

MAPPING THE DIGITAL STORY OF A SEED

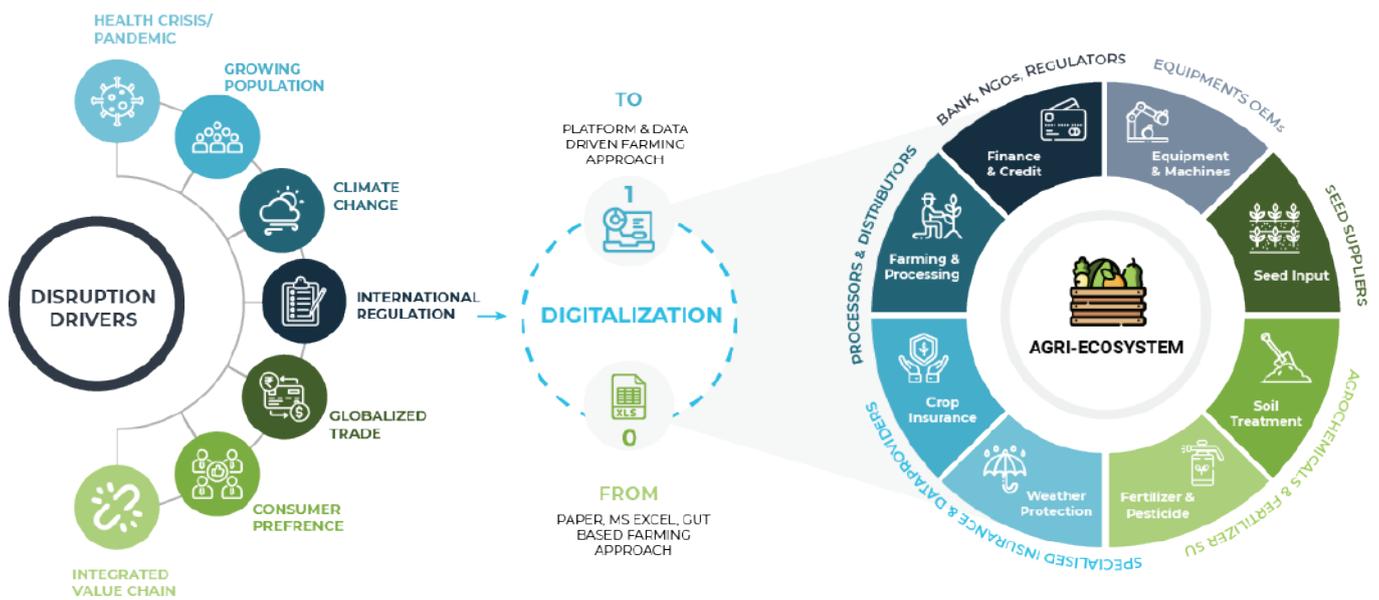
From Trials to Inventory - Transforming End-to-End Operations For Seed Enterprises With Technology



Preface

We're living through the biggest technology shift of our lifetime. As population explosion, climate change and water scarcity threaten global food security, promoting sustainable agriculture necessitates innovation in research and collaborations to ensure that comprehensive solutions are developed and adopted for food security and improved nutrition.

In recent years, the agri ecosystem has made a leap forward embracing new digital capabilities. Ag companies around the world are adopting measures that become imperative to manage and efficiently use scarce resources by leveraging digital and AI-driven technology.



Connected Platform-Software and Combined Analytics & Insights

Connected Farms- Connected Data from multiple sources

TRANSFORMATION

At CropIn, we believe technology has the power to make a positive impact on the life of every stakeholder in the agri ecosystem. Imagine the transformative potential of technology in the world where about 1 billion people (28% of the total population) depend on farming as their primary source of livelihood. In this white paper, we have also included success

stories from our experience in the seed industry. These stories demonstrate how technology is being leveraged to optimize operations, make data-driven decisions, deliver services seamlessly, connect people in new ways, and unlock innovative digital experiences. Together, we are building a digital future – and delivering a new generation of growth and opportunity for all.

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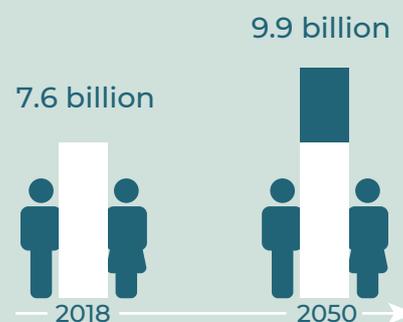
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Introduction

- Seeds are the basic building blocks of the agricultural process. Over the past several decades, the significance of seeds in the agriculture industry has increased rapidly on account of advancements in technology and the subsequent introduction of enhanced seed varieties
- Timely availability of quality seeds in adequate quantities determines the health and strength of an agricultural economy. Quality seeds suitable for various agro-climatic conditions in sufficient quantity and at affordable prices are necessary to raise overall crop productivity. High-quality seeds such as hybrid seeds offer better yield, significant uniformity, enhanced color, and disease resistance to the resulting plants
- Grains represent the biggest portion of daily calorie intake in developing countries of the Middle East, Africa, Asia/Oceania, and CIS, and therefore, the growing demand for grains, oils, and vegetables is going to be one of the most critical drivers of the seed market. Currently, grain seeds represent the largest seed type, accounting for nearly half of the total global production
- In 2019, North America was the largest geographical segment for the seed market and accounted for around 35% of the market share which is around a third of the global market. Genetically modified seeds are expected to be the leading segment in North America, which is contributing towards the growth of this region
- The global food demand is likely to increase by 70% in 2050 due to rapid population growth, urbanisation, and evolving diets. Therefore the seeds market will primarily be driven by the need to maximize agricultural productivity so as to meet this growing demand
- The ultimate goal to achieve food security, improve nutrition and deliver consistent quality, agtech, in the last few years, has helped the scientists & agronomists produce seeds that have improved yield and quality of harvests. As a result, the seed industry today is set to work with a 'farmer-centric' approach that is market-driven

Global Population



Total seeds market value
US\$ 68 billion
in 2020.



Projected
CAGR 7%
during 2020-2026



Value by 2026
US\$ 102 billion



Grain seeds -
account for nearly half of
the total global production

Largest Market:



North America
35%
market share

Fastest Growing Market:



Asia-Pacific Seed Market
worth \$22.91 BI in 2020,
estimated growth at
9.10% CAGR, to reach
\$35.41 BI by 2025

A. Global Seed Ecosystem



Individual plant breeders or plant breeding R&D based companies



Biotech trait development companies or trait license providers



Seed producers & Seed processors



Seed marketing companies



Farmer cooperatives involved in plant breeding, seed production, seed processing and marketing



Pure-play Plant breeding /R&D driven seed companies with end to end functions



Public sector institutions involved in plant breeding and seed production



Agri-Chemical majors with Seeds division with end to end functions



Intermediaries & organizations dealing with support functions



Suppliers (such as seed treatment, processing machinery)

B. Seed Industry Operating Model



Seed Distribution & Marketing

Front line demos to farmers and other stakeholders

Marketing & channel management



Seed Production & Processing

Production monitoring

Quality assurance at all levels



Seed/Plant Variety R&D

Development of plant varieties using conventional plant breeding complemented by Biotechnology tools/other methods

Product evaluation trials in multiple environments & farmer conditions for varietal release



2. GLOBAL TRENDS

AN OUTLOOK TO FUTURE

2. Global Trends

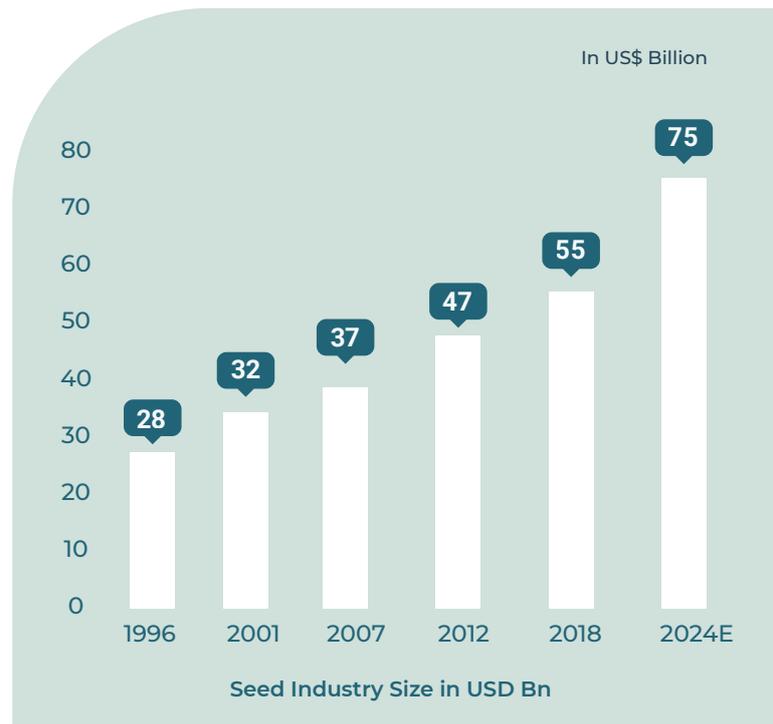
An outlook to the future

Seed markets are evolving rapidly, let's explore the key movers and shakers that will shape up the industry in near future.

The global seeds market size reached a value of almost USD 68 billion in the year 2020 and is estimated to account for a value of USD 63.0 billion in 2021. The seeds industry is further expected to grow at a CAGR of 7% between 2021 and 2026 to reach a value of almost USD 102 billion by 2026.

Data driven decisions for competitive advantage

- Data is the most precious asset for any organisation
- Global shift to a more data driven real-time decision making and business planning
- Farmers are becoming digitally connected and more aware at best practices
- Marketing and sales spends are planned based on data analytics and trend analysis
- Evidence backed operational cost optimization necessary to ensure long term profitability
- Combination of data, customer feedback and experience is key to product introduction and penetration strategy



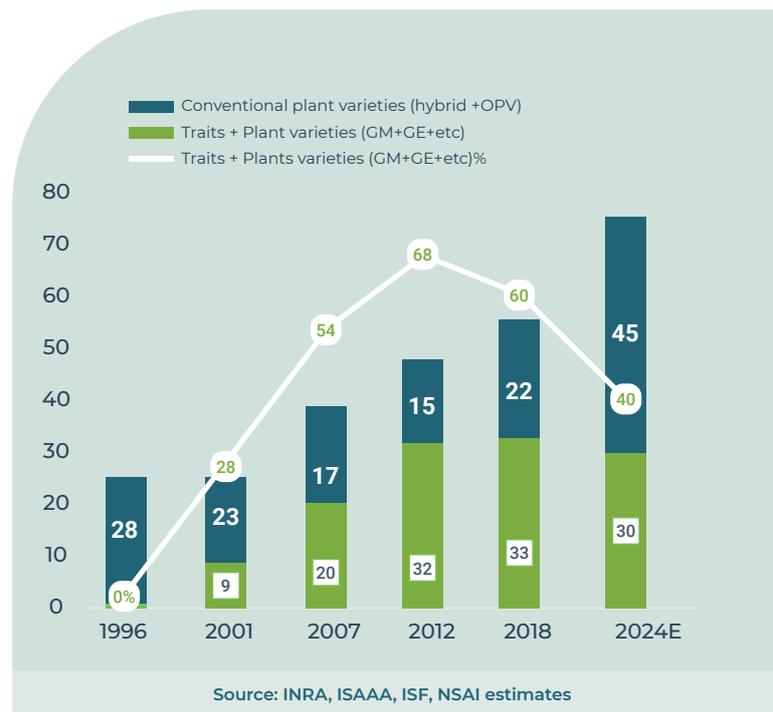
Increasing Adoption of Transgenic Seeds

- Farmers across major agricultural countries such as the United States, China, India and Brazil, are increasingly adopting transgenic seeds for yield benefits and high resistance traits

- Companies are also focussed on developing transgenic hybrids across crops by adopting breeding technologies such as Assisted Breeding and Computational Breeding

- Hybridization also increased in Cotton, Corn and Vegetables rapidly in the past two decades from as low as 25% to 97% in different regions of the world

- In 2019, 92% of the area under cotton cultivation in India was sown with transgenic seeds having high insect tolerance



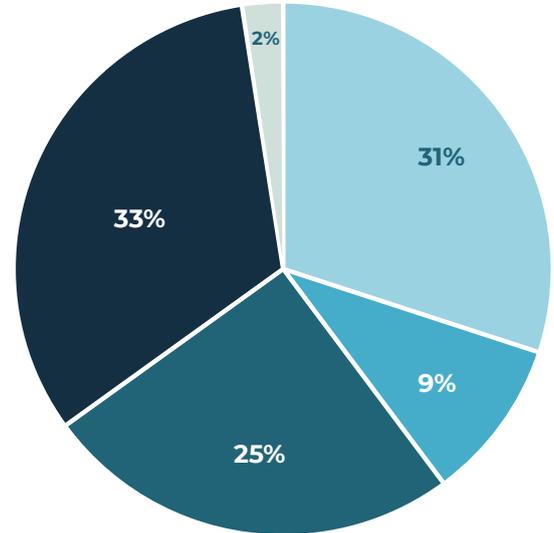
Source: INRA, ISAAA, ISF, NSAI estimates

2. Global Trends

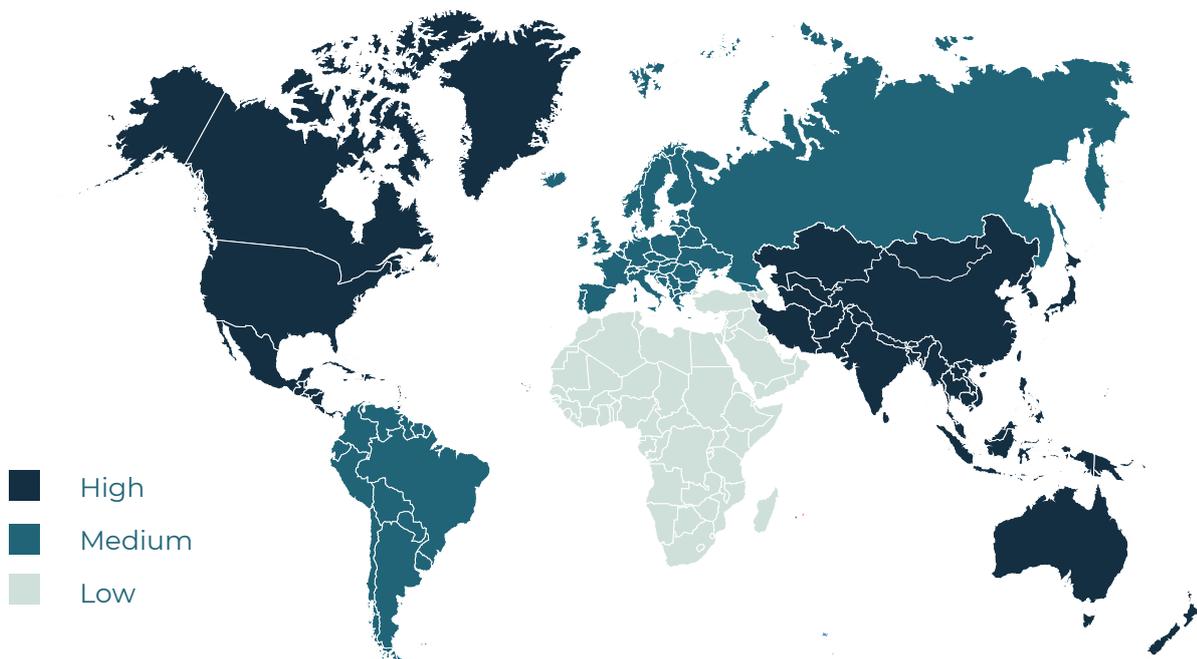
An outlook to the future

Asia-Pacific Is The Fastest Growing Market

- Asia-Pacific, the fastest growing geographical segment in the Global Seed Market, is dominated by the two major agricultural countries, India and China
- The region is witnessing increased adoption of hybrids in key crops such as Rice, Maize and Vegetables. For instance, the area sown under hybrid rice in India stood at 3.1 million hectares in 2018, which is 7% of the total rice area in the country
- Increasing technology adoption by seed companies is a major driver for the growth
- Also, increased area under cultivation of vegetables on account of the changing dietary preferences of the population, as well as support by the government, national and international associations to increase agricultural production are also fuelling the seed market in the region
- Asia-Pacific Seed Market - worth \$22.91 billion in 2020, estimated growth at 9.10% CAGR, to reach \$35.41 billion by 2025



Region-wise Seed Market, 2020



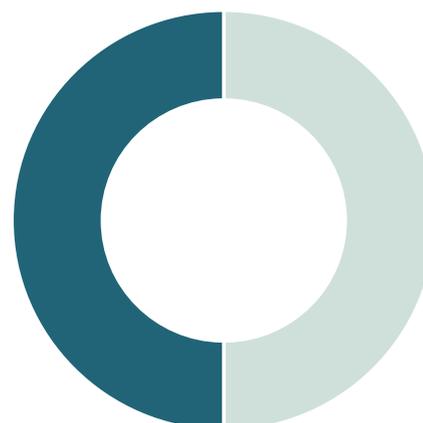
Global Seed Market : Growth Rate by Region, 2020

2. Global Trends

An outlook to the future

Genetically Modified Crops on the Rise

- Genetically Modified crop adoption grew from 1.7 million ha in 1996 to 190 million ha in 2017-18 in 28 countries. The advent of GM traits in Plant varieties has created a new product segment of GM trait crop seeds of both plant varieties and hybrids which grew to USD 33 bn in 2018-19.
- The global genetically modified seeds market size was valued at USD 20.07 billion in 2018 and is projected to reach USD 30.24 billion by the end of 2026, exhibiting a CAGR of 5.3%.
- Genetically modified crops have also created bundled agri-inputs (Eg: HT GM trait introgression in plant variety + use of Herbicide product).
- Health analysis, growth and yield forecast of different seed varieties across regions with technology has helped easy identification of high quality seeds for mass production



- Conventional Seeds
- Genetically Modified Seeds

Global Commercial Seed market Share, By Type, 2017

Rise in the Global seed trade

- The rise (\$11.289B in 2017) is due to high demand for quality seed and consolidation of top seed companies: Monsanto and Bayer, Dupont and Dow, Syngenta and ChemChina, Groupe Limagrain, Land O' Lakes
- Increase in global seed trade-imports by 22% from USD 9 bn in 2011 to USD 11 bn in 2016-17 opened up new opportunities for testing and sale of new plant varieties in geographies with similar agro-climatic conditions
- Rising end-to-end supply chain management technologies to easily ensure adherence to global export certifications and compliance standards

2. Global Trends

An outlook to the future

Increase in Seed Replacement Rate (SRR)

- Seed Replacement Rate is a measure of how much of the total cropped area was sown with certified seeds in comparison to farm saved seeds.
- The SRRs have increased from almost <10% in the 1980s to more than 40% in cereal crops in the past two decades in India and developing countries in Asia and Africa.
- Emergence of traceability tech for easy authentication on use of certified quality seeds of high genetic purity has led to an increase in SRR of cereals, oilseeds and pulses thereby resulting in significant improvement of crop productivity.



Diversified Scope and Demands



- The need to increase agricultural production owing to the rising population
- The growth in the use of biofuels such as corn biofuel
- Increasing demand for maize and soybean as fodder feed
- Growing demand for grains, oils, and vegetables seeds in developing countries of the Middle East, Africa, Asia/Oceania, and CIS as they are biggest portion of daily calorie intake.

A close-up photograph of a person's hands planting a small green seedling into a black plastic seedling tray. The tray is filled with dark brown soil and has several compartments. The person's hands are positioned over the tray, with one hand holding the seedling and the other hand gently pressing the soil around it. The background is blurred, showing more of the tray and the person's arms.

3. BUSINESS CHALLENGES DISRUPTORS AND TRANSFORMERS

3. Business Challenges

Disruptors and Transformers

By 2019, four seed companies, Bayer, Corteva, ChemChina and BASF had consolidated to dominate the commercial seed market controlling 60% of the global proprietary seed sales. Wave of big mergers and consolidation among Ag-chem majors with Seed business has altered the competitive landscape of the seed industry. **The challenge is for small and medium seed companies to navigate in such a skewed competitive market environment.**

Commercialization of fake hybrid seeds and counterfeit of products. According to the International Seed Federation (ISF), there has been an increase in illegal seed practices, including counterfeit seeds, fake seeds, fraudulent labelling, infringement of intellectual property, and regulatory offenses driven by the fact that low-income farmers are not in a position to purchase seeds in large quantities. This paves the way for the sellers to break down the bags, repack them in smaller volumes and sell them in loose form.

The seed & plant variety industry’s narrative was previously viewed from the lens of **“genetic gains developed by conventional plant breeding methods”** but now this has shifted to a complicated view driven by competing economic interests, especially after the advent of Genetically Modified crops bundled with advancing technologies. **The key challenge is to technologically transform the seed industry with conventional plant breeding at their core.**

Protection provided by **patent laws to Genetically Modified seeds** is making entry of new SME companies into the market difficult.



Market Concentration



3. Business Challenges

Disruptors and Transformers



After registering initial exponential growth, the Genetically Modified trait technology market stagnated since 2012-2016 between USD 32-33 bn due to emergence of resistance among target pests such as PBW in India. **New technologies such as Gene Editing are at its initial phases which need to be integrated successfully into breeding programs.**

Prolonged time & extensive research involved with Increase in R&D investments, technology costs, labour costs, seed production and supply chain costs has put margin pressures on conventional plant breeding based seed companies leading to the exit of **small and medium players from the market and high seed prices.**



Seed and plant variety are unique as a product, hence the global multilateral treaties have enabled creation of sui generis plant variety protection systems. **Force fitting global business models without alignment to local regulations and socio-economic conditions** is a huge challenge, which needs to be addressed on all fronts.

Commercialization of fake hybrid seeds and counterfeit of products. According to the International Seed Federation (ISF), there has been an increase in illegal seed practices, including counterfeit seeds, fake seeds, fraudulent labelling, infringement of intellectual property, and regulatory offenses driven by the fact that low-income farmers are not in a position to purchase seeds in large quantities. This paves the way for the sellers to break down the bags, repack them in smaller volumes and sell them in loose form.



The key challenge due to **global climate change** for the plant breeding/biotech based seed industry is to **develop climate resilient plant varieties** which can adapt to the new normal of changing climate patterns.



4. KEY ENABLERS

SCOPING GROWTH OPPORTUNITIES

4. Key Enablers

Scoping Growth Opportunities

Improved plant varieties with superior genetic backgrounds coupled with digitisation of farms and farmer data, right agronomic practices, necessary nutrition, crop protection and irrigation can deliver high breeding value and increased production

Digitisation of field data points for each variety of seed across regions will help identification of high quality seeds for mass production by providing health, growth and yield analysis. Sharing advisory and educating farmers strengthen farming as a profitable enterprise.



Seed authenticity ensures brand credibility and increased consumer confidence. Monitoring seed quality from production to retail in a highly dynamic operational environment is a major challenge to seed companies



Traceability systems using QR code/Barcode scanning solutions coupled with data analytics for regular monitoring of quality assurance will be an important enabler of seed companies to prevent counterfeiting

Need for assuring food security with sustainable agri practices drives the seed market. Improving profitability and productivity has been a key challenge for seed variety development in harmony with effective agronomic methods and suitable digitalisation

Digitalised R&D will help to develop comprehensive assessment approaches across multiple parameters for holistic assessment of plant varieties to tailor to mechanization and improve ergonomics



Harmonization of Sanitary and Phytosanitary (SPS) & Quarantine procedures globally has been a challenge for boosting international seed trade



An integrated international quality assurance and regulatory framework for both seed production and quality will ensure export compliances are followed and there is end-to-end traceability

4. Key Enablers

Scoping Growth Opportunities

Multiple trials for Distinctness, Uniformity and Stability (DUS) testing, State & Central/Federal varietal identification, Product registration leads to opportunity loss for seed industry

Alignment of testing mechanisms, standards and sharing of data and coordinated functioning of agencies through a single centralised platform will provide visibility into complete produce life cycles



A large proportion of seed requirement in food grains is met by farm saved or unlabeled seeds and unorganized sector

For new seed varieties, developed through comprehensive evaluation systems, communication to farmers of unique product advantages through demo farms will lead to higher adoption and SRR



Farm management technologies coupled with Genetic engineering and Biotechnology complement the conventional plant breeding process in terms of improving precision of selection

As Gene-editing/biotechnologies are capital intensive, Public-Private Partnership Model (PPP) with clearly defined project milestones linked to commercial objectives will enable integration of the new innovative technologies into breeding programs

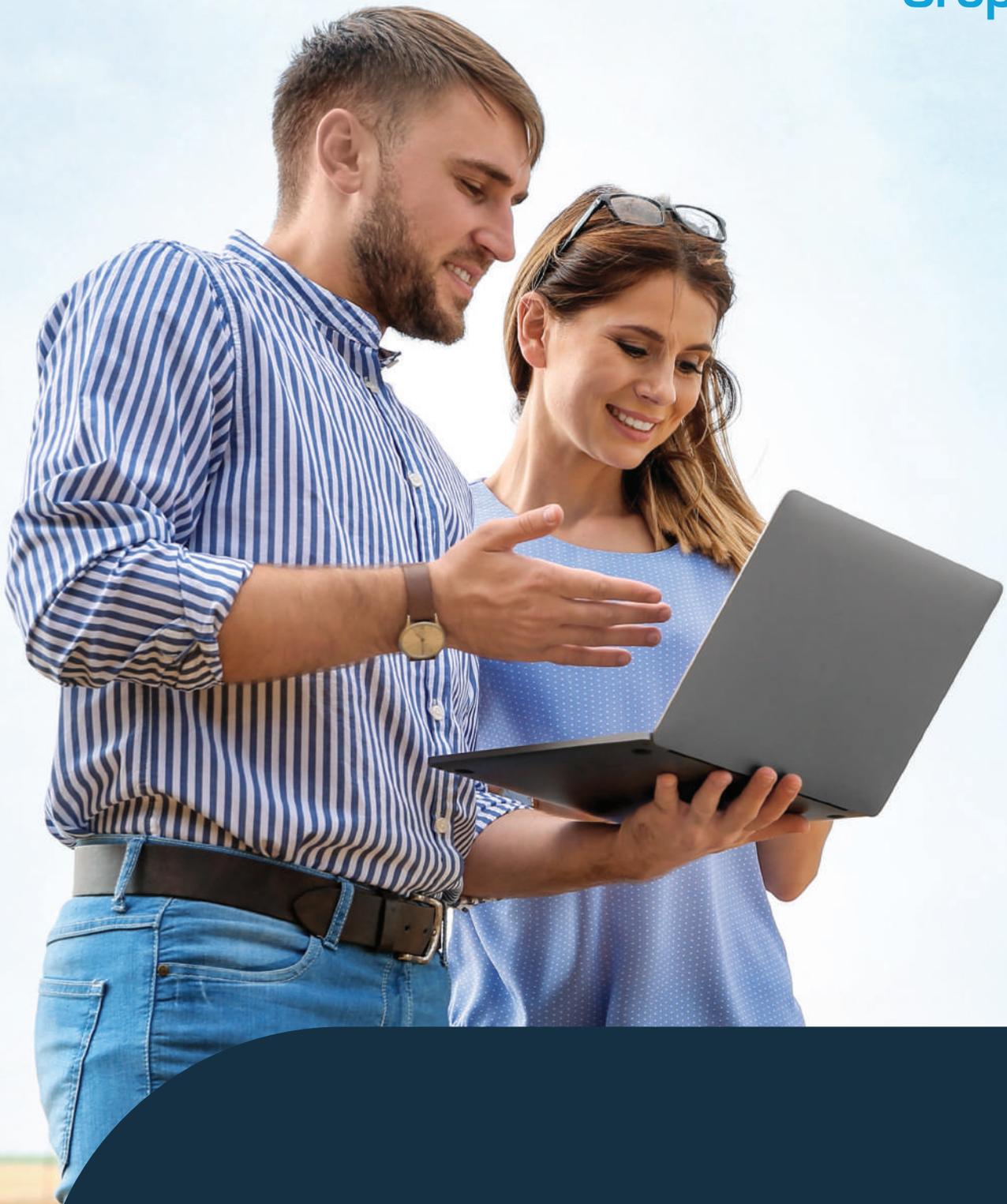




5. THE SEED VALUE CHAIN OVERVIEW FOR INTERVENTION

TAKING A CLOSER LOOK AT THE SEED INDUSTRY OPERATIONS





6. GROUND LEVEL CHALLENGES

6. Ground Level Challenges

Seed production organizations face hurdles of quality management, data collection, audit, and monitoring, while lack of precision tracking results in poor output predictability and ineffective management.

No Insights on Performance of Seed Varieties

- Analysing various metrics in order to substantiate grades with respect to seed varieties
- Regular performance assessment of each seed variety in different soil or agro-climatic conditions

Lack of Visibility of Field Operations

- Regularly inspecting crops on the field for farm management
- Manual auditing of plots and monitoring for diseases, proper isolation from neighbouring fields, timely application of fertilizers in correct quantities
- Visibility of the activities performed by field officers and growers to measure the efficiency

Low Production Accuracy

- Seed required for a crop in one region is different from that of other regions. Each variety requires a long R&D process and adoption of new varieties by producers is a long cycle
- Forecasting which product to develop for a market is challenging. Also, seeds are perishable goods so there is a time limit between production and sale of the product
- Maintaining production growth rates and grower efficiencies to reduce crop loss
- Setting preemptive protocols to gain insights into seed performance and tracking it across the value chain

Inaccurate Harvest Yield Estimation

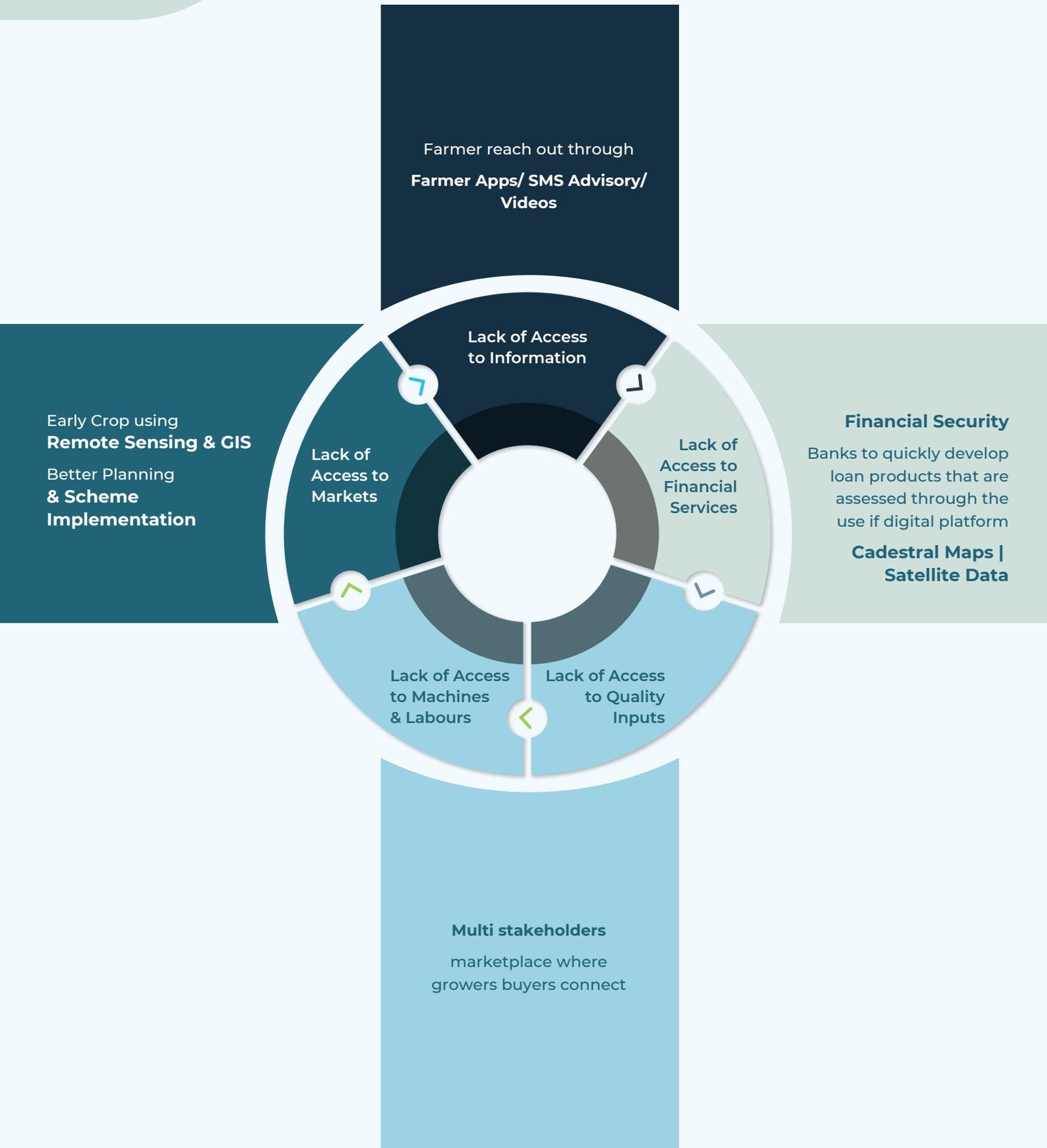
- Monitoring the entire seed multiplication process, from planning to production
- Providing field teams with the right package of practices for the seed variety being produced
- Identifying the area wise yield and markets, and correlating marketing and sales strategies to meet the demand
- Identifying the potential to augment seed operations for improving efficiency and productivity

Low Traceability Adoption

- Ensuring quality seeds are produced and preventing product recall
- Following and maintaining region-wise protocols due to rising food safety regulations
- Essential in curbing the sale of counterfeit, low-quality seeds
- During the seed multiplication process, visibility of stock/hybrid seeds being transferred from nurseries to main fields is preventing the mixing of high-quality certified seeds with sub-par ones that result in low yields and poor ROI for growers

7. THE CROPIN INNOVATION

7. The CropIn Innovation



Expanding Growth Opportunities For The Global Seed Market



Research and Development

- Simplified health analysis and yield forecast
- Easy identification of high-quality seeds for mass production
- Digitisation of farm and farmers' data
- End-to-end traceability of seeds to source

Solution Offering:



Seed Production

Crop Health Analysis and Yield Forecast

- Timely alerts when seed health falls below minimum threshold
- Pre-configured weather alerts and forecasts for precautions

Plot Level Data points Across Regions

- Direct farmer engagement and distribution of alerts/news through Acresquare
- SmartFarm Survey Forms to collect data

Solution Offering:



Sales and Marketing

- Provide digital marketplace platform to directly connect farmers with buyers driving end-to-end operations
- Understand agro-climatic zones by using weather forecasting and gain insights at the regional and postal level on where seed sales are likely to increase
- Historical data insights on seed production of a region and yield forecast
- Showcase seed quality data to farmers such as quality metrics, germination time, adaptability to weather conditions

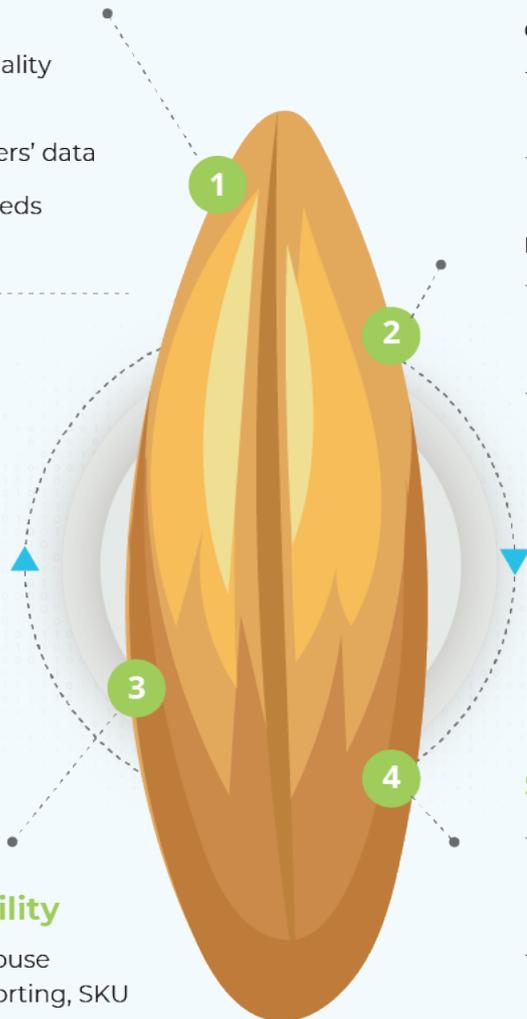
Solution Offering:



Warehouse & Traceability

- End-to-end visibility of warehouse operations such as grading, sorting, SKU tagging and inventory management to minimize manual errors and quality control
- Brand credibility with customers

Solution Offering:



8. INSPIRING GLOBAL SUCCESS STORIES

A. Savannah Seeds



Savannah Seeds is one of the world's foremost tech-based seed companies established in 2010. The company aims to develop smart rice with high yields and value-added traits. Their mission is to drive sustainable food production through rice seed technology and make a positive impact on farmers, employees and stakeholders.

The Challenge :

- Cumbersome and cost-ineffective process of the field agents to capture data
- Loss of data due to manual data collection through forms
- Lack of accurate means to geo-map plots
- Need for a centralised system for sending advisories to farmers on weather and PoPs (package of practices)
- Lack of visibility on the activities of the field staff
- Difficulty in monitoring the quality of agrochemicals used by farmers
- Inconsistent yield insights
- Requirement for real-time crop health monitoring

CropIn Innovation:

Owing to their unique requirements Savannah trusted CropIn and partnered with them in 2015 to leverage SmartFarm for their operations in Indian states of Delhi, Haryana and Rajasthan for

- Entire supply chain traceability
- Real-time data capture
- Timely crop advisory
- Plot geo-tagging and ar
- Alert log and management
- Customized reports

Impact:

-  Digitisation of farming operations across **2000+ acres** in Rajasthan & Haryana
-  **100%** of farms digitised
-  **99.5% of plots** now report the best in class quality
-  **6** paddy varieties
-  **40% increase** in operational efficiency
-  **60% reduction** in time of monitoring field operations
-  Alerts resolved within a **quick turnaround time**
-  **Customised reports** enabled management to make informed decisions

'We have been using CropIn's solution since 2015 in Rajasthan, Haryana and Delhi. With the help of CropIn's solution, now our team, including our managing director, have visibility on the entire farm operations. We can access CropIn's product at any time from anywhere. It also helps us in taking the right decisions at the right time throughout the crop production cycle i.e. sowing to harvest. Thus saving us a lot of time and increasing our team's productivity.'

-Rajiv Dabas
Senior Manager Production



Reference:

<https://www.youtube.com/watch?v=nktv0BOJUqU&t=58s>

B. Global Seed Producer Giant

The client is a Swiss-based global company that produces agrochemicals and seeds for farming communities around the world. As the world's largest crop chemical producer, the company is helping to improve global food security by enabling farmers to make more sustainable use of available resources. Their strong portfolio of 30 vegetable species and more than 2,500 varieties makes them the partner of choice for growers around the world.

The Challenge :

- Being a progressive organisation that carried out operations in multiple countries, digitising the various operations across the board is one of its priorities
 - Many of the field processes were performed manually, which led to discrepancies in data storage and analysis
 - Reports from its farms were not consistent across regions, and the extensive paperwork resulted in the loss of valuable data
 - The company's seed production division required a one-stop solution that improved efficiency for users at all levels and also provided real-time updates to key stakeholders around the globe
- The solution also had to be user-friendly and customisable to the requirements of users in different regions. In regions where the staff were being paid by the hour, the team required a reliable system that could help make their operations more efficient and productive and cut down avoidable administrative expenses

CropIn Innovation:

After considering many other options for a farm management solution that works best for their requirements, CropIn was selected to demonstrate a proof of concept for its SaaS solution 'SmartFarm'.

OBJECTIVES

The company's need of the hour was a comprehensive, user-friendly solution that could help achieve the following objectives:



Standardise global operations



Increase productivity



Promote process transparency



Arrive at reliable yield estimate



Fuel pre-commercial traceability



Integrate with existing systems

IMPACT:

What initially started as a six-country pilot project today covers 80% of the client's global seed production business that manages diverse crops that include sunflower, corn, rapeseeds, soybean, rice, cereals and other F&V seeds, and hundreds of crop varieties on both small and large farm holdings. CropIn has not only been able to provide an effective solution to some of its major problems but has proven to be an easy-to-use digital solution that fulfilled all of its objectives.



Standardising Global Operations



Enabled the field staff to capture the plot and farmer data, crop details



Provided managers with targeted information about everyday field operations



Has been configured to suit diverse regions, each with their own unique specifications



Standardised communications and processes across 16 countries

Increasing Productivity



Adopting Cropln's platform brought about **ease of operations, both on and off the field**. The field staff were able to accurately track and capture essential data points, even from activities that were unplanned



Additionally, users **customised and generated reports** by combining pre-season and in-season data. These **reports and data analytics** provide the Management and Leadership teams with business and operational intelligence for strategic decision making that enhances business operations globally



Cropln's **multi-stakeholder platform** also serviced the needs of different departments in the production ecosystem, including MOM, SPR, QA, Trialling, by providing access to centralised real-time cloud data



Cropln also supported the client with its **sustainability goals** by reducing the amount of paperwork involved in creating and submitting reports. Making the data available online for authorised users to access will simplified administrative processes, and also cut down avoidable expenses



Promote Transparency



Each of the processes **captured in the application** at real-time throughout the seed production cycle



Cropln serves as a **centralised platform** where users at multiple levels in various departments can access farm-level data and insightful reports on the activities, to improve people, process and performance



Yield Estimation



The client provided contract farmers with a reliable **real-time estimation** of yield before the start of the season based on historical data for a crop variety.



This info helped both the farmers and the field extension teams to plan their seasonal tasks



The research team used this data to improve the performance and quality of the seed variety



Pre-Commercial Traceability



By configuring the **best package of practices** for each crop variety, and creating a detailed activity plan based on the **crop's growth cycle**, the field staff ensured that the right farm practices were being followed. This ensures higher quality produce that is compliant with international market regulations and standards



SmartFarm also enables users to **generate customised reports** on the various activities and processes that went into producing the seed



Cropln's modules also helped the organisation's **Good Growth Plan** in the EAME region to monitor parameters contributing to sustainable agronomic practices



Integration With Existing Systems



Cropln's APIs allow **seamless integration with existing systems** enabling managers globally to customise their dashboards



To enable additional **data processing**, a **middleware** was used to further calculate the data filled in **Cropln's platform** and write it back into designated areas in SmartFarm for the field team to consume them

2. Global Seed Producer Giant

Some of the other notable features that aided the client's seed production activities include:



An **offline mode** that enables data collection even in the absence of Internet connectivity in remote locations



High levels **of data encryption** to provide security and preserve privacy



Multilingual support in **15+ regional languages, which simplifies the** company's communication with users in countries where English is not their primary language.

Scope

In the years to come, CropIn is set to scale up its operations and expand to other divisions of seed production, by leveraging its **cutting-edge AI- and ML-based solutions** for all-round progress of its operations.



C. PAGREXCO



CropIn is utilizing the captured farm data to establish end-to-end value chain traceability from farm-to-fork for one of the largest seed producing corporations for one of a kind seed potato traceability project.

The Challenge :

Punjab produces 27 lakh tonnes of potatoes every year, which means that ensuring a high quality of seed is absolutely critical. Currently, less than 1% of the total potato farm area is certified by the Punjab Seed Certification Authority. The absence of a well-developed certification process has resulted in the rampant sale of spurious and sub-par potato seeds in the name of Punjab-grown potato seeds, which has severely impacted the credibility and the brand value of the genuine high-quality seeds.

Given the sub-par, spurious seeds that are flooding the market and resulting in low yields and poor ROI, proper certifications and quality were required to transform potato seed production.

- Cumbersome and cost-ineffective process of the field agents to capture data
Loss of data due to manual data collection through forms
- Lack of accurate means to geo-map plots
- Need for a centralised system for sending advisories to farmers on weather and PoPs (package of practices)
- Lack of visibility on the activities of the field staff
- Difficulty in monitoring the quantity of agrochemicals used by farmers
- Inconsistent yield insights
- Requirement for real-time crop health monitoring

CropIn Innovation :

CropIn partnered with the Punjab Agri Export Corporation (Pagrexco) in 2019 to leverage technology to utilize the captured farm data to establish end-to-end value chain traceability from farm-to-fork for one of the largest seed producing corporations. CropIn deployed its suite of 4 products for the project - SmartFarm, SmartWare, SmartRisk and AcreSquare to achieve the following-



QR-code based tags during packaging and warehousing for end-to-end traceability



Ensuring **International Standards** and **appropriate certifications** for Exports



Harvest & Crop Management



Geo-tagging of plots



Raising alert & activity scheduling



Seed multiplication



Anti-counterfeiting of seeds by ensuring they are **PAGREXCO certified**

PUNJAB AGRO's



Certified Seed Potato

The contents of this pack are certified & and all the certification protocols can be digitally traced by scanning the QR code on this label

Certified that the seed potato has been grown in the state of Punjab, India with end to end traceability



QRidit

Powered by Cropin



Punjab State Seed Certification Authority, Chandigarh



Department of Horticulture Government of Punjab



Punjab Agri Export Corporation Chandigarh

The Impact:



22,000

Acres Digitised



35 Lakh

Metric Tonnes Produce Harvested



37,500

Farmers Registered



Seed-to-Shelf

Traceability Solution to Preserve Global Food Integrity

Expansion:

Organic Traceability Program - The same project is now extended to organic produce that is a testament of the solution's capability.

In the works: Basmati Rice Traceability & Supply System



110,000

Acres



30,200

Farmers

"We have an inventory of organic products and are in the process of enrolling farmers. We plan to implement the technology in the current Kharif season itself,"

-Ranbir Singh, General Manager, PAGREXCO

Reference:

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D. East-West Seed



East-West Seed is a privately-owned Dutch company that is one of the largest vegetable seed companies in the world and a producer of an assortment of hybrids and open-pollinated seeds.

East-West Seed is the market leader for tropical vegetable seeds in Asia. It develops, produces and markets hybrid tropical vegetable seeds. The company has developed its business over the last four decades using superior vegetable breeding combined with a carefully cultivated and

The Challenge :

The organisation faced the following challenges and there was an urgent need for digitization to help the company in their efforts to increase yield per acre.

- Cumbersome and cost-ineffective process of the field agents to capture data
- Loss of data due to manual data collection through forms
- Lack of accurate means to measure performance of each seed variety
- Lack of visibility on the activities of the field staff
- Difficulty in monitoring the quantity of agro-chemicals used by farmers
- Inconsistent metrics on seed performance across value chain

CropIn Innovation

EWS has partnered with CropIn to implement SmartFarm™ for its operations in six regions across Asia - Indonesia, India, Thailand, Philippines, Myanmar and Vietnam. The goal of the partnership is to achieve -

1 Visibility of Seed Varieties & Field Operations

- Analysing various metrics to substantiate grades with respect to seed varieties
- Measure performance of each seed variety in different soil or agro-climatic conditions
- Overview of field officers and growers

nurtured relationship with local farmers wherever it operates. The company holds strong market positions in Asia and is rapidly expanding in Africa and Latin America.

East-West Seed is presently enhancing its business operations and the technology they use. While the organisation has been extremely successful in their endeavours as a seed company in the last 39 years, they envision the crux of business transformation in their need to change the way they operate and in the way they make the best use of modern technologies.

2 Production Accuracy

- Maintain production growth rates and grower efficiencies
- Set preemptive protocols to gain insights into seed performance and track it across the value chain

Impact

Regions - Indonesia, India, Thailand, Philippines, Myanmar, Vietnam



35+ crops
400+ crop varieties recorded



21,624+
of area audited



14,200+
Farmers registered



272
Field staff empowered

Webinar

The Digital Story of a seed

A platform Approach



INDUSTRY EXPERT



Shijo Joseph

Group CIO, East-West Seed

SPEAKERS



Aakash Parekh

Vice President - Europe & Asia,
CropIn Technology



Pascal Van Dalen

AVP - Europe,
CropIn Technology

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About Cropin

Copyright © 2021 Cropin Technology. All rights reserved. Cropin is an Earth Observation & AI-led AgTech organization that empowers the farming community to 'Re-imagine Agriculture with Data'. Cropin is focused on helping the world's ag-ecosystem players to sustainably "maximize their per acre value" by combining pixel-level data derived from satellite imagery, in combination with IoT and field intelligence. Cropin is positioned to engage in a multi-disciplinary approach towards AI, Earth Observation, Agriculture, Meteorology and Computer

Sciences, all collaborating together to bring meaningful insight to improve the ag-ecosystem and impact the livelihood of a farmer. Cropin provides SaaS solutions to 225 agribusinesses and numerous governments and non-government organizations present in over 52+ countries. Cropin thus enables businesses to leverage technology to effectively drive their initiatives around Digitization, Compliance, Predictability, Sustainability and Traceability. Cropin has digitized over 13 million acres of farmland, enriched the lives of nearly 4 million farmers, and gathered data on 388 crops and over 9,500 crop varieties. Cropin has 92% score on adaptability, Over 98% client retention rate.

 **SmartFarm**[®]
Farm Management Solution

 **SmartRisk**[®]
Agri Business Intelligence Solution

 **SmartWare**[®]
Packhouse Solution & Traceability

 **RootTrace**[™]
The Seed-to-shelf Traceability Solution to Preserve Global Food Integrity

 **AcreSquare**[®]
A B2b Farmer Engagement Application

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