



Miljø- og  
Fødevareministeriet

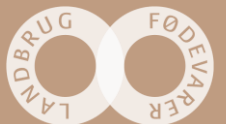
gudsp

# Handling cover crops in Denmark

Nanna Hellum Kristensen



SEGES





# Agenda

- Regulations
- Focus on catch crops instead of cover crops
- Cover crops under Danish conditions
- Trials
- Cover crops in maize
- Use of satellite



# Legislations

- All farms with a turnover above 50.000 kr. must have catch crops.
- There are 5 different rule sets and plenty of dates involved in the legislations (complicated).
- Most farms should have 14% of their area covered by catch crops.
- Limited amount of species available. Some rule sets require mixture of species.
- The Danish government will inspect the covering of the soils, and there are different limits depending on the date.
- Consequences of breaking the rules is less fertilizer available or not getting full support/funding.

Rules create lots of administration for all parts.



# Purpose of cover crops in Denmark

## Catching nitrogen

Nitrogen fixation

Sustain carbon in soils

Erosion

Other nutrients than nitrogen



# Cover crops under Danish conditions

**Sandy soils (< 5% clay) and clay soils (15-45% clay)**

Cover on sandy soils is important in the winter period

## Later harvest

Establishing cover crops before august 20<sup>th</sup>. Previous years this deadline was postponed due to late harvest.

## Establishment before or after harvest?

Sowing cover crops right after harvest

Sowing cover crop before harvest (july)

Undersown grass in cereals (in spring)





# Main species

- Brassicas
- spring barley
- winter rye
- phacelia
- Oats
- Mixtures...



# How much nitrogen can a cover crop reduce leaching?

Oversigten 2017 side 188-189

	Nitrogen uptake (kg N per hectar), 1. nov 2016	Nitrate leaching (autumn and winter) (kg N per hectar) May16-may17
Fodder radish, sown 4. sept	24a	10c
Spilled seeds/weeds	23b	15c
Bare soil	-	76a

JB 4: clay 10-15%, silt 0-30%, sand 55-90%

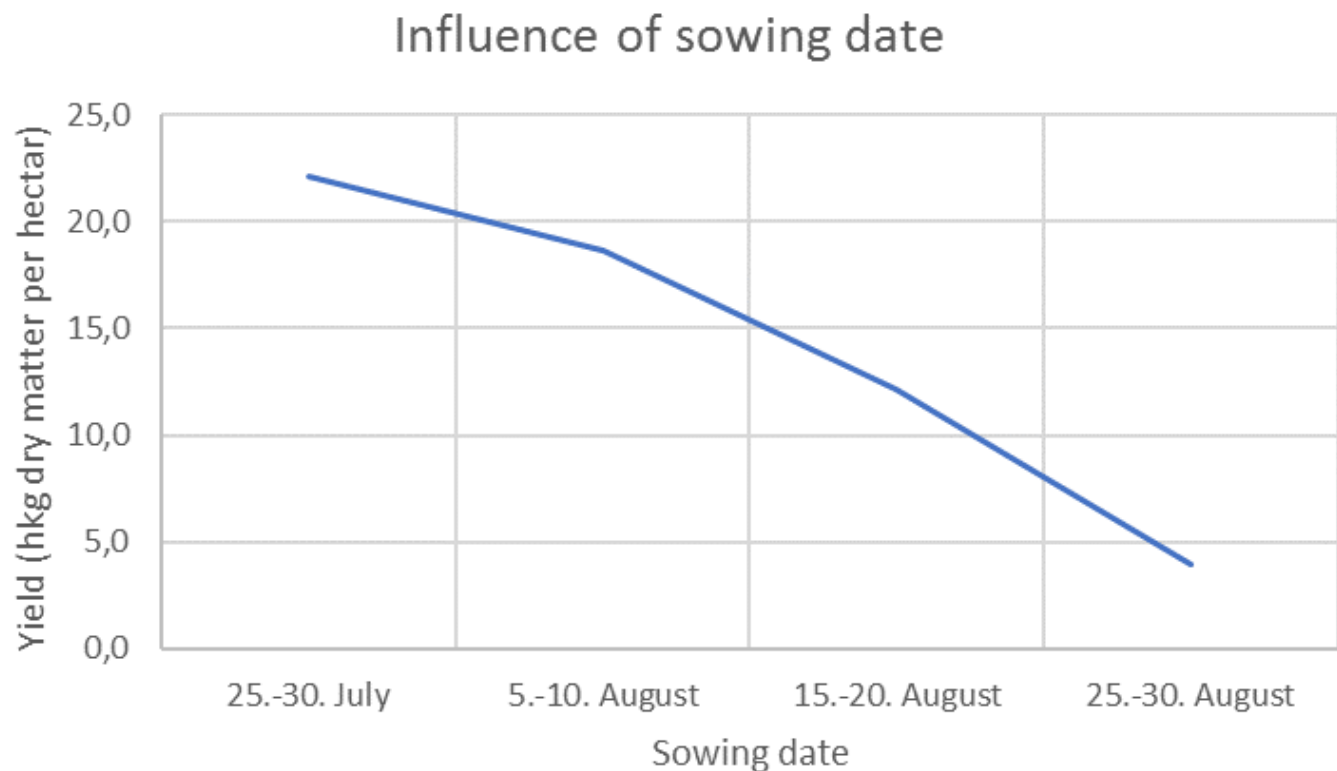
Species, clay soil	Nitrogen uptake (kg N per hectar),
Fodder radish, sown 17. july	77
Oat, sown 3. august	27
Spilled seeds/weeds	17

SEGES

Oversigten 2015 side 184-185



# Influence of sowing date on biomass



Mean of species (10 kg yellow mustard; 6 kg yellow mustard og 60 kg vetch; 7 kg Brassica rapa og 40 kg vetch; 50 kg rye og 7 kg Persian clover, 170 kg yellow lupin)



# Club root problems

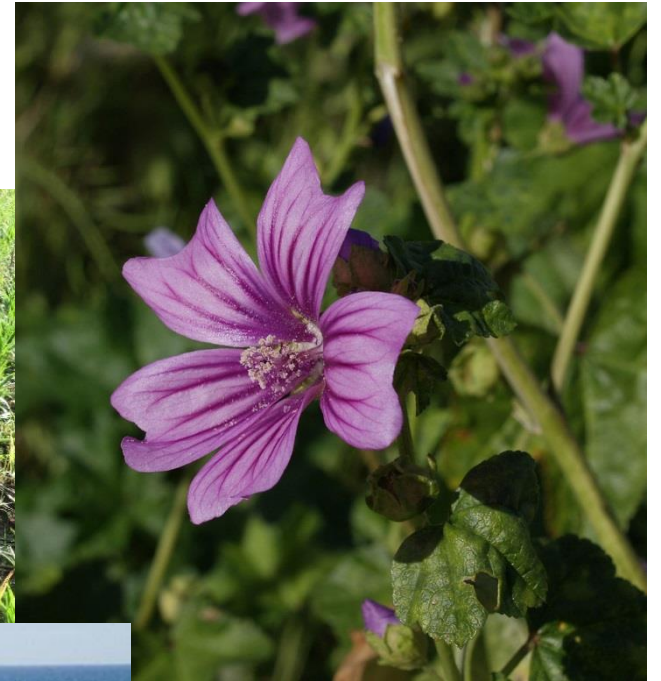


**Photo.** Club root in oil radish, Dec. 2016,  
by Ghita Cordsen Nielsen.

- We want to find new species.
- Demonstrations trials with different species in 2017

# Conclusion from trials with alternative species

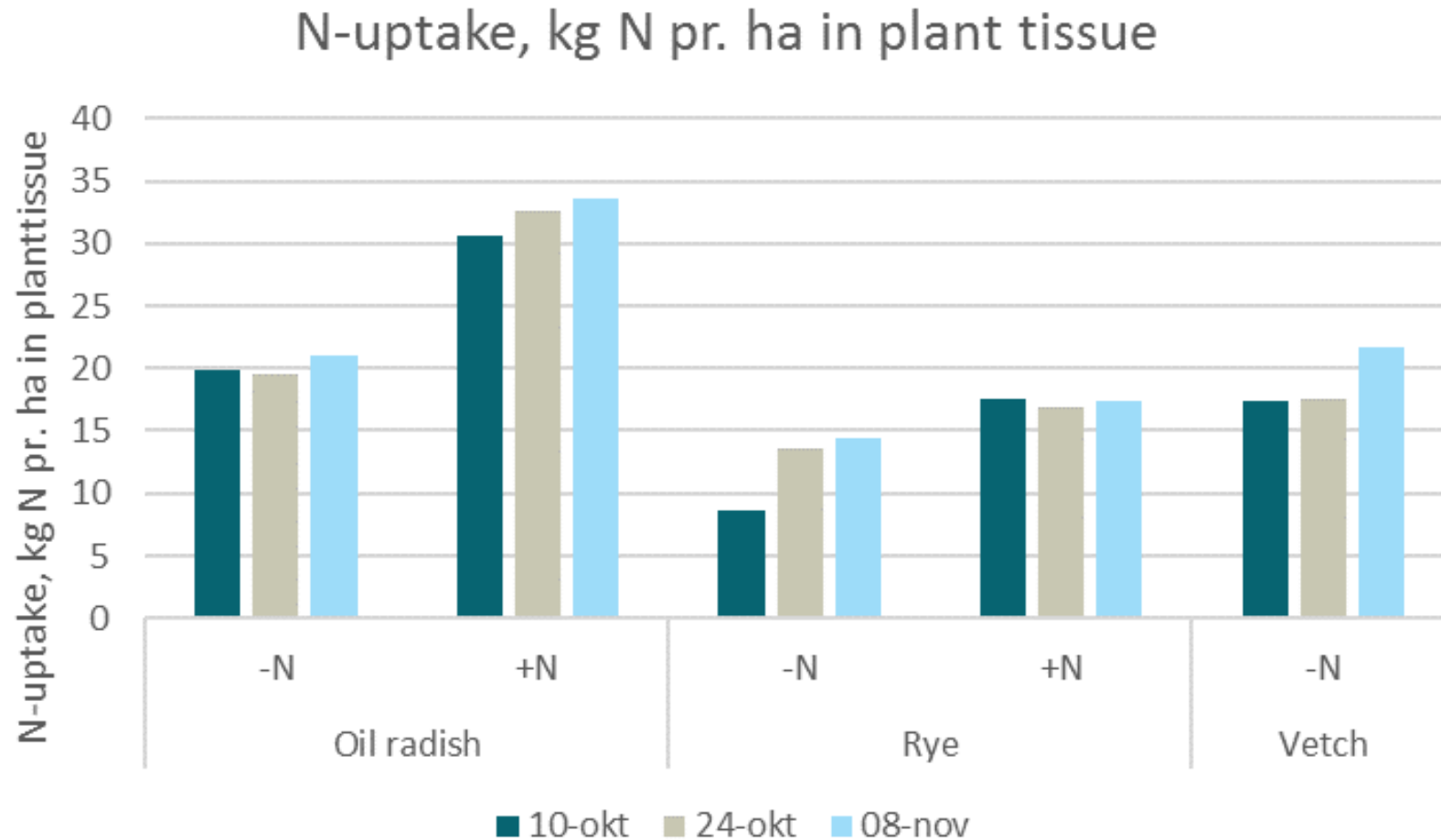
- Sun flower was poor
- *Malva* was poor
- Viper's bugloss and blueweed, seed did not germinate
- Fodder radish was the best
- **Oat** (black oat and regular oat) performed well
- **Common corn-cockle** (danish: klinte)



17 trial  
By Nanna  
S.



# Trials with nitrogen application



## SEGES recommendation with approved species

Soil type	Crop rotation	Proposal to species
Sandy soil	No oil seed rape	Fodder radish + rye, Fodder radish + phacelia
	Minimum 4 oil seed rape free years	Fodder radish + rye, Fodder radish + phacelia
	3 oil seed rape free years or less	phacelia + rye, spring barley + rye
Clay soil	No oil seed rape	Yellow mustard+ spring barley, Fodder radish + spring barley, Fodder radish + phacelia
	Minimum 4 oil seed rape free years	Fodder radish + spring barley, Fodder radish + phacelia
	3 oil seed rape free years or less	Phacelia+ spring barley
	+ beet	Yellow mustard+ spring barley, fodder radish + spring barley



## Grass in maize -alternative to spreading the seeds above ground.

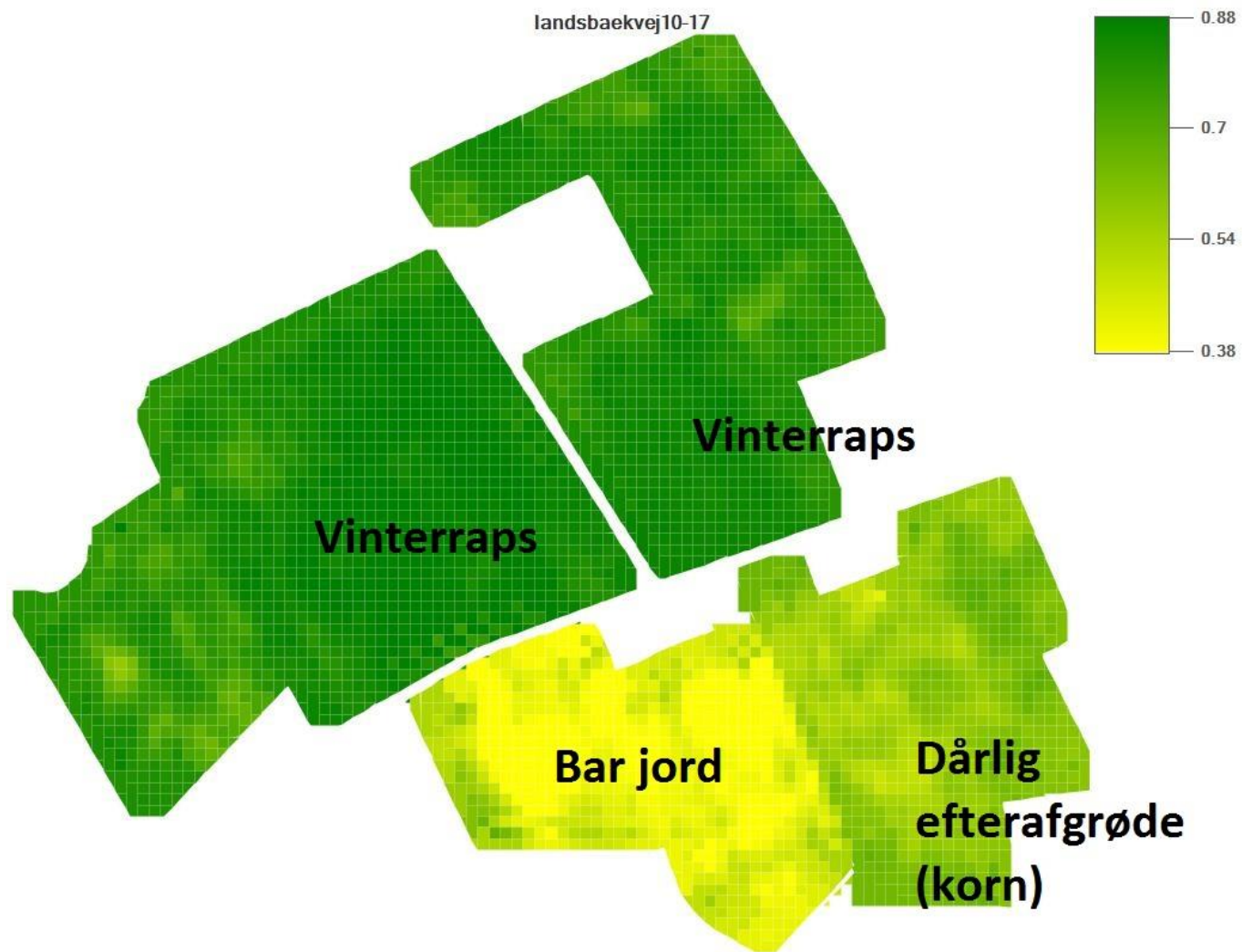


Thyregod A/S developed the new technique, which can be attached to a hoe. The seeds are sown in three lines with pressure from wheels. *Photo: Henning Sjørsløv Lyngvig, SEGES.*  
**SEGES**



Specific machine stations are developing equipment for sowing grass in maize using pressure from the wheel. *Photo: Henning Sjørsløv Lyngvig, SEGES.*

# Satellite pictures can reveal the coverage





# Calculating the effect of autumn coverage in the following crop

- Measure nitrogen uptake by satellite on each field
- Calculate, how much of this will be available for the following crop compared to bare soil
- How much nitrogen can you save?

## Depend on

Leaching (soil type and rainfall)

Temperature during growing season

The cover crop species

Ploughing time

# Satellite use for full inspection/supervision in future?







**Thank you for listening**



SEGES

