

# Powering Premium Fries with AI: How Cropin Enabled Surety of Supply for a US Food Processing Major



## Toward Surety of Supply

The potato's story is one of global migration. Fifty years ago, it thrived in Europe's temperate zones; today, China is the world's leading producer. While heat-tolerant varieties enabled expansion into warmer, non-traditional lands, climate change has made these new territories increasingly volatile.

For a global food processor, every crispy fry is a complex feat of coordination. In an era of shifting patterns and erratic weather, commercial success hinges on one factor: surety of supply.

Yet, that surety is under relentless pressure. From extreme weather to sudden disease outbreaks, risks often converge into a "perfect storm" for production. To stay ahead, global leaders need more than a traditional strategy—they need a sophisticated intelligence engine capable of out-innovating disruption itself.



## The Global Pioneer: A Profile in Scale

Our client is a titan of the global food processing industry, a vertically integrated agribusiness powerhouse renowned for its leadership in potato sourcing and processing. Having pioneered the commercial frozen French fry in the late 1940s, the company now operates across forty countries. They manage the entire crop lifecycle from proprietary seed development to distributing frozen specialties to the world's largest restaurant chains. Their success is built on a foundation of plant science and sustainability, ensuring consistent quality regardless of where the raw material was grown.



**Industry**  
Food Processing



**Deployment**  
China & Argentina



**Crop**  
Potato



**Solution Area**  
AI First Digitization, Plot-level  
Intelligence, Regional Intelligence



**Products Used**  
Cropin Grow, Cropin  
Intelligence, Cropin Sage

## The Regional Context: China and Argentina

Our partnership centers on two of the world's most vital, yet complex, agricultural landscapes:

- **China:** As the world's leading potato producer, China is seeing a massive shift in demand for processed products. As the first international processor to enter this market, the company introduced high-yielding varieties and advanced processing technology. Their current strategy involves securing "High-Yield Prefectures" to cater to a domestic market rapidly moving from fresh-market potatoes toward processed goods.
- **Argentina:** This region offers immense potential with year-round cultivation across diverse microclimates. The company produces specialized proprietary varieties here for the wider Latin American market. Managing this multi-season, geographically dispersed network requires a sophisticated approach to ensure rigorous quality standards are maintained.



## The Challenge: Navigating Supply Chain Disruption

Even for a global leader, the complexity of modern agriculture requires a new kind of resilience. The primary objective was to insulate the supply chain from disruption by evolving how data drives decisions in China and Argentina.



# 1. Uncovering Untapped Frontiers in China

## Resolutions

**Seasonal sown acreage estimation & Yield estimation of potato in the region**



### Crop suitability

**Weather prediction:** Temperature, Precipitation

**Extreme environmental conditions:** Frost, Frost-Free Period, Heatwave, Drought, Weather-based prediction of disease early warning

**Irrigation potential:** Water stress, Soil moisture, Evapotranspiration



To meet soaring demand in China, the company sought an aggressive expansion into new territories. To de-risk this high-stakes investment, they moved beyond simple historical data to seek "scientific certainty" at the grid level. Before committing capital, they needed answers to six critical questions:

- **Historical Footprint:** Have potatoes grown here before, and what were the exact yields?
- **Climate Correlations:** How do sowing and yield trends align with weather patterns and extreme event forecasts?
- **Predictive Potential:** What is the grid's capacity to support high-quality growth in upcoming seasons?
- **In-Season Visibility:** Can we track growth in real-time and accurately predict yield at maturity?
- **Quality & Disease Risk:** What is the probability of disease outbreaks affecting quality, both now and in the future?
- **Resource Availability:** What are the exact levels of water stress, soil moisture, and irrigation potential?

## 2. Transforming Procurement in Argentina



In Argentina, the company aimed to transform procurement into a proactive engine of growth. Moving away from manual coordination, they sought to build a "digital twin" of their potato farms to solve five core operational challenges:

- **Regional Orchestration:** Can we calculate the total yield and quality across all farms feeding a specific Procurement Center?
- **Real-Time Risk Oversight:** Can we monitor a vast, dispersed footprint in near real-time to guarantee consistent output?
- **Predictive Health Analytics:** Can we use predictive insights on crop health and irrigation to manage microclimate variations?
- **Proactive Mitigation:** Can climate-smart alerts enable interventions before environmental stress degrades the harvest?
- **Synchronization & Traceability:** Can we predict yields early enough to align factory schedules and ensure full traceability?

**By partnering with Cropin, the company aimed to leverage advanced agri-intelligence to ensure that every hectare contributes to a seamless, resilient, and uninterrupted global supply.**

# The End of the "Historical Normal"

For decades, global sourcing relied on the "Historical Normal", the idea that past weather patterns and market stability were reliable predictors of future harvests. In today's landscape, that era is over.



## Compounding Volatility

The Polycrisis Reality of heatwaves, shifting rainfall, and trade shocks now hitting simultaneously, overwhelms traditional, isolated risk models.



## The Cost of Hindsight

In a world of tight margins and high demand, waiting for a field report to confirm that a crop has failed is a multi-million-dollar mistake.



## From Buffer to Intelligence

Leaders are swapping physical inventory for Information Buffers—using AI to see yield estimates 45 days before they hit the factory gate.





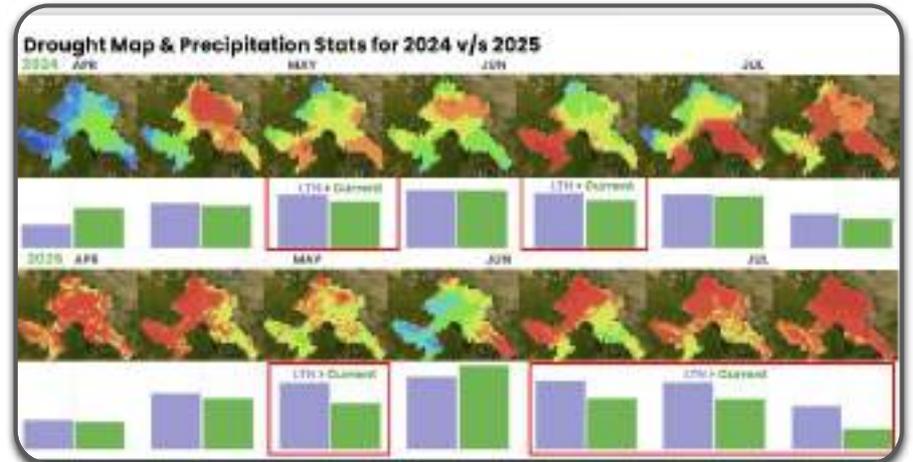
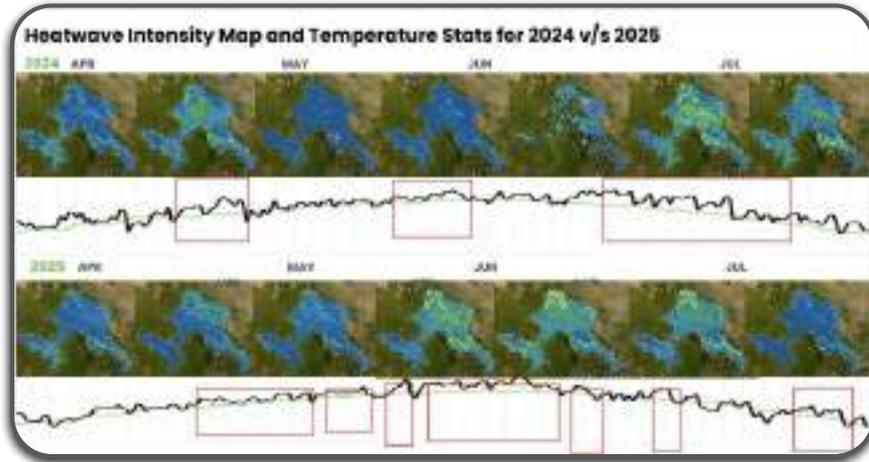
To secure the fry's future, the company needed to look beyond traditional agronomy. **Cropin Cloud** provided the intelligence platform required to turn complex supply chain planning into a predictable science. By synthesizing a sophisticated blend of **non-invasive satellite imagery**, geographical information such as elevation and soil maps, historical, current, and forecasted weather data, proprietary **Crop Knowledge Grids**, dynamic **Land Use Land Cover (LULC) data**, and other ancillary datasets, our deep-learning models delivered granular, actionable clarity.

**The Speed of Precision:** Cropin's baselined models delivered high accuracies out of the box. By integrating the client's historical data, we **hyper-tuned** these models to capture the unique characteristics of specific potato varieties and locations. This enhanced accuracy multi-fold, offering a scalable path to high-precision intelligence.



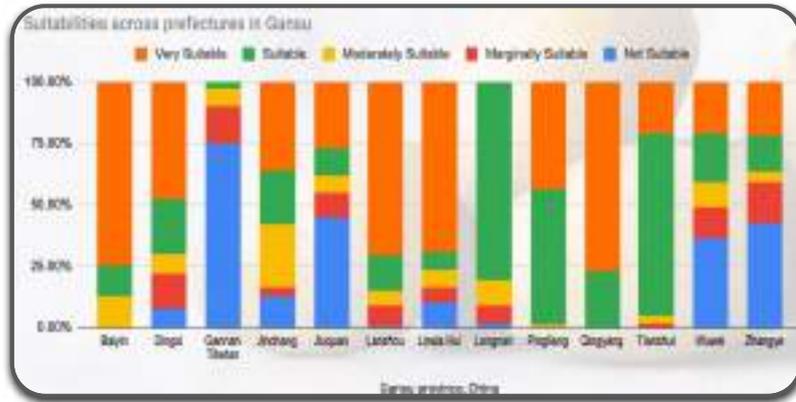
# Goal 1: Unlocking High-Yield Frontiers in China (Regional Intelligence)

In China, the objective was aggressive but calculated expansion. The company needed to know exactly where to plant next to ensure high-quality potato processing even before investing a single dollar. The company required intelligence for **520,000 sq km** across the **Gansu** and **Ningxia Hui** regions. Cropin provided critical insights into the season just ended, along with a predictive outlook for the upcoming year.



# From Analysis to Actionable Frontiers

Using **Cropin Sage's AI analytics**, we identified untapped, high-yield prefectures. By rigorous two-season analysis of potato area concentration and **disease risks** (Early Blight, Late Blight, and Bacterial Wilt) we turned vast data into a strategic roadmap covering:



- 🌿 **Active Agricultural Area** identified using dynamic LULC maps.
- 🌿 **Crop Suitability Maps** evaluated elevation, soil, rainfall, temperature, humidity, sunlight, wind speed, etc, for specific potato varieties.
- 🌿 **Sown Acreage Estimation** precise estimation of total regional cultivation.
- 🌿 **Yield Estimation & Yield Potential identified** "next frontiers" - by pairing past performance with future capacity.
- 🌿 **Resource Insights** offered granular data on water stress, soil moisture, and irrigation potential.

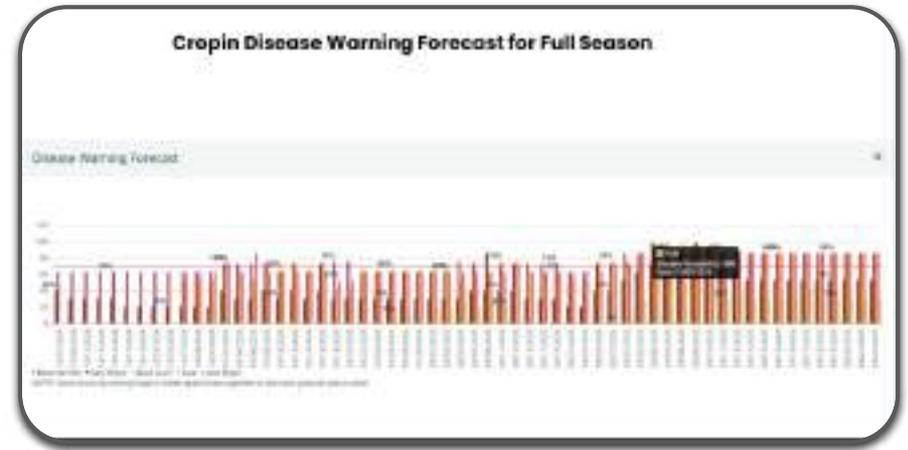
- 🌿 **Disease Probability Mapping** multi-season forecasts of blights and bacterial wilt.
- 🌿 **Comprehensive climate risk assessments** of temperature, precipitation, and extreme events like frost, heatwaves or drought.
- 🌿 **Hyper-local Weather Monitoring** pin-code level forecasts to optimize planting and harvest timing.

## Goal 2: Proactive Procurement & Plot-Level Intelligence in Argentina

In Argentina, where potato cultivation spans multiple regions and cycles throughout the year, the challenge was operational complexity. The company needed to move away from reactive procurement and manual oversight toward **a proactive engine of growth**.

### Remote Granular Oversight for High-Value Varieties

In Argentina, the focus was on **Remote Granular Oversight** across **10,000 hectares** of arable land. Cropin provided a digital twin of the landscape to





## The Results: Achieving Total Supply Chain Readiness

By deploying Cropin Cloud's predictive engine, the company moved from inquiry to action, consolidating its expansion goals with scientific certainty and from reactive to predictive with AI-driven agri-intelligence.



# 1. The Verdict on China: Scientific Expansion

Cropin provided the empirical evidence needed to de-risk the company's diversification strategy in China.

-  **Mapping the Footprint:** We provided the exact historical potato acreage and yield volumes for previous seasons, establishing a clear baseline for regional performance. By combining multiple datasets, our model identified high-yield, low-risk regions aligned with demand, enabling smart sourcing expansion. We identified clusters with higher potential yield in the upcoming season, even in regions with lower historical average yield.
-  **Climate & Yield Correlations:** Cropin Cloud platform mapped the direct relationship between sowing trends and weather normals, identifying how **Growing Degree Days (GDD)** and rainfall historically influenced yield quality. We forecasted increased drought severity in certain grids and heat troughs in others that could disrupt physiological processes in the crop. While a few other grids showed an increased precipitation deficit, impacting soil moisture availability and tuber bulking. Armed with these insights, the company could adopt irrigation strategies, optimize planting schedules, select heat-tolerant potato cultivars, etc to mitigate these risks.
-  **Predicting Future Potential:** We pinpointed specific, high-yield prefectures that were previously untapped and provided a ranked list of "next-frontier" regions for the 2025 season. This enabled data-driven, informed expansion strategies.
-  **Real-Time Growth & Maturity:** Through **5x5 km grid monitoring**, the company gained the ability to track crop maturity in real-time, allowing for a precise yield estimate computed as the crop reached peak maturity.
-  **Quality & Disease Forecasting:** The comparative study of disease risks (**Blights and Bacterial Wilt**) for two successive seasons allowed the potato processor to anticipate quality impacts and adjust their procurement strategy months in advance.
-  **Resource Blueprinting:** The client received precise data on soil moisture, water stress, and irrigation potential for every grid, ensuring that new acreage had the necessary resources to sustain high-yield varieties.

## 2. The Verdict on Argentina: Proactive Sourcing

Argentina has unique circular plots. Croppable plots were first geotagged and validated. Cropin platform offered plot level view of the selected plot with details on acreage, crop health, yield estimates, weather, and pests & diseases. Our data-driven insights shifted the procurement model from reactive to predictive, answering the core operational questions.

-  **Regional Aggregation:** Combining remote sensing capabilities, weather data, crop science, and proprietary crop knowledge graph, Cropin's conceptualized AI models estimated yield across the region. Procurement teams gained a **"total view"** of yield quantity and quality for every plot and village feeding into specific **Procurement Centers**.
-  **Total Risk Oversight:** The **"digital twin"** of the landscape enabled near real-time tracking of granular risks across a vast, multi-season geography. Stage specific Crop health was assessed based on crop greenness, nutrient uptake & water stress. Satellite-map-based advisories/alerts from the Cropin platform were delivered at the individual plot level when attention was required during the season.
-  **Growth Stage Analytics:** By remotely monitoring crop health and growth stages, the client could eliminate data gaps between the field and the office, ensuring consistency across all microclimates. We offered predictive analytics for crop health, irrigation advisory, crop stage, crop yield forecast, climate-smart advisory, weather & pest alerts, and more to maximize yields.
-  **Mitigation Window:** Using deep learning models, Cropin analysed crop health, predicted weather, offered pest and disease alerts providing actionable insights to improve agronomic performance, optimize input resource use and mitigate risks. Cropin's Disease Early Warning System (DEWS) models bucketed disease occurrence into four categories and issued critical warnings when the probability of disease occurrence reached a selected threshold, enabling proactive mitigation. Early-warning alerts for weather and pests provided **a clear window for intervention**, preventing environmental stress from degrading the quality of the proprietary varieties.
-  **Synchronized Operations:** With 45-day advanced yield estimates and harvest window prediction, the organization successfully aligned its factory processing schedules, storage capacity, and contracts with expected farm outputs, reducing waste and optimizing throughput.

# The Impact: A Resilient Future for Global Sourcing

The integration of Cropin Cloud has transformed how this global potato leader manages its most critical asset: **The Surety of Supply**. By bridging the gap between field-level variability and enterprise-level planning, the partnership has delivered:

-  **Strategic Growth with Certainty:** The company can now expand into new Chinese prefectures with confidence, knowing it is backed by scientific yield potential
-  **Unprecedented Operational Efficiency:** 5x5 km grid monitoring has significantly reduced the need for delayed manual coordination and field scouting.
-  **Climate-Resilient Procurement:** The ability to proactively manage weather and disease risks has insulated the supply chain from the disruptions caused by a changing climate.
-  **Superior Quality Control:** Monitoring the crop from seed to maturity ensures raw material reaches processing plants and meets global standards required for its world-class frozen specialties.



**520,000 sq km**

Regional intelligence delivered across-Gansu province and Ningxia Hui regions



**10,000 sq km**

Plot-level intelligence delivered in Argentina

For this global pioneer, the journey from the field to the fryer is no longer a matter of chance. It is a masterclass in **Predictive Agri-Intelligence**.

## Connect With Us

### Is your supply chain ready for the next disruption?

In an era where "**business as usual**" is a thing of the past, the leaders of tomorrow are those who turn agricultural data into a strategic asset. Don't leave your surety of supply to chance.



**Build Your Resilient Supply Chain with Cropin Cloud**

**Request a Demo of our Regional & Plot-level Intelligence Models.**



Founded in 2010, Cropin is the world's most advanced AI Platform for Food and Agriculture. Cropin Cloud, the world's first industry cloud for agriculture, has computed 10% of the world's cultivable lands. Implemented by over 250+ enterprises, Cropin empowers stakeholders to make informed decisions that enhance farming efficiency, productivity, and sustainability. Our teams are spread across India, the United States of America, Italy, the Netherlands, and Brazil. We have digitized 30 million acres of farmland and positively impacted over 7 million farmers worldwide. Our crop knowledge graph, spanning 400+ crops and 10,000+ varieties in 103 countries, powers the Cropin Cloud. We are at the forefront of uniting agribusinesses, development agencies, international organizations, and governments to leverage Agtech systems to transform global food systems and attain climate goals. Cropin is backed by Google, Bill & Melinda Gates Foundation, ABC Impact, and Chiratae Ventures, among other notable investors.

