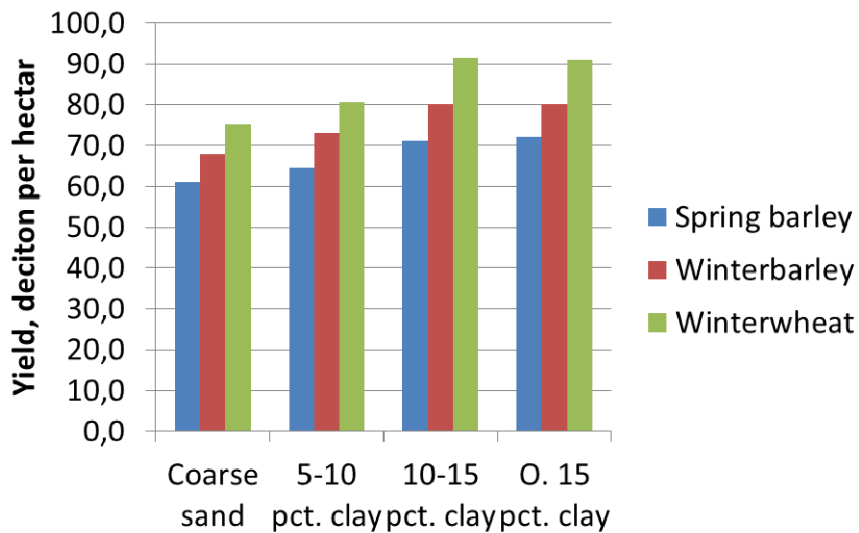


Växjo, 9th of December 2015
Chief Adviser Leif Knudsen,
Crops & Environment

OVERWINTERING OF CEREALS – MANGANESE, POTASSIUM AND SOWING TIME

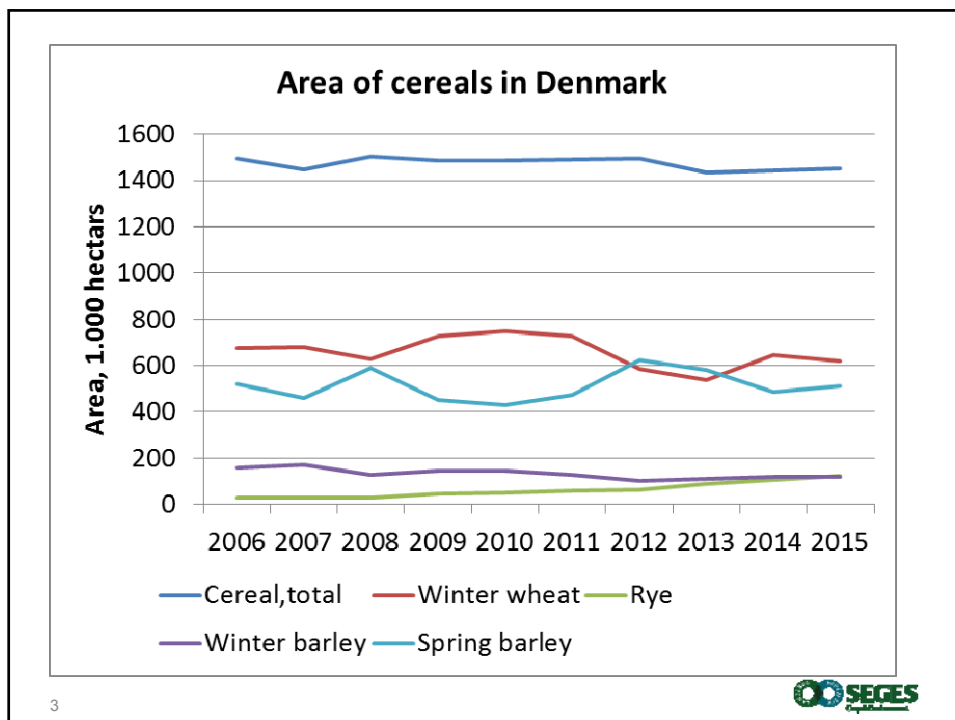


Yield in trials 2011-2015, cereals



2





- ## REASONS FOR BAD OVERWINTERING
- Snow – combined with *Microdochium nivale* / *Gerlachia nivalis* / *Fusarium* ... (sneskimmel)
 - Hard frost – windy conditions
 - Barley yellow virus and other pests
- 4 

Manganese deficiency in spring in winter barley




Manganese is a serious problem in areas in Denmark, sandy soils, high organic matter, high pH





Picture from trial no. 001 April 2006

Untreated	2 x MnSO ₄ autumn sprayed	30 N in amm.sul- phate footplaced	30 N in calcium- nitrate footplaced
Yield and yield response tr. 001 og 002			
23,6	+ 9,9	+21,1	-1,6
0	+30,7	+51,6	0
2 trials with foot placed fertiliser to prevent manganese deficiency in winter barley, 2006 			

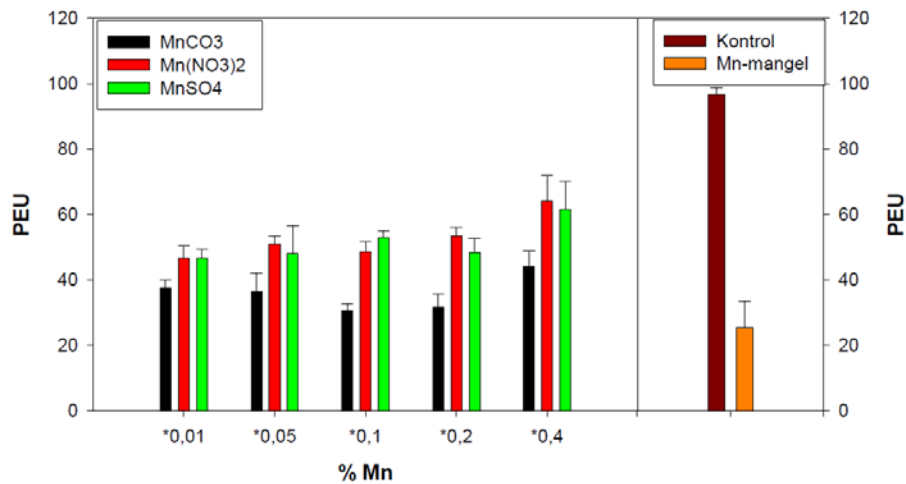
In practice
Only footplaced ammonium sulphate
in half of the area



Mn-Tester



MANGANESE – EFFECTS OF DIFFERENT SALTS



11

From Pei Pedas, Copenhagen University

CONCLUSIONS FROM LAB STUDIES AT UNIVERSITY OF COPENHAGEN

- Significant differences between effects of commercial manganese types
- MnSO₄ and Mn(NO₃)₂ have a higher effect than MnCO₃
- No effect of increasing the concentration of MnSO₄ and Mn(NO₃)₂
- Good effect of additives to increase uptake

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From Pei Pedas, Copenhagen University



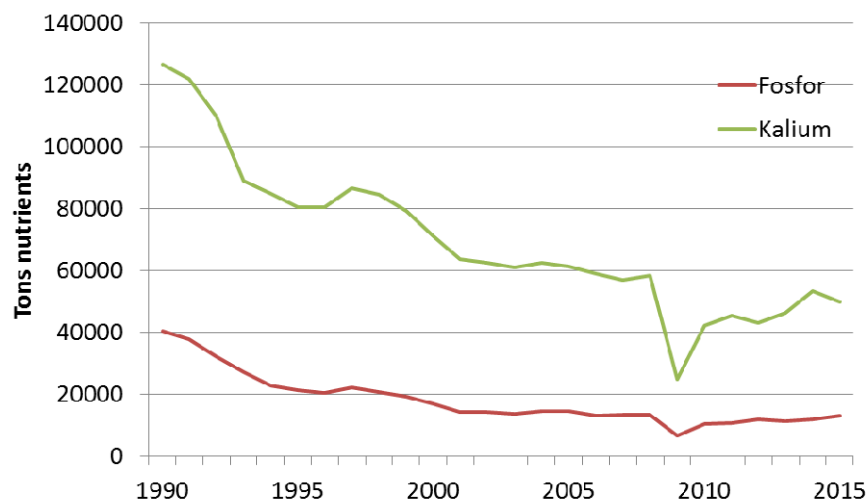
RECOMMENDATIONS FOR MANGANESE IN AUTUMN FOR WINTER CEREALS

- 1-2 treatments with manganese in autumn if manganese deficiency is probable
- No significant effects between types in practise
- Coating of seed is only effective for a short time and cannot replace foliar applications
- Placement of 30 N in ammonium sulphate in autumn is efficient to prevent Mn-deficiency
- Good effect of 15 N i ammonium sulphate with 4 kg Mn
- The effect is caused by increased mobility of Mn and is not an N-effect
- Placement of N with Mn is a good alternative to repeated spraying with mangan sulphate.
- Placement of N in autumn: Only when Mn is deficient

13 | 15-12-2015



Potassium and phosphorous use in mineral fertilizer in Denmark



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Potassium and nitrogen for rye in autumn

Vinterrug	November		Yield and yield increase	Netto yield increase
	Nitro- gen	Pota- sium		
	Pct. i dry matter		Deciton per ha	
<i>Number of trials 2012-14</i>	12	12	13	13
1. Unfertilized autumn	5,2	3,5	57,4	-
2. 30 kg N, autumn	5,5	3,4	2,3	-0,6
3. 50 kg K, autumn	5,2	3,7	1,2	-2,6
4. 30 kg N, 50 K autumn	5,4	3,8	2,2	-3,7
<i>LSD</i>			1,4	

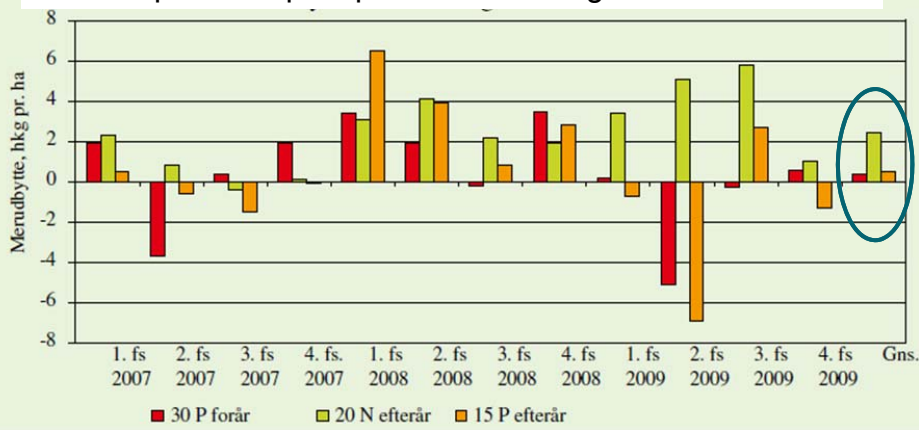
Coars sanded soils, low K status in autumn in soil (Kt below 5)

Better effect of the same amount of nitrogen in spring!

15



Yield response of phosphorus and nitrogen to winter wheat



12 trials 2007-2009, cold areas with late growing start in spring

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CONCLUSION OF P AND K AUTUMN

- P autumn is not necessary autumn but can be used if cheap and footplaced (Diammonium phosphate)
- Potassium autumn is not generally recommended but can be used on coarse sandy soils with low K in soil

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SOWING TIME OF WINTER CEREALS

- Recommended sowing time for winter wheat has for many years been 5-20th of September
- This is based on the highest probable overwintering of the cereals
- In practise sowing is started from first of September
- The legislation to reduce nitrogen leaching has lead to a discussion of very early sowing

18



EARLY SOWING – LEACHING OF NITROGEN

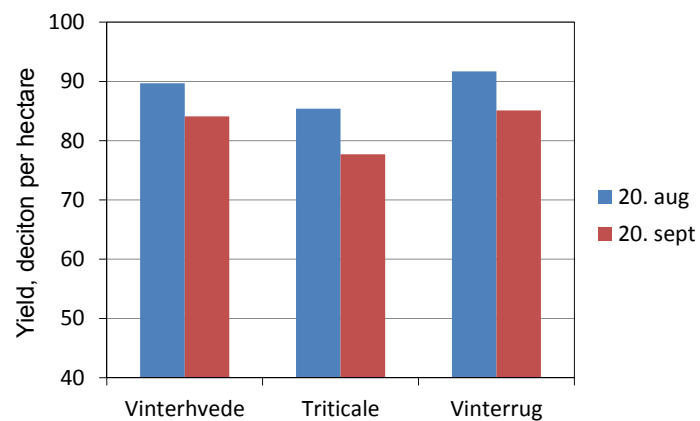
- Catch crops are very effective to reduce leaching
- Catch crops blocks for winter cereals in the crop rotation – high loss of income

19



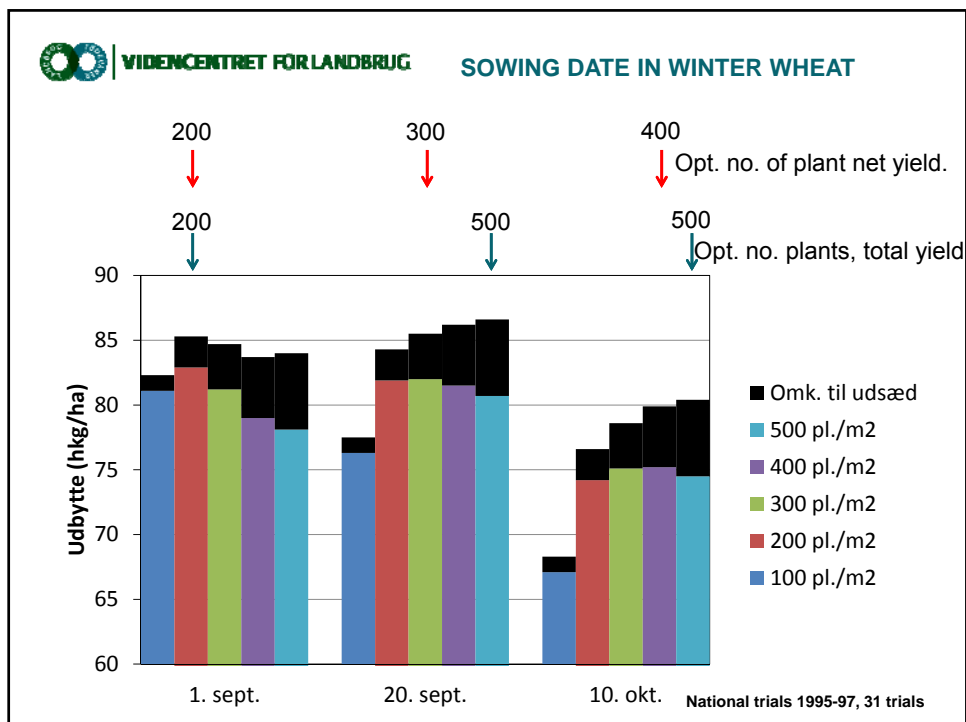
YIELDS WITH EARLY AND NORMAL SOWING DATE

6 TRIAL PER CEREAL SPECIES 2011-13, NATIONAL TRIALS



Yield responses, hkg/ha: 0 – 12,9 3 – 18,5 -0,7 – 18,2





EFFECT OF SOWING DATE TO LEACHING

- For each week sowing date is before 20th of September the uptake of nitrogen increase by 5-7 kg per ha.
- N-min in soil will be reduced 5-7 kg N per ha
- The leaching will be reduced the same way
- 1 ha of catch crop reduces leaching about 30 kg per ha
- 1 ha of early sown reduces leaching about 10 kg per. ha
- 4 ha of early sown winter cereals can in the legislation replace 1 ha catch crop

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STATEMENTS

- High area and yields in winter cereals are important for Danish Agriculture and especially for the pig production
- Overwintering is not generally a big problem in Denmark
- Manganese application in autumn is important on susceptible fields
- Potassium autumn is not generally recommended