

# Annual Report 2021





[FONTAGRO](https://www.fontagro.org/es/) is a cooperation mechanism administered by the Inter-American Development Bank (IDB) with membership, governance structure and assets of its own. FONTAGRO is internationally recognized for strengthening agri-food and agro-industrial innovation in a sustainable way. <https://www.fontagro.org/es/>. This publication is a summary of the XXV Annual Meeting of the Board of Directors of FONTAGRO, in which the results and achievements of the 2020-2021 period are presented.

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# Acknowledgements

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Our acknowledgement also goes to the FONTAGRO's scientists and project leaders, administrative personnel, the members of the Technical-Administrative Secretariat as well as other external support.

# FONTAGRO's response to COVID-19

In March 2020, the World Health Organization declared coronavirus infections (Covid-19) a pandemic. This health crisis impacted the global order, at health and safety levels, and it also created greater volatility in the financial markets and the performance of economic sectors. The agricultural and agri-food sectors were key to curbing disruptions in agri-food chains and particularly keeping the distribution of raw materials and food supplies, in order to protect the food security of the world's nations.

Given this situation, during 2020 and 2021, FONTAGRO revised their work plans and their technical, administrative, and financial impact, by coordinating the best actions together with project teams, and we established new operating methods based on the increasing digitalization of activities, training, product delivery, and performance management.

Our productivity continued to rise thanks to the collaboration of the representatives of FONTAGRO'S Board of Directors, researchers, sponsors (IDB and IICA), and strategic partners and external support experts.

The use of digital technologies promoted inter- and intra-work team interaction, even though it challenged lab and field activities that were limited under the local measures and health regulations. The progress of immunization campaigns made this scenario more flexible and, step by step, we began to return to the new normal.

# About FONTAGRO

FONTAGRO is a unique worldwide mechanism for the sustainable financing of agricultural research and technology in Latin America, the Caribbean and Spain, and constitutes a forum for the discussion of priority issues of technological innovation. Its purpose is to increase the competitiveness of the agri-food sector and reduce poverty, through the sustainable management of natural resources.

FONTAGRO is made up of 15 member countries: Argentina, Bolivia, Chile, Colombia, Costa Rica, Ecuador, Spain, Honduras, Nicaragua, Panama, Paraguay, Peru, the Dominican Republic, Uruguay and Venezuela. These countries are represented by the highest authority of their respective agricultural research institutes (INIAs), who lead national policies on the subject and are members of the FONTAGRO Board of Directors. The Inter-American Development Bank (IDB) and the Inter-American Institute for Cooperation on Agriculture (IICA) are its sponsors.

FONTAGRO was created in 1998, in an effort to promote agricultural research and development and compensate for the decline in investment in the sector in recent decades. Member countries have contributed US\$ 83.05 million in capital; as of 31 December 2021 FONTAGRO held an investment portfolio worth US\$ 103.4 million.

Its [governance structure](#) includes the Board of Directors, the Executive Committee, the Financial Committee, and the Technical- Administrative Secretariat managed by an Executive Secretary. Its institutional documents are the Articles of Agreement, the [Operations Manual](#), and the [Medium-Term Plans \(MTP\)](#). Also issued are annual external audit reports and publications on the analysis of [FONTAGRO's results and impact](#).

Its co-financed projects are regional platforms comprising at least two member countries of FONTAGRO, although other, non-member countries may also participate, in this case contributing their own funds. To date, 176 regional multi-stakeholder platforms have been co-financed for a

total US\$130.9 million, to which FONTAGRO has contributed US\$ 27.5 million (21%); other agencies, US\$ 18.2 million (14%); and the participating institutions (counterparts), US\$ 85.1 million (65%). In other words, for every dollar invested by FONTAGRO between 1998 and 2021, the organization has succeeded in obtaining up to three dollars from other parties, while supporting operations that encompass 34 countries with the participation of 434 public and private institutions, including national research institutes, universities, businesses, NGOs and regional and international organizations.

FONTAGRO has established strategic alliances with, among others, the Food and Agriculture Organization of the United Nations, the Alliance of Biodiversity International and CIAT, and the Global Research Alliance in New Zealand, represented in that country by its Ministry for Primary Industry. As a result, a unique organizational and institutional model was built, a model of inclusion where researchers, innovators and agents of agriculture and food development converge. Over the years, outcome research and impact studies have highlighted outstanding achievements not only in technical aspects but also in the creation of networks, spillovers and spin-offs, and, especially, in strengthening the capacities of all stakeholders in the value chains.

Of the results achieved by FONTAGRO projects, 77% are part of the scientific heritage of national agricultural research systems, 69% are being used by end beneficiaries, and 74% are regional public goods. A study carried out in 2020 on a group of eight projects showed that the total benefit, expressed as Net Present Value (NPV), was US\$ 83,753,240, far exceeding the US\$ 8,112,428 investments.

FONTAGRO grew stronger in recent years by becoming a key co-financing mechanism for science and innovation in Latin America, the Caribbean, and Spain, by creating internationally traded public goods, which resulted in the enhancement of their strategic role in the global arena.



# Letter from the President

We are glad to introduce the results for the year 2021, which was featured by a gradual worldwide recovery from the impact of the pandemic, and the return to the new normal.

The agricultural and agri-food sectors of Latin America and the Caribbean have increasing challenges to meet. While we were only thinking about the impact of climate change and variability until 2019, since 2020 we have learnt that a pandemic could be just as disruptive, or even more so, than anything we had known before. Therefore, countries through their national institutions of science and technology, together with the private sector, NGOs, and producers keep on working to promote the generation of new knowledge to address and create alternative solutions to these growing challenges. To that end, FONTAGRO's regional platforms for innovation, which gather many different science and technology players and bring together inter- and multidisciplinary scientific and technical teams, have become a key tool to face these big global changes by speeding up technical and scientific production, and the validation of technologies.

Since 1998, FONTAGRO has financed a total of 176 international projects for a total of \$130.9 million, of which \$27.5 million (21%) were contributed directly, \$18.2 million (14%) by other agencies, and \$85.1 million (65%) by matching funds of the respective institutions. Nonetheless, FONTAGRO has retained its startup money and even increased its value to \$103.4 million. This has been achieved through proper financial management, which led us to a current financial position with assets estimated at \$102.6 million (as of December 31, 2020), 24% higher than the initial membership fees contributed by the countries, reaching an investment portfolio as high as \$ 103.4 million, 1.2% more than 2020.

We have also focused on the management of alliances and memberships. Several activities were carried out to expand opportunities of agreement, which enhanced FONTAGRO's positioning and increased its visibility, as well as its impact on the region. Special mention should be made to the cooperation agreement with the New Zealand Ministry for Primary Industries (MIP) and the Alliance of Bioversity International and CIAT. This year new partners have joined, among US universities and the Food Action Alliance (FAA) of the World Economic Forum.

Programmatic activities for the year concerning the plan were completed and grew. The 2022 open call to participate in "Innovation for sustainable and resilient agri-food and territorial development in Latin America and the Caribbean" was successfully implemented and four new initiatives were approved. We continued with the administration and monitoring of 48 operations for an amount of \$11.2 million, which represents a total investment of \$38.1 million. New seed funds and agreed-upon projects were supported, based on the needs of the countries and the priority of the different themes.

A new 2020-2025 Action Plan was developed in knowledge management and communication, and a record of 954 new knowledge products was achieved, among digital, institutional, and technical publications of projects, scientific papers, workshops, news, and videos. I would like to emphasize that two committees were established in 2021, one of them related to knowledge management and communication, and the other one with a scientific and strategic focus. These committees are composed of country delegates and special guests and have provided a space for discussion and a forum for LAC's priority issues.

Finally, I wish to thank FONTAGRO's Board of Directors for allowing me to lead this Fund for the past three years and for sharing discussions and exchanges in favor of our region and FONTAGRO. I would also like to thank the sponsors, the IDB and the IICA for their work in support of FONTAGRO during this year, and all the staff of these institutions that support our work; as well as our new strategic partners, project leaders, and technical teams in the fields, and the Technical and Administrative Secretariat for their commitment and performance. I wish you all a good end of 2021, in health and peace.

## **Pedro Bustos Valdivia**

CHAIRMAN at FONTAGRO, National Director of Chile's National Institute of Agricultural Research (INIA)

# Message from the Executive Committee

We are excited to introduce our 2020-2021 annual report. Our programming highlights are presented there, together with other findings that emerged throughout the year, as new alliances were established with other agencies.

FONTAGRO shows once again that it is the sustainable financing mechanism for the development of agricultural technology and innovation in Latin America and The Caribbean, with a key role in the creation of regional public goods, currently reaching a minimum of 34 of the countries. With an existing portfolio of 48 international projects involving a total of \$ 38.1 million, strategic lines have been developed in the areas of innovation, climate change, value chain competitiveness, and sustainable management of natural resources and intensive production. Following the results for 2021, four new projects have been added to the portfolio, as well as seed funds and agreed-upon projects in vertical agriculture, bio-inputs, and satellite monitoring of pastures.

We held Executive Board meetings, and the [16th Annual Technical Monitoring Workshop](#) project, conducted virtually for the second successive year, where 15 teams presented their results and project [“Innovations for protected environment horticulture in the tropical zones”](#) won the 2021 Award of Excellence. We took part in multiple events together with other international agencies, such as FAO, IICA, CoSAI, the Bioversity International Alliance and CIAT, and the Global Research Alliance from the Ministry for Primary Industries. But we also came into contact with universities, venture capital companies, the World Economic Forum, other CGIAR institutes, and numerous other organizations, with whom we promote more sustainable, resilient, and inclusive agriculture as a whole.

Undoubtedly, 2021 has been a historical year for humanity, we have learned to overcome barriers to continue growing, a task that has been achieved thanks to the permanent support of the Executive Board, Sponsors, researchers, associated organizations, support consultants, and the Technical-Administrative Secretariat.



**Pedro Bustos Valdivia**  
National director of INIA, Chile  
President of FONTAGRO



**Arnulfo Gutiérrez**  
General Director of IDIAP, Panama  
Vicepresident of FONTAGRO



**Eugenia Saini**  
Executive Secretary  
of FONTAGRO

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Dominican Republic

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Uruguay

**Giomar Blanco**

Venezuela

# Our Philosophy

FONTAGRO has renewed its philosophy as a response to the shifts that challenge agriculture and nutrition everywhere. In doing so, it has redefined its mission, vision and values to strengthen its role as a mechanism for sustainable co-financing of R+D+i and enhance its actions as a forum for the discussion of priority issues in agri-food innovation. This philosophy comprises a set of principles that correlate /what we are with what we intend to achieve and, at the same time, constitutes a consistent work space which aligns FONTAGRO with all the actors participating in the initiatives to be promoted in the medium term.

## FONTAGRO´s Vision

“Transforming agri-food systems through the use of knowledge so that they will be more inclusive and sustainable for the environment and society”.

## FONTAGRO´s Mission

“Leading regional articulation, cooperation and dialogue through the sustainable co-financing of public goods initiatives that will contribute to the knowledge and innovation of agri-food systems and to the improvement of the population’s quality of life”.

## Our Values

Integrity, Solidarity, Efficiency, Transparency and Respect.

## 2020-2025 Strategies



**Strategy I:** Resilient and sustainable farm network.



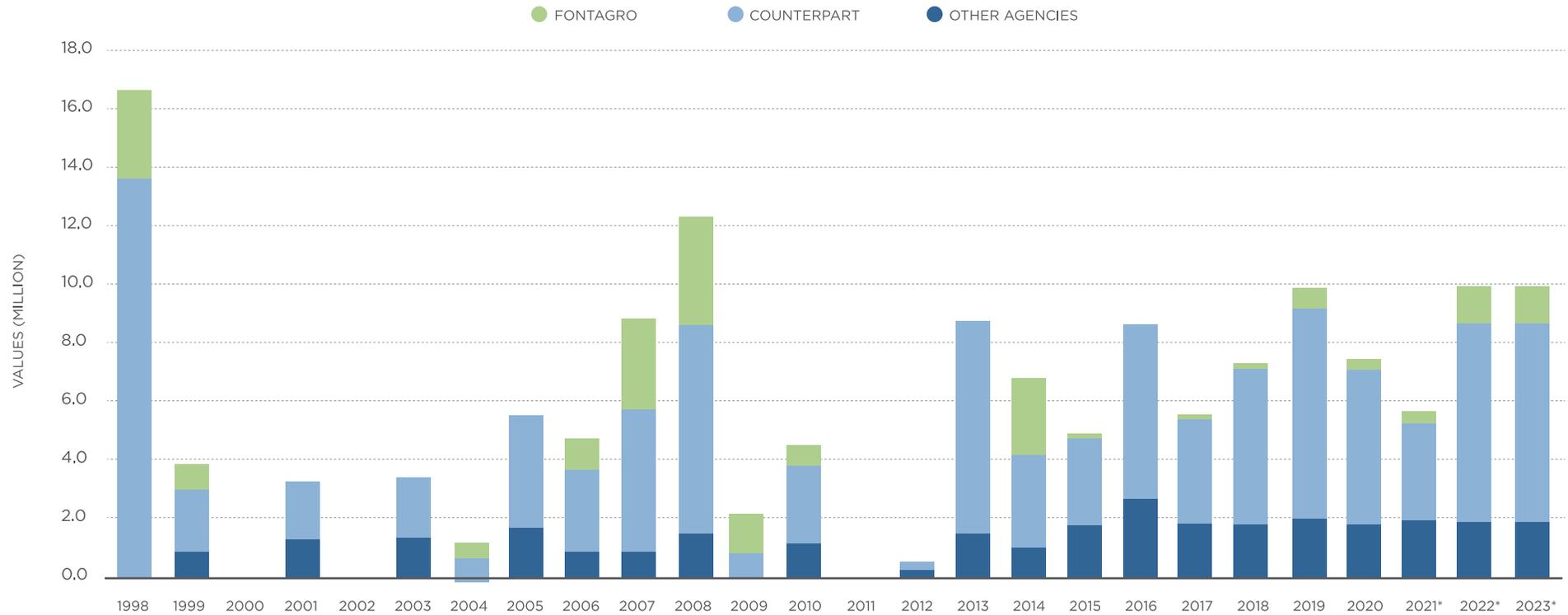
**Strategy II:** Sustainable production systems, agroecosystems and territories.



**Strategy III:** Food, nutrition and health.



# FONTAGRO Today



Source: Technical-administrative Secretariat (TAS), 2021.

Note:

(\*) projected values.

(\*\*) No Call for proposals were implemented in 2000, 2002, 2004, 2009, 2011, y 2012.

(\*\*\*) "Other Agencies" includes all kind of funding mobilized from other sources.

# Highlights

FONTAGRO's projects around the World

**176**  
Projects

**130,950,005**  
US\$ funds



- 2.1% asset increase (Financial Statement audited as of December 31, 2020, as compared to December 2019), particularly due to a positive variation in the value of investments.
- 48 projects in 2021 mobilizing \$38.1 million and \$11.2 contributed by FONTAGRO, leveraging up to \$3 per FONTAGRO dollar.
- 32,774 beneficiaries.
- 17,041 trained people.
- 532 pilot sites for technical and scientific validation .
- 705 networks and 165 work-teams.
- 133 concurrently validated technologies, of which 64 relate to Agtech.
- 25 new species identified.
- 8,000 seedlings produced.
- 954 new digital knowledge products, 16 institutional publications, 303 technical publications of projects, 13 new digital products.
- 46 scientific papers handed in to referenced journals.
- 23 theses.
- 204 workshops and seminars.
- XVI Annual Technical Monitoring Workshop with 16 speakers and 272 participants.
- Creation of the GCyC Committee.
- Establishment of the Strategic Scientific Intelligence Committee.
- Strengthening of competencies in the design of science and innovation projects and paper writing to disseminate results.
- 1,016 records and researchers on a new platform created to promote networks and encourage contact with experts.

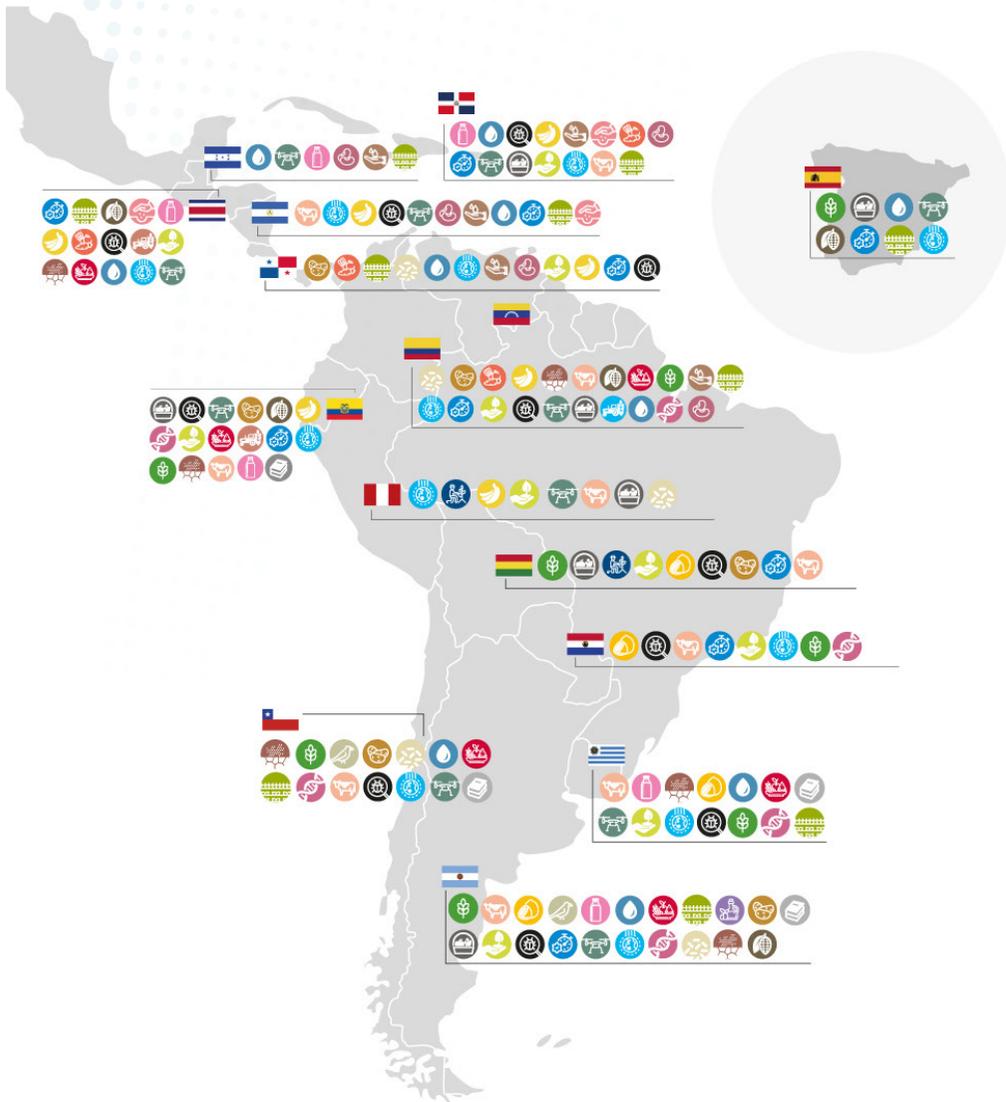


# Our Projects



- 1** AHOra: Application for Musaceae family producers  
AGROSAVIA, Colombia
- 2** 2030-2050 Platform for Water Management in Agriculture  
INIA, Chile
- 3** Scaling-up the improvements in organic family export bananas (BOFX)  
IDIAF, Dominican Republic
- 4** Sustainable control of the Huanglongbing vector (HLB)  
Fundación Argentina/INTA, Argentina
- 5** Multi-agency Cocoa Platform for Latin America and the Caribbean 2030  
ESPOL, Ecuador
- 6** 2019-2020 FONTAGRO POA  
Projects executed by STA
- 7** Sustainable intensification with legume-based livestock systems  
Fundación Argentina/INTA, Argentina
- 8** Sustainable intensification with legume-based livestock systems  
Fundación Argentina/INTA, Argentina
- 9** Irrigation advisory System and ICTs  
Fundación Argentina/INTA, Argentina
- 10** Early warning for potato late blight management  
INIA, Chile
- 11** Sustainable intensification of family farming in Peru and Bolivia  
CIRNMA, Peru
- 12** More rice with lower emissions and less water consumption  
FEDEARROZ, Colombia
- 13** Innovation and adaptation to climate change in livestock farming  
Fundación Argentina/INTA, Argentina
- 14** Implementation of the GCyC strategy  
Projects executed by STA
- 15** Controlled-environment Horticulture  
AGROSAVIA, Colombia
- 16** Digitalization of small-scale agriculture  
ZAMORANO, Honduras
- 17** SmartFruit-ALC HUB  
UFRO, Chile
- 18** Family Farmers, Innovation, and Markets  
Fundación Argentina/INTA, Argentina
- 19** Technological innovation in Andean cocoa  
University of Tolima, Colombia
- 20** Development of micro-economies in the production of essential oils in mining soils  
UNLP, Argentina
- 21** Andean Fruit Productivity and Competitiveness  
UNAL, Colombia
- 22** Network of Innovations in Dry Chaco  
Fundación Argentina/INTA, Argentina
- 23** Sustainable Dairy Intensification  
INIA, Uruguay
- 24** Yield improvement of potato and other Andean tubers - Root to Food  
PUJ, Colombia
- 25** Agro-ecological model for poultry coccidiosis  
Fundación Argentina/INTA, Argentina
- 26** Multipurpose agroforestry systems and family livestock farming  
AGROSAVIA, Colombia
- 27** Bovine productivity in the South American Chaco Region  
Fundación Argentina/INTA, Argentina
- 28** Towards more productive and sustainable rice  
INIA, Chile
- 29** Agtech for climate-smart Dairy  
Fundación Argentina/INTA, Argentina
- 30** Innovation for grazing and forage reserve management  
INIA, Uruguay
- 31** Prevention and management of Fusarium wilt  
AGROSAVIA, Colombia
- 32** Genome editing for animals and crops  
Fundación Argentina/INTA, Argentina
- 33** Alliances for Biofortified beans  
IICA - IDIAP, Panama
- 34** Quarantine diseases in fruits trees  
Fundación Argentina/INTA, Argentina
- 35** Rice farming practices  
IDIAP, Panama
- 36** Sustainable Seed Production  
INTA, Costa Rica
- 37** Nanofertilizer in soil and nitrous oxide emissions  
IICA - UIS, Costa Rica
- 38** Productivity and water resources  
IDIAF, Dominican Republic
- 39** Bioprocess to reduce the solubility of Rhizosphere Cadmium  
IICA - UTM, Costa Rica
- 40** Increasing Agricultural Production with lower emissions  
Fundación Argentina/INTA, Argentina
- 41** Carbon Sequestration Opportunities  
INIA, Uruguay
- 42** Carbon Sequestration Opportunities  
INIA, Uruguay

# The Sustainable Development Goals (SDGs)



## SECTOR

- AGRI-FOOD
- FAMILY FARMING
- POTATOES
- LIVESTOCK FARMING
- RICE
- CITRUS FRUITS
- SOIL
- BEANS
- OIL

## TOPIC

- BANANAS
- POULTRY
- DAIRY
- HORTICULTURE
- KNOWLEDGE
- COCOA
- WATER
- CROPS
- FRUIT
- CLIMATE CHANGE
- MARKETS
- SUSTAINABLE INTENSIFICATION
- DISEASE AND PEST MANAGEMENT
- AGTECH
- PRODUCTIVITY
- AGRONOMIC MANAGEMENT
- GENETIC
- SEEDS
- BIOFORTIFICATION





# Flagship Programs

## • NEW FINDINGS, TECHNOLOGIES, AND INNOVATION

1. Potatoes, the main food source of family farming in LAC, are affected by a disease called Late Blight (*Phytophthora infestans*) that seriously affects productivity and quality. Chile, Argentina, Ecuador, and Panama joined efforts to create an early warning system aimed at reducing chemical control and making production systems more sustainable and resilient.

[ATN/RF-16678-RG](#).

2. Every year, huge losses in citrus are reported which are due to HLB (Huanglongbing), a disease caused by bacteria. Argentina, Bolivia, Paraguay and Uruguay joined efforts to validate and disseminate Integrated Pest Management (IPM) to control and reduce the population of the vector carrying the disease by 35%. [ATN/RF-17232-RG](#).

3. Organic bananas are an important source of income for family farming in some countries in the region. The Dominican Republic, Ecuador, and Peru are scaling up technologies for the management of red-banded thrips. They use apps to capture and transmit data, thus improving productivity and profitability. [ATN/RF-17233-RG](#).



4. Green vegetable production is vulnerable to adverse weather conditions. Colombia, Costa Rica, Panama, and the Dominican Republic contributed to the improvement of competitiveness with infrastructure technologies for horticultural crops under protected environments.

[ATN/RF-16343-RG](#).



5. Cocoa, one of the most traded products in the world, has been damaged by an increased presence of cadmium. Ecuador, Colombia, Costa Rica, Germany, Belgium, the United States, Italy, Panama, Peru, and the Dominican Republic came together to standardize and officially approve the meth-

ods of cadmium quantification and create amendments to reduce its concentration in the bean. [ATN/RF-17235-RG](#).

6. Chile, Costa Rica, and Argentina have established a public-private partnership to develop an open-access technological tool called OpenFruit, which integrates geospatial, meteorological, edaphic, and productive data to produce alerts and facilitate decision-making by fruit producers, thus increasing productivity and quality. [ATN/RF-17245-RG-Agtech19056](#).

7. Colombia and Bolivia associated to create better family production systems of Andean tubers (potato, oca, and mashua) using seeds of good genetic and phytosanitary quality and agronomic management.

[ATN/RF-18120-RG](#).

8. Argentina and Chile look for a technological alternative to poultry health problems related to coccidiosis. The implementation of an agro-ecological and sustainable model is expected to increase productivity by 15%.

[ATN/RF-18136-RG](#).

9. Ecuador, Argentina, Spain, and Venezuela will work on a bioprocess formed by a consortium of native fungi which are effective at reducing cadmium in cocoa beans. [ATN/RF-18951-RG](#).

10. Given the first report of *Fusarium oxysporum* (FocR4T), Colombia, Costa Rica, Ecuador, Nicaragua, Panama, the Dominican Republic, Bolivia, Paraguay, and Peru came together to strengthen their capabilities and develop an efficient methodology for the pathogen's diagnosis. [ATN/RF-18761-RG](#).

11. Argentina, Chile, Colombia, Ecuador, Paraguay, Uruguay, and Brazil have innovated with biotechnological tools and genome editing to obtain plant and animal varieties with properties of productive, economic, and social interest. [ATN/RF-18757-RG](#).

12. Panama, Colombia, Honduras, Nicaragua, the Dominican Republic increased the spread of iron-rich bean varieties, which validates and upscales the bean varieties with the highest market demand, thus strengthening the food and nutritional security of the population. [ATN/RF-18797-RG](#).

## • TOGETHER FOR GREATER RESILIENCE TO CLIMATE CHANGE



reducing fertilizer use. [ATN/RF-16926-RG](#) and [ATN/RF-16927-RG](#).

14. Panama, Costa Rica, and Nicaragua have reduced their vulnerability to climate change through the Intensive System of Rice Cultivation (SICA), thus reducing the use of agrochemicals, seeds, and water. This increased yields by more than 40% and water use efficiency by more than 17%. [FTG/RF-14891-RG](#).

13. Argentina, Chile, Ecuador, Nicaragua, Paraguay, the Dominican Republic, Uruguay, and Brazil improved livestock production systems through the use of legumes in pastures, thus increasing the capacity to fix nitrogen, carbon sequestration in soils, and



[ATN/RF-17245-RG- Agtech19043](#).

16. Argentina, Spain, Nicaragua, Uruguay, and the Netherlands have created a public-private partnership that develops a mobile app called Irrigator Advisory Service (SAR) to strengthen the decision-making capacity of producers on water management. [ATN/RF-17245-RG- Agtech19037](#).

17. Increasing water use efficiency in agricultural fields is one of the big challenges, which is why Chile, Argentina, Colombia, Spain, and Uruguay came together to implement a consulting platform that has accurate time and space information of productive systems, thus allowing farmers and decision-makers to implement the quantitative management of irrigation in crops. [ATN/RF-17950-RG](#).

18. Honduras and Colombia have created and developed a low-cost soil humidity sensor to maximize production and optimize water use. [ATN/RF-17245-RG-Agtech 19055](#).

19. Argentina, Bolivia, and Paraguay, with the funding of the New Zealand Government, implemented an extended network in the South American Chaco for sustainable livestock raising. [ATN/RF-18079-RG](#).

20. The Intensive System of Rice Cultivation (SICA) technology has been validated in Chile, Argentina, Panama, Colombia, and Venezuela to be transferred to small farmers so that they can optimize the use of natural resources and reduce production costs. [ATN/RF-18105-RG](#).

15. Colombia, Peru, and the Dominican Republic, banana-producing countries, have developed a computer platform that converts local climate data into projections of banana growth, flowering, and harvest to support decision-making in the management of small banana plantations.



21. Argentina, Costa Rica, Honduras, the Dominican Republic, and Uruguay, with the funding of the New Zealand Government, have developed digital tools for the real-time monitoring of productive, climatic, and managing aspects of dairy cattle. [ATN/RF-18078-RG](#).

22. Uruguay, Argentina, Costa Rica, with the funding of the New Zealand Government, have developed a remote tool for the measurement of available pasture biomass, thus enhancing real-time decision-making on grazing and increasing grass harvest by 30%. [ATN/RF-18077-RG](#).

23. Colombia and Ecuador look for alternatives to stop soil deterioration, by synthesizing nano-fertilizer formulations that reduce fertilizer use and nitrous oxide emissions. [ATN/RF-18959-RG](#).

24. The Dominican Republic, Costa Rica, Nicaragua, and Panama came together to transfer water and soil management technologies to increase crop productivity. [ATN/RF-18766-RF](#).

25. Argentina, Chile, Colombia, Spain, and Uruguay reduced nitrous oxide emissions, thus improving the productivity and quality of 20 crops, through the use of genetically improved strains with higher efficiency in the activity of plant growth promotion. This increased production by 3% and reduced nitrous oxide emissions by 35%. [ATN/RF-18786-RG](#).



26. Uruguay, Argentina, Colombia, Costa Rica, and Chile have identified opportunities for soil carbon sequestration. [ATN/RF-18769-RG](#) y [ATN/RF-18770-RG](#).

## • SUSTAINABLE INTENSIFICATION AND NATURAL RESOURCES

27. Talking about sustainable intensification for dairy in Latin America and the Caribbean was challenging given the great diversity of production systems, the lack of characterization, and the different approaches. LACTIS has developed a platform for regional cooperation that established a baseline, development, and validated sustainability indicators for 11 countries. [ATN/RF-15940-RG](#).



28. Arid and semi-arid zones of LAC exhibit high environmental fragility and levels of rural poverty. Improvements in forage assessment, adjustment of stocking rate, strategic supplementation, and health management were some of the strategies implemented by 120 producers from Argentina and Peru

to adapt to climate challenges and strengthen local food security. [ATN/RF-16680-RG](#).

29. Rice producers from Colombia, Chile, and Peru face climate variability and a decrease in water availability. FEDEARROZ together with other organizations validated the sustainable intensification system for rice farming, reducing water use and GHG emissions, and increasing crop yields. [ATN/RF-16681-RG](#).

30. Peru, Colombia, and Germany will work for a technological solution through the use of multi-purpose agroforestry systems to improve milk production and producer profitability. [ATN/RF-18747-RG](#).

## • DEVELOPMENT OF REGIONAL ECONOMIES AND COMPETITIVE TERRITORIES

31. In Argentina and Colombia, biotechnology and phytoremediation technologies were promoted to recover mining soils through aromatic species. [ATN/RF-16110-RG](#).



32. The region of the American Dry Chaco with 125 producer organizations and research institutes has developed and validated climate-smart technologies to help 6,600 farmers adapt to climate change. [ATN/RF-16112-RG](#).

33. Colombia, Ecuador, Spain, and Peru have created a public-private partnership to boost the fruit sector, which is key to the economies of the LAC region. [ATN/RF-16111-RG](#).

34. Peru and Bolivia are implementing a method of participatory escalation, based on a virtual platform, to disseminate knowledge to 3000 young people from the Peruvian and Bolivian Highlands. [ATN/RF-16677-RG](#).

35. Improving access to cocoa markets is a priority for Colombia and Peru. The selection of genetic cocoa materials distinguished by their organoleptic quality and the validation of farming practices is the work on which four universities are focused. [ATN/RF-16109-RG](#).



36. Bolivia, Spain, and Argentina came together to identify short commercial circuits to help small producers improve their access to the market. [ATN/RF-16108-RG](#).

## • KNOWLEDGE MANAGEMENT AND COMMUNICATION

37. FONTAGRO supports knowledge and communication management activities in LAC. [ATN/RF-16639-RG](#).

38. FONTAGRO facilitates the organization of project design workshops with the allocation of seed funds. [ATN/RF-16338-RG](#).



# Programmatic activities



**2021 Open call “Innovation for sustainable and resilient agri-food and territorial development in Latin America and the Caribbean”**



**The strengthening of capabilities in the design of regional cooperation projects and the written recording of scientific results.**



**Committee for Knowledge management and communication. The knowledge management and communication action (GCYC) plan was developed and the GCYC committee was created.**



**Seed Funds**



**Scientific committee. The purpose of the scientific committee is to promote the development of new knowledge, science, technology, and innovation to facilitate the agri-food systems transformation.**



**Agreed-upon projects**

# Alliances and Memberships

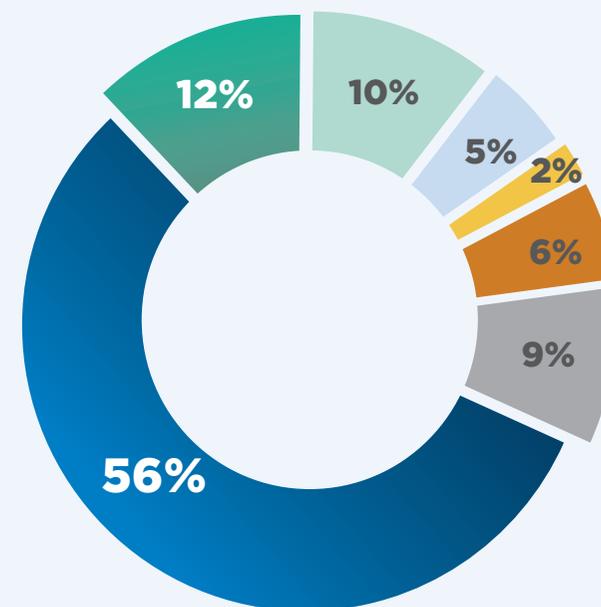
**MEMBERSHIPS.** Efforts continue to increase the fund's memberships.

**ALLIANCES.** Agreements were signed with the New Zealand Government, through the Ministry for Primary Industries, specifically a [Memorandum of Understanding](#) of August 8, 2021, and an agreement with the Alliance of Bioversity International and CIAT, [Memorandum of Understanding between the Alliance of Bioversity International & CIAT and FONTAGRO](#) on September 7, 2021, to build synergies that will allow us to strengthen the scientific-technological development in the region.

Synergies continued to be developed with the Inter-American Institute for Cooperation In Agriculture (IICA) through a series of webinars named "[Key players in the agricultural digitalization process in Latin America, the Caribbean, and Spain](#)", the [Global Alliance Against TR4](#), and the initiative [Alive Soils](#). With the inclusion of the FAO, among others, there was participation in the regional dialogues "Mitigation Ambitions in the Livestock Sector: Capacity Building and Networking for Review and Implementation" and the World Soil Day. Events took place and projects were designed together with the Global Research Alliance (GRA). With CGIAR, through the Alliance of Bioversity International and CIAT, technical-scientific synergies were promoted, as with the Commission for Sustainable Intensification (CoSAI).

Numerous other actions were carried out with [Wageningen University & Research](#), [CIRAD](#), [IFAMA](#), among so many other institutions, and can be accessed at [bi-monthly and special newsletters](#).

Total percentage contribution to the fund

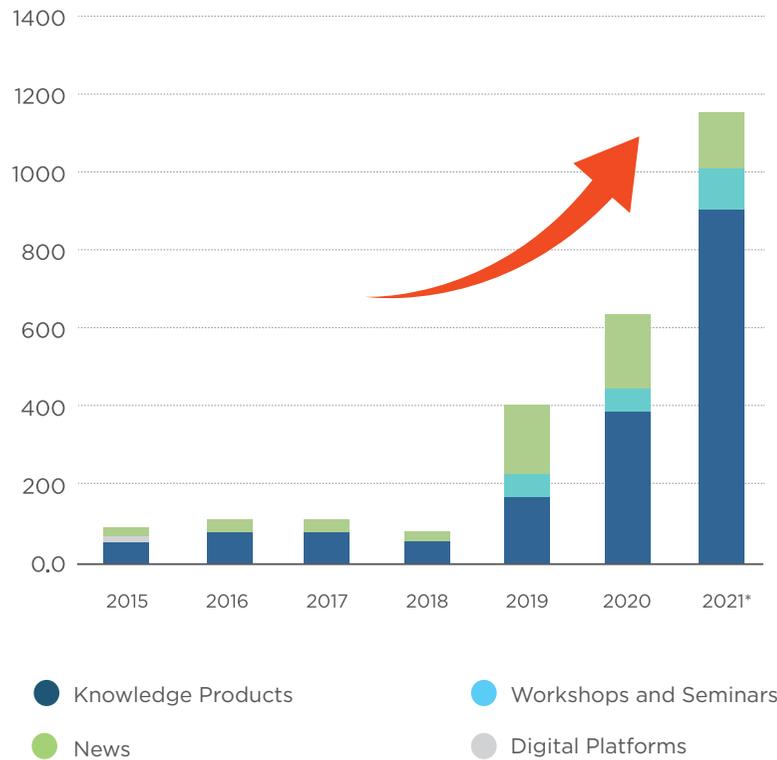


- 56% National Institutions
- 12% Regional Universities
- 10% International Institutions
- 5% Regional Institutions
- 2% Extra-Regional Institutions and Universities
- 6% Non-governmental Organizations
- 9% Private Sector



# Knowledge Management and Communication

Evolution of the Knowledge products.



Relevant subjects related with SDG´s in published articles with the support of FONTAGRO.



# 2020-2025 Action Plan for Knowledge Management and Communication

Aimed at promoting synergies among institutions to make visible the results and the impact of FONTAGRO's financing and its projects.



## IN 16 INSTITUTIONAL PUBLICATIONS

- [2019-2020 Annual Report](#)
- [Operations Manual](#)
- [2021 Manual on Knowledge and Communication Management](#)
- [Bioeconomy technologies to value garbage and waste as business opportunities for family farming \(Prepared by IICA\)](#)
- [Governance of knowledge and innovation in the Ibero-American agri-food systems](#)
- [Impact Innovations. Lessons on family farming and its link to nutrition in Latin America and the Caribbean \(SP/EN\)](#)
- [2020 - 2025 Mid-term Plan \(SP/EN\)](#)



## 303 PUBLICATIONS OF PROJECTS

Throughout this year, the Projects handed in 303 publications composed of 133 Technical Notes, 27 Research Projects, 86 Workshop Reports, 37 Scientific Papers (of which 19 are already published in referenced journals), 20 other publications (posters, workshop introductions, other information products). Sixty-four documents, out of the 303, are approved while the rest is under adjustment process for final approval. The following is an illustrative list of the products received per project:





### 13 DIGITAL PRODUCTS

- [2019-2020 Annual Report](#).
- [Report of the 16th Annual Technical Monitoring Workshop of FONTAGRO's projects \(web format\)](#)
- [Visual Summary of the Week of Knowledge](#).
- [30 webstories or impact stories](#), from the FONTAGRO's Project platform, both in Spanish and in English.
- 62 FONTAGRO in Brief ([47 in spanish](#) and [15 in english](#)).
- [30 FONTAGRO Techs](#). Done from the FONTAGRO's Project platform, both in Spanish and in English.
- [14 Blogs](#). Blogs were posted on the FONTAGRO's website and y also blogs were posted on Project webpages.
- 7 [bi-monthly newsletters](#) and 22 special newsletters to highlight milestones in FONTAGRO's programming. The newsletters were redesigned based on new digital content technologies.
- [Nuevo Logo](#). In August, the new logo was introduced at the researchers' meeting. It is aimed at positioning FONTAGRO's image.
- 26 Videos in [FONTAGRO's YouTube](#).

### 12 LANDING PAGE

Due to the worldwide health emergency and the connectivity boom, virtuality is the new common means to interact and communicate project achievements and results. To this end, a number of "landing pages" were created on our website, as a digital repository. These pages were created to introduce events, gather thematic information, promote networking, and the like. Below are some examples of what has been produced during the year:

- [Case Contest](#).
- [Knowledge Management and Communication](#).
- [The Road to Resilient Agriculture in Latin America, Central America, the Caribbean, and New Zealand](#).
- [Technical Cooperation for Resilient Agriculture - New Zealand, Latin America, and the Caribbean](#).
- [Knowledge Week](#).
- [Dialogue on Innovation in Sustainable Agri-food Intensification in Latin America and the Caribbean](#).
- [Boosting collaboration with New Zealand and FONTAGRO](#).
- [A cycle of AgTech Webinars](#).
- [Promoting Partnerships for Sustainable Development of Agriculture in Latin America and the Caribbean](#).
- [Course on Project Writing and Design](#).
- [Course on Scientific Article Writing](#).
- [The Scientific Strategic Intelligence Committee](#).



## 19 VALIDATED SCIENTIFIC PAPERS PUBLISHED IN INTERNATIONAL JOURNALS

- [Life-Cycle Assessment and Life-Cycle Cost study of Banana \(\*Musa sapientum\*\) fiber Biocomposite materials.](#)
- [Efecto de dos niveles de nitrógeno y potasio aplicados por fertirriego en las variables de crecimiento y concentración de macro y micronutrientes en plantas de aguacate \(\*Persea americana\* mill.\) Var. Hass.](#)
- [Evaluación de la influencia del grado de madurez de la gulupa \(\*Passiflora edulis\* Sims\) sobre la aceptación sensorial en productos alimenticios.](#)
- [Life cycle inventory data for banana-fiber-based biocomposite lids.](#)
- [Organic versus conventional: a comparative study on the shelf life of passion fruit \(\*Passiflora edulis\* Sims\) crops.](#)
- [Respuesta del cultivo de granadilla \(\*Passiflora ligularis\* Juss\) cultivar “Colombiana” al suministro de nitrógeno y potasio por fertirriego.](#)
- [A comprehensive approach for biorefineries design based on experimental data, conceptual and optimization methodologies: The orange peel waste case.](#)
- [Banana fiber-biocomposite applied in food packaging - Life-Cycle Engineering model for material selection.](#)
- [A literature review on life cycle tools fostering holistic sustainability assessment: An application in biocomposite materials.](#)
- [Comparative life cycle assessment of coffee jar lids made from biocomposites containing poly \(lactic acid\) and banana fiber.](#)
- [Effects of ultrasound-assisted blanching on the processing and quality parameters of freeze-dried guava slices.](#)
- [Enzymatic Browning and Color Evolution in Frozen Storage of Two Kinds of Minimally Processed Avocado Puree.](#)
- [Evaluation of Some Ingredients and Energy Content on Front of Pack Cereal Bar Labeling as Drivers of Choice and Perception of Healthiness: A Case Study with Exercisers.](#)
- [Genotype x Environment interaction in the yield and fruit quality of passion fruit germplasm grown in the Ecuadorian Littoral.](#)
- [Integral use of orange peel waste through the biorefinery concept: An experimental, technical, energy and economic assessment. Biomass conversion and Biorefining.](#)
- [Optimization of processing conditions and mechanical properties of banana fibers reinforced PLA/HDPE composite.](#)
- [Sustainable management of peel waste in the small-scale orange juice industries: a Colombian case study.](#)
- [Valorization of passion fruit stalk by the preparation of cellulose nanofibers and immobilization of trypsin.](#)
- [Actividad repelente de aceites esenciales de plantas nativas y su mezcla para controlar \*Tribolium castaneum\* en granos almacenados.](#)



## 74 WORKSHOPS AND SEMINARS including:

- [Signature of the Memorandum of Understanding between FONTAGRO and the Bioversity Alliance & CIAT and Dialogue on the Strategic Forward Planning in Sustainable Development of Agriculture in Latin America and the Caribbean.](#)
- [A cycle of AgTech Webinars: Development and Strengthening of Innovation Ecosystems.](#) A series of Webinars was organized together with IICA to discuss the development of innovation ecosystems and agro-digitalization players.
- [A cycle of AgTech Webinars: Development and Strengthening of Innovation Ecosystems.](#) The focus of the discussion was on AgTech in livestock production.
- [A cycle of AgTech Webinars: Modernization of tools for water-efficient management in agriculture.](#) In this webinar, experts presented a range of experiences in water management in the context of climate change.
- [Dialogue on innovation in sustainable agri-food intensification in Latin America and the Caribbean.](#) To consolidate collaboration between FONTAGRO and CoSAI (the Commission for Sustainable Agricultural Intensification) a webinar was organized to introduce and discuss successful experiences of innovation and research in agriculture and food systems.
- [Boosting collaboration between New Zealand and FONTAGRO.](#) The signature of the Memorandum of Understanding between the Ministry of Primary Industries of the New Zealand Government and FONTAGRO was celebrated virtually.
- [IFAMA 2021 Conference.](#) In the series of virtual conferences under the motto [“Innovations that will reshape the future of food”](#), FONTAGRO, invited by Bayer, shared the panel [“Is Latin America the next hot spot of AgTech?”](#).

## 4 “FONTAGRO NETWORK” INITIATIVES – PROJECT DATABANK

“[FONTAGRO NETWORK](#)” is an initiative that seeks greater interaction between scientists from different disciplines and entrepreneurs or agencies interested in cooperating with the development of new technological solutions for the agricultural and agri-food sectors in LAC. This strength of networking created by FONTAGRO over the years has facilitated the linkage among experts, technicians, scientists, scholars, producers, businessmen, and other international agencies working in different disciplines and with different experiences. This generated key synergies for the promotion of innovation. Currently, there are 16 registered initiatives, 4 new ones in this period. The platform was developed in two languages.

## 130 NEWS AND 5,490+ FOLLOWERS IN SOCIAL MEDIA

**4 DIGITAL PLATFORMS** to streamline GCyC and facilitate the dissemination of results. These are open-source platforms that can be used by any user. The platforms are project management platform, success stories management platform, FONTAGRO Network (Project Databank), researchers’ platform. Some institutions showed interest in accessing them, such as IDIAP from Panama, INTA Costa Rica, IDIAF from the Dominican Republic, INTA Nicaragua, and INIA Uruguay.

**STRENGTHENING OF CAPABILITIES.** Ongoing training was carried out and 40 researchers and communication teams received support on project recording and the use of the GCyC digital platform to create dissemination products. Three training sessions were planned to strengthen researchers’ skills in project writing and design, together with the University of Lleida (Spain) and the School of Agronomy of the University of Buenos Aires (FAUBA).

**CITATIONS.** 1,294 citations including Twitter, news, videos, forums, blogs, and webpages.

**FONTAGRO Website.** 42,912 sessions were computed, with a trend of increased access through computers and mobile devices.

**TECHNOLOGY TRANSFER ACTIVITIES.** . FONTAGRO’s project platform is an [open-source](#) platform, which allows any institution to use the tool according to their needs.



# Webinars FONTAGRO

**CICLO DE WEBINARIOS / AGTECH** | Protagonistas de la Agrodigitalización en América Latina y el Caribe

**#4** Desarrollo y aprovechamiento de tecnologías

## AgTech & Blockchain

**#3** Agtech & gestión del agua  
Modernización de las herramientas.

**#2** Agtech & ganadería  
Desarrollo y aprovechamiento de tecnologías.

**#1** Agtech y tecnología  
Desarrollo y fortalecimiento de ecosistemas de innovación.

Eugenia Saini abandonó la reunión

43 más

Tú

45 más

# XXV Annual Meeting of Fontagro's Board of Directors





# Abbreviations and Acronyms

<b>LAC</b>	<b>Latin America and the Caribbean</b>
<b>IDB</b>	<b>Inter-American Development Bank</b>
<b>BD</b>	<b>Board of Directors</b>
<b>EC</b>	<b>Executive Committee</b>
<b>FC</b>	<b>Finance Committee</b>
<b>TC</b>	<b>Technical Cooperation</b>
<b>FAO</b>	<b>Food and Agriculture Organization of the United Nations</b>
<b>FONTAGRO</b>	<b>Regional Fund for Agricultural Technology</b>
<b>KMCD</b>	<b>Knowledge Management, Communication and Dissemination</b>
<b>IICA</b>	<b>Inter-American Institute for Cooperation on Agriculture</b>
<b>R + D + i</b>	<b>Research, Development and Innovation</b>
<b>ATMR</b>	<b>Annual Technical Monitoring Report</b>
<b>OM</b>	<b>Operations Manual</b>
<b>MTP</b>	<b>Medium Term Plan</b>
<b>AOP</b>	<b>Annual Operating Plan</b>
<b>TAS</b>	<b>Technical Administrative Secretariat of FONTAGRO</b>
<b>TOR</b>	<b>Terms of Reference</b>

# Our Partners

## International Institutions



## Regional Institutions





# National Institutions



## Non Gubernamental Organizations



## Extra-Regionals Institutions and Universities



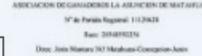
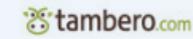


## Regional Universities





## Private Sector





# Annual Report 2021



Alianza



Ministry for Primary Industries  
Manatū Ahu Matua

