

ARGENTINEAN PROJECTS

SUNFLOWER	
Title	Functional genomic characterization of sunflower to improve its resistance to biotic and abiotic stress by using molecular tools.
Research Team Leader	Chan, Raquel Lía Grobocopatel, Gustavo
Institutions	UNS (National University of the South), UNMDP (National University of Mar del Plata), National Institute for Agricultural Technology (national institute for agricultural technology (INTA), UNL(National University of the Litoral), national seed institute, bioceres S.A., UBA, IOSOL S.R.L, ARPOV, ASA
Objetives	<p>The project aims to solve agricultural problems in sunflower crops by using state of the art technology. The goal is to improve the demands of the different actors of the value chain, such as producers, seed companies, government control agencies, and the oil and food industries, by improving yielding and quality.</p> <ul style="list-style-type: none"> - To create a multidisciplinary network for the use of emerging biotechnologies to improve sunflower biotic and abiotic stress resistance. - To identify and characterize new sources of pathogen resistance. - To study floral neuterism as a strategy to increase the biosafety of transgenic plants by mapping locus and physiologically characterizing the phenomenon. - To identify and characterize resistance to abiotic factors by means of DNA mapping and micromatrixes. - To increase the competitiveness of sunflower production in Argentina, increasing cropping areas and guaranteeing the sustainability of the productive system, by adding sunflower to soy crop rotation and interseeding.
FONCYT (1) SUBSIDY	<u>\$ 3,143,852</u> (\$2,344,852) (2), (\$799,000) (3)

WheatBiotechnology	
Title	Biotechnology tools applied to increase competitiveness and sustainability in wheat chain
Research Team Leader	Helguera, Marcelo Echenique, Viviana
Institutions	National Institute for Agricultural Technology (INTA) AGRONOMY department of the UNS (National University of the South) CONICET (National Scientific and Technical Research Council) centre of natural resources of the semi-arid region School of agronomy of the UBA (University of Buenos Aires) CONICET(national scientific and technical research council) (National Scientific and Technical Research Council) IBYF (Biochemical and Physiological Research Institute) - UNRC (National University of Rio Cuarto) - association of argentine cooperatives - bioceres

Objetives	<ul style="list-style-type: none"> • To create a national multidisciplinary network of capacities in the use of emerging technologies in new molecular developments (genomics, molecular markers, transformation, tilling) in combination with ecophysiological aspects of the crop. • To obtain varieties that are disease and abiotic stress resistant, which would lead to an increase in wheat production. <p>The delivery of the scientific information and results and developments obtained throughout the project to wheat producing and trading companies, which may lead to a significant technological development in Argentina. This would result in new varieties of soft and durum wheat with higher resistance to disease and with differentiated qualities. Trading and exports of Argentine wheat would gain a competitive advantage in the international market if there were varieties with good and differentiated qualities.</p>
FONCYT (1) SUBSIDY	\$ 1.612.920 (\$1,012,919) (2) (\$600,000) (3)

SoilGeneticResources	
Title	Application of genomic and metabolomic approaches to sustainable management of soil in agricultural activities and bioprospection of genetic resources for their biotechnological application
Research Team Leader	Mentaberry, Alejandro Nestor López, Fernando Gonzalo
Institutions	School Of Agronomy Of The Uba(University Of Buenos Aires) - School Of Exact Sciences Of The Unlp (National University Of La Plata) (National University of La Plata)- Research Centre Of The Unq (National University Of Quilmes)- National Institute For Agricultural Technology (Inta) - Institute Of Agrobiotechnology Of Rosario - Aapresid (Argentine No Till Farmers Association) (Argentine No Till Farmers Association) - Conicet(National Scientific And Technical Research Council)
Objetives	<ul style="list-style-type: none"> • The goal of the project is to better understand the interactions and dynamics of soil populations in relation to different production contexts and considering soil as an integrated biological system. In this effort it explores from descriptive aspects of microbial populations to bio-prospection, from the development of bioinoculants to the improvement of vegetable species through genetic engineering, and to the functional analysis of genes that encode proteins for industrial use. <p>The development of the project will allow to face the design of models which will relate the functions of the soil to the structure of its populations and to formulate more precise recommendations to manage them, as well as to access an immense source of genetic resources for agricultural and industrial applications.</p>
FONCYT (1) SUBSIDY	\$ 4.962.307 (\$2,285,707) (2) (\$2,676,600) (3)

BIOSPAS	
Title	Soil biology and Sustainable Agricultural Production
Research Team Leader	Wall, Luis Gabriel Lorenzatti, Santiago Nicolás
Institutions	AAPRESID (Argentine No Till Farmers Association) - Department Of C And T Of The Unq (National University Of Quilmes)- School Of Exact Sciences Of The Unlp (National University Of La Plata) (National University Of La Plata) - Ingebi (Institute For Research In Genetic Engineering And Molecular Biotechnology)- Foundation Of The Leloir Institute - School Of Exact, Physical And Natural Sciences Of The Unc (National University Of Córdoba) - Catholic University Of Cordoba Fca (School Of Agricultural Sciences) - National Institute For Agricultural Technology (Inta) - Unlp (National University Of La Plata) Fce (School Of Economic Sciences) Department Of Mathematics - School Of Agronomy Of The UBA (University of Buenos Aires) - UNS (National University of the South) CERZOS - National University of the Northeast
Objetives	<ul style="list-style-type: none"> • The goal of the project is to gain a better understanding of Soil Biology and the processes related to their nutritional states, crop development and productivity. <p>This new understanding will lead to more rational decision making on soil management, combining production increases and environmental preservation or improvement, taking into account the concept of process sustainability. Different approaches and techniques will be used, ranging from environmental variables and soil physical measures to the metagenomic molecular analysis of some functions of the biological component of soil, or to classic microbiological, biochemical, chemical and agricultural techniques. The wide range of information obtained from these will be mathematically analysed in order to find correlations which will allow the development of new productivity and soil quality indicators. This information will allow the development of new soil intervention strategies or techniques in order to solve the problems cause by crop intensification in Direct Seeding and to achieve new rational bases for soil management that have the highest productivity while building sustainable processes.</p>
FONCYT (1) SUBSIDY	\$ 3.488.100 (\$2,364,000) (2) (\$1,124,100) (3)

Mycotoxins	
Title	National integrated system for the prevention and control of mycotoxins in food chains (grains)
Research Team Leader	Chulze, Sofia Noemí Anunziata, Jorge Daniel
Institutions	UNRC (National University of Rio Cuarto)- UNL (National University of Litoral) - National University of Tucumán - UNLP (National University Of La Plata) - INTI (National Institute of Industrial Technology)- ANMAT (National Administration of Medicines, Food products and Medical Technology)- National Institute For Agricultural Technology (INTA) - SENASA(National Service of

	Agrifood Health and Quality)
Objetives	<ul style="list-style-type: none"> - The goal of the project is to develop a long term sustainable system of prevention and control of mycotoxins, with a plan that includes: - The creation of reference control laboratories and a mycotoxicology research laboratory to monitor and to prevent/control mycotoxins in food chains, - The development of technologies to be applied in Best Manufacturing Practices, Best Agricultural Practices and Hazard Analysis and Critical Control Point, together with continuous training of all the links of the chains. - To develop an appropriate legal base and a regulatory protocol or application and follow up recommendations, to comply with international regulations and at the protection level expected for the country.
FONCYT (1) SUBSIDY	<u>\$ 3.214.336</u> (\$1,064,649) (2) (\$2,149,687) (3)

MERCOSUR PROJECTS

SOYBEAN - BIOTECHSUR	
Title	Identification of useful genes ofr biotic and abiotic stress tolerance in soybeans
Leading Institute	Estacion Experimental Agroindustrial: Obispo Colombres
pARTNERS	Instituto de Agrobiotecnología de Rosario. (Pyme- Argentina) Facultad de Ciencias Exactas y Naturales UBA. (Argentina) Conicet (Argentina) INTA (Argentina) Universidad Federal Do Rio Grande do Sul (Brasil) Facultad de Ciencias Químicas, Universidad Nacional de Asunción. (Paraguay) Dirección de Investigación Agrícola (DIA) del Ministerio de Agricultura y Ganadería. (Paraguay) Instituto de Biotecnología Agrícola (INBIO). (Paraguay) Instituto Nacional de Investigación Agropecuaria. (Uruguay) Instituto de Investigación Biológicas-Clemente Estable. (Uruguay) Embrapa Soja. (Brasil) Universidad de la República de Uruguay. (Uruguay) Nidera SA. (Argentina)
Objectives	The general objective of the project is to characterize genes and/or technologies, derived from the functional analysis of genes, capable of adding value to soybean cultures which are under water availability stress or sanitary stress. The project will operate by articulating a network of private and public research in the MERCOSUR countries. The consolidation of such a network contemplates human resources development in areas of vacancy, especially Paraguay. The creation of such a "virtual institute will provide access to its members in cutting edge biotechnology areas, also applicable in other crops. The project involves the application

	<p>of advanced genomics tools to further knowledge and understanding of stress defense mechanisms to drought conditions and to fungal pathogens, of growing importance in the region. It will also allow the identification and functional characterization of candidate genes involved in these processes and assist in the genetic improvement of soybean.</p> <p>The expected results are:</p> <ul style="list-style-type: none"> the establishment of evaluation protocols, the design and construction of a platform to allow automatic evaluation of resistance to drought and the degree of resistance to water deficit and fungal pathogens in a wide range of soybean genotypes, the development of methods allowing the early detection of resistant genotypes, the characterization of the genetic and pathogenic of <i>M. phaseolina</i> and <i>P. pachyrhizi</i>, the identification of validated functional markers for the different soybean varieties, the genotyping of soy germoplasm with contrasting phenotypic characters, the genotyping of preexisting mapping populations, the obtention, genotyping and phenotyping of segregating mutants, the characterization of mayor genes and mapped QTLs for soy resistance, collections of stress specific expressed sequences (ESTs), ESTs correspondding to sequenced mi RNA, metabolic profiles, allelic variants of candidate genes, the generation of a TILLING platform, the initiation of candidate gene functional characterization, the formation of human resources, and a bioinformatics database.
Budget	<p>Total cost of action: 882350€</p> <p>EC contribution: 749993€</p>

EUCALYPTUS - BIOTECHSUR	
Title	Development of an itengrated genotification platform for bioprospection of candidated genes in MERCOSUR Eucalyptus germoplasm
Leading Institute	Instituto Ncaional de Tecnologia Agropecuaria INTA, Argentina
Partners	Desarrollo Madereros SA. (Paraguay) Mundial Forestación SA. (Uruguay) Facultad de Ciencias Agrarias- Universidad Nacional de Asunción (Paraguay) Embrapa (Brasil)
Objectives	The general objective is to establish a regional scientific-technological network sharing activities and capacities in the 4 participating countries. The groups will work on experiments based on two advanced genomic strategies such as genetic mapping and association mapping to determine the genetic basis of interesting phenotypic properties useful in the selection Eucalyptus plantations for industrial wood and for energy production. Specifically the group will develop a genotyping platform to

	<p>establish useful markers for Eucalyptus improvement, including:</p> <ol style="list-style-type: none"> 1) Germplasm characterization for haplotypic variation in genes of forestry interest in <i>E. grandis</i> (Ar/Py), <i>E. globulus</i> (Ar/Uy) and <i>E. urophylla</i> (Br). 2) Localize candidate genes in the genetic maps to be developed (Ar/Br) 3) Develop field studies of selected clones to be able to create association maps. (Ar/ Uy) 4) Develop pilot association maps (Ar/ Br/ Py/Uy).
Budget	<p>Total cost of action: 656858€ EC contribution: 558326€</p>