Internet and Mobile Technologies for Agrometeorological Applications

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Background

Pct. Danish households

2004:
PC: 81%
Int.net: 71%
Mobile: 90%

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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
Background: PlanteInfo

2 days prognosis 08.09.04 kl. 02.00 for grid 0589

- Humidity (mm/h)
- Temperature (°C)
- Relative humidity (%)
- Wind speed (m/s)

The prognosis is calculated with data from 08.09.04 kl. 02.00 for grid 0589.
Next prognosis will be at kl. 08.00 and is scheduled for kl. 12.00.
Farmers need information in the field
Information by SMS

<table>
<thead>
<tr>
<th>Hour</th>
<th>Rain (mm)</th>
<th>Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>09</td>
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<td>14.6</td>
</tr>
<tr>
<td>10</td>
<td>0.0</td>
<td>14.9</td>
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</tr>
<tr>
<td>12</td>
<td>0.2</td>
<td>16.0</td>
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<tr>
<td>14</td>
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<td>17.1</td>
</tr>
<tr>
<td>15</td>
<td>0.0</td>
<td>17.7</td>
</tr>
</tbody>
</table>

www.planteinfo.dk
Mobile phones with Internet access
Weather data

DMI

AMIS
Weather data

- **DMI**
- **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

DM

AMI

PlanteInfo

Weather database

Update manager

model

processed data

user data

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Weather data

DMI

AMIS

Update manager

model

processed data

Weather database

user data

Applications

PlantInfo
Weather data
Internet-based collaboration

- Sharing of data
  - open rain measurements
  - open irrigation info

- Collaboration
  - subscription system
  - models, components

- eAdvice
  - Services by advicers to customers
Smartphones

Nokia 6600
Siemens SX1
Sony Ericsson P900

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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

48 hour forecast
Grass forecast
Own rain observations
Irrigation Manager
Irrigation Man, - Demo
Weather radar
Field recordings network

02.08 20h Grid 0948
Rain

02.08 20h Grid 0948
Temperature
PlanteInfo Mobile

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PlanteInfo Mobile
PlanteInfo Mobile

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PlanteInfo Mobile
PlanteInfo Mobile
User interfaces

Mobile browser

Web browser
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