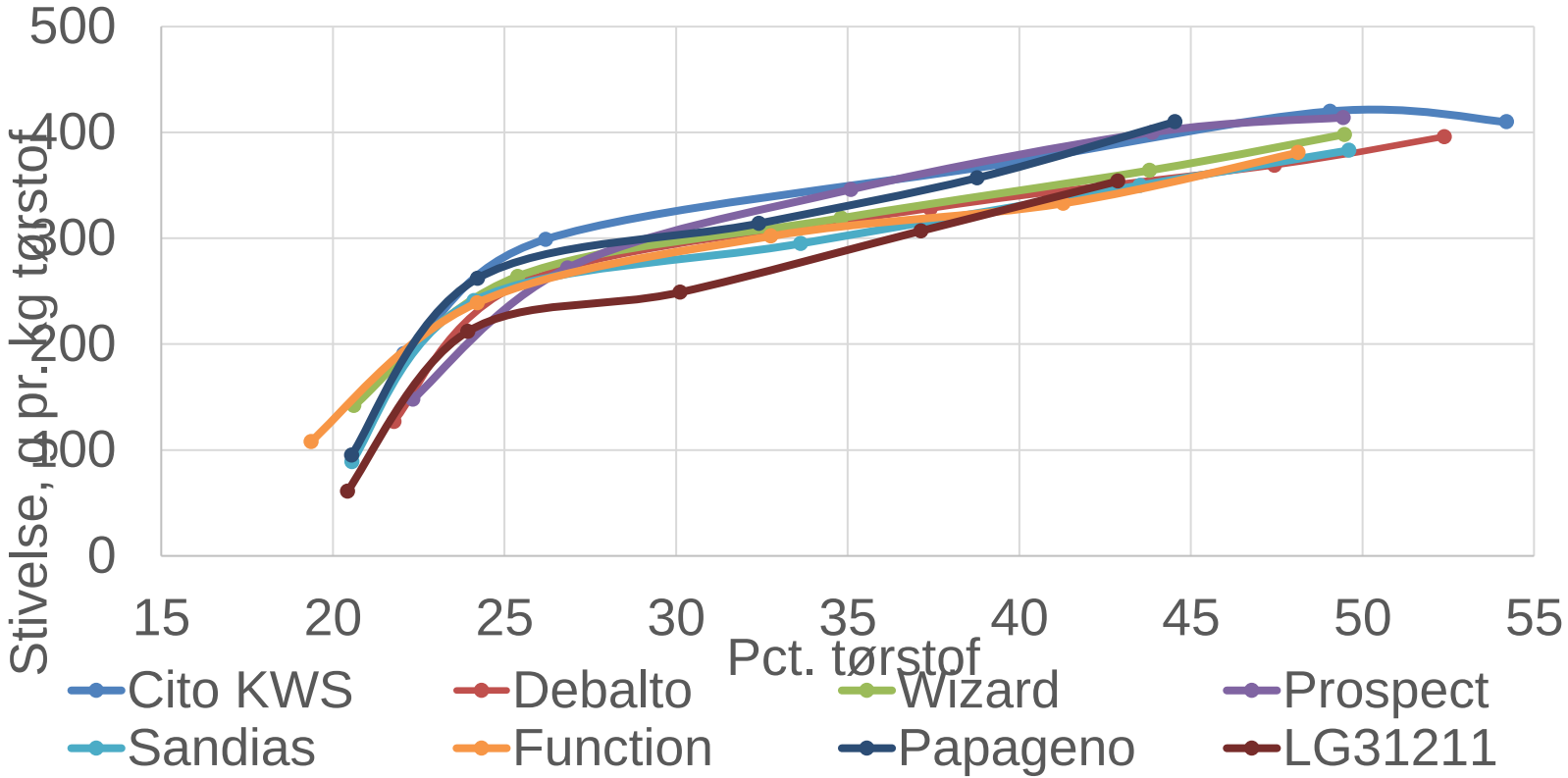
SEGES INNOVATION

Udbytte

- Topper ved middeldøgntemperaturen 10 ^{o}C
- Topper ved 35-40 pct. tørstof, hvis middeldøgntemperaturen er over 10 ^{o}C
- >200 FE pr. ha pr. dag op til 30 pct. tørstof under lune forhold
- Lejesæd koster udbytte

SEGES INNOVATION

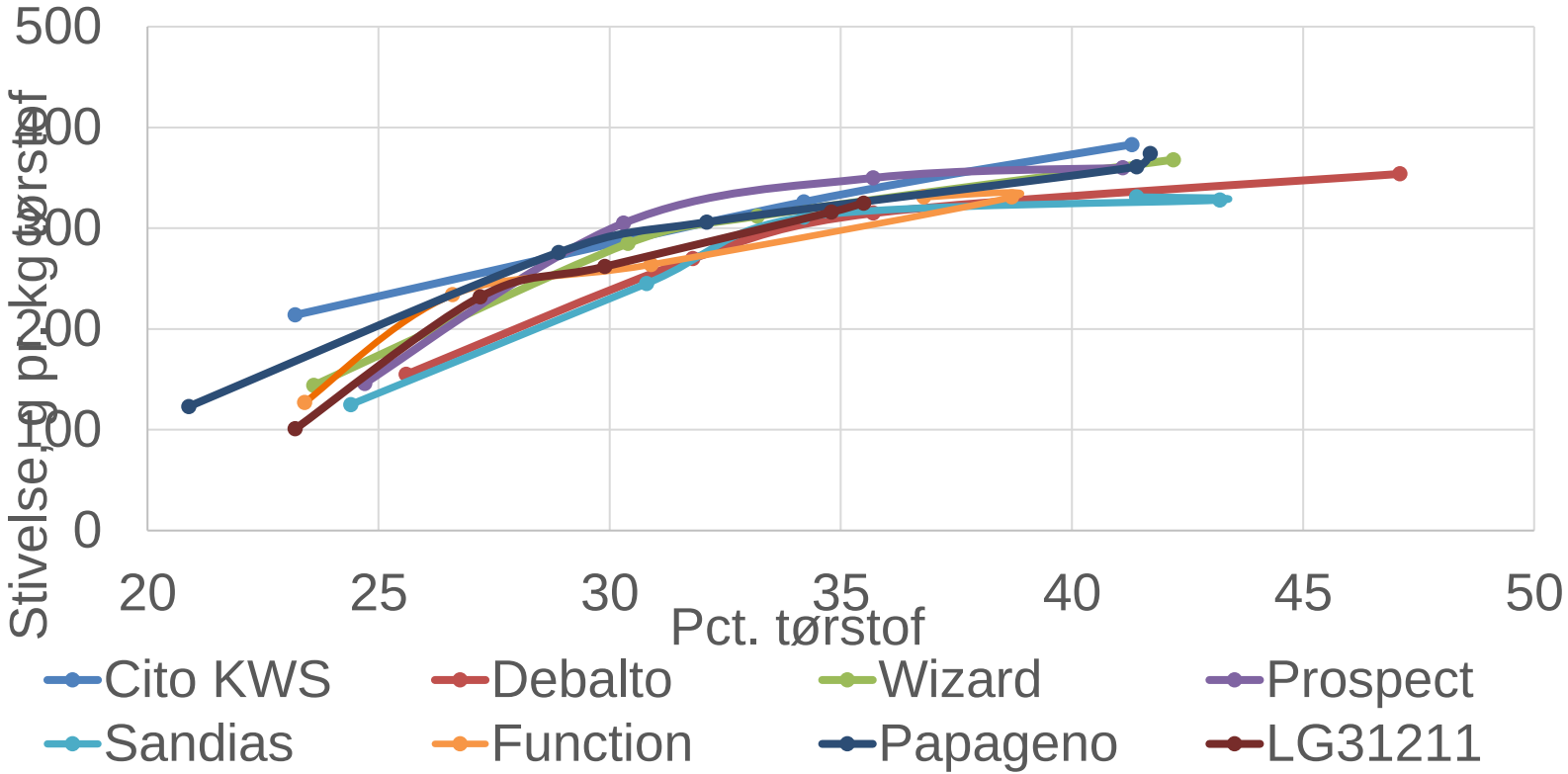
Stivelse, 2021



Landsforsøgene 2021, s. 437

SEGES INNOVATION

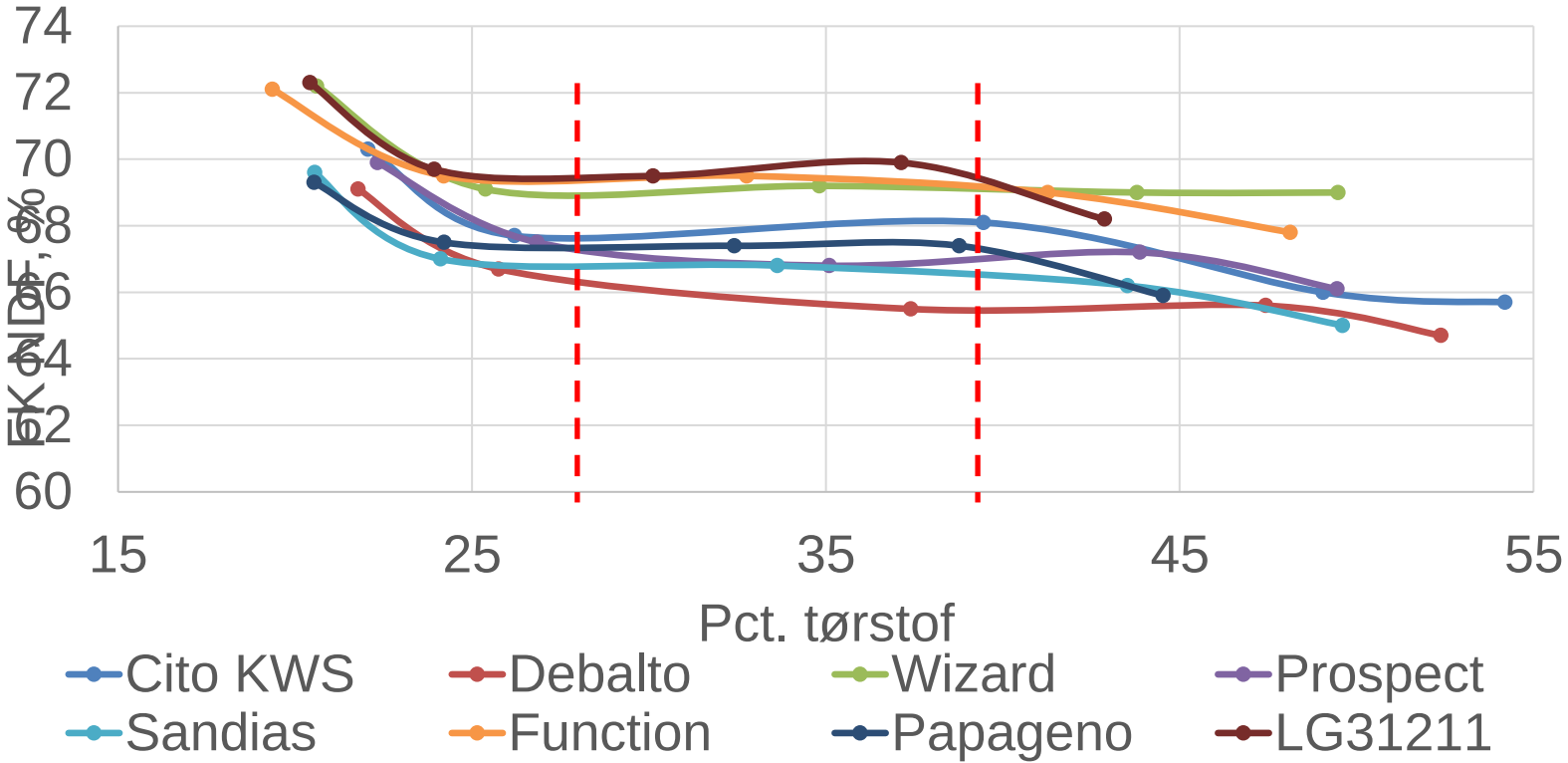
Stivelse, 2022



Landsforsøgene 2022, s. 418

SEGES INNOVATION

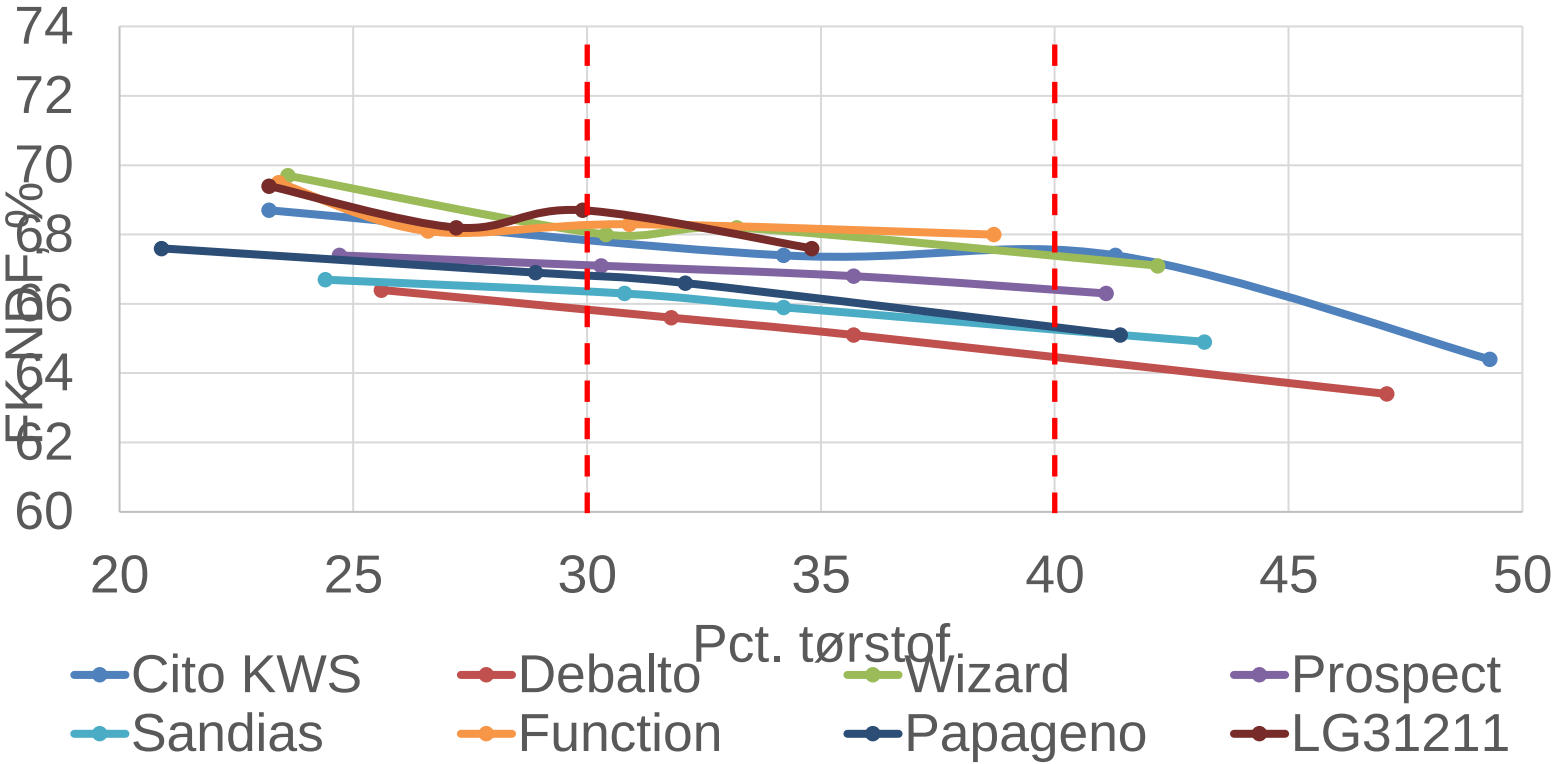
FK NDF, 2021



Landsforsøgene 2021, s. 437

SEGES INNOVATION

FK NDF, 2022



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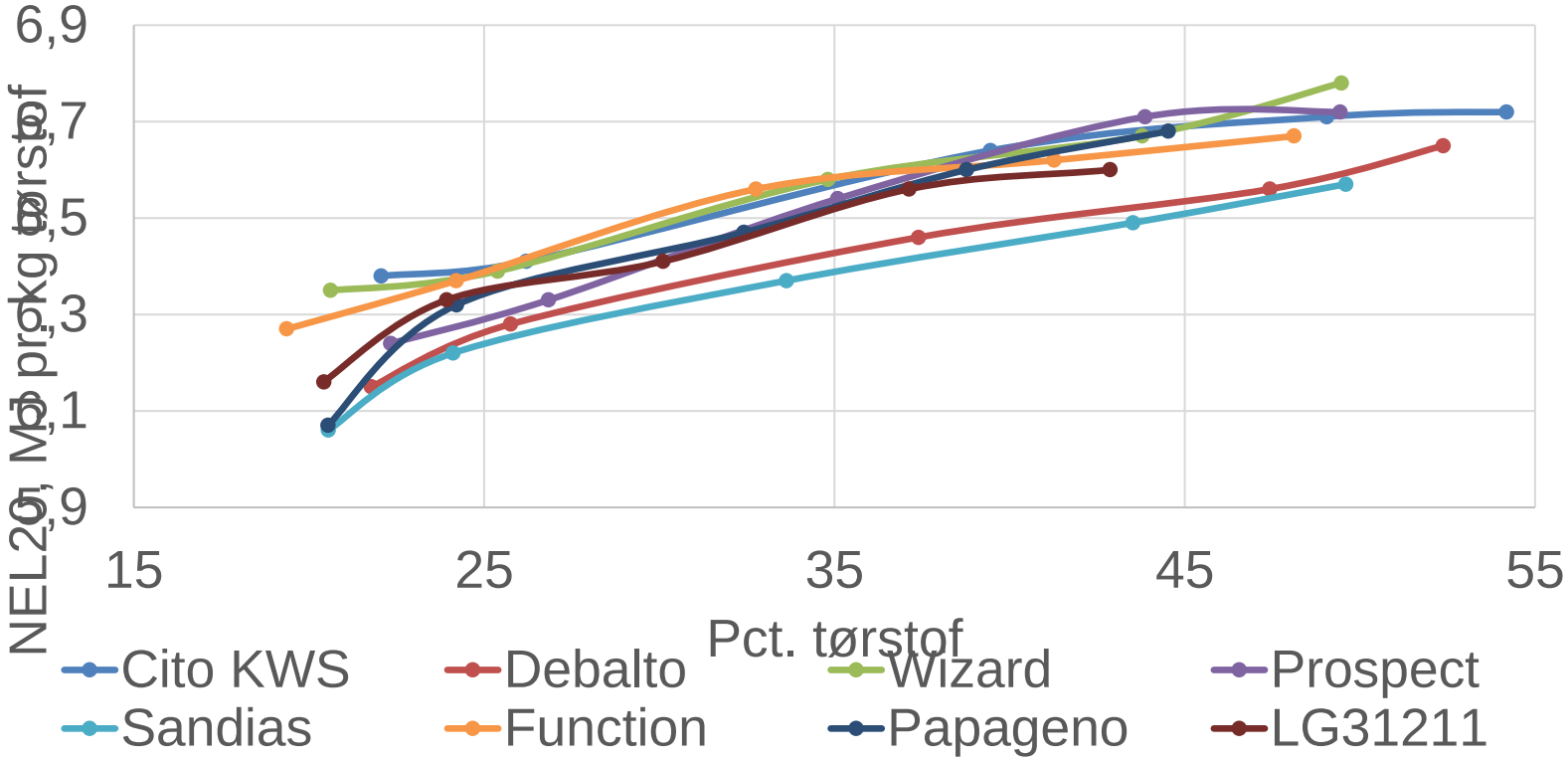
SEGES INNOVATION

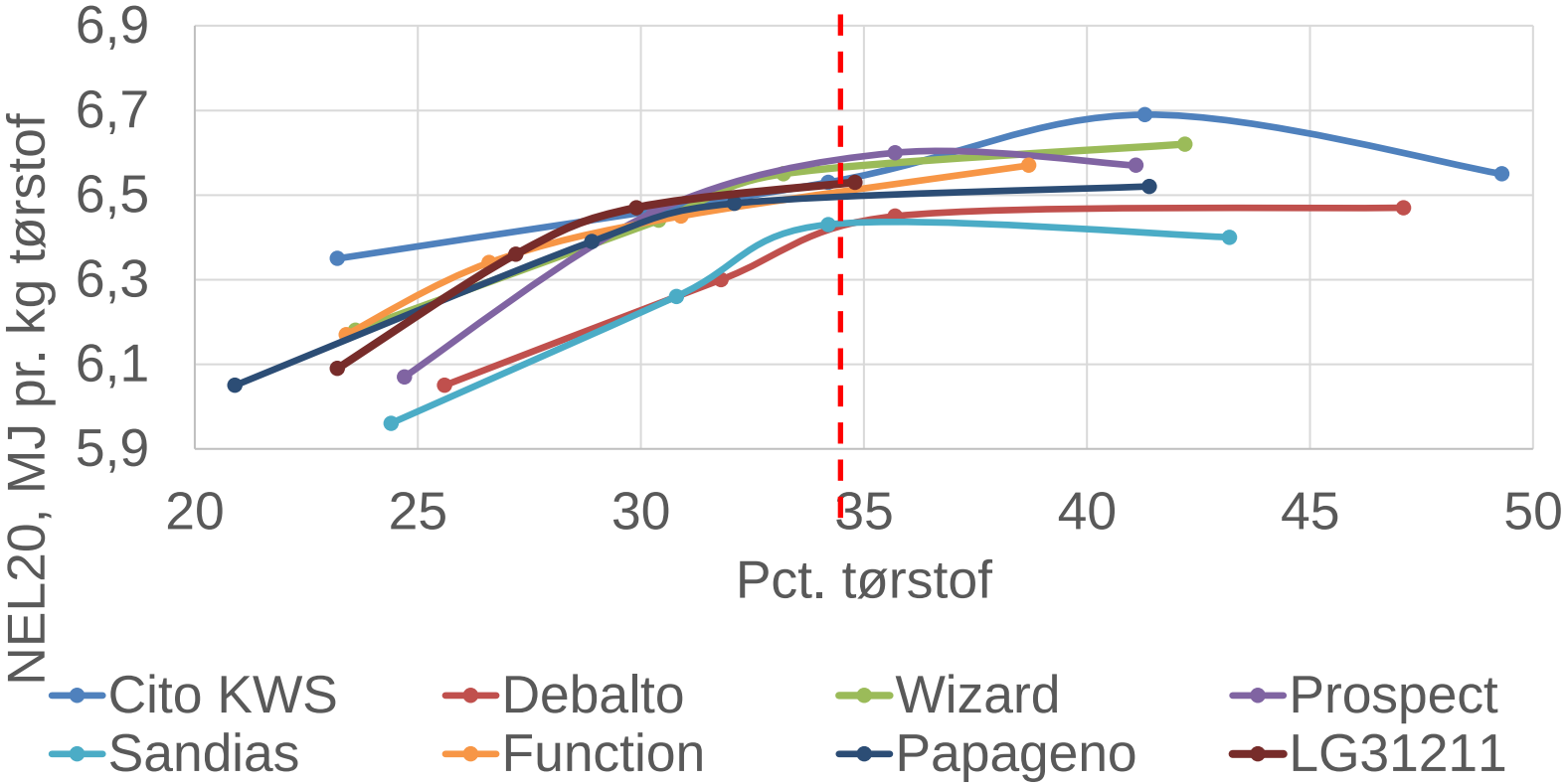
NEL_{20}, MJ pr. kg TS, 2021



Landsforsøgene 2021, s. 437

SEGES INNOVATION

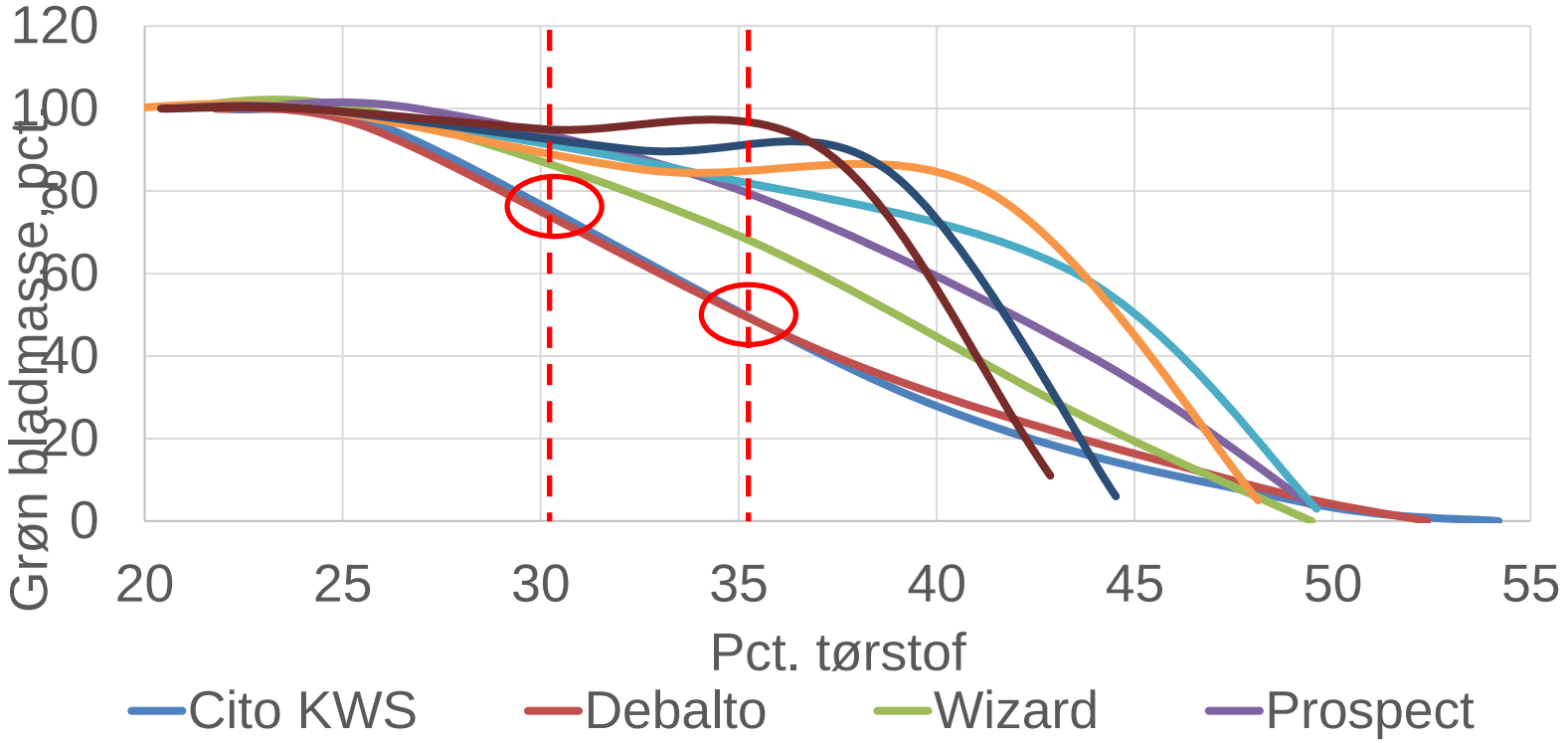
NEL_{20}, MJ pr. kg TS, 2022



Landsforsøgene 2022, s. 418

SEGES INNOVATION

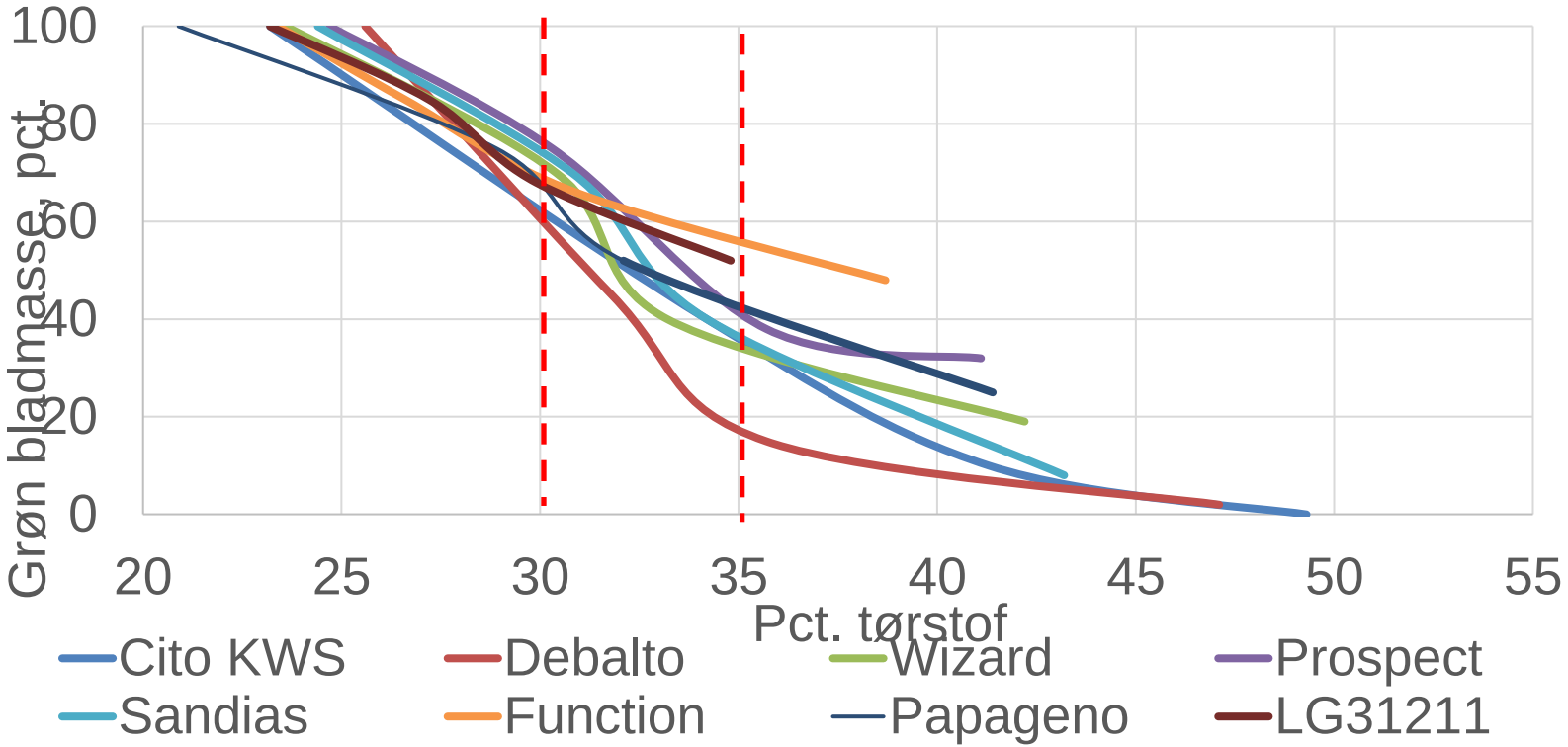
Grøn bladmasse, 2021



Landsforsøgene 2021, s. 437

SEGES INNOVATION

Grøn bladmasse, 2022



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SEGES INNOVATION

Høst af majs

- Før lejesæd
- Middeldøgntemperaturen mindst 10 °C

35-40 % TS contra 30-35 % TS – og middeldøgntemperatur >10 ºC

- Udbytte ↑
- NEL20, MJ pr. kg TS ↑
- Stivelse ↑
- uændret eller lidt lavere FK NDF → ↘
- Grøn bladmasse – især dry down typer ↓
- Stabilitet af ensilage i lageret ved opfodring ↓
- Foderoptagelse og mælkeydelse ↓

SEGES INNOVATION

Anbefalet høsttidspunkt

- 30-34 pct. tørstof
- 30-32 pct. tørstof ved stor majsandel i foderrationen
- 33-34 pct. tørstof ved stor græsandel i foderrationen

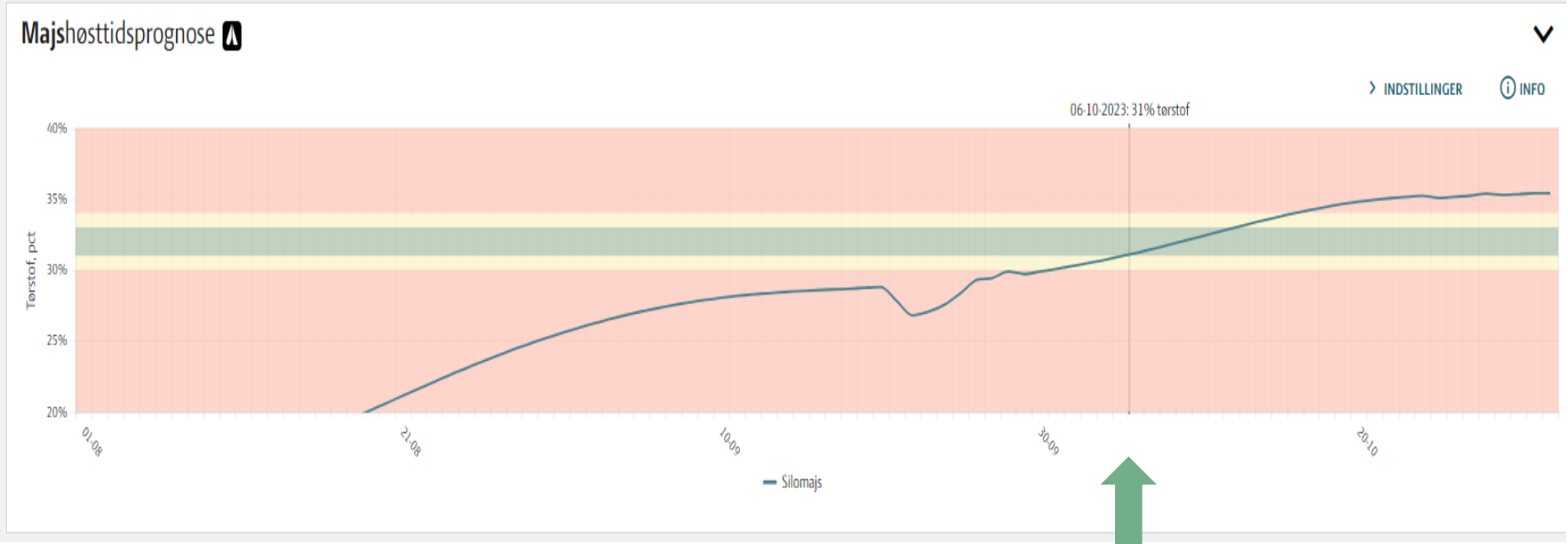
SEGES INNOVATION

Majs-høsttidsprognose – Cropmanager.dk

- Statistisk model baseret på
  - klimadata og 19.339 observationer for tørstofindhold 1992-2016
  - Forskel i sorters tørstofprocent ved høst i sortsforsøgene seneste 2 år
- Input
  - Postnr.
  - Sort
  - Sådato
  - Pct. tørstof i planteprøve fra aktuel mark
- Kontrolleres og justeres årligt på grundlag af planteprøver

SEGES INNOVATION

Majs-høsttidsprognose – Cropmanager.dk



Aktuel dato

SEGES INNOVATION

Tak for opmærksomheden