

URUGUAY

Gert-Jan Stads, Sandra Perez, Isabel Bortagaray, José Bervejillo, Miguel Sierra, and Nienke Beintema

KEY INDICATORS, 2006–2013

Total Agricultural Research Spending	2006		2009		2013
Uruguayan peso (million constant 2011 prices)	1,069.4		987.5		1,183.4
PPP dollars (million constant 2011 prices)	70.0	↓ -8%	64.6	↑ 20%	77.4
Overall Growth					
Total Number of Agricultural Researchers					
Full-time equivalents (FTEs)	376.7	↓ -2%	369.4	↑ 1%	371.9
Overall Growth					
Agricultural Research Intensity					
Spending as a share of agricultural GDP	1.69%		1.45%		1.40%
FTE researchers per 100,000 farmers	198.28		197.54		202.14

Notes: Research conducted by the private for-profit sector is excluded from this factsheet due to lack of available data. Acronyms, definitions, and an overview of agricultural R&D agencies are provided on page 4.

► As of 2013, the higher education sector accounted for about half of all the agricultural researchers employed in Uruguay, but the country's primary agricultural research institute, INIA, was responsible for two-thirds of the country's agricultural R&D expenditures.

► Despite erratic yearly fluctuations stemming from the fact that INIA's funding is tied to the total value of the country's agricultural production, total spending on agricultural R&D in Uruguay increased during 2006–2013.

► Uruguay's agricultural research system compares favorably with those of many other Latin American countries on a number of key indicators, including spending as a share of AgGDP, the number of researchers per 100,000 farmers, and the share of female researchers with PhD degrees.

FINANCIAL RESOURCES, 2013

Spending Allocation

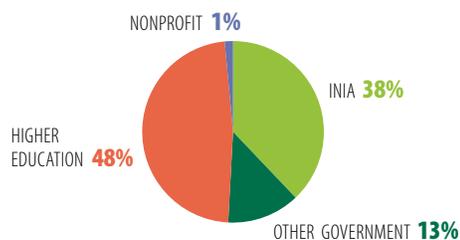
Salaries	52%
Operating and program costs	32%
Capital investments	16%

Funding Sources

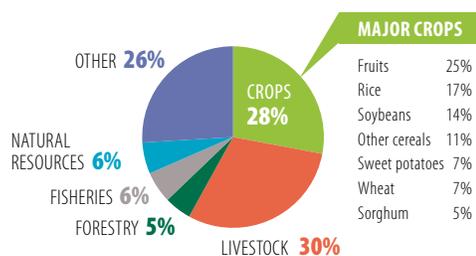
Government	43%
Donors	1%
Commodity levies	41%
Sales of goods and services	13%
Other	3%

Note: Shares are based on data for INIA only.

INSTITUTIONAL PROFILE, 2013



RESEARCH FOCUS, 2013

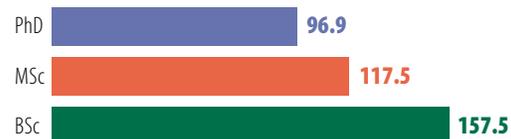


Notes: Major crops include those that are the focus of at least 5 percent of all crop researchers; 14 percent of total crop researchers focused on a wide variety of other crops.

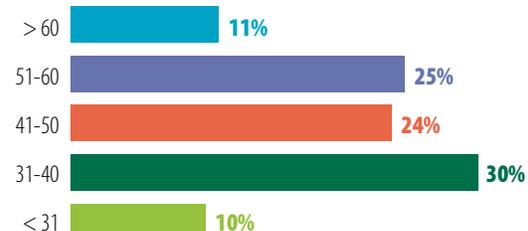
RESEARCHER PROFILE, 2013



Number by qualification (FTEs)



Share by age group (years)



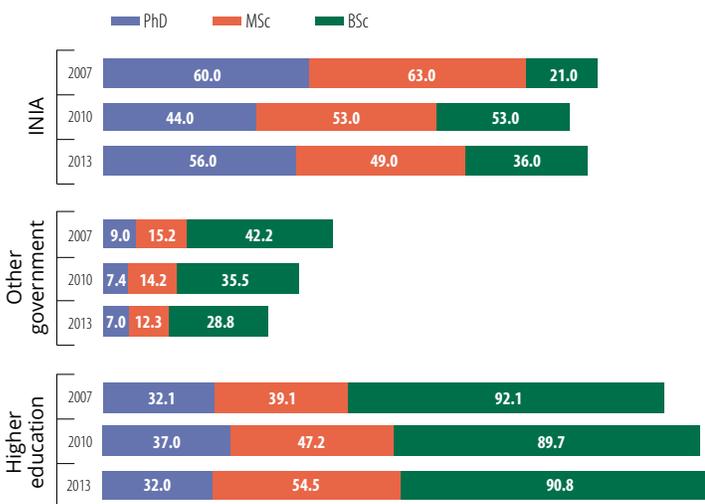
CHALLENGE

► Agricultural R&D agencies in Uruguay are challenged in their ability to attract and retain junior agricultural scientists interested in long-term careers in research. Recruiting scientists with highly specialized qualifications and experience in key research areas is also difficult. As a relatively small country, Uruguay lacks postgraduate training programs in certain key disciplines. Although an adequate system of scholarships for postgraduate training abroad is in place, this practice is costly.

POLICY OPTION

► An effective means of training local scientists and recruiting foreign specialists is needed, and must be based on a thorough analysis of skills gaps. Appropriate conditions and incentives also need to be established to encourage the long-term commitment of these researchers over time. One key obstacle, the large gap in the salaries offered by INIA compared with UdelaR, has recently been overcome, but more incentives are needed to attract highly qualified scientists into careers in research as opposed to the corporate sector.

Number of researchers by qualification level, 2007–2013 (FTEs)



The total number of agricultural researchers employed in Uruguay remained fairly constant during 2007–2013, but the composition shifted due to growth in the higher education sector and contraction within the government sector (other than INIA). In 2013, 26 percent of the country's agricultural researchers were qualified to the PhD level.

Number of PhD students enrolled at UdelaR, 2008–2013

	2008–2009	2009–2010	2010–2011	2011–2012	2012–2013
Faculty of Agriculture	0	5	20	14	15
Faculty of Veterinary Science	0	6	13	21	25

► DECENTRALIZATION AND REGIONALIZATION OF UdelaR

In 2007, the country's largest university, UdelaR, embarked on an important process of decentralization beyond its traditional Salto-based northern campus, which has housed Agronomy and Veterinary schools for decades. New regional university centers were established in the northwest, northeast, and east of the country in order to bring education and research closer to the communities UdelaR serves. The university also relocated some of its highly qualified researchers to the regions to establish satellites in the north, focusing on molecular virology and agri-food and agro-industry; in the northeast, focusing on livestock (primarily meat production) and forestry; and in the east, focusing on biodiversity, environmental sustainability, and ecosystems. Another important policy change that has promoted agricultural research within the higher education sector was the enactment of a 2010 law providing tax incentives for private R&D investment.

◀ Until recently Uruguay's agricultural researchers had to travel abroad to undertake PhD training, but as of 2010 UdelaR's Faculty of Agriculture and Faculty of Veterinary Science began offering PhD programs. As of 2013, the number of students enrolled in the two faculties had risen to 40, from only 11 in 2010.

CROSS-COUNTRY COMPARISONS OF KEY INDICATORS

	Total number of researchers, 2013 (FTEs)	Growth in number of researchers, 2009–2013	Share of PhD researchers, 2013 (FTEs)	Total spending, 2013 (million 2011 PPP dollars)	Overall spending growth, 2009–2013	Spending as a share of AgGDP, 2013
Uruguay	371.9	1%	26%	77.4	20%	1.40
Argentina	5,824.5	18%	21%	732.1	26%	1.29
Chile	715.7	6%	37%	186.4	-2%	1.65
Brazil	5,869.4	12%	73%	2,704.0	8%	1.82

Note: Please visit www.asti.cgiar.org/benchmarking/lac to benchmark Uruguay with other countries in Latin America and the Caribbean or compare the country's key indicators with regional averages.

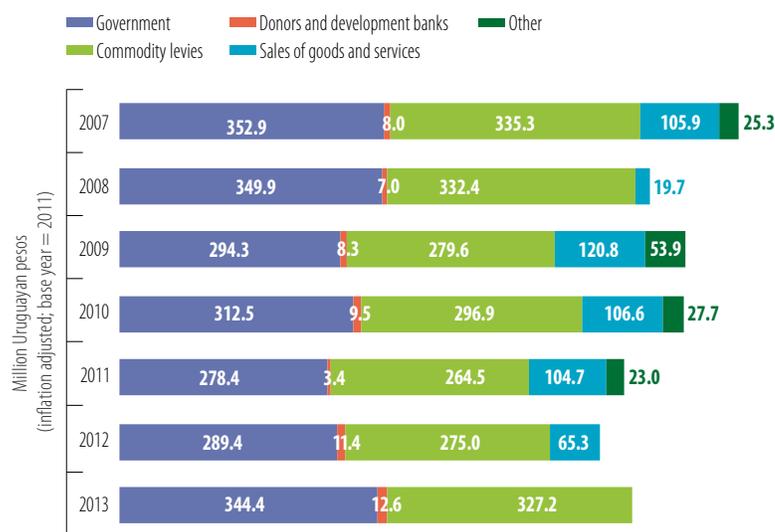
CHALLENGE

▶ Uruguay has traditionally had one of the most stable and well-funded agricultural research systems in Latin America, largely due to a unique method of funding for INIA, which is directly linked to the country's value of agricultural production. In recent years, however, volatility in the price of globally traded agricultural commodities, combined with sudden declines in demand by primary trading partners (such as Venezuela), have left the country's agricultural sector, and hence INIA, vulnerable to funding shocks.

POLICY OPTION

▶ The government has set ambitious goals for increasing agricultural production and productivity by 2030. Reaching these goals will require sustained and stable government support for agricultural research, as well as alternative actions to increase INIA's adaptability to a changing economic environment. Increased funding diversification—for example, through the sale of goods and services or by attracting complementary investment from the private sector—will be instrumental in mitigating future funding shocks.

INIA's funding sources, 2007–2013



▲ By law, INIA's funding is primarily generated through the combination of a tax on the sale of agricultural commodities and complementary funding from the government of approximately equal value. Although shares of funding have changed little over time, actual amounts have varied according to Uruguay's national value of agricultural production. So in years of falling production levels or market prices, the institute's budget has markedly declined. The remainder of INIA's funding is largely derived from donors and development banks, national and international competitive funds, and the internal sale of goods and services.

▶ NEW MECHANISMS PROMOTING SCIENTIFIC RESEARCH AND INNOVATION

A major milestone for the Uruguay's S&T system was the establishment of ANII, with the support of the World Bank and national government, in 2006. The agency is mandated to promote scientific research and innovation. It serves as a coordinating body for the development of knowledge, research, and innovation; it manages various incentive programs to enhance innovation in both the private and public sectors; and it funds research projects and provides scholarships for both national and international graduate programs.

As part of the cooperation agreement between ANII and INIA, the INNOVAGRO fund was established in 2008 as what is known as a sector fund to promote agricultural and agro-industrial R&D innovation, particularly in key export areas. Proposals are eligible from government institutes, universities, NGOs, and the private sector, and are selected on a competitive basis. Similar funds have been established for research and innovation projects in the areas of animal health, aquaculture, and fisheries.

New varieties released by INIA, 2007–2013

COMMODITY	NUMBER OF VARIETIES	COMMODITY	NUMBER OF VARIETIES
Grass (fodder)	35	Oats	6
Peaches	17	Oranges	6
Wheat	13	Tomatoes	3
Onions	11	Apples	2
Strawberries	10	Lemons	2
Sweet potatoes	9	Rice	2
Barley	7	Triticale	2
Potatoes	7		

◀ The majority of new varieties in Uruguay are spillovers from Argentina, Brazil, and the United States. Nevertheless, as the country's primary provider of crop research, INIA released 132 new crop varieties and numerous other technologies during 2007–2013.

Knowledge transfer activities by INIA, 2013

ACTIVITY/OUTPUT/PARTICIPATION	NUMBER OF EVENTS/OUTPUTS/PARTICIPANTS
Field days organized	105
Training events conducted	48
Brochures published	11
Participants trained	2,350

OVERVIEW OF URUGUAY'S AGRICULTURAL RESEARCH AGENCIES

Excluding the private sector, 15 agencies conduct agricultural research in Uruguay. INIA is the country's principal agricultural R&D agency (employing 141 FTE researchers in 2013). The institute focuses primarily on research related to crops, livestock, pastures and forages, and forestry. Headquartered in Montevideo, INIA also operates five regional experiment stations targeting regional production needs. DILAVE (14 FTE researchers in 2013) focuses on veterinary research, specifically disease prevention and diagnosis; IIBCE (9.9 FTEs) focuses more generally on biological research, but conducts some crop, livestock, and natural resources research; and DINARA (9.4 FTEs) focuses on fisheries research. The remaining government agencies target a range of issues (each employing 7 or fewer FTEs in 2013). Six higher education agencies performed agricultural R&D in 2013, accounting for 48 percent of the country's agricultural researchers. Four of Udelar's faculties conduct agricultural R&D, the largest of which are the Faculty of Agronomy (75 FTEs) and the Faculty of Veterinary Science (75 FTEs). The university has recently embarked on a decentralization process and now operates regional centers across the country. Although private universities play an important role in training, their research activities are limited. The nonprofit sector plays only a modest role in agricultural R&D in Uruguay (together, CINVE and SUL employed 5 FTEs in 2013). A number of national private companies, such as Maltería Uruguay, Bouza, Chacras del Sur, Estero, Milagro, and Genética Chebataroff engage in limited research, but their contributions to total national agricultural research are minimal.



Note: Excludes private for-profit agencies.

 For a complete list of the agencies included in ASTI's dataset for Uruguay, visit www.asti.cgiar.org/uruguay.

ASTI DATA PROCEDURES AND METHODOLOGIES

- ▶ The **data underlying this factsheet** were predominantly derived through primary surveys, although some data were drawn from secondary sources or were estimated.
- ▶ **Agricultural research** includes research conducted by the government, higher education, and nonprofit sectors; Research conducted by the private for-profit sector is excluded due to lack of available data.
- ▶ ASTI bases its calculations of human resource and financial data on **full-time equivalent (FTE) researchers**, which take into account the proportion of time staff actually spend on research compared with other activities.
- ▶ ASTI presents its financial data in 2011 local currencies and **2011 purchasing power parity (PPP) dollars**. PPPs reflect the relative purchasing power of currencies more effectively than do standard exchange rates because they compare prices of a broader range of local—as opposed to internationally traded—goods and services.
- ▶ ASTI estimates the **higher education sector's research expenditures** because it is not possible to isolate them from the sector's other expenditures.
- ▶ Note that, due to **decimal rounding**, the percentages presented can sum to more than 100.

 For more information on ASTI's data procedures and methodology, visit www.asti.cgiar.org/methodology; for more information on agricultural R&D in Uruguay, visit www.asti.cgiar.org/uruguay.

ACRONYMS USED IN THIS FACTSHEET

AgGDP	Agricultural gross domestic product
ANII	National Research and Innovation Agency
CINVE	Center for Economic Research
DILAVE	Directorate of Veterinary Laboratories
DINARA	National Directorate of Aquatic Resources
FTE(s)	Full-time equivalent (researchers)
IIBCE	Institute of Biological Research Clemente Estable
INIA	National Agricultural Research Institute
PPP(s)	Purchasing power parity (exchange rates)
R&D	Research and development
SUL	Uruguayan Wool Secretariat
Udelar	University of the Republic

ABOUT ASTI, IFPRI, AND INIA

Working through collaborative alliances with numerous national and regional R&D agencies and international institutions, **Agricultural Science and Technology Indicators (ASTI)** is a comprehensive and trusted source of information on agricultural R&D systems across the developing world. ASTI is led by the **International Food Policy Research Institute (IFPRI)**, which—as a CGIAR member—provides evidence-based policy solutions to sustainably end hunger and malnutrition and reduce poverty. The **National Agricultural Research Institute (INIA)** is Uruguay's principal agricultural R&D agency. It is governed by a board of directors composed of representatives from the Ministry of Livestock, Agriculture, and Fisheries as well as the private sector. Its main research focus is on crops, livestock, pastures and forages, and forestry.

ASTI/IFPRI and INIA gratefully acknowledge participating agricultural R&D agencies for their contributions to the data collection and preparation of this country factsheet. ASTI also thanks the Inter-American Development Bank for its generous support of ASTI's work in South America and Mexico. This factsheet has been prepared as an ASTI output and has not been peer reviewed; any opinions are those of the authors and do not necessarily reflect the policies or opinions of IFPRI or INIA.