

## Precision Farming to control irrigation and improve fertilization strategies on corn crops

Italy is one of the main maize grain producers in the European Union together with France, Germany, Hungary and Spain. According to a report from Business Insider, the 28 country members of the EU will harvest this year between 62.5 to 65.5 million tonnes of corn. Since 2015, the harvests have been lower than previous years due to the long drought periods.



*Piedmont, Italy*

**Omica** is an Italian start-up focused on Smart Agriculture. Its mission is developing innovative products that integrate new disrupting technologies such as the Internet of Things. In collaboration **with Libelium technology they have deployed a wireless sensor network to improve crops yields** by identifying less productive zones and also monitoring crop water and fertilizer requirements during the growth period.

### Real-time crops monitoring in a rural area



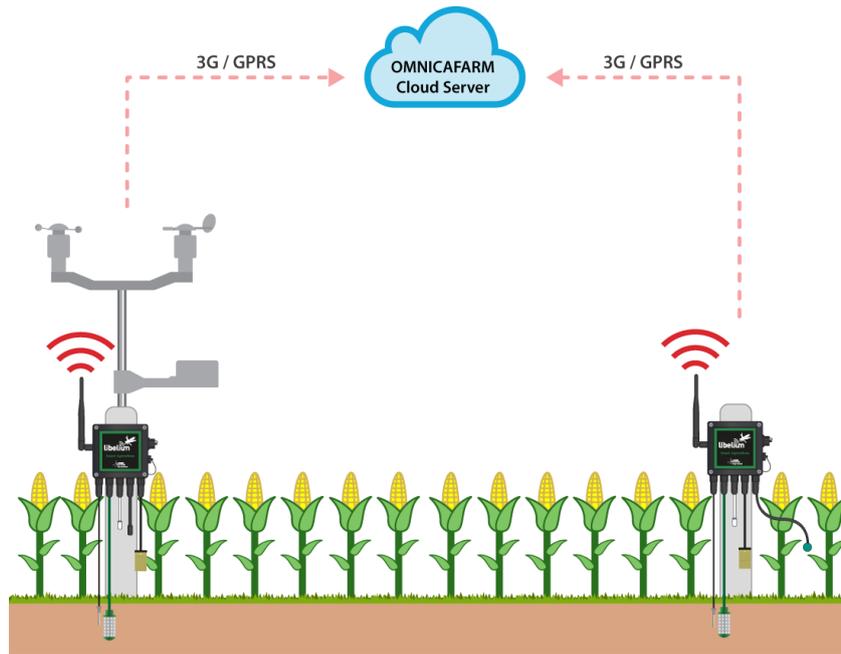
The project, that has been successfully completed during 2016 summer, has been carried out in Piedmont, a region in the north-west of Italy, at some **farms that produce corns for food and also biomass**. Regarding [Eurostat Crops Statistics](#), Italy produced in 2015 7,069,000 tons of corn in an area of 700,000 hectares.

The deployment on the corn fields consist on some [Waspnote Plug & Sense! Sensor Platforms](#) installed in different zones of the field:

- [Waspnote Plug & Sense! Smart Agriculture:](#)
  - Temperature + Humidity (Sensirion).
  - Atmospheric pressure
  - Soil moisture
  - Leaf wetness
  - Soil temperature
- Waspnote Plug&Sense! Smart Agriculture PRO:
  - Temperature + Humidity (Sensirion).
  - Solar radiation
  - Soil moisture
  - Leaf wetness
  - Soil temperature

Wasmote Plug & Sense! Smart Agriculture also includes a **Weather Station WS-3000 that is composed by three different sensors: anemometer, wind vane and pluviometer**. With the installation of the wireless sensor network farmers can monitor soil and micro-local weather conditions, rain level, wind direction and intensity, air temperature, leaf wetness and also soil moisture and soil temperature at a depth of 0.5 meters.

Developing technological projects in rural areas add some difficulties because of the **absence of physical communication infrastructures**. The Italian start-up has deployed a solution where Wasmote Plug & Sense! transmit data using 3G/GPRS. Thanks to GPS, farmers can move the sensor platforms to different areas depending on each need. The company has developed an own-cloud based application, [OMICAFARM](#), that **recognizes automatically sensors position and allows an immediate visualization in the map**.



*Corn crops deployment functioning diagram*

### Easy deployment to get a predictive model

Omica team considers that customers have been positively impressed by the ease of the installation: “In less than one hour, they have installed the sensors and then they have access both to **data collected in real-time by the sensors and information obtained by analysis of satellite imagery with a history of the last three years**”.

Some of the most important goals for maize crops farmers are having a **Geo-referenced Decision Support System** able to improve crop profitability acting both on the optimization of irrigation and planning precise fertilization and also having an instrument able to predict the crop yield during the growth period, before the harvest.



*The CAPTOR team installs nodes in volunteers' homes*

These requests have been solved just with OMICAFARM that combines different technologies in just one solution. They have integrated in the platform data collected with **Libelium sensors and data obtained by the multispectral analysis of satellite imagery**. The platform allows farmers to divide their fields into smaller and homogeneous zones to know specific water or fertilizer needs. With this information farmers can:

- **Quantify water requirements and water stress of the crop** comparing the effect of the strategies followed during the past years. This information can be visualized in geo-referenced maps and can be used to improve irrigation strategies.
- **Predict crop yield by identifying zones**, within the same field, showing a less growth than that one expected with a spatial resolution up to 10 meters. This information allows farmers to promptly act and recover from a growth deficit.

The Italian company has chosen Libelium technology for its wide range of sensors available and also the ease to develop the software for data acquisition and transmission. Wireless sensor networks deployed consist on **scalable and flexible monitoring systems with low installation, maintenance and also operative costs**.



*Wasp mote Sensor Platforms deployed in Italian corn crops*

With [OMICAFARM](#) farmers can know during growth stages which zones are more or less productive. The capability to update geo-referenced maps periodically, up to very 5 days, allows farmers to take decision and monitor their effects in a very short time. This valuable information has helped to:

- **Identify zones** with a variation in biomass up to 20%.
- **Locate areas that suffer of water stagnation** which increase the risk of pest and fungi
- Define **more efficient irrigation systems** that meet crops water requirements.

Contact [Libelium Sales Department](#) for more information about our products.

**More info:**

- For technical details on Waspote hardware, sensors and how to program a Smart Agriculture application: [Smart Agriculture Board Technical Guide](#)
- For technical details on Waspote hardware, sensors and how to program a Smart Environment PRO application: [Gases PRO Technical Guide](#)

Read more about Libelium sensor product lines in the [Waspote](#), [Waspote Plug & Sense! Sensor Platform](#) and [Meshlium Gateway](#) websites.

**References:**

- Omica: [omica-farm.com](http://omica-farm.com)
- Eurostat Crops Statistics: [ec.europa.eu](http://ec.europa.eu)
- Business Insider: [businessinsider.com](http://businessinsider.com)

Discover our [Smart Agriculture IoT Kits](#) at [The IoT Marketplace](#)

More case studies at: <http://www.libelium.com/resources/case-studies>

*TERMS AND CONDITIONS TO USE LIBELIUM CONTENT*

*Libelium is the owner of all images provided on the website and it can only be used quoting the source. Any video, photograph, diagram, infographic or logo cannot be used or transformed without Libelium authorization. You can request the files in high resolution to publish on your website or to insert in marketing flyers always using Libelium logo and linking with Libelium website.*

*If you are going to publish the article in a website or media or in a white paper or research study, it must be done including all the references and mentioning Libelium as the source of the content.*

© Libelium Comunicaciones Distribuidas S.L. – [www.libelium.com](http://www.libelium.com)