

IoT on a small farm

2.4.1



Dear student, welcome to the first chapter! In previous sections, you learned how data can guide decisions on when to irrigate, fertilize, or treat crops. But how can this process be fully automated on a small farm?

This chapter introduces real-world examples where small farmers combined sensors, connectivity, and mobile applications into one working solution. These case studies are drawn directly from farms in Spain, Bulgaria, Italy, the Czech Republic, and Austria.



Study text

These examples demonstrate that even small-scale farmers can build a connected system tailored to their local conditions – often using open-source platforms, low-cost hardware, and mobile apps.

Spain & Sweden – Agrodit Smart Irrigation System

Focus: Crop production in dry areas

Tools used: Soil moisture sensors, LoRaWAN network, Agrodit cloud platform

Process:

- **Sensors detect dry zones in the soil**
- **Data is transmitted via LoRaWAN to the cloud**
- **System activates drip irrigation in specific areas only**

Benefits:

- ✓ **Up to 50% water savings**
- ✓ **Low-cost setup with open-source software**
- ✓ **Soil protection and better water retention**



Bulgaria – ONDO Mobile Greenhouse Control

Focus: Small greenhouses

Tools used: Soil and air sensors, fertigation unit, mobile app

Process:

- **Sensors monitor soil temperature, pH, and moisture**
- **App adjusts both watering and fertilization**
- **User controls system remotely via phone**

Benefits:

- ✓ **Automation of irrigation and fertilization**
- ✓ **Designed for small farms and agri-startups**
- ✓ **Time and input savings, fewer mistakes**

Austria – Livestock Monitoring with Bolus Sensors ([SmaXtec](#))

Focus: Dairy herd health monitoring

Tools used: Internal bolus sensors (body temp, pH, activity), app

Process:

- **Sensors inside the cow's rumen collect continuous health data**
- **Information is sent to an app for real-time analysis**

Results:

- ✓ **Early detection of fever and heat**
- ✓ **Reduced calf losses**
- ✓ **Higher milk yield and fewer antibiotics**

Smart Tomato Irrigation – Italy (Parma Trial)

An experimental IoT trial in Parma's "Azienda Sperimentale Stuard" used LoRaWAN-connected soil and environmental sensors across three irrigation regimes:

Regimes: full (100%), 60%, and 30% of standard water use.

Collected data: soil moisture, temperature, CO₂, air humidity, water volume sampled every 10 minutes

Setup enables precise control and monitoring – demonstrating practical adoption of smart irrigation tech.

Why These Examples Matter

These systems clearly show how:

- **Soil sensors + connectivity (Wi-Fi, LoRaWAN) enable smart, low-cost systems.**
- **Automated irrigation (push alerts or direct control) saves water and time.**
- **Research and pilot data confirm improved plant growth and resource efficiency.**

