Sensor technology in agriculture

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Agri Yield Management

Combining
knowledge, sensor systems, information technology and crop information

Jan Hadders, Dacom BV

FHI PLATFORM OMGEVINGSTECHNOLOGIE


GRIMME
HERCULES

since 1987

Dacom : support farmers with high-quality systems and services in the optimization of their yields

Leading Agri Yield Management

Dacom International activities :

RIWA Project, Kindom of Saudi Arabia

Rationalization of the **I**rrigating **W**ater in **A**griculture

watersense

جهاز أبـو ظبـي للرقابة الغذائية
Abu Dhabi Food Control Authority

PEPSICO

SKY LARK
Duurzaamheid Doorgrond

bejo

FARM FRITES

masterplan
Phytophthora

ALPHI
ACTUAL LOCAL PHYTOPHTHORA INFORMATION

LambWeston Meijer

syngenta

McCain

nadec
Everyday

MasterLink

Heineken

Unilever

Ministry of Agriculture and Land Reclamation
Agricultural Research Center
Natio

INTER SNACK

Agri Yield Management

Combining :

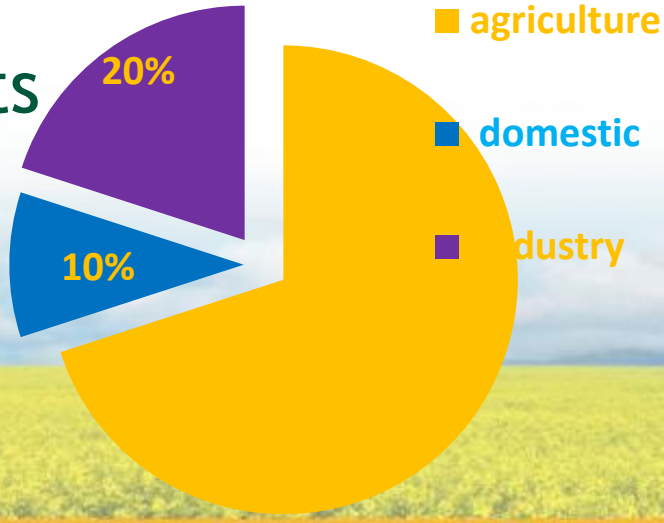
- **scientific knowledge**
- **sensor systems**
- **information technology**
- **crop information**

To generate information and advice
for all levels of farm management
to take the right actions
during the growing season

Agri Yield Management

Challenges of the agriculture:

- **Responsible for the global food production.**
  - ✓ Consumer demand will double in the next decennia
  - ✓ Consumer demands safe and sustainable food
  - ✓ Availability of farm land
  - ✓ Availability and cost of input products
  - ✓ Climate change
  - ✓ Availability of (irrigation)water



AYM data management:

Scientific knowledge and expertise

Climate: forecast & sensor data

Products: basic data & values

Crop: soil & field data

DACOM

DATABANK

DACOM SOLUTIONS

INSECT CONTROL

DISEASE CONTROL

IRRIGATION MANAGEMENT

FERTILIZER MANAGEMENT

Type of Plant sensor systems

- **Continuous sensing (C)**
- **Interrupted sensing (I)**

- **"Image" sensors** (implementation over the next 5 – 10 years)
  - Satellite (I)
  - UAV (I)
  - Ground Vehicle (I)
  - Plant Contact (I/C)

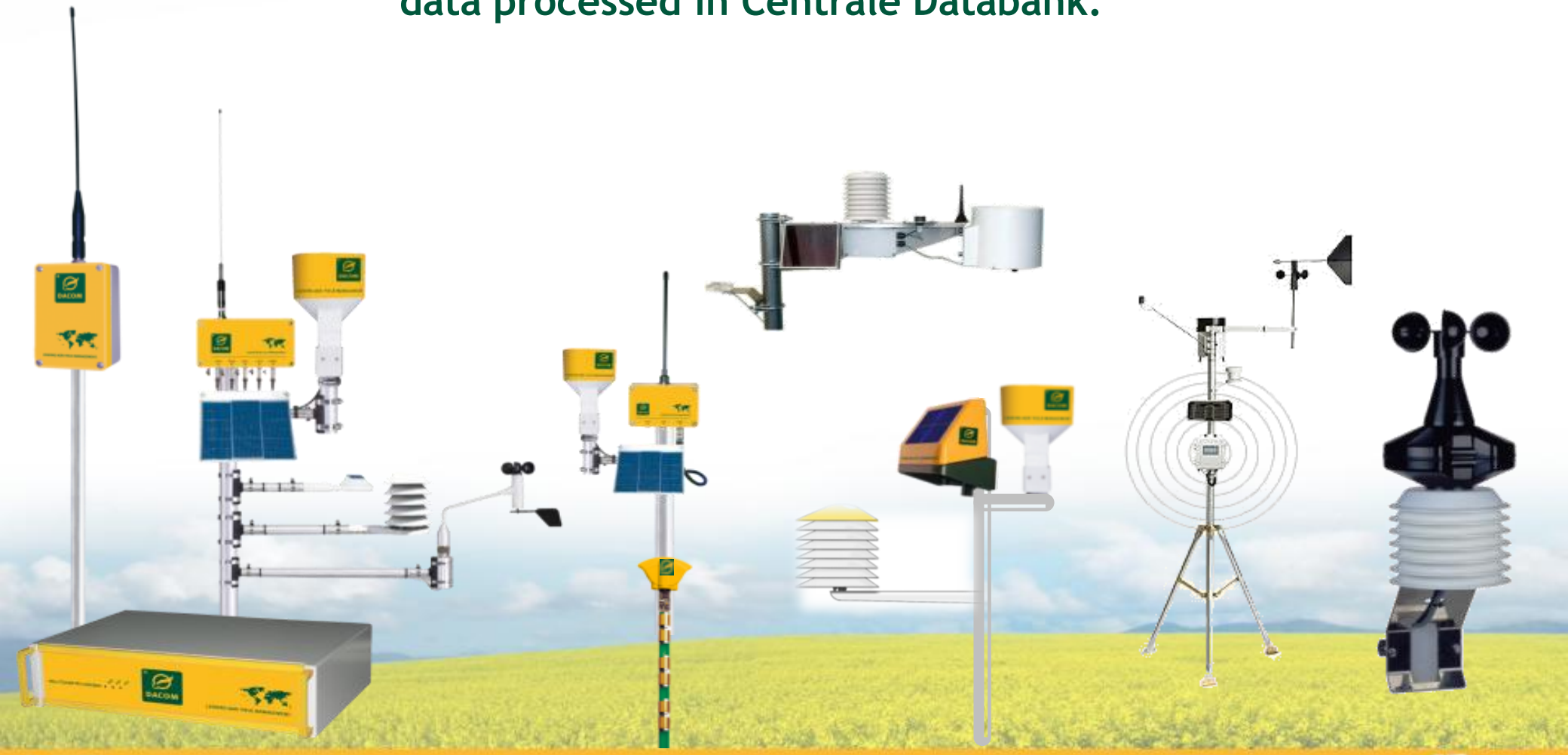
- **Environment sensors** (currently implemented)
  - Above ground (C)
  - Under ground (C)

LOKALE
WEERSGEGEVENS

DACOM INPUT

Dynamic Environmental Data Interface

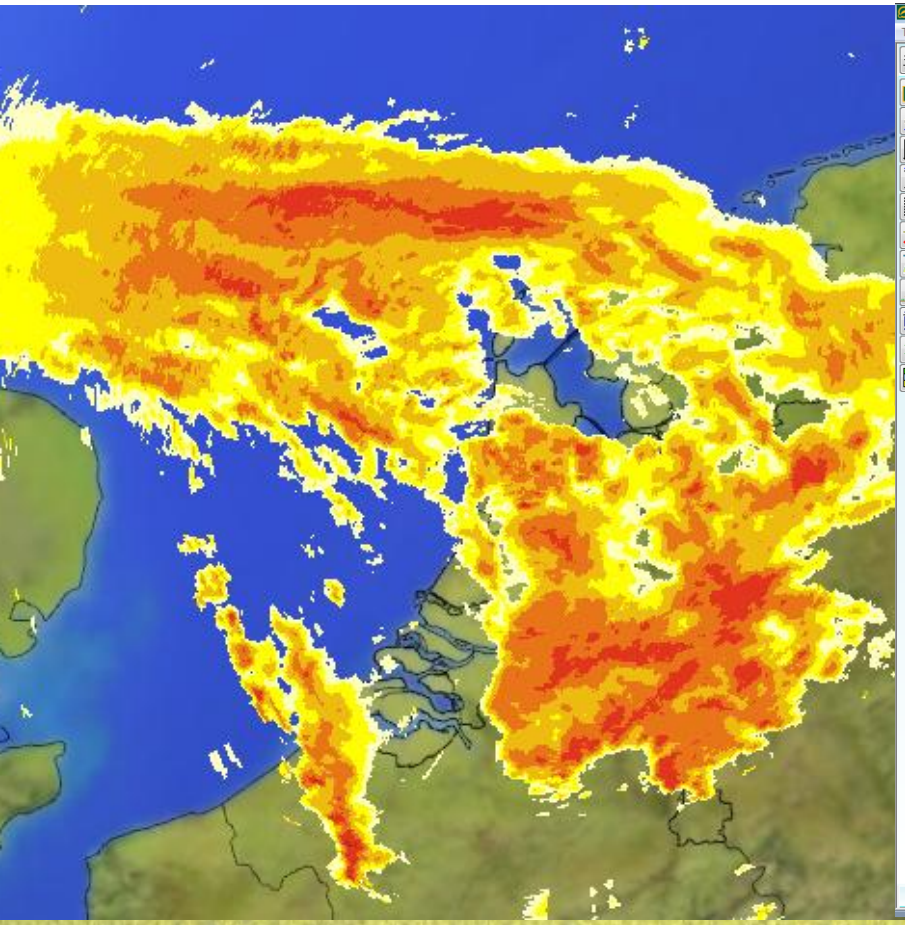
for data of all types of weather stations, data processed in Centrale Databank.

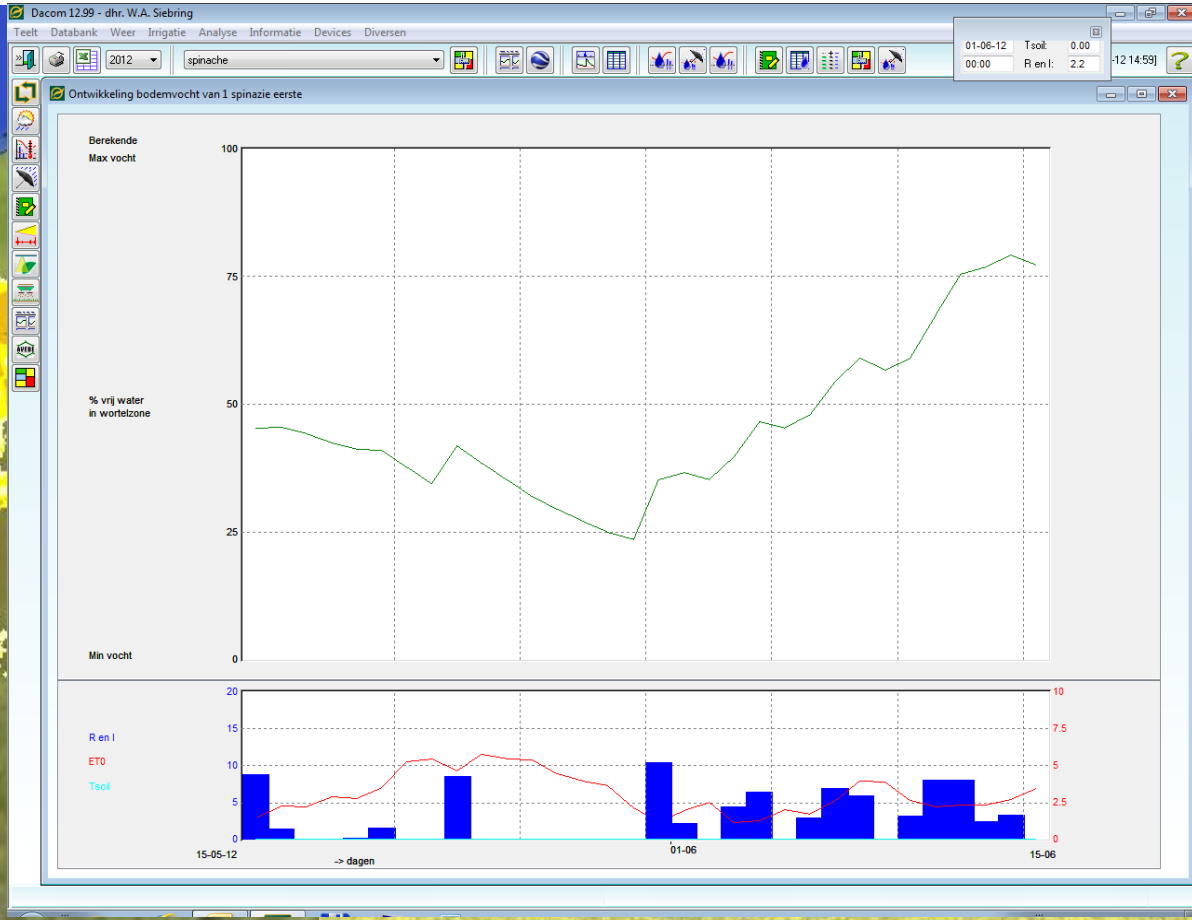


Climate:
forecast
& sensor data

DACOM INPUT

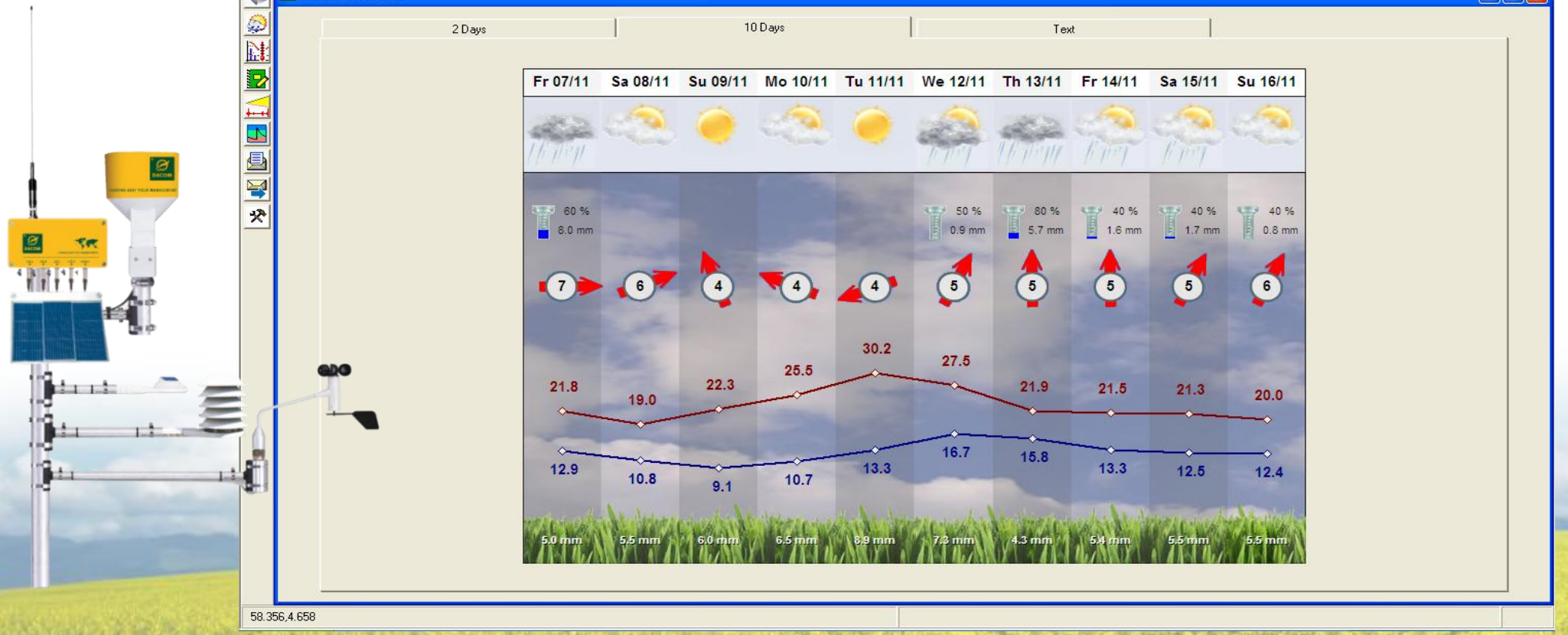
Radar images translated into mm of rain per 1 x 1 km, per image





Climate:
forecast
& sensor data

Agri weather forecast
for any (farming) site in the world



DISEASE
CONTROL

Disease management

AYM: precision timing and dose

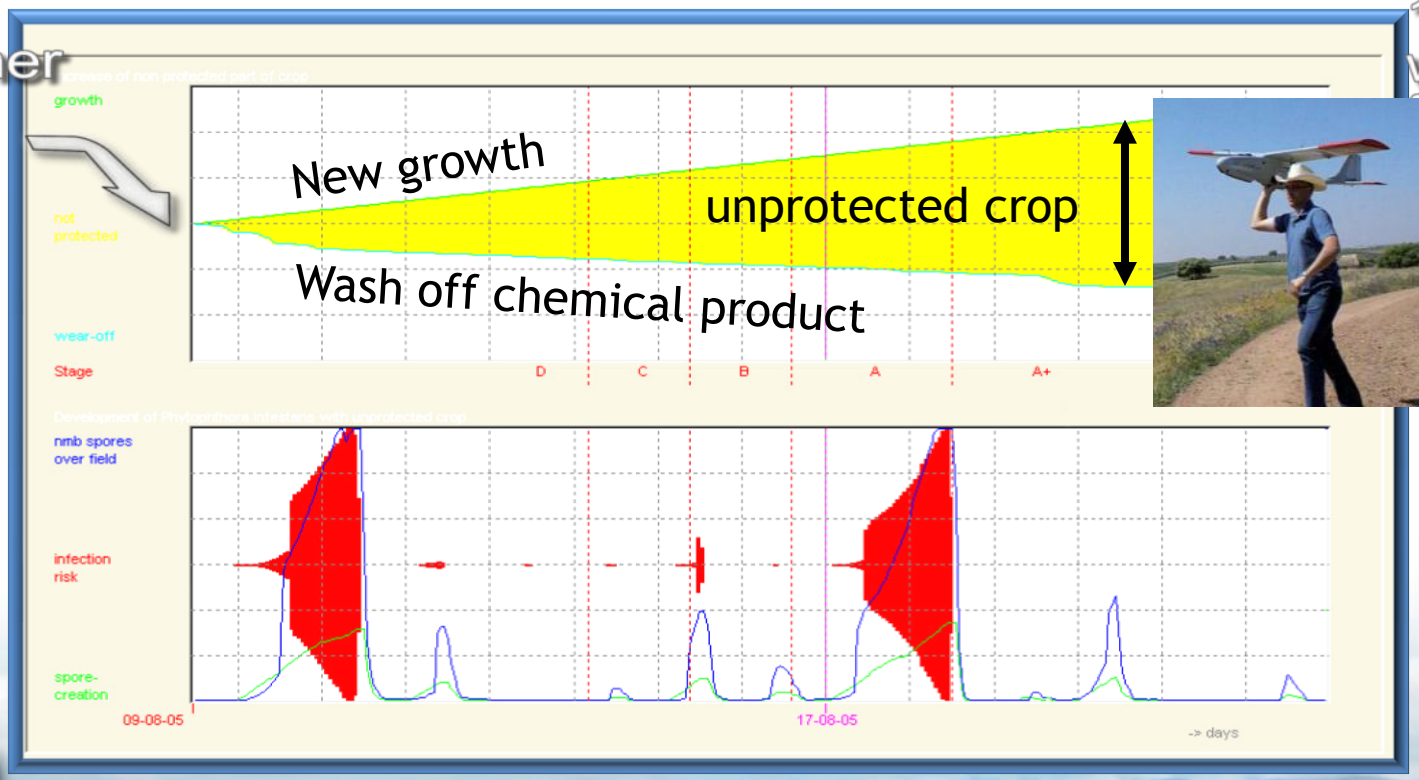
Boston, USA 1845-1850: arrival of starving people because of the Irish famine caused by Potato Late Blight

The 2012 situation:
crops still need protection with large doses of chemicals.

DISEASE CONTROL

Biological model runs life cycle of fungus to determine infection events

local weather data



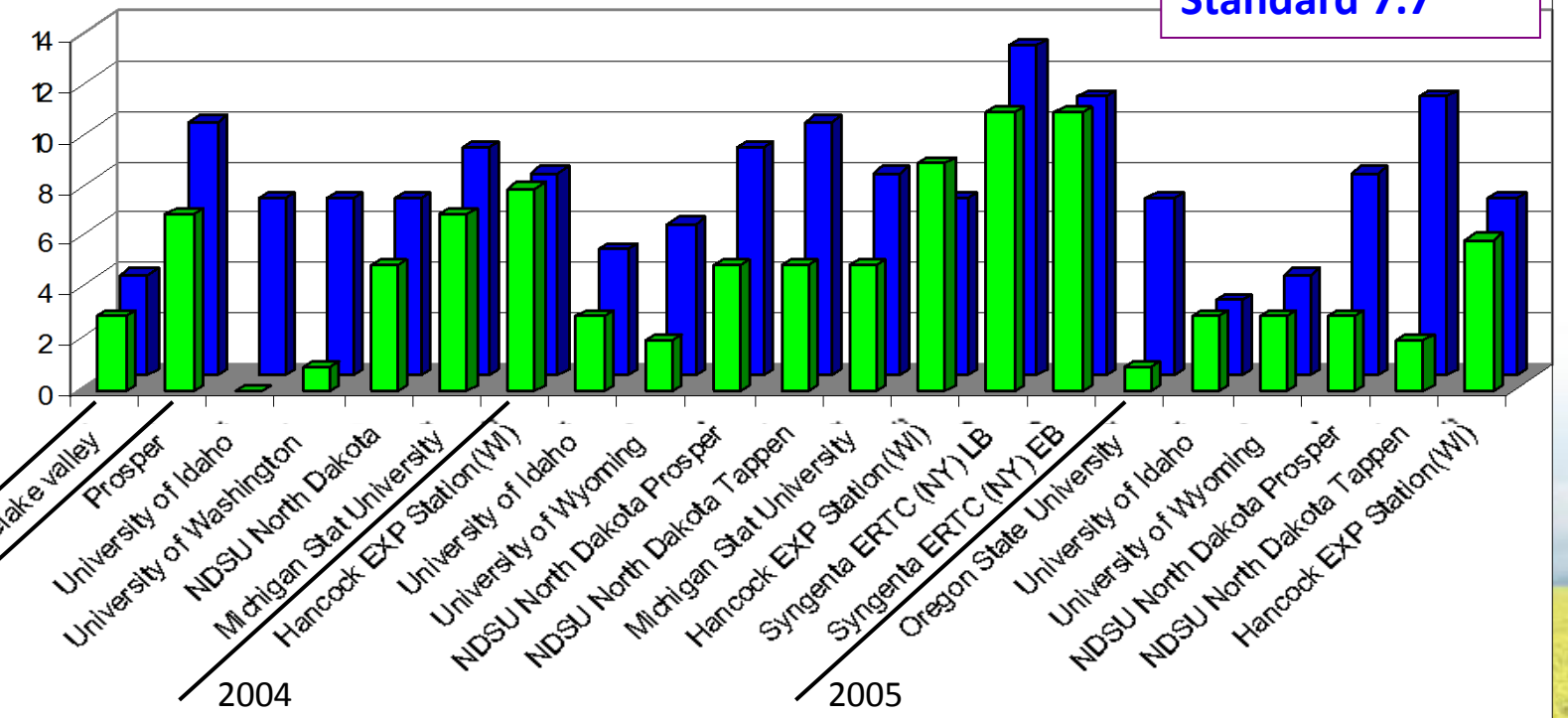
10 days weather forecast

Agri Yield Management: all elements put to work resulting in an accurate advice to put on a chemical or not....saving > 25 % of chemicals.

Number of Spray Applications 2002-2005 (n=21)

Dacom 4.8

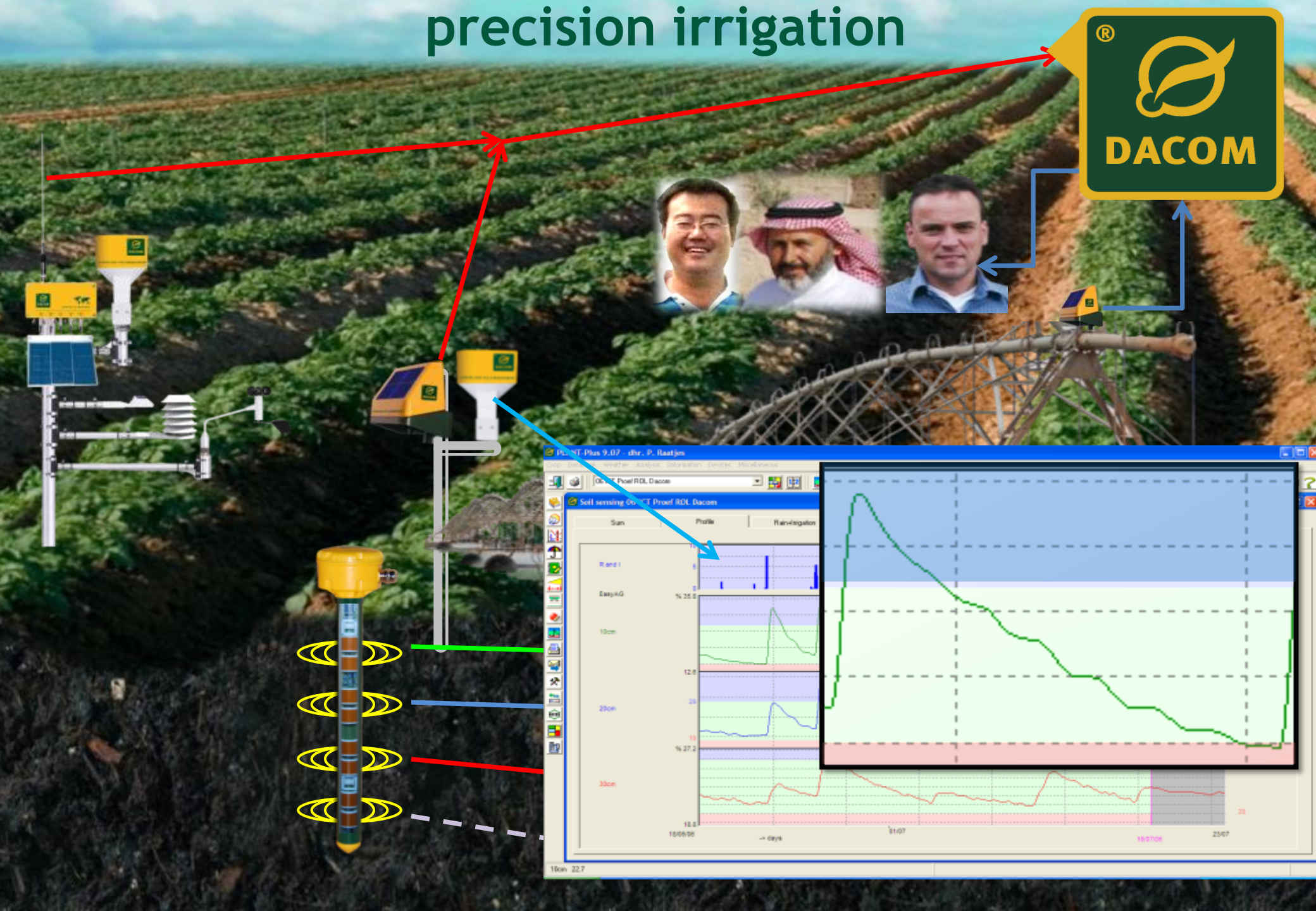
Standard 7.7



Agri Yield Management

DACOM

precision irrigation




Precision irrigation:
30 - 50 %
reduction possible

Dacom strategic sensors

Dacom strategic sensors

Under ground /
Soil sensors

Sensor gateway

Absolute control over <u>sensors</u> , <u>gateway</u> and user interface

The **Intellectual Property** of these products always to be at Dacom:
exclusive or shared with other markets ...

In real life there are always "**issues**" about this ownership

Investments in marketing effort versus development effort: 2 : 1

Future strategy

- Continue to develop/improve specific sensors with intelligence to:
  - Give real time advice on crop management
  - Predict harvest yield and quality well in advance for processors
  - To simplify the implementation
- Sensors for measuring salinity and nutrients in continuous measurement
- Sensors to measure crop characteristics periodical over larger area

Summary

- Sensors play an important part in modern agriculture
- Sensor data needs intelligence by combining it with:
  - Scientific knowledge
  - Information Technology
  - Field data
- Sensors are sometimes generic, sometimes agri-specific
- Agri-sensors have to work under harsh conditions, from Dutch polder to Saudi desert
- Implementation of Agri-sensors have proven to reduce fungicides and irrigation by > 25%
- **Testing complex interaction with nature is done in practice.....**


Agri Yield Management
Sensor innovation
=
building sustainable agriculture
Leading Agri Yield Management

(International) innovation…
a matter of trust

OCTOBER 18TH 2012
RDM CAMPUS
ROTTERDAM

EUROPEAN CEEES SEMINAR

EUROPEAN RELIABILITY AND ENVIRONMENTAL TESTING CONNECTED

FHI PLATFORM OMGEVINGSTECHNOLOGIE