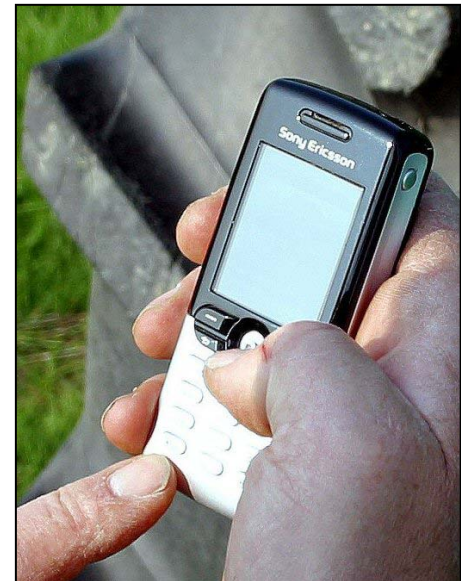


Internet and Mobile Technologies for Agrometeorological Applications

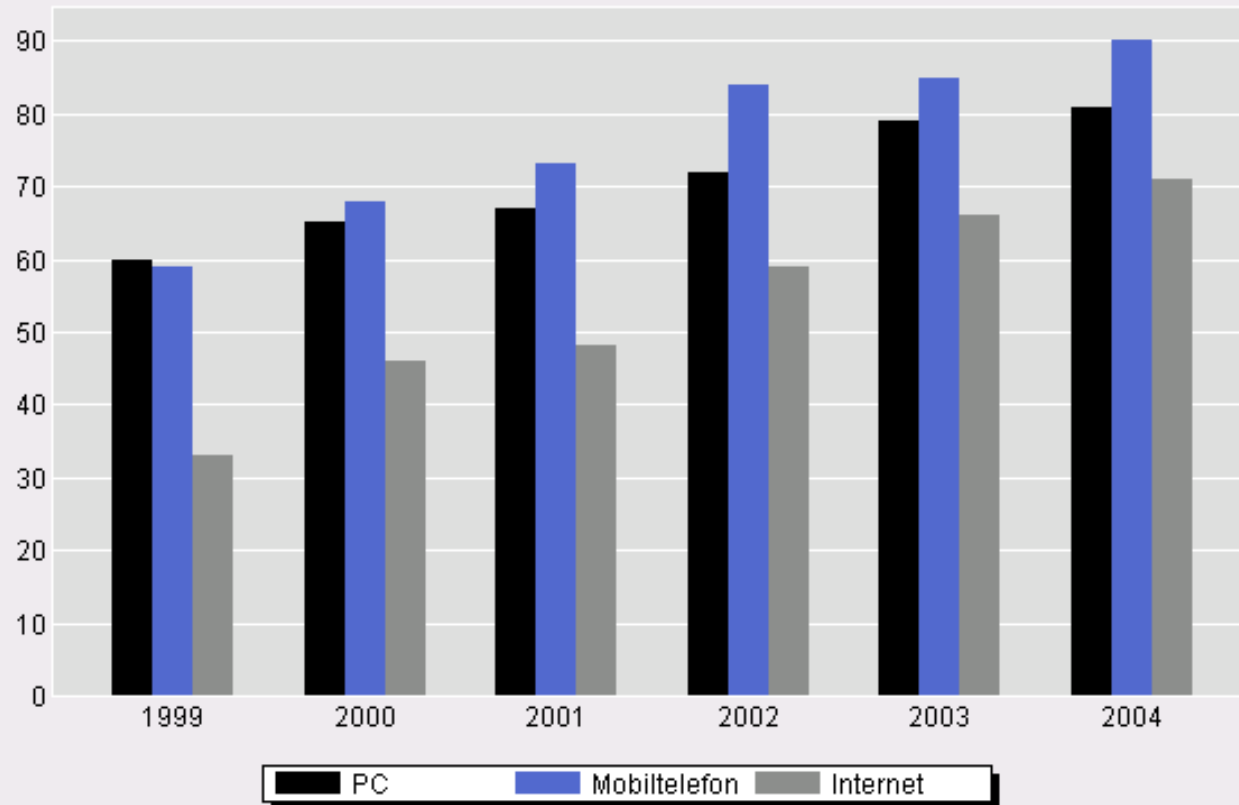
Allan Leck Jensen
Iver Thysen

Danish Institute of Agricultural Sciences



Background

Pct. Danish households



2004:

PC: 81%

Int.net: 71%

Mobile: 90%

© Danmarks Statistikbank

Background: PlanteInfo

- Web system (www.planteinfo.dk)
- Since 1996 for Danish farmers and advisers
- Dynamic information for plant production
 - Weather
 - Calculated risk of crop diseases and pests
 - Field recordings of crop diseases and pests
- Decision support systems
 - Irrigation
 - Plant protection, fertilization, variety selection
- Personalisation

Background: PlanteInfo


Pl@nteInfo KONTAKT FORETRUKNE PRINT 8. september 2004
Allan L. Jensen

[Forside](#) | [Vejret](#) | [Afgroeder](#) | [Plantevaern](#) | [Vand](#) | [Kvaelstof](#) | [Sorter](#) | [Bier](#) | [Mobil](#) | [eRaad](#) | [Links](#) | [Hjaelp](#) | [English](#)

Velkommen til PlanteInfo

Vejret i PlanteInfo
I Pl@nteInfo får du vejrudsigterne fra DMI præsenteret med de detaljer en planteavler har brug for. Læs mere [Om vejret](#). Du kan få SMS'er til bestemte tider på døgnet ([Daglig SMS](#)) eller hente SMS'erne når du ønsker det. ([SMS på bestilling](#))

Potentiel fordampning
06/09 kl. 08 - 07/09 kl. 08




0,5 1,0 1,5 2,0 2,5 3,0 3,5 4,0 4,5 5,0

[Fordampning i egen hjemmeside](#)

[Nedbør 06/09 kl. 08 - 07/09 kl. 08](#)

Vejledning
Se hvordan du bedst bruger PlanteInfo.
[Læs mere..](#)

Her bor jeg ...
Den røde prik på kortet viser hvorfra du får lokale vejrdata i prognoser, eVarsling m.m.



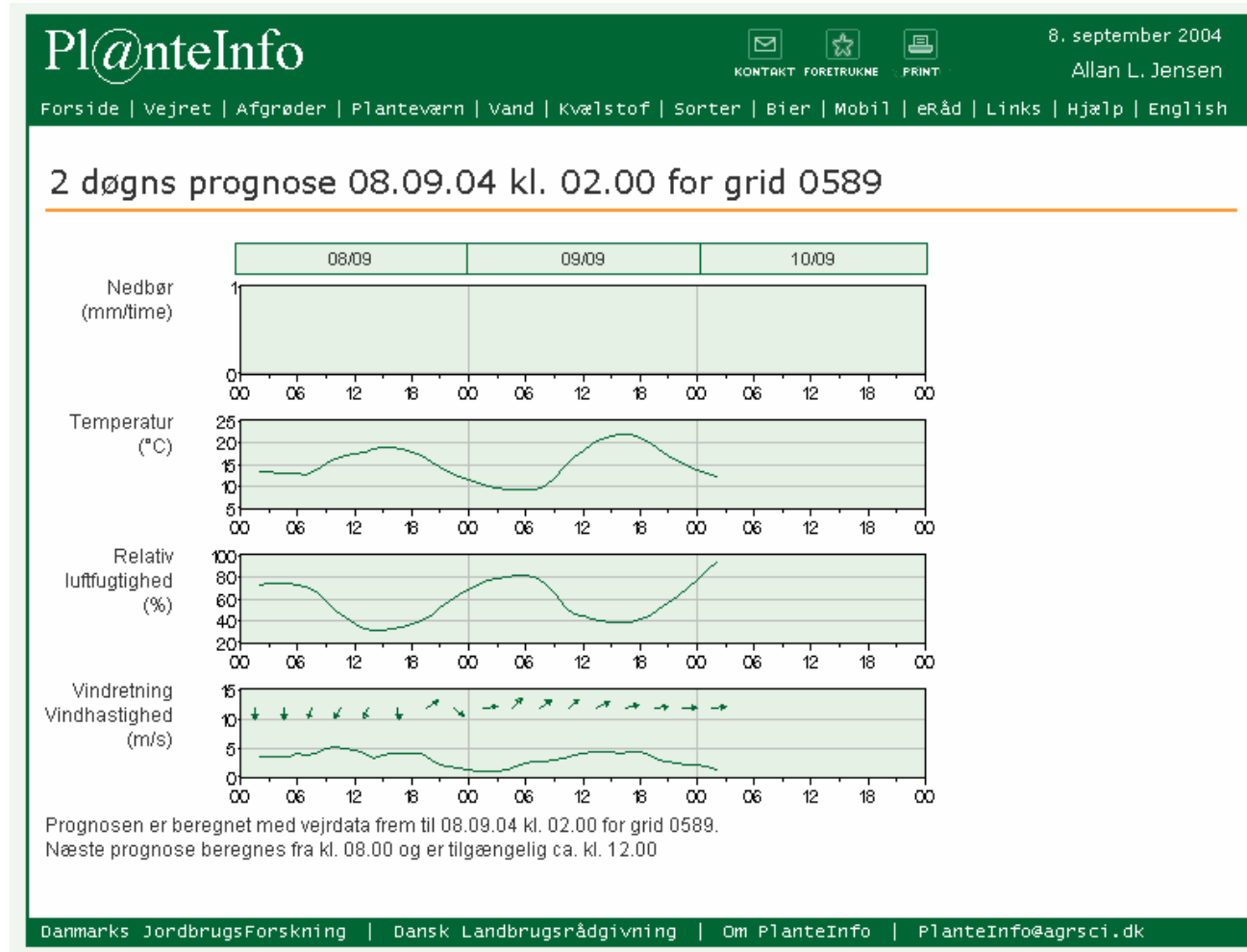
Grid 0589 [NY](#)

[Afmeld SMS og Email](#) uden at logge ind

[Sider med begrænset adgang](#)

Danmarks JordbrugsForskning | Dansk Landbrugsrådgivning | Om PlanteInfo | PlanteInfo@agrsci.dk

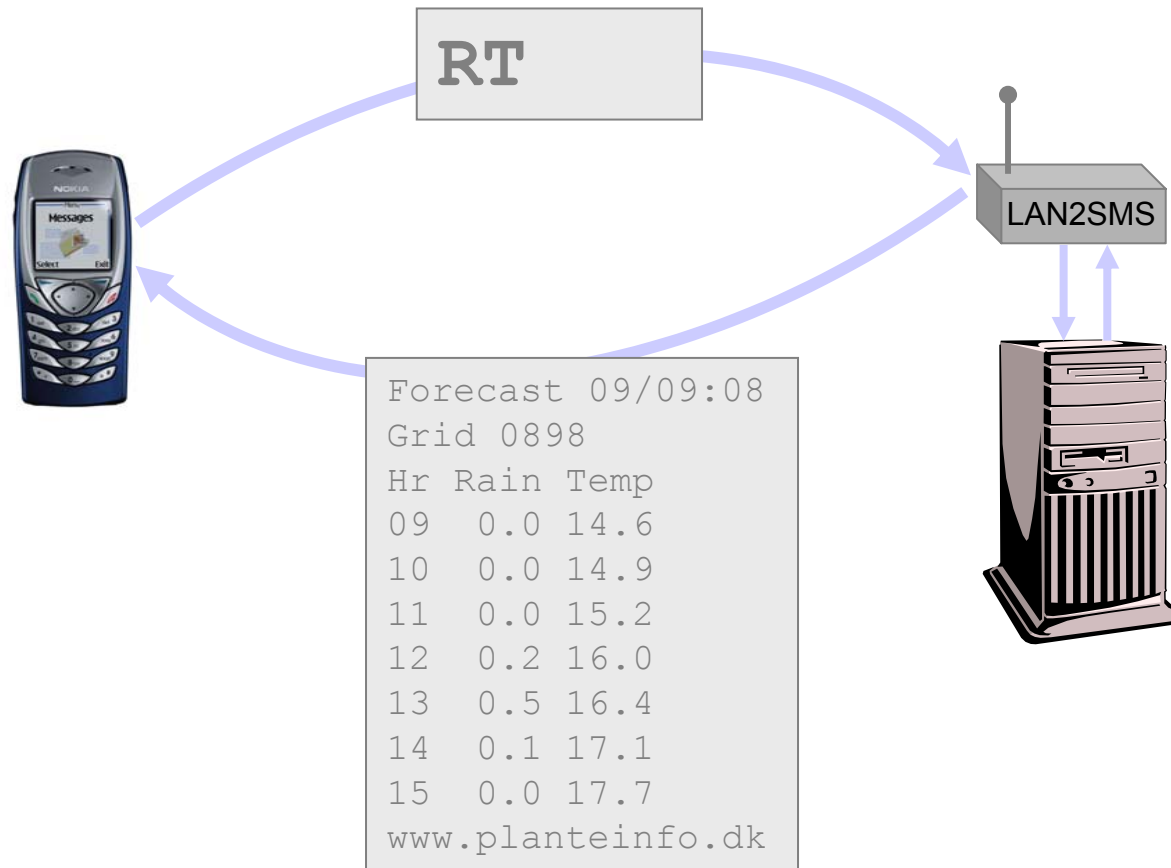
Background: PlanteInfo



Farmers need information in the field



Information by SMS



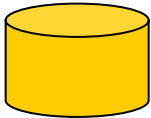
Mobile phones with Internet access



Weather data

DMI

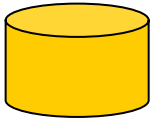
AMIS



Weather data

DMI

AMIS



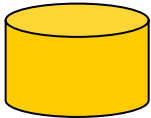
AMIS

- Forecasts (48 hours, 6 days)
- Observations
- Radar images (10 min.)
- 10 x 10 km grids

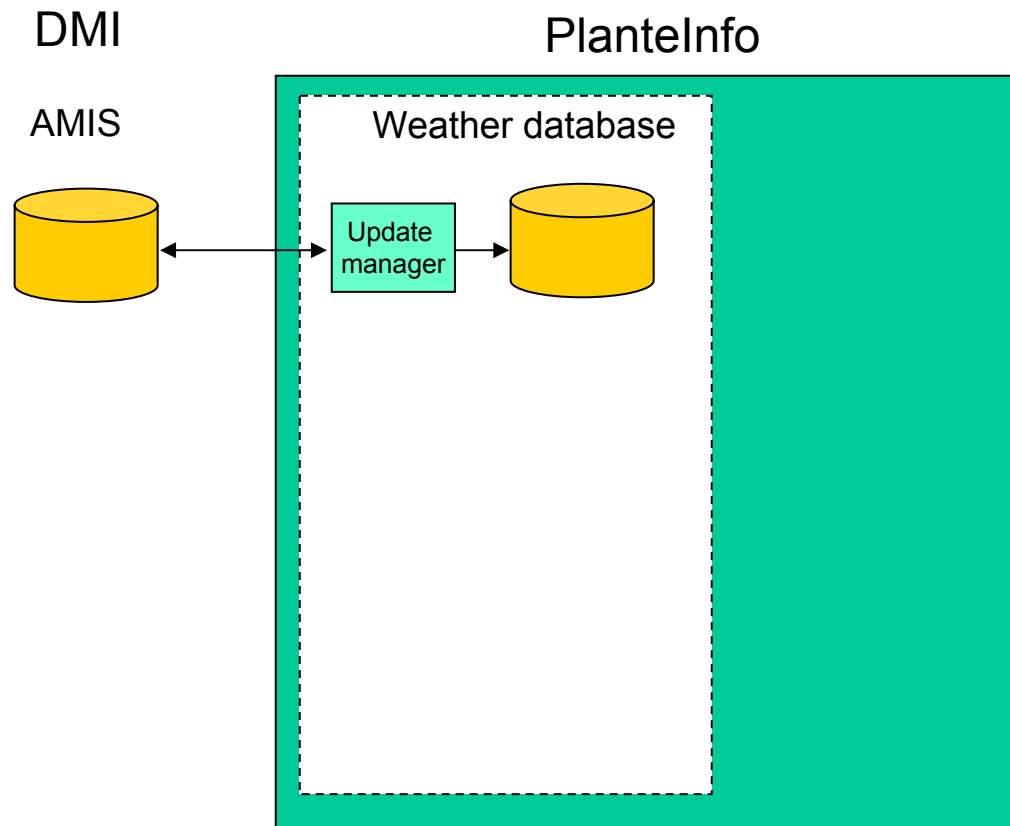
Weather data

DMI

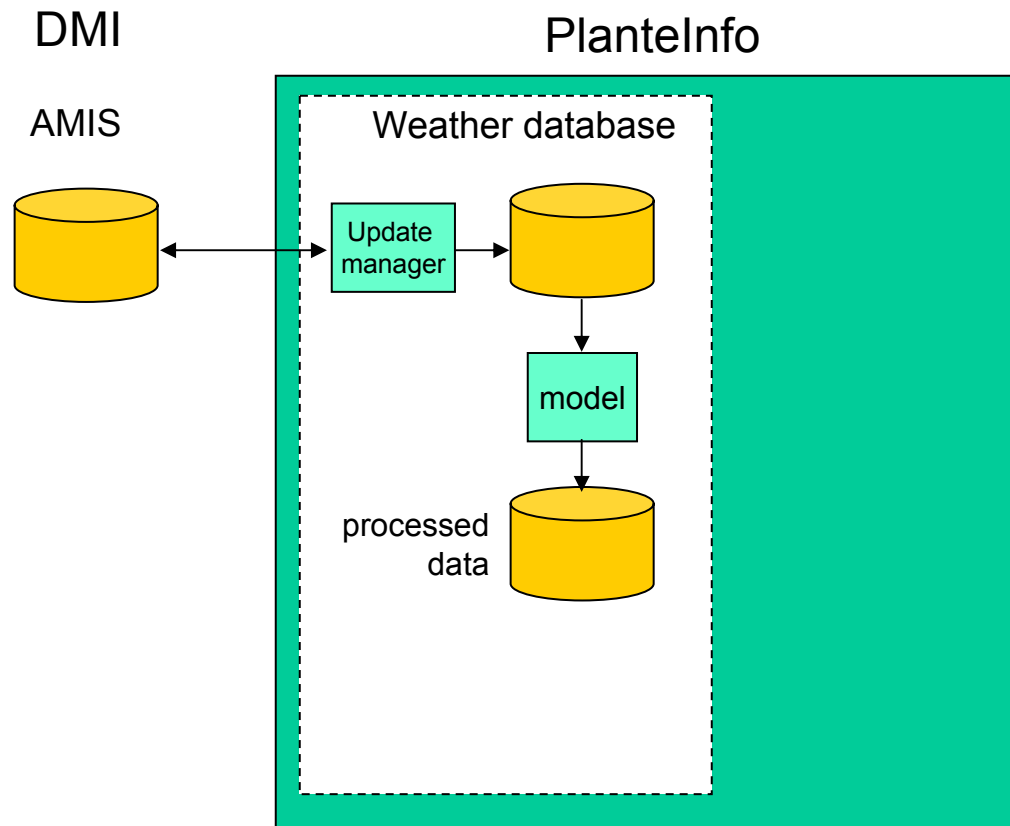
AMIS



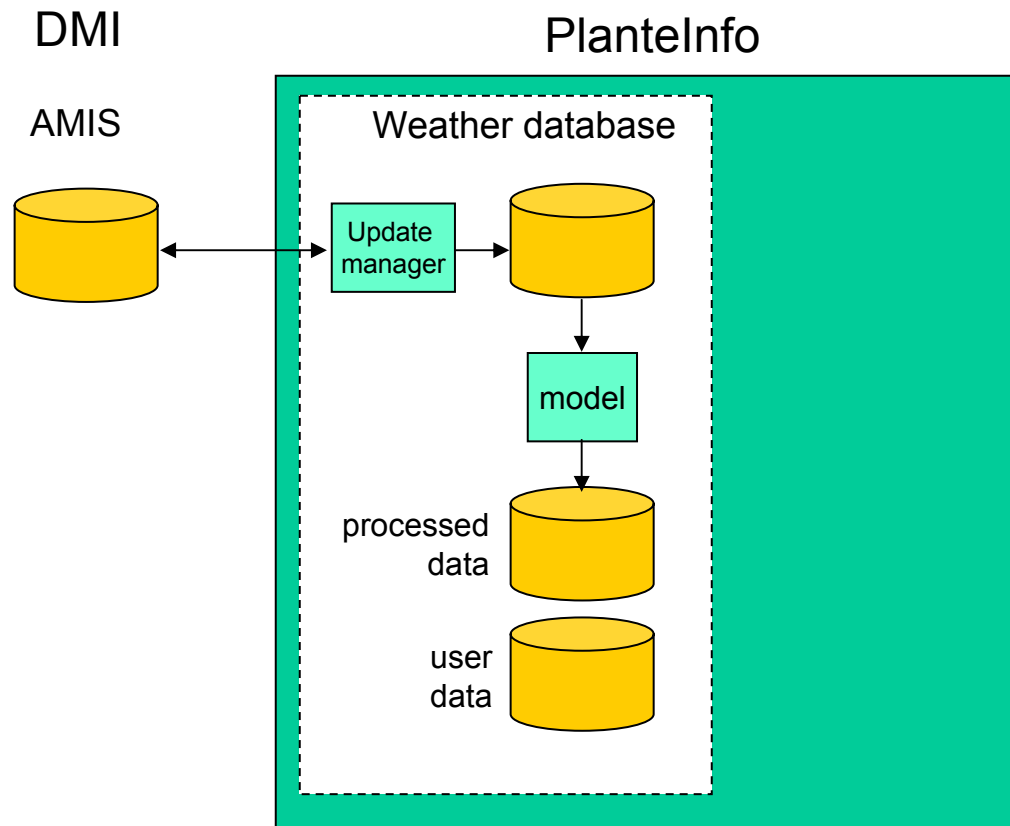
Weather data



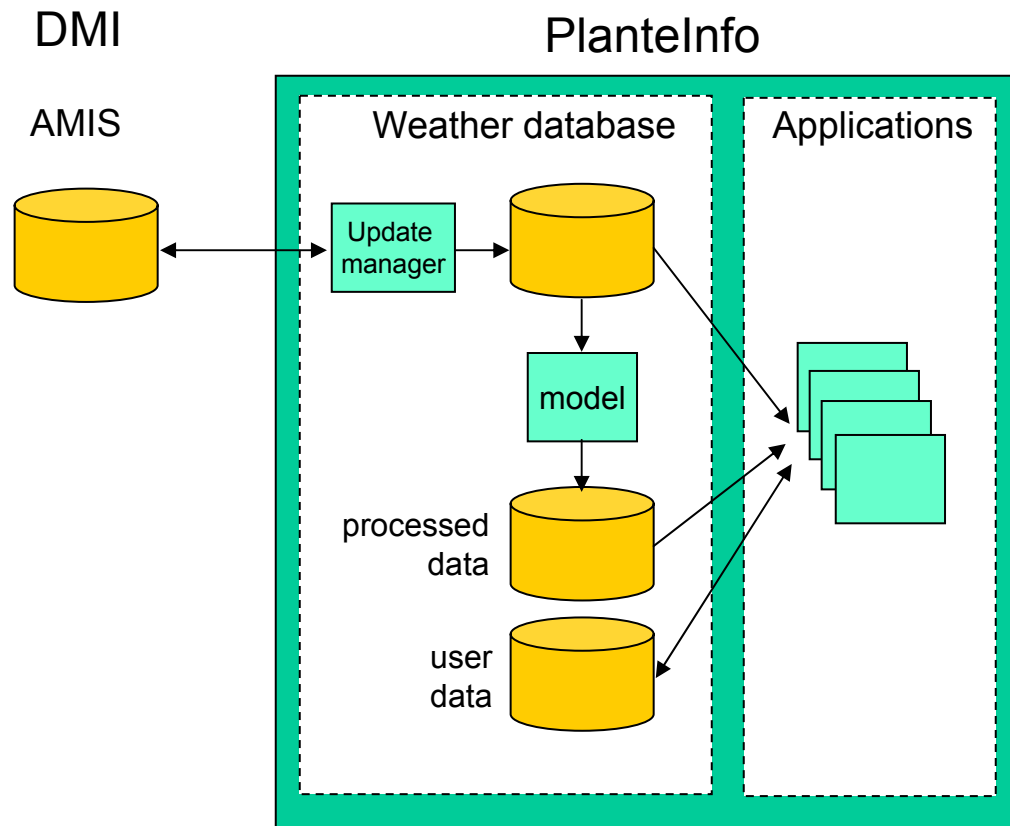
Weather data



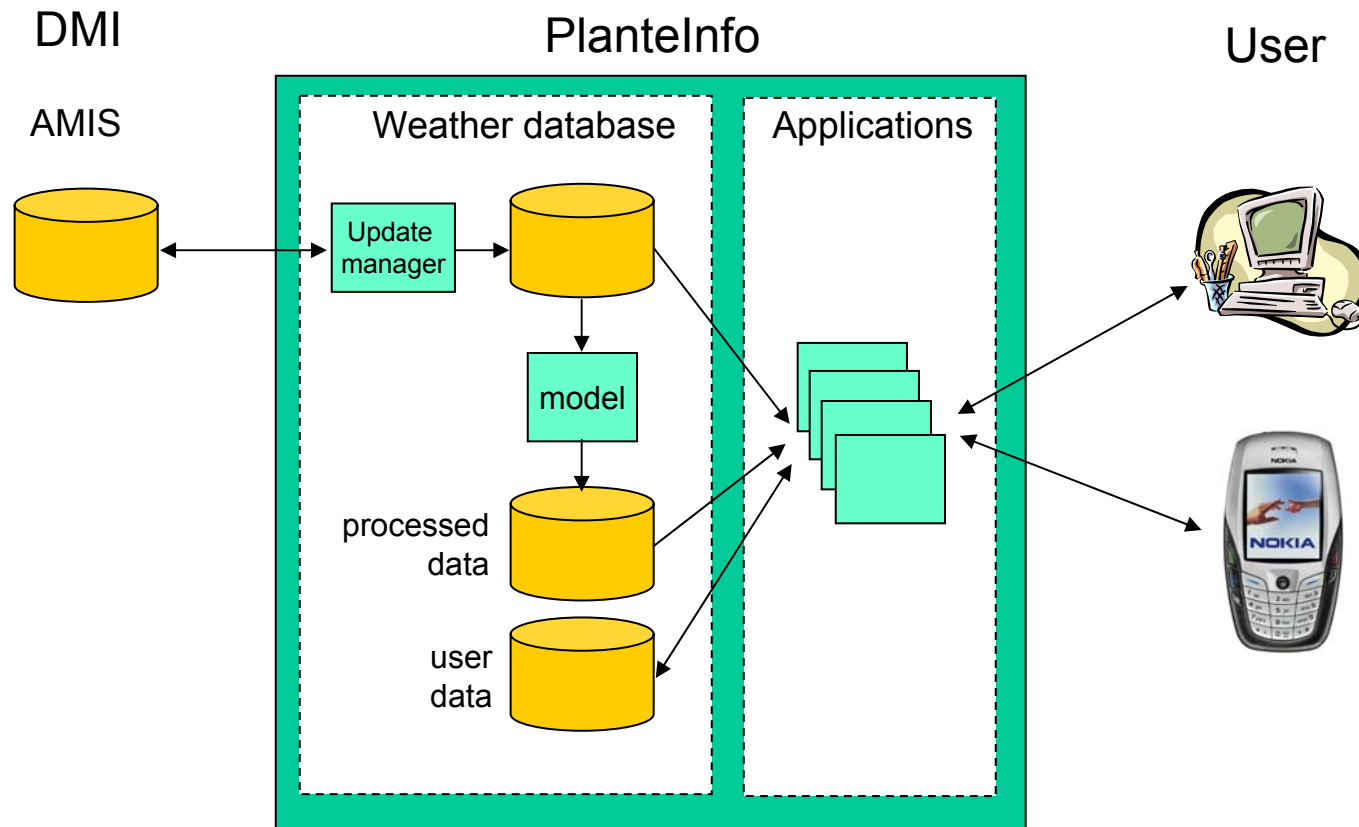
Weather data



Weather data

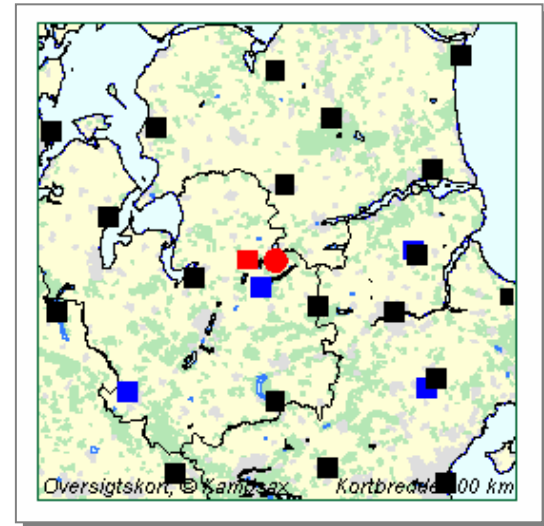


Weather data



Internet-based collaboration

- Sharing of data
 - open rain measurements
 - open irrigation info
- Collaboration
 - subscription system
 - models, components
- eAdvice
 - Services by advisers to customers



Smartphones



Nokia 6600



Siemens SX1



Sony Ericsson P900

Smartphone technology

- WAP 2.0 (XHTML)
- Internet browser (Opera)
- Screen (minimum 175 by 200 pixels)
- GSM mobile telephone network (covers 98% of Denmark)
- GPRS data transmission (~40kbps)

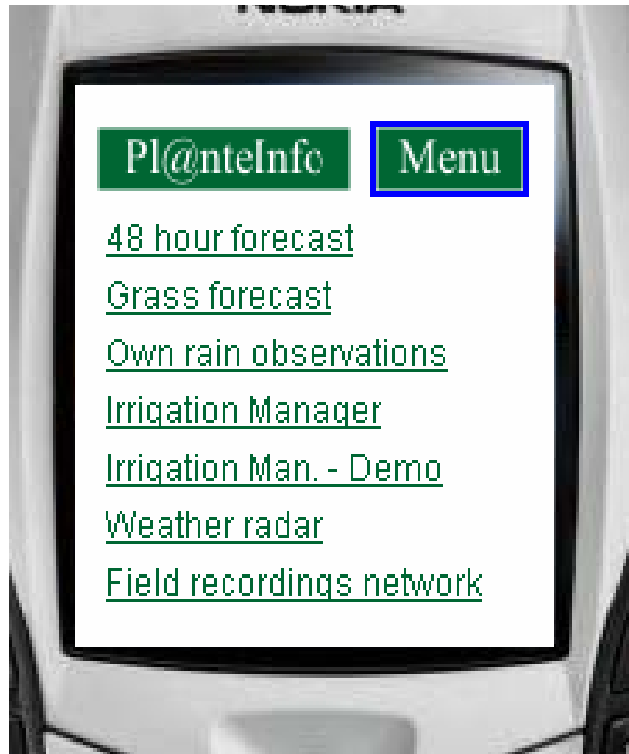
User interface

Smartphone vs. computer:

- Small screen
- Low bandwidth (GPRS)
- Limited keyboard
- No mouse or cursor

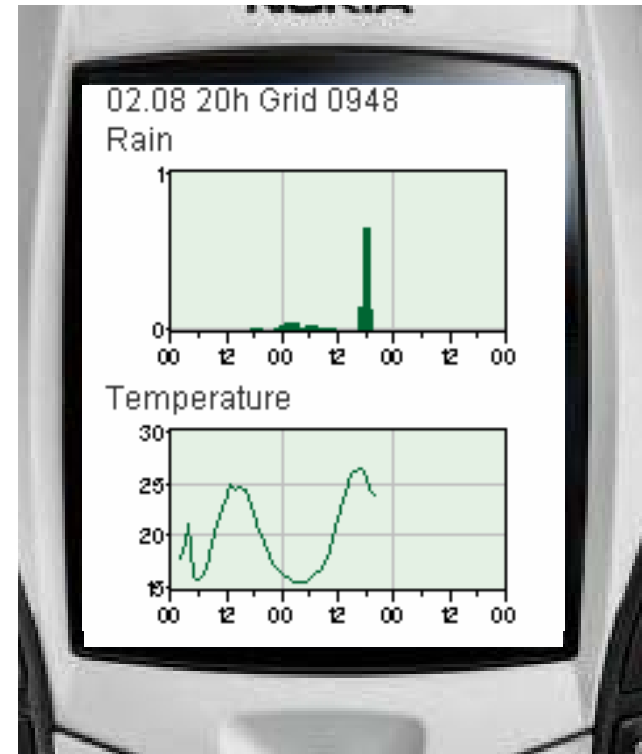
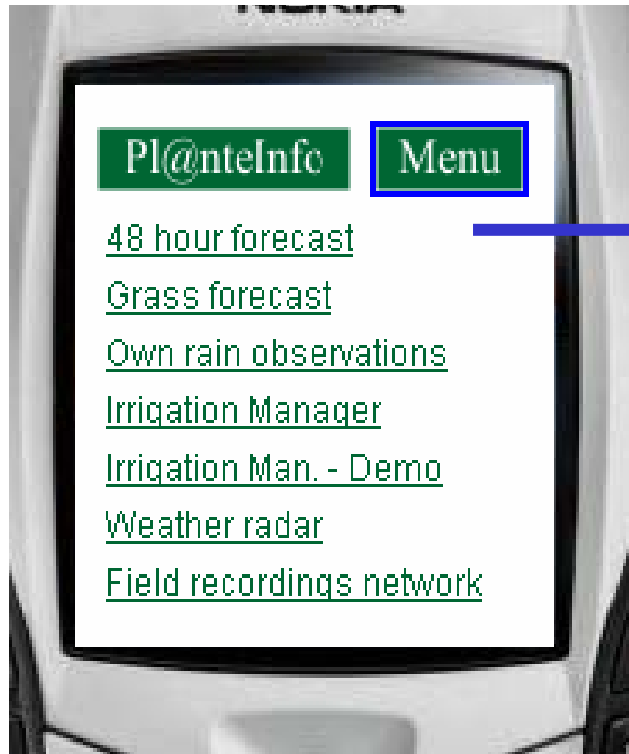


PlanteInfo Mobile

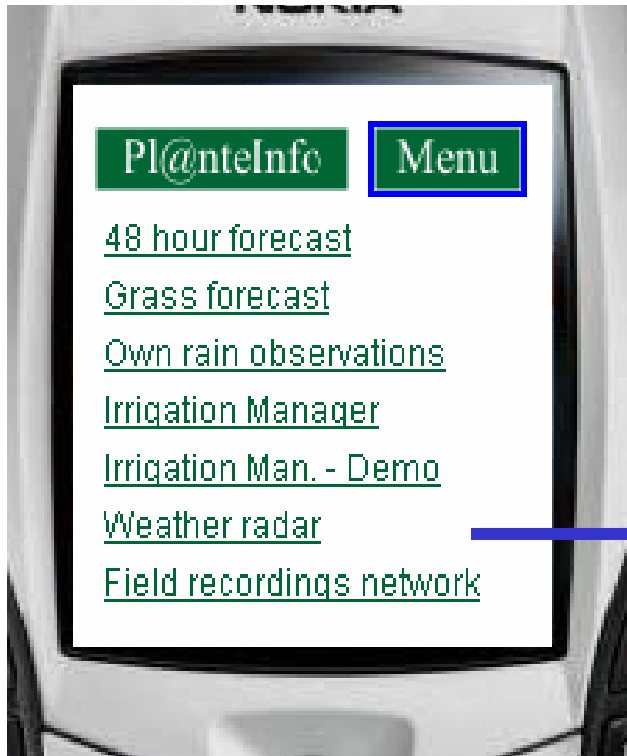


- Selected facilities from PlanteInfo where mobile access is an advantage
- Set-up of subscription and DSSs made on pc
- Automatic detection of browser (pc or smartphone)
- Automatic login

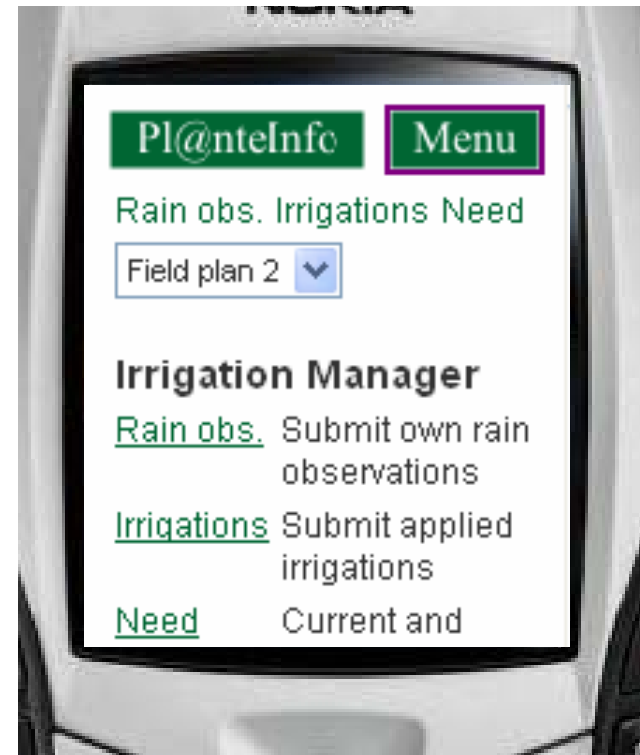
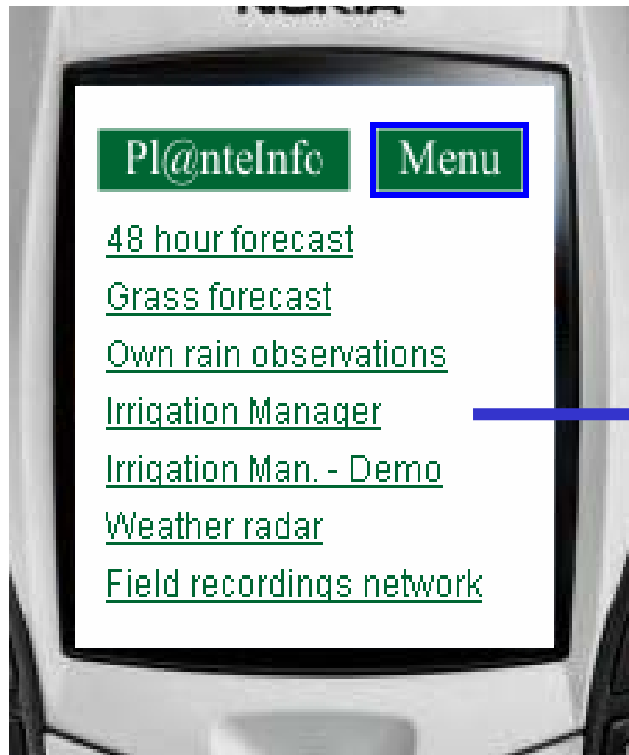
PlanteInfo Mobile



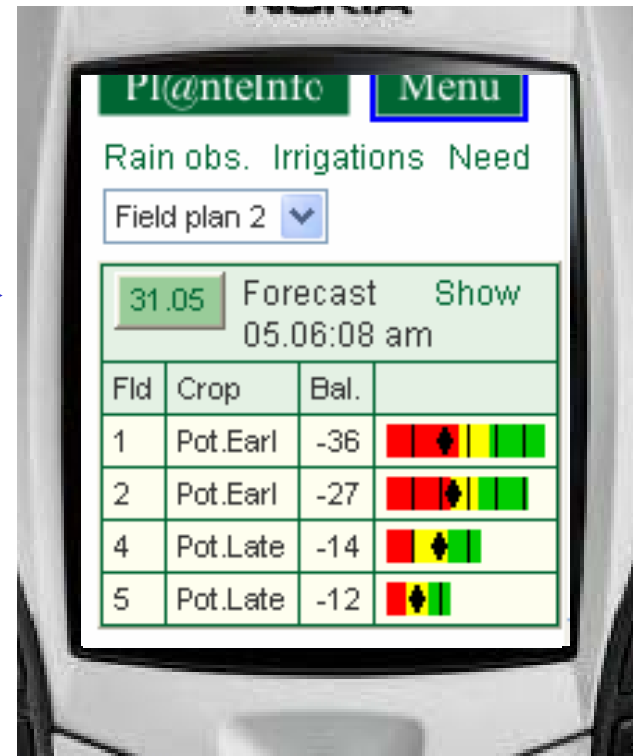
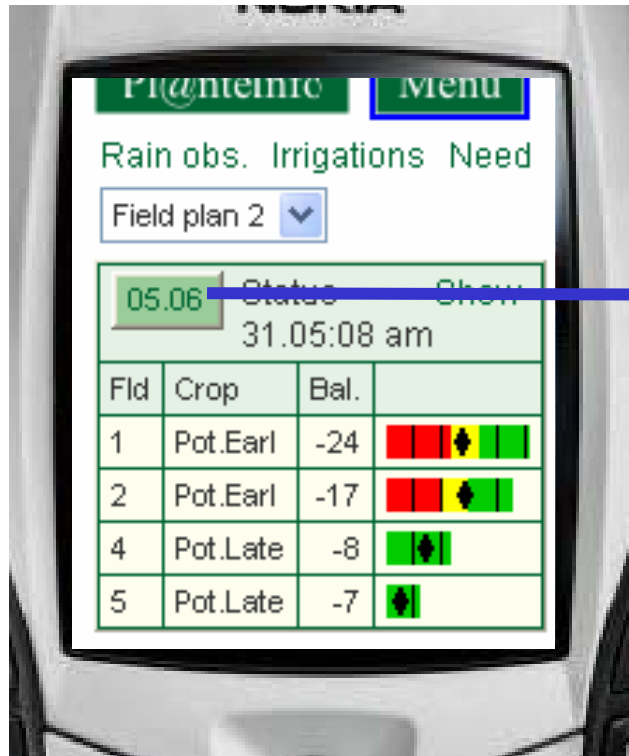
PlanteInfo Mobile



PlanteInfo Mobile



PlanteInfo Mobile



PlanteInfo Mobile

Rain obs. Irrigations Need

Field plan 2

Submit irrigation

Field	Latest		<< 31.05
	Date	mm	mm
1		<input type="text" value="24"/>	
2		<input type="text" value="17"/>	
3		<input type="text"/>	
4		<input type="text"/>	

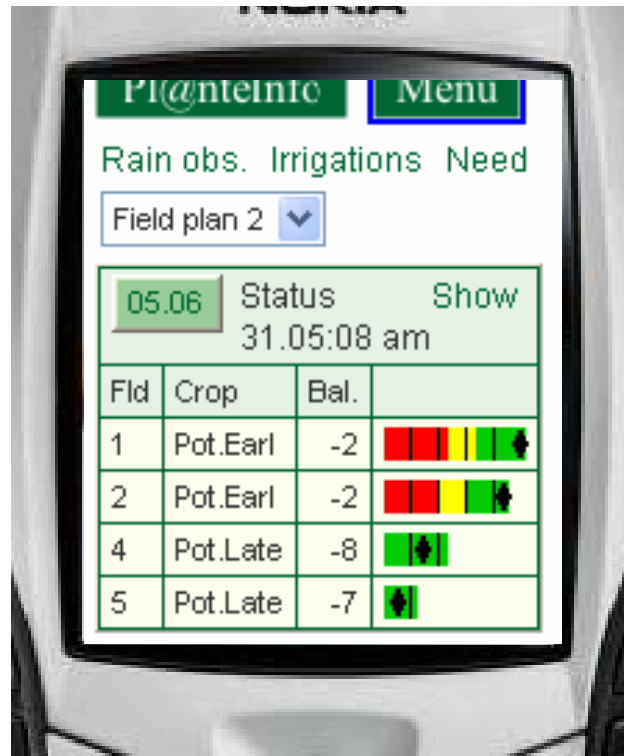
Rain obs. Irrigations Need

Field plan 2

Submit irrigation

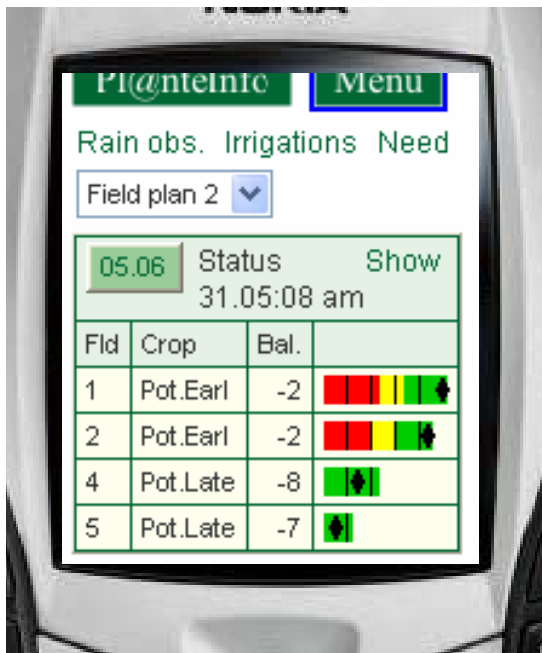
Field	Latest		<< 31.05
	Date	mm	mm
1	31.05	24	<input type="text"/>
2	31.05	17	<input type="text"/>
3			<input type="text"/>
4			<input type="text"/>

PlanteInfo Mobile



User interfaces

Mobile browser



Web browser

The web browser interface shows a title bar 'PlantInfo: Vandregnskab - Vandbehov - Microsoft Internet Explorer'. The menu bar includes 'Filer', 'Rediger', 'Vis', 'Foretrykne', 'Funktioner', and 'Hjælp'. The address bar contains 'Tilbage', a search icon, and 'Søg'. The main content area features a dropdown menu for 'Field plan 2' and a table with columns for 'Field #', 'Name', 'Soil type', 'Crop', and 'Balance mm'. The table contains five rows of data, each with a color-coded bar and a 'Details' button. A 'Print' button is also visible.

Field #	Name	Soil type	Crop	Balance mm
1	North field	1	Potatoes, early	-2
2	East field	1	Potatoes, early	-2
4	South field	1	Potatoes, late	-8
5	West field	1	Potatoes, late	-7

User interface - Experience

- Small screen:
 - Only scroll in one direction (vertically)
 - Put most important info in top left corner
 - Avoid frames, multiple windows
 - Colours have less contrast

User interface - Experience

- Low bandwidth:
 - Reduce html code, use CSS
 - Reduce image number and file size (compress)
 - Reduce use of JavaScript

User interface - Experience

- Limited keyboard:
 - Avoid text input from user, unless crucial
- No mouse or cursor:
 - Navigation by scrolling or jumping from link to link
 - Some JavaScript events don't work (onMouseOver,...)



Conclusion

- PlanteInfo uses internet to give dynamic, personalised information and decision support
- PlanteInfo uses internet-based collaboration
- System for automatic update of weather database
- PlanteInfo on computer and mobile
- PlanteInfo Mobile is a supplement