AGRInnova – Latin America and the Caribbean Challenges

#*	Company	Country	Challenge	Description
1	Adecoagro	Argentina	Crop residues recycle	Transforming rice straw waste to raw material
2	Huentala Wines, K-Bin S.A.	Argentina	Crop protection application planning	Optimize crop protection spraying in viticulture
3	Quequen S.A.	Argentina	Seed treatment for saline soil	Boost alfalfa production in saline soil conditions
4	Mondelez Global LLC	Brazil	Irrigation optimization	Optimize irrigation management for cocoa
5	PEDRA AGROINDUSTRIAL S/A	Brazil	Early detection	High resolution weed monitoring for sugarcane
6	Viterra Bioenergy SA	Brazil	Early detection	Mapping weeds, diseases and nutritional deficiencies in sugarcane
7	Prize Superfruit	Chile	Spray applications monitoring	Control of foliar applications and agricultural machinery
8	Grupo CASSA	El Salvador	In-field non-destructive NIR based crop analysis	Enhanced Quality, Efficiency and Productivity of sugarcane
9	Ingenio La Cabaña	El Salvador	Irrigation optimization	Decrease water usage and fossil fuel dependency in sugarcane production
10	Agricola Cerro Prieto	Peru	Yield prediction	Predictive yield optimization for avocado and blueberry

*Arranged by alphabetical order of country and company name

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Challenge form

Company name: Adecoagro

Country: Argentina

Challenge name: Adding value across the agricultural production chain for rice straw waste

Challenge: Crop residues recycle

The company
Adecoagro is a leading agricultural company in South America, focusing on the production of food and renewable energy. The company produce sugar, ethanol, energy, grains, rice, peanuts and dairy products.
The company was founded in 2002. Its headquarters are in Buenos Aires, Argentina. The company has operations in Argentina, Brazil and Uruguay.
The company serves more than 1,000 clients in a broad spectrum of fields, including major global food processors, energy companies, and local markets. The company employs more than 9,900 employees.
Adecoagro is a publicly traded company with an annual revenue exceeding $1B USD.

The Challenge
Adecoagro is committed to circular usage and waste reduction across its operation.
The company's rice production operation generates rice straw, a byproduct which is currently considered waste.
Rice straw waste is generated throughout the harvest season from January to May each year.
Nowadays, we do not collect rice straw. However, if we were to collect and transport it out of the field, the transportation costs would be high.
Rice straw waste has the potential to be recycled as a raw material for energy generation, construction materials, food packages, fertilizers, biochar, food ingredients.
Adecoagro is interested to pilot a technology that could support their circularity and waste reduction objective and for creating value out of rice straw.

Pilot location
The pilot will be implemented in Argentina.
The company manages 55,000 ha. of rice fields in Argentina, 15,000 ha. in Uruguay, and 200,000 ha. of other crops with potential to benefit from the same technology.

Links: https://www.adecoagro.com/

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Challenge form

Company name: Huentala Wines

Country: Argentina

Challenge name: Precise and sustainable crop protection application for viticulture

Challenge: Crop protection application planning optimization

The company
Huentala Wines is a family business part of Huentala Group. It is operating since 2002 in Gualtallary, Tupungato Mendoza, at the foot of the Andes Mountains, specifically located to grow and produce the most exclusive wines. In its 85 hectares planted and 50 hectares of expansion in process, the company is producing high quality wine grapes, as a result of the altitude conditions and the composition of the soil.
Since 2013, the winery has been producing premium wines. In 2024 the company is projected to sell 1.25 million bottles, with about 40% of which to export.
Huentala Wines has built a winemaking business based on technological innovation. From the process of grape variety selection to fermentation and even barrel cleaning, the entire operation is constantly researching and adopting advanced sustainable technologies.

The Challenge
As a premium winery and wine grapes cultivators, we strive to produce products of the highest standard, which is reflected through certifications and in our daily practices, but with the instability of climate conditions our decision-making processes are becoming more challenging each year. Due to that, we seek to improve our pest management and spraying operation through a decision support system for crop protection application planning. We want to optimize the use of agri-inputs in an effective manner, while considering both the agronomy perspective and the regulatory requirements, to optimize yield and quality for domestic and export markets.
Optimized spraying planning will save significant operating costs, as well as reduce our operation's environmental footprint.

Pilot location
The pilot project will be implemented in Argentina, in the company's vineyards.

Links: https://huentala.com/en/huentala-wines-in/

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Challenge form

Company name: Quequen S.A.

Country: Argentina

Challenge name: Seed treatment technology to boost alfalfa productivity in saline soils

Challenge: Seed treatment for saline soil

The company

QUEQUEN S.A. is a company based in Viedma, Province of Río Negro, in Argentine Patagonia. Founded in 1997, the company specializes in the production of large bales of alfalfa hay for export and the local market. The company also has extensive experience in growing, packaging and marketing onions for export markets.

The company's production covers more than 1,000 hectares of irrigated lands, of which, 450 ha. are destined for alfalfa and the rest for other forages such as moha, fescue and cereals.

In addition, the company has its own processing plant for the production of alfalfa.

The Challenge

Alfalfa cultivation on saline soils presents significant challenges, including reduced germination rates, stunted growth, and lower yields. These issues are exacerbated by the increasing salinity levels due to irrigation practices and climate change. The financial impact includes higher costs for inputs and lower profitability for farmers.

For ensuring food security and adapting to changing climate conditions, the company is seeking seed treatment technology for enhancing alfalfa yield on saline lands to address productivity and sustainability challenges.

Utilizing innovative seed treatment can improve crop resilience, it can enhance the seeds' tolerance to salinity and other abiotic stresses, leading to improved germination, growth, and yield, reduced crop losses, and improved economic viability for local farmers.

Pilot location

The pilot project will be implemented in Argentina, leveraging the expertise of local partners who are leaders in alfalfa cultivation. The expected outcomes include increased yield, reduced crop losses, and improved economic viability for local farmers.

If the pilot is successful, it has a scale up potential of 50,000 hectares in the region.

Links: https://www.internetviedma.com.ar/quequen/

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Challenge form

Company name: Mondelez Global LLC

Country: Brazil

Challenge name: Optimize irrigation management for cocoa crops in Brazil

Challenge: Irrigation optimization

The company
Mondelēz International is one of the largest snack companies in the world, with products sales in over 150 countries and global net revenues of approximately $36 billion in 2023. Among its iconic brands are Oreo, Ritz, LU, Milka and Toblerone chocolate. It has operations in more than 80 countries and employ approximately 91,000 employees.
Sustainability is one of Mondelez strategic priorities, with climate change and more sustainable ingredients as key topics to deliver against its environmental goals. The company is contributing to climate change mitigation through science-based targets, using natural resources more efficiently by developing sourcing programs across key raw materials, including Cocoa Life.

The Challenge
Future cocoa production in Brazil will be increasingly exposed to risks of longer, drier dry seasons, which heighten the potential of cocoa crop failure without additional irrigation. Understanding the irrigation requirements of cocoa will enable optimal water use efficiency whilst minimizing associated energy use. However, most methods for estimating water status of the crop are based on soil-water status and environmental factors which provide limited accuracy in a highly diversified cocoa farm conditions. Therefore, we are seeking a plant-based sensor monitoring system to provide accurate and consistent results. We want to test the technology in field trials in Brazil with the aim of increasing cocoa productivity whilst optimizing irrigation water use.
Currently, only a small fraction of the cocoa planted area globally is irrigated, shifting it to fertigation can increase yields, and conserve soil, water and fertilizers. The adoption of plant-based sensor aims to develop an optimized irrigation strategy for different cocoa varieties.

Pilot location
The pilot will be implemented in cocoa farms in Brazil.
If successful, the technology will be available as part of Mondelez's Cocoa Life farmer training program with potential to encourage its adoption in Brazil as well as other countries.

Links: https://www.mondelezinternational.com/

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Challenge form

Pedra Agroindustrial S/A

Company name: PEDRA AGROINDUSTRIAL SA

Country: Brazil

Challenge name: High-resolution monitoring in sugar cane fields

Challenge: Early detection

The company

Pedra Agroindustrial SA is a company in the sugar-energy sector that has been operating since 1931 in the production of renewable energy.
With 4 production units in the states of São Paulo and Mato Grosso do Sul, the company produce ethanol, sugar and electricity from the processing of sugar cane.
As it is associated with Copersucar SA, a cooperative that is the largest sugar exporter in Brazil, Pedra Agroindustrial has an entire marketing chain for its main products, while preserving its productive autonomy, as we sell the entire production directly to the cooperative. The company currently cultivates 180,000 hectares of sugarcane and employe more than 5,000 employees.

The Challenge

In sugar cane cultivation there is a need to control weeds throughout the sugar cane cycle. Continuous manual crop monitoring is extremely subjective and depends on large manual operation. Field visits do not provide a good representation of the real status and are not standardized, resulting in generic recommendations and investments in crop protection applications that are above or below the actual need. In addition, after a certain growth period of the sugar cane the ability to conduct manual survey is limited, due to the density of the crop in the field. By identifying the actual weed infestation, efficient control and potential productivity gains become possible. It also allows for the optimization of human resources, which can then be directed to the better planning and management of the operation. We seek a large-scale high-resolution surveying solution for weed detection throughout a vast area, that can provide early detection and species level recognition before an emergency action is required. Our goal is to have a digital tool that can provide standardization to the identification process and support optimized application planning.

Pilot location

The pilot will be implemented in Brazil. On part of the company's cultivated area.
If successful, the pilot has a significant growth potential in the company's operation.

Links: https://www.pedraagroindustrial.com.br/

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Challenge form

Company name: Viterra Bioenergia SA

Country: Brazil

Challenge name: Mapping of weeds, diseases and nutritional deficiencies in sugarcane

Challenge: Early detection

The company
Viterra Bioenergia SA is an agro-industrial company that grows sugar cane and process it to produce sugar, ethanol and electricity. The company has two industrial plants located in the interior of the State of São Paulo: Junqueirópolis (Rio Vermelho Unit) and Guararapes (Nova Unialco Unit). Currently, the units have, together, the capacity to process 6.4 million tons of sugarcane per harvest and employ more than 2,600 people in the agricultural, industrial and administrative areas, in addition to generating jobs in 22 cities in the region.

The Challenge
Diseases, nutritional deficiencies and mainly weeds are responsible for major problems in the sugarcane production process. Currently, our weed monitoring method is manual and lack standardization. Our objective is to carry out accurate diagnostic mapping of weeds at species level and thus build an herbicide budget based on real, accurate and objective data, avoiding waste and mainly acting in a sustainable way in relation to the environment.
Weeds are present all year round but develop more intensely during the rainy period of the year (October to April). Currently monitoring is carried out through field visits by technicians, and based on their observation, choice of products, doses and times of application is decided. The big challenge is the limited amount of observation and its standardization when done manually. Our goal is to find a digital tool that can survey the entire area quickly and accurately. With reliable information we can significantly improve our decisions and optimize chemical products usage, and by that increase yield, avoid waste save costs and reduce environmental impact. We also expect additional benefits, such as better labor management, harvesting, transportation and rational use of resources.

Pilot location
The pilot will be implemented in Brazil, at our units located in the State of São Paulo (Junqueirópolis and Guararapes).
If successful, the pilot will have the potential for significant growth in the company's operations.

Links: https://www.viterra.com.br/pt/bioenergia

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Challenge form

Company name: Prize Superfruit

Country: Chile

Challenge name: Digitalization and control of foliar applications and agricultural machinery

Challenge: Spray applications monitoring

The company
Prize is a leading fruits company that currently grows and processes fruit in Chile, Peru and Mexico, and is planning to expand its productive footprint into Asia, Africa and other regions. The company's operation includes processing and commercializing of their own produce as well as fruit from 300 third-party growers. The company was founded as a fruit export-only company in 2005. In 2011, it entered the processing business with the construction of a processing plant in Chile. In 2016, the company planted cherries and blueberries in Chile in their own farms, initiating a fully integrated business. Its current operations consist mainly of 780 ha. planted across six regions of Chile, producing cherries, blueberries, nectarines and plums; 504 hectares in Peru with blueberries, 143 hectares in Mexico with blueberries; three processing facilities in Chile and one in Peru; and offices in Chile and China. It has more than 1,000 employees, as well as thousands of seasonal workers according to the different farm's needs; selling 11 types of fruit; exporting to more than 30 countries through partnerships with more than one hundred global clients.

The Challenge
Crop protection spray applications in fruit trees account to 20-25% of the total agricultural costs, being one of the highest costs for the operation and many times the breaking point of positive or negative margins. The efficiency of the spray operation is determined on various factors, many of which are related directly to the machinery operator. On many occasions human errors in the spray application, such as: incorrect speed, incorrect volume per ha., wrong pressure, skipped rows, etc., leads to higher costs, higher environmental footprint and yield loss. The ability to monitor, manage and control spray applications in real-time, will directly impact the operations productivity and will support reducing the usage of crop protection products and potentially fertilizers as well. We seek to optimize the use and application of crop protection products, with the aim of reducing loss associated with incorrect application and increasing the volumes of fruit produced while decreasing environmental impact.

Pilot location
The pilot will be implemented in Chile.
If successful, the pilot has a significant growth potential within Prize's operation.

Links: www.prizesuperfruits.com

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Challenge form

Company name: Compañía Azucarera Salvadoreña, S.A. de C.V. Grupo CASSA

Country: El Salvador

Challenge name: Optimization for Sugarcane Cultivation: Enhanced Quality, Efficiency and Productivity

Challenge: In-field non-destructive NIR based crop analysis

The company
Grupo CASSA is an agroindustrial company that began operations in El Salvador in 1964. The company's operations focus on the production and processing of three products: sugar, molasses and electrical energy. It has two mills operating in the eastern and western parts or the country. The sugarcane for the operation is supplied from the company's 34,500 ha., which is leased to growers and represent 45% of the supply, 31% from producers and cooperatives who receive financing and technical support, and 24% from private producers. The company's production is supplying local and global demand to sugar and molasses, with export to more than 17 countries, from Latin America to Europe and Asia. The company employ more than 11,000 employees.

The Challenge
Current nutritional management across the operation is based on soil analysis mapping of the cultivated areas. The results of the analysis are recommendations per lot which leads to applications focused on correcting nutritional deficiencies and bio-stimulation. The response of the crop is measured by productivity and with 100 annual laboratory foliar analysis. Additionally, in preparation for the harvest, pre-harvest cane-quality sampling is done in the lab, which consists of six adult stems per lot. With this data, the productive areas that are ready for harvest are identified. The analysis is also used as a tool to monitor the crop's response to the sugar concentration plans that are applied for its maturation. However, the lab analysis logistics, cost and sample size are limiting and inefficient and can provide a misguided representation. We are seeking a tool for in-field non-destructive foliar analysis of sugarcane for prompt and accurate measurement of Brix, Pol, Purity, Humidity and Fiber. The tool will provide intensive sampling capabilities for optimizing nutrients programs and harvesting decisions. Following extensive trials and tests we look for a NIR based spectrometer, for achieving optimal measurements.

Pilot location
The pilot will be implemented in El Salvador, with significant expansion potential in scope and additional applications.

Links: www.grupocassa.com

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Challenge form

Company name: Ingenio La Cabaña

Country: El Salvador

Challenge name: Smart Cultivation: Innovation and Sustainability of Sugarcane in El Salvador

Challenge: Irrigation optimization

The company
Ingenio La Cabaña is a Salvadoran agro-industrial company dedicated mainly to the sugar sector. Its history dates to the 1920s, and since then, it has evolved to become one of the main sugar producers in El Salvador. The company is employing about 1,500 employees during the harvest season. It sources the sugarcane from its own 2,000 ha. of fields, as well as from over 700 third-party growers cultivating 9,200 ha.
The company main operations are divided to 3 units: 1. Production of raw sugar, white sugar and molasses; 2. Power generation from sugarcane bagasse, satisfying both internal needs and those of the national grid;3. Agricultural services to producers, which consist of advice on the different crop processes, ranging from the preparation of the land, sowing, fertilization, growth stages and harvest of the crop.

The Challenge
Our main challenge is the need to increase the productivity of sugarcane cultivation while improving sustainability and adapting agricultural practices to climate changes. We seek to adopt an advanced solution that optimizes water usage and reduce dependence on fossil fuels. Historically, rainfall was sufficient for our crops, but we see a greater need for irrigation due to changing seasonal patterns. However, irrigation requires high energy consumption, which is one of our biggest operational expenses. Decreasing water footprint by irrigation optimization will support energy savings and cost efficiency. A preferred solution will enable us to optimize irrigation by utilizing data for precise real-time monitoring of soil and crop conditions, that will facilitate more efficient irrigation. In addition, we see significant added value in solutions that enables utilizing the same data collection tools for the early detection of pests and weeds that will allow for timely and specific interventions, minimizing the use of chemical products and derived environmental impact.

Pilot location
The pilot will be implemented in El Salvador, in part of the company's cultivated area.
If successful, the pilot has a significant growth potential with the company's suppliers.

Links: https://www.ilcabana.net/

AGRInnova – Latin America and the Caribbean

Challenge form

Company name: Agricola Cerro Prieto (ACP)

Country: Peru

Challenge name: Predictive yield optimization to mitigate economic and environmental risks

Challenge: Yield prediction

The company
Agricola Cerro Prieto (ACP) is a Peruvian agricultural company that began operations in 2006, dedicated to the production, packaging and marketing of high-quality fresh agricultural products, such as avocado, blueberries and asparagus. ACP has 16 main strategic clients which are among the largest distributors, wholesalers and retail brands of fresh produce globally. The company exports to more than 22 countries and has a team of 547 permanent employees and up to 11,846 temporary workers during harvest times. ACP owns a total of 5,956 hectares of agricultural land, of which 4,190 are cultivated. The company is committed to maintain its leading position through innovation, sustainability and quality. The company has implemented advanced technologies and sustainable practices that improve operational efficiency and reduce environmental impact.

The Challenge
Early yield prediction is a critical activity to optimize the use of resources, as it is to provide detailed status and development of each plant, its productive behavior and its nutritional and health status. However, crops grow in complex environments influenced by numerous variables such as soil uniformity and type, meteorology, nutrients and pests, making accurate modeling extremely difficult, specifically in face of changing climate patterns. Inaccurate yield projections lead to supply chain disruption, lower customer satisfaction, produce spoilage and waste, increased labor and financial costs, and higher environmental footprint. Accurate yield predictions in avocado and blueberry production will increase quality and quantity of optimal fruit and reduce errors in the value chain processes. We seek to achieve an early count for both avocado and blueberry, with avocado as the first priority, during the phenological stage of flowering and fruit setting, which will allow more effective planning. In addition, the aim is to accurately measure the count, volume and weight of the fruit at the time of harvest, identifying the productive capacity of each plant.

Pilot location
The pilot will be implemented in Peru.
If successful, the pilot has a significant growth potential within the ACP's operation.

Links: https://www.acpagro.com/