Estonian Crop Research Institute

Use of automatic weather stations and decision support systems for optimization of disease control in potatoes

Mati Koppel

Potato late blight is one of most devastating plant diseases worldwide

Yield and quality losses by late blight may exceed 50%

Disease controll needs multiple application of fungicides during the season

Dendency on increase of number of fungicide applications

Increased risk on environment, human health and production costs

Proper timing of fungicides is highly coplex decision what needs qood knowledge on several aspects: biology of pathogen, climatic conditions, variety resistance, fungicide properties *etc*.




Decision support systems. NegFry - good results, complicated use

NegFry (Hansen, 1993) a PC based decision support system for late blight control was tested in Estonia in 1999-2002

NegFry advices treatment time to control late blight based on biology of pathogen, climatic conditions and variety resistance.

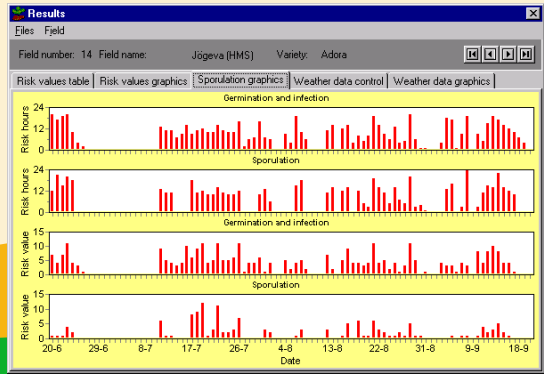
Good results in field trials

Reduction of fungicide application in 28% in result of 44 field trials in Baltic countries in 1999-2002 (Koppel at al., 2003)

Complicated to use for farmers

Some farmers got interested and tried it, but without success

A simplified system based on NegFry was developed and used to advice farmers in frames of Web-based DSS project in 2004-2012



Project of farmers cooperative Talukartul and Jõgeva PBI**:**

Implementation of site-specific system for control of potato late blight and monitoring of irrigation neccessity (measure 1.7.1 of Estonian RDP)

Project was initiated by farmers cooperative Talukartul

Need of farmers to quarantee equally high quality of potatoes

Need for reducing the risks on failure of late blight control

Use of DSS as marketing argument (no unneeded treatments)

Bases:

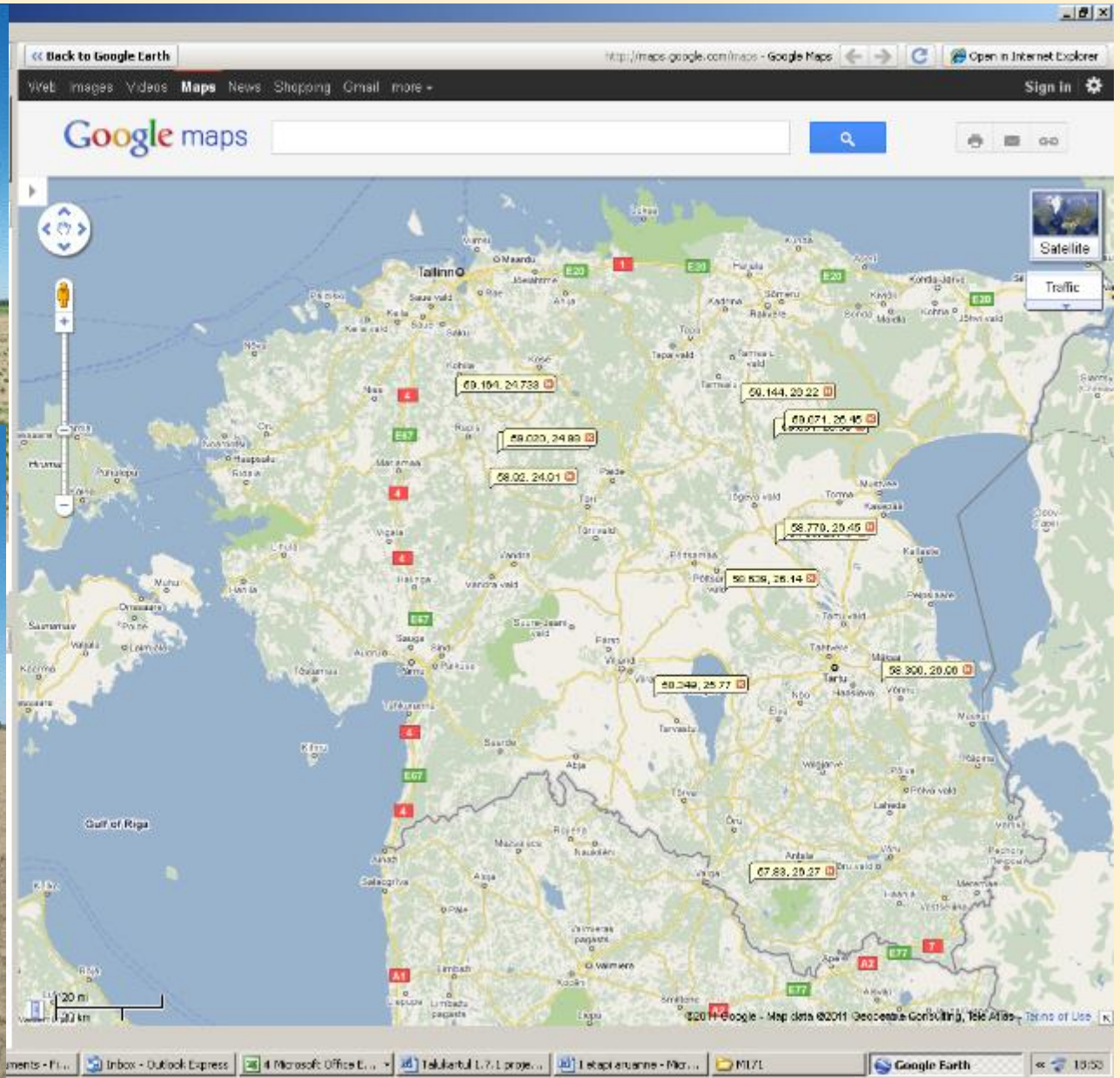
Based on pre-existing regular contacts between researchers and farmers the concortia was formed easily

Farmers need and experience of Jõgeva PBI in use of DSS were combined

Goal:

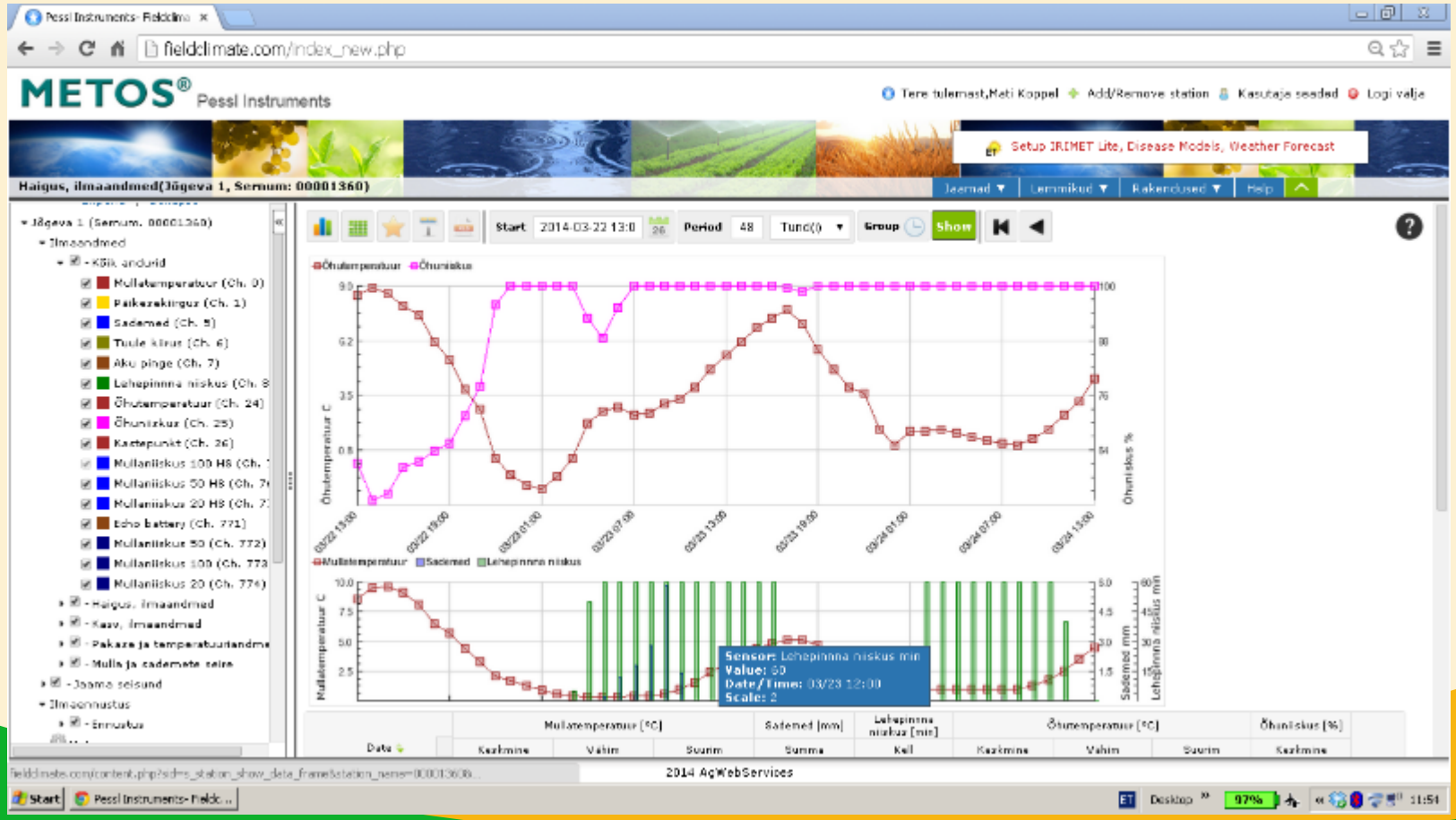
Reliable and simple (not complicated, not time consuming) solution for farmers for timing fungicide treatments.

What was done: 13 weather stations



www.fieldclimate.com

What was done: Translation of the website and supporting documentation, setting up user accounts



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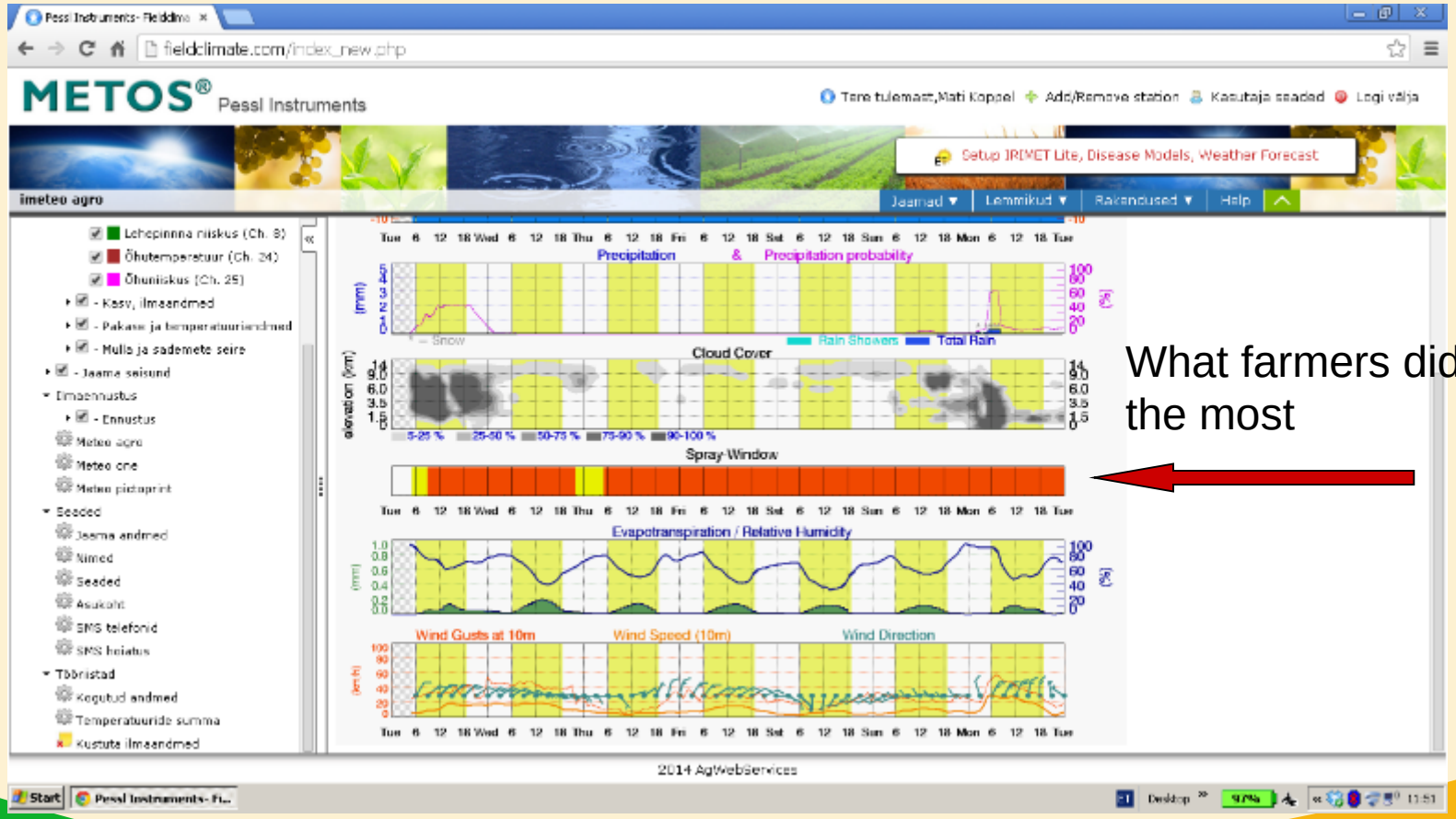
Field based weather forecast



What farmers did like the most

What was done:

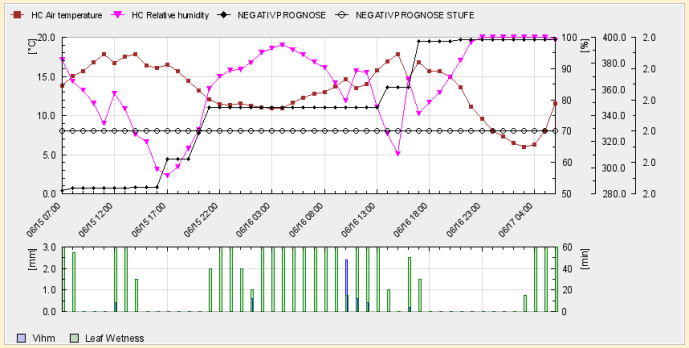
Adoptation to Estonian conditions:

selection of models,

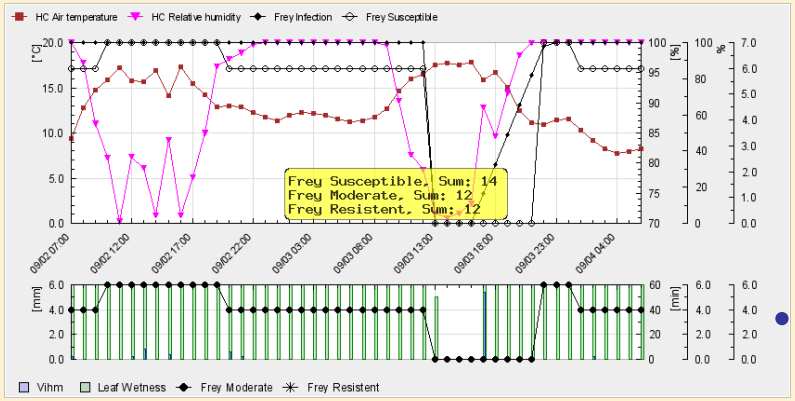
resistance of varieties,

selection of fungicides

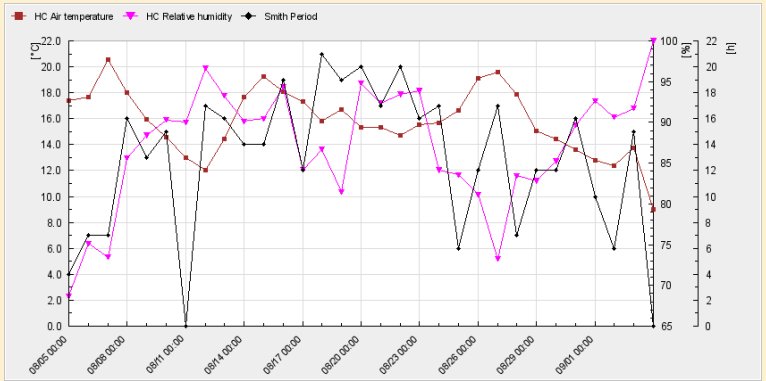
- Negative prognosis



- Fry model



- Smith periods



Models for timing fungicide applications - too complicated

What was done: Simple solution to forvard messages in Google Docs.

Learning by doing together

Results: Fungicide applications in farmers trials 2011

Location	User	Variety	No of treatments		
			Planned	Fieldclimate	Difference
Ingliste	Kalle Hamburg	Romera	5	**7**	**2**
Ingliste	Kalle Hamburg	Campina	5	**8**	**3**
Kehtna	Peeter Rostin	Secura	5	**7**	**2**
Kohila	Arvo Jakobson	Princess	5	6	1
Kissa	Gustav Põldmaa	Flavia	6	6	0
Simuna	Gustav Põldmaa	Secura	6	6	0
Ärina	Leho Meltsa	Flavia	4	**2**	**-2**
Iigaste	Mati Kivipalu	Secura	4	**2**	**-2**
Vasara	Argo Merila	Secura	5	5	0
Sava	Urmas Pärnalaas	Flavia	4	3	-1
Puhu	Rein Pruuli	Secura	4	**2**	**-2**
Kaasikutaguse	Jõgeva SAI	Fontane	5	4	-1
Jõgeva	Jõgeva SAI	Vigri	5	4	-1

Results: Additional income for farmers 88-1373 EUR/ha

Conclusions

Project was based on combination of farmers needs and interests and researchers capasity to understand and satisfy them

Existing good contacts between farmers and researchers formed a bases for a good start of the project

Farmers were satisfied that they had learned during the project how to use the system independently

Recommendations

We spend much time for coping the documents for reporting the expences and planned too less time for it. Plan full time for it!

A simpler rules for financial reporting or e-solutions are also welcome.

The rules where expences are covered after approval of the mid term report set high pressure for financial capacity to participate. Some pre-payment good be highly appriciated.

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Thank you!

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