



# Cropin Plot-level Intelligence

**Smarter Plots, Bigger Yields. All done  
remotely.**



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## Introduction: Setting the Stage for Agricultural Innovation

### The Future of Farming is Not Just in the Fields, It's in the Clouds.

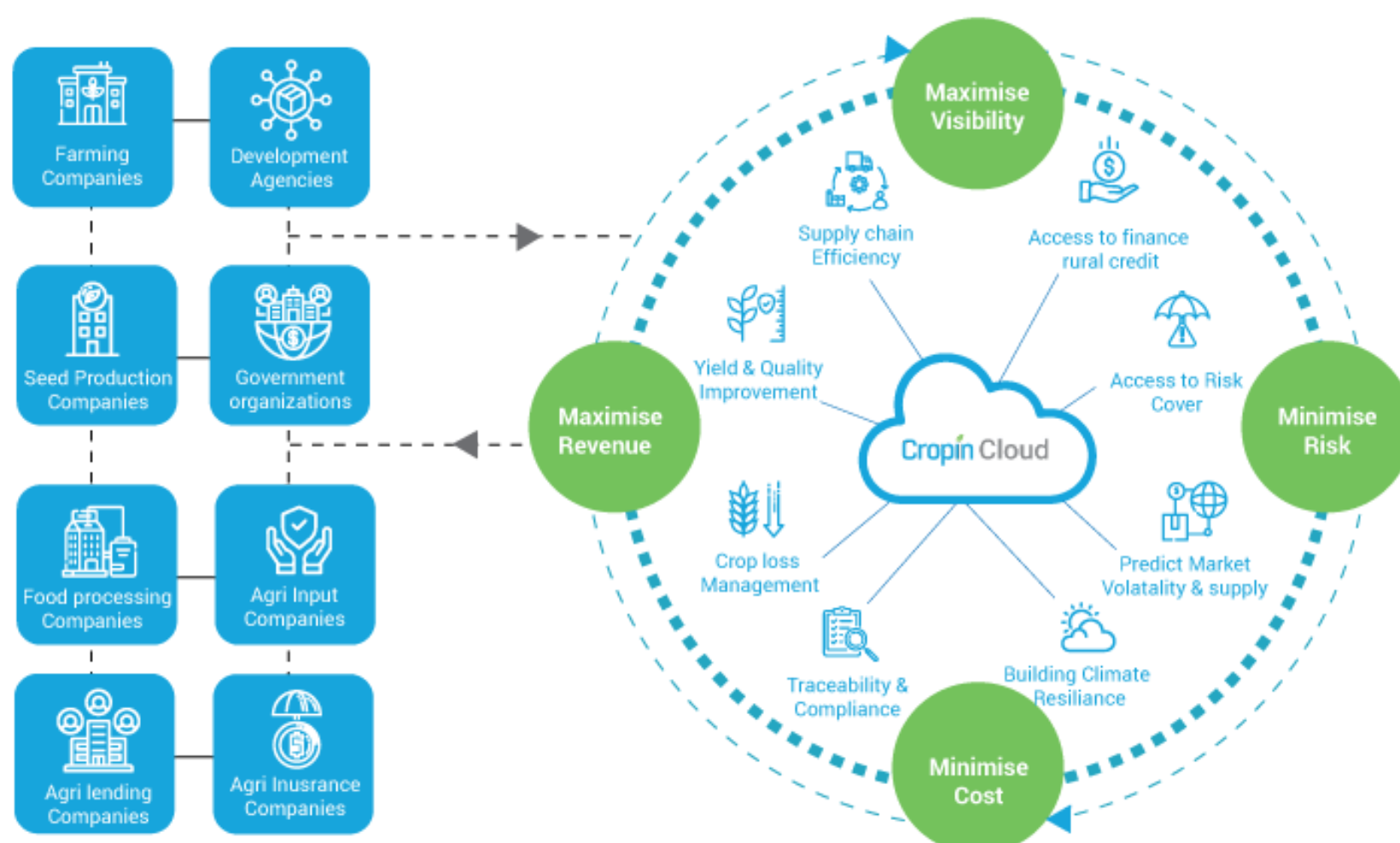
Welcome to a new era of agriculture—an era where the soil meets the cloud, where tradition marries technology, and where every seed sown has the potential to reap unprecedented rewards. Agriculture is not just an occupation, an industry, or even a way of life. It's the backbone of civilization, and it's on the cusp of a digital transformation that promises to redefine it from root to fruit.

But what's the catalyst for this transformation? Data. Precise, actionable, and timely data that can turn every plot of land into a wellspring of productivity and profit. It's not just about ensuring your crops are well-irrigated or that the soil has the right nutrients. It's about having a 360-degree view of every factor that influences your yield, and the power to optimize it.

For over a decade, Cropin has been at the forefront of this agricultural revolution. Our mission is singular but profound: to drive a 'Change for Good in Agriculture.' We aim to make every agricultural operation not just efficient but extraordinarily effective, from sowing the seed to selling the produce.

Through our Intelligent Agriculture Cloud, we offer near real-time insights that empower farmers to make data-driven decisions. These insights don't just improve productivity and profitability; they strengthen relationships and competitiveness in the larger agricultural value chain. And the impact is not just local—it's global. Through our ongoing work with over 250 Global Enterprises and several major Government and development Sector Projects, we've improved the lives of more than 7 million farmers across 92 countries.

So, whether you're a farmer, an agribusiness, or an industry that relies on agriculture, you have something invaluable to gain from this whitepaper. Read on to discover how Cropin's Plot-level Intelligence is setting the stage for the future of farming—a future that's not just sustainable but also incredibly profitable.



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# The Power of AI/ML and remote sensing based intelligence in Agriculture: The New Frontier

## *When Satellites Meet Soil: The Revolution in Farm Management*

Imagine a world where every seed sown comes with a data-backed guarantee of success, where the health of your crops is monitored from space, and where every drop of water and grain of fertilizer is optimized for maximum yield. Welcome to the future of agriculture—a future powered by Artificial Intelligence, Machine Learning, and Remote Sensing technologies.

Farming is no longer just about soil, water, and weather. It's about harnessing the power of data to make every square meter of your farm more productive, sustainable, and profitable. Cropin's cutting-edge technologies offer a bird's-eye view of your entire agricultural operation, providing near-real-time insights that are not just actionable but transformative.

### **Why is this a game-changer?**

- 1. Scale:** Satellite technologies allow for large-scale monitoring, covering vast expanses of farmland with pinpoint accuracy.
- 2. Reliability:** Consistent, repetitive data collection ensures that you always make decisions based on current information.
- 3. Cost-Efficiency:** High-quality data and actionable insights delivered at a fraction of traditional monitoring costs.
- 4. Comprehensive Insights:** From crop health and cropping patterns to yield estimations, get a 360-degree view of your farms.

But the impact doesn't stop at the farm gate. Effective farm management and optimization have far-reaching implications:

- **Food and Water Security:** Produce more with less, ensuring a stable food supply and optimized water usage.
- **Environmental Sustainability:** Lower carbon footprint and contribute to carbon sequestration.
- **Climate Adaptation:** Make farms resilient to changing weather patterns.

And we're not just talking about environmental sustainability; we're talking about social sustainability:

- **Fair Trade and Labor Practices:** Ethical farming that benefits everyone in the supply chain.
- **Empowerment:** Data-driven farming opens doors for youth and women, breaking down traditional barriers.



- **Regenerative Farming:** Contribute to biodiversity and soil health, ensuring a fertile future for the next generation of farmers.

The clock is ticking. The need for environmentally and socially sustainable agriculture is not just urgent; it's critical—for food security, for social security, and for the future of our planet.

### **The Green Revolution 2.0: Smart Farming in the Age of Industrialization**

As awareness grows about the urgent need for smart farming, we're witnessing the dawn of a new Green Revolution. This isn't just about policies, programs, or strategies; it's about fundamentally changing how we think about agriculture. It's about making every farm a smart farm and every farmer a smart farmer.

### **The Role of Technology: From Seed to Sale**

Technology is not just an enabler; it's a game-changer. By digitizing the farmer database, we're not just bringing transparency to the agricultural value chain; we're democratizing access to critical information. From crop planning and management to post-harvest practices, digital platforms offer a wealth of technical know-how. This is especially crucial for the export market, where transparency isn't just a bonus; it's a requirement.

### **The Digital Lifeline: Empowering the World's Poorest Farmers**

However, the impact of digitization goes beyond efficiency and transparency. It's about empowerment. By providing remote access to advice, inputs, and markets, digital platforms can lift some of the world's poorest people out of poverty. They can increase food security, boost yields, and make the entire food supply chain more efficient. More importantly, they give farmers a voice, enabling governments to direct and measure the impact of their agricultural investments more effectively.

### **The Future is AI-Powered**

The digital platform that can achieve all this isn't just any platform; it needs to be powered by Artificial Intelligence (AI) and Machine Learning (ML). These technologies are the key to addressing the unique challenges faced by farmers and agro-industries. They provide timely, data-driven insights and agronomic advisory services that can transform agriculture as we know it.



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## Unveiling Cropin's Plot-level Intelligence: An Overview

*The Future of Digital in Farming is Tailored, Monitored, and Always-On.*

Welcome to the next frontier in agricultural innovation: Cropin's Plot-level Intelligence. Imagine a world where every square meter of your farm is under the watchful eye of satellites and AI, where every seed sown gets an intelligence-backed risk cover. That's not science fiction; it's the reality we offer.

### **Integrated Data Science: The Heart of Crop Detection and Yield Forecasting**

Our platform goes beyond mere monitoring; it employs an integrated data science and analytical approach for precise crop detection and yield forecasting. Get a real-time snapshot of your crop's health and future yield, all backed by rigorous data science.

### **Your Farm's Control Center: The Web Interface**

Through our web interface, you can view your selected Area of Interest (AOI) with complete geo-tagged information. Whether it's the current crop health or a yield prediction 60 days post-sowing, all the data you need is at your fingertips. And it's not just current data; you can also access a 3-year historical weather pattern and a 7-day weather forecast, crucial factors in determining crop quality and yield.

### **Micro-Level Magic: Tailored Solutions for Every Plot**

What sets Cropin's Plot-level Intelligence apart is its focus on the micro-level. We're not just giving you a general overview; we're providing specific, actionable insights for each plot. From crop health to yield estimations, our platform tailors its advice to meet the unique needs of each farmer and stakeholder, whether you're operating in a single region or spanning multiple countries.

### **Objectives Achieved: The Power of Satellite Imagery**

- **Identify Growing Areas:** Know exactly where the major crop-growing areas are, updated fortnightly for real-time analysis.
- **Centralized Crop Health Monitoring:** Keep tabs on your crops' health throughout the season, all from one location.
- **Optimized Procurement:** Plan your logistics, warehousing, and packaging based on localized harvest forecasts.

### **Digital Engagement: Empowering Farmers**

The platform aims to enable your agronomists, field teams, and growers with real-time actionable intelligence, helping them make informed decisions to manage risks more effectively.





### **Predictive Power: AI and ML at Work**

Using cutting-edge AI and ML techniques, we offer predictions on everything from weather and irrigation requirements to market conditions. This enables everyone involved—from agro-industries to field personnel—to make data-driven decisions that improve performance, optimize resources, and mitigate risks.

### **Seasonal Insights: Before, During, and After the Harvest**

- **Pre-Season:** Understand your soil and historical crop data before you even sow the first seed.
- **In-Season:** From sowing to harvest, get end-to-end insights on yield estimation, crop stage, and weather.
- **Post-Season:** Analyze the harvest to improve future yield estimations and plan for the upcoming season.

### **The Unique Edge: Cropin Cloud's AI and Big Data Capabilities**

Our cloud-based platform is designed for robustness and scalability. Enabled by AI and big data, and designed for satellite image-based and weather based analysis, our platform's unique Ag Knowledge Graph improves the accuracy of our Machine Learning models, making your farms smarter with every season.

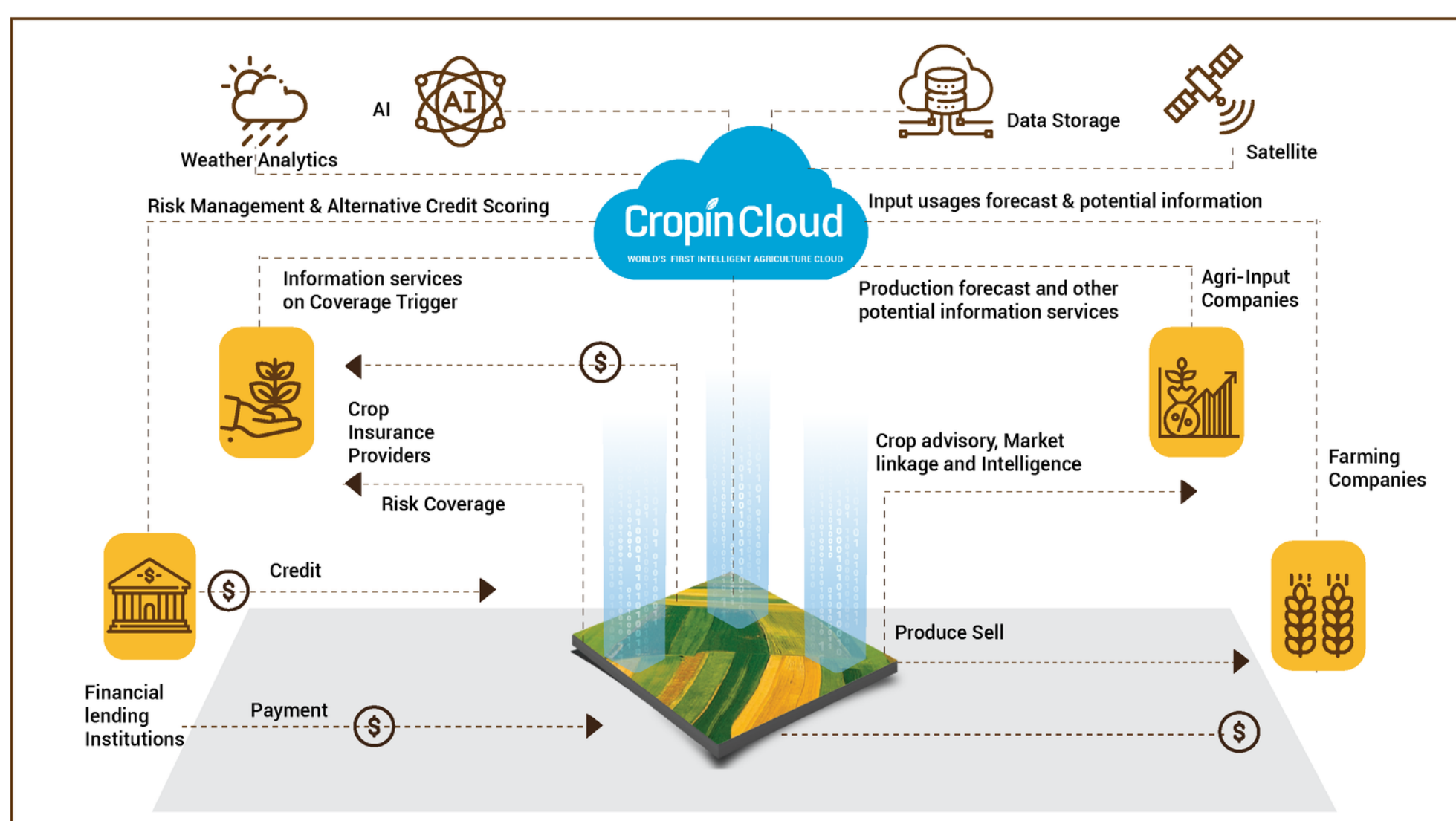
**Agri Knowledge graph  
that turns data into  
Actionable Knowledge**



## Operational Benefits: The Impact of Cropin's Plot-level Intelligence

### *Turning Data into Decisions for Sustainable Farming*

Cropin Cloud's Plot-level Intelligence platform serves as a digital asset that not only tracks and traces agricultural data but also opens up new opportunities for various stakeholders in the value chain, from input providers to financial institutions and institutional buyers.



### **Data as a Foundation**

Data isn't just a record; it's a cornerstone for building future-ready, climate-resilient smart farming solutions. Here's how leveraging insights from Cropin's Plot-level Intelligence can make a tangible difference:

### **Enhanced Decision-Making**

Access to accurate yield estimations, crop health monitoring, and crop stage progression allows agribusinesses to make data-driven decisions. Real-time insights into crop conditions enable better operational planning, resource allocation, and proactive risk mitigation.

### **Risk Mitigation**

The ability to predict disease and pest infestations in advance equips agribusinesses to take timely preventive measures. This reduces the risk of crop damage and allows for targeted interventions, minimizing negative impacts on productivity.

### **Precision in Resource Allocation**

Understanding a crop's health and stage enables more precise allocation of resources like fertilizers, irrigation, and crop protection products. This leads to improved resource efficiency, reduced input costs, and maximized yield.





**Weather and Irrigation Advisory**

Real-time weather and irrigation advisories help agribusinesses align their irrigation schedules with actual crop needs, optimizing water usage and minimizing waste.

**Operational Efficiency**

The platform streamlines operations by offering real-time insights, reducing the need for manual monitoring and field visits. This results in time and labor cost savings, as well as more efficient resource utilization.

**Quality Control and Compliance**

Continuous monitoring of crop health and stage progression ensures quality control throughout the production cycle. Early identification of potential issues allows timely interventions to meet compliance standards and market requirements.

**Improved Crop Planning and Marketing**

Insights into yield estimation and crop health enable more effective marketing and sales planning. Agribusinesses can make informed decisions about pricing, market positioning, and supply chain management.

**Sustainability**

The platform supports sustainable agricultural practices by optimizing resource use, reducing chemical inputs, and minimizing water wastage. This contributes to long-term environmental sustainability, improved soil health, and reduced waste.



## Core features of Cropin's Plot-level Intelligence:

### *Turning Data into Smart Farming Solutions*

Cropin's Plot-level Intelligence offers a range of features designed to empower agribusinesses with actionable insights for effective and sustainable farming.

Analytical Insights	Actionable Advisory
<p><b>Yield Optimization:</b></p> <ul style="list-style-type: none"> <li>• Best practices and inputs for maximizing yield, tailored to each plot.</li> <li>• Identification and mitigation strategies for factors affecting yield variations.</li> <li>• Data-backed risk mitigation to secure yield output.</li> <li>• Utilization of precision agriculture techniques for plot-specific yield optimization.</li> </ul> <p><b>Crop Stage Monitoring:</b></p> <ul style="list-style-type: none"> <li>• Accurate tracking of crop growth stages and lifecycle progression.</li> <li>• Timely interventions based on indicators of crop development delays or advancements.</li> <li>• Data-driven planning and procurement, aligned with harvest schedules and resource needs.</li> <li>• Evaluation metrics to compare actual crop performance against expected timelines.</li> </ul> <p><b>Crop Health Monitoring:</b></p> <ul style="list-style-type: none"> <li>• Early identification of diseases, pests, nutrient deficiencies, and water stress.</li> <li>• Targeted interventions for areas or plots with compromised crop health.</li> <li>• Real-time monitoring to facilitate timely actions and minimize yield loss.</li> <li>• Intelligent analysis of crop health deviations, providing actionable insights.</li> <li>• Effectiveness metrics for disease management strategies.</li> </ul> <p><b>Disease Early Warning System(DEWS):</b></p> <ul style="list-style-type: none"> <li>• Proactive anticipation of disease outbreaks and their potential impact.</li> <li>• Timely and targeted preventive measures to minimize disease occurrence.</li> <li>• Optimization of pesticide usage, reducing unnecessary chemical treatments.</li> <li>• Environmental stewardship through minimized impact and soil health preservation.</li> </ul>	<p><b>Irrigation Advisory:</b></p> <ul style="list-style-type: none"> <li>• Plot-level recommendations for optimal irrigation application.</li> <li>• Guidance on irrigation timing and volume based on crop needs and soil moisture.</li> <li>• Strategies for efficient water use to prevent under- or over-irrigation.</li> </ul> <p><b>Weather Advisory:</b></p> <ul style="list-style-type: none"> <li>• Season-specific weather guidance for effective farm management.</li> <li>• Recommendations on how factors like temperature, humidity, wind speed, and precipitation affect various farming activities.</li> <li>• Insights for proactive planning against adverse weather conditions.</li> </ul>

## Crop Stage Identification and Progression Monitoring: A Journey from Seed to Harvest

### Precision Agriculture: The Backbone of Smart, Sustainable Farming

Precision agriculture is not just a trend; it's a necessity as we aim to feed a growing global population efficiently and sustainably. High-resolution satellite imagery offers a wealth of real-time data, enabling growers and agribusinesses to make proactive, informed decisions.

### Cropin's NDVI-Based Crop Progression Model

Cropin's Plot-level Intelligence employs an NDVI-based mathematical model for Crop Stage Detection. This model uses a time series of high-resolution satellite images to identify key moments in crop development. It also predicts the current stage and progression of the crop based on heat units, providing valuable metrics like Crop Growing Degree Days. These insights allow users to gauge whether the harvest is on time and if the crop is progressing healthily toward maturity. This serves as a foundational step for understanding harvest deviations and planning subsequent activities like procurement.

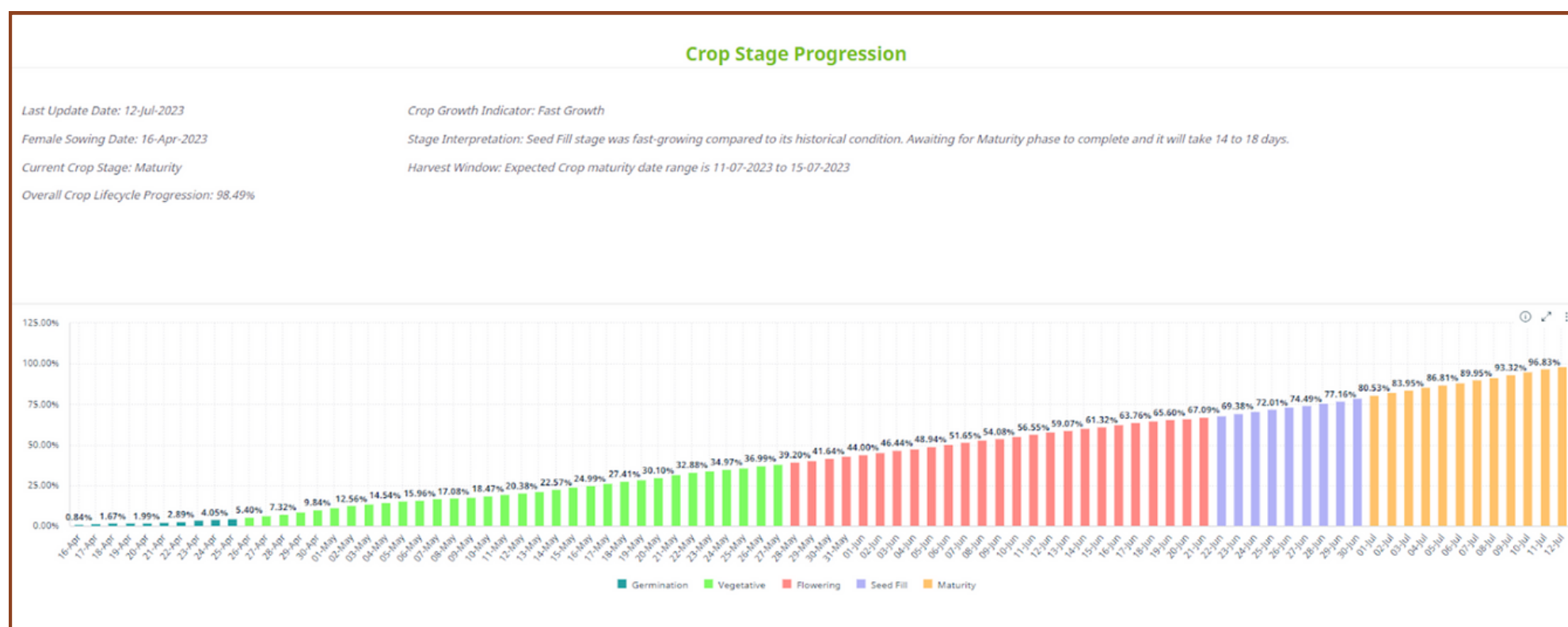


Fig:1

Fig:1 depicts the Crop Progression model has predicted this plot to have reached maturity date on 1st July, and the crop’s lifecycle progression is at 80.53%

### Key Metrics

- Crop Stage: Current developmental phase of the crop.
- Crop Progression: Proximity of the crop to the ideal harvest window.





## **Business Benefits Across Stakeholders**

### **For Contract Farming Companies:**

- Remote monitoring to identify exact crop growth stages.
- Proactive management of farm activities and crop requirements.
- Advanced planning for harvest and post-harvest activities.
- Increased visibility and transparency in production processes.
- Boosted productivity through data-driven decision-making.

### **For Agri-Input Companies:**

- Timely availability of agrochemicals and farm machinery.
- Enhanced customer engagement for promoting new products.
- Strengthened customer loyalty through targeted offerings.

### **For Government Entities & Policymakers:**

- Efficient crop-cutting experiments based on regional crop stages.
- Accurate estimates for effective food distribution strategies.
- Data-driven policy formulation for imports and exports.

### **For Banking, Financial Services, and Insurance (BFSI):**

- Monitoring crop growth for timely loan collection.
- Risk mitigation by identifying optimal times for customer repayments.



# Crop Health Metrics: A Comprehensive Guide to Monitoring Crop Vitality

## Turning Data into a Blueprint for Crop Wellness

Crop health is more than just a visual assessment; it's a data-driven understanding of various factors that contribute to the vitality of the crop within a plot. Cropin's Plot-level Intelligence employs three key metrics to gauge crop health:

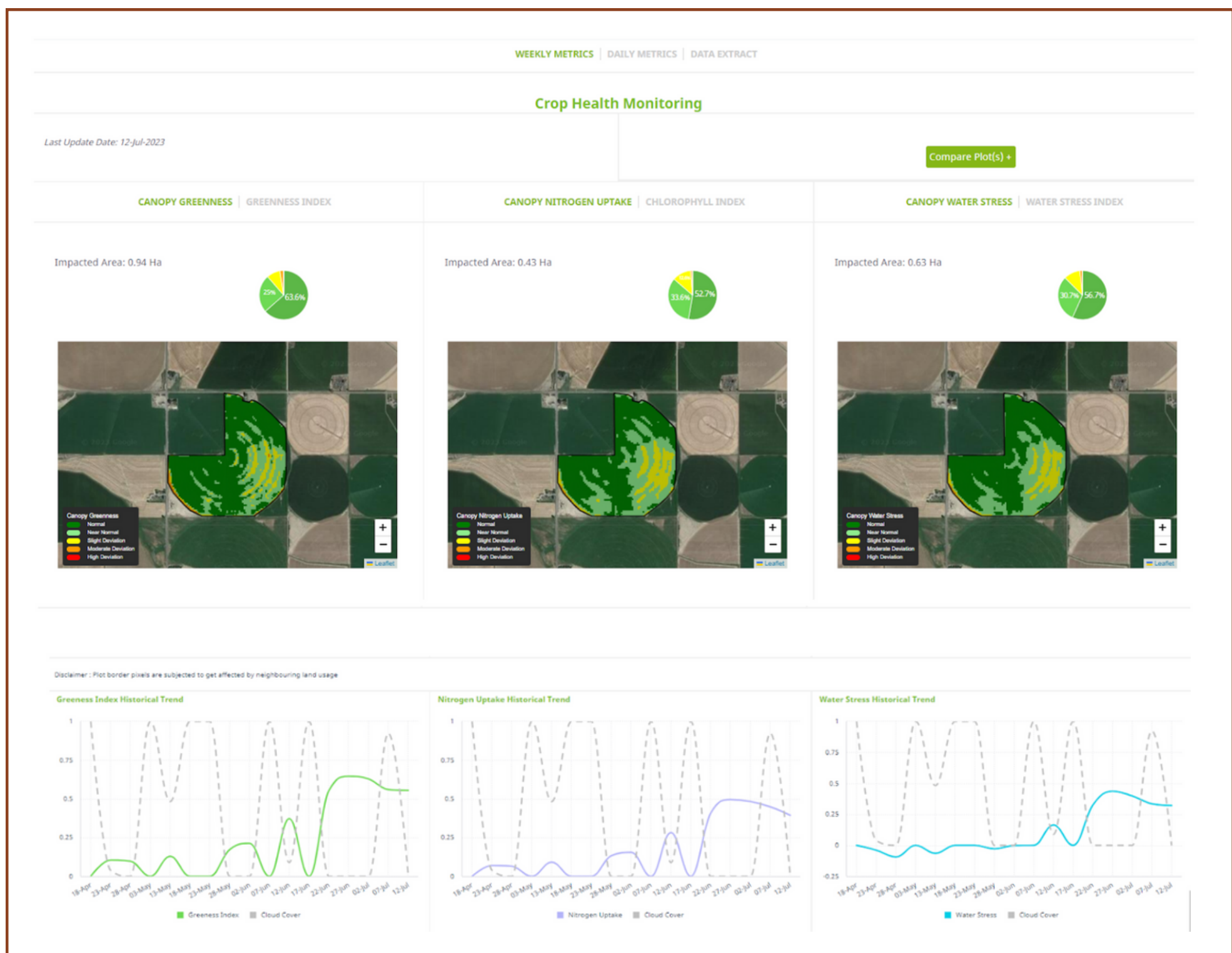


Fig:2

The screenshot in Fig:2 from the product dashboard indicates, based on Canopy Greenness, that around 36% of the plot is deviating from the normal. It correlates to the Water Stress map output, which indicates uneven irrigation happening on the plot that is leading to an impact on crop health. The Nitrogen Uptake section is also showing an impact, which could be due to uneven fertilizer application on the plot.

The map output would enable the agronomist/field agent/farmer to scout through the plots and find what exactly is going on that is affecting the crop health to mitigate any risk to yield loss, both quantity and quality-wise.

The historical trend line below each of these sections shows the raw index trend from the date of sowing to the current date throughout the season for NDVI, NDRE, and LSWI.



## Key Metrics for Crop Health

- **Canopy Greenness:** Derived from the Normalized Difference Vegetation Index (NDVI), this metric offers a data-backed assessment of vegetation health.
- **Canopy Nitrogen Uptake:** Utilizing the Normalized Difference RedEdge Index (NDRE), this metric serves as a measure of crop vigor.
- **Canopy Water Stress:** Based on the Land Surface Water Index (LSWI), this metric quantifies the total liquid water available in both vegetation and the supporting soil.

## Business Benefits Across Stakeholders

### For Contract Farming Companies:

- Remote, global monitoring of crop health.
- Early identification and remediation of nutrient or water deficiencies.
- Resource efficiency by focusing on areas that specifically need attention.
- Seasonal yield estimation based on real-time data.
- Yield recovery and maximization through timely interventions.
- Early detection and prevention of extensive damage due to pests or diseases.

### For Agrochemical Manufacturers:

- Data-driven marketing strategies based on satellite intelligence of plot performance.
- Inventory management through hotspot identification, ensuring product availability when and where needed.
- Sales maximization by mapping the right products to the right regions, based on plot information like crop detection, acreage, and historical performance.
- Effective monitoring of product performance on demo plots for continuous improvement.





## Yield Projections: A Data-driven Approach to Estimating the Harvest

### *Turning Predictive Analytics into Proactive Farming Decisions*

Yield estimation is more than just a seasonal guess; it's a data-driven model that predicts both overall production and yield per acreage when the crop reaches approximately 75% of its lifecycle. The most effective yield estimation techniques today leverage geospatial data and remote sensing technologies to provide near-real-time information on a global scale.

$$\text{Yield} \propto f(\text{Genetic, Management, Environment})$$

### The Science Behind Yield Estimation

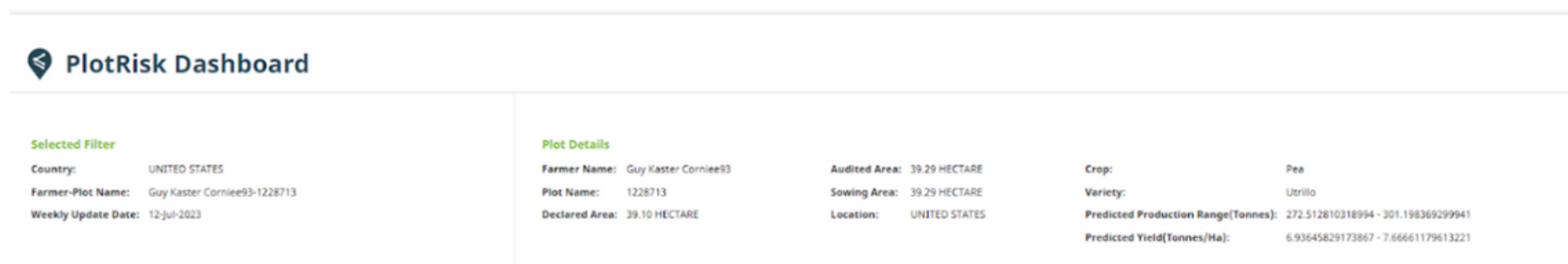


Fig:3

The above shows the Prediction Production Range in Tonnes and the Predicted Yield in Tonnes per Hectare as those are the preferred units by the customer.

The yield estimation process integrates weather data and remote sensing information at key crop stages. Analytical models are fine-tuned for different regions through a combination of:

- High-Resolution Satellite Data
- Crop Simulation Models
- Advanced AI & ML Techniques
- Remote Sensing and Weather Forecasts
- Advanced Statistical Data Analytics
- Applied Agronomy Knowledge

These models provide an accurate yield per hectare and an expected production range for each plot, available at least 30 days before the predicted harvest.



**For Farming Companies:**

- Enables proactive harvest and post-harvest decisions, from resource allocation to downstream planning.
- Scalability of the model to any location, geography, or crop, provided variety-level crop information is available.

**For Government Entities:**

- Early warnings for potential yield reductions, facilitating timely import and export decisions.
- Efficient design and implementation of agricultural policies and programs.

**For Agrochemical Manufacturers:**

- Targeted product availability in regions with low crop yield predictions.

**For Banking, Financial Services, and Insurance (BFSI):**

- Enhanced data accuracy for processing crop insurance claims.
- Assessment of a farmer's creditworthiness based on yield potential estimates.



## Disease Alerts: Timely Warnings for Proactive Farm Management

### Harnessing Technology for Early Disease Detection and Mitigation

Crop diseases can result in significant production losses, accounting for up to 40% of total yield in some cases. Early detection and mitigation are, therefore, crucial. Advances in satellite-based earth observation and widespread smartphone usage have paved the way for technology-driven Disease Early Warning Systems (DEWS) for plant diseases.

### How DEWS Works

The Disease Early Warning System (DEWS) is a weather-based model that predicts the likelihood of disease occurrence based on both historical and forecasted weather parameters, such as temperature and humidity. The model runs continuously from the date of sowing until the end of the season, capturing various diseases that could affect the crop.

Fig:4 is the DEWS Model run for a plot in France cultivating peas; the DEWS model indicated a 43% probability of Bacterial Blight occurrence. The advisory to users is to apply preventive sprays when the disease occurrence probability reaches a critical level, typically above 75%. These thresholds are also user-configurable.

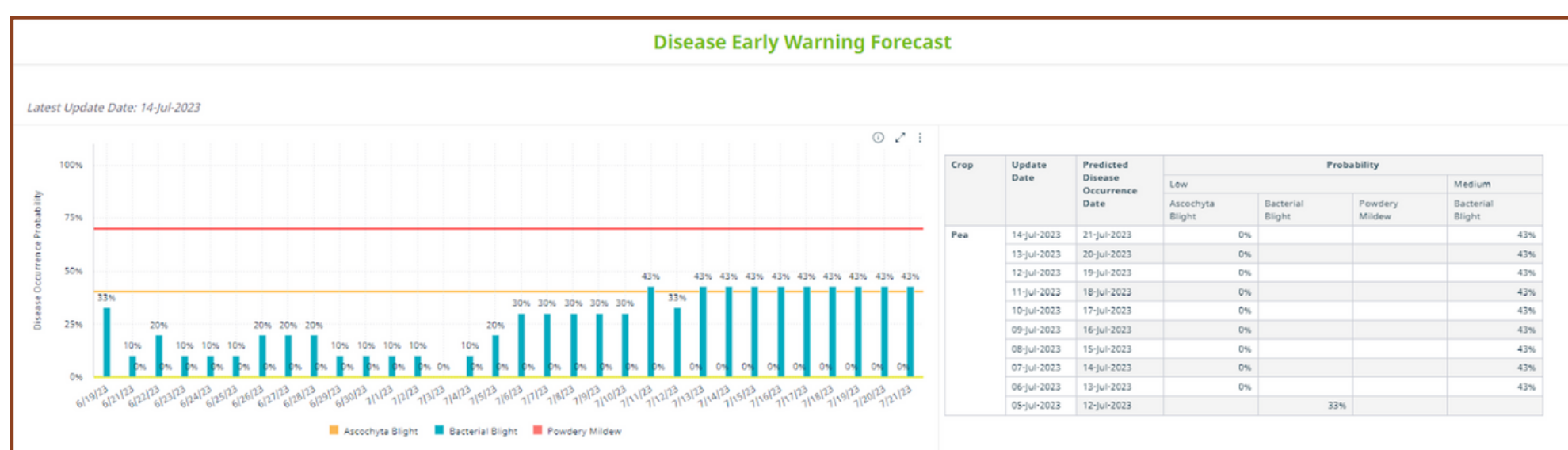


Fig:4

The DEWS system operates on a risk-scoring model, continually refining its predictions based on real-world data and historical trends.

### Business Benefits Across Stakeholders

#### For Farming Companies:

- Early detection of crop diseases to prevent extensive damage.
- Ongoing remote monitoring of crop health.
- Yield restoration and economic gains through timely interventions.

#### For Agri-Input Companies:

- Ensured availability of pest management products in high-risk regions.
- Data-driven marketing and sales strategies.
- Increased sales and customer loyalty through targeted product offerings.





## Irrigation Guidance: Smart Water Management for Sustainable Farming

### Turning Data into Drops: Precision Irrigation for Every Crop

Effective irrigation is vital for crop health, but traditional methods often lead to water wastage. Cropin's Plot-level Intelligence revolutionizes irrigation management by offering actionable insights based on a range of data points, from soil moisture to weather forecasts.

### How Cropin's Irrigation Advisory Works

The system uses satellite data, weather forecasts, evapotranspiration rates, and soil conditions to provide precise irrigation schedules. If IoT soil moisture sensors are available, the system can offer even more immediate insights. Automated alerts are triggered when soil moisture falls below critical levels, advising farmers on the exact amount and timing of irrigation needed.

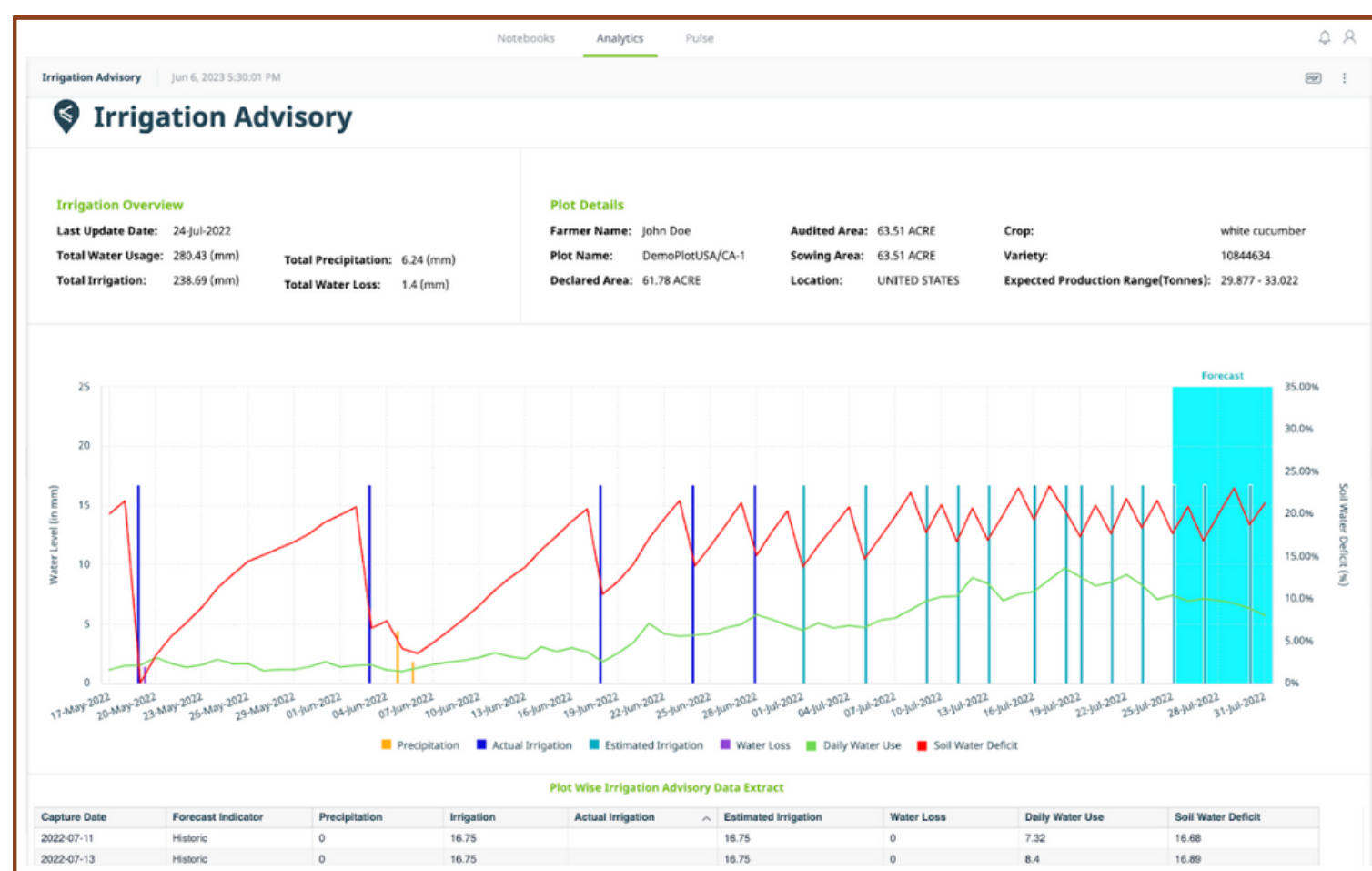


Fig:5

Fig:5 advises the user on how much and when to irrigate over the next 7 days as of today (as of 26th of July) by irrigating the field by about 45mm over the week. This is the optimal irrigation advisory based on water consumption of the crop, based on the type of soil and the soil water deficit components calculated for this field to ensure the farmer does not under or over-irrigate the plot that will impact the health of the crop.

Optimal irrigation is extremely crucial for the crop to be healthy throughout the season, hence, the irrigation advisory model can be configured to run on a daily basis to ensure insights consumption.

### Key Metrics Provided

- Current daily water use in mm
- Soil water deficit in percentage
- Precipitation information in mm
- Actual irrigation volumes from field data or IoT sensors
- 7-day forecast for irrigation needs and timing

## **Business Benefits Across Stakeholders**

### **For Farming Companies:**

- Plot-specific irrigation scheduling based on real-time data.
- Water budgeting based on precise crop water requirements.
- Enhanced water efficiency by focusing on areas that specifically need irrigation.
- Data-driven decision-making based on historical insights.
- Faster loan approvals through data-backed applications for micro-irrigation funds.

### **For Banking, Financial Services, and Insurance (BFSI):**

- Speedier loan appraisals using alternate agricultural data.
- Remote monitoring of micro-irrigation projects.
- Streamlined loan processes for increased productivity.
- Assurance that funds are used for their intended purposes.



## Adaptive Climate-Smart Weather Advisory: A New Standard in Precision Agriculture

### Weather Wisdom at Your Fingertips

#### The Power of AI-Driven Climate-Smart Advisories

Cropin's digital platform, fortified with AI capabilities, offers a comprehensive Climate-Smart weather advisory service tailored for smallholder farmers and key agricultural stakeholders. The platform captures farm-specific data and provides real-time, adaptive advisories that span the entire agricultural cycle—from crop planning and optimal sowing windows to timely harvesting.

#### Weather Advisory: Your 7-Day Farm Forecast and Beyond

With the Cropin Grow and Cropin Connect tools, users can access a detailed 7-day weather forecast covering essential parameters like temperature, humidity, precipitation, and wind speed. What sets this apart is the ability for users to customize alert thresholds, enabling them to take proactive measures against unpredictable weather conditions that could impact yields.

Moreover, Cropin offers hyper-local weather insights and remote sensing data, tailored to specific field boundaries, regardless of geographic location. This data is accessible from the date of sowing and continues throughout the season.

#### Your Daily Dashboard

Users can conveniently view daily forecast data on the asset monitoring page, where key metrics like minimum and maximum temperature, humidity, and wind speed are displayed in an easy-to-read daily calendar tab. These metrics serve multiple purposes throughout the season—from planning and procurement to crop growth tracking and harvest planning.

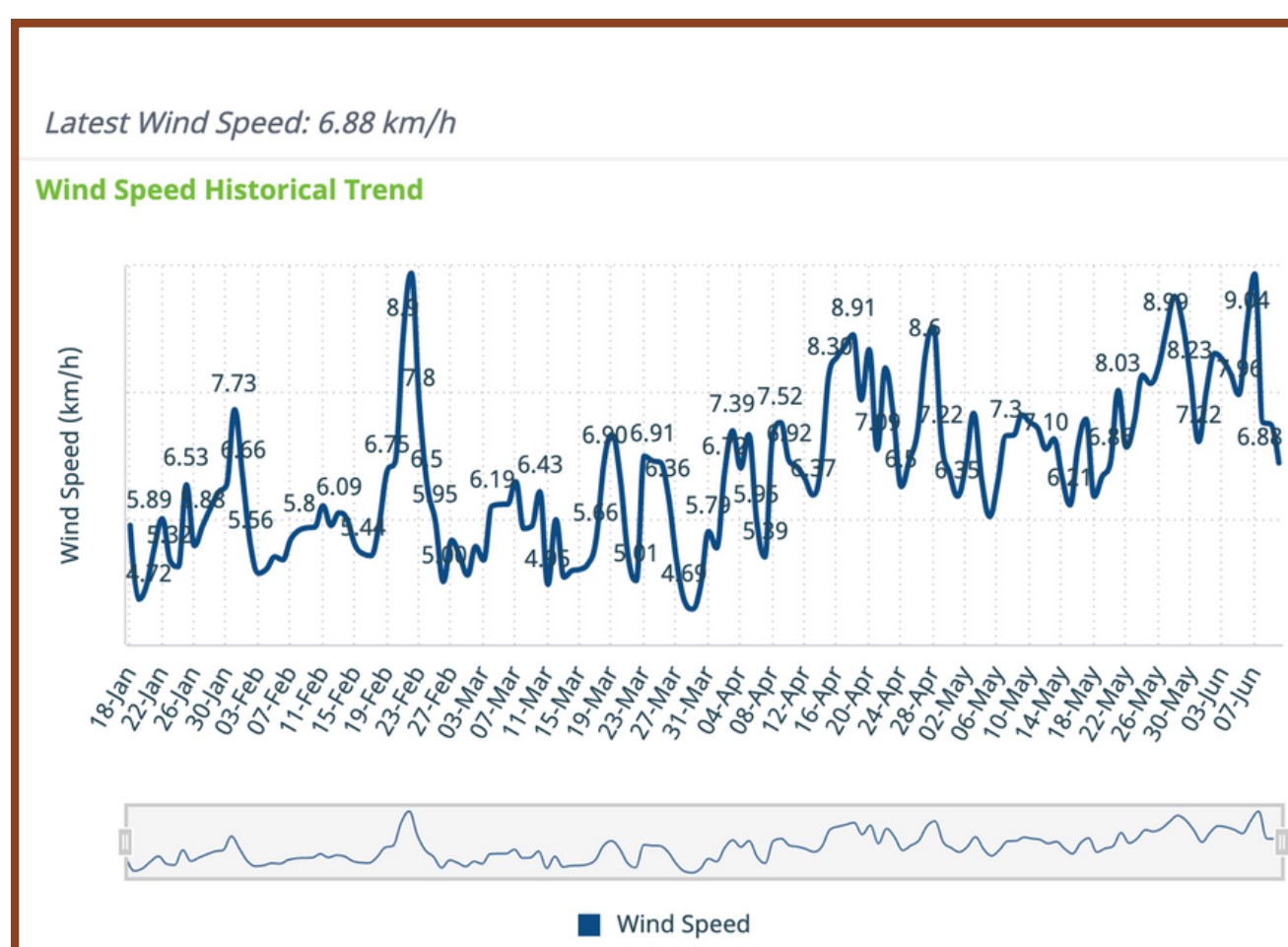


Fig:6

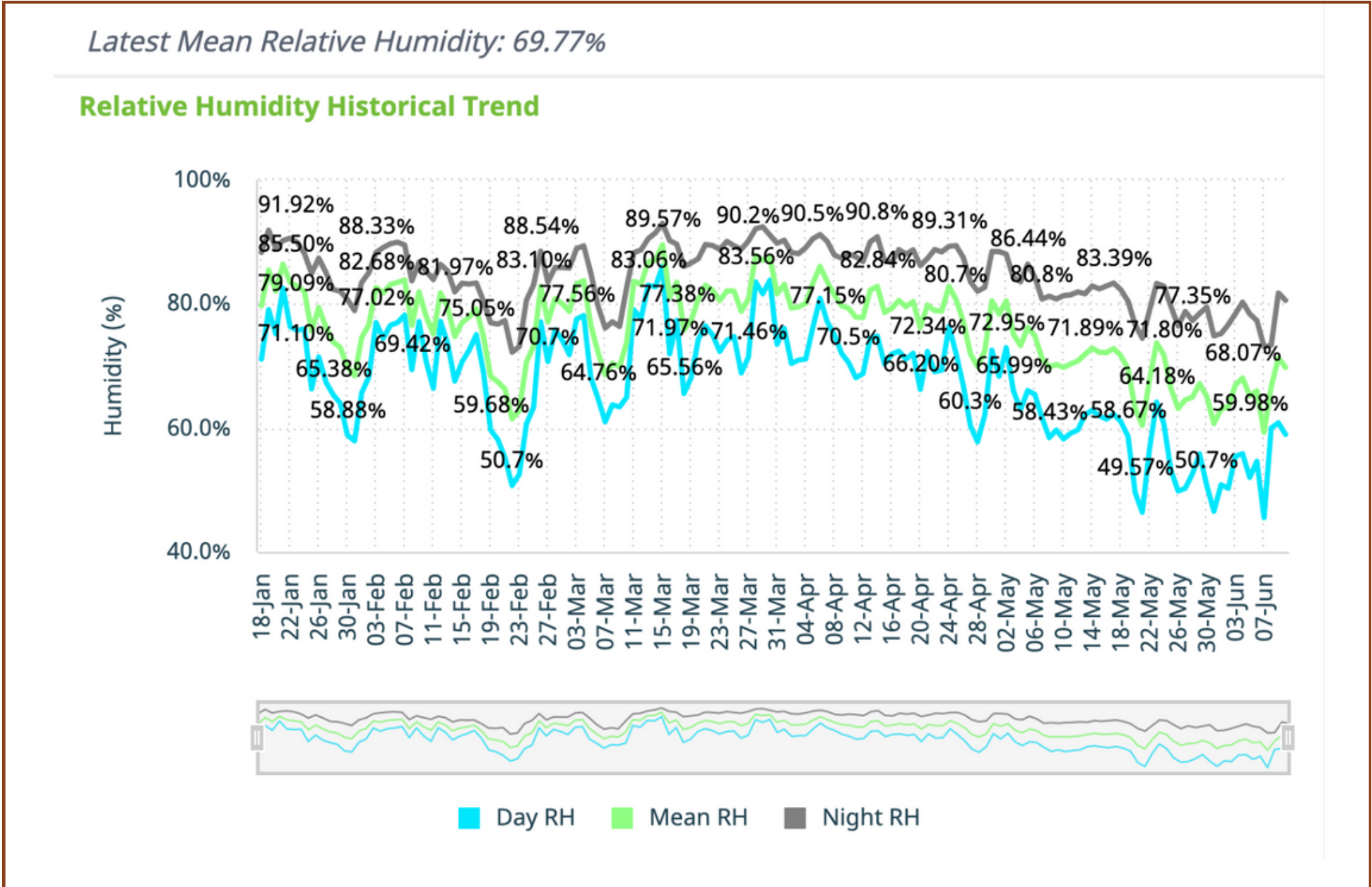


Fig:7

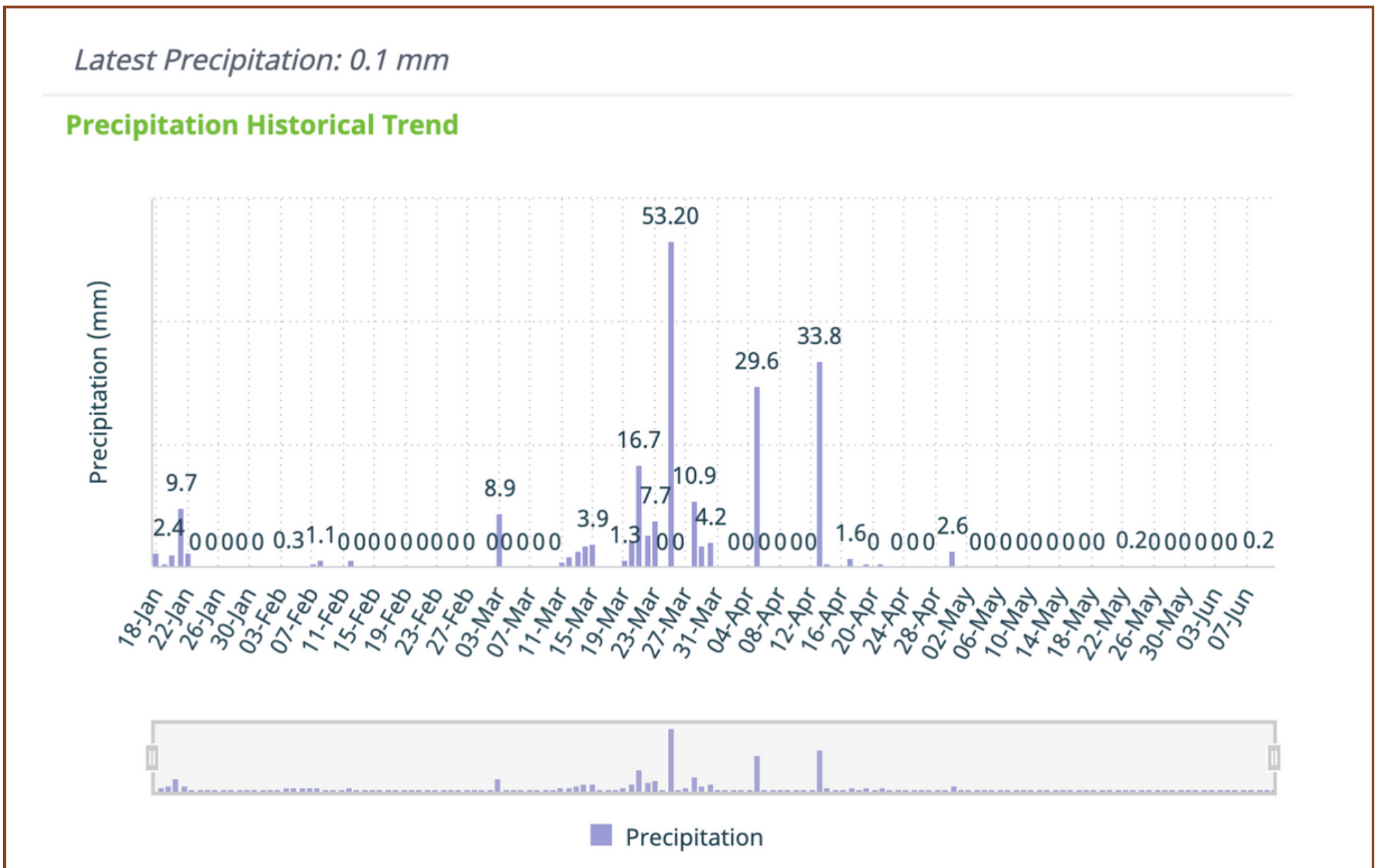


Fig:8





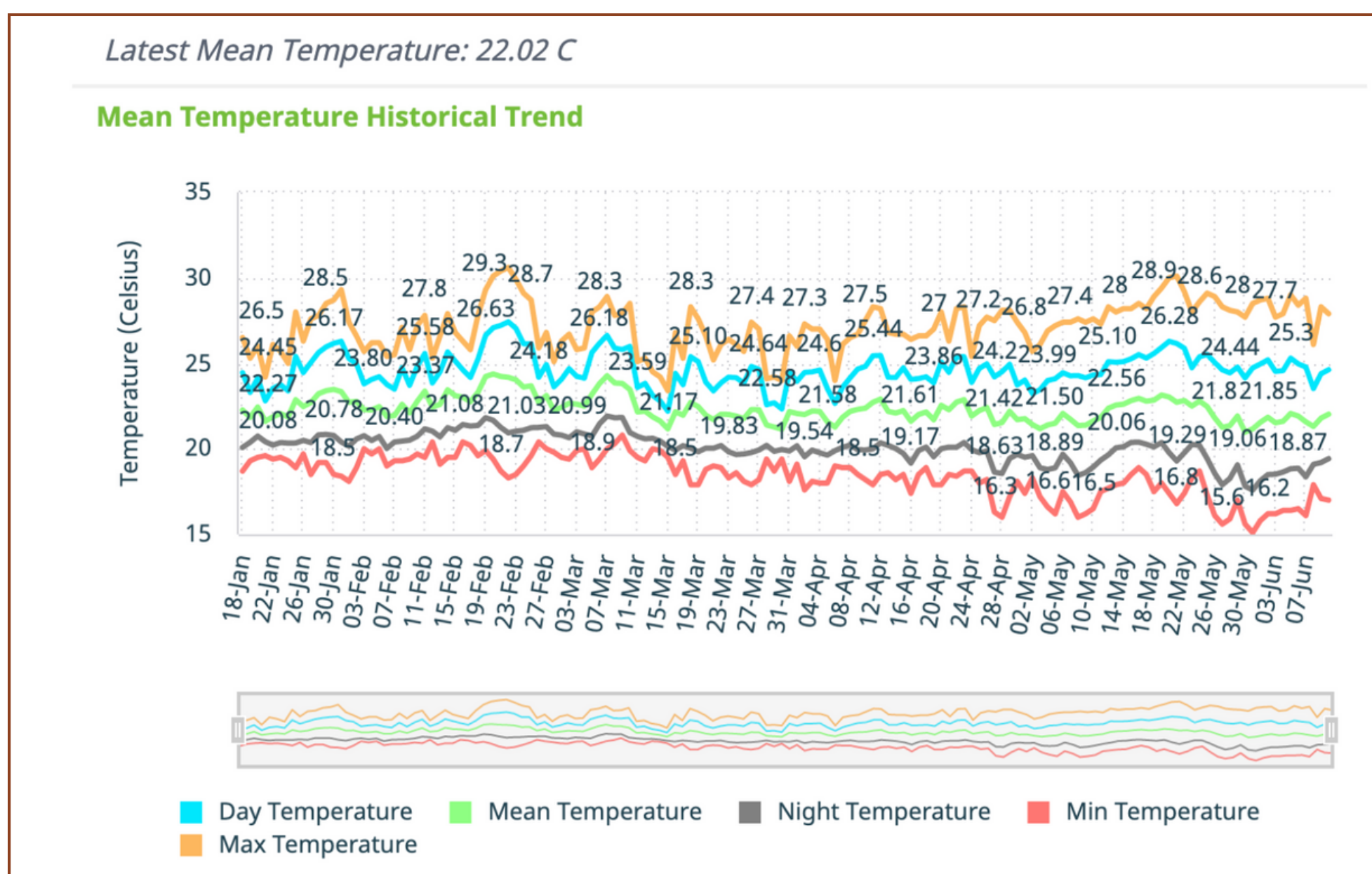


Fig:9

### Key Metrics and Advantages:

- Wind Speed
- Relative Humidity: Day, night, and mean
- Precipitation
- Mean Temperature: Minimum, night, mean, day, and maximum

### Tailored Advisories:

- **Sowing Window Advisory:** Utilizes historical data and current weather conditions to identify optimal sowing dates.
- **Irrigation Plans:** Develop an efficient irrigation schedule based on rainfall, temperature, and soil moisture data.
- **Early Warning for Pests & Diseases:** Offers predictive advisories based on current climate conditions and crop stage.
- **Fertigation & Pesticide Schedules:** Generated based on daily weather data.
- **Harvest Window Advisory:** Provides forecasts for extreme conditions like high temperatures or heavy rainfall, enabling better harvest planning.

These advisories are directly communicated to farmers via Cropin's portal, using SMS or IVRS gateways, making it easier than ever to farm smarter, not harder.



## Guided Scouting: Precision Field Sampling Through Remote Sensing

*Turning Pixels into Plots: The Future of Field Sampling is Here*

### The Power of Remote Sensing-Based Sampling

Remote sensing technologies have revolutionized the way we monitor and manage agricultural fields. By leveraging satellite imagery, aerial photography, drones, and sensor-based systems, this approach captures invaluable data on crop health, growth patterns, pest infestations, and nutrient deficiencies. The processed data then becomes a treasure trove of actionable insights for farmers and agronomists, aiding in more informed decision-making, cost reduction, and operational efficiency.

### Introducing Cropin's Intelligent Sampling

Gone are the days when field sampling was a manual, labor-intensive process. Cropin's Intelligent Sampling is a game-changing feature designed to meet the evolving needs of modern agriculture. Whether it's yield estimation, soil testing, quality control, or identifying water stress and greenhouse gas emissions, this feature streamlines the entire process.

### How It Works

Cropin Intelligent Scouting uses a range of intelligent indices like Canopy Greenness, Canopy Nitrogen Uptake, and Canopy Water Stress, along with established indices like NDVI, NDRE, and LSWI. This enables users to pinpoint exactly where sampling should occur for the most accurate results. Users can add sampling points directly onto the plots, optimizing the entire process for efficiency and accuracy. Different zones identified through these indices can be sampled, providing agronomists with a nuanced understanding of each farm's unique conditions.

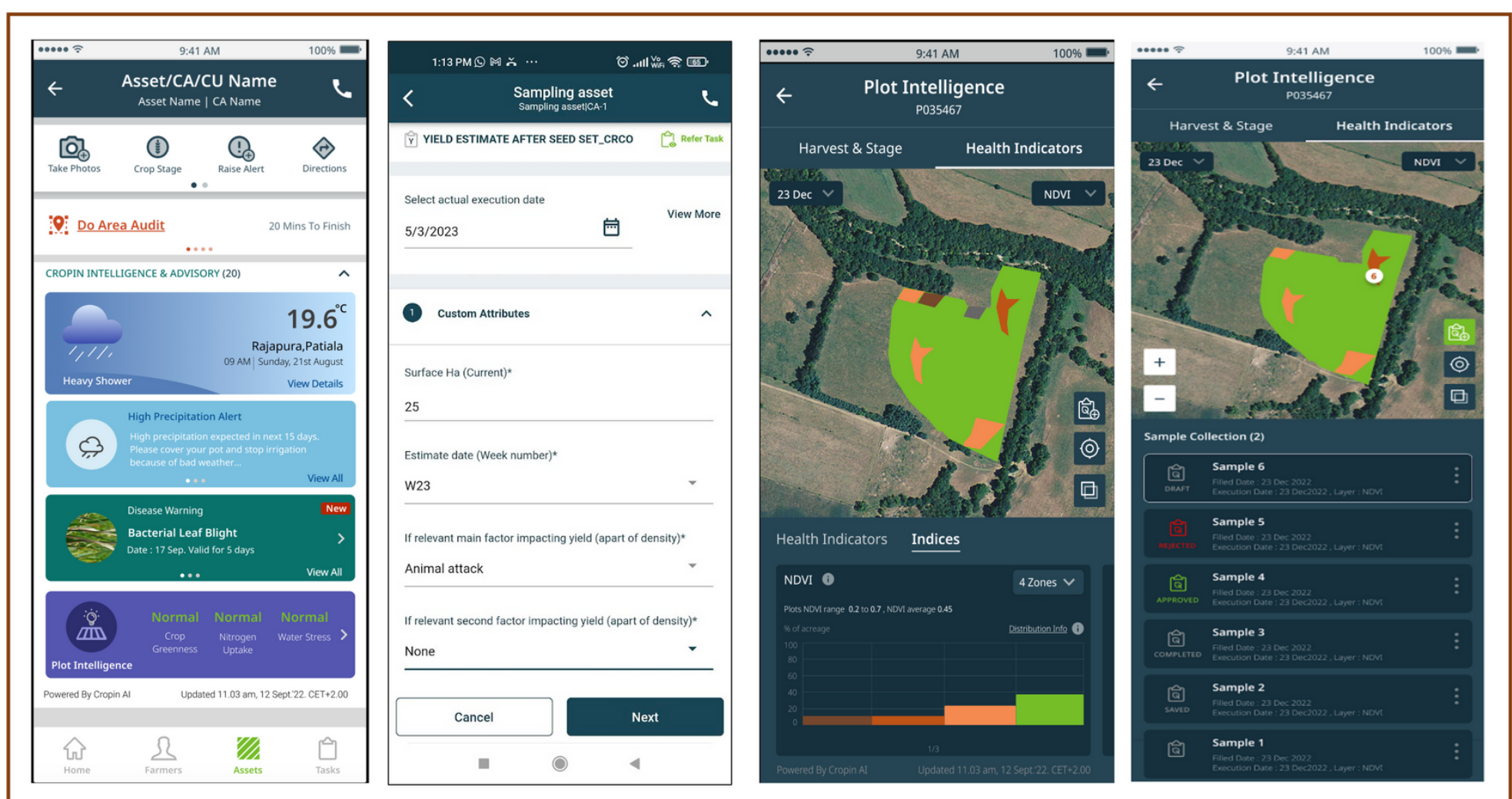


Fig:10

Snapshot - Mobile Application View - Zoning, Scouting & Sampling



## The Impact

This feature not only streamlines the sampling process but also equips agronomists and businesses with the data they need for informed decision-making. The result? Enhanced productivity and profitability.

In today's agribusiness landscape, adopting advanced digital farming techniques is not just an option; it's a necessity. Cropin's Intelligent Sampling heralds a new era in precision agriculture, offering transformative advantages that make guesswork a thing of the past.





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## Conclusion: Navigating the Future of Agriculture with Data-Driven Intelligence

As the global agricultural landscape undergoes rapid transformation, the need for innovative, scalable, and sustainable solutions has never been more urgent. This whitepaper has explored the multifaceted capabilities of Cropin's Plot-level Intelligence platform, a pioneering solution designed to meet the evolving challenges of modern agriculture.

From AI-powered Climate-Smart weather advisories to advanced yield projections, Cropin's suite of features offers a holistic approach to farm management. The platform's real-time, actionable insights empower farmers, agribusinesses, and other key stakeholders to make informed decisions across the agricultural value chain. Whether it's optimizing irrigation schedules, predicting disease outbreaks, or providing precise harvest estimates, Cropin delivers unparalleled efficiency and accuracy.

### Key takeaways from this whitepaper:

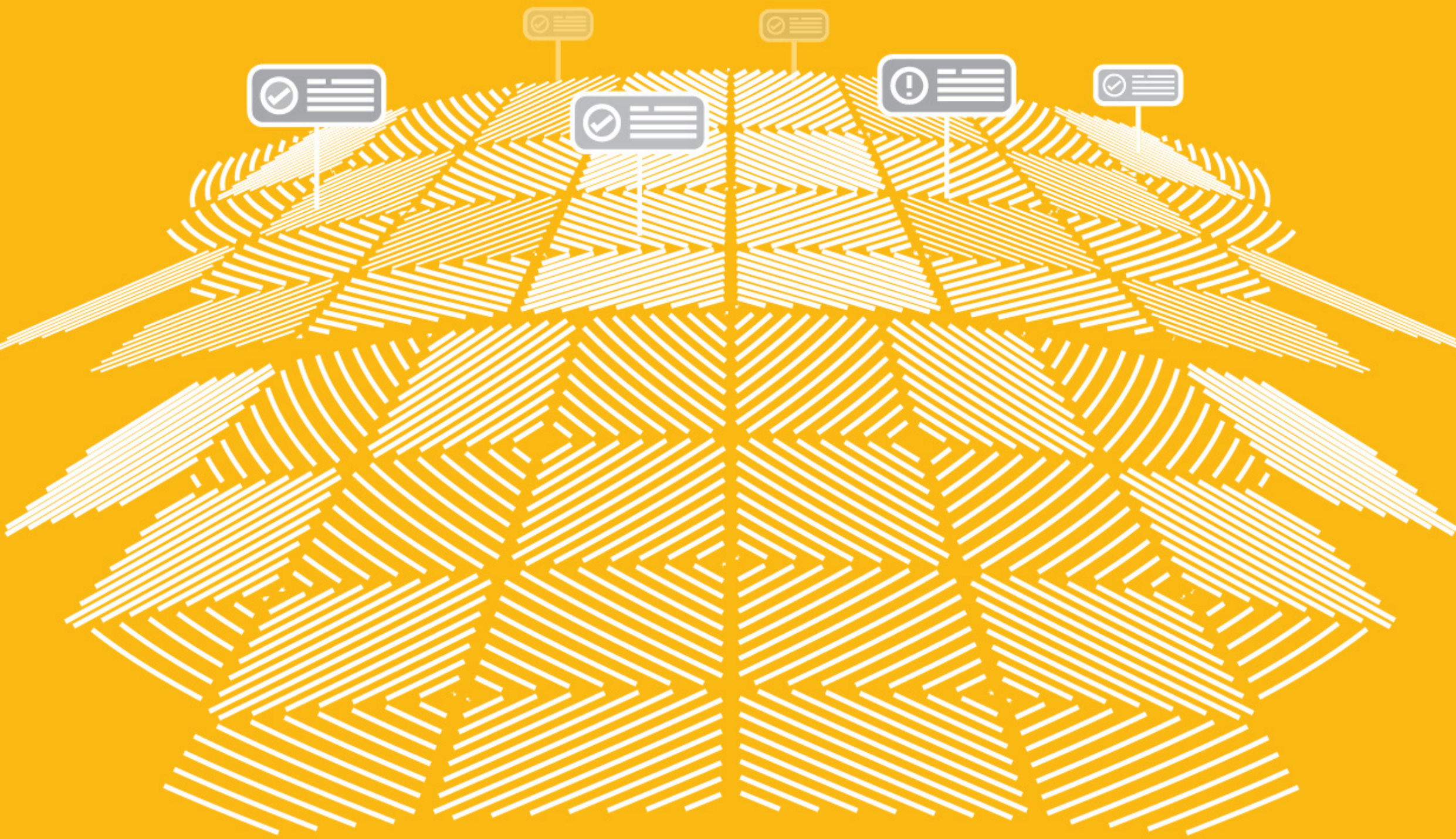
- **Adaptive Climate-Smart Weather Advisory:** A comprehensive service that offers real-time, adaptive advisories for every stage of the agricultural cycle.
- **Precision Resource Allocation:** The platform's ability to provide targeted advice on resource allocation, from irrigation to pest control, ensures both economic and environmental sustainability.
- **Risk Mitigation:** Advanced features like Disease Early Warning Systems (DEWS) and yield projections enable proactive risk management, reducing the impact of adverse conditions on crop health and yield.
- **Operational Efficiency:** Cropin's platform streamlines various aspects of farm management, reducing the need for manual monitoring and thereby saving time and resources.
- **Sustainable Practices:** The platform supports sustainable agricultural practices by optimizing resource utilization, thereby contributing to long-term environmental health.
- **Inclusive Benefits:** From smallholder farmers to government entities and agrochemical manufacturers, the platform's diverse range of features offers something for every stakeholder in the agricultural ecosystem.

In summary, Cropin's Plot-level Intelligence platform is not just a technological tool but a comprehensive solution that addresses modern agriculture's complex, interconnected challenges. By harnessing the power of advanced analytics, AI, and remote sensing, Cropin is setting a new standard in precision agriculture. As we look toward a future where food security and environmental sustainability are of paramount importance, solutions like Cropin's are not just advantageous—they are essential.

Thank you for taking the time to explore this whitepaper. We invite you to join us on this exciting journey towards a more sustainable, efficient, and prosperous agricultural future.







**Discover how predictive intelligence can enhance your farm operations & overall profitability, Improve yield forecasting and effectively balance supply and demand**

- Optimize the usage of agricultural inputs
- Monitor & reduce the carbon impact
- Implement sustainable practices
- Manage irrigation through water stress analysis

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