



TerraPrima
Group

Making the Farm Visible and Predictable

Product Overview

terraprimagroup.co.uk

Introduction

In a world where up to one-third of all food produced is lost or wasted before it is consumed, it's no surprise that almost a billion people are still hungry and struggling every day to survive. If we could save just one-fourth of the food currently lost or wasted globally, it would be enough to feed 870 million hungry people in the world. That's 12% of the world's population! The highly ineffective food ecosystem is also promoting the waste of labour, water, energy, land and other inputs that go into the production of food.

Agronomists are instrumental in improving the profitability of the farm, while also de-risking and prioritising operations. However, agronomists need objective data and an effective farm monitoring tool to provide a good service to farmers. Today decisions are based on experience, sporadic historical data or the current circumstances of a neighbouring farm. Agronomy services must evolve towards using real-time field data to make decisions.



DID YOU KNOW?

About **80% of global food loss** occurs prior to retail

Being a farmer is one of the toughest, riskiest and most stressful jobs worldwide. Farmers face great uncertainty and are under pressure to deliver more and better. Some common farming struggles include:

CROP YIELD VARIANCE

keeping productivity high and stable across crop cycles is hard and very important for the health of the business.

HIGH WORKLOAD

farmers are often forced to work long hours to stay on top of all farm tasks and keep the management of the crop constantly under control.

WORKFORCE

due to a shortage of farm labour, farmers need to constantly worry about the quantity and quality of workers, especially during harvest.

HARVESTING

it is very important to make accurate predictions for the right picking time and number of pickers required. Not being able to source the right amount of labour and at the right time can impact very significantly on the revenues and profitability of the business.

MARKETING RISKS

in every crop cycle, there's a real possibility of losing one's market for the product or that price received is less than expected, which hugely affects farm profitability.

About TerraPrima

The TerraPrima Group brings together the best of its two subsidiaries Mothive and Odyssey Sensors. TPG provides turnkey solutions from design and manufacture of all sensors through to cutting edge dashboard technologies and insights.

Formed in 2019 and headquartered in London (UK) our mission is to make farms visible and predictable. The TerraPrima Group empowers farmers with a simple, affordable turnkey solution that de-risks their operations and extracts more value from crops. We predict and inform farmers about the right time to harvest and related logistics, predict diseases, improve yields, automate farm tasks based on real-time crop needs.

For the first time we enable post-harvest players to access real-time farm data and predictions. This disrupts how agriculture is done today and creates an opportunity for stakeholders to develop new business models and solutions. By sharing predictions, we're also increasing food shelf-life and quality while reducing global food waste.



Our Solution

The TerraPrima Group has developed the next generation of field devices – called Ladybirds – that meet the demands of today's farmers and agronomists and enable accurate predictions about food production and farm operations, remotely and autonomously.

Our devices are easily installed next to the plants and collect environmental and soil data in real-time. From the field, the data is encrypted and sent to the TerraPrima cloud where we correlate it against other information sources before ingesting into our predictive computational models. These generate real-time alerts and recommendations for the farmer and agronomist, delivered through our dashboard (desktop & mobile), SMS or E-mail. Yes, we're conscious that not everyone has a smartphone!

Our solution is helping a multitude of fruit crops - from berries to grapes and olives. All farms are different and conditions change over time. This is why our solution is tailored to each farm and crop variety.



The Benefits



PREDICT & PLAN HARVESTING

Know in advance how many pickers are required for harvesting and when. Prioritise harvesting areas every day based on ripening stages.



PREDICT & PLAN LOGISTICS

Know in advance how many trucks are required and when to optimise shelf-life. Meet buyer product specifications for better pricing.



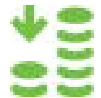
THE FARM AT YOUR FINGERTIPS

Start every day by looking at the status of your farm and accurately prioritise tasks.



REDUCE FIELD WALKS

Walk and inspect (growth, diseases and ripening) plants only where they need attention.



REDUCTION OF INPUT COSTS

Save up water with irrigation that depends on soil conditions and growth stage of the plants .
Ventilate only when needed. Spray only where and when there is a real risk of diseases.



IMPROVE YIELD

Mothive has demonstrated a **21% increase** in yield per plant (£830k increase in revenues in 30ha strawberry farm).



AUTOMATION THAT PROMOTES GROWTH

Reduce intensive work with the intelligent automation of irrigation and ventilation systems based on crop needs.



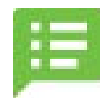
HISTORICAL DATA

Digitise your data & never lose farm information ever again.



NO MORE MANUAL READINGS

It's like having a battalion of workers and agronomists constantly in the field monitoring and taking care of your crop for you.



REAL-TIME ALERTS & RECOMMENDATIONS

Your crop tells you if it needs attention with frost and overheating alerts, fleece management, diseases prediction, fine tune growth stage, picking time prediction, and many features available.

TerraPrima Ladybird

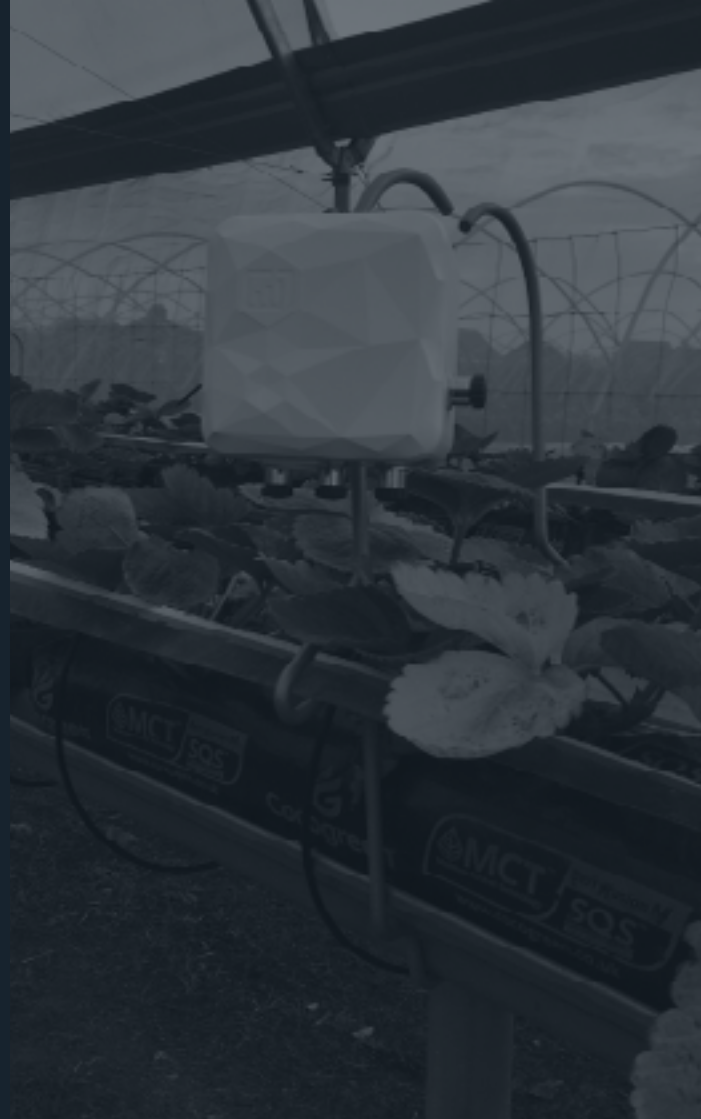
The Ladybird is a next generation wireless and battery-powered data logger with embedded sensors. It is installed next to the plants to measure all quantities that influence crop growth, every few minutes, 24/7.

The environment and soil conditions measured are:

- Air Temperature
- Air Relative Humidity
- Light
- Soil Moisture
- Soil Temperature
- Water Level i.e. runoff water, water tanks, etc.

It also controls the automation of existing systems such as irrigation and ventilation, based on real-time crop requirements. The data gathered by all Ladybirds is transmitted wirelessly to a gateway device (provided by TerraPrima), which agglomerates the data and securely transmits it to the cloud over the Internet.

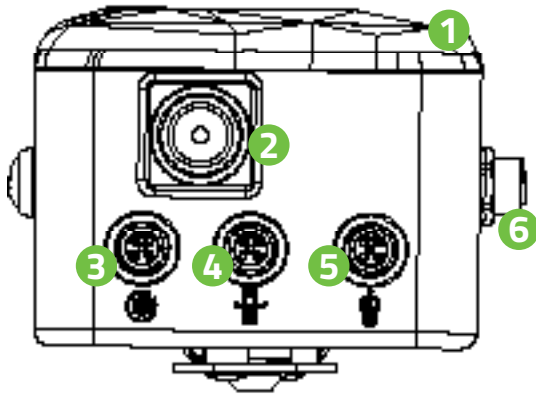
Installing the Ladybird is easy: choose the location, secure the device on the pole, turn it on, wait for the 3 green lights and you are all set to collect data. You will never need to turn it off and the battery life is 4 years. After that you will simply need to replace the AA batteries (widely available in every supermarket) and you are good to go again.



Technical Specifications

Light	Solar Radiation	Ultra-wide range light intensity measurement	Light intensity measurements of irradiance of PAR
Temperature	Air Temperature	Range -40 to +125 °C	±0.3 °C Typical Accuracy at 0 to +90 °C
Humidity	Air Relative Humidity	Range 0-100% RH	±3% RH Typical Accuracy at 0-100% RH
Soil Moisture	Delta-t SM150T probe	Range 0-100%	Mineral & Organic Soil ±3% Accuracy
Soil Temperature	Delta-t SM150T probe	±0.5 °C Accuracy at 0 to +40 °C	±0.75 °C Accuracy at -20 to +60 °C
Water Level Transmitter	WL13010	Measurement range: 0-1.0m	Accuracy: 0.5%FS
	WL16035	Measurement range: 0-3.5m	Accuracy: 0.5%FS
	Others	Other ranges available	Accuracy: 0.5%FS
Automation	Turn ON/OFF existing systems such as Irrigation and Ventilation		
Connectivity	LoRa	Up to 10km range in line of sight	
Power	Removable AA Batteries	Up to 4 years of battery life	
Protection	Protection against Dust & Water Immersion	Rugged Design	

Bottom View



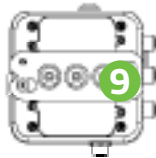
Side View



Top View



Back View



- 1 FULLY WEATHERPROOF**
small footprint, waterproof & UV resistant
- 2 TEMPERATURE & HUMIDITY SENSOR**
collects air temperature and relative humidity data
- 3 AUTOMATION CONTROL**
via M12 Connector
- 4 WATER LEVEL TRANSMITTER**
via M12 Connector
- 5 SOIL PROBE**
via M12 Connector
- 6 FIRMWARE PROGRAMMING**
via M12 Connector
- 7 LED INDICATORS**
and on/off button
- 8 LIGHT SENSOR**
collects light and solar radiation data
- 9 MOUNTING PLATE**
wall and pole plates available

TerraPrima Ladybird Schematic

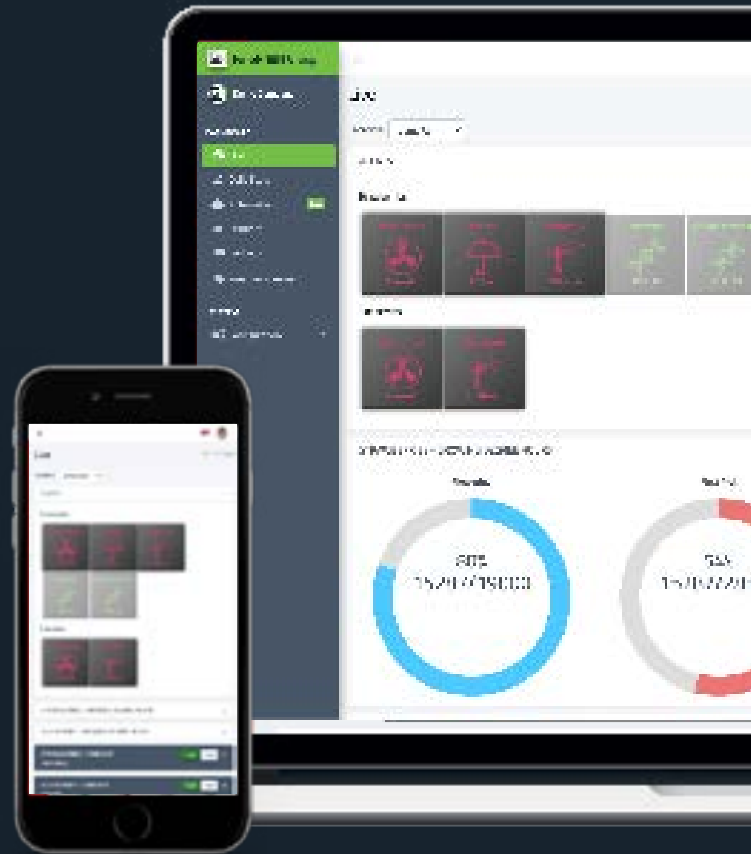
Dashboard

Easy-to-use cloud-based dashboard that shows live data, daily statistics, weather forecast, growing condition prediction, live countdown of picking time and your logbook. You can access the Dashboard from your computer, tablet or smartphone, anywhere you have an internet connection.



GET IN TOUCH FOR A LIVE DEMO

Email our sales team - sales@terraprimagroup.co.uk



Overview Features

Alerts

Alerts are displayed on the dashboard homepage so every time you login you can have a high level overview of your farm with a quick glance. Your farm's at your fingertips! You can choose to receive email and/or SMS notifications to stay informed and on top of things wherever you are. The main alerts are:

- Irrigation and ventilation ON/OFF
- Put fleece ON/OFF
- Risk of Disease
- Extreme weather conditions
- Thresholds
- Picking time notifications

Daily Statistics

Daily Statistics give you a detailed view of intra-day collected data in your entire farm. For each Ladybird in the field you can see all tracked quantities throughout the day. It's like being able to virtually walk around your farm and probe when and what you care about, every few minutes, everywhere!



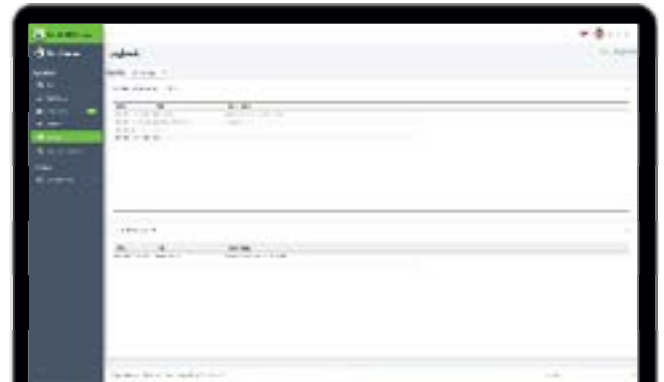
Overview Features

Historical Data

All data collected is securely stored in our databases and is always available for you to see, analyse, export and even delete – everything is GDPR compliant. Simply choose the date intervals, the groups and/or specific Ladybirds and plot or export the data you are interested in.

Logbook

The Logbook is a simple farm management tool that allows all farm workers to record important events and field assessments. The information recorded can also be used as input data into our learning algorithms to improve predictions.



Forecasting Features

TerraPrima developed (and is constantly improving!) bespoke algorithms that generate unique predictions and recommendations for each farm. All predictions are clearly shown on the dashboard and are easy to navigate.

Weather Forecast

5 day weather forecast data is pulled from the closest weather stations (based on geolocation) and you can see them by clicking on “Weather Forecast” on the side menu.

Localised Environmental & Soil Forecast

The user can create as many groups of Ladybirds as desired. You may prefer to use a location approach, or perhaps group per crop variety. Groups can also be overlapping (i.e. you may have a “strawberry” group, a “blueberry” group and a “North_Facing_Polytunnels” with both strawberry and blueberry groups). The system will automatically show 3 days of localised temperature forecasts, humidity and soil moisture per each user-defined group. Micro-climate conditions can vary significantly, especially when indoors.



Forecasting Features

Picking Time

TerraPrima's learning algorithms use the collected data to learn about your farm and accurately predict the growth of your plants.

On the dashboard, for each user-defined group you will see a live count-down of:

- Flowering
- First Pick
- 50% Pick
- 100% Pick

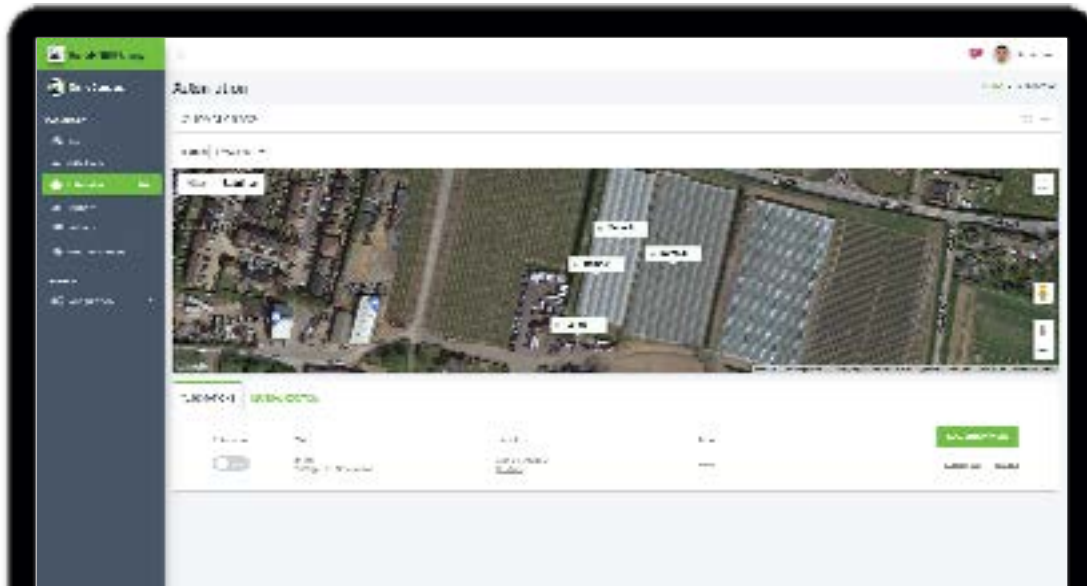
Localised Risk of Disease

Our predictive algorithms are able to predict localised Risk of Disease (such as botrytis, powdery mildew, etc.) for each group of Ladybirds.



Automation

The Ladybird can be hooked up to an existing external system such as irrigation, ventilation etc. to be remotely and intelligently controlled. Each automation can be turned On or Off manually, scheduled based on clock and day of the week or even linked to a sensors' data (for instance you could decide to turn ON irrigation for 10 minutes every time a specific soil moisture goes below a certain threshold).





Sales and Partnerships: sales@terraprimagroup.co.uk
Feedback and General Enquiries: info@terraprimagroup.co.uk

terraprimagroup.co.uk