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**ANTICIPATE, INNOVATE, OPTIMIZE: KEYS OF THE AGTECH INDUSTRY AGAINST
AGRO CATASTROPHIC EVENTS IN THE MERCOSUR REGION**



MERCOSUR GROUP

María Kavanagh – Argentine

Pery Saraiva Neto- Brasil

Ana Rita Petraroli- Brasil

Ivy Cassa – Brasil

Ricardo Peralta Larrain- Chile

Miryam Aragón Espejo- Perú

Roxana Corbrán- Uruguay

Andrea Signorino Barbat- Uruguay

External contributors S4 Agtech Agricultural engineer Santiago Gonzalez Venzano

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Introduction

The Mercosur Region, especially its agricultural sectors, are highly exposed to climatic threats and present multiple vulnerabilities. To reduce the associated risks, it is necessary and urgent to reduce and shield the sector through the comprehensive and coordinated management of the various actors. Being able to count on insurance is a fundamental part of the response, and the feasibility and sustainability of this protection depend on risk reduction.

The future impacts of climate change estimated by the initiative of The Economics of Climate Change in the Mercosur Region, suggest that the agricultural sector would be exposed to greater attacks due to temperature increases, changes in the rainfall pattern, expansion of arid areas and greater intensity of storms and droughts. Within the framework of a proposal for economic and social development from a perspective of structural change oriented by equity, strong measures of adaptation to changing climatic conditions would be required, aimed at improving the sustainability of productive systems, facilitating the inclusion of small producers and protect the food security of the population.

For the past 5 years investors have put their optimism in agriculture and food. Agriculture is the largest employer in the world and is by far the least digitalized industry. The enormous potential of this market, together with the low digitalization, prompted many investors to support enterprises in agriculture. Thus was born the concept of Agtech and Foodtech, the incorporation of digitalization in these sectors. The United States leads the creation of companies and investment in new technologies but there are very attractive foci of entrepreneurship throughout the world, including Israel and Europe.

In the Mercosur Region, the agricultural sector, is one of the main engines of innovation. By extension, importance and impact on the local economy, the technology industry has seen fertile ground in the field for its development. In this context, startups are increasingly betting on solutions oriented to this area, as it is one of the most attractive markets due to growth potential and reaching customers.

The Yield Lab is one of the most important incubators in the world when it comes to projects linked to Agtech. With a presence on the five continents the firm of St. Louis USA, looks with special emphasis on the Latin American region, where it

launched in 2017 its program of acceleration of technology-based projects linked to agribusiness.

In 2018, the Agtech sector had a strong growth. The agricultural revolution landed in the Mercosur Region with well-prepared and consolidated teams facing regional challenges. Digitization in the agricultural sector, is key to anticipate, innovate and optimize the management of agribusiness companies.

Argentinian Republic

The coverage for Agro before the paradigm shift

The new technologies allow us to make decisions to increase production and anticipate the consequences of climate change. The future of the field involves the investment in technology that is accessible to the producer, artificial intelligence is the biggest accelerator of progress.

The insurance sector is the level of the economy that has shown the least adoption and technological innovation in recent years. However, Argentina has managed to position itself and expand as a potential global food supplier and in the face of this challenge the key lies in the development of the local entrepreneurial ecosystem.

In the case of Argentina, S4 Agtech is a startup, selected among the six Argentine startups of insurtech that have revolutionized the insurance industry that make a big difference in the old insurance industry, devoted to agricultural technology that provides management solutions for risks to guarantee regional food production. It guarantees the safety of producers and companies when systemic risks occur, such as floods or droughts, paying them in advance. S4 provides risk management solutions to guarantee food production and develops index-based hedges to transfer volatilities from the agricultural industry to financial markets, through OTC derivative contracts (Over The Counter)

As a big data tool for risk management, S4 services are used by a wide range of clients, such as banks, insurance companies, agricultural providers and the like.

The products offered by S4 Agtech are:

S4 Index Indices for Drought and Flooding with the best market correlation

The S4 Indices are used to estimate yields, and to generate systemic climate risk coverage solutions, such as Index Coverage, climate insurance or input packs with built-in climate protection. Help agribusiness supplier companies to strengthen their relationship with their customers, strengthening their loyalty and increasing sales

S4Go, change the focus of the conversation between companies and their customers

Its customized platform for companies, allows estimating the historical and current productivity of the farmer and adapting the product offer according to his productive profile. It is objective, precise and scalable.

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Georeferenced Prescriptions

It allows satellite identification of the best technological proposal for a specific lot (genotype, density, planting dates, fertilizer doses, etc.) companies can control that their products are used in the right place and in the right way.

Crop Satellite Monitoring

It allows satellite measurement of the evolution of a crop in the campaign for different levels of geographic aggregation, comparing it with its own history and with the current and historical average of the department to objectively know how the crops evolve during the campaign.

Performance estimation

It allows estimating satellite crop yields for different levels of geographic aggregation to anticipate the outcome of the campaign.

More Views

It allows to visualize climatic forecasts, images of high spatial resolution, monitor water in agricultural surface, configure alert systems and integrate a CRM. All the functionalities to accompany the producer in the decision making in the year. Technology allows us to create coverage based on satellite data. They are objective, efficient and scalable, being able to accompany a large-scale commercial process with very low transactional cost.

On the other hand, climate volatility increases, determining more uncertainty in the producer's business. How to encourage investment in this context? Syngenta offers Technology + S4 Drought and Flood Coverage, If there is drought or flood S4 Coverage pays the producer, resulting in cheaper supplies.

In the 2017/18 Syngenta campaign, it invested 1.5 Million Dollars in S4 Coverages, and finally 4.6 Million Dollars were paid (95% for Drought and 5% for Flood) that were credited to the producers' accounts.

The program was a success because the value proposition was validated:

The producer invested in high-tech inputs and had coverage in case of drought or flood.

S4Index reflected production dips, reinsurance (Munich Re) paid compensation correctly, and Syngenta fulfilled the promise of distributing payments throughout its customer network.

Federative Republic of Brazil

Brazil is one of the largest food exporters in the world, a pioneer in the global agrotechnology industry. Due to the exponential growth in the agricultural sector of Brazil, different agrotechnology startups have emerged. Together, they are trying to make the industry bigger and better while seeking to improve production quality.

Forest fires increased 50% in Brazil during 2017, more than 22,000 sources of forest fires were detected. In the same period of 2015, the number was no more than 15 thousand. The monitoring data comes from the National Space Research Institute (INPE).

The Amazon was the biome that registered the most outbreaks: 49.7%. Mato Grosso, Roraima, Tocantins and Pará were the Brazilian states with the most fire. These data already count the first six days of June.

The Research Center and the Prevfogo Monitoring Center - National Center for Forest Fire Prevention and Combat, report that climatic phenomena are mainly responsible for the increase.

Dry weather facilitates the spread of fire, but human action is the main cause of fires, such as the use of combustion techniques in crops. According to the Prevfogo Research and Monitoring coordinator, although the beginning of the year has registered many focuses, most events occur between the months of August and October.

On the other hand, to avoid fires the rural producer must look for alternatives to fires. He also points out that although the Brazilian legislation prohibits the release of balloons, the practice, which grows a lot due to the June festivities, increases the number of fires in the country even more.

In this context, we consulted the company SINTECSYS, dedicated to the detection of forest fires, operating with a monitoring system that detects fire outbreaks quickly and effectively. The solution designed for remote areas does not require electricity, it operates through the photovoltaic system and also over the internet. It has its own system for data traffic that allows online monitoring for the entire area 360 degrees 24 hours a day and 7 days a week.

The system used, detects in 3 'the exact position of the fire outbreak by triangulation, the precise coordinate facilitates the arrival of the nearest brigade. All this in a radius of up to 15 km equivalent to 70 thousand area.

The insurance market covers the risk of fire, in this case we take Sancor Seguros Seguros Agrícola GRÍOS that offers a product against fire for sugar cane, covering according to policy clause, Fire: Violent and uncontrolled combustion, accompanied by flames and heat release , which destroys or damage

Republic of Peru

Peru has a significant extension of land suitable for agriculture, an activity on which millions of Peruvians depend, whether on the coast, mountains and jungle.

Space AG offers a digital platform for the management of high-value crops (blueberries, avocados, grapes, citrus fruits, among other fruits and vegetables) that analyzes data from drones, satellites and relates it to field information, using artificial intelligence to raise the farmer productivity and optimize the use of critical resources such as water.

Irrigation system optimization

Through images captured with drones equipped with thermal cameras, the company offers to improve the integral management of irrigation in the fields.

Water leak detection

Irrigation Uniformity Analysis

Identification of areas with water stress

Detection of structural problems in irrigation systems

Better yield projections and harvest volumes

The technology applied detects anomalies in the crops and leaf area. With the use of artificial intelligence, production projections are improved.

Dead plant count

Exact calculation of net productive areas

Statistically Representative Sampling

Detection of problems in plants and depopulation areas

Digital and integrated field management

Integrates all the variables of the field into a single platform so that the agricultural producer can easily see it from anywhere.

Exact calculation of net productive areas.

Integration with irrigation and meteorological systems

High precision digital mapping by lots or irrigation valves

All variables organized in one place and easily accessible

Conclusion

The future of agriculture depends on its digital transformation. Farmers will benefit from each of these digital transformation trends by freeing them from environmental concerns, they will obtain a better yield crop and the ability to manage them with new and efficient methods. As urbanization increases, agricultural methods must grow with it.

It is important to highlight that one of the most innovative pieces of the agricultural digital transformation is the ability to use machine learning and advanced analysis to extract trend data, creating models that allow farmers to make better decisions. Machine learning can predict which traits and genes will be better for crop production, giving farmers around the world the best breed for the location and climate where they are found. Likewise, the projection models of volumes and harvest times allow to optimize the management of wages, harvest the fruit at its best and negotiate better amounts and prices with customers.

Machine learning algorithms can also be used in the manufacturing aspect of agriculture, where consumers buy their products. These algorithms can show which products are bought the most and which products are falling on the market. Therefore, these systems create competent and effective forecasts for agriculture in the future.

Like the use of robots and artificial intelligence in other industries, robotics within agriculture would improve productivity and result in higher and faster yields. These robots, like the spray and weeding robots recently acquired by John Deere, can reduce the use of agrochemicals by 90%.

Other robotics companies are experimenting with laser and camera guidance to identify and eliminate weeds without human intervention. These robots can use the guide to navigate between rows of crops by themselves, reducing the workforce behind it. Other companies are creating plant transplant robots that add a new level of efficiency to traditional methods and, finally, automation is being tested to harvest fruits and harvest nuts, something that has always seemed too delicate for robotics in the past.

Agtech is changing agribusiness worldwide. Thanks to technology, it is possible to find new ways of doing things and thus be able to better face the changes of the future, it is important that companies worldwide adopt digital transformation and innovate with technology that allows them to be sustainable and scalable,

especially in those countries where agribusiness plays an important role. Only then can they take agriculture to a new level and be prepared for the challenges that come.

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