

AgroSense

Care without nuisance



WIRELESS
AGRICULTURAL DATA
ACQUISITION SYSTEM

What does the AgroSense system do?

The AgroSense system is comprised of a wireless network of small meteorological stations and other measuring equipment. It is an easy-to-install, accurate and reliable solution to collect high-resolution data such as soil moisture, leaf wetness, etc. and to identify needs for irrigation, application of pesticides and other treatments.

Measured values are transferred wirelessly by the system and the data are stored centrally. The system also enables the user to visualise the stored data. If the pre-set limits are exceeded, the system automatically alarms the user by sending a text message or an e-mail.



IRRIGATION

Irrigation is very important as it enhances crop security, making it easier to plan returns on investments. At the same time, it is a serious expense that needs to be optimised. The AgroSense system's soil moisture and water potential sensors make the quantity and removability of water in the soil or the substrate visible, tracing water penetration in the root zone and at its boundary, optimising irrigation water consumption.



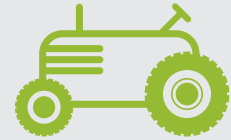
NUTRIENT
MANAGEMENT

Nutrient management is a key point of producing quality foodstuffs. On the one hand, replenishment of nutrients translates to costs borne by the farmer and on the other hand, wherever technology permits continuous replenishment, the optimal growth of plants can be supported. The AgroSense system is capable of measuring the solar energy the plants can use and the conductivity of the soil or the substrate, allowing optimisation of the distribution of nutrients.



PLANT PROTECTION

Plant protection forecast models is one of today's fastest growing fields. Climatic conditions allow deduction of the formation of several diseases. With the help of the AgroSense Nodes, adequately detailed measurement of the cultivation area is possible, as more than 100 nodes may be deployed for an AgroSense base within a distance of 900 m. The plant protection forecast and interventions may be segmented.



CHECK OF THE WORKING AREA

For farmers who find coordination of cultivating several fragmented cultivation areas problematic, the AgroSense system provides easy to understand information presented on maps to support their decisions. For the machinery applied, the recent evolution of soil moisture may be important, and the values of leaf moisture, wind direction and wind strength are required for plant protection interventions.

What is AgroSense system comprised of?

AgroSense Node

Its major function is to collect and wirelessly transfer signals received from the sensors. It has various external sensor interfaces with up to a maximum of 4 sensors as well as an integrated humidity and temperature sensor.

The values of measurements performed at specific intervals, like every second or once a day (typically every 10 seconds) are transmitted in the form of radio signals to the base station (AgroSense Base).

Sensors

The sensors coupled with the nodes transfer the data to be collected by the system. The set of sensors for installation can be extended and changed, but the most common type of sensors are as follows:

- ▶ Soil moisture sensor
- ▶ Soil temperature sensor
- ▶ Air temperature sensor
- ▶ Hygrometer
- ▶ Leaf wetness sensor



AgroSense Base

Data gathered by the AgroSense Nodes are received by the base station via a wireless network. It can use its own integrated sensors or receive externally connected sensors. Their data, along with the data from the nodes, are transmitted via a GPRS module to the AgroSense server. Power is supplied by a high power solar cell and a battery. Integrated and connectable sensors:

- ▶ *Precipitation sensor*
- ▶ *Wind direction and wind velocity sensor*
- ▶ *Air pressure sensor*
- ▶ *Air temperature sensor*
- ▶ *Air relative humidity sensor*



Graphical user interface

The AgroSense server safely stores and processes the data received. With adequate access rights, you can be anywhere and have access to the information using a web browser and receive up-to-date information about the status of the arable land and any necessity for actions.

There is a web-based user interface to interactively display and monitor data in a quick and transparent manner. In the event that the pre-set limits are exceeded, the system can send an alarm to the designated users by a text message or an e-mail.

Installation and usage of the AgroSense system

Using the system is easy and convenient. Depending on the size of the area, our experts install 1 base station on approximately 50- 200 acres and there is no need to do anything else with it.

The supplied data acquisition units (AgroSense Nodes) are already switched on, so all you have to do is install them at the locations that need to be monitored. The supplied units are attached to an 8mm diameter pole and may easily be stuck into the ground. Finally, the sensors need to be deployed, for instance the soil moisture and temperature sensors are to be dug in the ground and the artificial leaf of the leaf wetness sensor is to be placed.

You can then start using the system via the online graphical interface. Each data acquisition unit, their respective sensors and the subsequent measurement results appear on the user interface.

The system continuously saves the measurement results to allow preparation of subsequent reports. If the pre-set alarm limits are reached or exceeded, the system warns you by a text message and/or e-mail to allow the required actions to be taken as quickly as possible.

What are the benefits of the AgroSense system?

- ▶ **LARGE DISTANCE OF COMMUNICATION;**
300 metres for typical agricultural application or ideally 900 metres*, which is suitable to cover up to **250 acres**
- ▶ **ACCURATE DATA;**
The sensors that we offer and build into our system are all tested, high precision and reliable sensors

AgroSense Nodes:

- ▶ **THEY ARE EASY TO DEPLOY OR RE-DEPLOY**
- ▶ **FLEXIBLE APPLICATION**
Integrated temperature and humidity sensor + connectivity of 4 external sensor
- ▶ **VERY LOW POWER CONSUMPTION;**
Able to operate up to a year with 1 lithium AA (mignon) battery**.
Alternatively, you can order a solar cell for the equipment to extend the maintenance-free period even further
- ▶ **UNOBTRUSIVE OPERATION**
The AgroSense Node, except for the antenna, can be placed underground to conceal it from unauthorised persons from a couple of meters

* Directly overlooking to the base or with an antenna placed 1 metre above ground.

** Expected battery life depends on the frequency of measurements and the number of sensors connected.

Please visit www.agrosense.com for a list of our retailers.

For further information please get in touch with us by using any of the following contacts:

 **AgroSense**

E-mail: info@agrosense.com

www.agrosense.com



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