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Honduras

Agricultural Biotechnology Annual

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Report Highlights:
Honduras is the only country in Central America that allows commercial production and field trials of agricultural biotech crops. In 2011, there were 29,579 hectares of commercial corn production of biotechnology varieties in Honduras, as well as several field trials of new biotech crops.

Section I. Executive Summary:

Honduras is the only country in Central America and one of the five countries in Latin America which allows the field testing and commercial production of biotech crops. At present, BT (MON810), Roundup Ready (RR) (NK603), Herculex I and VTPRO (MON 89034) are commercially produced in Honduras.

In 2011, there were 29,579 hectares (ha.) in commercial production of genetically modified (GM) corn in Honduras. The GM corn is planted in seven Departments in Honduras. GM corn is not planted in three Departments and in the municipality of Pespire, Choluteca, as these communities requested that GM corn not be planted there. Additionally, commercial production of GM corn has been restricted to areas away from native corn stocks. It should be noted that the areas of the country that do not allow GM corn are known to have high levels of poverty. Preliminary data from producers indicate that the per hectare maximum traditional corn yield is 2.7 metric tons, hybrid yield is 3.6 metric tons, and GM yield is 8.0 metric tons.

Honduras' biotechnology system is sanctioned by the Phytozoosanitary Law of the Ministry of Agriculture and Livestock (SAG) and is regulated by the Biosecurity Regulation with Emphasis in Transgenic Plants. As part of Central American-Dominican Republic Free Trade Agreement (CAFTA-DR), the Phytozoosanitary Law was reviewed and modified. Honduras ratified the Cartagena Protocol in September 2008. The regulation regarding intellectual property protection of plant varieties was approved by the Honduran Congress in March of 2012.

The biosecurity regulation assigns SAG's National Service of Plant and Animal Health (SENASA) as the responsible agency for creating the regulatory framework for agricultural biotechnology. A special committee, the National Committee of Biotechnology and Biosecurity composed of technical scientists from ten public and private sector institutions, evaluates the request, makes the scientific analysis, and advises SENASA in the decision making process.

Honduras' corn crop is sold within the domestic market and exported to Argentina, Colombia, and the United States. Honduras imports corn and soybeans from the United States to supply its poultry, livestock, shrimp, and tilapia industries.

Section II. Plant Biotechnology Trade and Production:

Honduras is the only country in Central America and one of the five countries in Latin America that allows the commercial production of biotech crops. The field tests and the approved products by crop are the following:

Approval Year	Company	Crop	Commercial Name	Event	Type of approval
1997	SYNGENTA	Banana		H17, H20, H51, H53	Field trial
1998	MONSANTO	Corn		MON 810 & NK 603	Field trial
2001	MONSANTO	Corn	YieldGard & Roundup Ready	MON 810 & NK 603	Commercial
2002	MONSANTO	Soybeans		40-3-2	Field trial
2003	SYNGENTA	Banana		40-3-2	Field trial
2006	PIONEER	Corn		TC 1507	Field trial
2006	MONSANTO	Corn		MON88017	Field trial
2007	PIONEER	Corn		TC1507	Field trial
2008	MONSANTO	Corn		MON89034	Field trial
2009	PIONEER	Corn		TC1507	Semi-Commercial
2010	PIONEER	Corn	Herculex I	TC1507	Commercial
2010	MONSANTO	Corn	VTPRO	MON89034	Semi-Commercial
2011	BAYER CROPSCIENCE	Rice		LLRice62	Field trial
2012	MONSANTO	Corn	VTPRO	MON 89034	Commercial

Source: SAG's National Service of Plant and Animal Health (SENASA), Seeds Department

In 2011, there were 29,579 hectares of GM corn in commercial production in Honduras. At present, BT (MON810), Roundup Ready (RR) (NK603) and Herculex I are commercially produced in Honduras. The VTPRO (MON 89034) was approved in March 2012. The process of reproduction of seeds has begun.

The corn is planted in the Departments of Francisco Morazán, Comayagua, Olancho, La Paz, Valle, Yoro and El Paraíso. GM corn is not planted in the Departments of Intibucá, Lempira, and Gracias a Dios, or in the municipality of Pespire, Choluteca, as these communities requested that GM corn not be planted there. Additionally, commercial production of GM corn has been restricted to areas away from native corn stocks.

The Pan-American Agricultural School, better known as Zamorano University, has been a research center for biotech crops for the last 12 years. During the planting season 2011-2012, Zamorano planted 332 ha. with GM corn. Additionally, Zamorano carries out research contracted by seed companies to

monitor the susceptibility of the pests that control the event and to evaluate its effectiveness. Monitoring is also done about natural enemies.

Expanded use of biotechnology has the potential to benefit Honduran society. Annually, across the country, there are about 390,500 hectares planted in corn, with only about 58,000 hectares (15%) planted with hybrids and GM corn. The remaining areas are planted with corn seed varieties donated to farmers by SAG and seeds saved from previous harvests by farmers, often referred to as "criollo" varieties. GM seed companies are interested in expand the production areas in the country.

Honduras imports corn and soybeans from the United States which include GM grains in support of its poultry, livestock, shrimp, and tilapia industries. Additionally, Honduras has widely accepted U.S. Government food donations of soybean meal and yellow corn for these industries since 1999. Honduran GM corn production is used within the domestic market and is exported as well, with GM seed production being exported to Argentina, Colombia, and the United States.

Section III. Plant Biotechnology Policy:

Honduras currently allows field testing and commercialization of GM crops. The opening of the country to biotechnology began when the Standard Fruit Company submitted a request to evaluate genetically modified banana plants in 1996. As there were no regulations related to biotechnology at the time, the Seeds Certification Department of SAG initiated the "Biosecurity Regulation with Emphasis in Transgenic Plants." The regulation was approved in 1998 through Agreement No.1570-98. The legal base for this regulation is the Phytozoosanitary Law of 1994. As part of CAFTA-DR, the Phytozoosanitary Law was reviewed and modified by Decree No. 344-2005 published in 2006.

The Cartagena Protocol on Biosafety was ratified by the Honduras Congress in September 2008. The Law for the Protection of New Varieties of Plants was approved by the Honduran Congress in March 2012, which had been pending since 2001. The law protects intellectual property rights of the developer of new varieties and the variety itself. With the approval of this Law, Honduras complies with the International Union for the Protection of New Varieties of Plants (UPOV). UPOV is an intergovernmental organization established by the International Convention for the Protection of New Varieties of Plants. The Convention promotes an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society.

The Biosecurity Regulation with Emphasis in Transgenic Plants makes SENASA responsible for the regulatory framework for agricultural biotechnology, including GM product import requests and field testing and commercialization requests for GM crops. The regulation provides the procedures to evaluate a request and assigns the scientific analysis to the National Committee of Biotechnology and Biosecurity (NCBB). The NCBB was created in 1998 to provide advice to SENASA in the decision-making process. The Committee is composed of technical scientists from the following ten public and private institutions:

- National Service of Plant and Animal Health (SENASA), Ministry of Agriculture and Livestock

(SAG)
- Directorate of Science and Agricultural/Livestock Technology (DICTA)/SAG
- Focal Point of the Codex Alimentarius in SAG
- Ministry of Public Health
- Ministry of Renewable Resources and Environment (SERNA)
- Competitiveness and Innovation Directorate of the Ministry of Planning (SEPLAN)
- National University of Honduras (UNAH)
- Honduran Foundation for Agricultural Research (FHIA)
- Pan American School of Agriculture - "Zamorano"
- Standard Fruit Company

The requirements to request field testing and commercial liberation of an event are based on the Phytozoosanitary Law and the Biosecurity Regulation with Emphasis in Transgenic Plants. The process is the following: (1) a company submits a request to SENASA; (2) SENASA's Director summons the NCBB to review the request; and (3) each institution in the NCBB carries on its analysis and depending on issues raised during the analysis, they continue to meet until a consensus is reached.

The regulation for biosecurity indicates the NCBB should provide an answer to a request within 90 days. When the NCBB reaches a consensus, it forwards the resolution to the Director of SENASA. Once the Minister of Agriculture and Livestock approves, the Director of SENASA notifies the resolution and findings of the NCBB to the requesting company.

The estimated time until commercialization varies according to the questions or doubts the NCBB raises. In some cases, the NCBB requests more information from field tests as part of the pre-commercial stage. This stage is usually conducted on one hectare of land. After the test stage is completed, the NCBB can advise SENASA to extend the area from one hectare up to 500-600 hectares, depending on the company's request. The NCBB recommends companies carry out field tests within normal production cycles: the first cycle of harvest begins in May and/or June and the second cycle begins in August and/or September. As an example of the estimated time for commercialization, Monsanto started field tests for BT corn in 1998. After various evaluations and compliance for the requirements requested by the NCBB, various events were approved for commercialization in 2001.

Monsanto managed the following stages: Field test on one hectare, a second field test from one to 500 hectares, a pre-commercial stage of field test from 500 to 1,500 hectares, and the final commercial stage of more than 3,000 hectares. Pioneer started its field tests for Herculex I in 2006 and the NCBB recommended the commercial liberation in 2010. Monsanto requested the field trials for VTPRO (MON 89034) in 2008, and the commercial liberation took place in March 2012.

Honduran officials normally participate in meetings of international standard-setting bodies related to biotechnology.

Section IV. Plant Biotechnology Marketing Issues:

Market acceptance for selling biotechnology products by producers and importers is favorable. The

Ministry of Agriculture and Livestock requires labeling for the GM seed. It does not require labeling for packaged foods or feeds. There are no technology fees. Particularly, producers using biotechnology see the benefits of increased yields. However, there are still myths about GM products that need to be addressed.

The chart below shows preliminary data from corn producers that use different agricultural technologies.

Yields in Corn Production

	From **Metric tons per hectare**	**To** **Metric tons per hectare**
Open Varieties	2.3	2.7
Hybrids	3.2	3.6
Genetically Modified via modern biotechnology	5.4	8.0

The fruit and vegetable producers that grow crops for export find it very useful to rotate their crops with GM corn. This assures them that the fruit and vegetables exported are free of pesticide residues and pests. Consumer groups, however, are uncertain about the benefits of GM grains because they have been influenced by widespread negative information which is not based on science**.**

Two representatives of the public and private sector of Honduras wrote guidelines that are useful for firms looking at Honduras as an export market for GM crops. Companies requesting a risk evaluation for a test trial or the commercial liberation of a biotechnology product must provide the following information to the Biotechnology and Biosafety Committee:

- *Personnel involved*. Names, addresses, and telephone numbers of the people that have developed or supplied the event.

- *Purpose of the evaluation*. Provide a detailed description of the purpose of the introduction of the event, including the experimental design and/or the proposed production.

- D*escription of the genetic material*. Provide a description of the desired or real characteristic of the modified genetic material. Also include how the characteristic differs from the parent non-modified organism (i.e., morphologic or structural characteristics, activities and physiological processes, number of copies of the material inside of the recipient organism (integrated or

extracromosomic) products and secretions and characteristics of growth.

- *Transformation methods*. Country and place where the parent plant, the receptor organism and the vector were collected, developed and produced. Transformation methods and selection processes employed.

- *System used to produce the event*. Provide a detailed description of the molecular biology of the system (For example: donor-recipient-vector) that will be used to produce the event.

- *Place of evaluation*. Country and geographic location of the evaluation, specifying the exact description of the areas to be evaluated.

- *Biosecurity measures*. Provide a detailed description of the processes and security measures that have been used or will be used in the country of origin, the countries that will be in transit and in Honduras, to prevent the contamination, liberation and dissemination of the production of the donor organism, the recipient organism and the vector, the constituent of each event and the event.

- *Programmed destination*. Provide a detailed description of the programmed destination (including the final destination and all the intermediary destinations), uses, and/or distribution of the event (Example: greenhouses, laboratories, or place of the growth chamber, site of the field test, site of the pilot project, production, spreading, manufacturing site, proposed site of sale and distribution).

- *Containment measures*. Provide a detailed description of the procedures, processes and security measures proposed that will be used to prevent the escape and spreading of the event in each of the programmed destinations.

- *Method of final disposal*. Provide a detail description of the proposed method for the final refusal of the event.

Source: Rogelio Trabanino of Zamorano University and Carlos Almendares of the Plant Health Division of SENASA.

Section V. Plant Biotechnology Capacity Building and Outreach:

In 2007, the Foreign Agricultural Service (USDA/FAS) office in Tegucigalpa organized a series of conferences, "Ten Years of Biotechnology." The speakers made presentations focused on scientific studies on the use of biotechnology. The audiences included the Minister of Agriculture and SAG officials, the Minister of Natural Resources, officials from other GOH institutions, non-governmental organizations, journalists, and public opinion makers.

USDA/FAS has also coordinated with Zamorano University on biotechnology outreach activities. In 2007 Zamorano organized a Biotechnology Conference with the participation of the Minister of Agriculture and Livestock. Through the USDA Cochran Exchange Program, members of the NCBB

have participated in biotechnology training.

In 2010, through a regional biotech outreach program, FAS/Tegucigalpa, eight Honduran public and private entities, and the Inter-American Institute for Cooperation in Agriculture (IICA) supported outreach activities consisting of six presentations and various field visits to biotech farms and Zamorano University. Honduras was chosen for this venue because it is the regional leader in biotechnology. The target audiences included the Honduran Biosafety Commission, the Minister of Agriculture and his chief advisors, the Minister of Environment and staff members, Private Volunteer Organizations (PVOs) working in the areas of food security and agricultural development, and faculty and student body representatives of Honduran agricultural universities. The speaker gave presentations about "Biotechnology and Food Security," and during a field visit to commercial biotech farms, local farmers explained the benefits they have received from the cultivation of GM corn.

The most important presentation took place on June 29, 2010, for PVOs, the private sector, and the media. More than 400 people attended the presentation including the Belizean, Salvadoran, and Guatemalan delegations. The event was inaugurated by the Honduran Presidential Designate Samuel Reyes who represented Honduran President Lobo, U.S. Ambassador Hugo Llorens, FAS Administrator John Brewer, IICA Director-General Dr. Victor Villalobos, and Honduran Minister of Agriculture and Livestock Jacobo Regalado. Also participating were Honduran farmers who gave brief but powerful testimonials concerning how they had benefited from biotechnology. Media coverage of the public events was extensive.

Overall, the outreach program improved the public perception of biotechnology within key target groups. It also helped elevate further the profile of Honduras as a regional biotech leader and served as an opportunity for the new government to focus on activities that would help small growers adopt biotechnology. The outreach program demonstrated the institutional support biotechnology already enjoys in Honduras evidenced by the eight Honduran public and private entities that supported the event.

In May 2012, the first International Conference on Agriculture and Environment (ICAE) took place at Zamorano University. The ICAE was organized by Zamorano with the support of regional and national host organizations such as: the Ministry of Agriculture and Livestock (SAG), the Ministry of Natural Resources and Environment (SERNA), the Inter-American Institute for Cooperation in Agriculture (IICA) and the Central America Integration System (SICA). The collaborating institutions were: the International Food Policy Research Institute (IFPRI), the Service for the Acquisition of Agri-biotech Applications (ISAAA), the Public Research and Regulation Initiative (PRRI), USDA, and the Department of State.

The ICAE's objective was to strengthen the development and safe use of agricultural biotechnology as a key tool to improve productivity and competitiveness in the agricultural sector and for the sustainable use of genetic resources for agriculture and food and energy security. ICAE aimed to discuss factors such as: "the ability of the biotechnology sector to deliver appropriate technologies to farmers, while ensuring environmental protection, the development of a functional biosafety system that contributes to agricultural development and environmental protection efforts, the need to address a shared vision for implementing the agricultural and environmental agenda as it relates to biosafety and biotechnology".

ICAE proposed that "a shared vision is critical to Latin America's ability to implement the necessary paradigm shift towards agricultural food/fiber/energy systems that successfully ensure food security and foster economic growth, while caring for the environment. A shared vision is key to addressing and resolving the conflicting policies while achieving all the development and environmental protection objectives within the region."

The Conference brought Ministers and Vice-Ministers of Agriculture and Environment of the Central America region. This was an exceptional occasion in which both Ministries discussed the interrelations of their agendas. ICAE noted that "decision makers often face conflicting views on policy issues, such as the science-based versus precautionary approach, and economic development versus environmental conservation". ICAE pointed out that "the discussion needs to be firmly based on facts, scientific evidence and analysis of policy issues relevant to the region. This analysis should include a balanced and complete assessment of plant biotechnology and other technologies that support sustainable agriculture and enable environmental protection. A key to this assessment is the discussion of international and regional policy and regulatory frameworks that are likely to have an impact on policy making at the national level."

ICAE also indicated "the need for Central America, to start discussions in order to devise a platform to advance common interests in international discussions, while simultaneously introducing innovative domestic approaches to biotechnology development and innovation. This requires collaboration and agreement among regional actors and competent authorities within countries. The conference enhanced the understanding of the participants on how the international meetings of Rio +20 and the Cartagena Protocol on Biosafety are interrelated and on how the outcomes of these events can be implemented nationally. The intent was to form a shared vision and develop the process of finding, informing and strengthening regional commonalities".

During the three days of ICAE, a wide range of presentations were given to representatives of the Central America Agricultural Council (CAC), the Central American Commission for Agriculture and Environment (CCAD), regulators, research and technology representatives from the Ministries of Agriculture and Environment of Central America, national and international agricultural and environmental agencies, universities, NGOs, and industry representatives. The speakers were scientists and regulators with international experience from Argentina, Brazil, Colombia and the United States.

The scientists and regulators that attended ICAE wrote the "Zamorano Declaration" which in summary draws attention to:

"Central America, as the other countries in Latin America, is in a crossroads. It is where the agricultural production for food, bioenergy, fiber and other biomass converge with poverty, food insecurity and loss of biodiversity. Latin America will face in the XXI century a similar situation that the world lived in the XX century, when the food production was slower than population growth, causing massive problems of food insecurity. The challenge of global agriculture for the next decades is to produce 80 percent more food, while caring for the environment. The goal will be difficult to achieve because agriculture will confront complex challenges including accelerated climate change, water deficit and urban population growth. The world will again face a severe crisis of food.

Therefore:

- To do the things as we used to is not an option anymore: we should develop a shared vision between the agricultural and environmental agendas and advance into a change of paradigms.
- We should stand facing challenges with technology and not with ideology.
- There are two big obstacles that should be analyzed by decision makers:

1) The little investment and lack of tangible incentives for research, agricultural development and technological innovation.

2) The existence of outdated regulations that make the application of new technologies difficult.

These obstacles, besides other structural ones, endanger the ability of our countries to face food insecurity and the protection of the environment.

- The agricultural policies for Central America should be more compatible with the environment and the biodiversity. They should include financial incentives for producers to invest in productive systems with ecologically sustainable systems.
- The environmental policies for Central America should promote new forms of agriculture of high yield and low environmental impact. The needed protocols should promote the use of modern technologies - which include biotechnology among others – to respond to the needs of the Central America Integration System (SICA) and not respond to other needs. Policies are required to facilitate research and field trials of new crops and agricultural products.
- The Central America Agricultural Council (CAC) and the Central American Commission for Agriculture and Environment (CCAD) should work together to develop new regional policies that are functional. They should identify agencies to lead the processes for research and propose the policies of the future. They should collaborate to generate funds to promote research in the SICA region. The Ministers should take the leadership to promote these regional policies, collaborating between the Ministries of Agriculture and of the Environment."

Another result of ICAE was the creation of a Technical Group of Experts AdHoc (AHTEG) integrated by regulators of the Central American region. The proposal for the creation of a Central America Technical Committee on Biosafety (CTCBio) is to "strengthen the development and safe use of agricultural biotechnology as a key tool to improve productivity and competitiveness in the agricultural sector and for the sustainable use of genetic resources for agriculture and food security".

The specific needs, strategies, and new activities of Honduras for agricultural biotechnology identified by scientists and producers using biotechnology are described below:

1. Continued education and training activities for the GOH, the private sector, agricultural technical schools, universities, producers, exporters and the public at large in order to:

   a. Address the food crisis and serve as a development tool by increasing agricultural productivity and food security, reducing crop input costs, and helping to alleviate poverty.

b. Acknowledge the global scientific consensus on the safety of eighteen years of research on biotechnology products.

c. Address the environmental gain from decreased pesticide use and reduced soil erosion, while stressing the potential for improved nutrition and disease prevention.

d. Raise the capacity to abide by global trading rules and apply science-based evaluation of agricultural production methods and regulations.

2. Strengthen the alliance between the private sector and the GOH to:

a. Preserve native varieties of corn through the establishment of germ plasm banks or the financing of the production of local varieties.

b. Establishment of pilot projects in key regions of Honduras in which growers could see and compare the various qualities of GM corn (e.g. resistance to pests/disease and increased yield potential/profitability) in comparison to non-GM corn.

c. Bolster food security by using the positive impact of GM crops on costs-of-production and yields, reduced use of agrochemicals, and research and development that can promote agricultural growth and reduce rural poverty.

d. Strengthen competiveness and food safety for exporters to comply with CAFTA-DR and other trade agreements by using corn within fruits and vegetable crop rotations.

e. Enhance the positive benefits of GM crops to human health, e.g., the ability of GM corn to decrease the presence of Fumonisins and Aflatoxins in the Honduran corn crop which causes spina bifida and various types of cancer, respectively.

3. Follow up the achievements and agreements of ICAE. The agriculture and environmental governmental agendas need to work towards clear biosafety regulations that promote sustainable agricultural development.

Section VI. Animal Biotechnology:

In Honduras, there are no agricultural products that have been developed or derived from animal biotechnology. There are no regulations being developed for products derived from modern agricultural technologies.