

Promilleafgiftsfonden for landbrug

6. Status on Promilleafgiftsfonden projects - 25 & 26



- 2023-2025
 - ❖ Halm til det hele (Straw yield + Protein Wheat)
 - ❖ KlimaProtein (Drought/roots Faba bean + Clovers)

Klimaprotein 2023-25



“Sustainable cultivation of protein crops with a low environmental and climate footprint for the climate of the future”



Halm til det hele



Mere halm fra forædling muligt...

Det Nationale Bioøkonomipanel: *"halm er en af de bioressourcer, der både kan øges betragteligt, og som ikke udnyttes optimalt i dag."*

Høstteknologi kan øge mængden af halm vi samler – få det hele med

Men forædling kan øge mængden af strå vi kan samle

Vi har i årevis forædlet mod mindre strå

20% mere strå muligt (siger forædlerne) uden det giver tab i kerne (lejesæd?)

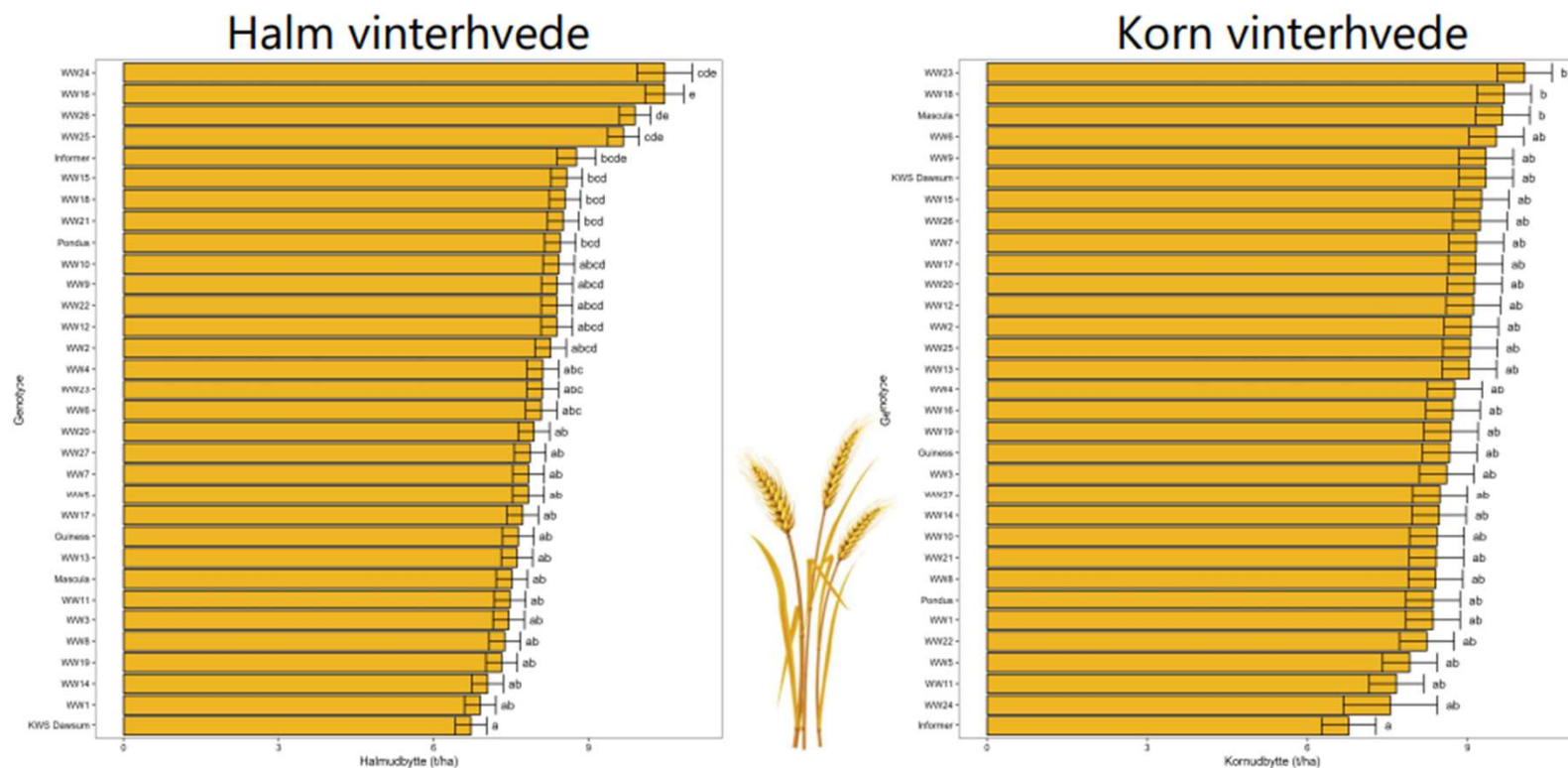
Men forædlerne vejer ikke halm ved høst, sortsbeskrivelse ser ikke på halmudbytte, så hvordan kan vi lede efter halmrige sorter og hvad er potentialet (mangler studier)?

Foto: Janus Asbjørn Schatz-Jakobsen, Sejet planteforædling

HTDH: Large variation in straw yield, also in high yielding varieties.



Variation i udbyttet

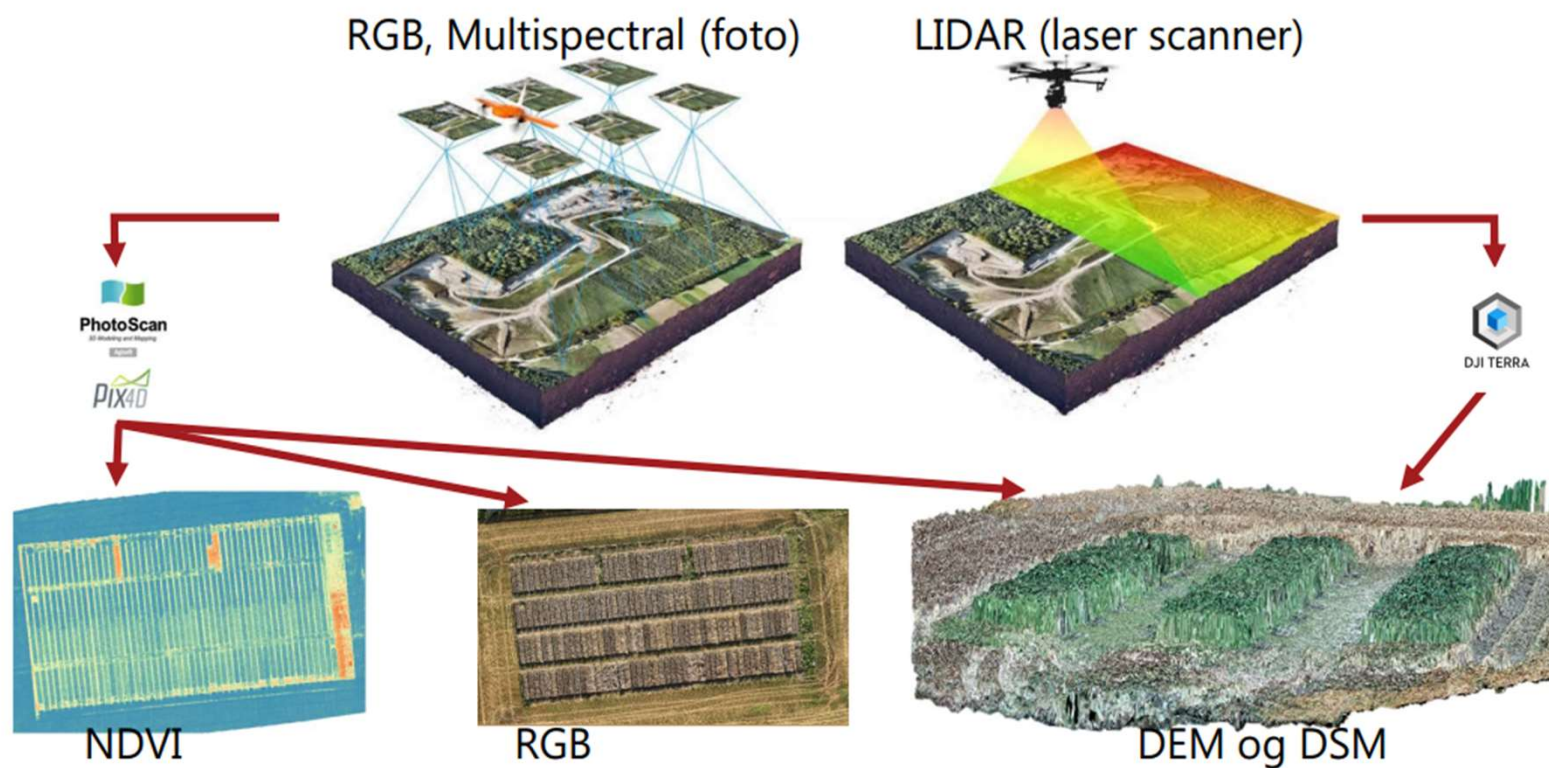


HTDH: Potentialer for brug af droner til biomasse bestemmelse



Måling af digitale højder og biomasse dække

<https://www.mosaic51.com/technology/lidar-vs-photogrammetry-which-is-better-for-point-cloud-creation/>



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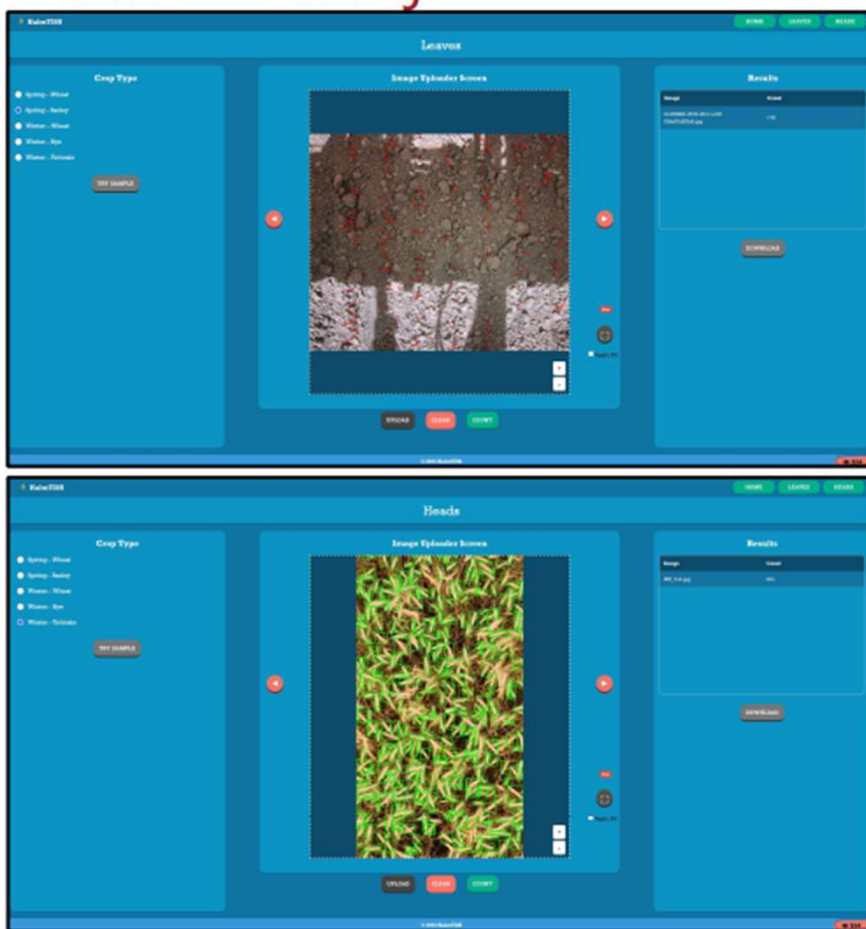


09-12-2025

HTDH - Digitale modeller baseret på dronedata til brug hos forædlerne



Online værktøj



<https://halmtdh.atkhan.info/>

- Fri tilgængelig website
- Afgrøde-specifikke modeller
- Plantetælling
- Asktælling

Billige metoder til at kvantificere flere udbytte komponenter i marken, Der kan bruges aktivt i forædlingen af Mere højtstående sorter.



Increasing Grain Protein Content (GPC) In Wheat – The Genomic way

Sandip M. Kale



Promilleafgiftsfonden for landbrug



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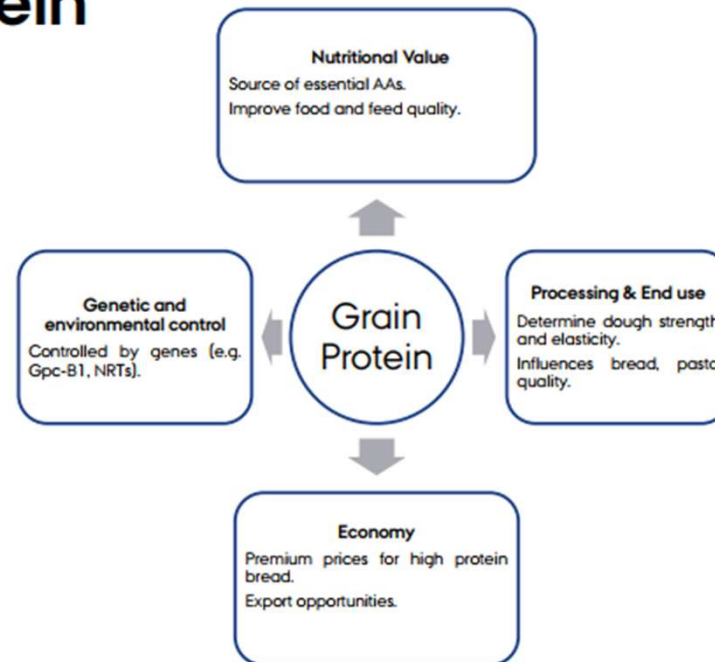


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HTDH: Increasing the grain protein content (GPC) in wheat – the genomic way.



Wheat Grain Protein



 DEPARTMENT OF AGROECOLOGY
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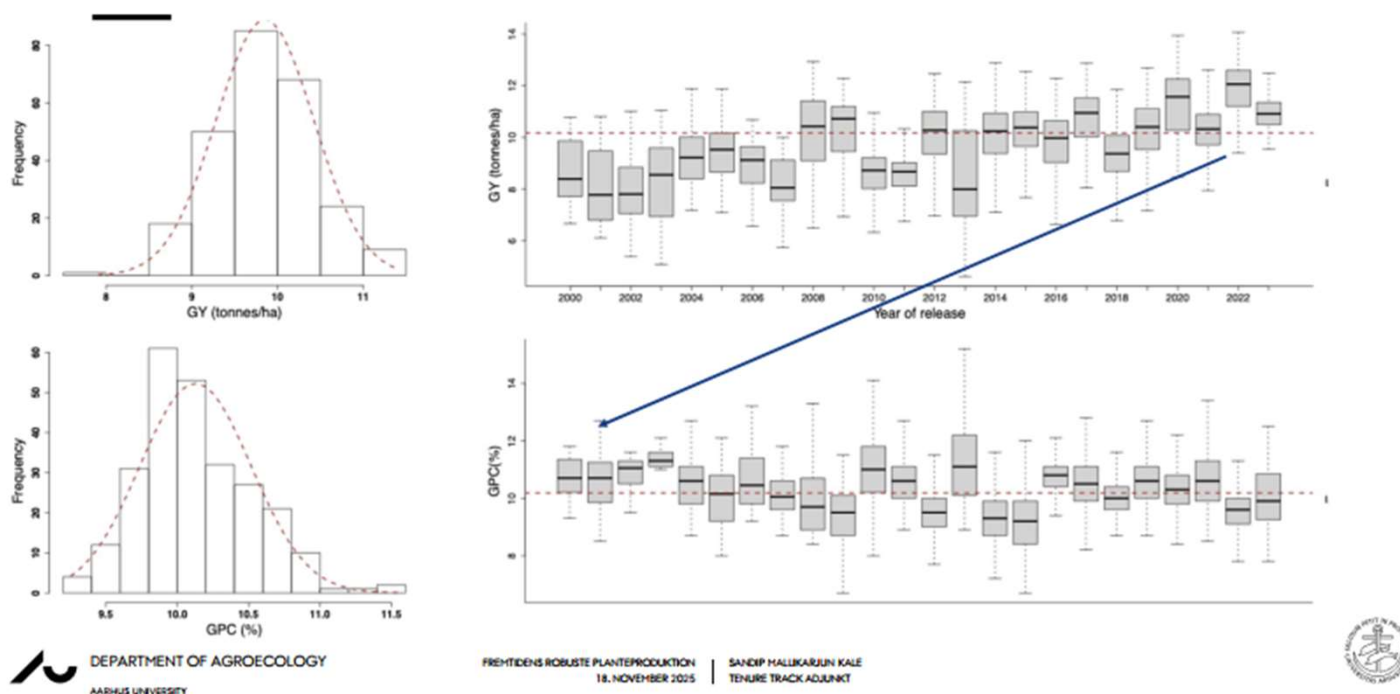
FRETTIDENS ROBUSTE PLANTEPRODUKTION | SANDIP HALLIKARJUN KALE
18. NOVEMBER 2025 | TENURE TRACK ADJUNKT



HTDH – Increasing the grain protein content (GPC) in wheat – the genomic way.



Wheat Grain Yield (GY) & Grain Protein Content (GPC)

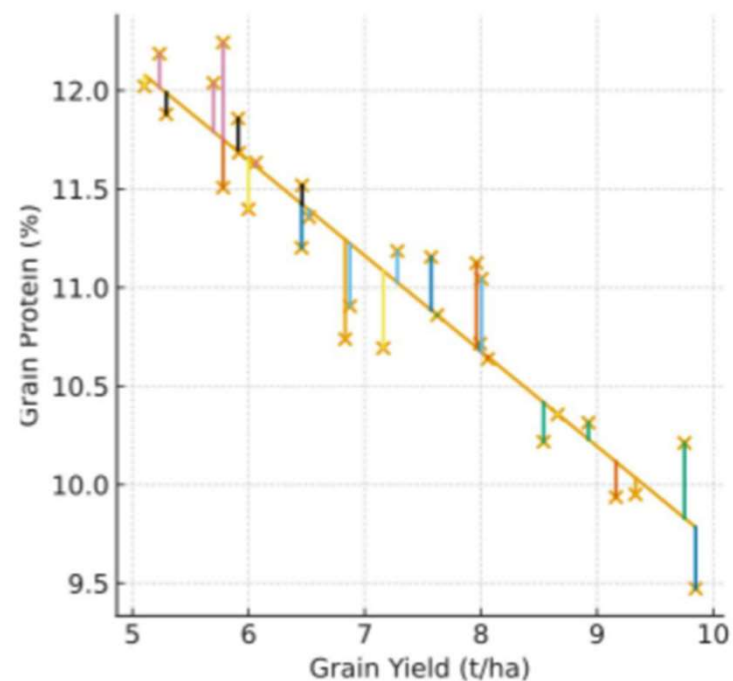
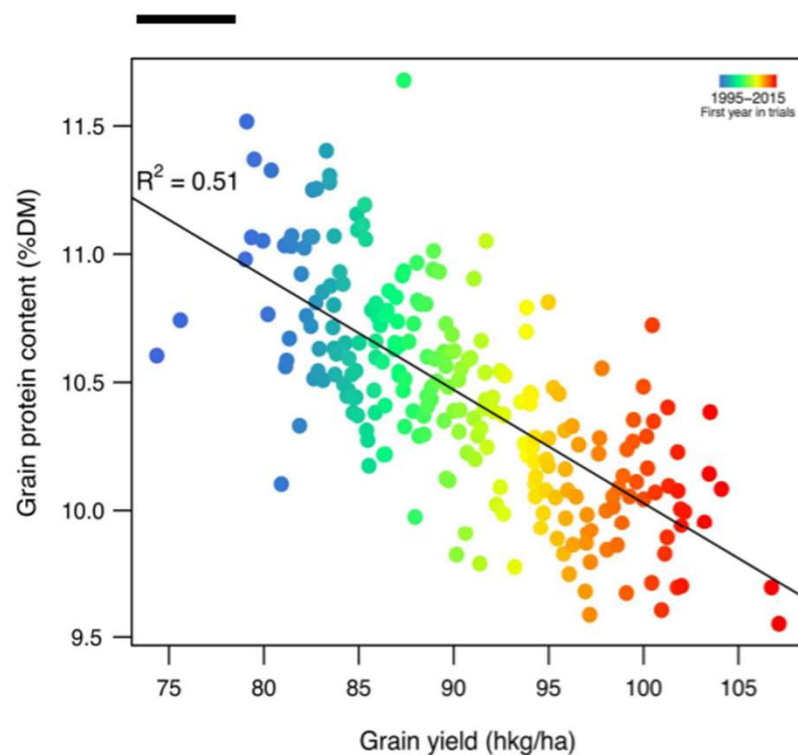


Invers correlation between yield and proteincontent– the project focused on the decoupling of the two

HTDH – Increasing the grain protein content (GPC) in wheat – the genomic way.



Tackling negative relation in GPC & GY



HTDH – Increasing the gran protein content (GPC) in wheat – the genomic way.



Summary & Future Prospective

- We identified a region on chr2B explaining 11.5% and 14.45% of the variation in GPC and GPD, respectively.
- It corresponds to a 0.5% increase in GPC.
- The region also harbor *Pm6* locus and negative effect on GPC.
- Breaking the linkage between *Pm6* and GPC is needed.
- New Breeding Techniques (NBTs) like mutation breeding, CRISPR-Cas9 can be used
- GWAS fixing the introgression

HTDH – Increasing the grain protein content (GPC) in wheat – the genomic way.



Screening of genetic and phenotypic data from different populations of winterwheat varieties from Scandinavia and Europe.

A specific region is responsible for lower protein grain content

The gene is coupled with a resistance trait for mildew, but via CRISPR or similar methods, they can be decoupled

Successful decoupling can increase the grain protein content with 0.5%

It would contribute significantly to the Danish protein balance and the quality of Danish winterwheat



Klimaprotein – Focus on fava bean, red/white clovers



Rødkløver
Trifolium pratense



Hvidkløver
Trifolium repens



Hestebønne
Vicia faba



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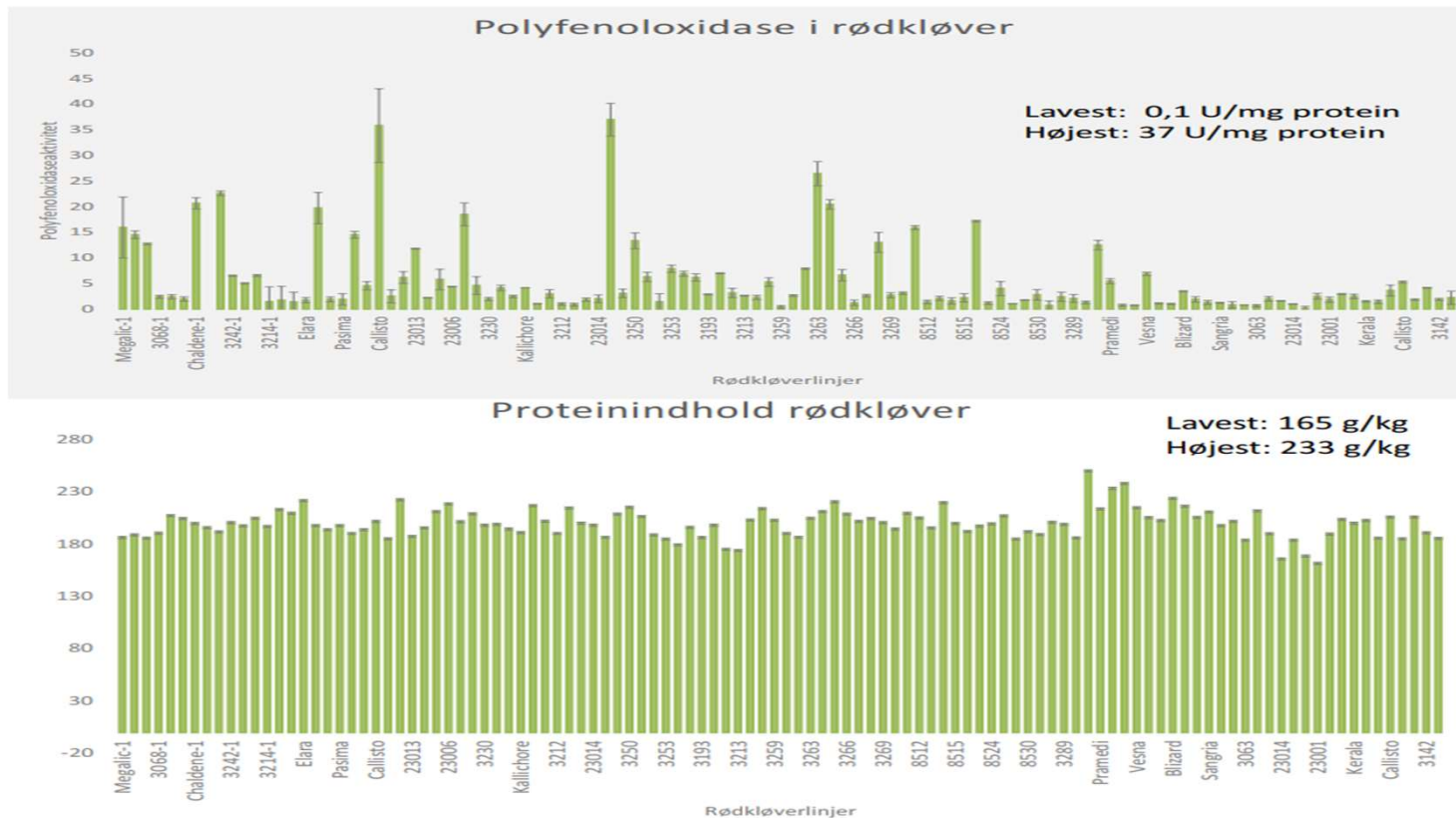


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Klimaprotein – forædling efter højere polyphenoloxidaseaktivitet og proteinindhold i rødkløver



Der er tilstrækkelig variation i både råprotein og polyphenoloxidase aktivitet i rødkløversorter. Udfordring at rødkløver er populationssorter



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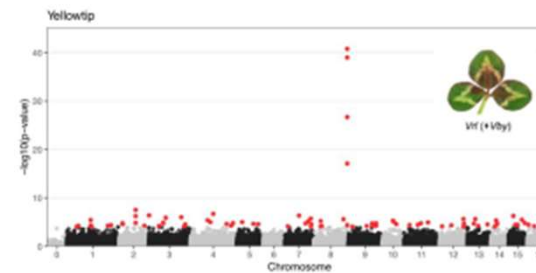
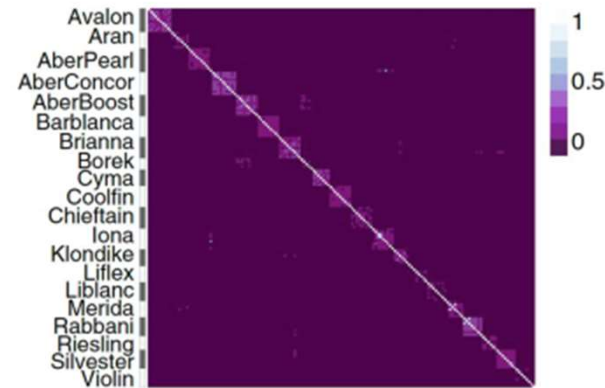
Klimaprotein – muligheden for at bruge bladaftegninger i forædlingen af nye kløversorter



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COMBINED GENOMES WENT GLOBAL IN ALLOPOLYPLOID WHITE CLOVER
www.plantcell.org



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Klimaprotein – Hestebønne, koblingen mellem tidlig rodudvikling og udbytte



Article

The giant diploid faba genome unlocks variation in a global protein crop

<https://doi.org/10.1038/s41586-023-05791-5>

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Check for updates

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Hestebønnegenomsekvens og genetiske markører
Der skabes løbende mere viden om hestebønner,
som kan hjælpe i forædlingsindsatsen

IMFABA MEETING
30 JAN, 2024 | ELESANDRO BORNHOFFEN
POSTDOC



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Klimaprotein - Hestebønne, koblingen mellem tidlig rodudvikling og udbytte



- There was a positive correlation between early root growth and yield, although large variation.
- This knowledge should be implemented with breeders, for the early screenings



De første danskforædlede hestebønnesorter kommer snart!