



HONDURAN FOUNDATION FOR AGRICULTURAL RESEARCH

INSTITUTIONAL PROFILE



La Lima, Cortés, Honduras, C.A. December 2018

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HONDURAN FOUNDATION FOR AGRICULTURAL RESEARCH

I. BACKGROUND

An enthusiastic group of representatives of public and private sector linked to Honduran agriculture, decided to create the FHIA during 1984. FHIA was officially created the 15th of May 1984 and started operations the 1st of January 1985. It was created to strengthen the process of generation, validation and transfer of technology for the national agricultural sector, as well as to help diversify the agricultural production of the country.

In the process of creating the Foundation, SAG (Ministry of Agriculture and Livestock) and USAID (United States Agency for International Development) played an important role. This initiative was seconded by the United Brands Company that transferred to the Government of Honduras the facilities where its Tropical Agricultural Research Division, in the municipality of La Lima, Cortés, had operated. In La Lima, Cortes were established the headquarters of the FHIA.

FHIA began operations using the existing offices and laboratories in the facilities donated by United Brands (Chiquita). This included the transfer of a 100 hectares experimental station, located in La Lima, Cortés. This experimental station has been dedicated to banana research and genetic improvement of bananas for many years. For its part, USAID approved a project to finance the Foundation's operations for the period 1984 -1994 and the Government of Honduras committed a financial contribution for the same period. In addition, USAID provided funds for the development and improvement of the infrastructure. In 1993, USAID through the Honduran Government, provided funds for the creation of an endowment fund for financing future research activities.

Currently, the Foundation continues with its main facilities in La Lima, Cortés, and has regional offices in the municipalities of La Masica, Atlántida and in Comayagua, Comayagua. In addition, it operates four Experimental and Demonstration Centers, located in different agroclimatic regions of the country.

II. NATURE OF THE FOUNDATION

The Foundation was created as a private, apolitical and non-profit company. The General Assembly currently has 88 Members and it is the primary decision-making body of the foundation. The Board of Directors is elected by the Assembly. It has 9 members and is presided by the Minister of SAG, who represents the Government. The remaining members of the Board are representatives of the private sector of Honduras.

III. INSTITUTIONAL MISSION AND GOALS

3.1. Mission

The mission of the FHIA is to participate actively in the development and improvement of the agricultural sector, through the generation, validation and transfer of technology to farmers.

3.2. Goals

- Conduct agricultural research in crops for domestic consumption and export, including aspects of production, processing and marketing at national and international levels.
- Develop technical assistance and projects for producers promoting agricultural diversification, with high value crops and using modern technology, emphasizing the application of good agricultural practices to optimize production and productivity, conservation natural resources and the environment.
- Provide laboratory services and other services related to research and technology transfer.

IV. INTERNAL ORGANIZATION

For the fulfillment of its mission and goals, the Foundation is organized as follows:

General Assembly: is constituted by all members (actually 72) and is the highest authority of the Foundation. It meets ordinarily once a year and elects the Board of Director. It evaluates the results of the previous year activities, reviews and approves the Operation Plan and Budget for the following year.

Board of Directors: it is composed of nine members appointed by the General Assembly. It is responsible for ensuring the compliance with the statutes, internal regulations, policies and execution of the operation plan and annual budget.

General Director: is appointed by the Board of Directors and is the legal representative of the Foundation, responsible for efficient institutional functioning and execution of the operational plans and annual budget.

Research Division: is responsible for the design, planning and execution of research activities. To fulfill its functions, it has the following research programs: Banana and Plantain, Cacao and Agroforestry, Diversification and Horticulture. It also coordinates the operation of the Technical Unit and the development of special Projects financed by outside sources. Personnel assigned to the different Research Programs also have the responsibility to carry out technical assistance activities for producers.

The **Technical Unit:** it is integrated by three departments: Plant Protection, Post-harvest and Economy and Marketing. These departments are designed to provide services to the Programs and Projects in research and technology transfer, as well as the general public.

Services Division: is responsible for providing services to the Programs, Departments and Projects of the Foundation, as well as to farmers in the country and abroad. It includes the Agricultural Chemical Laboratory, the Pesticide Residues Analysis Laboratory and the Agricultural Services Unit.

Communications Division: is responsible for the administration of the Agricultural Communication Center that has three Operational Units: Training, Library and Publications. Provides services to the Programs, Departments and Projects of the Foundation and assist them in the execution of research and technology transfer activities.

Administration: it is subdivided into: Human Resources, Accounting, Maintenance and Supplies and IT Support. It provides support to all the activities of the Foundation.

Human resources: is in charge of the administration of personnel and the implementation of personnel policies.

| Area | Leadership | Technicians | Support for | Total |
|----------------|------------|-------------|-------------|------------|
| Administration | 4 | 6 | 39 | 49 |
| Research | 8 | 12 | 88 | 108 |
| Services | 2 | 6 | 9 | 17 |
| Communications | 1 | 5 | 8 | 14 |
| Projects | 2 | 95 | 15 | 112 |
| Total | 17 | 124 | 159 | 300 |

The Market Information System for Agricultural Products of Honduras (SIMPAH) is a service that collects and disseminates timely and reliable information about the wholesale prices of agricultural inputs and products that are sold in the main markets of Honduras and Nicaragua. In coordination with SAG, FHIA has been administering SIMPAH since 1998.

The Agrifood Information System (INFOAGRO) is a service provided to the SAG since 2011, to manage and disseminate all information related to the agricultural sector of Honduras, especially the activities of the different offices and agencies of SAG. INFOAGRO manages the SAG web page.

V. RESEARCH PROGRAMS

The research objectives for each of the Programs are the following:

5.1. Banana and Plantain Program

Its main objective is the development of banana and plantain varieties resistant to the main pests and diseases of economic importance, with high productive potential and with the ability to develop under adverse production conditions. It seeks to reduce the dependence of these crops on agro-chemicals, reduce production costs and contribute to the sustainable development of production while minimizing the impact on the environment.

5.2. Cacao and Agroforestry Program

Generation, validation and transfer of technology with the cultivation of cocoa and with agroforestry systems, with potential for small and medium producers established in flat and hillside areas, with high precipitation. The systems investigated should be a cost-effective alternative to shifting cultivation and contribute to the protection of natural resources. Due to the socioeconomic characteristics of the beneficiaries, efforts are focused on the identification, evaluation and transfer of cultural practices of low cost and minimal use of agro-chemicals to improve income.



5.3. Diversification Program

It is in charge of identification and introduction of new crops (fruit trees, spices, roots and tubers) that contribute to national agricultural diversification. It promotes high income crops for domestic and international markets. Conduct research in agronomic management to generate technological innovations that allow efficient production in the country and provide technical assistance services to farmers.

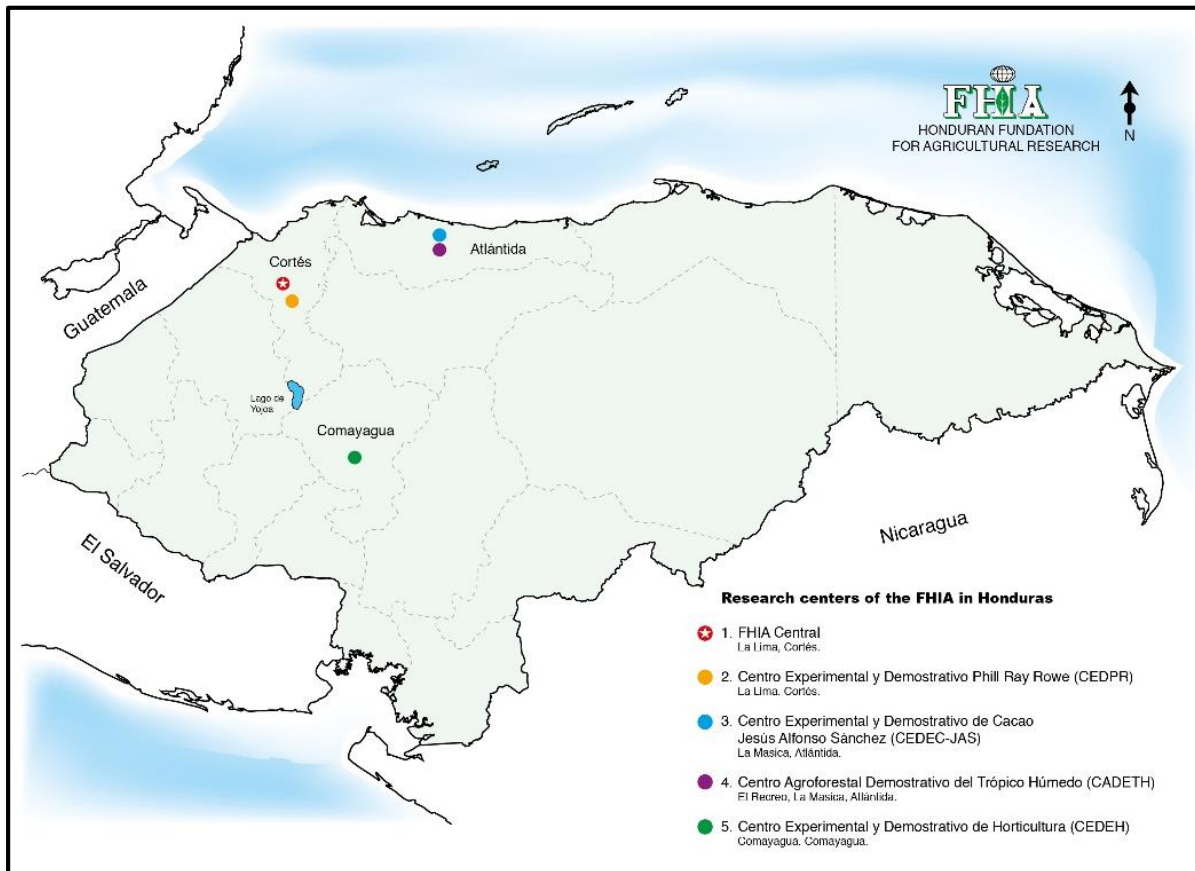
5.4. Horticultural Program

Identification of profitable horticultural crops, evaluation of production systems, varieties and cultural practices that allow an efficient production in the country, for the local and export market

VI. INFRASTRUCTURE

For the fulfillment of its functions, the FHIA has main offices in the municipality of La Lima, Cortés, where it has buildings for offices, laboratories and warehouses. In addition, it operates four experimental stations in different agroclimatic zones of the country, where it conducts research activities. These stations are:

1. Centro Experimental y Demostrativo Phil Ray Rowe (CEDPR). Guaruma, La Lima, Cortés.
2. Centro Experimental y Demostrativo de Cacao -Jesús Alfonso Sánchez (CEDEC-JAS), La Masica, Atlántida.
3. Centro Agroforestal Demostrativo del Trópico Húmedo (CADETH). El Recreo, La Masica, Atlántida.
4. Centro Experimental y Demostrativo de Horticultura (CEDEH). Comayagua, Comayagua.



VII. FINANCING SOURCES

To guarantee the stable and sustained operation of the Foundation, USAID, through the Government of Honduras, created an endowment fund in 1993. This fund is administered by a Board of the endowment fund composed of 5 members, 4 of which are members of the Foundation and one represents the Ministry of Finance. The Foundation's main sources of funding since 1994 have been: the interest generated by the endowment Fund, the international cooperation agencies, mainly for the development of technical assistance projects for producers and income generated by the Foundation for laboratory services, technical advice, sale of publications, services of research, nurseries and training services.

VIII. INTERINSTITUTIONAL RELATIONS

For the efficient development of its activities, the FHIA maintains close inter-institutional cooperation relations with all public institutions linked to the national agricultural sector, especially with the SAG. Therefore, the work of the Foundation is consistent with the strategic rural development plans established by the Government of Honduras.

The Foundation has the ability to enter into agreements to conduct research and development projects with national and international companies and institutions. In this regard, he has developed extensive

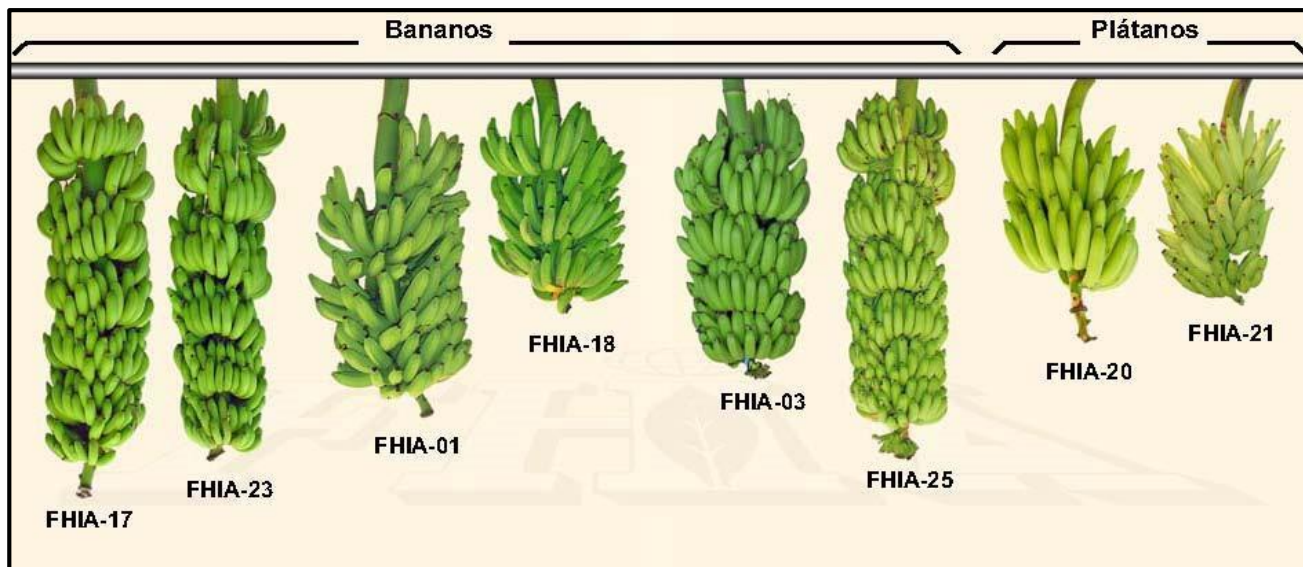
experience in cooperation with institutions such as USAID and USDA of the United States, IDRC, CESO and CIDA from Canada, GIZ of Germany, KUL of Belgium, JICA of Japan, DGIS and PAH of the Netherlands, IAEA, SECO and COSUDE of Switzerland, CIRAD / FLHOR and IPGRI / INIBAP from France, IDB, World Bank, CFC, FAO, IICA, CATIE, World Wildlife Fund (WWF), Dutch Cooperation Service (SNV), AACID/ETEA of Spain, local universities (UNA, EAP, USPS, UPNFM, UTH and CURLA), USA and Swiss Universities (Penn State, Arkansas State University, LSU) and with associations of producers nationwide.

The Foundation has agreements with several agricultural research institutions, private companies and laboratories in several countries to carry out research and agricultural technology transfer work.

IX. MOST RELEVANT ACHIEVEMENTS OF THE RESEARCH PROGRAMS

9.1. Banana and Plantain Program

The banana and plantain varieties developed by FHIA exhibit high resistance to diseases such as black Sigatoka and Panama disease (TR1 and TR4). FHIA continues to be the most advanced international center for the development of resistant varieties utilizing traditional breeding techniques. The variety FHIA-01, also known as Goldfinger, is produced in small quantities in several countries, especially in Cuba, Bolivia, South Africa and Australia. The variety called FHIA-03 has given excellent results in several parts of the world and is an immediate alternative for the production of cooking bananas for domestic consumption. In Cuba, more than 10,000 ha of FHIA-18, FHIA-21 and FHIA-23 for consumption as fresh fruit are also cultivated with excellent results. In Brazil, the production of several of the FHIA hybrids is expanded, especially the FHIA-18 and the SH-3640. Thousands of farmers in Africa (Tanzania, Burundi, Uganda, Ghana, Malawi, Mozambique) are benefitting from the production of FHIA's improved bananas and cooking bananas. In the Dominican Republic, several thousand hectares have been established with FHIA 20 and 21 dedicated to the processing industry. These hybrids are also being produced in many countries in Latin-America in small farms and used for processing and fresh consumption.



Banana and plantains hybrids developed by the Banana and Plantain Program of the FHIA.

The annual benefits to producers, due to increases in yields and the decrease in the use of agro-chemicals, are conservatively estimated at around \$600/hectare. There are thousands of small producers in Africa,

Asia, Oceania and Latin America who have successfully planted FHIA hybrids for domestic consumption and export to regional markets.

9.2. Cacao and Agroforestry Program

The identification of cultural practices to increase cacao production, productivity and preserve the natural resources has been a driving force behind the activities of this program. Through research conducted since 1985 crop yields were doubled, to 650 kg/ha, in 1998. Then, in 1998 hurricane Mitch came to destroy the cacao production of the country through the dissemination of monilia, a new disease in the country and the destruction of plantations.

After 34 years of dedicated research work at the CEDEC-JAS in La Masica, it was possible to develop agroforestry systems for cocoa production, associated with species of fine timber trees, which constitute an alternative system to the production of cacao and replaces the traditional shade of legumes. This practice significantly improves the economic income of the producers.

Since 1997, CADETH in El Recreo, has developed an extensive research program in the management of agroforestry systems in the humid tropical hillside conditions. The information generated is transferred through special projects to hundreds of small producers located in hillside areas, in the country. These projects have been oriented to the promotion of the integral and rational management of natural resources, to improve the income of farmers and their living conditions, while improving the environment.



The program has been instrumental in reviving the cacao sector, which almost disappears after hurricane Mitch. This was possible thanks to a grant received from the Canadian Government to plant, rehabilitate and renovate 4,000 hectares. The with additional support from the Government of Honduras and COSUDE from Switzerland, and additional 3,000 hectares were planted. It is important to note that the cacao planted recently in Honduras is consider fine cacao with aroma.

9.3. Diversification Program

Mango, rambutan, black pepper, ginger and sweet potatoes, coconut, avocado, allspice, and liquidambar

The diversification program has worked in many areas with tropical crops, to make them a real alternative to traditional crops and help in the diversification of the agricultural sector. Among its achievements, the following can be mentioned:

Mango: The Program has promoted the practice of induction of flowering that has been adapted to produce mango at the most profitable time of the year. Currently this practice is used in the Comayagua area.

Rambutan: The cultivation of rambutan has become a very important diversification crop, especially in

hillsides in very humid areas of the North Coast. There are currently (2019) 2,500 hectares in production and 6,000 hectares planted with quality materials introduced into the country by the FHIA. In the 2018 harvest, US \$ 1.2 million was exported, to the United States, Canada and Europe. Also, large exports were made to El Salvador. The total value of the production in 2019 was estimated at \$12 million, mostly in farms with less than 5 hectares.



Black pepper: an extensive research program to improve the agronomic management of the crop and the introduction of improved varieties has improved and promoted the production of black pepper in the country. A technology of asexual propagation of this crop has been developed, propagating genetic materials selected for their production and quality.

Ginger and sweet potatoes: Significant advances have been achieved in the production and promotion of the production of roots and tubers, especially the cultivation of ginger and sweet potatoes. The production technology currently used by small producers in several regions of the country allows them to compete in international markets.

Coconut: Since the year 2000, efforts to re-establish the coconut plantations that were eliminated on the Atlantic coast of the country, due to the arrival of the ALC disease (Lethal Yellowing of the Coconut Palm). In 2000 FHIA imported from Jamaica the Yellow Dwarf Malaysian coconut and established a coconut orchard that started the production of nuts in 2003. More than 200, 000 have been produced. Lately, the variety “green dwarf coconut” has been introduced and is on-going evaluation.



Avocado: The climatic variation and the low prices experienced in coffee have been the best ally for the promotion of the planting of avocado (*Persea americana* L.) Hass variety, as an alternative of diversification for the high areas of Honduras. Every year the interest is increased and more sowings of avocado cv. Hass. This crop is the main diversification alternative for coffee zones located at more than 1,000 meters above sea level, and this Program continues to support initiatives to increase the planting area of this fruit.

Allspice: This crop is an alternative to reforest especially for the protection of areas in microbasins. The implementation of the propagation technique using Parafilm® coverage has increased the sowing expectations, increasing the area with productive plants.

During the year 2018 a group of 8 exporting companies managed to send to the US and European market 2,000 tons of pepper, 100 containers of 20 tons each, at an average price of US \$ 3,000 per ton, managing to generate some US \$ 6,000,000 in foreign exchange.

Liquidambar:

In the last two years, through a project funded by the GIZ of the Government of Germany and by the

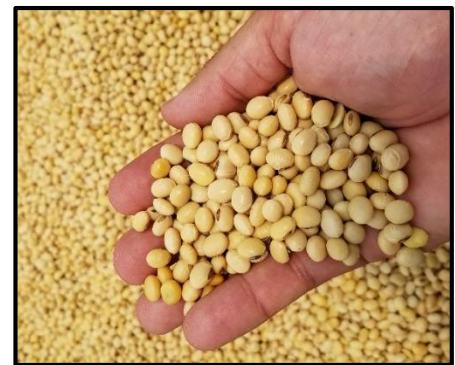
French industry of perfumes Mane, the Diversification Program and the Postharvest Department of the FHIA have managed to slightly technify the production of liquidambar balsam and improve its quality after the harvest, which is an ancestral product of the Pech tribes, located in the Sierra de Agalta, Montaña El Carbón, Montaña de Botadero and Sierra del Río Tinto in the department of Olancho. Through this technification, the aim is to preserve the producing trees in order to prolong their useful life and productivity. The FHIA Postharvest Department has designed a filtration process and improved quality of the exported product that has led to a doubling of the price received by producers compared to previous years.

9.4. Horticultural Program

Identification of several vegetables and their respective varieties suitable for local production and export i.e. Cucumber, tomato, chili, onion, pumpkin, squash, watermelon, blackberry and raspberry, has been an important part of the work of this Program. It has also generated technological innovations for the production of oriental vegetables for export. Through the activities of this Program, a significant contribution has been made to the improvement of the production of hot-climate vegetables for the internal and external markets. In the case of oriental export vegetables, in addition to generating technical information on aspects of planting density, pest and disease control and post-harvest management, the production technique of Chinese eggplant grafts has been perfected, which has required the production of more than 500,000 grafts in the last 3 years, to partially satisfy the demand of the producers. The Vegetable Program of the FHIA was pioneering several years ago in the evaluation and validation of technologies for the production of vegetables under protected conditions for the production of seedlings in mesh houses and for the commercial production of tomatoes, cucumbers and peppers using micro, macro and megatunnel, reducing up to 80% pesticide applications and significantly increasing the production and profitability of the crops evaluated.



Since October 1990, the soy varieties FHIA-11 and FHIA-15 were registered in the National Register of Species and Varieties eligible to Certify, and as such they were released and authorized for multiplication and commercial use, according to the opinion of the Technical Advisory Committee of Seeds of the Ministry of Natural Resources of Honduras. These genetic materials are conserved and disseminated in several areas of the country due to their productive characteristics and their adaptation to the current production areas.



9.5. Department of Plant Protection

The staff of the Department of Plant Protection has provided on-site assistance in their respective thematic areas in Peru, Nicaragua, Mexico, Guatemala, etc. In addition, he has conducted training locally

for audience of regional origin focused on the dissemination of the philosophy of IPM (Integrated Pest Management) in aspects such as the recognition and management of integrated diseases caused by viruses in vegetables, field diagnosis of phytosanitary problems and nutritional disorders, management of potato-striped psyllid complex of potato, design and analysis of experiments in agriculture, safe and effective use of pesticides, etc.



The phytosanitary diagnostic service provided by FHIA through this Department continues to be one of the emblematic services of the institution that benefits national agriculture. From 1995 to 2018, 23,875 samples covered by 6,717 income records were analyzed. Of these samples, 67% were admitted to the Phytopathology Laboratory, 30% to Nematology and 3% to Entomology. The main clients are private companies, government entities, independent producers and the different programs and projects of FHIA. Phytosanitary problems are diagnosed mainly in samples of tropical fruits, edible grains and vegetables.

It is important to note that during 2011-2012 was built and equipped the CEPACBA (Center for Production of Biological Control Agents for Agriculture), funded by the World Wide Fund for Nature (WWF for its acronym in English) with local bottler Coca Cola, for the efficient production of the entomopathogenic fungus *Metarhizium anisopliae*, whose main use is for the fight in sugarcane of the species of the insect known as "spittlebug". Currently this input is produced in commercial form.

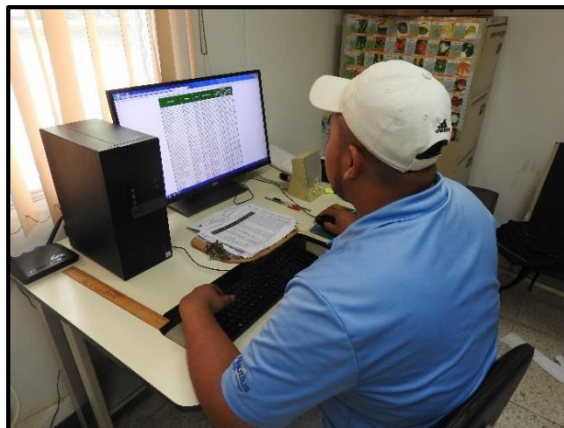
9.6. Agricultural Communication Center

Actively participates in the training process of thousands of national and foreign technicians and producers, coordinating the annual development of a broad training agenda, especially in the areas of crop production, postharvest handling of fresh fruits and vegetables, safe handling of pesticides, marketing and marketing of agricultural products, agroforestry, agricultural business administration and management and conservation of natural resources. Additionally, this Center has played an important role in the process of dissemination of technical-scientific information generated by the Foundation, through manuals, guides, brochures, leaflets, posters, videos and other communication materials, which are used in the agricultural extension activities carried out by the Foundation. In recent years the use of ICT (Information and Communication Technologies) has been incorporated to expand the dissemination of information within and outside the country.



9.7. Marketing Office

Through the Marketing Office, FHIA has developed over the last 10 years a high experience and capacity to administer information services to the national agricultural sector. Through SIMPAH, the FHIA collects and disseminates timely and reliable information on the wholesale prices of inputs and agricultural products that are marketed in the main markets of Honduras and Nicaragua. In addition, it administers the INFOAGRO through which it offers information on the country's agri-food sector.



X. COMMITTED TO AGRICULTURAL DEVELOPMENT

The technical-scientific staff of the Foundation, as well as its logistic structure, are able and willing to continue providing quality technical assistance services to producers in Honduras and other countries, to strengthen the process of modernization and the competitiveness of the sector agriculture in Honduras and other countries.



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