BETTER POLICIES FOR BETTER LIVES

Co-operative Research Programme:
Sustainable Agricultural and Food Systems

Agriculture, Food, Fisheries and Forestry Research Facilities

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State or Federal Research Facilities, Institutes or Organisations

Agricultural Research Institute – INIA (Instituto de Investigaciónes Agropecuarías)

https://www.inia.cl/quienes-somos/#

INIA is a private non-profit corporation linked to the Chilean Ministry of Agriculture. It has 10 Regional Research Centres, 10 Experimental Centres, 6 Technical Offices and specialised laboratories. It has a network of germplasm banks, active banks of crops, vegetables, fruits, legumes and potatoes and a microbial genetic resources bank.

National Sustainability and Environment Programme

https://www.inia.cl/en/programas-nacionales/sustentabilidad-y-medio-ambiente/

The mission of INIA's National Sustainability and Environment Programme is to develop knowledge that contributes to improving the sustainability of Chile's agricultural systems, to obtain quality food, generated in systems of reduced environmental impact, adapted to climate change, maximizing agro-ecosystem services and streamlining the use of inputs.

To this end, the Programme analyses and monitors the country's main agricultural activities and manages natural resources that have negative impacts on the environment, in order to determine whether an agro-system is sustainable in the long term, in the face of global changes or anthropogenic effects.

The aim is to propose adaptations and innovations that constitute sustainable alternatives for land and water use and management. This, based on scientific criteria oriented to the generation of technologies and the implementation of public policies, for a more sustainable, ecological and productive development of national agriculture.

Areas of Competence/Research

1. Climate change: integrated agronomic mitigation/adaptation strategies
2. Sustainable soil management and use of organic waste
3. Sustainable management of water resources
4. Dynamics, behaviours and risk analysis of the use of agrochemicals
5. Climate risk management
6. Development of agroecological production systems

Plant Health

https://www.inia.cl/programas-nacionales/sanidad-vegetal/

The Plant Health programme contributes to the reduction of damage caused by phytopathogenic agents, arthropods and weeds associated with agricultural and forestry production, generating

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effective and efficient solutions that respond to the demands of producers, markets and society, through sustainable strategies and technologies aimed at improving the productivity and competitiveness of agriculture and the quality and safety of food generated by this sector.

Areas of Competence/Research

1. Integrated pest and disease management
2. Risk analysis of emerging pests and diseases
3. Chemical ecology and evaluation of natural substances in phytosanitary control
4. Plant health and climate change
5. Evaluation of biological control agents and pollinators
6. Pesticide application technologies

Horticulture

https://www.inia.cl/programas-nacionales/hortofruticultura/

Areas of Competence/Research

1. Fruit trees and vines:
    - Increased competitiveness
    - Adaptation to climate change
    - Control of pests and diseases
2. Vegetables:
    - Increased competitiveness and quality of horticultural production
    - Adaptation to climate change
    - Control of pests and diseases

Genetic Resources

https://www.inia.cl/en/programas-nacionales/recursos-geneticos/

The mission of the Genetic Resources programme is to strengthen and modernise the comprehensive management system of plant genetic and microbial resources sheltered in the INIA Network of Banks, to achieve optimal levels of conservation, according to the needs of the country and international standards, promoting equitable access and exchange for its valuation and use.

1. Increased conserved genetic base of endemic and native species
2. Collections management
3. Collection valuation

Crops

https://www.inia.cl/programas-nacionales/cultivos/

This programme seeks to create and adapt new varieties of crops and forage, and develop technological protocols, according to the needs of the different agro-ecological conditions of the country, to overcome the productive gaps and contribute to the increase of competitiveness and sustainability of the sector in Chile, in a climate change scenario.

Areas of Competence/Research

1. Genetic improvement of crops and forage
2. Integrated pest, disease and weed management
3. Crop agronomy and production systems

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Livestock Systems

https://www.inia.cl/programas-nacionales/sistemas-ganaderos/

Areas of Competence/Research

1. Animal production systems
2. Grazing, feeding and animal nutrition
3. Valorisation of animal products

Foods

https://www.inia.cl/programas-nacionales/alimentos2/

This programme's mission is to value and promote innovation in the development of differentiated raw materials for the production of healthy foods that respond to the new global challenges of sustainability, sustainability, safety, quality, post-care and added value. In line with the global challenges of food and agriculture, INIA seeks to develop new safe and specialized raw materials for the healthy and high value-added food market, through genetic improvement, clean production, and traceability throughout the production system.

Areas of Competence/Research

1. Valorising and identifying raw materials with food potential
2. Developing specialised and innocuous raw materials for the food industry
3. Generating innocuous and differentiated livestock products, with traceability throughout the production chain
4. Producing safe raw materials, incorporating a traceability system in the production chain, in terms of residues of pesticides, heavy metals, toxins, nitrates and others.
5. Forming institutional capacities and generate public-private strategic alliances on healthy food issues and high added value for the food industry.

Technology Transfer and Extension

https://www.inia.cl/programas-nacionales/transferencia-tecnologica/

This programme's mission is to generate innovation processes in the target population, through the development of training and dissemination activities with a territorial approach, that prioritises the topics to be worked on by each Regional Research Centre according to local demands, allowing a specialised response and with a high level of irradiation. Train extensionists, advisors and transferees, among other agents of change, in those knowledge and technologies validated by the leading farmers; expanding the likelihood of its adoption by other farmers; achieving greater coverage and impact.

Areas of Competence/Research

1. Territorial approach
2. Validation and technology adaptation
3. Distance training

Foundation for Agricultural Innovation – FIA (Fundacíon para la Innovación Agraria)

http://www.fia.cl/

The Foundation for Agrarian Innovation (FIA) is the agency of the Ministry of Agriculture (MINAGRI), whose mission is to contribute to the efficient solution of **strategic challenges** related with the national agricultural, livestock and forestry sector and / or the associated agri-food chain, through the

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promotion, articulation and technological diffusion of innovation processes oriented towards sustainable development.

Specifically, FIA seeks to support the development of innovative solutions around the following **strategic challenges**:

- Water efficiency and adaptation to climate change: Support innovations that contribute to water efficiency, as well as mitigation and / or adaptation to climate change in the Chilean agricultural, livestock and forestry sector and / or the associated agri-food chain.
- Development of innovative markets: Contribute to the development and adoption of innovations that create or expand highly differentiated markets that use distinctive attributes of the agricultural, livestock and forestry sector and / or the associated agri-food chain and that increase the added value of national production.
- Innovation in processes: Support the development and adoption of innovations that result in improvements in high-impact production processes and well-being for workers in the Chilean agricultural, livestock and forestry sector and / or the associated agri-food chain.

In order to advance in contributing to the efficient solution of these strategic challenges, FIA makes the following four support services available to the sector to promote innovation:

1. **Financial Incentive**: This service corresponds to support funds for the execution of innovation initiatives in the forestry sector and / or the associated agri-food chain.
2. **Information**: This service offers information resources – generated by FIA or other institutions – to support decision-making regarding innovation processes in the forestry sector and/or the associated agri-food chain.
3. **Training for Innovation**: This offers a series of training opportunities for forestry and agricultural innovation and / or the associated agri-food chain, aimed at schoolchildren, youth and adults.
4. **Networks for Innovation**: The networks provide activities that seek to promote the link with different actors of the entrepreneurship and innovation ecosystem of the forestry sector and/or the associated agri-food chain.

ANID – National Agency for Research and Development (Agencia Natíonal de Investigación y Desarrollo)

https://www.anid.cl/

ANID is the service responsible for administering and executing the programmes and instruments aimed at promoting, encouraging and developing research in all areas of knowledge, technological development and innovation based on science and technology, in accordance with the policies defined by the Ministry of Science, Technology, Knowledge and Innovation, based on the work ethics of excellence, equity and unity.

Areas of Competence/Research/Faculty/Department

ANID provides funding for basic and applied research. It offers opportunities for individual funding, postgraduate studies scholarships in Chile and abroad, funding for research centres and many opportunities for international cooperation.

Universities/Higher Education Institutes

Austral University of Chile (UACh)

https://international.uach.cl/research-profile/

UACh is situated in an exceptional environment, at the doorstep of Patagonia, offering unique possibilities for the study of great biodiversity and natural resources as well as for high-impact projects related to climate change and the development of sustainability strategies. The university's ample

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landholdings represent a natural laboratory for forest restoration and the study and protection of watersheds and their flora and fauna, as well as studies in conservation, invasive species management, aquaculture and silviculture production.

Forestry, Agriculture and Veterinary Faculty

https://international.uach.cl/forestry-agriculture-and-veterinary/

Areas of Competence/Research/Faculty/Department

1. Agronomy
2. Food engineering
3. Conservation and natural resource engineering
4. Forest engineering
5. Veterinary Medicine

UACh Core Research Areas

https://international.uach.cl/research-groups/#uach-core-research-areas

Research activities at the University are grouped into Core Research Areas. The purpose is to enhance and complement distinct capacities while developing high-impact multidisciplinary research.

Transdisciplinary Studies of Socio-Ecological Strategies for the Sustainability of Southern Forests (TESES)

1. Biodiversity
2. Ecohydrology
3. Anthropology of forests, education, communications
4. Land-use planning
5. Bioenergy economy
6. Economics and economic policy

Centre for Research on Volcanic Soils (CISVo)

1. Agricultural and forest sciences
2. Natural resources
3. Soil sciences
4. Food sciences
5. Engineering sciences

Multidisciplinary Network for the Development of Marine Larviculture of Species with Complex Life Cycles

1. Aquaculture, endocrinology
2. Animal pathology, physiology
3. Ecophysiology and population genetics
4. Biotechnology

Santo Tomás University

https://www.santotomas.cl/who-we-are/

The University's mission is to contribute to the development of the country, through the training of professionals and graduates with disciplinary, learning and personal competences, inspired by Christian values, that allow them to perform and develop fully in the world of work and in their environment, and through the generation of knowledge, innovation and connection with the environment, in relevant areas.

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Research Centres

https://www.santotomas.cl/who-we-are/research-centers/

1. Austral Biotech
    - Biotechnology for aquaculture and agriculture
    - Biosensors for pharmaceuticals – for salmon industry, microalgae applications, agricultural pathogen detection systems
1. Centre for Applied Research in Aquaculture and Fisheries (CAPIA)
2. Centre for Ovine Development in Drylands (OVISNOVA)
    - Animal health, safety, genetic and productive improvement, and sustainability of sheep flocks
3. Research and Development Centre for Climate Change (CIICC)
    - Effects of climate change on coastal ecosystems
4. Bahía Lomas Centre
    - Specialised research on migratory beach birds, cetaceans, ecosystems and Selk'nam culture

Universidad de Las Américas (UDLA)

https://www.udla.cl/universidad

Universidad de Las Américas is a quality university, with increasing levels of academic development and institutional complexity that aspires to be recognised for its commitment to the progress of its students and the communities with which it relates.

Faculty of Veterinary Medicine and Agriculture

https://veterinaria-agronomia.udla.cl/

Areas of Competence/Research/Faculty/Department

1. Animal health
2. Public health
3. Animal welfare and behaviour
4. Education in agricultural sciences
5. Agricultural productions

Institute of Natural Sciences

https://cienciasnaturales.udla.cl/

Areas of Competence/Research

1. Deforestation
2. Generic Biodiversity

Catholic University of the Maule

Faculty of Agrarian and Forest Sciences,

http://portal.ucm.cl/facultades/facultad-ciencias-agrarias

The importance of the management and conservation of renewable natural resources are at the heart of the Faculty of Agrarian and Forest Sciences' ethos, which it combines with ethical and humanistic

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criteria to face the challenges of generating changes in Chile's productive matrix with energy efficiency in a context of sustainability and environmental responsibility.

Areas of Competence/Research/Faculty/Department

1. Biotechnology Centre of Natural Resources (CENBIO)

University of the Bío Bío

https://www.ubiobio.cl/w/

The University of Bío Bío is the heir of the tradition of public higher education in the Bío Bío Region. Its mission is to generate, apply and communicate the knowledge in sciences, technology, arts and humanities, forming competent, integral and reflexive professionals to answer the regional and national needs, to serve society with excellence and quality.

Areas of Competence/Research/Faculty/Department

1. Health and Food Sciences
    - Specialising in food, applied nutrition and community health
2. Wood
    - Production systems and science and technology of wood and its derivatives

University of Chile

https://www.uchile.cl/English

The University of Chile is the oldest higher education institution in Chile. Generating, developing, integrating and communicating knowledge in all areas of knowledge and culture are the mission and basis of the University's activities.

Faculty of Agricultural Sciences

http://www.agronomia.uchile.cl/investigacion

Research is oriented to all areas that intervene in the agri-food chain of agriculture or aquaculture, as well as the natural resources and the environment.

Areas of Competence/Research/Faculty/Department

1. Strengthening genetic improvement of the peach tree through international linkage and assisted selection
2. Climate Science and Resilience
3. Technical Centre for Food Innovation
4. Co-Inventa: Platform for innovation in food packaging

Faculty of Forestry Sciences and Nature Conservation

http://www.forestal.uchile.cl/

Areas of Competence/Research/Faculty/Department

1. Bioenergy
2. Climate change and biodiversity
3. Silviculture issues

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Faculty of Veterinary and Animal Sciences

http://www.veterinaria.uchile.cl/

Areas of Competence/Research/Faculty/Department

1. Cost-benefit analysis of disease surveillance, control and prevention measures
2. Genomic editing by CRISPR / CAS9 in the Atlantic salmon for functional studies of genes associated to genetic resistance to *P. salmonis*
3. Strengthening the area of animal disease ecology: new approaches for zoonosis research
4. ARCONE: Antimicrobial Resistance Cooperative Network

Institute of Nutrition and Food Technology

https://inta.cl/

Research Director: Lee Ann Meisel (lmeisel@inta.uchile.cl)

Areas of Competence/Research/Faculty/Department

1. Food – antioxidants, food biotechnology, lipids
2. Basic nutrition – bioinformatics and genetic expression, Cellular and molecular biology, Plant molecular genetics
3. Human nutrition – Micronutrients
4. Public nutrition – Food microbiology and probiotics, Nutrition and neurological sciences

University of Concepción (UdeC)

http://www.udec.cl/pexterno/

The University was founded to be a centre of varied information for the public, of university extension, scientific research and experimentation and the promotion of the highest literary, humanistic and philosophical culture, in addition to training professionals in liberal careers and technical professionals, as the development and increase of national wealth required.

Faculty of Agronomy

http://www.agronomiaudec.cl/

Areas of Competence/Research/Faculty/Department

1. Animal Production
    - Sustainable production systems for beef, sheep, goats, poultry and pigs; milk and egg production
    - Production and use of forage species and varieties; management and conservation of forages
    - Animal nutrition and feed; the use of agro-industrial by-products and non-traditional foods and ingredients
2. Plant Production
    - Biocontrol and sustainable management of plant protection
    - Management of nutritional and functional quality in cultivated plants
    - Fruit and viticulture of Cold Zones
    - Adaptation and management of annual crops
3. Soils and NRNN
    - Sustainable management of soil, water and nutrients
    - Biotechnology applied to plant nutrition

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- Geomatics applied to natural resources

Faculty of Agricultural Engineering

http://www.fia.udec.cl/

Areas of Competence/Research/Faculty/Department

1. Agro-industries
    - Agroindustrial Development Centre
    - Process Engineering
    - Biological Systems Engineering
    - Bioactive Compounds
    - Biomaterials
    - Heritage Foods
    - Development of Innovative Products
2. Mechanisation and Energy
    - Use of non-conventional renewable energies.
    - Electronics, automation and robotics applied to agriculture and agribusiness.
    - Information technologies and data processing.
    - Administration and management in the agricultural and agro-industrial sector.
    - Agricultural mechanization
3. Water Resources
    - Water management in agriculture
    - Hydraulic and environmental engineering applied to agriculture
    - Water treatment
    - Water governance
    - Environmental sciences

Faculty of Biological Sciences

https://cienciasbiologicasudec.cl

Faculty of Environmental Sciences

http://www.fcaudec.cl/

Areas of Competence/Research/Faculty/Department

1. Territorial Planning and Urban Systems
    - Dynamics and forcing factors of land-use change at landscape scale
    - Cultural heritage and landscape as relevant factors in territorial identity
    - Environmental planning and management of natural areas, protected areas and cultural spaces
    - Rural development and ethnic component; territory and public management in vulnerable areas
2. Aquatic Systems
    - Water quality in continental and marine aquatic systems
    - Pollution of continental and marine aquatic systems
    - Biodiversity and bioindicators of aquatic pollution
    - Carrying capacity and resilience of the aquatic environment

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- Conservation of Aquatic Biodiversity
- Structure and Functioning of Aquatic Ecosystems
- Climate change and its effects on water resources
- Global change and its effects on marine biogeochemical cycles
- Ocean acidification and socio-economic implications

Faculty of Forest Sciences

http://www.forestal.udec.cl/

Areas of Competence/Research/Faculty/Department

1. Forest Management and Environment
    - Biodiversity, Sustainable Management and Tourism
    - Dendroenergetic Crops
    - Landscape Ecology and Spatial Analysis
    - Invasive Species
    - Resource Assessment
    - Conservation Planning
    - Ecological Restoration
    - Wood Technology
2. Forestry
    - Cultivation of Plant Tissues
    - Genomics and Genetic Engineering of Plants
    - Plant Health
    - Applied Semichemistry
    - Forestry
    - Soils, Nutrition, Fertilisation and Sustainable Productivity
    - Nurseries and Afforestation

Faculty of Natural and Oceanographic Sciences

https://www.naturalesudec.cl/

Areas of Competence/Research/Faculty/Department

1. Botany
2. Zoology
3. Oceanography

Faculty of Veterinary Sciences

http://www.veterinariaudec.cl/

Areas of Competence/Research/Faculty/Department

1. Department of Pathology and Preventive Medicine
    - Animal and Public Health
    - Macroscopic, Hispathological and Microbiological Diagnosis
    - Parasitic Diagnosis
2. Department of Animal Science
    - Assisted Animal Reproduction
    - Reproductive and Therapeutic Biotechnology

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- Animal Nutrition and Feeding
- Genetic Improvement
- Sustainable Animal Production
- Environmental pollution
- Dairy and Meat Technology
- Animal Welfare
- Rural Development
- Wildlife and Wildlife Conservation
- Backyard Avicola Production

3. Department of Clinical Sciences
    - The resolution of diseases either by clinical or surgical means that allow a healthy life of the animal population

University of La Frontera

http://en.ufro.cl/

The Universidad de La Frontera (UFRO) is a state, public institution of higher learning, considered among the best universities in the country based on its remarkable indicators of quality and excellence. It became an independent institution on March 10, 1981, after the merger of the Temuco campuses of the University of Chile and the State Technical University. The Universidad de La Frontera is a learning community dedicated to the creation of human capital in undergraduate and graduate studies, in the areas of continuing education development, scientific and technological research, the promotion and creation of the arts and cultural development, and the education of citizens able to confront the challenges of their time.

Faculty of Agricultural and Forest Sciences

http://en.ufro.cl/index.php/fac/faculties/faculty-of-agricultural-forest-science

E-mail: decagr@ufrontera.cl

The aim of this faculty is the education of highly qualified professionals and postgraduates, to generate and transfer scientific and technological knowledge in the fields of agriculture, forestry, renewable natural resources and biotechnology, maintaining a permanent link with the environment with the purpose of contributing to the growth and sustainable development of the local community, the region and the country.

Areas of Competence/Research/Faculty/Department

1. Department of Forest Sciences

    Working in the areas of Forest Science and Natural Resources Engineering Sciences, the department develops research and uses technology applied to natural resources, forest and related ecosystems in classification, restoration, environmental and natural resource economics, management, conservation, quantitative methods of natural resources and biotechnology.

2. Agricultural Production Department
    - Productive management of fruit trees, ferti-irrigation, health, management and economy
    - Sustainable animal production, with emphasis on production and management of grasslands, nutrition, reproduction and good livestock practices in ruminant species
    - Productive management of cereals for food (human and animal), including plant nutrition, irrigation, sanitation, management and economy
    - Management and administration of agricultural companies
3. Department of Agronomic Sciences and Natural Resources

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- Integrated Pest Management
- Agroecology and organic production systems
- Sustainable management of soil
- Botanical water and applied plant physiology

University of Talca

https://www.utalca.cl/en/universidad/

The University of Talca was founded in 1981, as a result of the efforts of various stakeholders to open a university in the region and after the merging of the old headquarters of the University of Chile and the Technical University of the State. As of today, it has become one of the main national benchmarks for public non-profit higher education of excellence. The University has a commitment to ensuring the quality of education and research in an increasingly international context.

Faculty of Engineering

Areas of Competence/Research/Faculty/Department

Centre for Bioinformatics and Molecular Simulation

http://www.ingenieria.utalca.cl/cbsm

The Centre for Bioinformatics and Molecular Simulation has the mission of managing research in bioinformatics to support the progress of areas of science such as biotechnology, medicine and agronomy.

Faculty of Agricultural Sciences

Areas of Competence/Research/Faculty/Department

1. Centre for Research and Transfer in Irrigation and Agroclimatology

The Centre's objective is to satisfy the growing needs of the agricultural sector in knowledge and solutions for irrigation management, agroclimatology, precision agriculture and the adaptation of agriculture to water scarcity.

- Water consumption and irritation management
- Water relations and bio-mathematical modelling
- Precision farming
- Development of spatialised sensors for agriculture
- Remote perception to estimate evapotranspiration, water balance and footprint of water
- Climate change and water sustainability in agriculture

2. Centre for Native Plants of Chile
3. Technological Centre for Soil and Crops
4. Geomatics Centre
5. Centre for Genetic Improvement and Plant Phenomics
6. Pome Fruit Centre
7. Vine and Wine Technological Centre
8. Institute for Biological Sciences
9. Institute for Innovation Based on Science

Universidad Mayor

https://www.umayor.cl/um/

Universidad Mayor opened its first academic programs in 1988 with bachelor's degrees in Architecture and Engineering, and very quickly became the first private university in Chile to offer Agronomy and Forest Engineering (1989) and Veterinary Medicine (1991).

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Vice-Rector's Office for Research

https://vri.umayor.cl/?_ga=2.256348363.197819210.1626884479-1997711113.1626884479

Areas of Competence/Research/Faculty/Department

1. Centre for Genomics and Bioinformatics – exploring diversity from cells to ecosystems
    - Plant genomics
    - Microbial genomics
    - Bioinformatics and computational biology
2. Genomics, Ecology & Environment Centre (GEMA)
    - Biodiversity and biogeography of soil protists in continental and oceanic islands
    - Climatic and temporal control on microbial diversity-ecosystem functioning
    - Environmental factors that promote soil microbial activity and soil organic matter formation
    - Invasive alien species – bumble bees
    - Co-operation: lessons from nature
    - Exogenous and endogenous determinants of the structure of herbivore-plant-arthropod facilitation networks
3. Ecosystem Monitoring and Modelling Centre
    - Ecological modelling
    - Ecological restoration
    - Landscape ecology
    - Biometrics
    - Ecosystem services
    - Biological conservation
    - Biodiversity
4. Plant Resources Technology Centre
    - Genetics and breeding of native plants
    - Remote sensing and plant ecophysiology
    - Postharhargic genomics
    - Secondary metabolites
    - In vitro reproduction
5. Hémera Earth Observation Centre
    - Land cover and vegetation change
    - Food safety and precision agriculture
    - Effects of climate change and natural resources conservation
6. Reproductive Biotechnology Centre
7. School of Veterinary Medicine