Agriculture benefit from the LOFAR infrastructure

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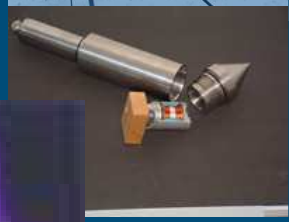
LOFAR

LOFAR

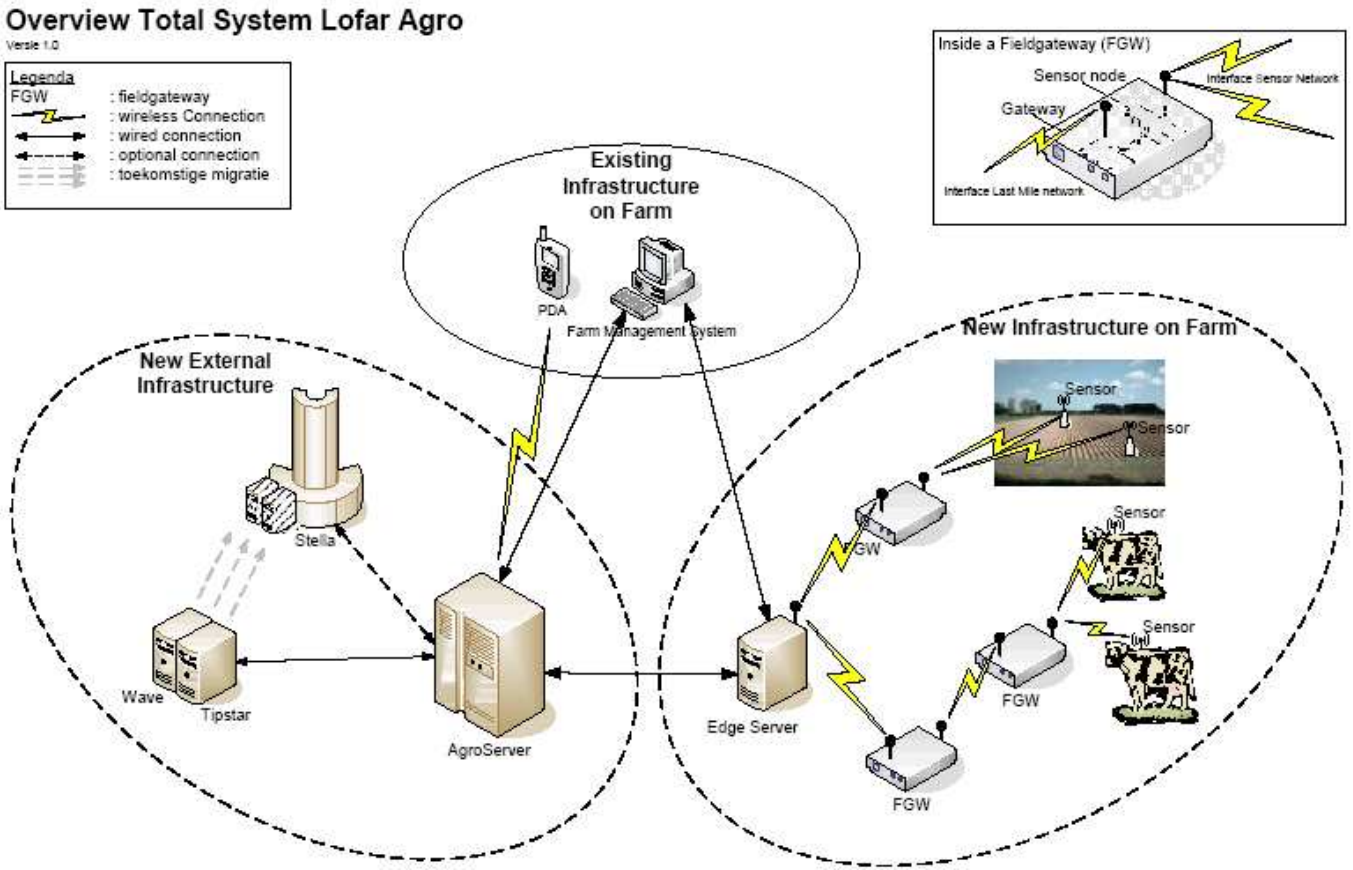
- ASTRON initiative
- ICT project
- Large number of small sensors (antennas) form together one big antenna
  - Radio waves from hemisphere and vibrations in earth
- Infrastructure for data transport
- Need for processing power (Stella)



Can this infrastructure be used in agriculture?

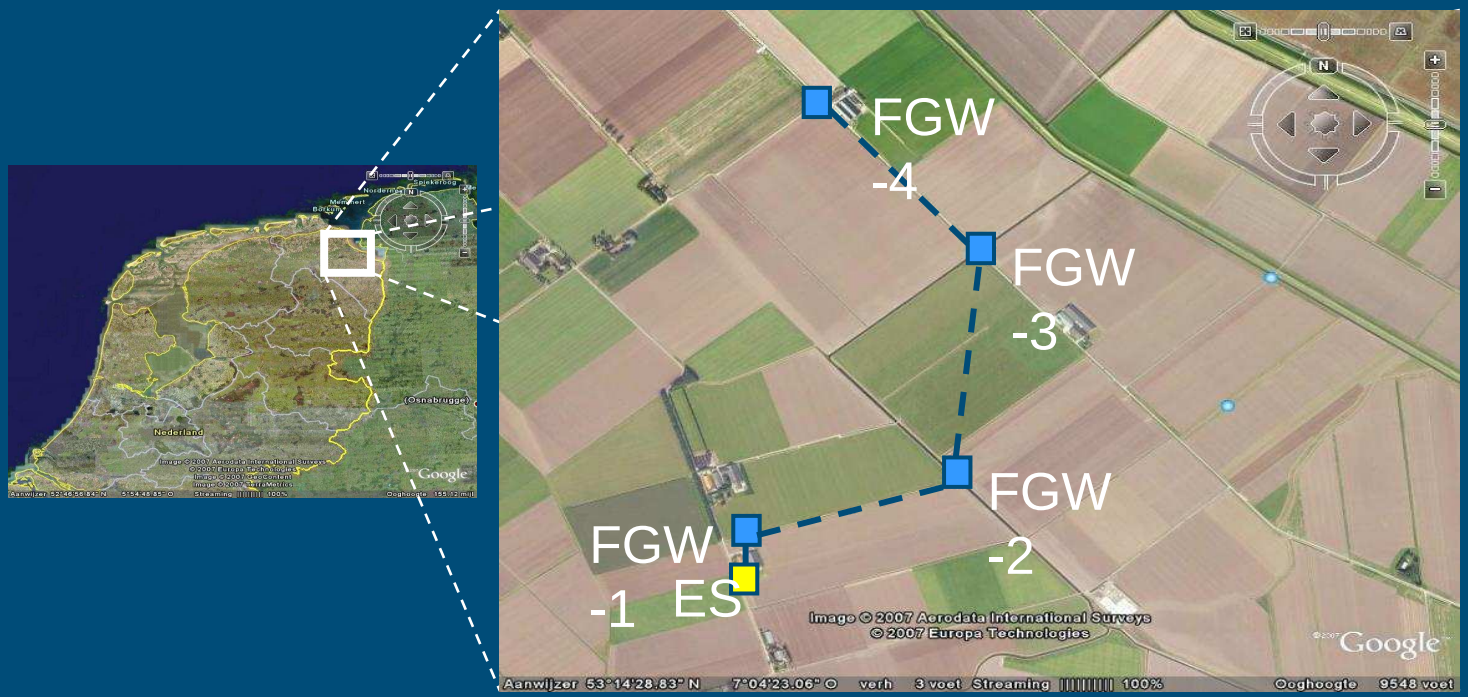
- New possibilities for?
  - (Wireless) Sensors
  - Infrastructure
  - Models
  - Processing power
- Business?
  - Farmers
  - Industry
  - ASTRON
  - Researchers

LOFAR Agro Infrastructure



Four ‘projects’ addressed

- **Last Mile:** connecting wireless sensor networks in a rural area to the LOFAR infrastructure

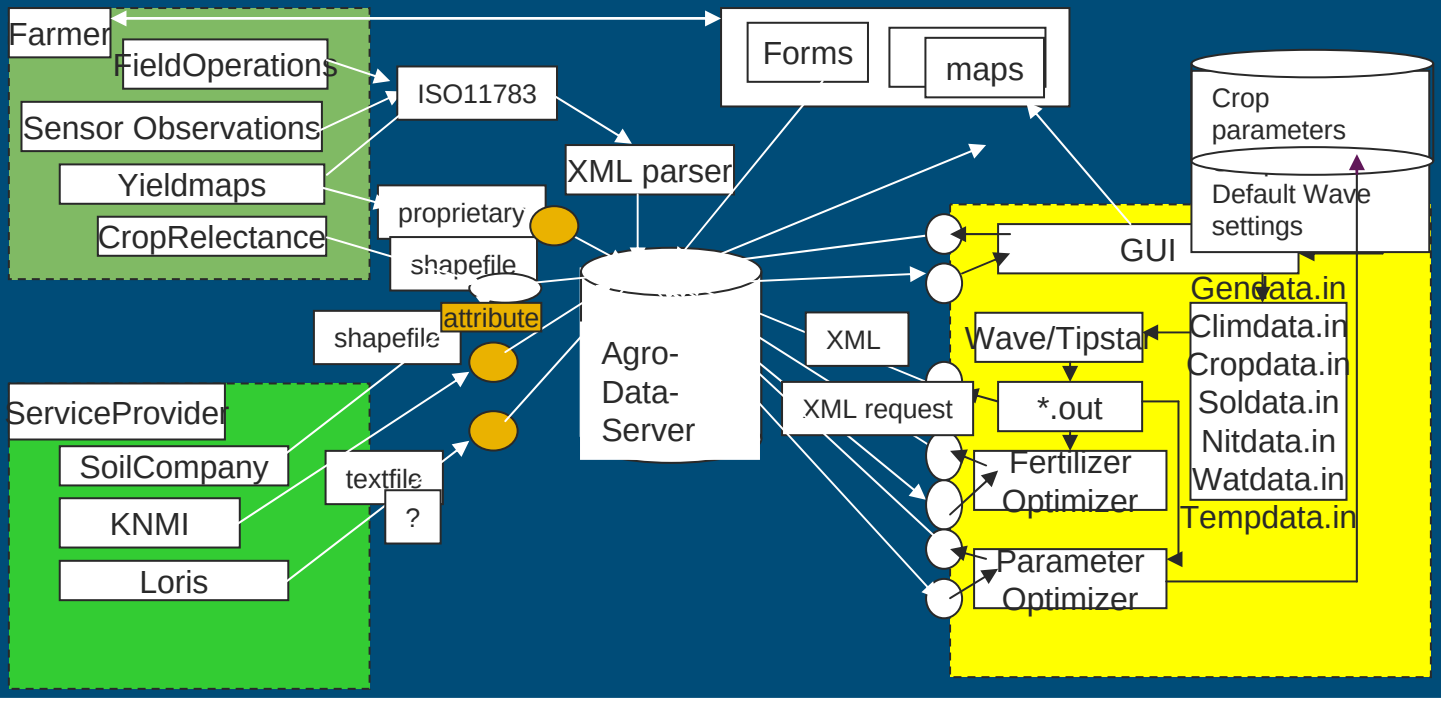


Four ‘projects’ addressed

- **Phytopthora:** micro climate observation and modelling

Four ‘projects’ addressed

- **Precise Soil and Water:** fertilising on sub-parcel level during growing season based on a dynamic ‘real time’ fertilising model and weather forecasts.

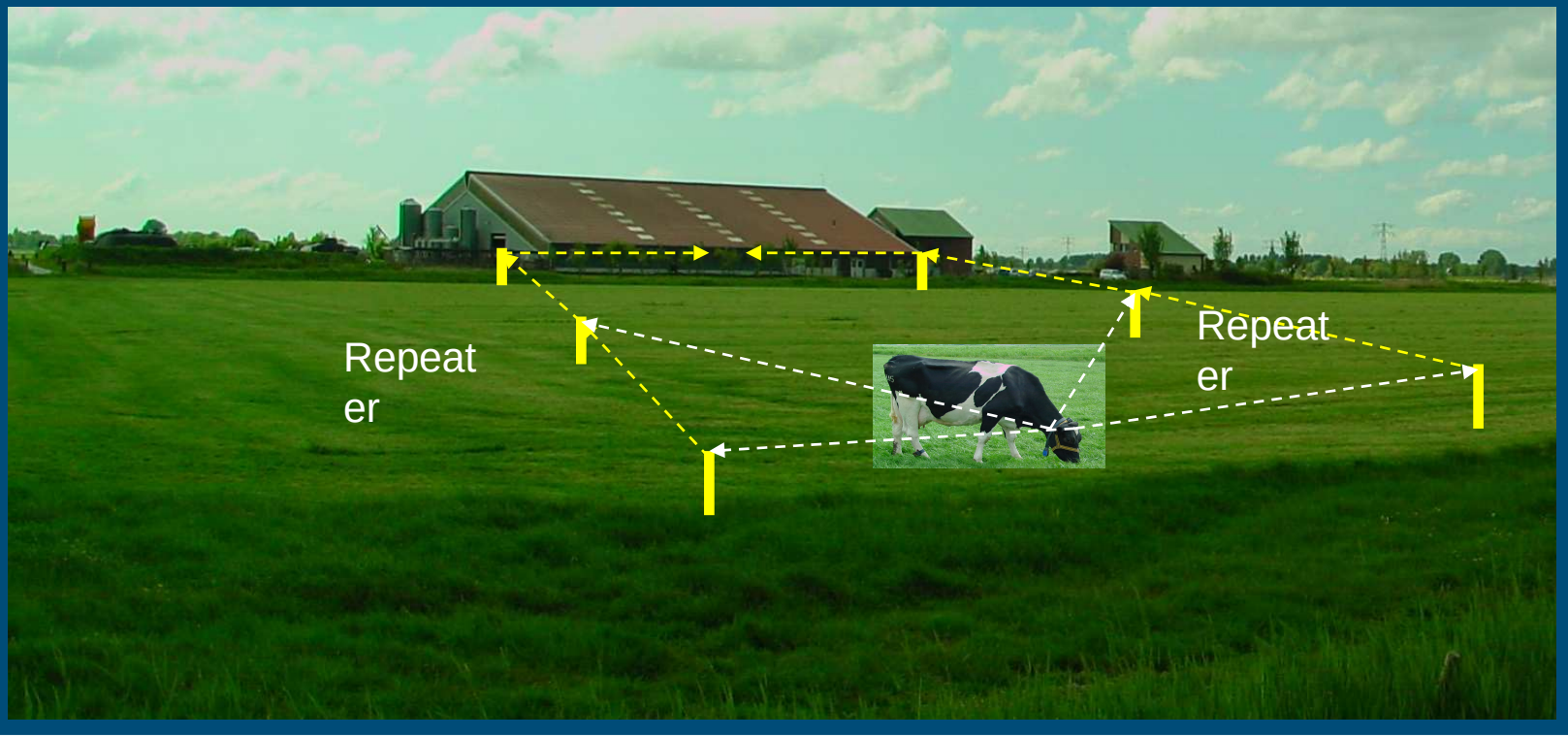


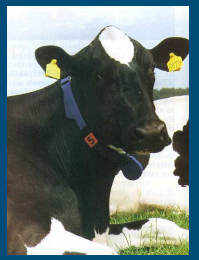
Exercise

- 6 farmers
- Parcels of 32, 14, 33, 20, 11 and 22 ha (total 132 ha).
- Calculation per grid point 18 * 18 m, (30/ha) = 3960 grid point.
- 30 weather scenario's per grid point
  - Minimum of 3 weather predictions for 2 weeks
  - 10 weather scenario's (10 year average) for long term prediction
- Fertilizing. At start of season 50 scenarios.
- ➔ 1500 calculations per grid point
- ➔ 45000 per hectare.
- ➔ For 2008 only for 2 ha/farmer 6 x 2 x 45000 = **540,000**
- One calculation on a normal PC = 12 sec
- ➔ 75 days for one PC

Four ‘projects’ addressed

- **Dairy production:** ‘real time’ observing and interpretation of sensor data from moving cows





Lessons learned from Agro

- Processing power is really needed
- LOFAR infrastructure → hybrid structure
- AgroServer → business model
- Interaction needed between farmers, industry and researchers.
- Deterministic explanatory models in real time dynamic decision environments requires a lot of knowledge form the advisor and end user.
- Wireless sensing networks ~ persistent technological problems

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