

UNESCO CHAIR/UNITWIN NETWORK PROGRESS REPORT FORM

Title of the Chair/Network:	UNESCO Chair Agricultural Biotechnology for Local Development (CUBADEL)
Host Institution:	Universidad de Granma, Facultad de Ciencias Agrícolas
Date of establishment of Chair/Network: <i>(mm, yyyy)</i>	14 de march de 2014
Period of activity under report: <i>(mm, yyyy - mm, yyyy)</i>	January 1 to December 31, 2015
Report established by: <i>(name, position)</i>	Dr. C Juan J. Silva Pupo, Coordinator chair

To be returned by electronic mail to both: unitwin@unesco.org and i.nichanian@unesco.org

Or by mail to UNESCO, Division for Teacher Development and Higher Education,

Section for Higher Education

7, place Fontenoy – 75352 Paris 07 SP, France

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1. Executive Summary:

Major outcomes, results and impact of the Chair, including on national policies, in relation to its objectives as stated in Article 2 of the Chair Agreement (between the Institution and UNESCO)

(Not exceeding 300 words)

The work of the UNESCO Chair stands out for participation in research related to the propagation, conservation and production of healthy plants combining biotechnology and traditional methods, water and salt stress, environment, urban and peri-urban agriculture and local development among others, with the presence of international and national projects, being greater the impact of investigations, achieving greater visibility of science embodied in the proposal for an ACC prize, an Ramal prize Agriculture 2015 Award for Technological Innovation at the provincial level a Provincial prize in the event PROECO the Central University of Las Villas, scientific publications referenced databases. It is noteworthy participation in a significant number of national and international prestigious events. Also excels successful coordination of the VIII International Workshop on Sustainable Agriculture and Plant Biotechnology as part of the V Cuban Congress of Local Development held in March 2015.

Vocational motivation activities in biotechnology UNESCO associated schools and other educational institutions in the province Granma developed. At the national workshop network of UNESCO Chairs in Cuba it was agreed that the Chair was home to the X Workshop in 2016. Contacts with Cuban and foreign scientific institutions as the University of Ghent, Belgium were established.

2) Activities:

Overview of activities undertaken by the Chair during the reporting period

a) Education/Training/Research <i>(key education programmes and training delivered and research undertaken by the Chair during the reporting period, target group and geographical coverage)</i>	
i) Education (leading to certificate)	<p>Profiled electives biotechnology as Biotechnological Processes, micropropagation and biotechnology elements in the careers of Industrial Engineering, Agricultural Engineering and Forestry respectively Engineering are taught.</p> <p>The following courses as part of several master's degrees by the members of the UNESCO Chair were held.</p> <p>Project management course (Master of Agricultural Sciences)</p> <p>Scientific communication course (MSc in Sustainable Management of Natural Resources)</p> <p>Biostatistics course (MSc in Sustainable Management of Natural Resources)</p> <p>UNESCO Chair members participated in training graduate students in Agroecology and Endogenous Development and mastery of Sciences.</p>
ii) Training (short term)	<p>Training for professionals in Granma province and the University itself in the plant tissue culture and laboratory technicians, built to support research and teaching were developed. Among the activities are the following:</p> <p>Preparation of culture media.</p> <p>Use and operation of laboratory equipment.</p> <p>Sowing in the laminar flow.</p> <p>Vegetable disinfection samples to establish in vitro.</p> <p>Other training activities and training were also developed in related to the actions of the members of the chair, as the focus of the logical framework and planning matrix areas.</p>
iii) Research	<p><u>Projects where members of the chair participate.</u></p> <ol style="list-style-type: none"> 1. Ecophysiological characterization of coccoloba uvifera. Case tolerant to salinity and drought in Cuba species. Budging VLIR, Bélgica. Coordinator: Dr. Raúl López Sánchez (2014-2018). Monto en el periodo 5 800 CUC. 2. Network of Biodiversity. EDUNABIO. Financista: DAAD Alemania. Coordinator: Dr. Raúl López (2014-2018). 3. Agrochain project. Coordinador FCA: Dr.C. Misterbino Borges García. (2014-2020). Food production. 4. Seed production system categorized yam (Dioscorea spp) in the province of Granma. Coordinador: Dr.C. Misterbino Borges García. University Project. 5. Development of national currencies for protection and benefit of

crops of economic interest biostimulators. (P131LH001160). Dr.C. Orlando González Paneque (2014-2018). National Programme for Food.

MAIN SCIENTIFIC RESULTS

1.-Methodology of Selection of plants tolerant to salinity agricultural interest in Granma Province.

2. Genetic transformation in soybean variety INCASOY 27.

3. Bank of seed production and spread categorized yams (*Dioscorea* spp) in the province of Granma. Creating the first seed bank categorized in the eastern region of Cuba, composed of seven clones of three species of these three commercial (Belep, Guinea and Papa) and four endogenous (Caballo, Caraqueño, Creole and Chinese White) own achieved the region. A production of 12,000 categorized seeds, which were distributed to the municipality approved producers Bayamo (1.1 ha) and Jiguaní (0.1 ha) was obtained advanced. The seeds were established under field conditions with 100% survival and the plants showed a vigorous and exuberant vegetative development. This innovation is the first of its kind in the eastern region of Cuba and relevance and demonstrated a significant impact on the recovery and sustainable agricultural extension of a crop of great commercial and nutritional interest.

4. Establishment of in vitro *Citrus aurantifolia* Swing. var. Mexican from nodal segments.

It was shown that the use of sodium hypochlorite 1% for 20 minutes was effective in disinfecting nodal segments of Mexican lime, with a high percentage of establishment (76%) and a vigorous vegetative development of in vitro plants. It was identified as the main pollutants in vitro culture of nodal segments of Mexican lime bacteria and fungi *Aspergillus niger* filamentous and *Penicillium* spp.

5. Spread accelerated from Guinea yam tubers minisegments.

As part of the adjustments of the production technology of healthy plants yam Clone Guinea from the technique minisegments a commercial scale was shown that results obtained showed that the best treatments were sizes minisegments 1.5 and 2 cm² with a good vegetative development and production of commercially valuable tubers (1.3 and 1.2 kg), with a cost savings of 837 000 Cuban pesos for 1000 production climbed 000 seedlings. These results are in phase introduction in the farm seed categorized the CEBVEG in the UDG that is taxed at the provincial seed farm in Granma.

6. Cell suspensions in cocoa from callus CCN-51 clone.

Formation of somatic embryos in globular stage in clone CCN-51 from callus with the use of orbital shakers was obtained, demonstrating the potential of cell suspensions to induce formation of somatic embryos in amounts higher to the culture medium semisolid, particularly in this clone had not been achieved induction of somatic embryos.

Prizes awarded

National awards

- Ramal Agriculture Award 2015 obtained by the DrC. Misterbino Borges García
- Test skills in plant biotechnology. STUDENT FORUM NATIONAL AGRICULTURAL SCIENCES. Author: Deysi

	<p>Cristina Corrías Romero Promotor: MSc. Lillien Fajardo Rosabal. Obtained category of OUTSTANDING.</p> <p>CITMA provincial awards (2)</p> <ul style="list-style-type: none"> ➤ Methodology Selection of plants tolerant to salinity agricultural interest in Granma Province DrC . Raúl López Sánchez y Ernesto Gómez Padilla. ➤ Genetic transformation via <i>Agrobacterium tumefaciens</i> soybean cultivar Cuban IS-27 [<i>Glycine max</i> (L.) Merrill]. Jorge Pérez Pérez <p>Provincial Technological Innovation Award (1)</p> <ul style="list-style-type: none"> ➤ System seed production and extension categorized yam (<i>Dioscorea</i> spp) in the province of Granma Responsible: Dr.C. Misterbino Borges <p>Awards Municipal Forum of Science and Technology (4)</p> <ul style="list-style-type: none"> ➤ Respuesta agronómica del ñame clon Criollo a partir de bulbillos aéreos a nivel local. Dr. C. Misterbino Borges García*, Ing. Ubail Ávila Medina y MSc. Tania Lambert García. ➤ Prospección y producción de metabolitos secundarios bioactivos en masas celulares de <i>Theobroma cacao</i> L. M.Sc. Lillien Fajardo Rosabal, Dr. C. Juan J. Silva Pupo, Dr. C. Blanca Gallo Hermosa, Dr. C. Maria Viloría Bernal, Yeilen P. Figueredo Delgado ➤ Estudio fitoquímico y de la actividad antibacteriana y antifúngica <i>in vitro</i> de los extractos de las hojas de <i>Faramea occidentalis</i> (L.) A. Rich. (Nabaco). Ms.C. Mijail Mijares Bullaín Galardis ➤ Establecimiento y multiplicación <i>in vitro</i> de <i>Citrus aurantifolia</i> Swing. var. Mexicana a partir de segmentos nodales. MSc. Yanet Hernández Jerez, DrC. JJ Silva y Dr.C. Misterbino Borges García. <p>Award provincial</p> <ul style="list-style-type: none"> ➤ Recuperación del cultivo del limón criollo a través de las técnicas de cultivo de tejidos. Yanet Hernández Jerez, Juan José Silva y Misterbino Borges. Obtuvo categoría de MENCION. EVENTO PROECO celebrado en el IBP, UCLV. Abril 2015 <p>Award Rector 2015. The Best scientific collective: Plant Biotechnology Studies Centre</p>
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b) Conferences/Meetings

(key conferences and meetings organized by the Chair or to which its Chairholder contributed)

i) Key conferences and workshops hosted by the Chair

The VIII International Workshop on Plant Biotechnology and Sustainable Agriculture was developed as part of the V Cuban Congress of Local Development, sponsored by the own University of Granma and participation of colleagues from Mexico, Venezuela, Guatemala and Brazil also he succeeded to Cuban experts several universities and research centers in the country. Among the works presented one on the results and prospects of development of the UNESCO Chair in Agricultural Biotechnology for local development.

At the end of the year in December to round off the work the First Workshop of the UNESCO Chair was held with the participation of members of the chair and professors of the Faculty of Technical Sciences working in the use of methane to produce renewable energy as well as professional of the Biofactory Granma devoted to the propagation of plants by biotechnological methods. Altogether a total of 11 papers were presented.

Workshop Network of UNESCO Chairs in Cuba. January 2015.

□ Results of the UNESCO Chair in Agricultural Biotechnology 2014. Paneque Orlando González, Juan J. Silva Pupo and Misterbino Borges.

Workshop Network of UNESCO Chairs in Cuba. December 2015.

□ Results of the UNESCO Chair in Agricultural Biotechnology 2015. John J. Silva Pupo, Orlando González Paneque, and Misterbino Borges Garcia.

ii) Other conferences/organizational activities undertaken by the Chairholder

Conference: The Development of Biotechnology in Cuba. Contributions to food security, was given by Dr. Juan J. Silva Pupo C in school associated with UNESCO Battle of Guise in the municipality of Rio Cauto and the Pre-University Institute of Exact Sciences "Silberto Alvarez" the municipality Bayamo, between the two conferences attended by 288 pre-university and polytechnic students, teachers and administrators.

Conference: The logical framework in project development. Dr. C. John J. Silva Pupo. Participating leaders of the UNDP project "Agrocadenas". 15 people attended.

Biodiversity Fair yam. IV Local Development Workshop CUM Jiguaní. Dr. C Misterbino Borges Garcia. 50 participants

iii) A selection of conference presentations by the Chairholder and other colleagues Una selección de las presentaciones de la conferencia por el titular de la Cátedra y otros colegas

Local Development Workshop Gulf (GOLF 2015)

Conference: "Biotechnology and its impact on agriculture" DrC. Orlando González Paneque.

iii) A selection of conference presentations by the Chairholder and other colleagues A selection of conference presentations by the holder of the Chair and colleagues

V Cuban Congress of Local Development. VIII International Workshop on Sustainable Agriculture and Plant Biotechnology. March 2015.

1. Identificación y producción *in vitro* de metabolitos secundarios de interés fitosanitario en tres clones de *Theobroma cacao*. MSc. Lillien Fajardo Rosabal.
2. Estudio fitoquímico y de la actividad antibacteriana y antifúngica *in vitro* de los extractos de las hojas de *Faramea occidentalis* (L.) a. rich. (nabaco). MSc. Mijail

Bullaín Galardis.

3. Avances en la transformación genética vía *Agrobacterium tumefaciens* de embriones somáticos de soya. MSc. Jorge Pérez Pérez.
4. Metodología de propagación *in vitro* de *Citrus aurantifolia* christm. swing. var. "mexicana". MSc. Yanet Hernández Jeréz.
5. Avances de la Biotecnología Vegetal en el CEBVEG de la Universidad de Granma y su impacto en el desarrollo local sostenible. DrC. Misterbino Borges García.
6. Resultados de la desinfección de explantes de *Agave cocui* para el establecimiento del cultivo *in vitro*. UDG-Universidad Nacional Experimental Francisco de Miranda. DrC. Juan Silva Pupo.
7. Experiencias sobre la formación académica del programa de Maestría en Agroecología y Desarrollo Endógeno impartido en el estado de Barinas, Venezuela, por la Universidad de Granma. Roberto Velázquez Feria.
8. Cátedra UNESCO en Biotecnología Agrícola para el Desarrollo Local. Resultados y perspectivas. Dr. C. Juan Silva Pupo, Dr. Orlando González Paneque y Dr. C Misterbino Borges García.

Venezuelan XXI Congress of Botany

- Desinfección superficial de bulbilos de *Agave cocui* para la inducción *in vitro* de embriogénesis somática. Yuslegny Chirinos, **Juan J. Silva** y Liannete Yépez.

21st International Congress on Modelling and Simulation (MODSIM2015).

Broadbeach. Queensland, Australia from Sunday 29 November to Friday 4 December 2015.

- Covariance analysis of sugarcane variety experiments (*Saccharum* spp.) in contrasting environments. **S. Rodríguez^a**, **S. Berres^b**, G. Antúnez^a, Y. Pérez^a, L. Silveira^c, L. Rodríguez^d, F. Guevara^e, I. Expósito^a, S. Valle^f, M.C. Conci^g, G. Cupri^h and A. Mercado^a

EVENT PROECO held at the IBP, UCLV. April 2015 (provincial character).

- Recuperación del cultivo del limón criollo a través de las técnicas de cultivo de tejidos. Yanet Hernández Jerez, Juan José Silva y Misterbino Borges. **Obtuvo categoría de MENCION.**

Congress University 2016 May 2015 (Event base and provincial).

- Cátedra UNESCO en Biotecnología Agrícola para el Desarrollo Local. Resultados y perspectivas. Dr. C Juan Silva Pupo, Dr. C Orlando González Paneque y Dr. C Misterbino Borges García.
- Resultado de cooperación interuniversitaria. Doctorado conjunto en ingeniería rural. UPM, España – UDG, Cuba. Sergio Rodríguez Rodríguez; Yulianne Pérez Escalona e Iliana Arias Yero

Local Development Workshop Gulf (DelGolf 2015)

Conferencia: "La Biotecnología y su impacto en la agricultura" DrC. Orlando González Paneque.

IV Workshop on Local Development Jiguani municipality.

Feria de Biodiversidad de ñame. DrC. Misterbino Borges García

FORUM ON SCIENCE AND MUNICIPAL.

- Estudio fitoquímico y de la actividad antibacteriana y antifúngica *in vitro* de los

extractos de las hojas de *Faramea occidentalis* (L.) A. Rich. (Nabaco). Ms.C. Mijail Mijares Bullaín Galardis. **Obtained category of outstanding.**

- Establecimiento y multiplicación *in vitro* de *Citrus aurantifolia* Swing. var. Mexicana a partir de segmentos nodales. MSc. Yanet Hernández Jerez, DrC. JJ Silva y Dr.C. Misterbino Borges García. **Obtained category of outstanding.**
- Respuesta agronómica del ñame clon Criollo a partir de bulbillos aéreos a nivel local. Dr. C. Misterbino Borges García*, Ing. Ubail Ávila Medina y MSc. Tania Lambert García. **Obtained category of outstanding.**

FORUM OF SCIENTIFIC AND TECHNICAL BASE.

- Empleo de la luz solar en la formación y multiplicación de embriones somáticos de tres cultivares cubanos de soya. MsC. Jorge Pérez Pérez. **Obtained category of excellent**
- Respuesta agronómica del ñame clon Criollo a partir de bulbillos aéreos a nivel local. Dr. C. Misterbino Borges García*, Ing. Ubail Ávila Medina y MSc. Tania Lambert García. **Obtained category of excellent.**
- Estudio fitoquímico y de la actividad antibacteriana y antifúngica *in vitro* de los extractos de las hojas de *Faramea occidentalis* (L.) A. Rich. (Nabaco). Ms.C. Mijail Mijares Bullaín Galardis. **Obtained category of excellent.**
- Establecimiento y multiplicación *in vitro* de *Citrus aurantifolia* Swing. var. Mexicana a partir de segmentos nodales. MSc. Yanet Hernández Jerez, DrC. JJ Silva y Dr.C. Misterbino Borges García. **Obtained category of excellent.**
- Selección de variedades frijo Caupi (*Vigna unguiculata* (L) Walp) y cepas nativas de *Bradyrhizobium* em suelos afectados por sales. DrC. Ernesto Gómez Padilla y DrC. Raúl López Sánchez. **Obtained category of excellent.**
- Prospección y producción de metabolitos secundarios bioactivos en masas celulares de *Theobroma cacao* L. M.Sc. Lillien Fajardo Rosabal, Dr. C. Juan J. Silva Pupo, Dr. C. Blanca Gallo Hermosa, Dr. C. Maria Viloría Bernal, Yeilen P. Figueredo Delgado. **Obtained category of outstanding.**
- Cultivo de plantas ornamentales en macetas en el CEBVEG. Tec. Dariela Olivet Cedeño. **Obtained mention category.**
- Rescate y propagación de *Salix babilónica*. DrC. JJ Silva, Yanet Hernández Jerez y Sergio Rodríguez. **Obtained mention category.**

STUDENT EVENTS.

1. SCIENTIFIC FORUM STUDENT UDG

- Establecimiento y multiplicación *in vitro* de *Citrus aurantifolia* Swingle a partir de semillas. **Obtained category of outstanding.**
Autora: Maricel Bahi Arevich. Promotor: MSc. Yanet Hernández Jerez
- Efecto de ANA y BAP en la multiplicación *in vitro* del ñame (*Dioscorea alata* L) clon caraqueño. **Obtained category of outstanding.**
Autora: Yuneisi González Reyes. Tutor Dr. C. Misterbino Borges García
- Uso de cámara húmeda en la aclimatización de plantas *in vitro* de ñame (*Dioscorea alata*) clon caraqueño. Nazer Oscar López Pérez. Promotor: Dr. C. Misterbino Borges García y M Sc. Yanet Hernández Jerez. **Obtained mention category.**
- Efecto de distintos sustratos en la aclimatización de plantas *in vitro* de ñame (*Dioscorea alata*) clon caraqueño. Promotor Dr. C. Misterbino Borges García y M Sc. Yanet Hernández Jerez. **Obtained mention category.**

2.- STUDENT FORUM NATIONAL AGRICULTURAL SCIENCES

- Establecimiento y multiplicación *in vitro* de *Citrus aurantifolia* Swingle a partir de semillas. Autora: Maricel Bahi Arevich. Promotor: MSc. Yanet Hernández Jerez

- Efecto de ANA y BAP en la multiplicación *in vitro* del ñame (*Dioscorea alata* L) clon caraqueño. Autora: Yuneisi González Reyes. Promotor Dr. C. Misterbino Borges García
- Efecto del ácido salicílico en la formación de callos y diferenciación celular en tres clones de *Theobroma cacao* L. Author: Deysi Cristina Corrias Romero. Promotor: MSc. Lillien Fajardo Rosabal
- Producción de callos para la obtención de metabolitos secundarios de interés fitosanitario en cultivos celulares de *Theobroma cacao*, clon UF-650. Author: Yeilen Paula Figueredo Delgado Promotor: MSc. Lillien Fajardo Rosabal
- Prueba de habilidades en BIOTECNOLOGÍA VEGETAL. Author: Deysi Cristina Corrias Romero Promotor: MSc. Lillien Fajardo Rosabal. Obtuvo categoría de RELEVANTE.

c) Interuniversity Exchanges/Partnerships

(principal exchanges/partnerships between the Chair and other institution,s including UNESCO Chairs/UNITWIN Networks)

- Workshop INTERREG Caribbean. Guadalupe. France. Dr. C Misterbino Borges Garcia. Research project proposal development for the Caribbean on yam cultivation.
- Participation in the mastery of Agroecology and Endogenous Development at the University Institute "Alonso Gamero" Coro, Falcon State, Bolivarian Republic of Venezuela. Dr. Orlando Gonzalez Paneque
- Investigatory stays at the University of Antwerp, Belgium and Rostock in Germany. Dr. Raul Lopez Sanchez

d) Publications/Multimedia Materials

(major publications and teaching/learning materials)

Please tick relevant fields of output and indicate volume of output:

	[tick]	[no.]
Books	<input type="checkbox"/>	
Books (edited)	<input type="checkbox"/>	
Books (chapters)	<input checked="" type="checkbox"/> X	1
Monographs	<input type="checkbox"/>	
Research Reports	<input type="checkbox"/> X	
Journal Articles (refereed)	<input checked="" type="checkbox"/> X	7
Conference Proceedings	<input type="checkbox"/> X	
Occasional Papers	<input type="checkbox"/>	
Teaching/Learning Materials	<input type="checkbox"/> x	1
Multimedia Materials (CD-Rom)	<input type="checkbox"/> X	
Multimedia Materials (Video)	<input type="checkbox"/>	

	Multimedia Materials (Other) <input type="checkbox"/>
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Give details of major publications and materials including full citations.

- **Doctoral Theses**

- Somatic embryogenesis in soybean (*Glycine max* L. Merrill) culturing INCASOY-27 and its application in genetic transformation via *Agrobacterium tumefaciens*. Dr. Jorge Pérez Pérez

- Cawpi selection of varieties of beans and *Rhizobium* strains tolerant to salinity. Dr. C Ernesto Gomez Padilla

Master thesis

Evaluation of the antibacterial activity of dry extract of leaves *Faramea occidentalis*. Ms. C Mikhail Bullain

ii) Publications

1.- Determinación de la concentración mínima inhibitoria de Glufosinato de amonio para seleccionar embriones somáticos transformados de soya cultivar INCASoy-27. *Cultivos Tropicales*, 36 (3): julio-septiembre, 2015. **MSc. Jorge Pérez Pérez**

2.- Evaluación de la actividad antibacteriana del extracto seco de las hojas de *Faramea occidentalis* en la revista argentina *Química Viva*. 2015. **MSc. Mijail Bullain Galardis**

3.- Sensibilidad al herbicida Glufosinato de amonio en plantas de soya cultivar INCASoy-27. *Centro Agrícola*, 41 (4): 63-67. octubre-diciembre, 2014. **MsC. Jorge Pérez Pérez**

4.- Tamizaje fitoquímico de los extractos de *Faramea occidentalis* (L.) A. Rich.(nabaco) en la Revista Cubana de Plantas Medicinales. 2015. **MSc. Mijail Bullain Galardis**

5.- Extracción in situ de ADN genómico para el análisis por PCR de regiones de interés en cuatro especies vegetales y un hongo filamentoso". *Biología Vegetal*, 14 (3): 151-154. julio-septiembre, 2014. (Grupo 2). Coautor: Rojas, L.E.; Reyes, M.; Pérez-Alonso, N.; Olóriz, M.I.; Posada-Pérez, L.; Ocaña, B.; Portal, O.; Chong-Pérez, B.; **Pérez-Pérez, J.L.**

6.- Respuesta en campo de plantas in vitro de *Dioscorea alata* L. clon 'Caraqueño' en distintos momentos de plantación. *Biología Vegetal* Vol. 15, No. 3: 137 - 142, julio - septiembre, 2015. **Misterbino Borges García**, Rafael Gómez-Kosky, Edil Estrada Abeal, Diana Reyes Avalos, Bernard Malaurie y Reisel Destrada Batista.

7.- Evaluación de dos métodos de monitoreo de *Maharva andigena* Jacobi en el cultivo de la caña de azúcar (*Saccharum* spp., híbrido) en la provincia de Pastaza, Ecuador. *Rev. Protección Veg.* Vol. 30 No. 3 (sep.-dic. 2015). Segundo Valle Ramírez, Miguel Iparraguirre Cruz, Ana Puertas Arias, **Sergio Rodríguez Rodríguez**, Antonio Fiallos Robalino, Leopoldo Hidalgo Díaz, Ileana Miranda Cabrera

8.- Resultados del programa de maestría en Agroecología y Desarrollo Endógeno impartido en Barinas, Venezuela, en la UPT José Félix Ribas, por la Universidad de Granma, Cuba. **Roberto Velázquez**; Oscar Rodríguez; Francisco Contreras; **Orlando González**; **Juan J. Silva**. *REVISTA POLITÉCNICA Y TERRITORIAL*. VOL 1, NRO.1, 2015. BARINAS,

VENEZUELA.

9.- Evaluación de genotipos mejorados de frijol negro (*Phaseolus vulgaris*), en Barinas y Monagas, Venezuela. Águeda Duran A; Tania Lambert G; **Roberto Velázquez** F. REVISTA DE CIENCIAS AGRÍCOLAS, Volumen 31 (2): 63 – 75 Segundo Semestre ISSN Impreso 0120-0135. Colombia, 2015.

Books

1.-Algunas experiencias académicas de los programas de maestría y doctorado desarrollados por el Convenio de Cooperación Integral Cuba-Venezuela: **Roberto Velázquez** et.al., p 52/59. MES-MPPEUCT 20072014 / compiladores: Guillermo Jesús Bernaza Rodríguez, Adda Crisey Porras y Allan A. Pierra Conde. -- La Habana : Editorial Universitaria, 2015. -- ISBN 978-959-162436-9.-- vi, 99 páginas: ilustraciones, tablas. Capítulo: "Experiencias sobre la formación académica del programa de maestría en Agroecología y Desarrollo Endógeno", impartido en el estado Barinas, República Bolivariana de Venezuela. DrC. **Roberto Velázquez Feria** Oscar Rodríguez; Francisco Contreras; **Orlando González**; **Juan J. Silva**.

e) Cooperation with UNESCO Headquarters, Field Offices

Communication with Dr. Salvatore Arico as the focal point of the UNESCO Chair in order to see possibilities of cooperation between the chair and UNESCO established.

f) Other

(any other activities to report)

Preparation of new international projects for submission to calls in Bélgica. Project to present the Ernest Solvay Foundation.

contact Dr. Stefaan Werbrouck University of Ghent was established. This allowed the presentation of a project to VLIR call, not being approved the proposal, but will be improved and will be presented in 2016.

A meeting with Javier Garijo Association Euskadi-Cuba Friendship for submission of new projects in 2016 was held.

The participation of members of CEBVEG Court in the Student Forum and the Science and Technology Faculty and the National Forum of Students of Agricultural Sciences stands out, and as arbiters of articles and projects of national and international.

Excels the formulation and management of new projects: Strengthening knowledge management and innovation for local development in the municipality of Jiguani, Granma province. Financier NGOs Euskadi-Cuba CERAI. DrC. Misterbino Borges Garcia.

Participation in the National Biotechnology Network Guatemala (RedBloNaGual).

A teacher is a member of the Provincial Executive Committee of the ATAF Granma province.

A teacher is technical advisor council member Bayamo municipality.

A teacher is a member of the scientific center of Granma.
 Participation of members of the chair as arbitrators in several publications: mesoamericana Agronomy, Biotechnology magazine Revista Colombia and FEC Science at the University of Zulia.
 Participation in the discussion list of plant tissue culture at the University of Minnesota, United States.
 Research Institute visits were conducted in Frutales to establish lines of joint research.
 Preparation and submission to the website of the Network of UNESCO Chairs in Cuba.
 Visit to the Cuban Commission for UNESCO.

3. Future Plans and Development Prospects:

Outline of action plan for the next biennium and short/medium and long-term development prospects. Please do not hesitate to refer to difficulties that the Chair has experienced
 (Not exceeding 300 words)

1. Strengthen the activity of research, development and innovation of the UNESCO Chair in terms of enhancing scientific results.
2. Propose a new Master of Agricultural Biotechnology including plant biotechnology and microbial biotechnology to respond to the eastern territory in that regard.
3. Promote the presentation of international cooperation projects to improve the infrastructure of teaching and promote better conditions for research, graduate studies and other activities of the chair.
4. Strengthen links with UNESCO Schools Granma province through conferences, exhibitions and other forms of vocational training to careers that contribute to agricultural biotechnology.
5. Establish links with the Biosphere Reserve Alejandro Humboldt Park existing in the eastern region of Cuba.
6. Continue the organization of the UNESCO Chair Workshop annually.
7. Increase working relations with the institutions with which contacts were established to enhance the chair, such as: Polytechnic University of Madrid, Polytechnic University of Cartagena and Alicante in Spain and the University of Ghent, Belgium.
8. Keep the website of the chair and its hyperlink to the website of the Network of UNESCO Chairs.
9. Establish an exchange with other similar UNESCO Chairs internationally and with UNESCO Chairs in Cuba.
10. Improvement of methodological scientific work in the electives taught by the members of the chair related to biotechnology.

Appendix:

1) Human Resources

General Coordinator: Dr. C Juan J. Silva Pupo Email : jsilvap@udg.co.cu

Chairman of the Academic Committee: Dr. C Juan J. Silva Pupo Email: jsilvap@udg.co.cu

Committee Academic and teaching staff

Dr. Orlando González Paneque

Dr. Misterbino Borges García

Dr. Jorge Pérez Pérez

Dr. Ernesto Gómez Padilla

Dr. Sergio Rodríguez Rodríguez

Dr. Raúl López Sánchez

Ms. C Yanet Hernández Jerez

Ms. C Lillien Fajardo Rosabal

Ms. C Mijail Bullain Galardi

Ms. C Luis Tamayo

Ing. Aracelis Villavicencio Ramírez

Technical Dariela Olive Cedeño

2) Financial Resources

Please tick sources of financial contribution and specify the amount in U.S. dollars

	[tick]	Amount (\$)
Host Institution	<input type="checkbox"/>	<u>70000 CUP</u>
Partner Institution	<input type="checkbox"/>	<u>6000.00 USD</u>
Government Body	<input type="checkbox"/>	_____
Other Public Institution/Body	<input type="checkbox"/>	_____
(incl. Research Councils)		
UNESCO	<input type="checkbox"/>	_____
Other UN Agency	<input type="checkbox"/>	_____
IGO	<input type="checkbox"/>	_____
NGO	<input type="checkbox"/>	_____
Industry	<input type="checkbox"/>	_____
Other Private	<input type="checkbox"/>	_____

Give details of financial contributions, material resources and space.

University of Granma provides budgetary resources salaries of members of the chair, the supply of electricity, water and transportation for the operation of laboratories within it.

Support was also received on diets and tickets to attend the performance of the two workshops of the Network of UNESCO Chairs in Havana.

By the draft ecophysiology *Coccoloba I uvifera* funded by Belgium VLIR financing (6,000 euros) was received in equipment and sundries.

University of Granma maintains the space designated for the operation of the Chair.

Other financing arrangements, which should materialize in 2016 were also conducted.

End of the Form