

BLIGHT MANAGEMENT DSS FOR CONTROL OF POTATO LATE BLIGHT EXPERIENCES FROM DENMARK

BENT J. NIELSEN, JENS GRØNBECH HANSEN & LARS BØDKER
AARHUS UNIVERSITY & KNOWLEDGE CENTRE FOR AGRICULTURE



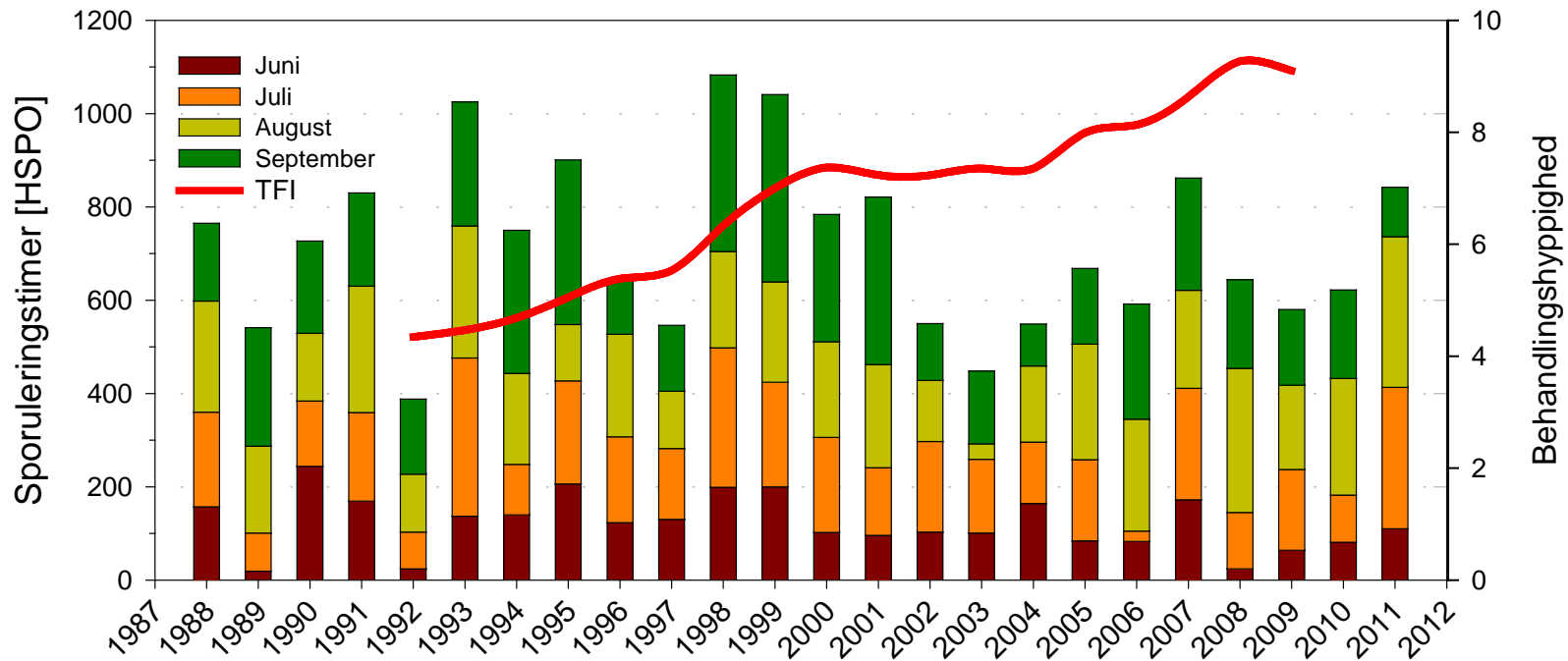
UNIVERSITET

Potato FAQ....

- How close is late blight to my area / field
- Is it "blight weather" now?
- "Blight weather" the coming days?
- Is it time to adjust / change strategies?
- Need for effective preventive fungicides?
- Need for curative actions?
- Can I save money?



National concerns...



- Increasing use of fungicides
- Farmer economy
- Danish potato production

Decision support

- Possibility to reduce fungicide input
- Effective disease control
- Improvements in control strategies
- Same or higher net yield
- Research and development supported by
 - Danish Potato Council (KAF)
 - Ministry of Environment
 - Ministry of Agriculture (NaturErhvervstyrelsen)

Blight Management



- Decision support system for control of potato late blight (*Phytophthora infestans*)
- Support to potato growers and advisors
- Information and forecast system
 - Monitoring of first attack and spread of LB
 - Weather forecast
 - Prognosis for potential infection pressure
- Recommendations
 - Recommended dose level depending on risk (not public yet)
- www.landbrugsinfo.dk (www.skimmelstyring.dk)

Occurrence of late blight



- No attack in country
- Attack in country
- Attack in region
- Attack in field



Recordings from advisors that frequently are visiting potato fields

Red: New infections. Blue: > 10 days old

Monitoring
network

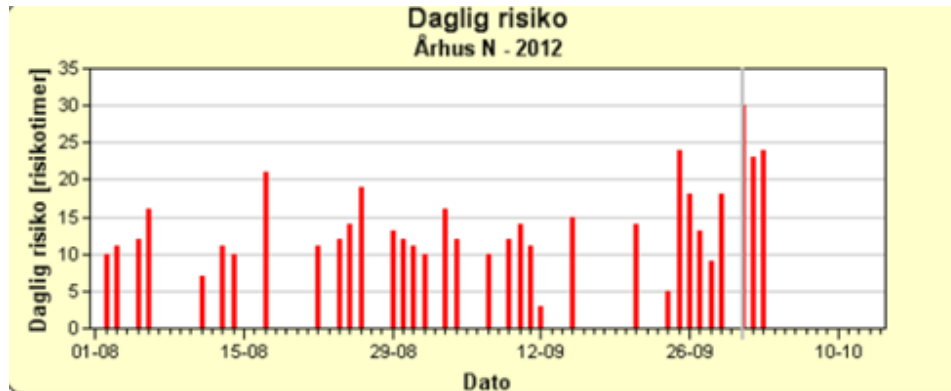
www.lanbrugsinfo.dk

Infection pressure



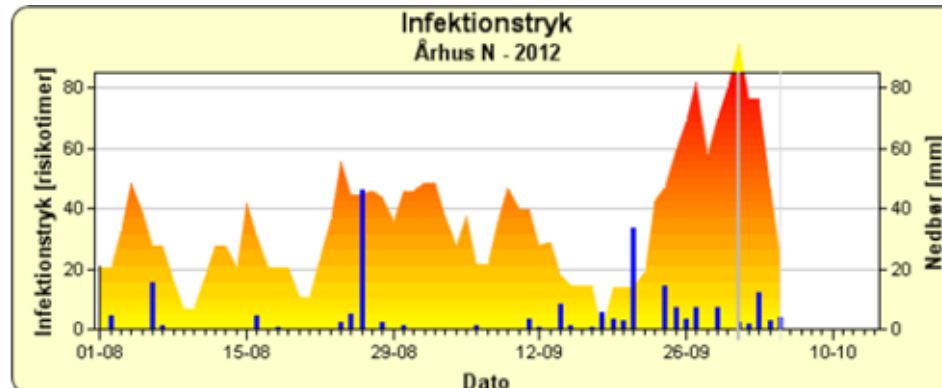
Local weather

- Temperature
- Rh
- Hourly values
- 4 days weather forecast



Daily risk values (HSPO, hours/day):

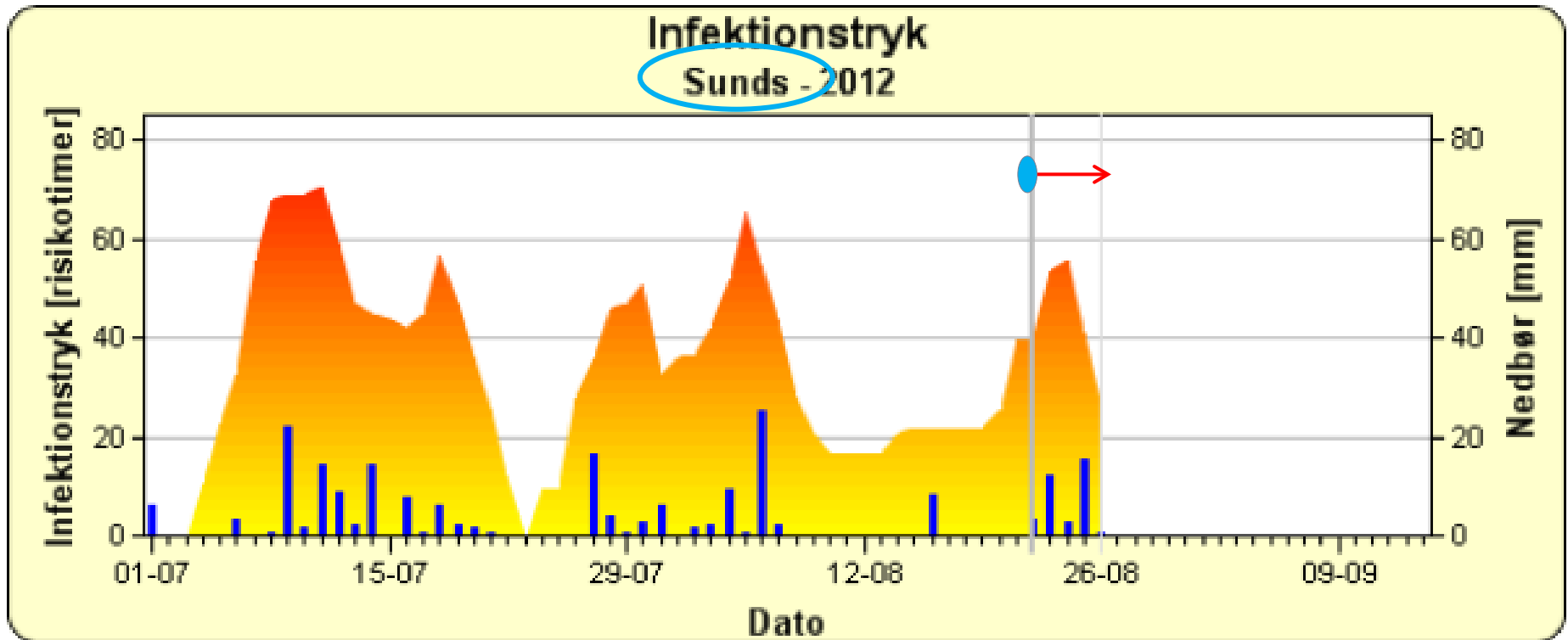
- Temperature > 10C
- RH > 88 %



Sum HSPO: (running mean) Prognosis for the day and coming 4 days

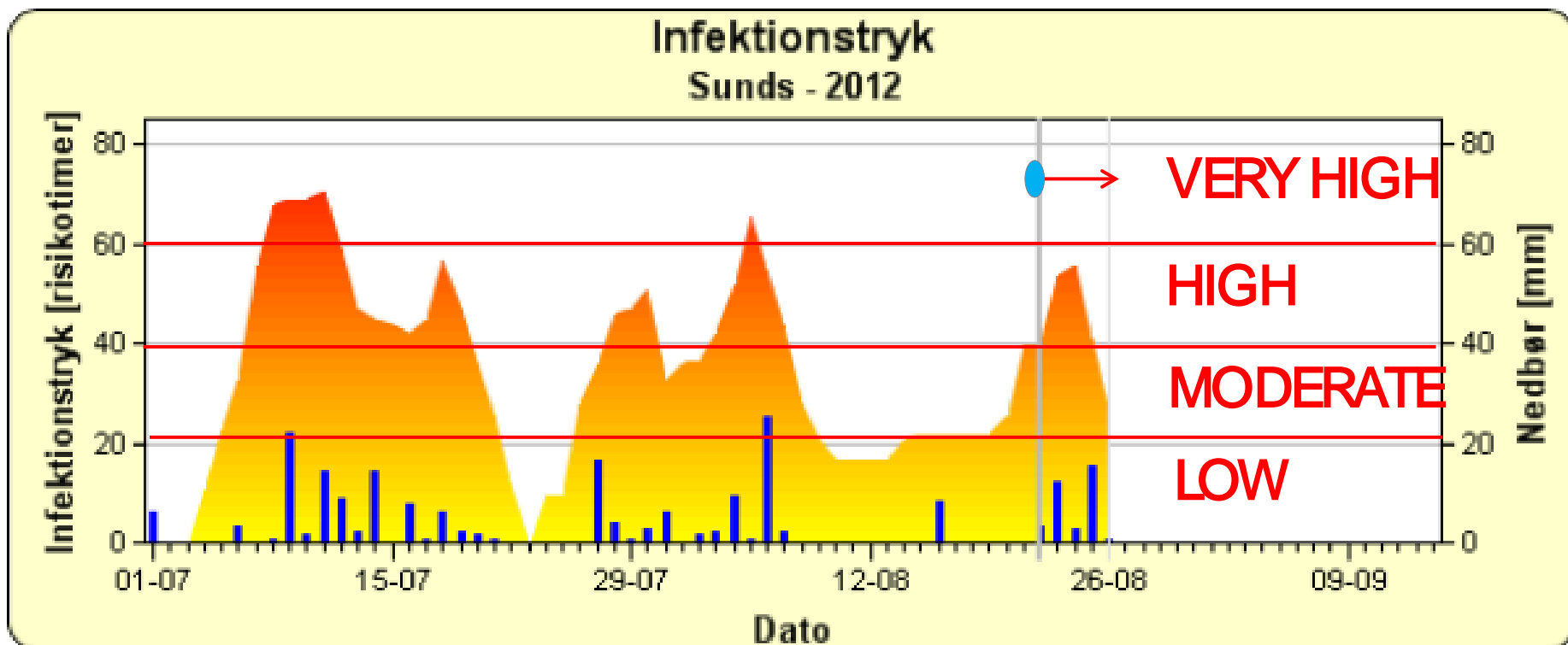
Estimate of spore production, spread and infection

Infection pressure

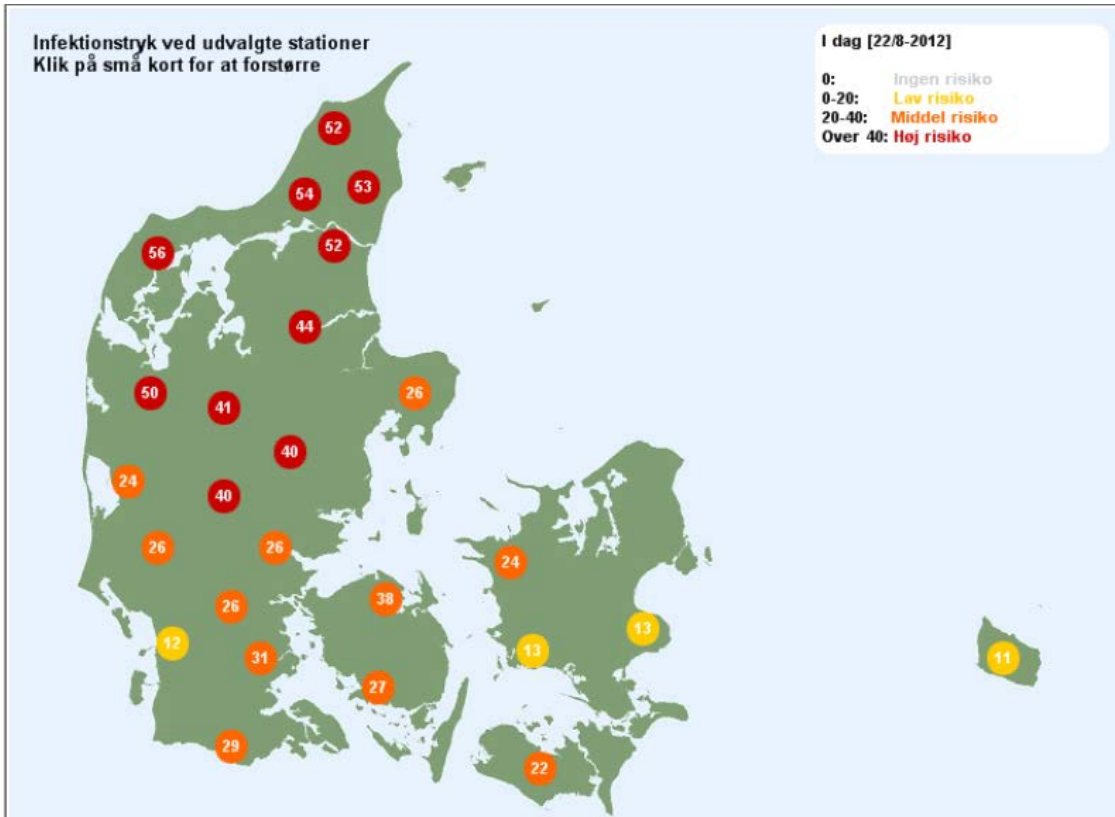


Historical data
Actual day ●
4 days forecast

Local risk level



Regional risk levels



I dag [1/10-2012]



I morgen [2/10-2012]



I overmorgen [3/10-2012]



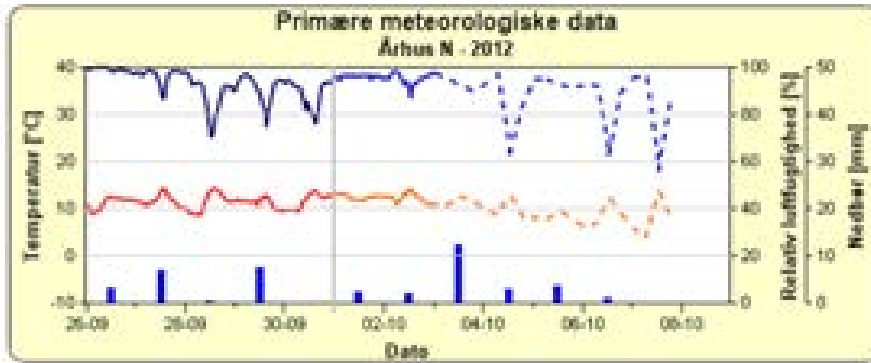
+ 3 [4/10-2012]



+ 4 [5/10-2012]



Weather data



Rh, temp and precipitation historical values and 7 days prognosis
(Danish Met. Office)

6-døgnsværprognose



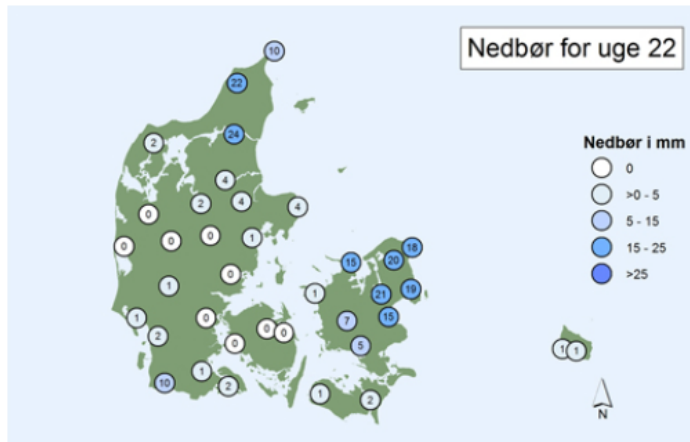
Regional weather forecast
(Danish Met. Office)

Actual day

Weather data

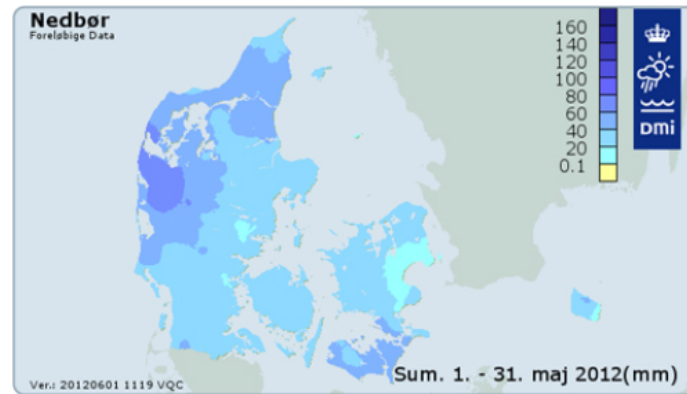


Status for precipitation



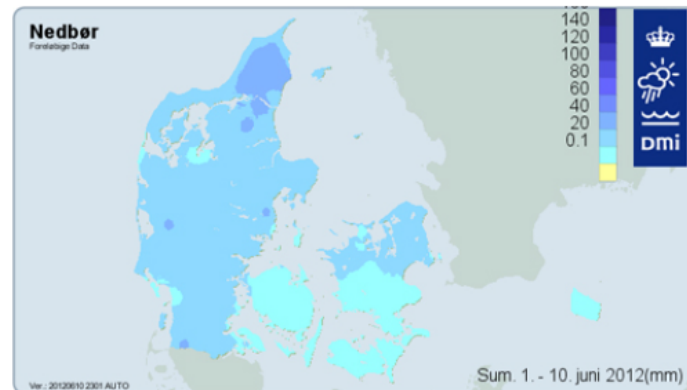
Source: DMI-Ugenedbør. Enlarge map: [week 22 \(28/5 - 5/6\)](#)
[week 21 \(21/5 - 28/5\)](#) [week 20 \(14/5 - 21/5\)](#)
[week 19 \(7/5 - 14/5\)](#) [week 18 \(30/4 - 7/5\)](#)

Actual week



Source: DMI-Unpublished. Do not distribute

May

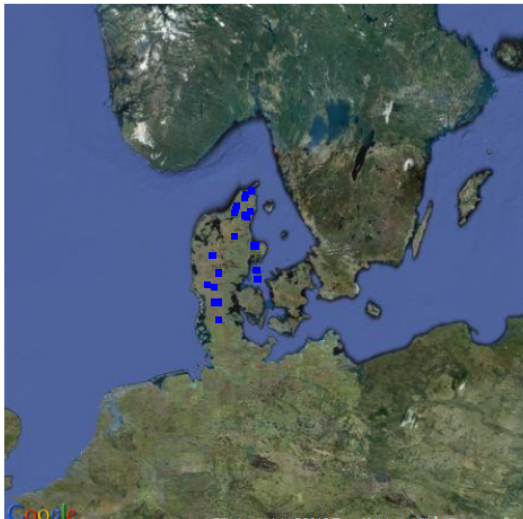


Source: DMI-Unpublished. Do not distribute

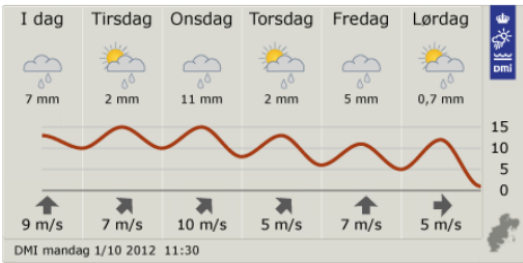
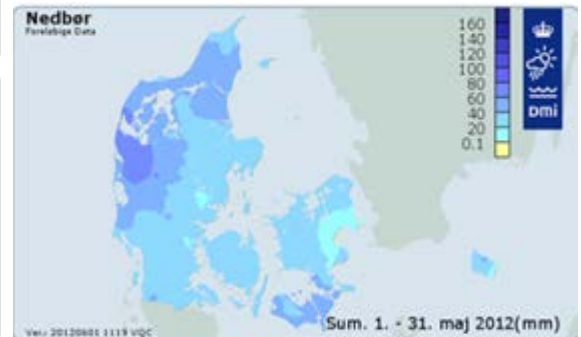
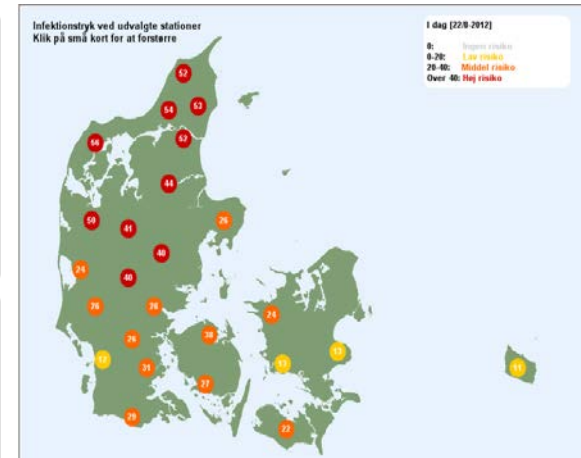
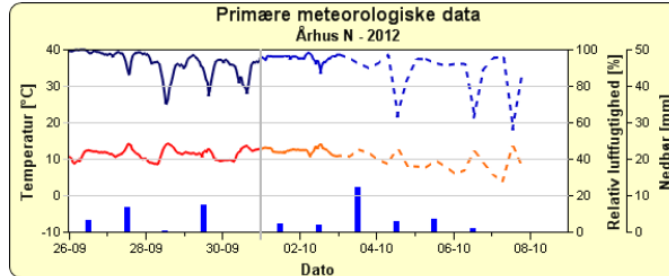
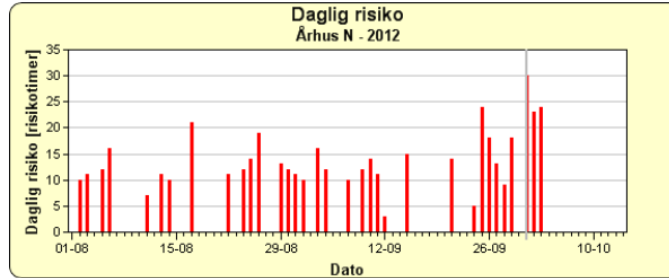
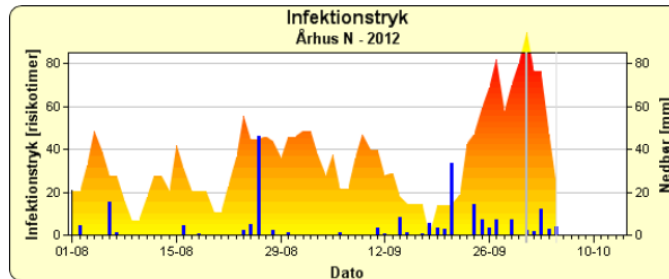
Given period

Distribution of precipitation on a daily basis:
[7 May](#) [8 May](#) [9 May](#) [10 May](#) [11 May](#) [12 May](#) [13 May](#) [14 May](#) [15 May](#) [16 May](#)
[17 May](#) [18 May](#) [19 May](#) [20 May](#) [21 May](#) [22 May](#) [23 May](#) [24 May](#) [25 May](#)
[26 May](#) [27 May](#) [28 May](#) [29 May](#) [30 May](#) [31 May](#) [1 June](#) [2 June](#) [3 June](#) [4 June](#)
[5 June](#) [6 June](#) [7 June](#) [8 June](#) [9 June](#) [10 June](#)

Available tools at www.landbrugsinfo.dk

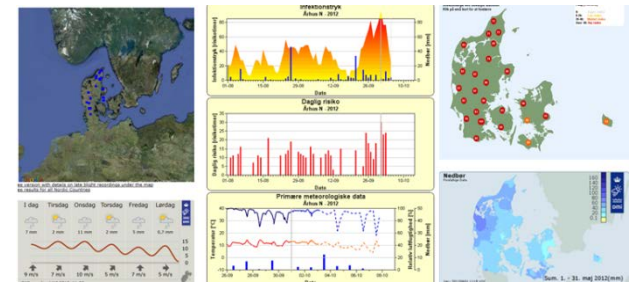


See version with details on late blight recordings under the map
See results for all Nordic Countries



Use of information

- Farmers
- Starch producers
- Advisors
- National advisory service



Decision support

- ✓ Background information combined with other information
- ✓ Support not decision model (!)
- ✓ Recommendations and newsletters to farmers
- ✓ Weekly advisor telephone meetings in the season (Monday)

Toolbox on development platform

Different applications under development



Skimmelstyring
 Reduceret ressourceforbrug, optimering og værdiløft i kartoffelproduktionen

Home Om projektet Om Skimmel

Velkommen til Skimmelstyring

News

19 January 2012 **Startmøde på nyt projekt om bekæmpelse af Kartoffelskimmel**

Tirsdag den 31. Januar mødes alle deltagere i GUDP projektet "Skimmelstyring" på Forskningscenter Flakkebjerg.

Kartoffelskimmel har igennem de seneste år udviklet et mere aggressivt angrebsmønster. Det betyder, at forbruget af svampemidler i kartofler over en 10-årig periode er steget til det dobbelte, så det i dag udgør ca. 25 pct. af det samlede forbrug af svampemidler i landbruget. Hvis vi skal fastholde en dansk produktion af kartofler til en årlig værdi af ca. 1 mia. kr. i primærproduktionen og ca. 900 mio. kr. i eksportindtægter, er det afgørende, at pesticidforbruget reduceres både af hensyn til konkurrenceevnen og det omgivende miljø.

Formålet med projektet er at sikre en konkurrencedygtig kartoffelsektor, der er baseret på en bæredygtig produktion med et reduceret forbrug af pesticider samt en øget effektivitet og indtjening, der samlet set understøtter et værdiløft i hele værdikæden. Projektets overordnede mål er fra 2015 at opnå en besparelse i kartoffelproduktionen på ca. 14 mio. kr. pr. år samt en reduktion i pesticidforbruget på hhv. 20 pct. i stivelseskartofler og 10 pct. i øvrige kartofler.

Endvidere er målet at forbedre kapacitetsudnyttelsen i stivelsesindustrien samt sikre råvarer til konkurrencedygtige priser, hvilket samlet set styrker konkurrenceevnen i sektoren. Disse mål nås ved udvikling og implementering (industri, rådgivere, landmænd) af et webaseret beslutningsstøttesystem SKIMMELSTYRING for kartoffelskimmel, som ud fra regionale og lokale forhold understøtter en behovsbestemt anvendelse af svampemidler i kartoffelproduktionen.

Links

[EuroBlight](#)
[Landbrugsinfo, Kartofler](#)
 Fungicidernes effektivitet fra EuroBlight [her](#)
 Presentationer fra seneste EuroBlight workshop
 Projektbeskrivelse på GUDP hjemmeside

Kontakt
 Bent J. Nielsen

01 October 2012

Login

Login name:
 Password:

[Forgot your password?](#)

Deltagere

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VIDENCENTRET FOR LANDBRUG

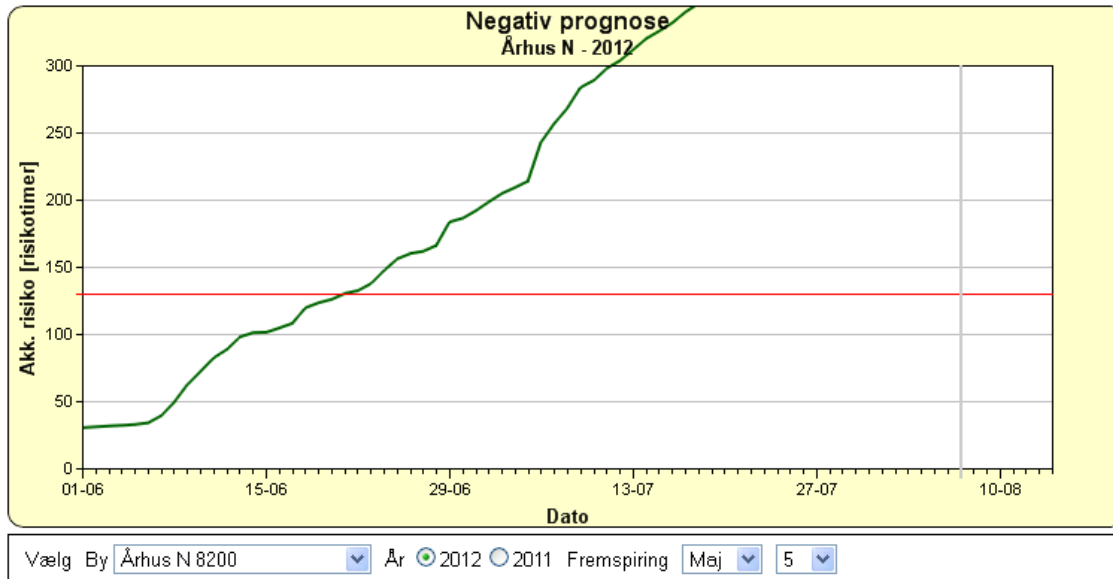
Dmi
 Vejr, klima og hav

AKV

GUDP project platform

Development tools for the project

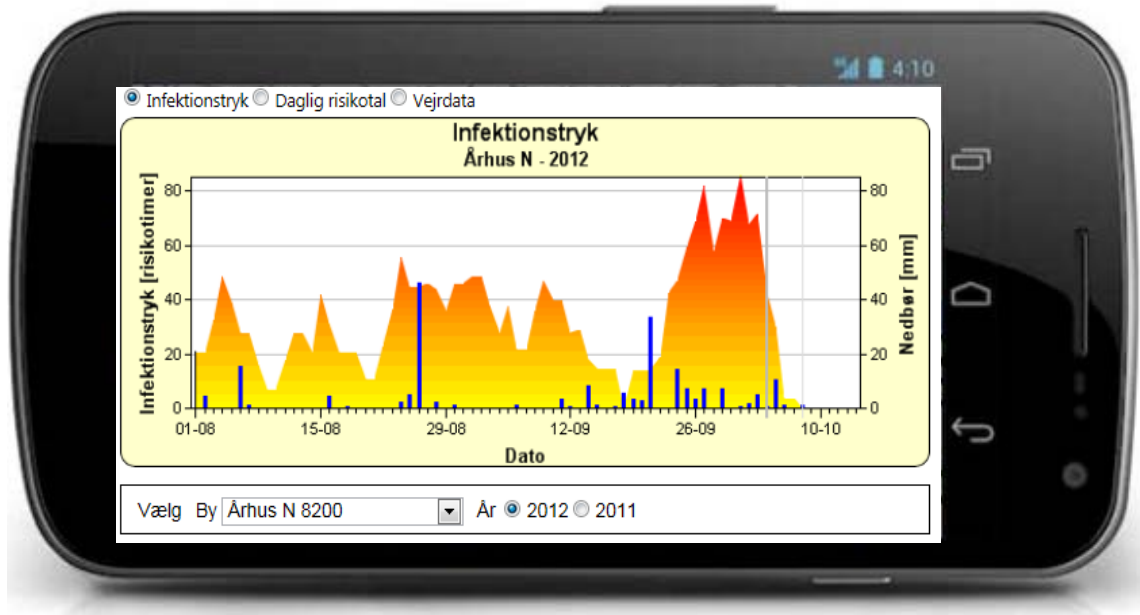
Toolbox: Negative prognosis



Model to forecast risk of late blight outbreak (values > 130) (Ulrich and Schrodter)

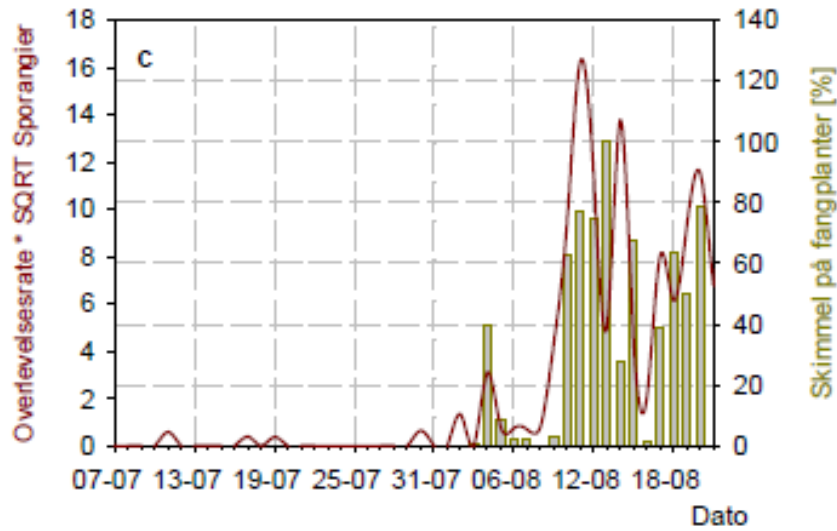
- Temperature, Rh, and rainfall (starting at crop emergence)
- Accumulated risk values
- Can be used predict the timing of the first treatment.
- Model assumes the same amount of initial inoculum is present every year
- Old model that just needs to be implemented and explained

Toolbox: Smartphone applications



Local Infection pressure available as application on smartphone (demo version)

Toolbox: Index for survival of sporengia

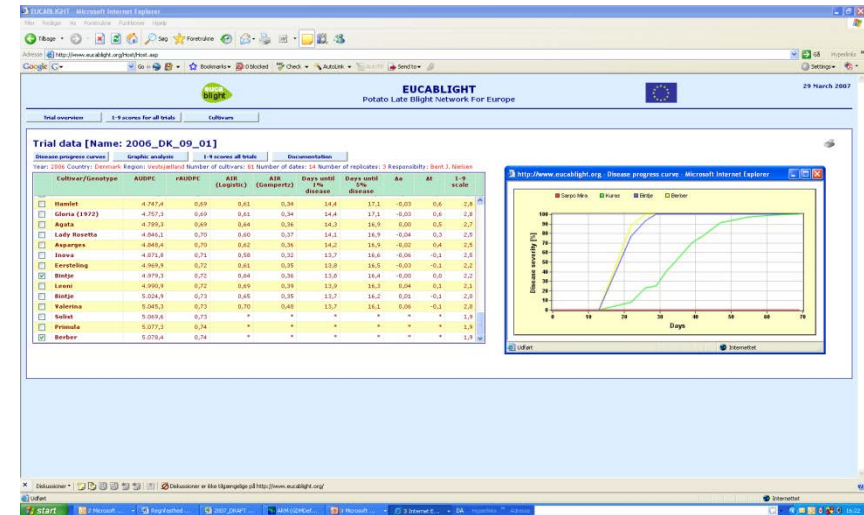
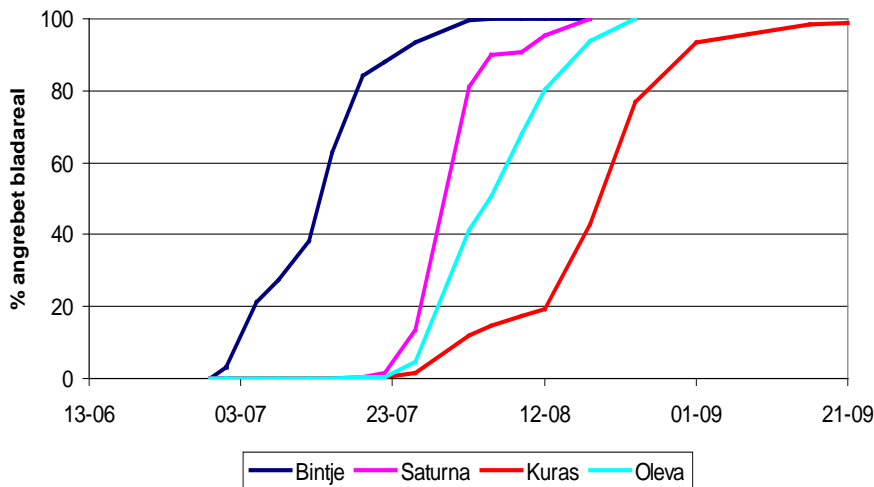


Survival of
sporengia depends
on global radiation
(UV)

- Infection risk = survival rate x sporengia
- UV radiation + prognosis for UV radiation

Toolbox: Resistance level in varieties

- Susceptible
- Moderate resistant. Higher level beginning of season (Kuras)



Test after Eucablight protocol.
No trials for the moment

Toolbox: Fungicide dose model

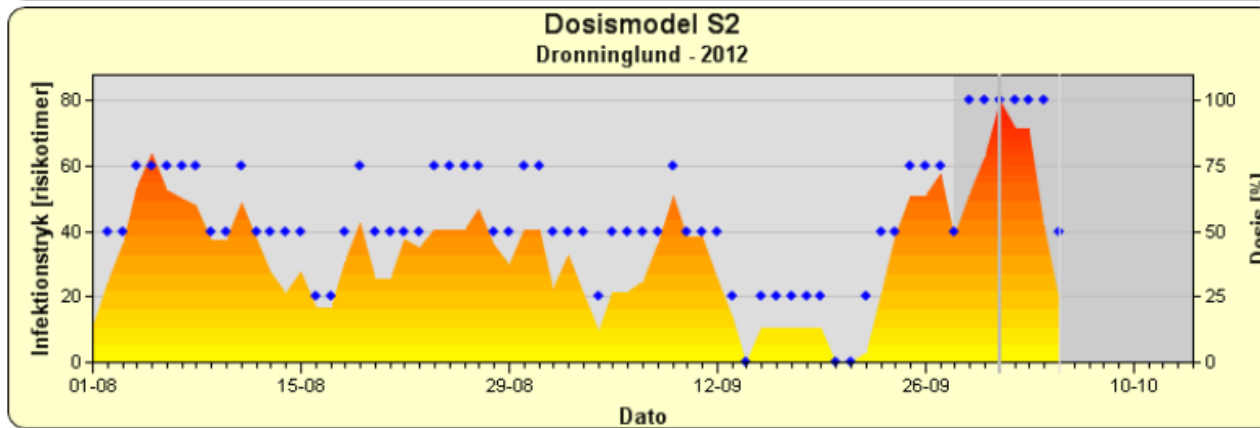
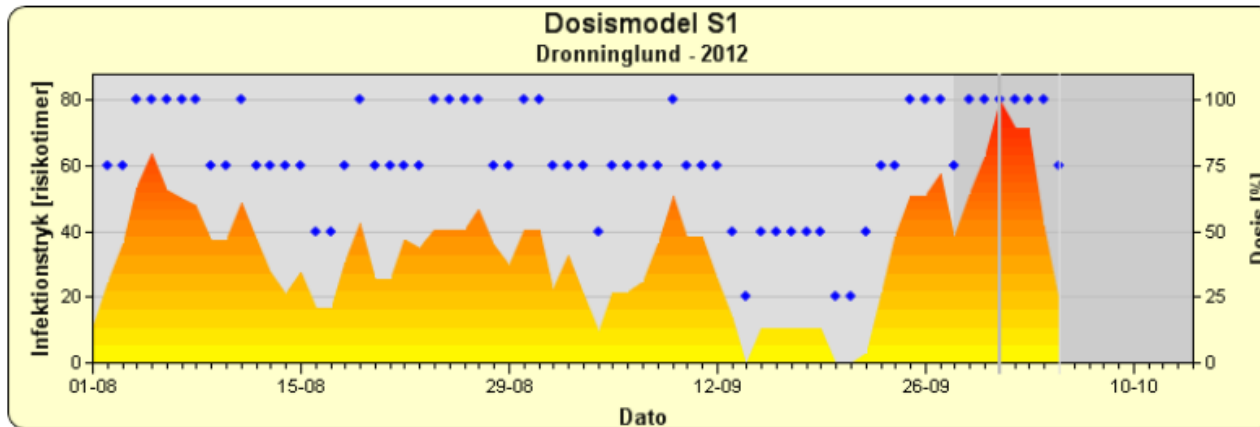
Dosismodellen

This is a graphical representation of Dose models S1; S2 and P (Praksismodel) Updated 19 June 2012

[Modeller i Excel](#) [Manual til forsøg, 19. Juni, 2012](#)

Lokalitet:

Skimmel fundet: i Danmark i regionen i marken



Dose varies depending on risk situation (actual and coming days)

Fungicide dose model

- Use of fungicides (dose x intervals) depend on risk situation (actual and coming days):

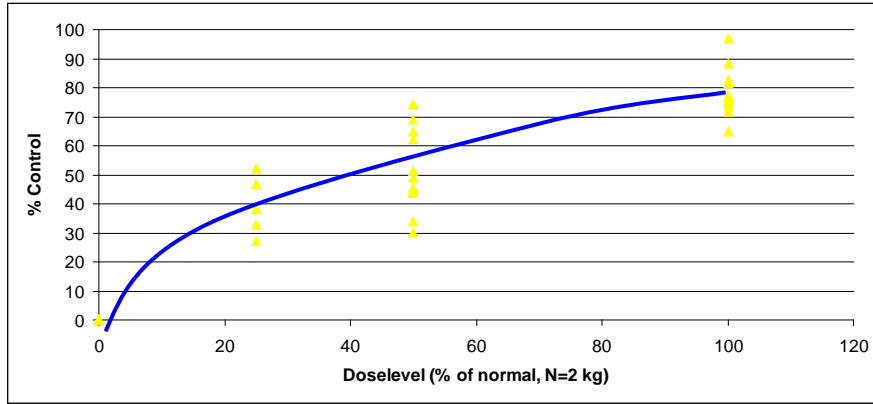
- **Recommended actual dose:**

Infection pressure x occurrence of LB x level of resistance

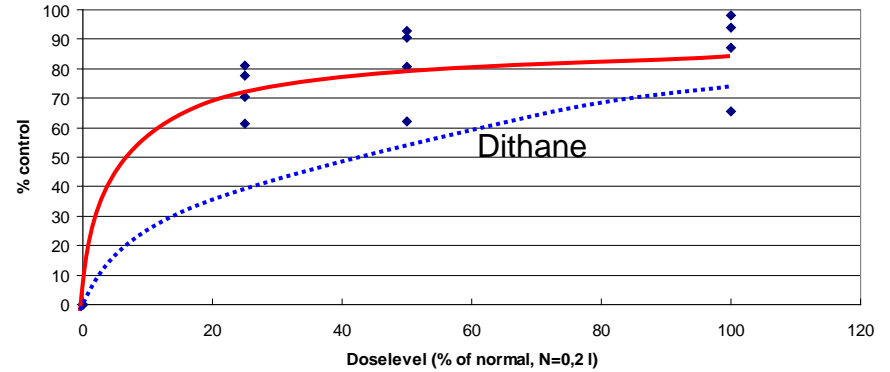
- No or low risk of infection: No spraying or low dose of **effective** fungicides
- Increasing risk of infection: Dose of **effective** fungicides depends on actual risk

Dose-response curves for potato fungicides, examples

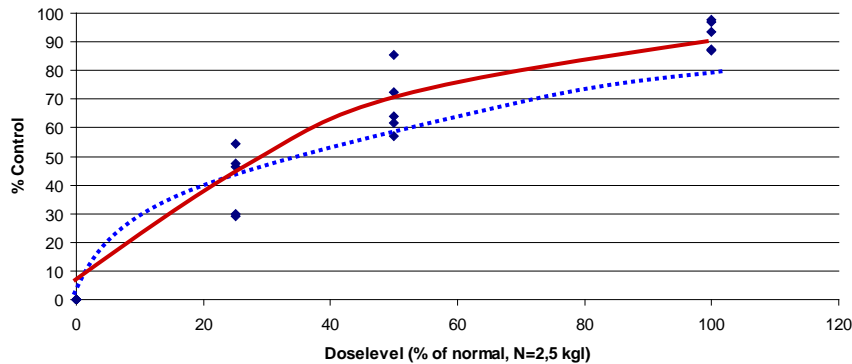
Dithane



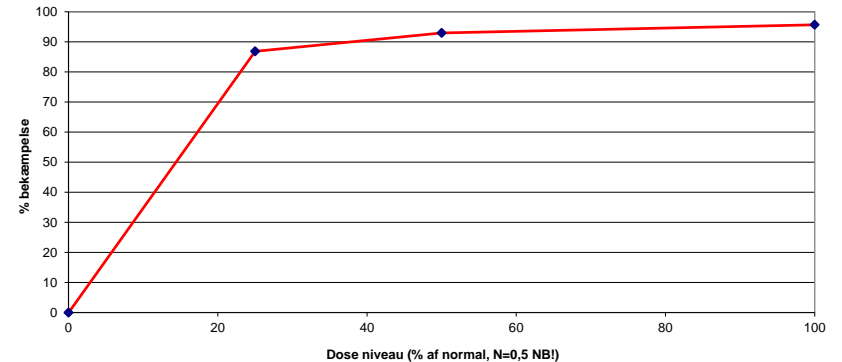
Ranman



Curzate M



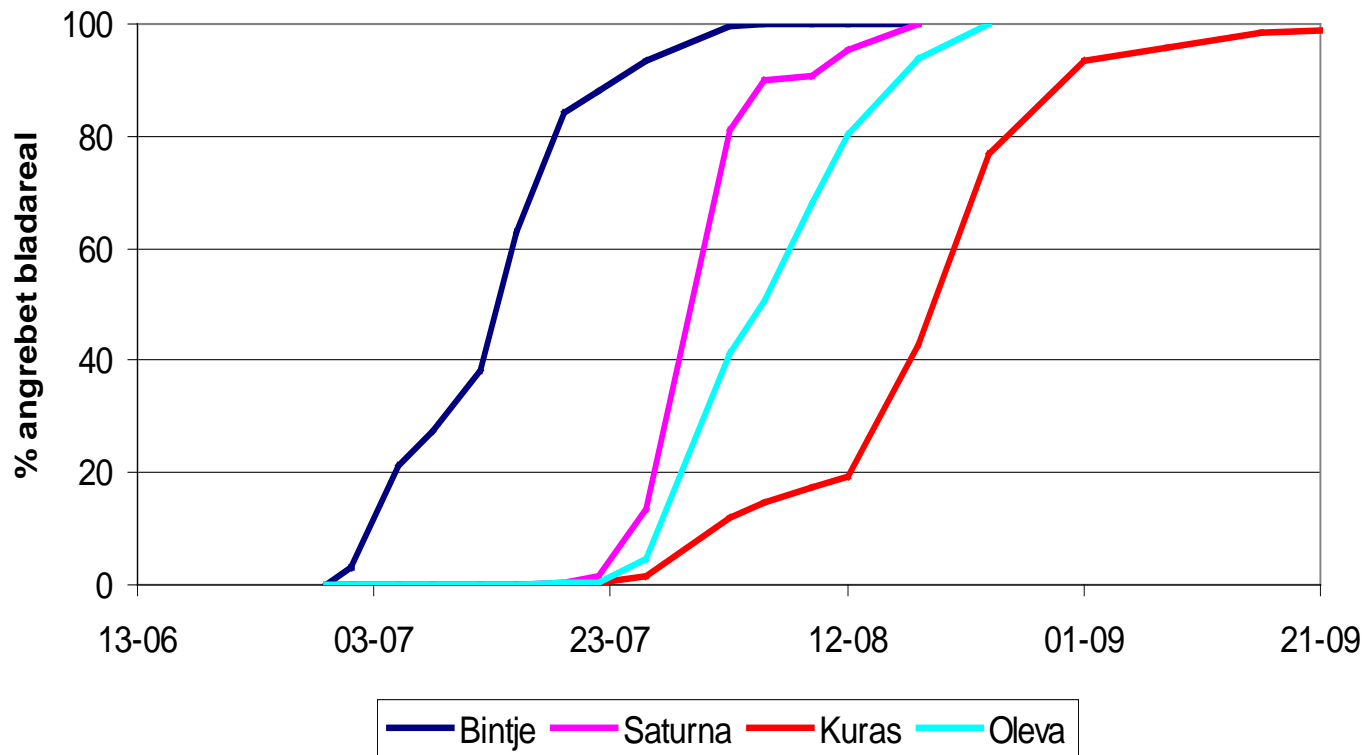
Revus



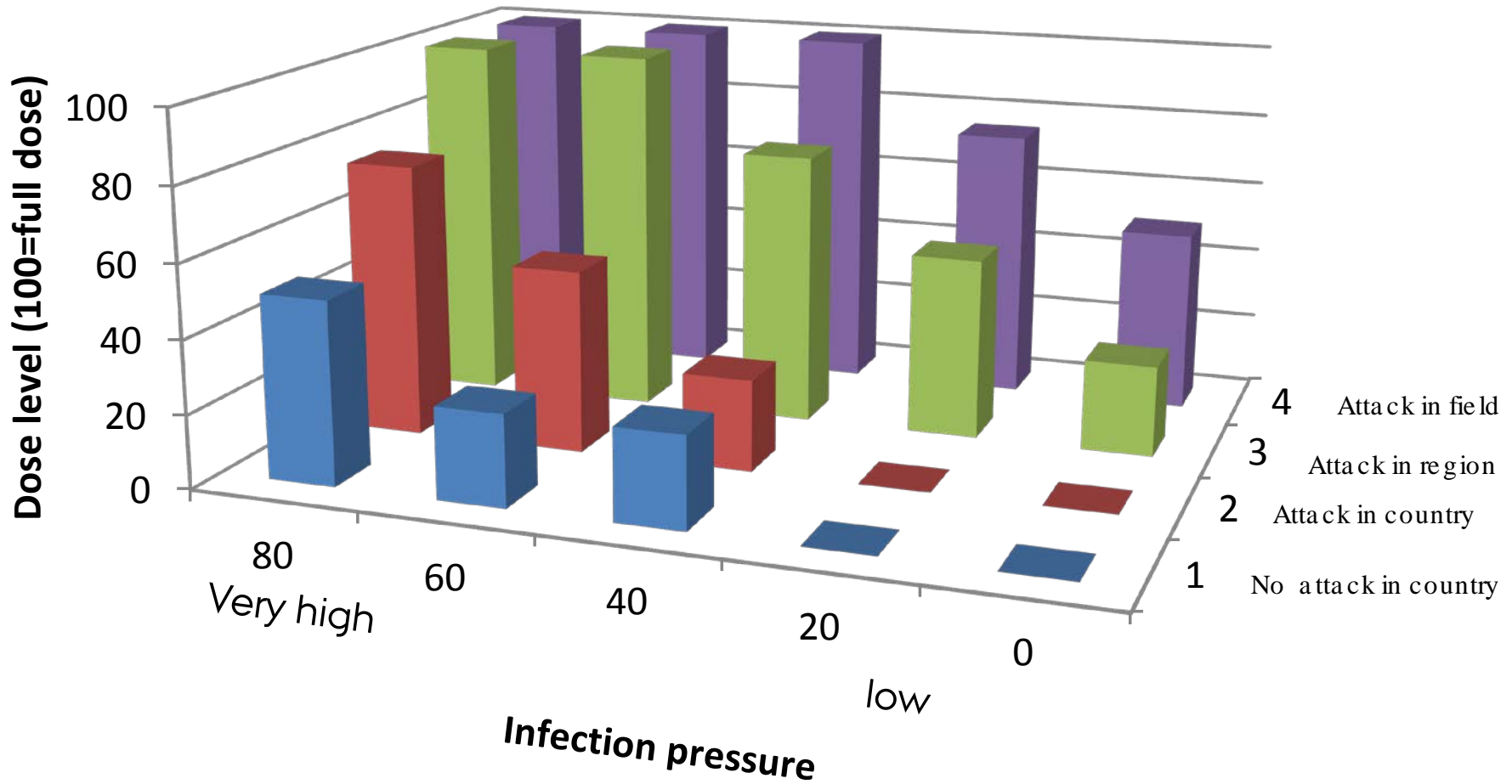
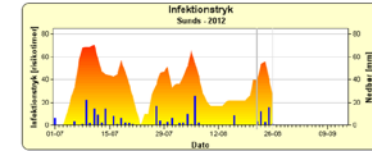
AU, Flakkebjerg 12 sprayings, 7 days intervals

Resistance level in varieties

- Susceptible
- Moderate resistant. Higher level beginning of season (Kuras)



Fungicide dose levels in model



Field trials with dose models 2009-2011

1. Dithane NT 2 kg/ha
2. Ranmen – Revus 1/1 dose
3. Ranman – Revus ½ dose

4. Model 1 Reduced dose especially early season

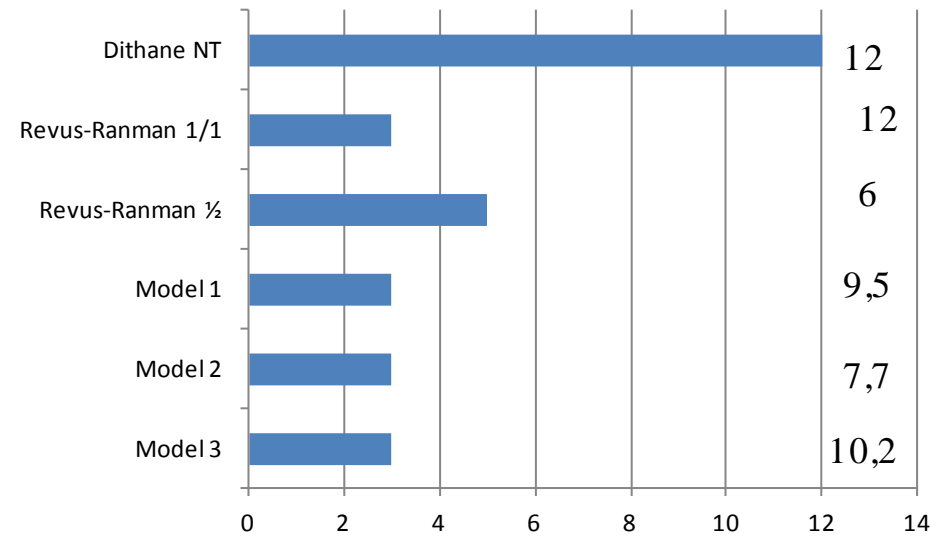
5. Model 2 Dose further reduced

6. Model 3 As model 1 but includes Dithane NT

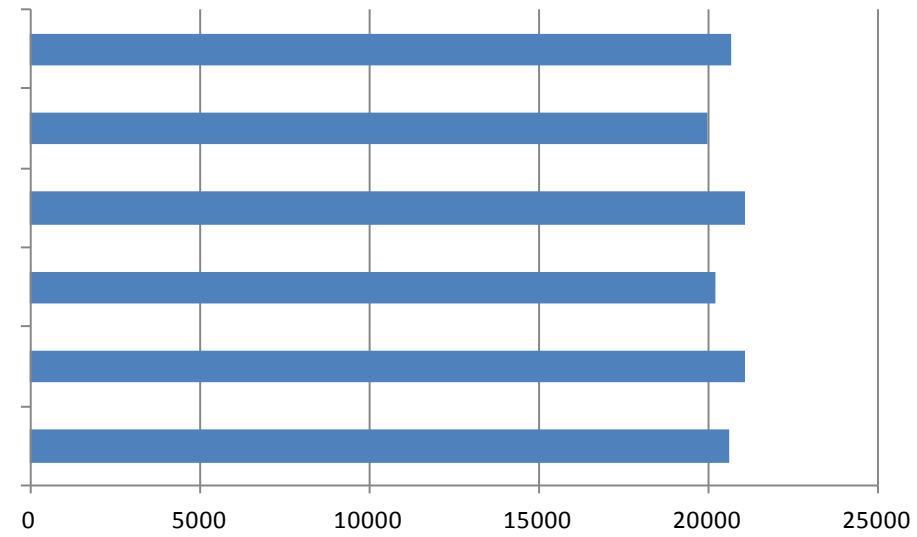
Variety: Kuras (starch variety)
Locations: 3 (Flakkebjerg, Herning & Try)

9 trials 2010-2011

% late blight (early sep.)

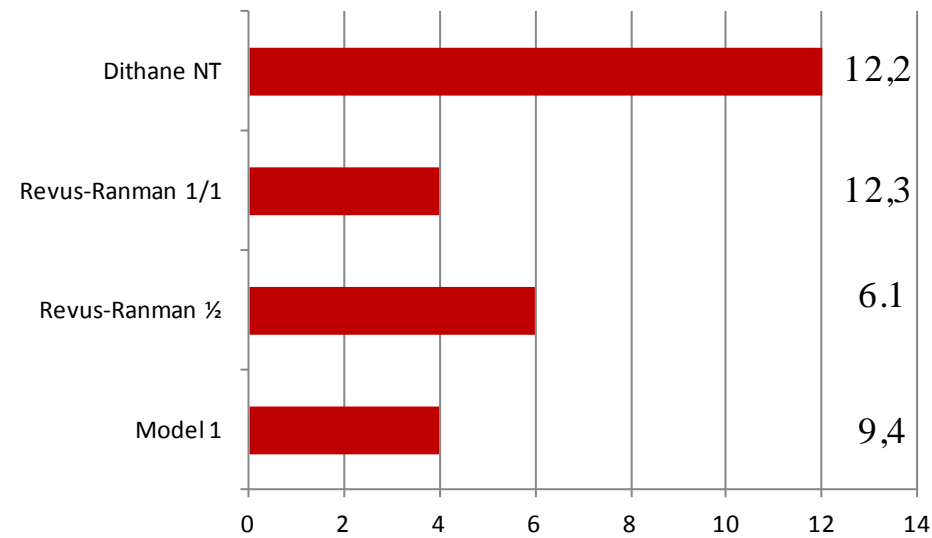


Net yield (DKR/ ha)

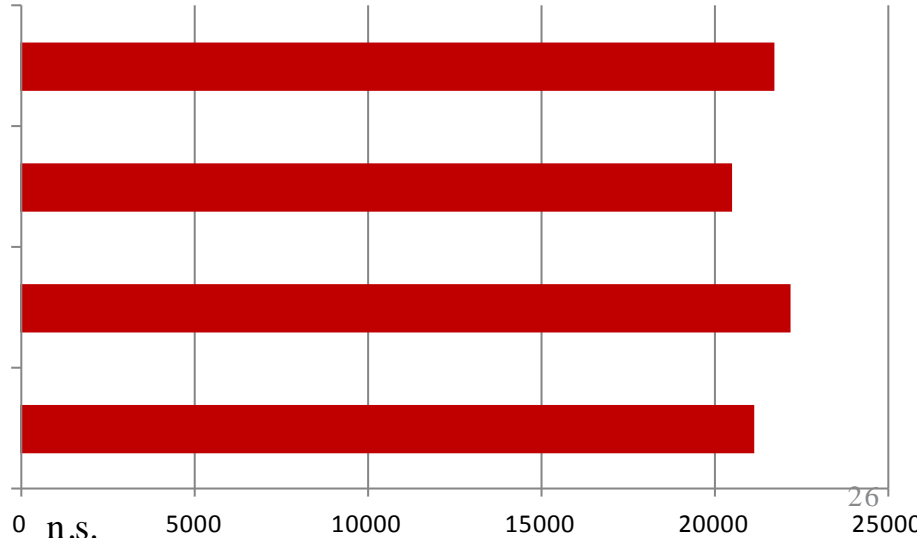


12 trials 2009-2011

% late blight (early sep.)

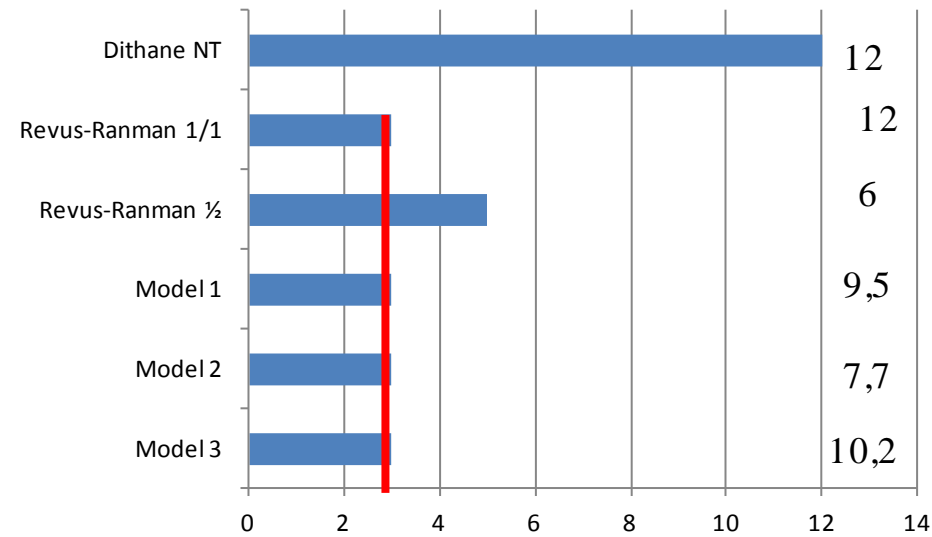


Net yield (DKR/ ha)

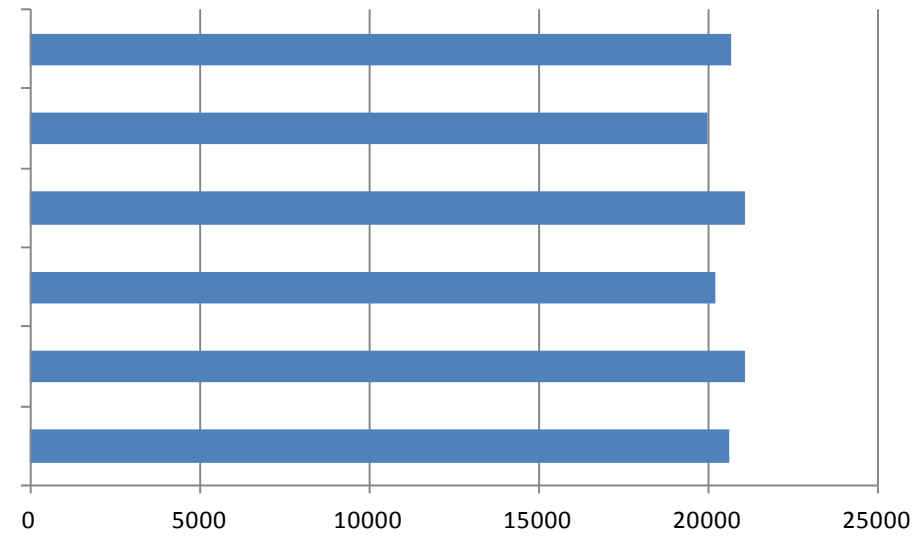


9 trials 2010-2011

% late blight (early sep.)

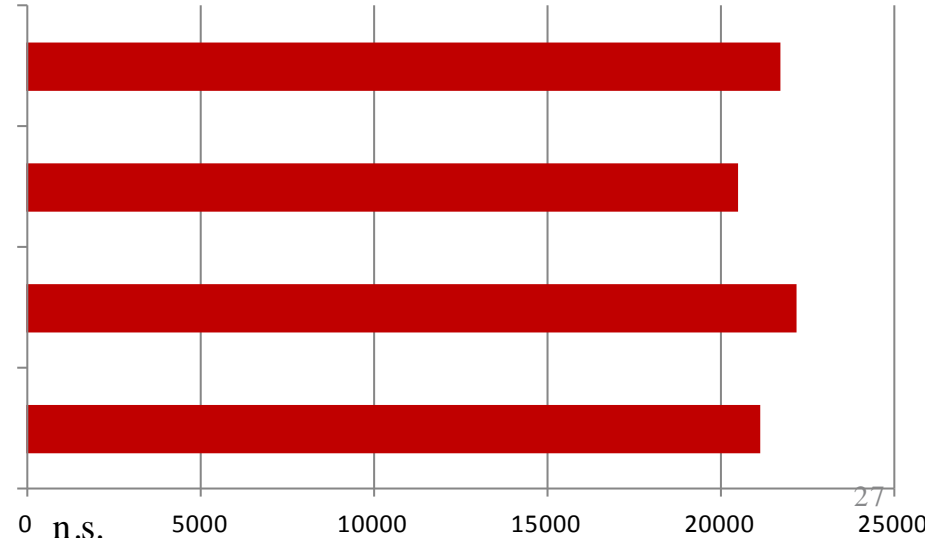
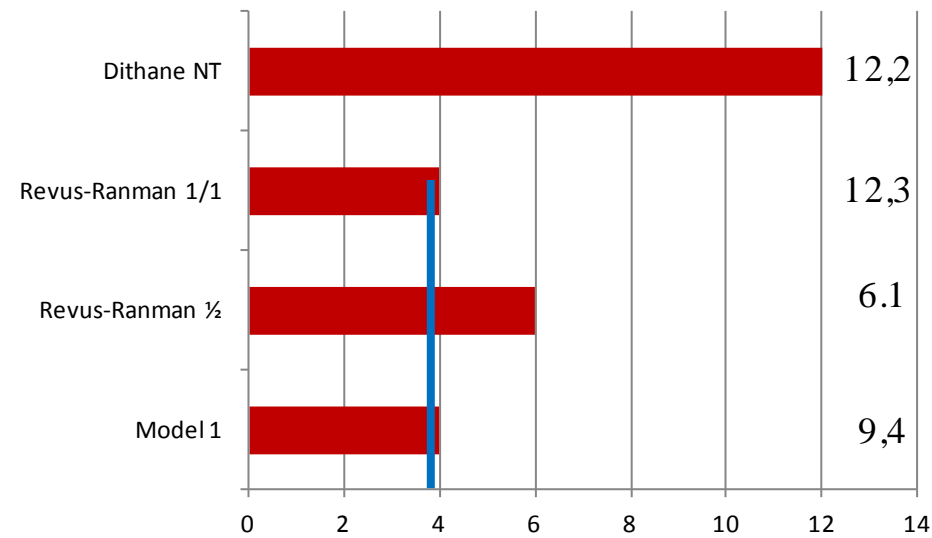


Net yield (DKR/ ha)



n.s.

12 trials 2009-2011

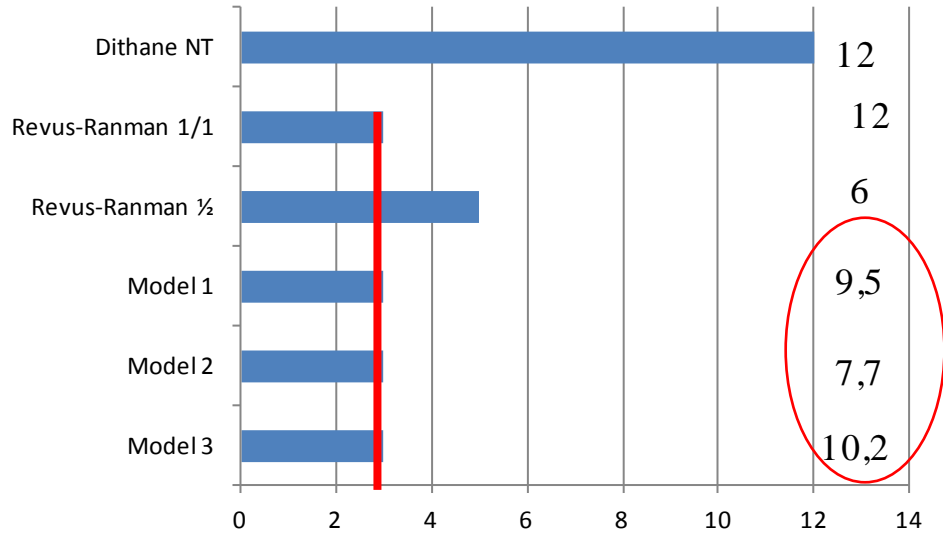


n.s.

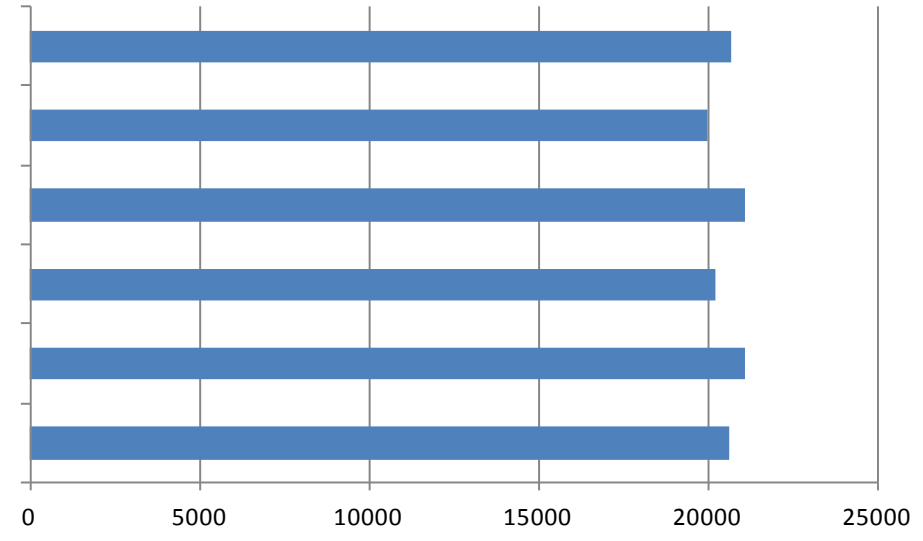
9 trials 2010-2011

TFI

% late blight (early sep.)

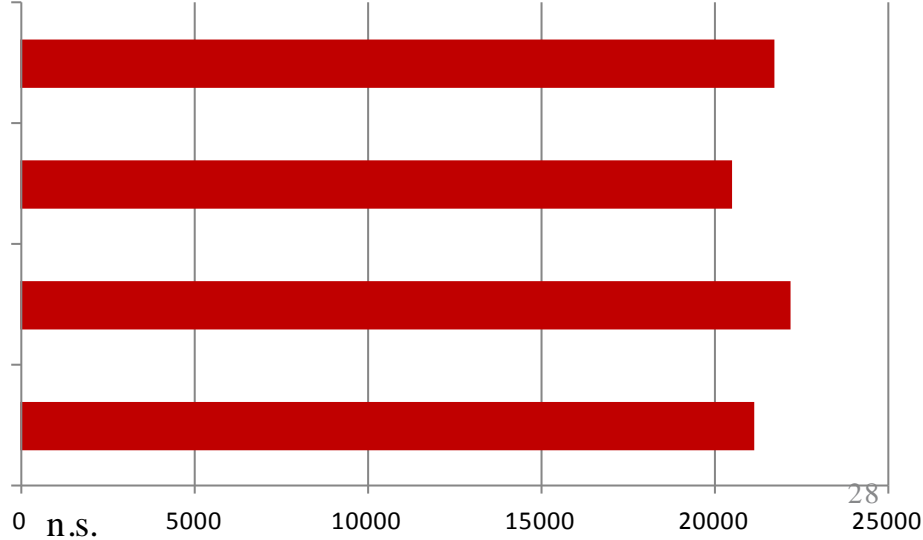
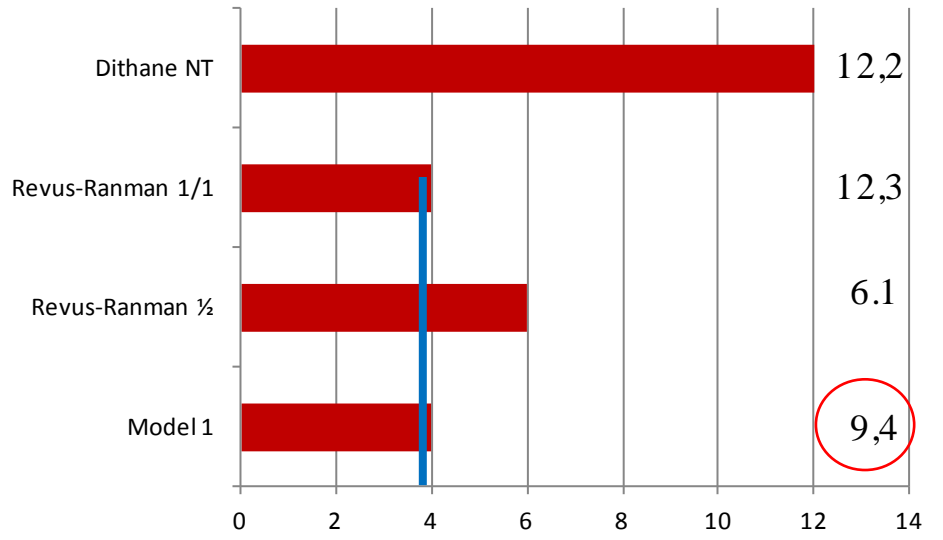


Net yield (DKR/ha)



n.s.

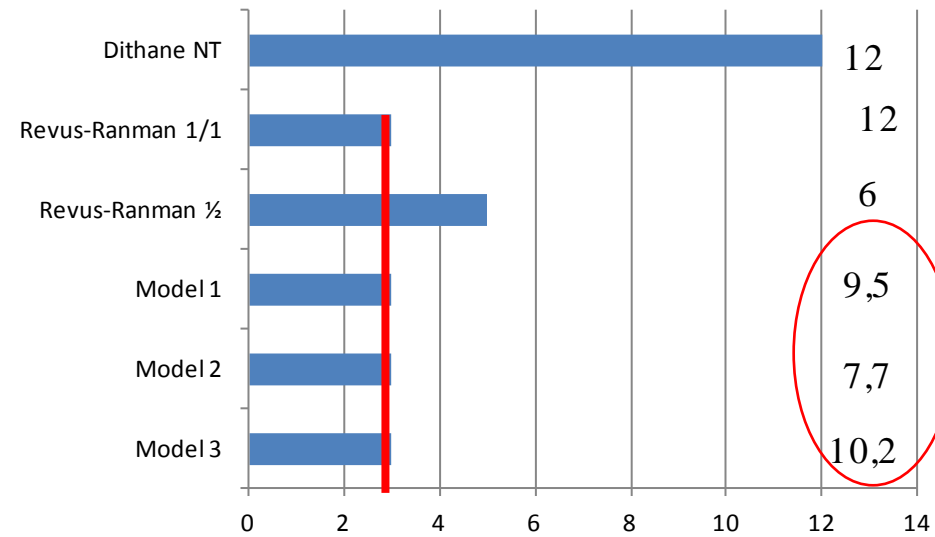
12 trials 2009-2011



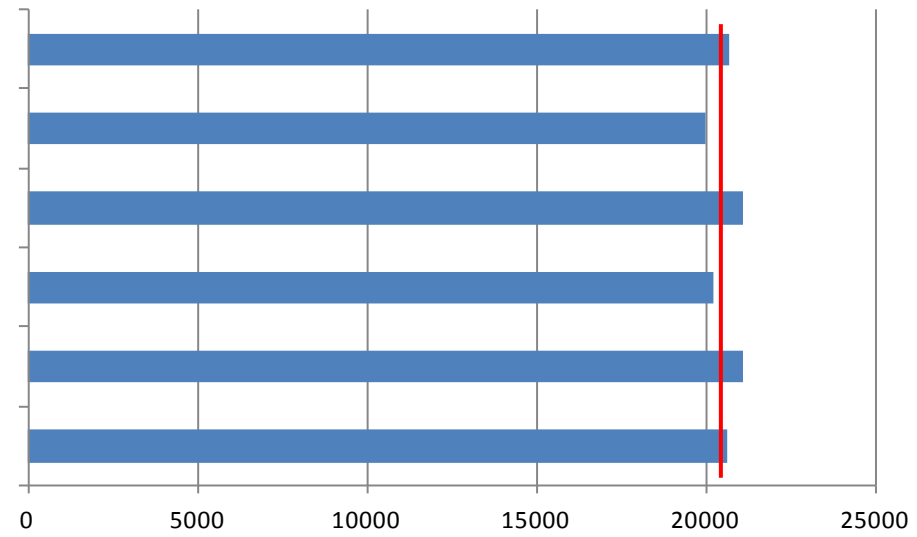
n.s.

9 trials 2010-2011

% late blight (early sep.)

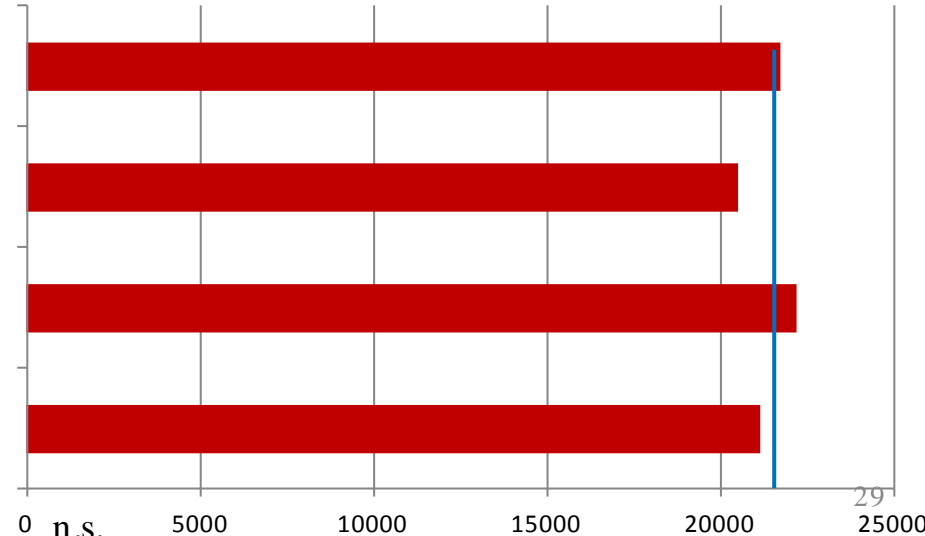
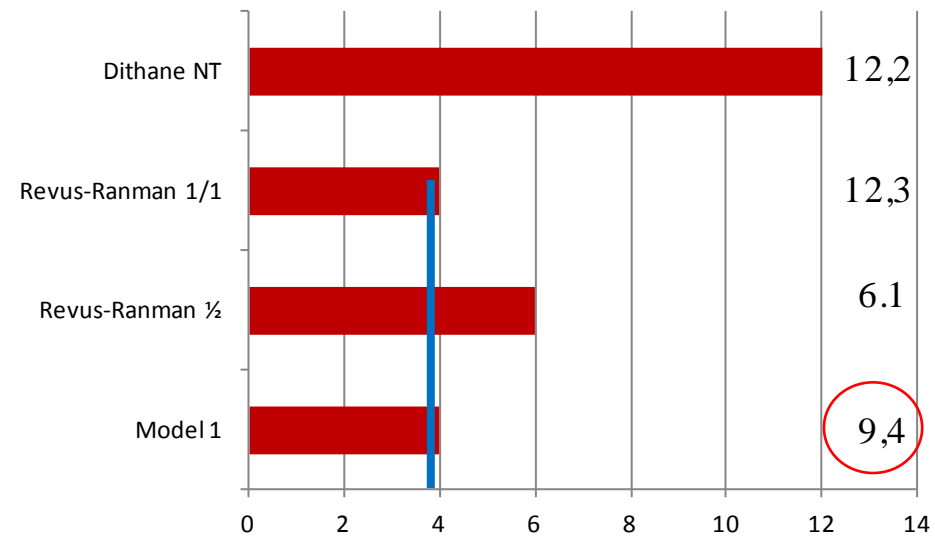


Net yield (DKR/ha)



n.s.

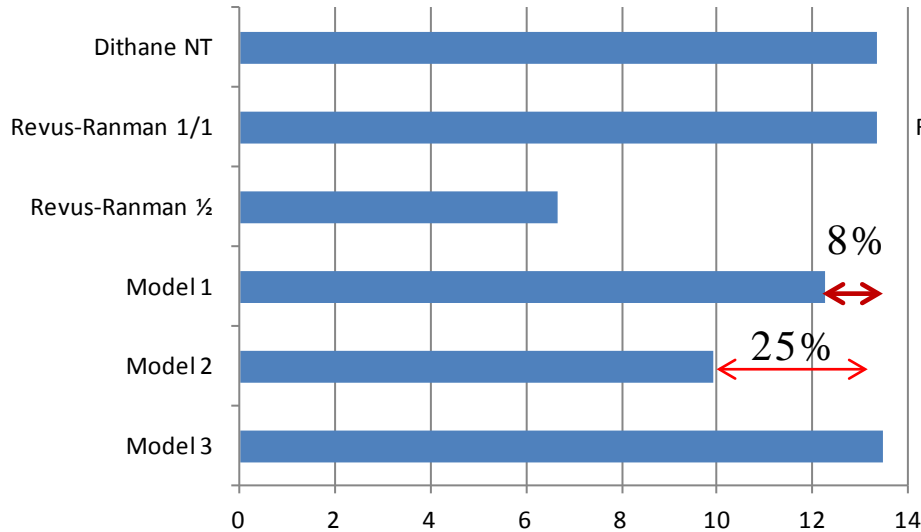
12 trials 2009-2011



n.s.

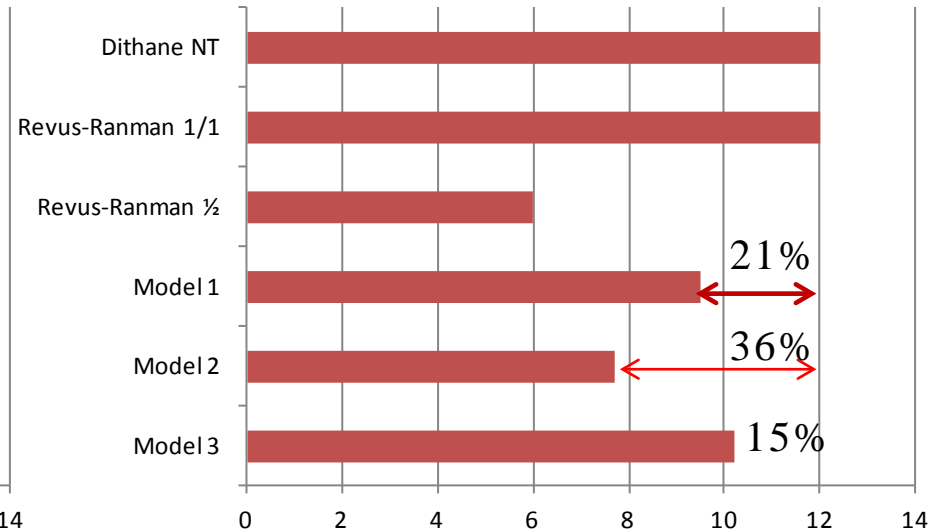
Treatment frequency index *)

3 trials 2011



Reduction 0-25%
(favourable blight conditions)

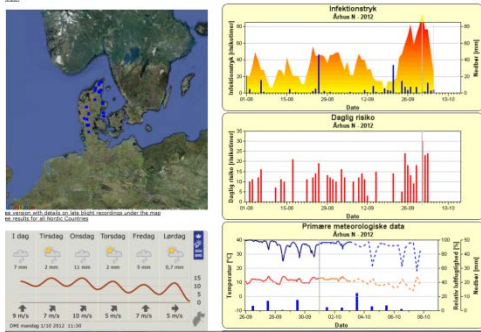
9 trials 2010-2011



Reduction 15-36%

*) number of times sprayed with standard dose (e.g. $4 \times \frac{1}{2} = 2$)

Summary: Blight Management



- Monitoring system works and shows the first attacks and spread of LB
- Calculation of infection pressure works
- Level reflects periods with low and high LB disease pressure (experienced from practice)
- Basis for adjusting strategies and timing of curative products

Summary: Dose model

- Still a research model
- Basis for reduction in fungicide input (approx. 30%)
- Same or better LB control as full standard dose
- Same net yield as standard routine
- Improvements:
 - Alte rna r ia modul
 - New fungicides (prev./ cur.)
 - Early start

Blight Management

LandbrugsInfo

Print

Søg



See version with details on late blight recordings under the map
See results for all Nordic Countries

