From Agropolis International Thematic File
directory n° 15 - October 2012 - 48 pages
“From Brazil to Europe: 10 years of Labex Program, EMBRAPA’s laboratory without walls”
EMBRAPA’S Labex Program

Labex-Europe is now 10 years old, so it is time to learn from and share this unique international scientific cooperation experience.

The idea emerged from Brazil.

In the late 1990s, EMBRAPA explored a new partnership concept, i.e. the ‘laboratory without walls’ or ‘external laboratory (Labex)’, with Francisco Reifschneider, Eliseu Alves and Alberto Portugal being the main architects.

Senior researchers are posted for 2-4 years in top-notch research laboratories abroad to foster exchange of their experience with other researchers. The ultimate aim is to generate new knowledge that will serve to develop innovative technologies for tropical agriculture. They join a high-level team and collaborate in a joint research project that will serve to create a research cluster through Brazilian and European scientific networks.

These researchers must also devote a third of their time to exploratory activities (scientific monitoring, visits, participation in conferences, etc.) and to information activities geared towards coordination and supervision of the program.

Four years after the first Labex was set up in the United States in 1998 (in collaboration with USDA-ARS*), a second one was launched in Europe. The French research centers CIRAD (Agricultural Research for Development), INRA (Institut National de la Recherche Agronomique) and IRD (Institut de Recherche pour le développement) mandated Agropolis International to sign an agreement between EMBRAPA and the regional multi-institutional consortium (28 research and higher education establishments) hosted in the Agropolis International facilities in Montpellier, France. Labex-Europe was inaugurated in 2002. Labex has also set up offices in other regions of the world (South Korea in 2009, China in 2012).

* United States Department of Agriculture, Agricultural Research Service.
A successful partnership experience

Brazil is now the main scientific partner of the Montpellier agroenvironment cluster, in which one research unit in four is involved in an ongoing cooperation with one or more Brazilian research and training institution. In this setting, the Labex-Europe Program is an instrument to pave the way to new synergies for the scientific teams. The presence of experienced Brazilian researchers and network leaders, who are highly familiar with the Brazilian research system, is a direct and high quality source of information.

Joint interest projects are proposed by hosted Brazilian researchers. These projects were found to be excellent contributions as these scientists are aware of the strengths and weaknesses of the stakeholders in both countries. The established collaborations are ongoing and even being diversified. The Labex Program is thus an instrument for the strengthening and diversification of established partnerships but especially an opening towards collaborations with excellence research teams. One of the tangible results is the creation of the International Advanced Biology Consortium (CIBA, p.36), which pools Brazilian and French partners for the purpose of improving plants of interest for tropical and Mediterranean agriculture. Labex is therefore also a complement to standard cooperation tools. Although virtual communication, with all of its advantages, is now omnipresent, joint work as part of a team within the same laboratory can bind links of a completely different type.

A model that can be used for other partnerships in Montpellier, Europe and elsewhere

Based on the work started by researchers of the Labex-Europe Program, EMBRAPA is now developing this strategic partnership model not only in France but also in other European countries, especially England (Rothamsted Research Station, p. 34-35) and Germany (Julich Institute, p. 13). A Labex researcher was hosted in the Netherlands (Wageningen University, p. 32) for 4 years and other host countries are targeted in the future.

As EMBRAPA’s Labex Program has been efficient in one direction, it could also operate well in the other—this is the aim of the ‘Inverse Labex’ project, tested by foreign senior researchers in EMBRAPA research centers in Brazil. In addition to the many IRD and CIRAD researchers posted in various EMBRAPA centers in Brazil, a Korean RDA researcher, two ARS/USDA researchers and an English researcher from the Rothamsted Research Station, associated with the Biotechnology and Biological Sciences Research Council (p. 35), have been hosted in different laboratories. Soon, a German researcher from Julich Institute (p. 13) may come to an EMBRAPA research centre as well. The Brazilian Labex model has also inspired other countries: in March 2012, Agropolis International signed a partnership agreement with INTA (Instituto Nacional de Tecnología Agropecuaria) in Buenos Aires to host the first LabIntex offices in Montpellier, which is based on EMBRAPA’s Labex Program (p. 45).

Pedro Arcuri (EMBRAPA, Brazil), Yves Savidan (IRD, France) & Paula Dias (Agropolis International, France)

“WE WANT OUR EMBRAPA RESEARCHERS, AND NOT JUST OUR STUDENTS, TO ‘RUB SHOULDERS’ WITH LEADING TOP-NOTCH SCIENTIFIC RESEARCH TEAMS IN PROGRAMS THAT ARE AT THE CUTTING-EDGE, EACH IN ITS SPECIFIC FIELD, AS REGARDS NEW TECHNOLOGIES AND INNOVATION.”

Eliseu Alves & Francisco Reifschneider (EMBRAPA)
Some key dates in the history of EMBRAPA’s Labex Program

1998
Beginning of EMBRAPA’s Labex Program—First laboratory without walls set up in the United States

2002
Inauguration of EMBRAPA’s Labex-Europe at Agropolis International (Montpellier, France)

2002 - 2005
Natural resource management—Spectral reflectance used to map soil properties (José Madeira)

Agrifood technology—New sources of plant enzymes isolated from Brazilian biomass (Regina Lago)

2006
Beginning of a Labex-Europe position at Wageningen University (Netherlands)

2007 - 2009
Natural resource management—Assessment of the agroenvironmental impacts of perennial crop based farming systems (Geraldo Stachetti Rodrigues)

2008
Founding of the International Advanced Biology Consortium (CIBA)—Franco-Brazilian scientific collaboration

2009
Inauguration of EMBRAPA’s Labex-Korea—Partnership with the Rural Development Administration

2009 - 2011
Agrifood technology—Impact of information and innovations on consumer food choices and on their willingness to pay (Rosires Deliza)

Agrifood technology—Bacterial spore resistance to thermal stress (Amauri Rosenthal)

2010
Natural resource management—Dynamics of rural areas based on landuse change interpretation (Margareth Simões)

2010 - 2013
Genomics, plant biotechnology and molecular plant-microorganism interactions—Functional genomic analysis of interactions between Mycosphaerella graminicola and wheat (Alexandre Amaral)

2012
Beginning of a Labex-Europe position at Jülich Institute (Germany). Development of high throughput plant phenotyping methods (Paulo Herrmann Jr.)

2012
Inauguration of Labex-China—Partnership with the Chinese Academy of Agricultural Sciences

2012 - 2016
Plant-genomics and biotechnology—Functional analysis of drought and salt tolerance in rice (Ana Brasileiro)

2012 - 2010
Plant-microorganism interactions. MusaForever Program (Manoel Souza)

2005 - 2008
Agrifood technology—Possible alternatives to chemical methods for the conservation of minimally processed plant products (Heloísa Filgueiras)

From Brazil to Europe: 10 years of Labex Program
EMBRAPA’S Labex Program

A word from Dr Elisio Contini, the first coordinator of EMBRAPA’s Labex-Europe

The Labex-Europe Program institutionalizes long-term scientific and technical cooperation between EMBRAPA, Agropolis International institutions and other European centers of excellence in agricultural research. The presence of Brazilian researchers in these research centers highlights EMBRAPA’s strategic decision to advance its knowledge as well as Brazil’s interest and dynamism in terms of partnerships in joint research projects and monitoring new scientific discoveries on this continent.

The scientific links remain established via research networks and clusters after the scientists return to Brazil, often giving rise to new projects. The Labex-Europe Program is an international cooperation instrument which, with the support of the Agropolis International, frees it from the long bureaucratic procedures required for the approval of international scientific cooperation projects. The Labex-Europe Program has shown its strategic asset of being able to strengthen the quality of research carried out by EMBRAPA by allowing its researchers to work in centers of scientific and technological excellence. Although it’s a small program, a feature to be kept as it is essential for effective coordination, the Labex-Europe has enabled European researchers to deal with new research issues and with challenges associated with emerging countries undergoing technical and scientific development.

By being involved in looking for new technologies and responses to problems affecting tropical agriculture, they have made progress in gaining the knowledge required to cope with global agricultural challenges in a setting of climate change, urban population growth and a need to develop technologies to ensure sustainable agricultural intensification while also being environment-friendly. Finally, application of knowledge generated by international cooperation will contribute to combating poverty worldwide.

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A word from Dr Pedro Arraes Pereira, Director-President of EMBRAPA

Since EMBRAPA was founded, research and scientific cooperation capacity building has been pivotal to fulfill its vision: natural resource management associated with innovative knowledge-based technologies as the basis for intensive, sustainable and highly efficient agriculture.

Our most valuable asset is thus our team of more than 2000 PhD researchers (or scientists) and their scientific networks. This is why EMBRAPA developed the ‘virtual laboratories abroad’ concept, the Labex Program, about 15 years ago.

As a former coordinator of its US branch, I have witnessed its symmetrical scientific cooperation performance. Now that we are celebrating the 10th anniversary of the Labex-Europe office being set up in Montpellier, the results presented in this publication are evidence that the decision taken by our former directors to count on the support of Agropolis International and its members, in order to coordinate the presence of our researchers throughout the continent, was strategic.

EMBRAPA is therefore extremely thankful for their acceptance of the Labex concept. Scientific cooperation explains part of the Brazilian agricultural achievements. In 40 years, EMBRAPA became a network of 47 research centers, spread throughout Brazil and covering our five biomes.

Over this period, crop yields increased steadily by up to 4% per year in Brazil, representing an overall increase of 200%, whereas the increase in land available for agriculture only increased by around 30%.

Brazil preserves land from agricultural use. It has around 60% of its territory legally classified as indigenous land, biological reserve or natural park, while at the same time it is one of the leaders in biofuel, plant fiber and food production.

Nevertheless, in a global setting where there is increased demand for agriculture that has to cope with climate change, soil acidity, emerging diseases and many other urgent challenges, R&D institutions must now work together towards developing sustainable intensification practices and biotechnologies in order to increase productivity and provide environmental services such as biodiversity preservation and water quality.

Labex-Europe, despite its small size, has already obtained results that fulfill EMBRAPA’s vision by creating or strengthening scientific networks and new scientific knowledge. Therefore, Labex-Europe’s results significantly contribute to harmonizing economic development and environmental conservation. In this setting, agriculture becomes a solution, not a problem, towards building a more sustainable future.

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'LABEX-EUROPE’S RESULTS SIGNIFICANTLY CONTRIBUTE TO HARMONIZING ECONOMIC DEVELOPMENT AND ENVIRONMENTAL CONSERVATION'
The world is changing, thus implying that what we currently call globalization is simply a transition from a Western oriented world to a multipolar world within which emerging countries are claiming their rightful place. Is this not what Southern Cone countries are doing with their high ambitions of becoming global stakeholders in agriculture and food sectors? And is it not what they are involved in doing by encouraging their agricultural research institutions to collaborate more effectively with the best research teams worldwide, and by setting up platforms in the United States, Europe and Asia? EMBRAPA is a remarkable forerunner in this sense—it has been thriving in France and throughout Europe from its base in Montpellier (France) for 10 years now! And now the Argentinian Instituto Nacional de Tecnología Agropecuaria (INTA) is preparing to do the same.

I am delighted by these initiatives, as a result of which Brazil has become a key scientific partner of Montpellier research teams, and the relevance of its performance record is recognized and shared: joint programming initiatives, researcher mobility, renewal of research focuses, all through the pooling of temperate and tropical research resources. Agricultural research is becoming globalized to come up with appropriate solutions to food security and malnutrition questions that are still pending at the outset of the 21st century. Population movements and subsequent behavioral changes, the threat of climate change, the need to reconsider the allocation of water resources for different uses, and other imminent uncertainties, will inevitably contribute to renewing our research agenda.

Agriculture is still vital for humankind, but keep in mind that this is not a disembodied activity—it involves men and women worldwide who care for their crops and livestock every day. We also need to focus on what happens to these people as a result of the changes that are under way—their professional and family lives, workload, income, the future of rural areas in different regions, marked by the specific historical and geographical settings, relationships between the countryside which feeds them and the cities where populations throughout the world are increasingly concentrated. Agricultural research should be focused on all of these issues so as to be able to foresee future trends and investigate ways to safeguard the future in suitable ways. Technological development alone will not guarantee that the development will be sustainable, respectful of the environment and the societies that it impacts. It is my sincerest hope that all of these questions will be addressed in our collaborations with the Brazilian teams and facilitated by the presence of Labex EMBRAPA in Montpellier!

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