

Models for VRA in winter wheat

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SEGES

Promilleafgiftsfonden for landbrug



Variable rate application trials, 2019-21

- 3 years
- 8 sites
- 4,000 plots
- 30 hectares

Trial plan

-all combinations of low and high N-rates

	Kg N in March (early spring)	Kg N in April (st. 30-32)	Kg N in May (st. 34-37)
1	20	20	20
2	20	20	60
3	20	60	20
4	20	60	60
5	60	20	20
6	60	20	60
7	60	60	20
8	60	60	60



Building a statistical yield model

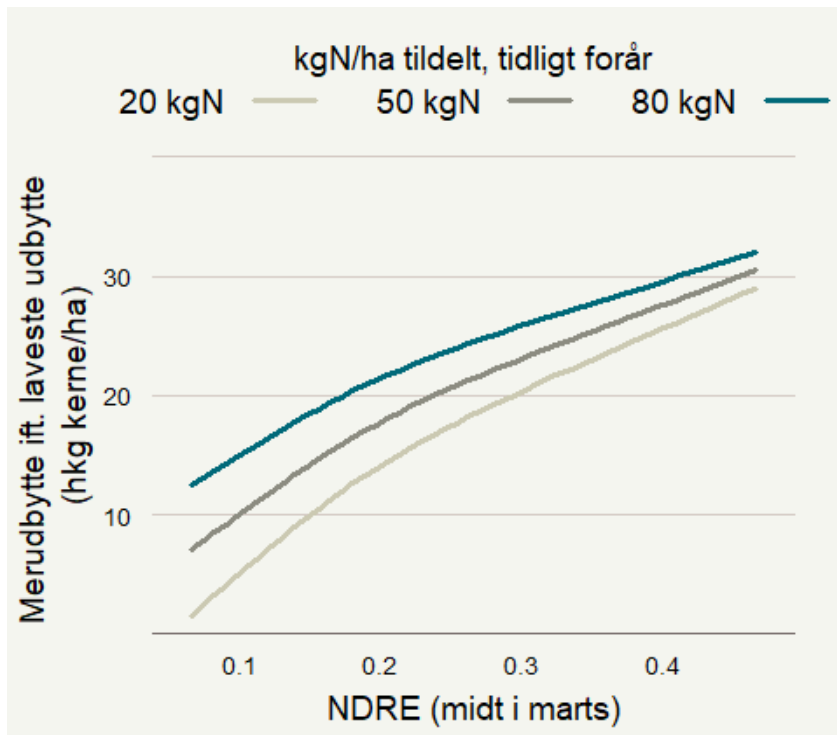
- Data from seven trials were pooled (one "global" model)
- Data on N-rates, biomass (NDRE four times), EM38, topography are included in the full model
- A regression model including N-rate and NDRE alone explains:
 - 44 % of variation in grain yield (an AI-model explains 58%!)
 - 52 % of variation in protein percent (AI-model 90%)
 - 65 % of variation in protein yield
- Including EM38 and topography improves the model statistical significantly, but the model explains only marginally more of the variation

Model performance

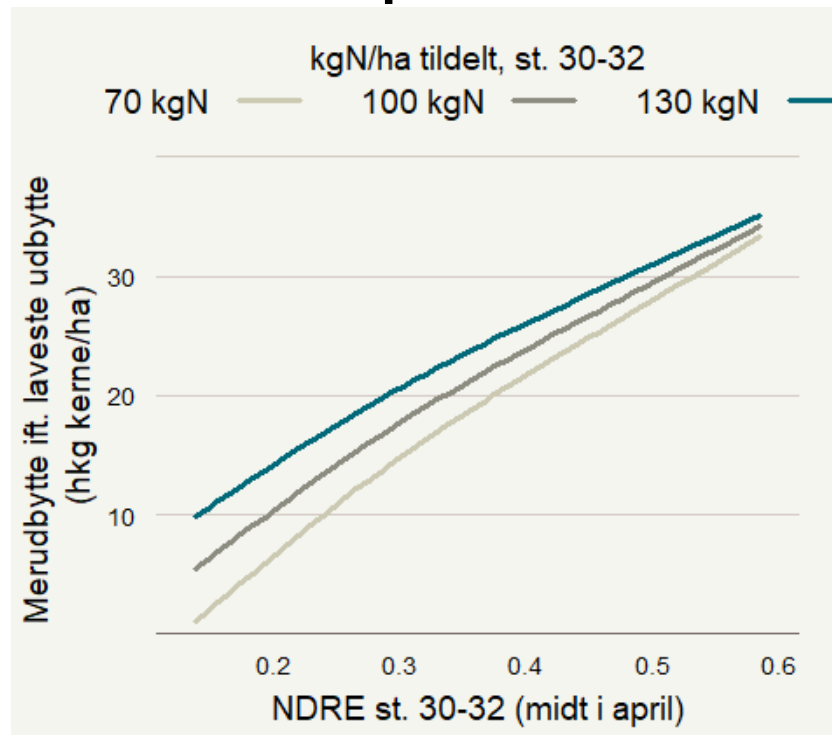
Year	Trial no.	Site	RMSEP	
			Grain yield	Protein procent
All	All	All	$\pm 11,3$	$\pm 1,0$
2019	001	Sporup	$\pm 15,2$	$\pm 0,5$
2019	002	Følle	$\pm 10,0$	$\pm 0,5$
2020	001	Gjern	$\pm 10,2$	$\pm 2,0$
2020	002	Sorring	$\pm 6,6$	$\pm 0,5$
2020	003	Auning	$\pm 12,1$	$\pm 1,0$
2021	001	Sporup	$\pm 16,5$	$\pm 1,0$
2021	002	Skjørring	$\pm 13,9$	$\pm 0,6$

Modelling yield response

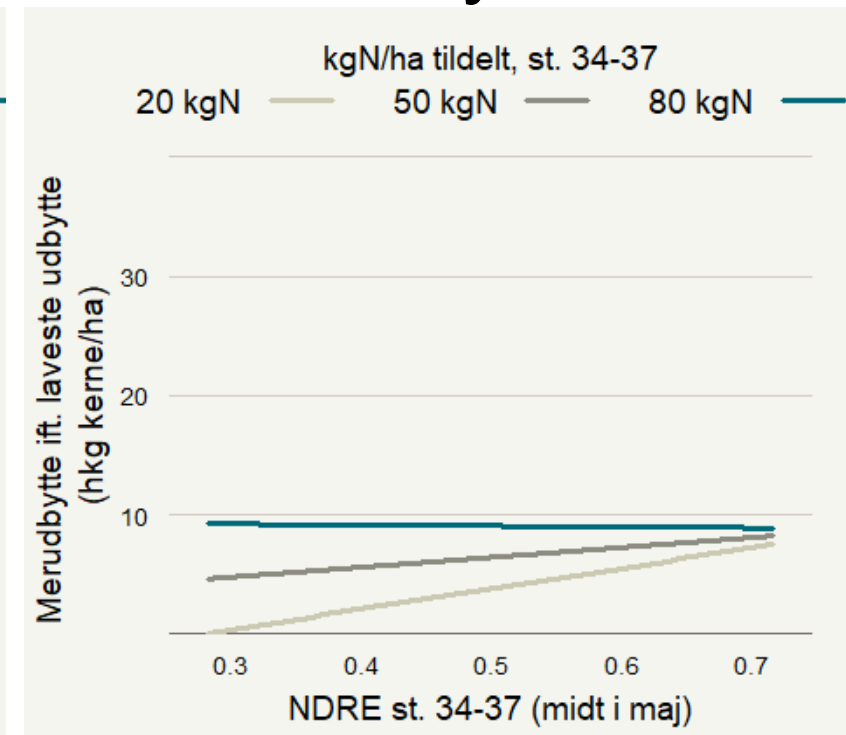
March



April

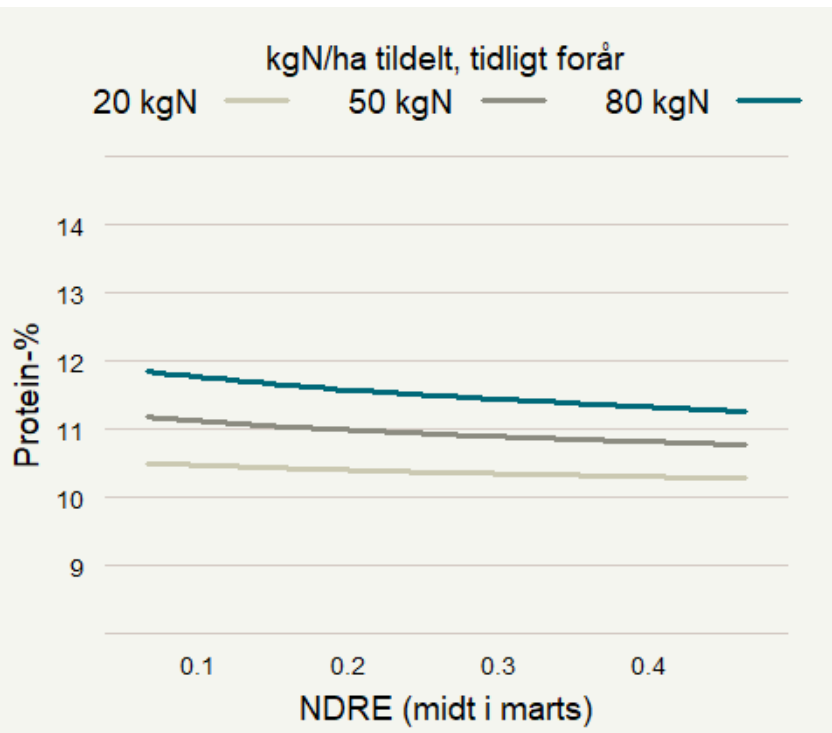


May

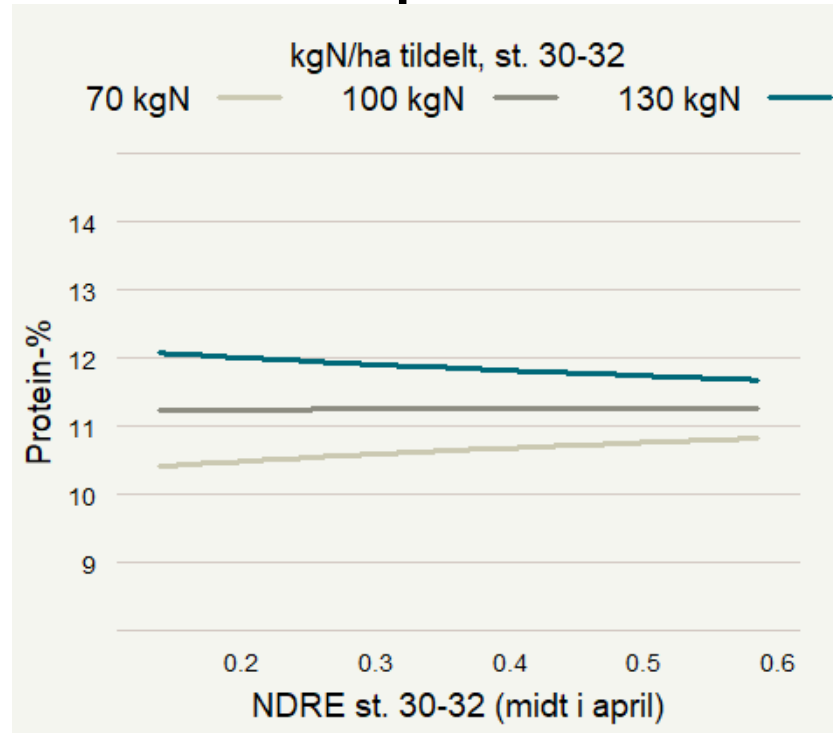


Modelling protein percent

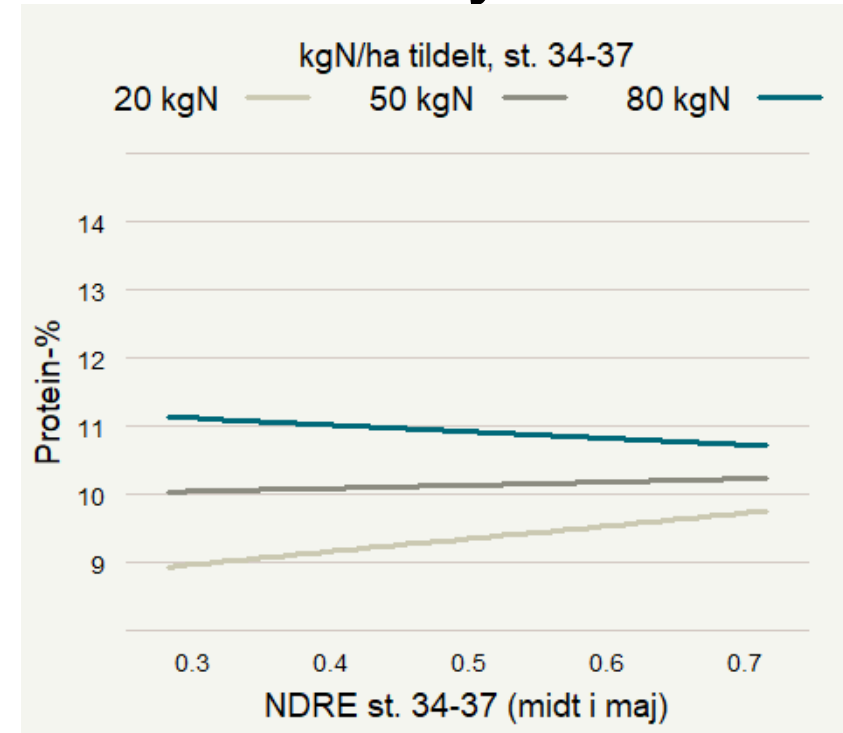
March



April



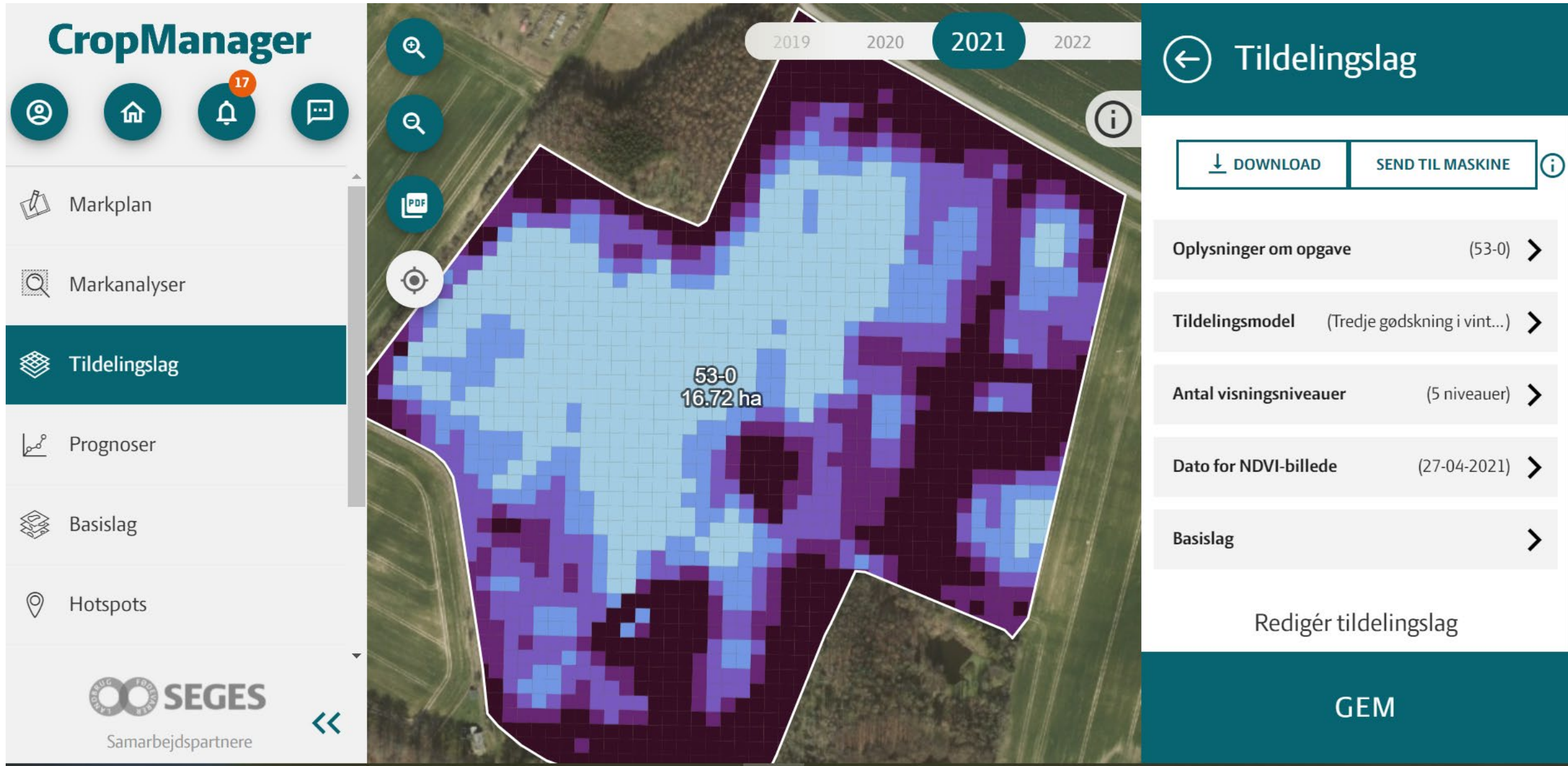
May



The princip of Robin Hood

- For all applications in March, April and May
- Yield and protein percent

Results will be used to improve our models in CropManager



Thanks for your attention!

