



FACULTAD DE AGRONOMÍA E INGENIERÍA FORESTAL
PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE

School of Agricultural Science and Forestry
Priority Research Areas

The *School of Agricultural Sciences and Forestry* was founded in May 1904 and has a long history in teaching and research, having contributed significantly to the development of the agricultural sector Chilean. The school has a complete infrastructure for teaching, extension and research, for 1,188 undergraduate students, 102 master's students and around 50 doctoral students during 2016. The academic staff is composed by 57 full-time and 53 part-time. In recent years, the school has reinforced its research with emphasis on four multidisciplinary priority areas: Food Safety and Quality, Sustainable Production, Biotechnology and plant breeding, and Natural resources management and global change

1) Food Safety and Quality

Chile is an agri-food power that seeks to expand and diversify its offer to the world. Therefore, researching and developing technologies to produce and maintain a high quality of fruits, vegetables and livestock products, is central to the research of our school. The quality and safety of agricultural products range from organoleptic quality from harvest to final consumer (postharvest), which is considered to comply with the standards of pathogenic microorganisms (microbiological safety, chemical residues (chemical safety) and other foreign substances (physical safety).

2) Sustainable Production

Maintaining and recovering the productive capacity of renewable natural resources, is a challenge of our researchers. Through an integrated management strategy, using support tools that involve chemical, biological, cultural, and environmental alternatives, we work in developing new and more efficient technologies to produce more and healthier produce.

3) Biotechnology and plant breeding

Biotechnology tools helps applied research in many different ways: to identify a strain of pathogen, to evaluate diversity of a population, to discover the underlying molecular mechanism that regulate a particular metabolic route, among many others. Plant breeding helps to improve plants performance for food, feed, fiber, fuel, shelter, landscaping, eco-systems services and a variety of other human activities. We currently have Plant Breeding Programs in raspberry, cherry, peach, wheat, and native species as alstroemeria and quinoa.

4) Natural resources management and global change

The impact of natural resources management on food and feed availability is huge. Our research topics goes from governance of water resources, ecosystems services, biodiversity, rural development, ecological restoration, impact of environmental policies to development of models to evaluate the impact and adaptation strategies of plants to climate change.

Below we present a detailed list of the research lines organized by areas.



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Research Lines 2017

Area	Faculty	E-mail	Research lines
Sustainable production	ALBORNOZ, FRANCISCO	fralbornoz@uc.cl	<ul style="list-style-type: none"> Plant nutrition Soilless crops Nutritional quality of vegetable crops and its agricultural management
	ALCALDE, JOSE ANTONIO	jalcalde@uc.cl	<ul style="list-style-type: none"> Environmental control of the synthesis of phenolic compounds in wine and table wine. Brewing. Conservation and ethnoornithology of the Mapuche hen.
	BAS MIR, FERNANDO	fbas@uc.cl	<ul style="list-style-type: none"> Salmon production: estimation of growing curves and growth models according to diet and temperature. Animal Nutrition: Omega 3 / Omega 6 ratio in salmon diets and their impact on growth and immunity. Production of pigs and environment: technologies for the control of odors and flies in pig farms.
	BONOMELLI DE PINAGA, CLAUDIA	cbonomel@uc.cl	<ul style="list-style-type: none"> Soil as a productive factor: uses, deterioration, pollution. Needs demands, supplies of nutrients for crops to make sustainable uses of fertilizers, amendments and fertilizers. Soil and fruit quality: relationship between nutrients and exportable fruit.
	CONTRERAS, ESCOBAR SAMUEL	scontree@uc.cl	<ul style="list-style-type: none"> Effect of internal environment on seed production and quality. Seed technology (treatments for quality improvements in seed quality.
	ENRIQUEZ DANIEL	daniel.enriquez@uc.cl	<ul style="list-style-type: none"> Methane amendments in dairy cattle. Use of fresh forage to improve the quality of milk. Sustainable management of pastoral systems.
	FIGUEROA ESPINOZA, RODRIGO	rfe@uc.cl	<ul style="list-style-type: none"> Population dynamics of weed communities. Sustainability of weed control strategies. Environmental impact of weed management
	FIGUEROA, JAIME	figueroa.jaime@uc.cl	<ul style="list-style-type: none"> Pigs nutrition and management Feeding behaviour of mamals Palatability and hedonic reactions during consumption Innate and learned flavour preferences
	GIL MONTENEGRO, PILAR	pmgil@uc.cl	<ul style="list-style-type: none"> Irrigation and efficiency of water use in fruit trees and vines. Mitigation and management of the stress effect by salinity, water deficit and asphyxia in fruit trees. Electrophysiology in fruit trees.
	GOMEZ UNJIDOS, MIGUEL	mgomezu@uc.cl	<ul style="list-style-type: none"> Anatomy and morphology of plants. Adaptations of plants in the Mediterranean area of Chile. Plant diversity.
MARTIZ, JOHANNA	jmartiz@uc.cl	<ul style="list-style-type: none"> Plant breeding of citrus fruits without seed. Citrus production Development of sustainable techniques for pollination in citrus and avocado. 	



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Sustainable production	MUÑOZ, ALEJANDRA	aemunoz@uc.cl	<ul style="list-style-type: none"> • Field biodiversity indicators • Conflict of wild life and farming activities. • Functional biodiversity in agroecosystems
	PENA REYES, IVAN	ipena@uc.cl	<ul style="list-style-type: none"> • Names and definitions of databases for analysis • Statistical methodology for analysis and modeling
	PEREZ DONOSO, ALONSO	agperez@uc.cl	<ul style="list-style-type: none"> • Plant water relations: water use efficiency, vascular physiology. • Use (sustainable) of growth regulators in grape production. • Viticulture and productivity / quality of grapes
	RIVEROS, JOSE LUIS	jlriverosf@uc.cl	<ul style="list-style-type: none"> • Sustainable production of ungulates. • Production, safety and rurality in minor ruminant systems. • Animal reproduction in ruminants.
	STEINFORD, URSULA	usteinfo@uc.cl	<ul style="list-style-type: none"> • Plant physiology and flowering control • Genotype by environment interactions • Ornamental plant adaptation to climate change
	TORO, PAULA	pmtoro@uc.cl	<ul style="list-style-type: none"> • Management of animal production systems • Simulation models of animal production system • Animal feed and nutrition
	VALDES, HECTOR	hevaldes@uc.cl	<ul style="list-style-type: none"> • Fruit plant protection • Grapevine sustainability • Modelling of agricultural systems
	ZAVIEZO PALACIOS, TANIA	tzaviezo@uc.cl	<ul style="list-style-type: none"> • Biological control of pests. • Alternatives to pesticides, particularly pheromones • Ecology of pests and natural enemies.



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Natural resources management and global change	ANRIQUEZ NILSON, GUSTAVO	gustavo.anriquez@uc.cl	<ul style="list-style-type: none"> Productivity, adoption of technology, stochastic frontier models. Evaluation and welfare of environmental policies. Impact of CC on agricultural productivity. Spatial convergence of income.
	ARELLANO OGAZ, EDUARDO	eduardoarellano@uc.cl	<ul style="list-style-type: none"> Ecological restoration. Management of organic waste. Contamination of soils.
	ARRIAGADA CISTERNAS, RODRIGO	rariagadac@uc.cl	<ul style="list-style-type: none"> Evaluation of the impact of environmental policies (causal influence). Spatially explicit econometric models of land use change. Causal relations between poverty and forest. Economics of ecosystem services.
	BECERRA OSSES, PABLO IGNACIO	pablobecerra@uc.cl	<ul style="list-style-type: none"> Restoration ecology: evaluation of factors influencing natural regeneration and assisted by planting and planting of native species. Biological invasions: effects and consequences of exotic species of plants and animals on native species.
	BOBENRIETH HOCHFARBER, EUGENIO	ebobenrieth@uc.cl	<ul style="list-style-type: none"> Prices of agricultural products. Empirical identification of long-term trends in consumption, prices and stocks of agricultural products. Relationship between food prices and fuel prices.
	BORQUEZ COUSINO, RICARDO	rborquec@uc.cl	<ul style="list-style-type: none"> Arbitrage theory (commodity prices). Statistics and time series. Applied economics (dynamic models).
	DONOSO HARRIS, GUILLERMO	gdonosoh@uc.cl	<ul style="list-style-type: none"> Governance of water resources. Analysis of the economic and social state of water resources. Self-government and specialized resolution of conflicts resolution.
	FERNANDEZ, MARIA PAULINA	pferman@uc.cl	<ul style="list-style-type: none"> Functional-structural plant modeling Forest dynamics, growth and yield Wood quality and silviculture Urban forestry
	FOSTER BONNETTE, WILLIAM	wfooster@uc.cl	<ul style="list-style-type: none"> Poverty and small farming. Economic geography. Value of agricultural land.



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Natural resources management and global change	GILABERT, HORACIO	hgilab@uc.cl	<ul style="list-style-type: none"> • Biometry of renewable natural resources. • Mathematical models in renewable natural resources. Optimization applied to environmental problems. • Quantitative ecology.
	GINOCCHIO CEA, ROSANNA	rginocch@uc.cl	<ul style="list-style-type: none"> • Environmental restoration / rehabilitation • Integrated management of mining, agricultural and depurative waste. • Bioavailability of inorganic pollutants in terrestrial environments and environmental enrichment of metals. • Use of humic substances in the recovery of metals by foam flotation.
	MAO, LUCA	lmao@uc.cl	<ul style="list-style-type: none"> • Fluvial geomorphology. Hydrology. • Management of watersheds. • Use of rural / urban land / water and climate change.
	MELO CONTRERAS, OSCAR ALFREDO	omelo@uc.cl	<ul style="list-style-type: none"> • Quality and attributes of products and services and their effects on the market. • Aquaculture and fisheries: bioeconomic models / expansion.
	MEZA DABANCENS, FRANCISCO	fmeza@uc.cl	<ul style="list-style-type: none"> • Facilitation of the use of climatic applications for decision making in production (long term). • Micrometeorology: Study of water and radiation energy flows, to develop precise models of production and development of growth. • Climate change: development of models to evaluate the impact and adaptation strategies of plants. • Intercomparison of crop simulation models (hydrological climatic, etc): vulnerability analysis to climate change for Maipo and Maule valley basins.
	MIRANDA SALAS, MARCELO DAVID	mmirands@uc.cl	<ul style="list-style-type: none"> • Dynamics of landscape and territory. • Dynamics of natural and urban vegetation productivity • Spatial statistics. • Sensors and GIS
	REYES, SONIA	sreyespa@uc.cl	<ul style="list-style-type: none"> • Architecture urbanism and geography.



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Biotechnology and plant breeding	CARRASCO GALVEZ, BASILIO ALEJANDRO	bcarrasco@uc.cl	<ul style="list-style-type: none"> • Biotechnology applied to the exploration, use and protection of natural vegetal resources. • Traditional and assisted plant breeding
	GAMBARDELLA CASANOVA, MARINA	mgambardella@uc.cl	<ul style="list-style-type: none"> • Plant breeding of raspberries and strawberries. • Plant health in propagation.
	GEBAUER HERNANDEZ, MARLENE GLORIA	mgebauer@uc.cl	<ul style="list-style-type: none"> • In vitro culture tools for plant breeding of recalcitrant species. • Plant breeding of Alstroemeria • Wheat breeding program to improve quality.
	O'BRIEN, JOSÉ	jobrieno@uc.cl	<ul style="list-style-type: none"> • Regulatory factors of hormone response during organogenesis. • Transverse responses mediated by cytokinins during abiotic and biotic stress. • ROS study (reactive oxygen species) and its role in defense systems.
	ROSALES VILLAVICENCIO, MARLENE	irosalesv@uc.cl	<ul style="list-style-type: none"> • Molecular diagnosis of viruses and pathogens with metagenomic approach (potato, liliun, tomato, pine, among others) • Molecular techniques for virus and viroids identification in ornamental species
	SCHWEMBER NEIRA, ANDRES RICARDO	aschwember@uc.cl	<ul style="list-style-type: none"> • Genetic diversity of horticultural legumes for industrial purposes. • Wheat breeding program to improve quality.
	VEGA CONTRERAS, ANDREA	avegac@uc.cl	<ul style="list-style-type: none"> • Effect of salinity on response to biotic stress • Mapping of metabolic pathways of genes responses to biotic stress at molecular level.
	VIANNA, JULIANA DE ABREU	jvianna@uc.cl	<ul style="list-style-type: none"> • Molecular studies of evolution of native fauna (birds, reptiles). • Migrations associated with evolution.
	AYALA ZAPATA, CHITA MARLENE	mayalaz@uc.cl	<ul style="list-style-type: none"> • Physiology, production and breeding of cherry trees.
FUENTES, FRANCISCO	frfuentes@uc.cl	<ul style="list-style-type: none"> • Plant breeding of quinoa. 	



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Food safety and quality	AYALA ZAPATA, CHITA MARLENE	mayalaz@uc.cl	<ul style="list-style-type: none"> • Fruit tree physiology and production. • Systems of conduction and automation in orchards. • Physiology, production and breeding of cherrytrees.
	BORDEU SCHWARZE, EDMUNDO	ebordeu@uc.cl	<ul style="list-style-type: none"> • Wine microbiology, malolactic fermentation and microbiological stability. • Microclimate and quality of the wine. • Physicochemical stability of wine.
	CHORBADJIAN, ALONSO RODRIGO	rchorba@uc.cl	<ul style="list-style-type: none"> • Plant resistance to insect Selectivity of insecticides
	FELLENBERG, MARIA ANGELICA	mafellen@uc.cl	<ul style="list-style-type: none"> • Microbiological food safety. • Public policies associated with safety
	FUENTES, FRANCISCO	frfuentesc@uc.cl	<ul style="list-style-type: none"> • Plant breeding of quinoa. • Molecular studies of the anticancer effect of quinoa.
	IBAÑEZ, RODRIGO	rodrigo.ibanez@uc.cl	<ul style="list-style-type: none"> • Dairy chemistry and biochemistry • Modification of processing techniques to improve cheese quality • Milk proteins and peptides with bioactive properties • Functionality of milk and dairy products, based on the use of rheological analyses • Evaluation of novel ingredients and their potential use in dairy products • Changes in the physicochemical properties of milk during lactation and its effect on the properties of dairy products
	MONTENEGRO, GLORIA	gmonten@uc.cl	<ul style="list-style-type: none"> • Antimicrobial properties of extracts of honey, with applications in food.
	MUJICA, ANA MARIA	amujicar@uc.cl	<ul style="list-style-type: none"> • Botanical genetic diversity of native plants
	SA FONSECA, RUI	ruisa@uc.cl	<ul style="list-style-type: none"> • Fish nutrition in new species: determination of nutritional needs in species with potential for aquaculture. • Energy metabolism: Determination of the effect of feeding in the activity of key enzymes of intermediate metabolism, proximal composition and digestibility • Stress, oxidative stress and nutritional additives: effect of growing and nutrition conditions on stress and oxidative stress (parameters and enzymes) and metabolic protective effect of nutritional additives.
	SILVA TORREALBA,	fsilvat@uc.cl	<ul style="list-style-type: none"> • Agrifood policies
	VARGAS-BELLO PEREZ, EINAR	evargasb@uc.cl	<ul style="list-style-type: none"> • Lipids in livestock products Lipids in milk and by- products • Modified atmosphere packaging
	ZOFFOLI GUERRA, JUAN PABLO	zoffolij@uc.cl	<ul style="list-style-type: none"> • Non-destructive analysis tools • Non-chemical alternatives to the control of phenological disorders