Promoting Climate-Resilient Food Production

With Agritask

Agritask

Introduction
The Need for Resilience

Climate change is here. With global temperatures already exceeding 1.1 Celsius above pre-industrial era, we are witnessing more and more record breaking heatwaves, floods, droughts, fires, and storms – hitting at increasing frequency throughout the year. At best – It will take several decades to bounce back to our predictable weather patterns. At worst – we are facing a new, volatile, and significantly more hostile world for food producers and the humans who rely on them.

The frequency and intensity of droughts increased by 29% since 2000, heatwaves tripled in frequency since the 1960s, and extreme or out of season storms are becoming more frequent and devastating.

29%
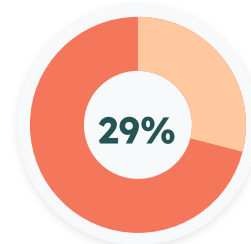
Increase in frequency of droughts
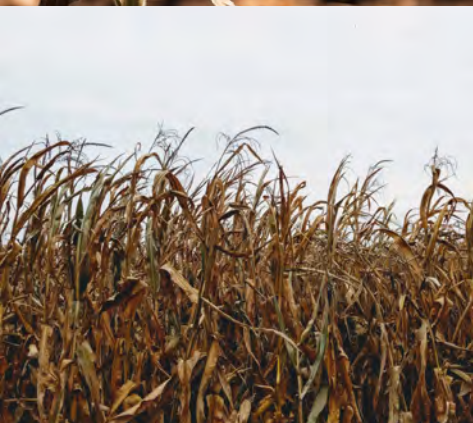
Food production systems are already feeling the pressure. The 2022 summer heatwave in the northern hemisphere had led to a sharp decline in yields (16% for grain maize, 15% for soybeans and 12% for sunflowers), wheat export bans, and spillage due to disruptions in supply routes – manifesting in rising commodity prices and consumer uproar. The future is even more precarious, with major grain crops projected to suffer anything between 17-60% decrease, according to different scenarios. Under a +2°C warming scenario, we may see soybean and corn production being cut in the near future by 40% and 60%, respectively. Under a +2°C scenario, 40% of maize crops in Europe are projected to be tainted with aflatoxins – a toxin derived from heat and moisture loving fungi. Extreme weather conditions are predicted to reduce global rice yields – the most important staple food in the world – by 10.6% in the current decade and by 33.6% by the end of the century.

For some crops, changing climate patterns threaten not only yields, but the existence of entire varieties. Grape varieties, for instance, rely on specific soil and weather conditions to produce signature wines, disrupting production and threatening brand reputation in traditional wine regions.

Similarly, certain varieties of apples are becoming increasingly harder to cultivate under these changing conditions. Rising temperatures and fluctuating rain patterns are narrowing suitable cultivation areas for coffee and cacao, and require establishing new plantations in higher altitudes.

Post-Harvest Food Loss

40%

~17%

Global

Emerging Economies

Food production is a well oiled machine, with finely timed supply shipment and processing that relies on perishable inventories. ~17% of food is lost before reaching retailers and consumers, owing to the fragility of raw materials. This number is even higher in emerging economies, with 40% of food loss occurring in the post-harvest phase.

Disruptions to crop cultivation throws a wrench into the process, shifting timelines, yields, quality and budgets. Today, procurement managers are operating blind, based on order forms and assumptions. As the climate changes, these assumptions are moving further and further from reality, creating a pressing need for actual data on supplies as they are being cultivated. The operational continuity of the organization depends on it.

Promoting Resilience with Agronomic Intelligence and Analytics

Climate change creates a variety of cross-organizational challenges, spanning sourcing, R&D, customer service, and sustainability departments. Building resilience in the supply chain therefore requires a multi-stakeholder approach and functions.

Agritask's agronomic intelligence and analytics platform enables organizations to deploy dynamic procurement strategies, innovative crop varieties and cultivation techniques, agile weather-risk mitigation, and sustainable agriculture initiatives.

Procurement Decision Making
Stakeholder: Procurement Directors

Shifting weather patterns will likely change crop production patterns across the world.
Different crops thrive under different conditions, meaning that certain crops may need to "relocate". Others may suffer a rise in production costs – the result of compensating for adverse conditions with costly agricultural inputs.
Procurement Managers may need to reconsider their selection of suppliers, basing their decisions on a complex interplay of cost, consistency, quality, yield, carbon footprint, and various regulatory and internal due diligence demands.

Agritask's agronomic intelligence and analytics platform collects agronomic, production, and sustainability metrics on a grower-by-grower basis, providing insightful visibility into the entire supply array.
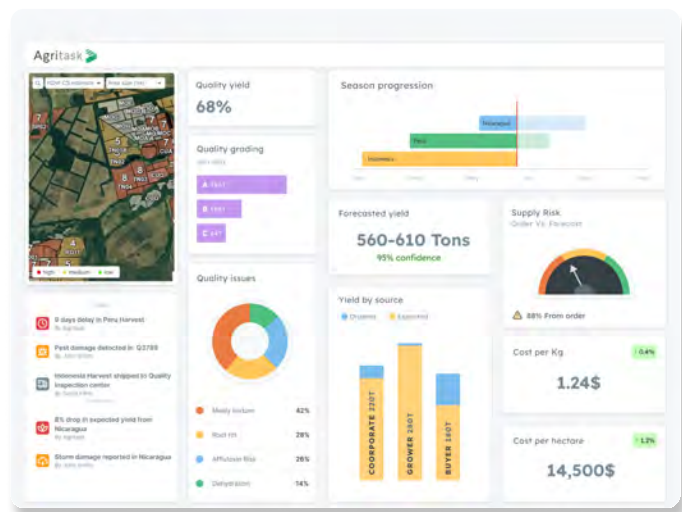
Grower Benchmarking

Agritask enables detailed supplier and grower benchmarking, accounting for costs, yield, quality, consistency, and sustainability metrics, enabling decision makers to make granular contracting decisions.

Supplier Due-Diligence

Agritask's plot-based due-diligence allows decision makers to detect risks to compliance and reputation by indicating deforestation and land rights-violation risks, orchestrating 3rd party certification processes.

Sustainable Production Simulator

Agritask enables decision makers within the organization to simulate carbon emissions under different production scenarios across regions and crops, and compare them against the organizations' emissions reduction roadmap.

Developing and Implementing Climate-Resilient Playbooks
Stakeholder: R&D and Grower Support

Crop-cultivation protocols and best practices have been honed for decades, designed to maximize yield and quality under given external conditions. Unfortunately, these conditions are becoming increasingly volatile, subjecting crops to extreme and unpredictable conditions. Agronomists can offer theoretical courses of action, yet actual climate-resilient protocols– necessarily adjusted for crop, variety, region and specific conditions – can only be formed through trial and error. Forming proprietary climate-resilient playbooks is both a competitive edge and a mean to minimize supply disruptions in volatile times.

Agritask's agronomic intelligence and analytics platform aggregates granular agronomic data and weather data on a plot-by-plot basis, enabling agronomists to compare methodologies and results per region, crop and variety. This critical agronomic R&D is not performed under controlled lab conditions, but in the real-world, wide-scale production of raw materials for the food and beverage industry. The resulting massive crop and region specific data can be used to formulate new and highly specific crop models for different conditions and predict crop behavior – accelerating the R&D cycle to match with the rapid pace of external changes.

Optimizing seed variety selection per region

Seeds are a costly input, and are selected with care by suppliers wishing to optimize their yield and quality – yet this decision making process is based on partial information. Agronomic knowledge on new seed varieties is derived from test plots – limiting results to specific conditions and regions. Agritask enables agronomists to gather information on variety performance across the world, and under a range of real-world conditions – scalably optimizing variety selection at the plot level.

Implementing variety-specific playbooks at scale

The platform embeds real-world derived best practices, defining variety and region-specific agronomic protocols – covering activities from pre-planting to post-harvest. The platform also allows for scalable and dynamic risk mitigation, enabling users to define automated thresholds based on agronomic indicators, weather forecasts and remote sensing.

Real-world evidence collection

Agritask does not operate in a controlled environment – it optimizes raw material production in active supply chains across the world. Agritask not only captures and monitors agronomic data and actions, it records a variety of geo-specific weather data, soil composition analysis, moisture indicators, and more. This allows Agritask users to compare cultivation methodologies, plant health and yields across a wide range of weather conditions.

Real time fine-tuning

Agritask connects corporate agronomists directly to growers in the supply array, enabling collaboration and fine-tuning of growth practices throughout the season. Agronomists can send individualized or region-specific notifications and alerts to growers, enabling real-time adaptation and optimization throughout the season. The platform embeds the resulting best practices, defining variety and region-specific agronomic protocols and automated thresholds, allowing for risk mitigation on a global scale.

Invasive Hazards – Early Detection and Mapping
Stakeholder: R&D

One of the best documented impacts of climate change is the shift in pest distribution, creating compounding threats to crop health. Not unlike humans, plants are particularly vulnerable to new and formerly unknown pathogens and pests – meaning invasive species can create a lot of damage in a short span of time. Rapidly spreading threats call for equally agile pest monitoring systems.

Agritask's agronomic intelligence and analytics platform allows users to continuously monitor emerging threats to plant health through intuitive reporting workflows and remote sensing tools. Through flexible embedded workflows and protocols, the platform automatically updates regional threat maps, alerts growers to evolving risks to crop health within their plots, and issues customized agronomic advisory to prevent and mitigate both existing and invasive threats.

Mapping threat progression

Agritask visualizes emerging threat progression and prevalence by aggregating geo-located agronomic data and regional risk map integrations. Agronomists can easily and intuitively assess risk to raw material production at a glance, enabling quick adaptation responses in the supply chain.

Alerts and crop monitoring

Agritask utilizes remote satellite imaging and algorithms to track crop health throughout the season, issuing pin-pointed alerts and inspections to monitor emerging threats in the supply array.

Tailored advisory

Agritask embeds and automates agronomic protocols and best practices, allowing for region and crop specific notifications and agronomic advisory on prevention and control methods at defined times and situations.

Strong wind was detected
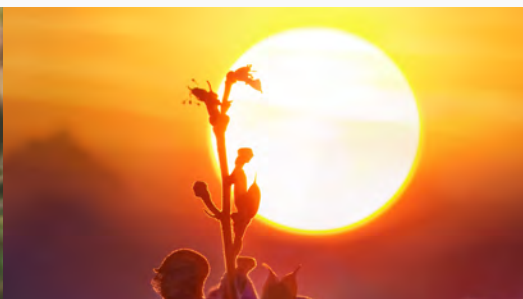Wind speed of 90kph was measured at the field

High temp for 5 days straight
Wind speed of 90kph was measured at the field

Heavy rain of over 100mm
Wind speed of 90kph was measured at the field

Adapting to Extreme Events
Corporate Agronomists and Supply Chain Managers

As the climate grows more volatile, quickly identifying and adapting to extreme weather events is key to secure the supply of raw materials and adjust production schedules to avoid waste and shortages.

Agritask's agronomic intelligence and analytics platform facilitates knowledge transfer between growers, expert corporate agronomists and supply chain managers. The platform concentrates plot-level data on upcoming weather extremes, soil conditions and growth phase, enabling informed decision making and risk assessment. Growers benefit from tailored agronomic advice and notifications, and deliver critical data on the timing, quality and quantity of crops at risk, allowing for early adaptation and adjustments down the value chain.

Droughts and Heatwaves

Shifts in precipitation patterns will necessitate adjusting agronomic practices throughout the season and adopting agile procurement strategies to prepare and compensate for extreme events.

Data-driven variety selection

Multi-factor decision support for seed variety selection, balancing yield, soil conditions, weather risk and variety requirements.

Timely agronomic advisory

Agritask delivers timely notifications, advising on adjustments to cultivation methods and timelines based on remote growth monitoring and crop models.

Dynamic yield estimation

Reevaluating harvest timing, yields and quality grading as drought and heat threats unfold, providing supply chain managers with actionable insights to shortage and quality risks and enabling quick logistical realignment.

Floods and Storms

Powerful storms and heavy rainfall pose season-long risks for crops – with more diseases, pests, soil erosion and stand dilution. Early notice can make or break a season.

Automated advisory

Alerts and reminders on preventative maintenance measures based on highly granular weather forecasts – allowing growers to efficiently invest time and efforts to combat specific upcoming threats such as floods and storms.

Optimized input use

Utilizing hyper-local weather forecasting and crop growth data, Agritask enables agronomists and growers to optimize the type of fertilizers and pesticides and time their application to maximize input efficiency and minimize the risk of chemical runoffs and water source pollution.

Dynamic yield estimations

As the season progresses, Agritask continuously estimates eventual yields, accounting for storm and wind damage to crops in its models.

Frost

Simple out-of-season overnight cold snaps – an increasingly common affair – can lead to catastrophic damage to yield in orchards, necessitating careful monitoring.

Automated plot-level warnings

Agritask enables agronomists to set time, region, and crop-specific thresholds to automate alerts and notifications, recommending preventative measures to safeguard yields at scale.

Recovery monitoring and supply planning

Agritask enables agronomists and procurement managers to monitor frost recovery, enabling informed decision making on plot allocation and supply procurement strategies through dynamic yield estimations.

Developing and Implementing Climate-Resilient Playbooks
Stakeholder: R&D and Grower Support

Various sustainable farming practices, aimed at restoring soil health and structure, have been proven to improve crop resilience to extreme weather conditions. Healthy soils absorb and retain water, safeguarding against droughts and floods. However, implementing sustainable farming practices had proven to be a challenge for major food and beverage manufacturers and the growers in their supply array. The distributed nature of the crop supply array means that sustainable farming protocols must be optimized for crops and regions, and that validating grower compliance can be difficult – especially for globalized operations.

Agritask's agronomic intelligence and analytics platform delivers automated crop and region specific agronomic advisory on sustainable practices from experts and corporate agronomists to growers across the world, providing scalable agronomic support throughout the season. Utilizing remote sensing tools, precision scouting and easy-to-use reporting workflows, Agritask enables project managers to remotely validate compliance, track sustainability metrics and troubleshoot implementation challenges throughout the supply array.
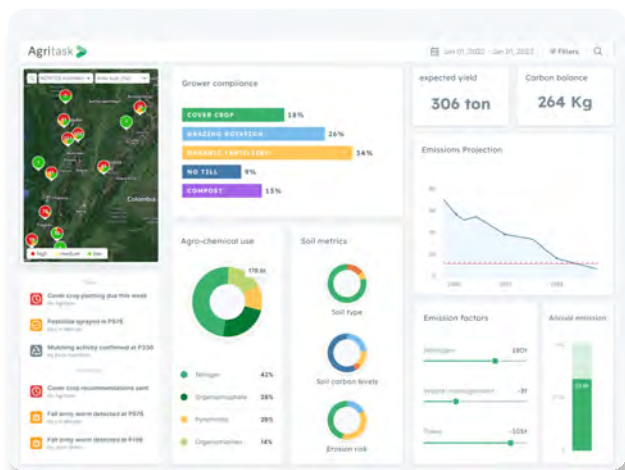
Agritask allows sustainability managers to scale, monitor and optimize sustainable farming initiatives, providing remote verification, automated advisory and reporting tools for various regenerative agriculture practices:

Cover Crops

Agritask delivers company-defined agronomic advice, and remotely verifies cover crops have been planted by analyzing satellite imaging indicators such as NDVI (normalized difference vegetation index), benchmarking growers for compliance.

Minimal till

Agritask remotely verifies minimal or no till through remote imaging, detecting changes in soil coloring and cover, delivering corporate advisory and benchmarking compliance.

Crop rotation

Agritask enables companies to leverage crop rotation to establish dynamic procurement strategies and robust grower collaborations through timely notifications.

Integrated pest management

Agritask embeds crop and region-specific best practices and thresholds directly into the platform, automatically issuing timely alerts and recommendations through the growers' mobile app. The platform's NDVI-powered uniformity maps enable agronomists to remotely monitor crop growth, pin-point areas for inspection and offer appropriate treatments. Agritask also enables growers and agronomists to engage in trial and error across regions to gain knowledge and insights and effectively control pests while minimizing the use of pesticides.

Optimized fertilization

Agritask aggregates plot-level agronomic data, including soil chemistry analysis, yields, and various agronomic indices, enabling agronomists and project managers to provide advice on optimized fertilizer use (quantity, type, timing and location) while safeguarding yields.

Carbon accounting

Agritask monitors agricultural carbon emissions, providing granular visibility and array-wide insights on the source and intensity of carbon emissions in the agriculture supply chain.

Case Study #1

Improving quality and reducing spillage through supply orchestration

🧪 The Challenge:

Safeguarding quality in volatile weather

A large food and beverage company needed to monitor the quality and harvest timing of one of their key ingredients across its 15,000 hectares supply array. Quality popcorn kernels contain precise levels of humidity, and are at risk of contamination and dehydration from heat and processing delays. The company needed a solution to orchestrate supply timing and secure ingredient quality.


💡 The Sulotion:

Timely visibility and harvest orchestration

Agritask's agronomic intelligence and analytics platform enabled the company to track plant growth and weather patterns, and recommend early or delayed harvesting accordingly. This visibility into harvest timing also enabled better logistical coordination, adjusting processing capacity as needed.

📄 Results:

Despite experiencing irregular weather patterns, the company saw an 11% increase in high quality yields and a 7% decrease in impurities (season over season), and an overall decline in post-harvest spillage.

11%
Increase in high quality yield
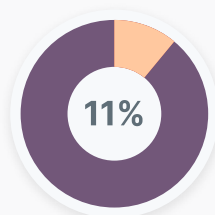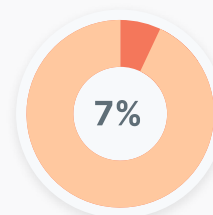
7%
decrease in yield impurities

Case Study #2

Empowering growers with an agronomic Decision Support System (DSS)

The Challenge:

Implementing variety specific protocols

A leading planting material manufacturer required a solution to better support their clients' cultivation efforts. Their clients grow different varieties of potatoes under different climate conditions, each requiring its own set of agronomic protocols to guarantee optimal quality and yields.

The Sulotion:

Seed selection DSS and tailored agronomic advisory

Utilizing the company's agronomic protocols and best practices, Agritask created a seed selection decision support system for growers, based on their region, climate risks, and produce specification needs. For each variety, Agritask embedded the company's specified agronomic protocols, delivering timely notifications and advisory on soil prep, nutrient management, weather adaptation and haulm killing timing.

Results:

The company was able to support its strong clientele throughout unpredictable growing seasons, delivering expected yields and securing consumer loyalty.

Case Study #3

# Mitigating weather-risks in smallholder farms

The Challenge:

Optimizing production in rural Vietnam

Agriculture is one of the largest sectors in the Vietnamese economy, with ingredients such as coffee beans, rice, and peppercorn exported across the world. Most Vietnamese farmers, however, lack formal agronomic training and do not have regular access to agronomic advisory. This results in unstandardized production and low ability to adapt to weather extremes.

The Sulotion:

Plot-level, dynamic agronomic advisory

Agritask was implemented to provide scalable agronomic advisory to farmers cultivating rice, coffee and peppercorn in rural Vietnam. Utilizing precision weather forecasts, growers were able to receive timely alerts and instructions on proper drainage preparation and maintenance, ahead of forecasted rainfall. By logging their activities and resource use into the app, Farmers were able to receive agronomic advice on when and how to use plant protection and fertilization measures, based on crop status and predicted weather, thus preventing excess chemical runoff due to heavy rains.
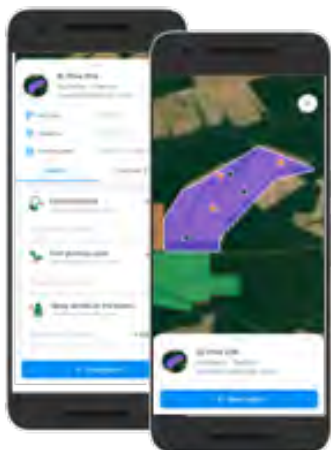
Results:

The app was widely adopted by farmers of all ages, with 89% engagement rates and an enrollment rate that surpassed the project goals by ~25% (and counting). Farmers using the app have received over 40,000 notifications and alerts, protecting crops and mitigating chemical runoffs.

Want to learn more about Agritask?

Request a demo

Agritask