



Agranimo

Product Catalogue



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- Yield Forecasting
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Tools For Field Managers

We started Agranimo to support growers to maximize their production of high quality crops in a more sustainable way. We are proud to see how our sophisticated yet user-friendly and cost-effective solutions are already solving challenges faced by growers today!

While we acknowledge that a good soil moisture probe or leaf wetness sensor is important, our value comes from the technical support of a team of agronomists guiding product development and providing personal support to every grower to ensure those tools bring optimal value to the operation.

Our key focus areas are irrigation management, crop protection (frost, integrated pest management), yield forecasting and sustainability reporting.

We are continuously innovating, conducting field trials and creating partnerships to make sure our customers receive the most practical and effective service.

To learn more about our services and products, explore our catalogue and get in touch to discuss and identify the best tools which fit your organization's requirements.

[Contact us](#)



Irrigation Management

Irrigation scheduling is crucial to effectively manage water resources and optimize profitability of an orchard. With a customizable approach based on your fields characteristics, our irrigation management model consists of FDR soil moisture probes and Micro-climatic indicators like the evapotranspiration (ET) based water balance. These tools are the most precise and cost-effective methods used to determine scheduling decisions.

Our particular focus is on installation, calibration and determination of management thresholds, because it is crucial to install sensors in a fairly represented location with good soil to sensor contact for most accurate and ideal results.



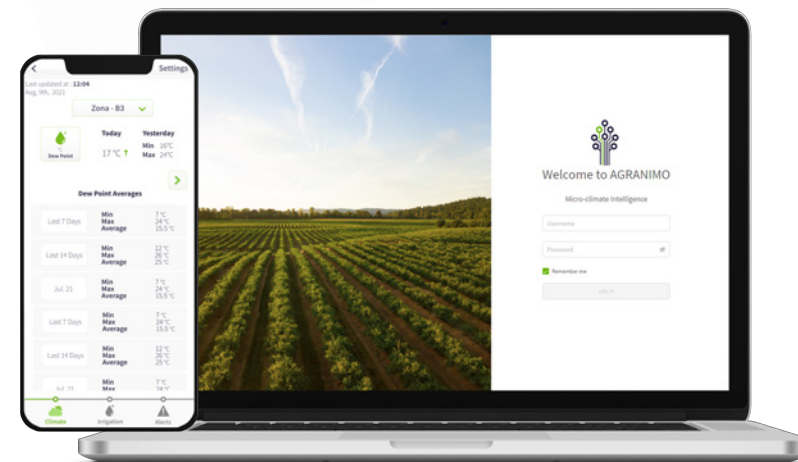
Agranimo irrigation management tools include:

Sensors

- Patented Agranimo manufactured FDR soil moisture sensors (completely wireless, see technical description in the annex) at several soil depths
- Pairing with weather stations
- Third party sensor integrations

Software Platform and Mobile Application

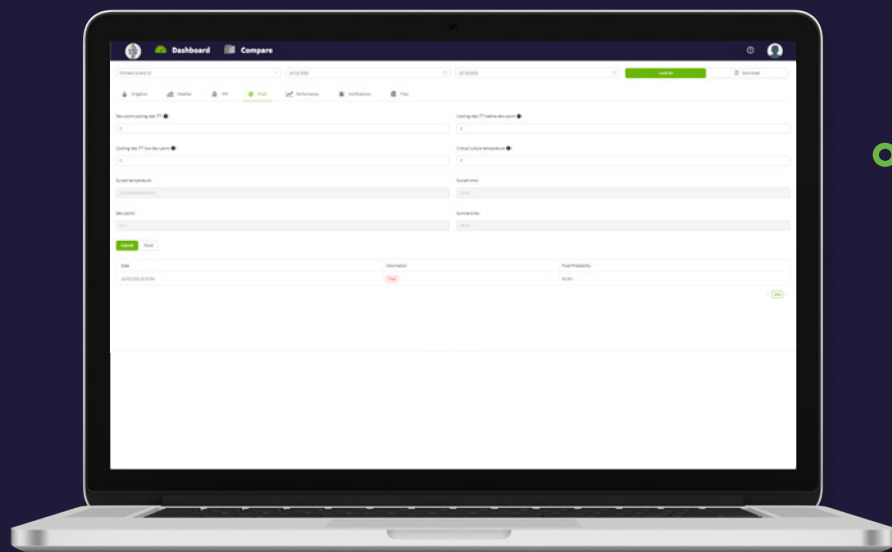
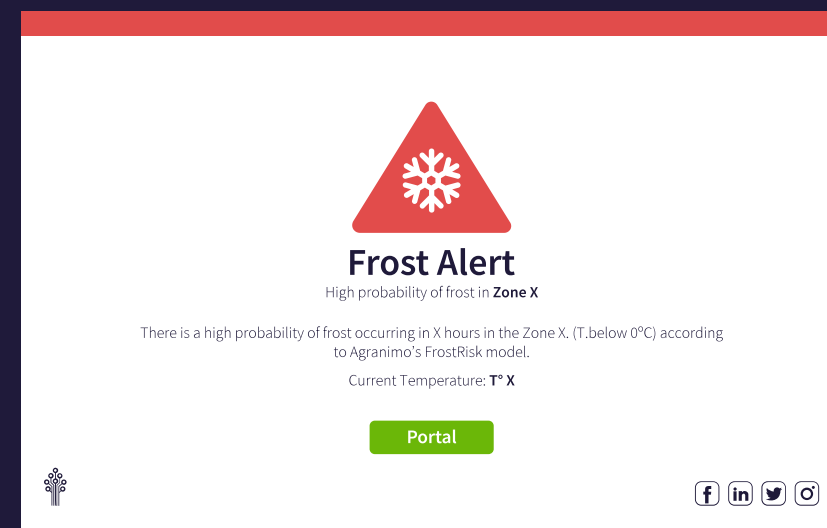
- Calibration per specific soil type
- Irrigation detection and record per management sector
- Irrigation efficiency indicators (Percolation, Saturation, Daily Rate of Soil Water loss, Water Balance (ET/SM)
- Weekly irrigation report



Frost Forecasting

Agranimo's Frost Risk model allows us to provide a frost prediction 10 hours before the frost event. Such notice time helps better prepare the use of prevention methods, such as irrigation or wind generators. This model has been developed using advanced statistics and machine-learning methods, and is trained on millions of data points from various locations where we operate.

Additionally, we provide tools to receive frost alerts, post frost reports, as well as a simulator of temperature and dewpoint changes during the night.



Pest / Disease Risk

Phenology is an important part of monitoring the development of pests and fungi. By monitoring temperature, humidity and leaf wetness, we can help monitor pest cycles and determine the best time for protective applications to prevent damages.

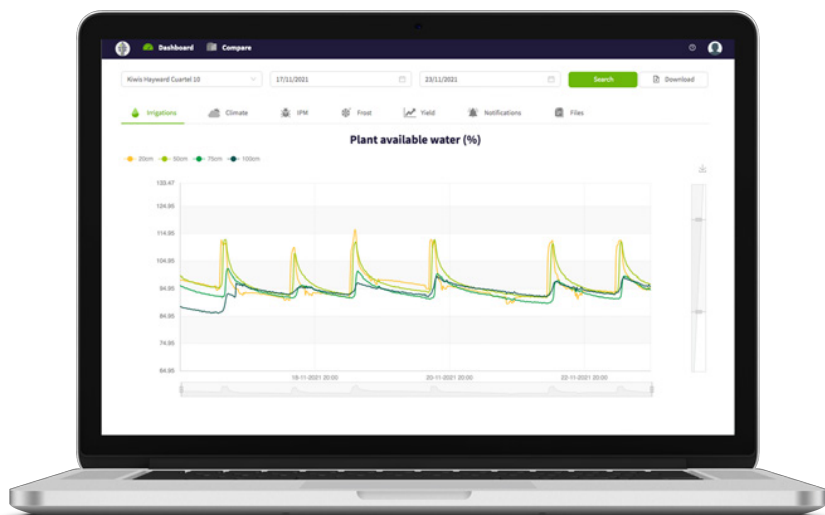
Currently implemented models include **Apple Scab** and **Strawberry Mildew**.

We are working on additional disease models, and will be happy to prioritize developments based on your individual requirements.



Agranimo Web Portal Features

Our portal provides a comprehensive yet thorough information center for your micro-climate intelligence, with granularity based on individual management zones. The software can be accessed from any internet-enabled device and shared with your team with an unlimited number of users.



Irrigation Module

- **Calibration** of sensors based on the soil type to set up key management indicators such as field capacity and maximum allowable depletion
- **Soil sampling** support to transform Gravimetric Water Content into actual ML of water in the soil
- **Seasonal field** capacity calibration adjustment
- **Visualized graphs** at various soil depths
- Agranimo's unique Irrigation Indicators help quickly assess irrigation performance:
 - **Percolation:** To measure how much water is overused based on the field-capacity
 - **Saturation:** How much time is spent with water levels above field capacity
 - **Daily Rate of Soil Water Loss:** A comparative indicator between irrigation frequencies in different sectors
 - **Water Balance (evapotranspiration per irrigation):** Allows comparing for how effectively the plants are using water between different sectors



Climate Module:

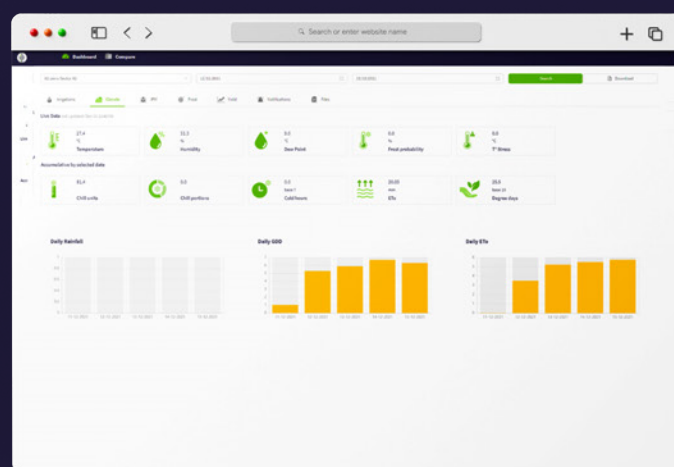
Quickly calculate phenological indicators for the desired date range and compare between management zones to benchmark performance

- Growing Degree Days
- Chilling Hours / Cold hours / Chill portions accumulation
- Temperature stress
- Dew point
- Evapotranspiration

Compare efficiency between zones:

The compare function lets you evaluate the efficiency of your orchard per zones with

- Water use efficiency indicators
- Phenological indicators comparison between zones
- Latest climate and soil data comparison between zones



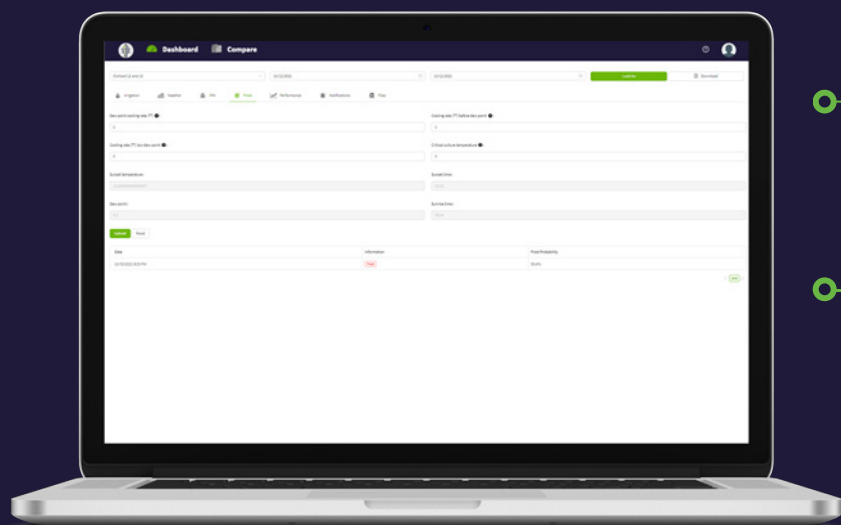
Zone	Temperature	Humidity	Evapotranspiration
Zone 1	15.0	75.0	1.5
Zone 2	16.0	78.0	1.6
Zone 3	14.0	72.0	1.4
Zone 4	17.0	80.0	1.7
Zone 5	15.5	76.0	1.55
Zone 6	16.5	79.0	1.65
Zone 7	14.5	73.0	1.45
Zone 8	17.5	81.0	1.75
Zone 9	15.2	74.0	1.52
Zone 10	16.8	77.0	1.68
Zone 11	14.8	73.5	1.48
Zone 12	17.2	80.5	1.72
Zone 13	15.8	76.5	1.58
Zone 14	16.2	78.5	1.62
Zone 15	14.2	72.5	1.42
Zone 16	17.8	81.5	1.78
Zone 17	15.4	75.5	1.54
Zone 18	16.6	77.5	1.66
Zone 19	14.6	73.5	1.46
Zone 20	17.4	80.5	1.74



Frost Control

Agranimo's forecast will notify you of the upcoming frost, and the simulation tool will help you decide the best time to activate your protection method.

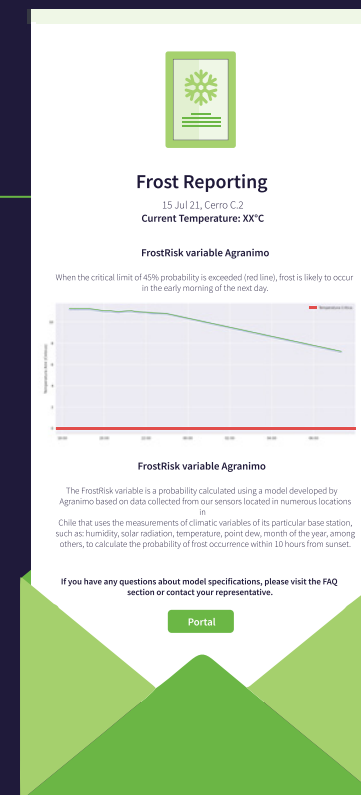
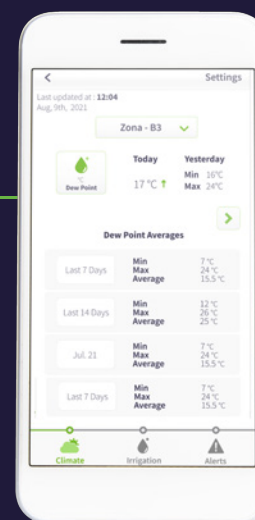
- 10-hour frost prediction model
- Notification via email, SMS and automated phone call
- Visualization of Dew Point and Temperature predictions to determine the best time to start frost management activities



Alert and Notifications/Weekly Reporting

We send out Alerts and Notifications in case of **Frost** or **Pest/Disease** risk, and provide weekly email reports with an irrigation record and the key associated Management Indicators.

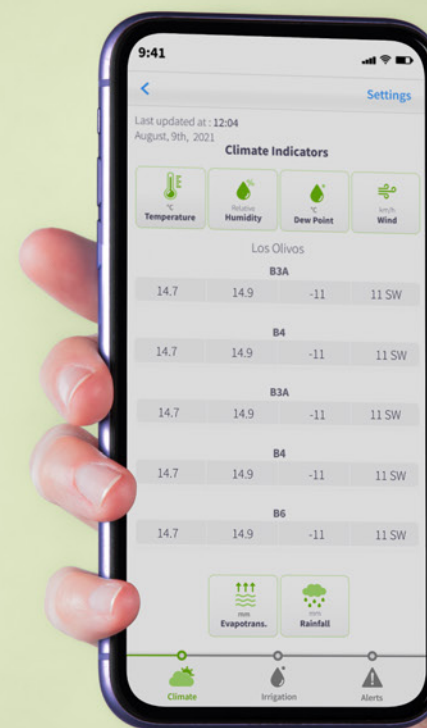
Alerts are available through email, **Mobile App**, **SMS** and **Automated Calls**.



Agranimo Mobile App

The Agranimo mobile application is designed to provide quick information for fast decision making on the go. An overview of all field zones are displayed with all relevant key data points:

- Real time soil sensor and weather station indicators
- History of phenological indicators
- Alerts and notifications for risk prevention





Main Equipment - Technical Details

FDR soil moisture probe:

- 8096 - step resolution in soil moisture levels
- Readings update interval: 15 minutes
- Working Temperature Range: -45..+75°C
- Hermo-compensated: accurate measurement regardless of external effects
- Fully enclosed design: sensor protected from direct soil contact increasing durability
- Tightly sealed top cap allows in-field service without probe deinstallation
- 1/16°C soil temperature resolution
- Plug-and-play design: add or replace probes to the network without data loss
- 1.5 years on 3 AA batteries – no solar panel, which means flexible placement where needed most
- Produced by: Agranim



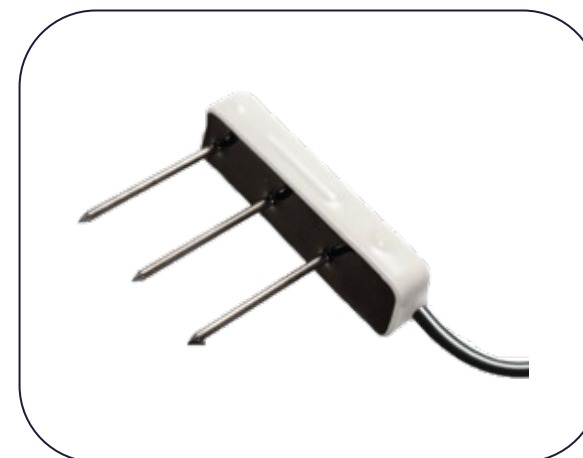
Temperature and humidity sensor with a passive solar radiation shield

- Relative Humidity range 1 to 100% RH
- RH Accuracy $\pm 2\%$
- Temperature range: $-40..+125^{\circ}\text{C}$
- Temperature accuracy $\pm 0.3^{\circ}\text{C}$
- Drift less than 0.03°C per year
- Fully calibrated in-house before and after assembly, linearised, and temperature compensated
- Produced by: Agrainimo



Ruggedised electrical conductivity (EC) sensor (Teros12)

- Apparent Dielectric Permittivity (ϵ_a): $\pm 1 \epsilon_a$ (unitless) from 1 - 40 (soil range), $\pm 15\%$ from 40 - 80
- Electrical Conductivity (EC): $\pm 5\%$ from 0 to 5 dS/m, $\pm 10\%$ from 5-10 dS/m, 10-23 dS/m custom calibration required
- **Note:** Temperature measurement may not be accurate if sensor is not fully immersed in the medium of interest, due to excessively long equilibration time
- Produced by: Metergroup (Decagon)



Rain Sensor (Pluviometer)

- Daily Rainfall Range: 0.0 mm to 999.8 mm
- Accuracy: For rain rates up to 50 mm/hr: $\pm 4\%$ of total or 0.2mm whichever is greater
- Produced by: Davis Instruments



Wind Sensor

- Range: Wind Speed: 0.5 to 30 m/s
- Wind Direction: 0 to 360°
- Accuracy: Wind Speed: ± 3 m/s or 5% whichever is greater
- Wind Direction: $\pm 10^\circ$
- Produced by: Argent Data Systems



Solar Sensor

- Range: 0 to 1300 W/m²
- Resolution: 3 W/m²
- Accuracy: +6 %
- Produced by: Agranimmo



Leaf Wetness

- Range: 0 to 1
- Wet/Dry Threshold: Selectable
- Material: High sensitive gold plated grid
- Modular Design
- Produced by: Agranimmo





Additional Consulting Services

The Agranimo team is composed of agronomists, electric, software and data engineers. We aspire to shine light across all our areas of expertise to provide customized solutions.



Yield Forecasting

Agranimo has developed a new method of forecasting orchard yield using biomass sampling data. We have been running field trials in cherries, blueberries, apples and avocados which have shown over 90% accuracy with samples taken right before harvest. We have validated that the accuracy variation is low when applied to different varieties and crops, which is why we are happy to be able to build a personalized yield forecasting model for your crops. During our current field trials, we are evaluating the accuracy of the forecast for samples taken after flowering and fruit drop stages.

Contact us for more information, we will be happy to provide a custom yield forecast for your crops.



Crop-specific Phenological Markers

At Agranimo we recognise the importance of crop-specific phenological monitoring to be able to optimise field management strategy to produce best results. This can be done via climate and soil sensors, drone and satellite images, leaf or fruit tissue sampling.

We have built customised crop monitoring recommendations for some of our clients. Once we help build the monitoring plan, we assist with the execution and data analysis to provide insights into the relationship between crop environment, yield volume and quality. Based on the insights we assist in optimising field management and building processes for continuous monitoring and improvement.

Contact us for examples of executed projects.



Sensor Management Platform for Partners

Consultants, exporters and distributors provide support to growers in order to create a reliable and profitable supply chain. This process typically involves frequent farm visits and collection of different types of data to create actionable recommendations.

While working with many fields, installed sensors, soils and crop types, we have developed a management platform for all of the connected devices. It allowed us to open the sensor management platform to installation partners, agricultural consultants and IT departments of large fresh produce organisations so that they can leverage this platform to provide support to field managers.

If you have challenges related to the calibrations and technical management of different sensors in the field, contact us to explore how Agrainimo sensor management platform and our suite of integrations can help.





Custom Data Integration and Analysis

Agricultural industry is categorised by a lot of data, which can be leveraged to improve profitability, traceability and sustainability of the operations. However, connecting data sources, processing, storing and analysing data in real-time is often a difficult task.

We have built a number of data integrations and data pipelines and are happy to execute custom data aggregation and analysis projects. This can include connecting your system to our portal or vice versa.



Sustainability Reporting

Sustainability reporting is quickly becoming a requirement for all of the fresh produce companies, and farm data plays an important role in estimating environmental impact and identifying ways to reduce it. Our expertise in climate analysis can assist your organization in reporting sustainability from the following areas:

- Water usage
- Fertilizer usage
- Soil management and carbon
- sequestration
- Ecosystem services

Apart from impact accounting we can help determine activities to help minimize the environmental impact.

Contact us to evaluate the sustainability goals or requirements of your organization.





Thank You

For Your Attention

If you have any questions or want to place an order contact us at
contact@agranimo.com

