Strategic Investment in Rapid Technology Dissemination: Commercialization of Disease Resistant Bean Varieties in Guatemala, Nicaragua, Honduras and Haiti.

(Associate Award to the Dry Grain Pulses CRSP)

October 1, 2010 – September 28, 2013

FY 2011 ANNUAL TECHNICAL PROGRESS REPORT

Period October 1, 2010 – September 30, 2011

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LIST OF ACRONYMS

Acronym	Meaning
CSB	Community Seed Banks
BTD	Rapid Bean Technology Dissemination Project
CIAT	Centro de Investigación Agrícola Tropical, Cali, Colombia
CRSP	Collaborative Research Support Program
Cwt.	Hundred-weight (sacs of 100 lbs)
DICTA	Dirección de Ciencia y Tecnología Agropecuaria-Honduras
DR	Dominican Republic
EAP	Escuela Agrícola Panamericana-Zamorano, Honduras
FIPAH	Fundación para la Investigación Participativa con Agricultores en Honduras
FTF	Feed The Future
FUNDIT	Fundación para la Innovación Tecnológica, Agropecuaria y Forestal
FY	Fiscal Year
ICTA	Instituto de Ciencia y Tecnología Agrícolas, Guatemala
IDC	Indirect Cost - rate
IICA	Inter-American Institute for Cooperation on Agriculture
INTA	Instituto Nicaragüense de Tecnología Agropecuaria, Nicaragua
MO	Dry Grain Pulses CRSP Management Office- MSU
MSU	Michigan State University
MT	Metric Tons
NGO	Non-Governmental Organization
NSS	National Seed Service- Haiti
SNEA	Sistema Nacional de Extensión Agrícola- Guatemala
SOW	Scope(s) of Work
UNISEM	Unidad de Semilla – INTA, Nicaragua
UPR	University of Puerto Rico
USAID	United States Agency for International Development

1. Introduction

The Bean Technology Dissemination (BTD) project ("*Strategic Investment in Rapid Technology Dissemination: Commercialization of Disease Resistant Bean Varieties in Guatemala, Nicaragua, Honduras and Haiti* ") addresses the shortage of high-quality bean seed of improved varieties available to resource-poor farmers in Haiti, Guatemala, Honduras and Nicaragua. The objectives of the project are aligned with the goals of the U.S. Government's Feed the Future (FTF) Initiative which involves a multi-agency response to increasing staple food prices and the persistent food insecurity in many developing countries. In support of FTF programming, the BTD project seeks to contribute to the achievement of four central goals: (1) to increase agriculture productivity, profitability and income of farm families; (2) to disseminate outputs of agriculture research so as to reduce risk/vulnerability and to increase productivity gains of staple crops; (3) to increase market access in an improved policy environment with greater private sector investment; and (4) to increase nutritional interventions so as to reduce child mortality and improve nutritional outcomes. The BTD project is proud to have successfully completed the first year's activities (FY 2011; October 1, 2010 – September 30, 2011) and to have laid a strong foundation in all four host countries to achieve the dissemination goals during this and the remaining two years of the project, FY 2012 and 2013.

During this first year of the project, BTD activities focused on identifying appropriate partners and establishing sub-contracts for implementation of project activities both at the regional and at the country levels. As outlined in the Semi Annual Report presented to USAID in June 2011, finding institutional partners with a reputable background in seed systems support and ties to small-holder farmer organizations demanded a major portion of the BTD Management Office's (MO) attention during the first months of the project. Efforts during the second half of Year 1, however, focused more on providing leadership in project implementation; developing Scopes of Work for each partner institution and holding them accountable for achievement of target dissemination goals in each country. We are confident that strong institutional ties and administrative platforms have been established on which Year 2 and Year 3 activities can be expanded.

Working with four different countries has demanded a tailored approach necessary to address the needs of diverse bean farmer populations, to align with varied agriculture policies of the host country governments regarding seed programs, as well as to adapt to the administrative cultures of the implementing partner institutions. The diversity of approaches and distinct roles is reflected in the Scopes of Work developed for each of the seven sub-contracted institutions. Regional coordination, constant communication, transparency, sharing of lessons learned from one country to another, and both in-country as well as MO programmatic monitoring have been absolutely essential for effective implementation of the project and for dealing with the diverse partner institutions (National Agriculture Research Institutions, National Extension Systems, agricultural universities, NGOs, and private businesses). Nonetheless, such a customized approach has paid off leading to the following quantitative highlights for FY 2011.

- **22,221**: number of small-holder farmers who received quality seed of improved bean varieties (developed with financial support from the Bean/Cowpea and Dry Grain Pulses CRSP) through dissemination efforts during two planting seasons in FY 11 in the four

countries. Summary tables of distribution data are provided in a summary for each country.

- **5,238**: number of hectares cultivated with improved bean varieties multiplied and disseminated by BTD partners during the period of July and November 2011.
- **55**: number of producer organizations partnering with the BTD project in seed multiplication and dissemination (this includes previously established community seed banks in Nicaragua, rural NGOs partnering with EAP/Zamorano, and farmer groups multiplying seed for DICTA).
- **207**: number of "community seed banks" established and benefitting; 200 organized in Nicaragua as part of the Year 1 Scope of Work and 7 new banks in Guatemala as a result of the exchange of experiences with the Nicaragua INTA model.
- **11**: Number of improved seed varieties disseminated that were developed with support from the Bean/Cowpea and Dry Grain Pulses CRSPs.

As is evident in this FY 2011 Report, the MO has placed high priority on implementing the BTD project in a manner that contributes to the establishment of "sustainable" bean multiplication and dissemination systems in each country; systems that continue following the completion of this three-year project. This sustainability goal has also been given nearly equal priority as the dissemination targets (number of beneficiary farmers) by the NARSs partnering in the project. The consensus of the bean sector based on years of experience in both developed and developing countries is that community preoccupation for and commitment to ensuring "seed security" plus farmer ownership of the production of high quality seed (of large-seeded self pollinated staple grains such as beans) to meet local planting needs are critical "sustainability factors" that should be considered in the design of the BTD project.

The MO has been extremely pleased to have established a partnership with INTA (Instituto Nicaragüense de Tecnología Agropecuaria) which has a vision for the establishment of "Bancos Comunitarios de Semilla" (Community Seed Banks) for the multiplication of quality seed of improved varieties of staple grains (e.g., open pollinated maize, common bean, sorghum, etc.) as a strategy to meet the needs of small-holder resource-poor farmers in Nicaragua. Through the BTD project, INTA has been able to effectively implement its national strategy of establishing and providing technical assistance to 200 Community Seed Banks (CSB) and to promote the adoption of improved bean varieties with high yield potential. Based on this emerging base of experience with CSBs in Nicaragua, the MO has been seeking to educate the NARS in Guatemala, Honduras and Haiti about the potential advantages and sustainability characteristics of the CSB model. It is the MO's view that the CSB approach is adaptable enough to accommodate variations in community organization, types of bean-based cropping systems, and socio-economic environments to be transferable to other countries in Central America and perhaps in other continents (i.e., Africa). It is in this context that the MO views the cross-training on community based seed systems with ICTA-SNEA staff in Nicaragua, the establishment of 7 CSBs in Guatemala in FY 2011 and the interest by the Ministries of Agriculture in Honduras and Guatemala to promote the CBS model in the future as being major first year achievements of the BTD project.

On the other hand, the MO reports that it has faced significant challenges and complications during Year 1 to implement the BTD project in Haiti. The fundamental challenge has been to

engage partners which are either inherently weak (public sector institutions) and overcommitted due post earthquake reconstruction and recovery efforts in Haiti. Moreover, the MO has discovered that the National Seed Service (in the Ministry of Agriculture) believes that a strong alliance with the private sector will be the more sustainable approach for Haiti considering socio-economic norms. The focus during FY 2011 in Haiti has been therefore to define the roles of the various public – private players in the project (e.g., NSS, IICA, Agrotechnique), to establish the necessary contractual relationships and Scopes of Work, and to jump start the seed system by purchasing Certified Seed of a validated improved bean variety (DCP-40) and supporting the mass multiplication of the variety for future dissemination. Despite mixed experiences in year 1 in Haiti, the MO remains hopeful that the appropriate steps have been taken towards reaching a large number of Haitian bean farmers with an improved technology package. The engagement of the private sector is and will continue to be a priority approach but will require close monitoring and reassessment as the project progresses. Details on the challenges faced in Haiti are shared in section two of the report.

This FY 2011 report is organized in three major sections. First, country summaries are presented highlighting partner activities on seed multiplication, farmer training, technology dissemination, and performance monitoring. This is followed by reflections on challenges faced and lessons learned delving into proposed changes in Year 2. And third, an annex presents draft Scopes of Work and Budgets for Year 2. These are shared for USAID's information and continued perusal of the activities under the Associate Award.

2. Guatemala Summary

The BTD Project activities in Guatemala are being carried out by the Instituto de Ciencia y Tecnología Agrícolas (ICTA) and the Servicio Nacional de Extensión Agricola (SNEA). Both institutions are sub-sub-contracted through the Fundación para la Innovación Tecnológica Agropecuaria y Forestal (FUNDIT), the sole contracting entity with Michigan State University. The success of the BTD project in Year 1 in Guatemala can be largely attributed to the administrative capacity and the essential role that FUNDIT has played. FUNDIT has facilitated the timely flow of financial resources to ICTA and SNEA to deploy human resources and to procure materials and services for completion of project activities and has ensured compliance with the terms of the subcontract. This section summarizes the activities undertaken by ICTA and SNEA under the BTD sub-contract with FUNDIT.

Seed Multiplication- Guatemala

In Guatemala, ICTA is the national entity authorized to produce "genetic", "basic" and "registered" seed of staple crops including common bean, maize and other basic grains. As a long-term CRSP partner, a member NARS in the Central American bean research network, and one of the first institutions to commitment to the BTD project, ICTA's priority was to ensure the timely production of genetic seed stocks of bean varieties that have demonstrated high yield potential and adaptation in key bean producing areas of the country. After a comprehensive assessment of the areas with limited access to improved varieties, the Department of the Petén and the south-eastern departments (known as the "dry corridor") of Guatemala were selected as

the focus for Year 1 seed dissemination activities. This led to the selection of ICTA PETEN and ICTA LIGERO as the varieties with the highest potential to increase yields and which had not been widely disseminated among small-holder farmers. ICTA LIGERO was considered most suitable for promotion in the "dry corridor" due to its genetic resistance to the whitefly-transmitted golden mosaic virus, a problem under drought conditions. Farmer and market acceptance of this variety have also been highly positive from past experience. Additionally, ICTA LIGERO (which means "early" in Spanish) is precocious, maturing early, thus allowing farmers to escape the effects of drought during the "primera" and "postrera" planting seasons. For the Petén region in Northern Guatemala, ICTA PETEN has recently been released and has demonstrated good yield potential, earliness and higher iron concentration (76 ppm dry wt basis).

Through the BTD project, ICTA provided the "genetic" seed for these two varieties in October 2010 and proceeded to select seed multipliers in areas with a history of zero or lower infestations of seed-transmitted viral diseases. Another selection criterion was the cost to produce a 100 lb sac (cwt) since certified bean seed can be very expensive in the Guatemalan seed market. Based on these criteria, two farmers were selected and contracted in the Petén Department. Training and periodic visits were made by the ICTA team to ensure that appropriate steps were being taken to grow disease free grain of high quality. Table 1 summarizes the different seed categories and amounts produced in Year 1.

Table 1. Bean seed production, category and quantity

Seed Variety	Seed Category	Amount Seed Produced (cwt)
ICTA LIGERO	Certified	534.06 cwt
ICTA LIGERO	Genetic	5.6 cwt
ICTA PETEN	Certified	680.16 cwt
ICTA PETEN	Genetic	9.39 cwt
TOTAL		1229.21cwt

Figure 1. A field of ICTA LIGERO at flowering stage, Sayaxché, Petén, January 2011

Figure 2. ICTA Petén in flowering stage. Sayaxche, Petén, January 2011

Table 2 shows the seed that entered the ICTA warehouse for seed conditioning and packing. It is noteworthy that training on good harvesting and handling practices resulted in a low rate of rejection at the seed grading and packaging plant with only 0.8% of ICTA LIGERO and 2.4% of ICTA PETEN rejected. This means that the investment by the BTD project in the monitoring of the seed grain production resulted in a significantly higher yield (in terms of quantity of grain harvested that met seed quality standards) than grain from other regions of the country (a 5% and higher rejection rate is typical).

Table 2. Seed harvesting and conditioning results Year 1

Seed Variety	Seed Category	Harvested seed (c.w.t.)	Seed for Dissemi-nation (c.w.t.)	Seed bags of 20lb (number)	ICTA's stock for Year 2 (c.w.t.)	Seed Dockage (c.w.t.)
ICTA LIGERO	Quality-declared	534.06	500	2500	30	4.06
ICTA LIGERO	Genetic	5.6	0	0	5.6	0
ICTA PETEN	Quality-declared	680.16	564	2820	100	16.10
ICTA PETEN	Genetic	9.39	0	0	9.39	0
TOTAL		**1229.21**	**1064**	**5320**	**144.99**	**20.16**

Training and Technology Dissemination Activities- Guatemala

ICTA and SNEA technical training in FY 2011 was aimed at promoting an effective role for extension officers at the community level where they are assigned. This training took place before any seed dissemination activities took place. The BTD project agreed with ICTA and SNEA that newly-hired extension officers (the large majority) should be trained on extension approaches to build sustainable community-based seed multiplication and dissemination capacity. The vision was that extension agents would establish a network of rural promoters (progressive leader farmers), and train them on "seed" production practices and the use of other bean yield enhancing technologies. The Promoters would then be tasked with training other farmers in their respective communities on the value of planting improved varieties, the benefits of planting quality

seed (high germination potential, vigor and free of seed borne diseases), and methods to best handle and plant the quality seed.

The first training module consisted of an introduction to the project, emphasizing the importance of sustainable seed systems (Table 3). The second training module focused on best bean production practices and the use of *Rhizobium* inoculum to enhance biological nitrogen fixation. Interestingly, some extension officers were not familiar with these technologies and practices. The third module dealt with the BTD project organizational structure, encouraging extension agents to assume direct responsibility for dissemination activities, keeping good records on recipients of the seed technology package, evaluating results and farmer experience, and for motivating farmers to organize Community Seed Banks, similar to the model being implemented in Nicaragua.

Table 3. Training of extension staff in Guatemala through the BTD project.

Origin of Participants	# Participants	Training Date
Chiquimula	27	29/06/2011
Jalapa	2	29/06/2011
Jutiapa	28	30/06/2011
Santa Rosa	10	30/06/2011
Peten	46	07/07/2011
TOTAL PARTICIPANTS	113	

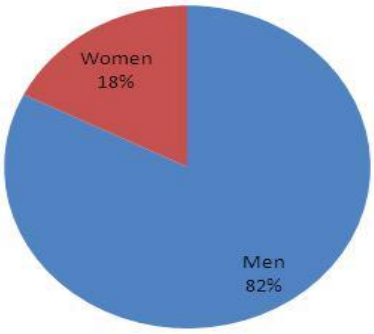
SNEA Knowledge-Sharing Tour to Nicaragua- Guatemala

In order to further motivate extension agents to engage in the organization of community seed banks, a knowledge-sharing trip to Nicaragua was organized in July 2011 with 25 selected SNEA extension agents and leading farmers from the Petén, Santa Rosa, Jalapa, Jutiapa and Chiquimula Departments in Guatemala. INTA hosted the group while visiting Nicaragua at the behest of the BTD MO.

Figure 3. SNEA and ICTA visiting INTA Nicaragua

The INTA vision and approach to organizing and supporting CSBs was explained to the SNEA visitors. Tours included a visit to three CSBs in Estelí and Masaya, Nicaragua. An outcome of this experience was a collective decision by participating extension agents to organize CSBs in their respective communities in Guatemala upon their return. With support from the BTD project, 7 CSBs were organized in Guatemala in FY 2011 and 35 more are being planned for Year 2.

Seed Dissemination- Guatemala



As of October 31, 2011, ICTA reports that 4995 farmers (18% of the recipients were women and the 82% men) received a 20 lb bag of improved bean seed. The dissemination was carried out by SNEA under close supervision and coordination with ICTA and FUNDIT. All targeted departments were reached in accord with the scheduled seasonal plantings of ICTA LIGERO and ICTA PETEN. A list of municipalities reached is provided in the Annex.

Figure 4. Proportion of men and women farmers reached by seed dissemination efforts.

Figure 5. Dr. Flores participates in a seed delivery event in Chiquimula with ICTA and SNEA personnel in Guatemala.

3. Honduras Summary

The project in Honduras is led by the Bean Program at the Escuela Agricola Panamericana-Zamorano, a long-term partner in the Bean/Cowpea and Pulse CRSPs. EAP/Zamorano plays a unique role in the project's three-year strategy by providing "basic genetic seed" and "foundation seed" of the selected improved bean varieties for dissemination to the national programs in the four participant countries in the BTD project. These NARS then assume responsibility for the multiplication and production of either "Registered" or "Certified Seed" to be distributed either to CSBs, NGOs or to private agri-businesses.

EAP/Zamorano also has the responsibility of working with community-based NGOs and farmer groups (CIALs) in strategic bean-producing regions of Honduras to multiply registered seed for the production of "apta" seed that is distributed to small-holder resource-poor bean farmers. The Honduran Ministry of Agriculture considers "apta" the equivalent of "quality-declared seed".

A second key BTD partner in Honduras is the Dirección de Ciencia y Tecnología Agropecuarias (DICTA). As a governmental entity, DICTA is within the Secretaría de Agricultura y Ganaderia in Honduras and has a national mandate to generate and transfer technologies that support and increase production and agricultural productivity. In the BTD project, DICTA is dependent upon EAP/Zamorano for providing foundation seed of the selected bean varieties and for technical training of DICTA staff. Although, EAP/Zamorano has overall coordination responsibility for the BTD project in Honduras, it was decided by both institutions that MSU (as the MO) should establish independent subcontracts and Scopes of Work with each to ensure better accountability and communication with the Management Office. As part of the division of responsibilities in Honduras, it was also decided that each institution would be responsible for the dissemination of seed to different departments (bean producing regions) within Honduras.

With the support of its different regional offices, DICTA was able to meet seed multiplication and dissemination goals in FY 2011 and to make important steps towards the promotion of CSBs as a sustainable seed production alternative for small holder farmers. This is a significant and dramatic departure from DICTA's historic role in seed distribution programs under the government's "Bono Productivo" program. The Bono Productivo program has frequently been criticized by government authorities as a short-term solution to farmer seed needs. Free inputs (including sorghum, corn and bean seed) have been made available to farmers with little evaluation and follow up considerations towards the long-term sustainability of the seed systems. While the community seed bank model has not been portrayed as a panacea to the ongoing problem of limited access by small-holder resource-poor farmers to high-performing quality bean seed, DICTA understands that community-based seed production can be a sustainable lower-cost alternative to ensure seed availability and has the potential to remain in a community independently or as a complement to the Bono Productivo program. The following outlines the achievements by EAP/Zamorano and DICTA during Year 1.

Seed Production and Dissemination- Honduras

In preparation for seed demand by the NARS in the four participant countries in the BTD project, EAP/Zamorano multiplied one ton of genetic seed stocks of improved small red and small black improved bean varieties in October 2011. The varieties were Amadeus, Cardenal, Carrizalito, Dehoro, Tio Canela.

Approximately two tons of foundation seed of small red and black bean improved cultivars were also produced at EAP/Zamorano during the first or "primera" planting season (May-Aug, 2011). This foundation seed was harvested and conditioned. Part of this foundation seed is being used by farmer seed producers to produce "qualified seed" during the postrera season (Oct-Dec 2011), with the assistance of technical personnel from sub-subcontracted EAP/Zamorano partner organizations in the Lake Yojoa and Yorito-Vallecillo regions.

Since the postrera and summer seasons are considered the best for producing high quality seed due to low disease incidences, EAP/ Zamorano also produced 5 tons of foundation seed during these two seasons to supply the Year 2 demands of INTA/Nicaragua, ICTA/Guatemala, DICTA/Honduras as well as "qualified" seed producers in Honduras. Genetic stocks of the

small red and black bean cultivars reproduced during Year 1 are being utilized for these foundation seed increases.

The production of "apta" or qualified seed took place in several localities. More than eight tons of qualified seed were produced in fields of selected member farmers of Local Agriculture Research Committees (CIALs) in the Yojoa Lake, Yorito-Vallecillo and Yeguare areas in Honduras, in collaboration with technical personnel of the Rural Reconstruction Program (PRR), the Foundation for Participatory Research with Farmers of Honduras (FIPAH) and farmer leaders of the Association of CIALs from the Yeguare Valley (ASOCIOGUARE). This seed increase occurred during the irrigated season (Feb-Apr 2011) using registered seed provided by Zamorano.

In FY 2011, DICTA decided to multiply foundation seed stocks of the following improved small red bean varieties (registered for commercial production in Honduras) into "apta" seed; Amadeus-77, Carrizalito, Cardenal, Tio Canela 75, and Deorho. A total of 6 cwt of foundation seed of each variety were received from EAP/Zamorano and were distributed among four seed production groups in western Honduras and 7 individuals in the Department of Olancho (Eastern Honduras). Contracts were established with all seed producers. Contracts were required to ensure that the seed multipliers used critical inputs (fertilizer, etc.) and that the seed would be purchased by DICTA at the time of harvest. This arrangement was accepted by DICTA contingent upon the provision of high quality seed by the farmers. Table 4 outlines the partners involved in seed multiplication.

Table 4. List of seed multipliers contracted by DICTA in Year 1

West	Group Name	Members (#)	Location
1	Asociación Local	9	San Antonio Mercedes
2	Empresa La Flor	9	Agua Blanca, San Marcos
3	Empresa Los Pinares	4	Mejocote El Rodeo Del Pinal
4	APANAL	9	El Naranjito, Santa Barbara
East			
1	Angel Javier Banegas	1	La Lima Campamento
2	Justo Pastor Ochoa	1	Quebrachal, Silca
3	Oscar Rutilio Calix	1	La Boca, Gualaco
4	Nelvin Rolando Padilla	1	La Boca, Gualaco
5	Leonel Antonio Torres	1	Estiquirin, El Rosario
6	Silvio Antonio Antunez	1	Sabana Grande, El Rosario
7	Rony Gregorio Juarez	1	Ocotal, El Rosario

Table 5 summarizes the amounts multiplied of each variety and also identifies the regions and/or departments where these varieties were disseminated in 20 lbs bags. Figure 1lists the varieties and amounts produced and the regions where each variety was disseminated in Year 1 based on

previous variety adaptability experience by EAP/Zamorano and DICTA. These target departments are characterized by diverse microclimates with spotty lowland areas and hill-side farming on moderately infertile soils. In Honduras, a common practice is for small-holder farmers to buy bean "grain" in local markets for planting purposes. Unfortunately, the traceability of the grain to a production field is nonexistent and the grain lacks varietal identity, uniformity and germination vigor, plus frequently carries economically important diseases. As a consequence, farmers plant their bean fields without the benefit of genetically improved seed (varieties) with resistance to biotic and abiotic stresses, climatic adaptation and high yield potential.

With the advent of the BTD project, Mr. José Virgilio Garcia, regional DICTA coordinator expressed recently that this project has changed the traditional conduct of farmers in the region toward procuring and carefully handling the "seed" to be used for planting purposes. In Olancho, one of the largest and most populated departments in Honduras, 60% of the bean planting surface is in lowland valleys, and 40% is in hills and rugged mountains. According to Mr. Omar Sarmiento, Regional Coordinator of Olancho, the bean seed procurement behavior of farmers in this area is similar to growers in western Honduras where the farmers are forced to purchase grain to be used as seed due to lack of access. Moreover, the seed that farmers obtained through the Bono Productivo program frequently was not true to varietal type and lacked important quality factors such as high germination rates and uniformity of emergence. Through the BTD project, however, farmers are not only accessing quality seed, but also DICTA technicians are overseeing the cultural management practices and monitoring the phytosanitary health of plantings for the production of the "apta" seed to be packaged and distributed to farmers in Honduras.

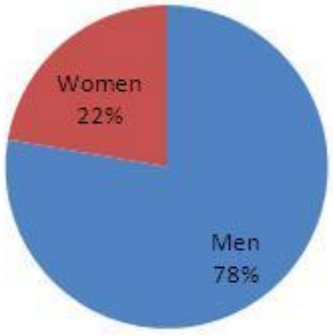


Figure 6. Proportion of men and women reached by seed dissemination efforts in Honduras

The varieties disseminated in larger volumes were developed under the Bean/Cowpea and Dry Grain Pulses CRSPs projects (maintained by EAP/Zamorano´s Bean Research Program). These stocks were regenerated and used to reproduce the foundation seed. As a result, more than eight tons of foundation seed was produced at EAP/Zamorano during the postrera (Oct-Dec, 2010) and the irrigated (Feb-Apr, 2011) seasons. The foundation seed produced by EAP/Zamorano during these two seasons was distributed to institutions and organizations participating in the BTD Project in Honduras, Guatemala, Nicaragua and Haiti (see Table 3).

EAP-Zamorano reported that foundation seed of the following requested bean varieties were sent to collaborators of Nicaragua (INTA Rojo and INTA Matagalpa) and Haiti (Aifi Wuriti, Tio Canela 75 and MEN2201-64ML) for reproduction as foundation and registered seed by INTA and the National Seed Program (NSP) in these countries.

Table 5. Seed Varieties Produced in Honduras for Different Regions (20 lb bags)

Locality of Multiplication	Amadeus-77	Cardenal	Carrizalito	Dehoro	Tio Canela-75
Zamorano	1212	21	45	66	
Yoro	77		13	12	
El Paraiso	740	21		22	
Francisco Morazan	155			20	
Santa Barbara	192		22	12	
Comayagua	48		10		
DICTA	740	404	113	609	180
Occidente	681	132	51	609	88
Olancho	59	272	62		92
DICTA Total	**740**	**404**	**113**	**609**	**180**
EAP/Zamorano Total	**1212**	**21**	**45**	**66**	
GRAND TOTAL	**1952**	**425**	**158**	**675**	**180**

Figure 7. Field technician and senior students checking foundation seed production at Zamorano (November 2011).

Figure 8. Planning meeting of PRR and Zamorano technicians with farmers to produce qualified seed in the Yojoa Lake region (May 2011).

Training- Honduras

EAP/Zamorano has carried out important training activities during this year. It has established more than 12 demonstration plots including *Rhizobium* inoculation using a mixture of three strains in comparison with non-inoculated plots were in farmer fields from the Lake Yojoa region. With the exception of the inoculation treatments, these plots are being managed using farmer production practices. Field days were conducted in these inoculated plots at flowering stage (mid-July) in the various communities to demonstrate differences in nodulation and plant

growth, in response to the inoculation treatments. Increased effects on plant growth and nodulation were observed in plants sampled from inoculated plots.

Figure 9. Left: Rural Bank "Mi Buen Pastor" from El Carmen Village, Lempira were trained on soil conservation practices before they received 20lb of seed. Right: field planted with BTD-sponsored improved seed under improved soil conservation practices.

DICTA has also trained groups of farmers on bean production management practices from soil conservation practices to women groups to drip irrigation management, and integrated pest management practices. Seed production and post-harvest techniques, particularly on the use of drying tunnels has also been carried out. More specialized training on business plan development has been provided to rural banks interested in seed production under the national seed certification scheme. Some of the early experiences with farmer groups have been used as case studies for others. For instance, group "La Flor" from San Marcos de Caiquin, in the Department of Lempira, was showcased in the training of 8 groups of seed multipliers where 40% of the members are women. Table 6 presents the details on the groups and the locations where training took place.

Rhizobium Inoculum Production and Dissemination- Honduras

During the primera season, available *Rhizobium* inoculum was used in two trials conducted in the PRR field station and in one farmer field in the Lake Yojoa region, to validate the use of *Rhizobium* inoculants in comparison with farmer fertilizer treatments. Nodulation and plant growth were determined by taking plant samples at the flowering stage. These trials have been harvested recently and seed yield will be determined soon. Results from these trials will be presented in a workshop to be conducted with farmers from the participating CIALs during Year 2. Based on the positive results of these trials, EAP/Zamorano is expecting an increase in the demand of inoculants based on the results from the demonstration plots and field trials. More than 200 doses of 200 g of *Rhizobium* inoculant are being prepared for their distribution in Honduras to interested farmers from CIALs and other organizations.

Table 6. Training Activities Carried out by EAP/Zamorano and DICTA During Year 1

Target Beneficiaries	Training Theme and Location	Number of trainees
Eight seed producer groups were trained, but only four groups were selected for seed multiplication contracts: • La Flor • Apanal • Los Pinares • Asociacion Fronteriza Oscar Mejia Guerra	Bean seed production/ Santa Rosa de Copán	32 (20 men, 12 women
Asociación Fronteriza Oscar Mejía Guerra en San Antonio Mercedes Ocotepeque	Construction and use of drying infrastructure	9 (6 men, 3 women)
Empresa La Flor		45 (15 men, 20 women)
ACAN	Bean Production Techniques	1 man
ASOPRANO	Bean Production Techniques	1 man
Las Gameras	Business plans for seed production/ different locations	6 men
Sagrada Familia		
Sol Naciente		
Unión y Progreso		
Esfuerzo de Todos		
Amor y Lucha		
Diaconia Nacional	Bean Production Techniques	1 man
Empresa Campesina Salama	Bean Production Techniques	1 man
Fundacion para el Desarrollo Rural FUNDER	Bean Production Techniques	1 man
ICR	Bean Production Techniques	1 man
Miembros Iglesia Catolica	Bean Production Techniques	4 men
Nuevo Amanecer	Bean Production Techniques	1 man
Unidad y Democracia	Bean Production Techniques	1 man
Zamorano staff	Rhizobium technology/Zamorano facilities	16 (13 men, 3 women)
PRR and FIPAH	Rhizobium utilization mini course and on farm demonstrations/Yojoa Lake	32 farmers (24 men, 8 women)
16 FIPAH farmer groups	Seed production and conditioning and on farm demonstrations/ Yohoa Lake, Yorito-Vallecillo	153 (96 men, 57 women)

In addition, more than one ton of *Rhizobium* inoculant mixture of three strains has been prepared to supply demands of the project collaborators from Honduras, Guatemala and Nicaragua. Recently, 20 packages of 200 g each were provided to Ing. J.C. Villatoro by ICTA (Guatemala), to be used in field plots to demonstrate responses to *Rhizobium* inoculation in Guatemala. In addition, 500 packages of 200 g each of *Rhizobium* inoculant will be provided to Ing. Aurelio Llano in INTA (Nicaragua) for distribution to a similar number of farmers in Nicaragua, along with the packages of qualified seed of improved bean varieties.

Seed Dissemination- Honduras

Most of the seed production and distribution activities with partners and farmers in Honduras have been carried out in accord with the Year 1 Scope of Work. Based on data reported to the MO as of September 30, 2011, an estimated 6387 farmers received a 20 lb sack of quality seed in Honduras during FY 2011. The full amount of qualified seed harvested couldn't however be disseminated during Year 1 due to poor synchrony with the planting cycles in certain regions of the country. The MO however will continue to collect the data during the first and second quarters of Year 2 until a complete record is obtained. Table 7 shows the dissemination data for both EAP/Zamorano and DICTA during Year 1. Data tables and individual progress reports submitted by EAP/Zamorano and DICTA were too extensive to be included in this project summary report.

A visit by *t*he BTD Project Manager, Dr. Luis Flores, in August 2011 assessed progress in completing project activities and provided an opportunity to confirm delays in production and seed dissemination. Accomplishments were discussed and a visit to collaborators from PRR and qualified seed production fields managed by farmer from participating CIALs of the Lake Yojoa region took place. The majority of fields were ready to be harvested, and good seed yield and quality were observed. Farmers were most grateful for the support received from the BTD Project and enthusiastic about the yield they obtained, estimated to be more than double than the yields they were accustomed to obtaining. This was before their CIALs were established and assistance was received from the PRR in collaboration with Zamorano.

Table 7. Foundation seed of bean improved varieties distributed to collaborators from the participating countries

Country (collaborator)	Small red varieties		Small black varieties	
	Quantity (ton)	No. Varieties	Quantity (ton)	No. Varieties
Honduras: DICTA PRR/ASOCIALAYO FIPAH/ASOCIALs ASOCIOGUARE	 2.0 1.5 1.5 0.7	 5 15 10 1		
Nicaragua (INTA)	0.9	2	0.5	2
Guatemala (ICTA)			0.7	4
Haiti (NSP)	0.2	1	0.3	3

4. Nicaragua Summary

The Nicaragua program has been the most ambitious of all four countries seeking to establish a total of 200 functional CSBs in the five bean-producing regions of Nicaragua. By providing a start-up kit of inputs to plant one manzana (0.7 ha), the goal established by INTA was to multiply and produce at least 15 cwt of seed per individual CSB. This would be enough seed to provide 20 lb bags of "quality-declared" seed to at least 50 small holder farmers in a community (after seed conditioning, 15 cwt usually yields 5-10% less seed). The goal of the project for was to reach 10,000 farmers in Year 1 requiring a production of approximately 3,000 cwt. In preparation for potential failures due to climatic conditions or organizational factors, INTA projected that at least 75% of the overall goals would likely be achieved.

The INTA model consists of organizing CSBs in key communities in strategic bean producing regions where technical staff have identified progressive farmers who are concerned about their "seed security" and interested in utilizing improved technologies to increase bean productivity. CSBs vary in number of members, bylaws of the organization and geographic extension of their member base. Each CSB has an identified leader farmer, a "Promotor", with whom INTA technical staff interact. The Promotor receives regular training on seed production and handling. Since the bank is capitalized each year by INTA through the provision of "registered" seed of a preferred improved variety of a small red type bean, plus a package of inputs (fertilizer, silos, etc.), each CSB commits to providing 20 lb of the quality-declared seed to 50 farmers in their community or neighboring communities. The recipient farmers commit to pay back the CSB with seed or with quality grain in order to maintain a reserve of improved genetic material. The BTD project considers this model the best community-based alternative for a "sustainable" seed system. In this model, the quality of seed produced is constantly assessed by end-users, the cost of the seed is considerably lower as compared to "certified" seed available in commercial agriculture depots, and the seed is available within a short distance from the farmers. This translates into an economic advantage (labor and transportation costs are saved).

While the approach is not 100% effective and may be prone to organizational, climatic and financial shocks, the high number of functioning CSBs demonstrates the potential of the model. The BTD project has encouraged ICTA and SNEA from Guatemala and DICTA in Honduras to learn from this model and to adapt it to own situations in order to build stronger, sustainable seed system to meet the needs of small-holder bean producers.

Seed Production and CSB training- Nicaragua

During the first cycle of seed multiplication by the CSBs in Nicaragua, a total of 134 ha was planted. This fell short of the 142 ha goal (200 manzanas would have been produced if each CSB planted 1 mz) established in the Scope of Work. Certain CSBs in the North and South Pacific Centre planted only 50% of their commitment. Total seed production was recorded at 2640.4 cwt, representing 88% of the target set of 3,000 cwt for the production of good quality seed. Average yields of 13.87 cwt per manzana (circa 450kg/ha) were obtained, slightly lower than the 15 cwt established as the yield goal per manzana. In part, the under-performance of the

varieties during the first multiplication cycle was attributed to delays in receipt of inputs by the CSBs from INTA due to administrative processing challenges.

Of the 6 varieties proposed in the original workplan, only three were successfully multiplied and disseminated in during the first year. These were INTA ROJO (received by most CSBs), INTA FUERTE SEQUIA and INTA Matagalpa (the same as DEOHRO in Honduras). These last two were disseminated to a significantly lesser extent in FY 2011. For year two of the project, INTA is committed to making adequate quantities of "registered" seed of all three varieties available to the CSBs so that they can have a true choice of which varieties they prefer and they believe will be most adapted to local conditions.

Since beans can be planted during one, two and even three planting seasons each year depending up the region of Nicaragua, the time when CSBs receives registered seed and inputs from INTA and produces the quality declared seed for distribution purposes varies from one region to another. As a consequence, success in achieving yield targets in the seed multiplication plots is highly dependent upon climatic conditions during the particular growing season.

A case in point was bean yield produced during the "postrera" season (the second planting season) in Northern Nicaragua. During the months of August and September 2011, a prolonged heavy rainy period during the pod-filling and maturation stage limited yields and resulted in poor grain quality. The resulting harvested grain was considered unacceptable to be used as seed for subsequent planting. In this instance, CSB members in certain locals decided to sell the grain and purchase new seed stocks which would need to be multiplied again.

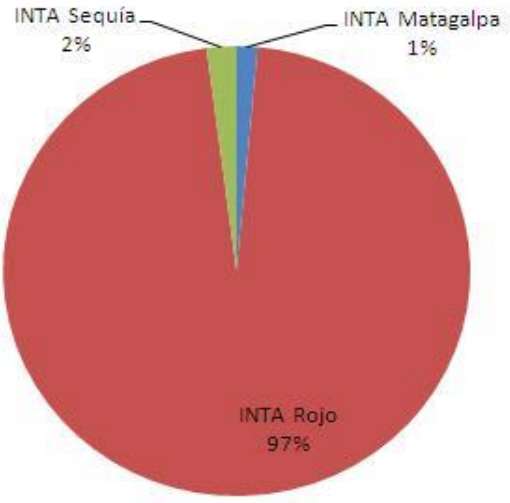


Figure 10. Seed varieties disseminated in Nicaragua

Another factor that INTA could not effectively control was the plot size planted by CSBs. From region to region, the plots varied in size which affected the rate by which inputs were used and the quantity of quality declared seed that was produced. If seed production was lower that INTA projections, a reduced number of beneficiary farmers would receive seed following that multiplication season. From a technical monitoring standpoint, there also seemed to be a correlation between the frequency and quality of technical assistance provided by assigned technical extension staff and CBS performance. In addition, the selection and commitment of the "promotores" to support the goals of a particular CBS also influenced success.

These are all lessons learned that should benefit the project in Year 2. INTA will be convening a meeting of Regional Directors in December 2011 to evaluate project implementation issues throughout the country and proposing changes to improve effectiveness in reaching

dissemination targets for FY 2012. Issues to improve CSB performance that are likely to be addressed include standardization of plot sizes and enhancement of the quality of technical assistance. INTA will also likely redirect and focus greater resources to those regions with high populations of bean farmers, with farmers who are committed to the CSB model, and where administrative support for project implementation by regional offices is strongest. The expectation is that such adjustments will allow the BTD project to attain higher numbers of beneficiaries with the bean technology package during the coming year, especially during the postrera and apante seasons. These are important bean production seasons in Nicaragua, and thus critical for the government's efforts to reduce domestic bean grain prices and to achieve national food security goals.

Seed Dissemination- Nicaragua

Preliminary projections of the number of seed recipients in Nicaragua pointed to approximately 9,400 beneficiary farmers. Due to challenges in data collection (obtaining names of recipient farmers) and collecting the data from all the CSBs by the five INTA regional offices by early November, data indicated that only approximately 6000 beneficiary farmers received seed in Nicaragua for FY 2011; 5,005 farmers benefitting from seed produced during the postrera season and 1,002 producers during apante for the 2011 agricultural campaign. This totals up to 1,200 cwt of seed distributed while the record shows that at least 2,600 cwt had been produced. In a recent meeting with the INTA Director General and her team, the issue of improving data recording in the field was discussed. INTA agrees that better and more timely record keeping has to be a norm for each regional office. The pictures below show some of the seed dissemination activities.

Figure 11. Seed dissemination activities reaching men and women

5. Haiti Summary

Implementation of the BTD project in Haiti has represented a mix of opportunities and challenges. On one hand, engaging a unique combination of institutions, the National Seed Service (NSS), the Inter-American Institute for Cooperation in Agriculture (IICA) and the private sector enterprise "Agrotechnique" afforded an opportunity to test a distinct seed model from that being implemented in Central America. The different but complementary roles by the partners included the multiplication of foundation seed by NSS, the production of quality-declared seed and dissemination by Agrotechnique through its agriculture depots in different regions of the country, and coordination, project oversight, training and promotion by IICA.

NSS completed its responsibilities for FY 2011 by producing "registered" seed in the Savane Zombi area, and IICA successfully established a tri-partite agreement with Agrotecnique and NSS to conduct the seed dissemination activities through more than 90 agriculture depots around the country in Haiti.

The greatest disappointment has been obtaining Agrotechnique's cooperation to follow-through on its commitments. In November 2011, the MO was informed by IICA that Agrotechnique's management had not multiplied adequate amounts of seed of the improved bean varieties to meet the dissemination goals for December 2011. December is a strategic time when seed should have been made available in the agriculture depots for the next planting season in the low alleys of the west, north and eastern part of Haiti.

The problems with Agrotechnique are forcing NSS and IICA to begin devising a different approach to seed multiplication and dissemination in Year 2 for Haiti. This does not mean that the possibilities for a public-private partnership with Agrotechnique for the production and dissemination of quality bean seed are not feasible. Rather, it means that the BTD project needs to pursue a dissemination strategy that seeks to maximize numbers of beneficiary farmers with a smaller package of quality seed, sacrificing seed system sustainability objectives.

A positive outcome of the Haiti component of the BTD project in FY 2011 was the revitalization of the capacity of the Faculty of Agriculture and Veterinary Medicine (FAMV) at the University of Haiti to produce commercial quantities of *Rhizobium* inoculum with technical assistance from the University of Puerto Rico. Details on this activity are presented later in this report. The objective is locally produce *Rhizobium* inoculum that can be combined (50 g of inoculum) with each 4 kg sack of quality bean seed of DCP-40.

Seed Multiplication- Haiti

The initial seed multiplication activity in Haiti was to produce basic seed of DPC-40 stock sourced from the Dominican Republic by the National Seed Service during the period from late March to early July 2011. For this multiplication effort, NSS planted 8 ha of DPC-40 in Savane Zombi, a farm owned and operated by the Ministry of Agriculture, Natural Resources and Rural Development (MARNDR). A total of 10 MT was harvested from this planting. After grading and conditioning the seed, a total of 6.5 MT of "certified" seed were obtained.

Since the germination rate (87%) and overall quality of the certified seed was quite good, Agrotechnique agree to purchase the seed from NSS for multiplication purposes in several parts of the country. The plan was for Agrotechnique to then package and market at grain prices the multiplied seed just prior to December 2011 planting season.

Figure 12. Production of DPC-40 by the National Seed Service in in Savane Zombi.

From the original 10 MT of DPC-40 purchased by MSU from the Dominican Republic to kick-start multiplication efforts by NSS in early 2011, Agrotechnique obtained 4.6 mt to be multiplied by their contract farmers. This multiplication campaign was carried out in the Department of Grande Anse, in the localities of Beaumont and Pestel during the period from July to December 2011. Agrotechnique distributed the certified seed it received to 163 local seed multipliers (Men and Women) as a loan. While reports on the development of the crop were highly positive, the final seed recovery was disappointingly low resulting only in a recovery of 10.6 MT. Table 8 details the outcome of this multiplication campaign.

Table 8: Summary of total results obtained in the first campaign of multiplication carried out with DPC-40 in Beaumont (in metric tons)

Seed Multipliers	Total quantity distributed as loan from NSS	(I) Total quantity reimbursed as interest	(R) Total reimbursed to Agrotechnique	(A) Total quantity as surplus purchased By Agrotechnique to the multipliers	(R+A) Total quantity available at Agrotechnique
163 Seed multipliers	4.6	1.1	5.7	4.9	10.6

The 2011 bean multiplication experience with Agrotechnique generated many questions about why farmers would not return a greater amount of the seed of the improved bean variety DCP-40 that they had increased. Unfortunately it was not possible to obtain accurate data from the farmers on the yields obtained. Inquiries by IICA's project manager and questions to Agrotechnique revealed that the seed multipliers, working under informal agreements, thought that they were receiving a seed gift and thus refused to sell back the harvested grain they produced to Agrotechnique. Seed multipliers recognized the yield potential of DPC-40 and observed resistances to three viral diseases. As a result, the farmers decided to keep the seed for their own dissemination and planting purposes. In conversations with Agrotechnique, the farmers called the DCP-40 seed different appellatives or nick names that characterize its productivity potential. Agrotechnique chose one of these appellatives, "Ti Towo" (little bull) to promote the seed as shown in the label below. An order of 25,000 labeled bags has been completed to package the 10.6 MT of DCP-40 seed produced to be distributed through Agrotechnique's agricultural depots throughout the country.

Figure 13. Label elaborated by IICA and NSS in conjunction with Agrotechnique

An estimated 2300 farmers are projected to receive quality declared seed of DCP-40 through Agrotechnique outlets in December 2011 and early January 2012. Each bag will have two mamits (a local measure equivalent to circa 2 kg for a total of 4 Kg per bag). As of Dec 8, 2011, NSS confirmed that Agrotechnique is on board with the dissemination plans but is unfortunately trapped in several legal litigations on matters not related to our project which have deviated their attention away from the bean dissemination activities.

A second campaign of basic seed production was launched by the NSS in Savane Zonbi during the season from September to December 2011. Approximately four hectares were planted with DPC-40. The yield from these fields will be either disseminated through Agrotechnique once the program takes off, or will be disseminated by IICA and NSS to established farmer organizations in Haiti.

Although Agrotechnique did not carry out its role with integrity, the MO was pleased to learn that the seed multiplier farmers contracted had an extremely positive experience with DPC-40. It is hoped that these farmers share their observations of the high yield potential and disease resistances with other farmers, thus creating demand for this improved bean variety. This has consequently motivated NSS to procure 40 MT of DCP-40 with funding from MARNDR to be disseminated from May-August 2012, the major planting season within the important bean producing regions in Haiti. The BTD project is in talks with both, NSS and IICA, to join in this effort and to provide packets of *Rhizobium* inoculant to be distributed with the seed.

UPR and FAMV Production of *Rhizobium* Inoculum- Haiti

University of Puerto Rico scientists have worked closely with FAMV to upgrade the *Rhizobium* inoculum production and testing laboratory capacity, partially destroyed by the earthquake in early 2010. After the contract with IICA was finalized in June 2011, financial support was provided to rehabilitate the facilities and restart *Rhizobium* production. A contract has been signed with the Faculty of Agronomy (FAMV) and a budget prepared to ensure future provision of inoculum for the BTD project. The majority of the equipment has been installed to produce the *Rhizobium* strains recommended by UPR for enhancing BNF in beans grown in Haitian soil. (See the figures below).

Figure 14. Laboratory and Greenhouse facilities at FAMV

While dissemination activities appear to be stagnated in Haiti, other activities have been taking place in support of our objectives. The following summary illustrates these activities.

TABLE 8 Summary of activities conducted for the year 1

Planned Activities for Year 1: Objectives	Activities Carried Out	Results
OBJECTIVE 1: Coordinate the production of quality-declared seed of improved varieties of bean and other grain legumes. **1**- Ensure the coordination of project activities in-country (Haiti).	IICA AND NSS organized several meetings to define the strategy for implementing the project in the field.	The project was launched and currently is being implemented.
2- To subcontract with Agrotechnique and other partners to produce 35 MT of quality-declared/certified seed of the improved CRSP developed bean variety DPC-40.	4.6 MT of DPC-40 were provided to Agrotechnique.	A first campaign of seed multiplication was conducted in Beaumont by Agrotechnique with the participation of 163 seed multipliers.
3- To coordinate the	10 hectares of land	

Planned Activities for Year 1: Objectives	Activities Carried Out	Results
multiplication of seed of other improved varieties and also to sow 10 hectare in DPC-40 plus cowpea and pigeon pea seed.	were planted with DPC-40 by the NSS in Savane Zonbi from March to July. A second planting was also established in late September for harvest in December 2011.	The total seed yield obtained from this FY 11 campaign to produce basic seed was **6.5 T**.
4- To hire the services of a Project Coordinator	IICA launched a recruitment notice through a newspaper and 5 applicants were interviewed.	Since the beginning of August 2011, an agronomist, Mr. Luclain Noel Jean, was hired as a technical promoter to coordinate the activities of the project in Haiti.
Objective 2: Design, coordinate and monitor the dissemination of quality declared seed and rhizobium inoculant to 1000 resource-poor farmers in strategic regions of Haiti. **1-** Establish a memorandum of understanding and potentially a sub-contract to disseminate the BTD technology package.	IICA presented an MOU to Agrotechnique in early August 2011.	The MOU was reviewed by the lawyers of Agrotechnique. The document has been revised and awaits signature.
2- Develop a promotional strategy for the pwa KRISP technology package including technical information materials, radio spots on best production and storage practices, benefits of pwa KRISP seed and use of *Rhizobium* inoculum.	Selection of a local name to facilitate the commercialization of the KRISP bean in Haiti: **PWA TITOWO (Little Bull)**	-A label has been designed for the bags. -25000 bags have been ordered from the Dominican Republic. About 10000 bags have already been delivered to Haiti.
3- Coordinate the production of *Rhizobium* inoculum.	IICA has subcontracted with the FAMV for the production of *Rhizobium* inoculum.	The contract was signed between IICA and the Faculty of Agronomy. The laboratory is ready to produce *Rhizobium* inoculants and conduct field trails to validate effectiveness in enhancing nodulation and BNF in bean fields.

Planned Activities for Year 1: Objectives	Activities Carried Out	Results
4- To design a promotion and dissemination strategy for *Rhizobium* inoculum through field demonstrations, printed material, radio spots etc.	A brochure has been elaborated.	The brochure will be sent to printing. Meetings will be planned with key partners to promote the new bean label "TI TOWO".
5- To hire a project coordinator to provide oversight and technical assistance on the promotion and dissemination of the *Rhizobium* inoculum.	Five visits have been made by the coordinator to the R*hizobium* facility.	Preliminary steps have been taken to culture and produce *Rhizobium* inoculum: establishment of field trials, rehabilitation of the unit production, install irrigation system for the greenhouse.
OBJECTIVE 3: Develop and implement a sustainable seed production and distribution system in Haiti. **1**- To achieve the sustainability objectives of the project by working closely with other partners on the design and implementation of a seed system in Haiti.	Ongoing	Ongoing

6. Lessons Learned from Regional Project in FY 2011

As we look back and evaluate technical progress achieved during the first year (FY 2011) of the Rapid Bean Technology Dissemination Project, it is important to realize the project encountered challenges by seeking to build sustainable seed systems to ensure that resource-poor small-holder farmers have access of quality bean seed of improved varieties. Small-holder bean farmers in Central America and Haiti typically have limited access to financial resources, are dispersed geographically, have extensive experience in the management of bean-maize cropping systems under stressful conditions, but lack knowledge of technologies and management practices that could potentially enhance their yields and profit margins. The fundamental objective of the BTD project is to disseminate quality seed of improved bean varieties (with resistances to economically important diseases, adaptation to environmental stresses such as drought, agronomic traits to enhance yield potential, and grain quality traits) developed over many years of investment by the Bean/Cowpea and the Dry Grain Pulses CRSP to as many small-holder farmers as possible. The ultimate goal of the BTD project was thus to increase national production of beans through the adoption of higher yielding bean varieties and to enhance national food security in the four target countries of Honduras, Guatemala, Nicaragua and Haiti. After completing one year of the project, the Management Office and partners continue to

believe that (1) enhancing access to quality seed (through dissemination) and (2) seed system sustainability are worthy objectives that can be concurrently achieved through the project. It has become evident though that each country is distinct and to implement effective seed dissemination programs in partnerships with NARS and extension systems in a sustainable manner requires flexibility and designing approaches that are compatible with national seed policies and government agriculture development priorities.

To conclude this FY 2011 report, the MO would like to mention and briefly discuss three "lessons learned" from this past year. These include:

- The Community Seed Bank model can be effective in sustainably enhancing resource-poor farmer access to quality seed of improved varieties as well as other yield enhancing technologies.
- The gathering of data necessary for performance monitoring is problematic when depending on technical staff of NARS or extension agents, and resources are limiting.
- Greater effort needs to be directed toward developing a more viable and cost effective seed dissemination approach for Haiti.

The MO is coming to appreciate the qualities/characteristics of the Community Seed Bank model that contribute to its effectiveness in sustainably enhancing small-holder resource-poor farmer access to quality bean seed. Some of these characteristics among others include:

- Enhancing the "seed security" and reducing the vulnerability of communities of farmers to seed shortages due to unfavorable weather or high seed prices.
- The maintenance of seed and grain reserves long term so that the community is not vulnerable to complete crop failures during any one season. Some of the stored bean grain can be used to address temporary community food security needs.
- Enabling farmers to gain an understanding of the value of "quality" seed for field establishment and achievement of high bean yields.
- Identification of a small group of progressive farmers in a community with natural linkages and trust to assume responsibility for the Community Seed Bank.
- Enhancing CSB member access to "registered" seed of improved bean varieties of their choice on an annual basis.
- Farmer ownership of the seed multiplication process where there is self interest
- Locating the multiplication of bean varieties near the sites of production so as to eliminate the need for transport of "heavy" seed to the remote communities of bean farmers.
- Ensuring resource-poor farmer access to "quality" seed at an affordable price (beneficiary farmers return 2 units of grain for each unit received from the CSB)
- Promoters (who are leader farmers) serving as points of contact for technical extension staff in the community
- The seed multiplication sites within the community afford excellent opportunities for other farmers to observe the field performance of improved bean varieties plus other yield enhancing technologies.
- The CSB affords a mechanism to validate and rapidly transfer other yield enhancing technologies such as the use of fertilizers and post-harvest grain handling practices (e.g., grain silos).

Based upon the positive and promising experience with INTA in working through the nearly 200 Community Seed Banks to disseminate quality seed of improved bean varieties to large populations of small-holder bean farmers in Nicaragua, the MO is taking measures to motivate and encourage the NARS in Guatemala and Honduras (e.g., ICTA/SNEA and DICTA) to consider and potentially adopt the CSB model. We recognize however that each country situation is unique and that the model may not be directly transferable to Honduras and Guatemala due to variations in the structure and mission of the NARS and the national extension programs (if they even exist). On the other hand, the low cost for start-up of CSBs with a seed production and storage kit and the clear effectiveness of the model for the transfer of yield enhancing technologies make this model compelling. The MO experience in Guatemala in FY 11 (where 7 CBS were implemented) has shown that the cost to establish an individual CSB is only approximately $600. Although we recognize that this cost excludes the salaries of SNEA and ICTA technicians and their transportation and support expenses, we believe that this still represents a small investment for a NARS if it has the technical capacity and extension staff. Alternatively, when the CSB model was presented and discussed in Haiti, key informants expressed concerns about its viability in the Haitian socio-economic and political environment. Due to the post-earthquake socio-economic hardships, community collaboration to improve rural livelihoods does not seem to be embedded in the Haitian value and social systems as in Latin America. Without necessarily trying to prove this judgment wrong, the BTD project is planning to launch in FY 2012 several bean seed multiplication efforts with organized groups of small-holder farmers in Haiti where social cohesion and trust are sufficiently strong among members to potentially lead to success.

The culture of gathering reliable and timely monitoring data by subcontracted NARS staff was put to a test in Guatemala, Honduras and Nicaragua. The MO was particularly pleased that ICTA and SNEA in Guatemala recorded data on the localities where the bags of the bean seed were distributed and on the demographics of the beneficiaries (e.g., gender, etc.) and the amount and varieties of seed handed out. This data is extremely important not only for performance monitoring and ensuring accountability for deliverables, but also for assessing the effectiveness of the approach long-term. With such information, it will be possible to return to the target communities to assess long-term varietal adoption rates and changes in bean production.

While challenges were experienced in Honduras and Nicaragua with accurate and timely data gathering, the MO however was successful in obtaining adequate data for performance evaluation purposes of the subcontracted partners. A troublesome surprise, however, was INTA's lack of organization in certain regions to account for all the seed multiplied by CSBs, a situation that has resulted in the project in Nicaragua falling short of its FY11 targets in terms of numbers of beneficiary farmers. The MOs assessment is that the actual numbers of beneficiaries (farmers receiving multiplied seed from local CSBs) is substantially higher that INTA was able to demonstrate due to likely poor record keeping by certain CSBs or to ineffective data collection, compilation and reporting by INTA technical staff in certain regions. As the project moves into Year 2 (FY 2012), the MO will be working closely with INTA administration to ensure greater accountability for collection and reporting of dissemination data.

The Dry Grain Pulses CRSP MO believes that a systematic study of the Community Seed Bank experience in Nicaragua should be conducted so as to better understand the model as it is currently being implemented throughout the country and to evaluate its long-term effectiveness

and sustainability. Visits to numerous CSBs by Drs. Widders, Flores and Maredia have revealed slight variations in organization structure, function and strength of farmer leadership. It is important to document these differences and to monitor farmer perceptions, commitment and change of practices (e.g., adoption of technologies including improved varieties and the use of quality seed) to be able to make conclusions on the success of the model and its transferability to other contexts whether in other Central American countries or Africa.

Finally, the MO will need to reassess its seed dissemination strategy for Haiti in conjunction with subcontracted partners (NSS and IICA) as it establishes Scopes of Work for FY 2012. The most important question to be asked is whether to continue to pursue a seed dissemination strategy that is based up the sale of seed by a private sector business such as Agrotechnique. Matching business interests with achievement of development goals can make partnerships with the private sector quite difficult. We now recognize that BTD has limited "leverage" to influence Agrotechnique's management decisions apart perhaps from social capital to direct them to invest efforts that lead to public goods (increased farmer access to improved varieties) and do not provide opportunities for profit generation. Despite this fact, the Pulse CRSP MO does not believe it had been a mistake in attempting to implement a new private sector-based approach to "seed" production and dissemination. What we are learning, however, is that accountability mechanisms and incentive structures need to be put into place with businesses such as Agrotechnique to ensure achievement of intended deliverables. In addition, it is obvious that the private sector will be unable to reach many of the neediest populations of resource-poor bean farmers in Haiti. Many of these farmers would need to walk long distances to an Agrotechnique outlet and frequently they may not have the resources to purchase the seed even if being sold a grain prices. On the positive side, the NSS and the BTD project are hoping that the word rapidly spreads among farmers about the apparently positive experience of the 163 farmers who grew the DCP-40 in FY 2011 to the extent that it creates a demand among farmers for seed of this variety in the future. This would certainly open up greater opportunities and options for achieving the target dissemination goals of 30,000 beneficiary farmers in Haiti during the course of the three year project.

ANNEX

a) List of Departments and Municipalities for Seed Dissemination in Guatemala

Department	Municipalities
Chiquimula	Olopa, San Juan Ermita, Jocotan, San Jacinto, Chiquimula, Camotan, San José La Arada, Ipala, Quetzaltepeque.
Jalapa	San Manuel Chaparron
Jutiapa	Agua Blanca, Jutiapa, Comapa, Conguaco, El Adelanto, Moyuta, Yupiltepeque, Atescatempa, Pasaco, Quezada.
Santa Rosa	Santa Cruz El Naranjo, San Rafael Las Flores, San
Peten	Dolores, La Libertad, Poptun, Sayaxche, San Juan Tecuaco, Santa Maria Ixhuatan, Nueva Santa Rosa.

b) Three Year Summary of MO and Sub-Contracted Funds with Partners

	MSU	UPR	Zamorano	DICTA	INTA	TBD	ICTA	NSEA	IICA	NSS	Total
Original budget	$757,055	$308,069	$784,200	$0	$376,200	$103,500	$376,200	$103,500	$360,000	$223,200	$3,391,924
Revised budget 1	$757,055	$126,875	$594,310	$189,600	$478,426	$0	$375,319	$101,706	$422,068	$77,300	$3,122,659
Revised budget 2	$757,055	$110,625	$672,750	$235,658	$526,368	$0	$377,431	$102,454	$396,306	$116,010	$3,294,657
Variance (revision 1)	**$0**	**$181,194**	**$189,890**	**($189,600)**	**($102,226)**	**$103,500**	**$881**	**$1,794**	**($62,068)**	**$145,900**	**$269,265**
Variance (revision 2)	**$0**	**$197,444**	**$111,450**	**($235,658)**	**($150,168)**	**$103,500**	**($1,231)**	**$1,046**	**($36,306)**	**$107,190**	**$97,267**

c) Sub-Contract Amendments for Year 2 (FY 2012)

Guatemala

Strategic Investment in Rapid Technology Dissemination: Commercialization of Disease Resistant Bean Varieties in Guatemala, Nicaragua, Honduras and Haiti. **(Associate Award to the Dry Grain Pulses CRSP)**

October 1, 2011 – September 30, 2012

AMENDMENT TO FUNDIT SUBCONTRACT:

ICTA AND SNEA WORK PLAN

SCOPE OF WORK - Year 2 (October 2011- September 30, 2012)

Organization to be Sub-Contracted:

Fundación para la Innovación Tecnológica, Agropecuaria y Forestal (FUNDIT)
18 Avenida "A" 1-40 Residenciales Alamedas de Santa Clara, Sector Las Margaritas Zona 3, Villanueva

Project Leader: Jose Angel Dávila Estrada , Director FUNDIT. 18 Avenida "A" 1-40 Residenciales Alamedas de Santa Clara, Sector Las Margaritas Zona 3, Villanueva (502) 50384289, jade0210@gmail.com

Administrative/Financial Officer for Organization: Deisy Mazariegos 18 Avenida "A" 1-40 Residenciales Alamedas de Santa Clara, Sector Las Margaritas Zona 3, (502) 5038 4289 Villanueva.
deisy_mazariegos_fundit@hotmail.com

Partner Host Country Organizations:

Instituto de Ciencia y Tecnología Agricola (ICTA), Ing. Julio Cesar Villatoro. Km 21.5 Carretera hacia Amatitlan, Bárcena Villa Nueva, Guatemala. (502) 54179200. juliocevillatoro@hotmail.com,

Servicio de Extension Rural (SER) Ing. Pedro Antonio Rosado Pol. 12 Av. 19-01 Zona 1. Guatemala, Ciudad. 2221 1309. prosado@yahoo.com.mx

I. Amendment justification:

During the first year of the Bean Technology Dissemination (BTD) project a subcontract with FUNDIT included the work with ICTA and SNEA to achieve the four major project objectives listed below through specific activities to be monitored, quantified and evaluated on an annual basis. In continuing with this three-year initiative, the four objectives of the three-year project remain as follows:

Objective 1. To develop sustainable national capacities in Guatemala for the production and distribution of quality seed of improved varieties of beans developed through investments in research by the Dry Grain Pulses CRSP for the benefit of small holder farmers in target areas of the country to increase national productivity.

Objective 2. To develop national capacities for the production and use of *Rhizobium* inoculants on beans to enhance the sustainability of cropping systems and bean productivity in low fertility fields.

Objective 3. To develop and implement a sustainable bean seed production and distribution system in Guatemala so as to ensure access by small-holder resource-poor farmers to quality seed with high productivity potential.

Objective 4. To monitor and evaluate the dissemination and adoption of improved varieties of bean seed and *Rhizobium* inoculants and their contributions to national food and nutritional security.

ICTA and SNEA have satisfactorily completed the set of activities specified during Year 1 as confirmed in recent field visits by the Pulses CRSP management office and progress reports submitted according to contract. Specifically, ICTA was able to fulfill the expected results outlined in their schedule of deliverables particularly addressing critical dates for seed production planning, field monitoring, harvesting, seed conditioning and delivery to SNEA personnel for field dissemination. SNEA also brought about the training activities with a cadre of extension agents and delivered the seeds in the target communities according to plan. These activities were critical for the success of the project in the Peten department where the variety ICTA Peten was distributed as well as for the south-eastern region in Guatemala where the variety ICTA Ligero was successfully disseminated.

As ICTA and SNEA closed the loop on the schedule of deliverables for Year 1 it is important to outline two major lessons learned for the Pulses CRSP, FUNDIT and ICTA that set the stage for the contract amendment for Year 2. First, the role of ICTA in negotiating contracts with highly qualified seed reproducers has been highly successful during Year 1, but it is still prone to default or side-sales by farmers in the absence of formal contracts. Managing this risk with more frequent visits during the growing stages of the crop paid off since it gave farmers a sense of security about the seriousness of the deal. Most farmers operate in an informal economy where implicit contracts are the norm and explicit contracts may not be respected despite their formality. Second, it is important to generate more opportunities for both organizations, ICTA and SNEA, to visit fields together and host training events with extension agents so that the strong interest and ownership documented on the community seed banks launched during Year 1 can be replicated as we expand into Year 2 and activities in the Western Highlands.

This SOW builds on the results and lessons learned from Year 1for ICTA and SNEA within the framework of the three-year BTD project. This document explains in detail the activities to be carried out by ICTA and SNEA under FUNDIT's coordination. For a more convenient monitoring and evaluation of this contract the deliverables, timeline and budget associated to ICTA and SNEA are provided separately.

III. ICTA Planned Activities in this Scope of Work:

In Guatemala, the Institute of Agricultural Science and Technology (ICTA) continues to be recognized for its role in the introduction, testing and registration of improved varieties of beans for commercial production by farmers. ICTA is therefore an important partner in producing quality-declared seed for the BTD project's dissemination of improved seed varieties, producing *Rhizobium* inoculum and training farmers on improved seed storage techniques. These activities constitute the technological package promoted by the BTD project under USAID's Feed the Future initiative for Guatemala, Honduras, Nicaragua and Haiti.

A. Project Activities in Year 2 (October 1, 2011 – September 30, 2012):

Objective 1: Production of quality-declared seed. This category is equivalent to certified seed in the formal system, but due to the need to streamline the process, the production of qualified seed will not follow the formal certification process strictly. The following activities will be undertaken:

a) FUNDIT will work with ICTA to verify that production lots will be supervised and the recommended visits by technicians from ICTA will be carried out.

b) FUNDIT will not provide any inputs to the seed producers, but will make arrangements to purchase at a negotiated rate $1551 per metric tons equivalent to 22 cwt at Q[1]550/qq at the farm gate. A total of 33 tons will be purchased this year from producers in the community of San Geronimo, in the department of Baja Verapaz. This area has the capacity to grow beans under irrigation in the dry season which increases the probability of producing healthy seed. Two variety will be produced, specifically 17MT of ICTA Hunapu for the western highlands and 10MT of ICTA Ligero for the southeastern region of Guatemala.

c) FUNDIT will coordinate with ICTA the transportation of the seed from Baja Verapaz to the ICTA warehouses in Guatemala City where the seed will be conditioned, packed and stored under recommended conditions until it is ready for dissemination by SNEA.

Objective 2. Training of extension agents in seed production, post-harvest management, agronomic crop management practices and the use of *Rhizobium.*

a) FUNDIT will coordinate with ICTA technicians the organization and delivery of training programs to SNEA extension agents on central topics such as seed production, crop management and seed preparation.
b) Training on *Rhizobium* technology will be imparted to at least 150 new extension agents and leading farmers in two or three different training locations in the Guatemalan highlands.

Objective 3. Organization and establishment of community seed banks (BCSs, Spanish acronym) for the sustainability of bean seed systems in Guatemala

The experience in Nicaragua with BCSs has been a leading example to ICTA and SNEA to venture into organizing similar community structures to address production, availability and dissemination of improved bean seed and other technologies. The practicality in putting together these organizations by extension agents and the long-term impact on the national bean seed system have been the major motivation behind this objective. It is noteworthy that the investment made in Year 1 to visit the Nicaragua INTA model for BCSs has paid a high return particularly in inspiring the more than 20 field extension agents that accompany the mission to be among the first ones in the country to establish BCSs with project support. As a result, 6 BCSs have started to work in Year 1 in different communities of the Peten and southeastern Guatemala and 20 more BCSs are expected to be organized and supported in the western highlands. The role of ICTA in this process is to provide the technical oversight so that the quality-declared seed fulfills the minimum phytosanitary characteristics under the national seed production protocols. To this effect, at least one visit per field during the seed growing cycle will be scheduled by ICTA technical staff.

Objective 4. Data collection from beneficiaries, monitoring of project activities and performance evaluation of achievement of production and dissemination objectives for the Year 2.

Data has been collected to establish the baseline at the start of the project during Year 1 gathering information during seed production and distribution to 5,000 beneficiaries receiving 20lbs each. The collection of these data was carried out using the formats and following the recommendations of the MO developed by Dr. Mywish Maredia. During Year 2 data will be collected on the activities following up to seed dissemination such as production by project beneficiaries, activities led by BCSs in the Peten, southeastern departments and the new departments in the western highlands where ICTA Hunapu will be distributed.

[1] Q= Quetzales is the Guatemala currency with an average exchange rate of Q7.8 per US$1.

B. ICTA Timeline of Activities for Year 2:

Objective/Activity	Year											
	2011			2012								
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Objective 1: Seed Production												
Assessing fields for seed production	x											
Seed contracting	x											
Seed field technical visits		x	x	x								
Seed Purchasing				x	x							
Seed Transportation to ICTA						x						
Seed Conditioning						x	x					
Delivery to SNEA								x				
Objective 2: Training												
Training of SNEA extension in the higlands on bean production technology package			x	x			x	x				
Objective 3: BCSs follow up												
Training of organization of BCSs				x	x	x						
Visiting BCSs in eastern Guatemala with extension agents from Western Guatemala								x				
Objective 4: Monitoring and evaluation												
Field supervision of seed dissemination							x	x				
Data Collection										x	x	
Final report											x	x
Planning of SOW and Budget for Year 3												x

C. ICTA Cost Application (Budget and Budget Notes)

ICTA Year 2 Budget	Year Two
	3/1/11-9/30/12
Institution Name	
A) Project Management	
Project Coordination at FUNDIT and ICTA	$13,000.00
Sub Total	**$13,000.00**
B) Seed Production	
Purchase of 18 MT of Icta Hunapu seed	$27,923.08
Purchase 10 MT Icta Ligero seed	$15,512.82
Transportation and conditioning of seed at ICTA	$3,426.92
Seed bags and labels (already purchased in Year 1)	$0.00
Sub Total	**$46,862.82**
C) Objective two: Training of extension agents and farmer leaders in bean production technology	
Two training aids	$4,000.00
10 training events in different locations	$12,000.00
Materials and supplies for trainees	$5,200.00
Sub Total	**$21,200.00**
D) Training and monitoring activities on BCSs	
Field monitoring of at least 35 BCSs	
Transportation and per diem	$15,300.00
Sub Total	**$15,300.00**
E) Objective three, Monitoring & Eval.	
Part-time hired M&E Specialist from ICTA	$1,800.00
In country travel to visit project locations	$7,480.00
Sub Total	**$9,280.00**
Total Direct Expenses	**$105,642.82**
Indirect Cost	**$10,564.28**

ICTA YEAR 2 BUDGET NOTES		
CRSP Bean Technology Dissemination Associate Award		
(October 1, 2011 - September 30, 2012)		
A) Project Management		
Project Coordination at FUNDIT	13,000.00	Coordinator hired at f $1000/month with a 13 salary/year hiring policy. This equals $1083/month. For this year, the hiring period is 12 months.
Sub total	**13,000.00**	
B) Seed Production		
Purchase of 18 MT of Icta Hunapu seed	$27,923.08	18MT of seed at Quetzal 550 per 100lbs bag (cwt) is equivalent to Q12100. The exchange rate is 7.8 quetzal per US$1, is equivalent to $1,551.28/MT. See formula in excel.
Purchase 10 MT Icta Ligero seed	$15,512.82	10MT of seed at Quetzal 550 per 100lbs bag (cwt) is equivalent to Q12100. The exchange rate is 7.8 quetzal per US$1, is equivalent to $1,551/MT. See formula in excel.
Transportation and conditioning of seed at ICTA	$3,426.92	From Year 1's experience, there is an expense of Q45 ($5.77) per cwt to bring the seed to the ICTA facilities, clean, treat, bag and label the seed ready for dissemination. There are 22cwt per MT and a total of 27MT which equals 595 cwt. See excel formula
Seed bags and labels (already purchased in Year 1)	$0.00	This was purchased in Year 1
Sub Total	**$46,862.82**	
C) Objective two: Training of extension agents and farmer leaders in bean production technology		
Two training aids	$4,000.00	Two training aids will be hired to support the training organization and delivery during the course of the Year 2 work plan.
10 training events in different locations	$12,000.00	This is calculated at $1200 per event for venue rental and refreshments. Extension agents already have their per diem covered by the Ministry of Ag. This events are smaller in size than previous events, but the budget considers more events in total
Materials and supplies for trainees	$5,200.00	At least 260 training kits containing field books, printed materials and training guides will be purchased at a rate of $20/kit.
Sub Total	**$21,200.00**	
D) Training and monitoring activities on BCSs		
Field monitoring of at least 35 BCSs		

ICTA YEAR 2 BUDGET NOTES		
CRSP Bean Technology Dissemination Associate Award		
(October 1, 2011 - September 30, 2012)		
Transportation and per diem	$15,300.00	This is to cover the transportation and per diem cost of the M&E expert from ICTA's follow up on the quality of seed produced by BCSs in the different regions. The number of days reflects at least one visit to every field. While trips to Peten take no less than three full days, trips to the Western highlands or the southeastern region can be done in the same day driving from the ICTA offices near Guatemala City.
Sub Total	**$15,300.00**	
E) Objective three, Monitoring & Eval.	**$0.00**	
Part-time hired M&E Specialist from ICTA	$1,800.00	This is to cover the partial cost of the M&E technicians at 75% during two months
In country travel to visit project locations	$7,480.00	$170 for 10 field days a month for two months of M&E activities traveling to project locations.
Sub Total	**$9,280.00**	
Total Direct Expenses	**$105,642.82**	
Indirect Cost	**$10,564.28**	
Grand Total	**$116,207.10**	

IV. SNEA Year 2 Planned Activities in this Scope of Work:

As SNEA has worked with ICTA satisfactorily during Year 1, a close cooperation with ICTA has proven to be a good formula to complement the project activities by facilitating the dissemination of the quality-declared seed to resource-poor farmers in the target departments. As SNEA grows more confident with this role it is expected that the technology package will continue to rich target farmers to increase bean productivity on low fertility soils in the southeastern side of Guatemala with 9MT of ICTA Ligero variety to be produced this year in the department of Baja Verapaz. SNEA is also expected to continue dissemination activities in the department of Peten with circa 5MT of ICTA Peten variety produced in Year 1.

During Year 2 further cooperation will be necessary as the BTD project expands its geographic scope to include the western highlands, an area characterized by higher altitude where only the variety ICTA Hunapu has been identified as a high performer. ICTA Hunapu will be produced from October 2011 to January 2012 and is expected to be ready for dissemination by early May 2012, ready for the first production season of 2012.

The expectation for this year is that SNEA will build on Year 1 activities and the experience of some of the most enthusiastic extension agents to facilitate the exchange of knowledge and experience between the eastern and western departments of the country, particularly on community organization, production and storage of improved varieties and the use of other improved agronomic practices and techniques such as the use of *Rhizobium* inoculum. The following sections detail out the expected activities for SNEA during Year 2.

A. Project Activities in Year 2 (October 1, 2011 – September 30, 2012):

Objetive 1: SNEA will be responsible for disseminating the seed of the improved bean varieties to target farmers in the departments of Quiche, Solola, Quetzaltenango,San Marcos, Huehuetenango and Totonicapan, Peten, Chiquimula, Zacapa, Jutiapa and Jalapa. The following activities will be carried out under this amendment:

- FUNDIT will work with SNEA to select the municipalities in each region where seed of the improved bean varieties ICTA Peten and Icta Ligero and the new variety added to the BTD project, ICTA Hunapu. T
- A total of 18MT of ICTA Hunapu, 9MT of ICTA Ligero and 5MT of ICTA Peten will be diseminated to new beneficiaries at a rate of 20lbs per beneficiary as done in Year 1.

- FUNDIT will coordinate with SNEA the transportation of quality seed from the ICTA warehouses to the extension offices with the goal of reaching at least 6,250 farmers during Year 2 with the produced seed by ICTA and the distributed seed through BCSs. The attached table has been discussed with ICTA and SNEA to reach this goal.

CUMULATIVE NUMBER OF FARMERS REACH THROUGH PRODUCED SEED AND THROUGH BCSs				
	Year 1		Year 2	
Geografic region	Produced Seed	Expected farmers accessed through BCSs	Produced Seed	Expected farmers accessed through BCSs
Peten	2500	1250	800	400
Southeast	2500	1250	800	400
Western highlands	0		900	450
Total	**5000**	**2500**	**2500**	**1250**

Grand cumulative total by end of Year 2 Total: 11250 farmers

Objetive 2. To continue the develop national capacities for the production and use of *Rhizobium* inoculants on beans to enhance the sustainability of cropping systems and bean productivity in low fertility fields.

- FUNDIT will coordinate with SNEA and ICTA for the training of the extension agents in the production of seed, post-harvest technology and agronomic management practices to enhance pulse productivity. Unlike Year 1 when there was no capacity to produce Rhizobium inoculum in country, it is expected that by the beginning of the Primera season in May 2012 there will be enough production capacity at ICTA to supply more farmers with enough inoculum for their 20lbs sacs of the improved varieties.

- Training on *Rhizobium* technology (use and application) will be provided to at least 150 new extension agents and agriculture promoters in from the target communities in new regions.

Objetive 3. To expand the establishment of community seed banks in all the deparments where improved seed varieties have been distributed.

- 35 new Bancos Comunitarios de Semillas (BCSs) will be implemented besides the 15 BCS launched in Year 1 for a total of 60 BCS running at the end of Year 2. Each BCS will get two silos, one sorting screen and 30 sacs to start off working through a modus operandi adapted to every community. Experience by SNEA in the first BCSs has shown that some farmers prefer to give back one pound per pound they received from the BTD project, while others have accepted to bring back two pounds of their fields. The

quality of the bean produced will be assessed by ICTA after training on best seed production practices has been imparted by extension agents. Each bank will have one silo to store seed while another silo will be used to store grain that farmers bring in payment for their 20lbs of improved variety, but that has not met the phytosanitary requirement to be considered as quality-declared seed.

- Community seed banks permit the recovery of seed provided to farmers, the multiplication and dissemination of quality seed to communities of farmers, and a means for farmers to proactivity take measures to ensure their access to productivity-enhancing technologies. The monitoring and success of BCSs fall under the responsibility and leadership of each extension agent. Therefore, training and field visits will be scheduled by SNEA and ICTA to follow up the development of this initiative and to document challenges.

Objetive 4. Collection of Monitoring and Evaluation Data

- FUNDIT will make sure that SNEA and ICTA collaborate closely to collect monitoring and evaluation data on time following the formats developed for this activity.During Year 1 this information was collected late which creates further delays in report writing to the donor agency. This situation must be avoid in Year 2 by the timely deployment of the project monitoring personnel budgeted under ICTA and a suitable scheduling of field visits with SNEA extension agents.

B. SNEA Timeline of Activities for Year 2:

Objective/Activity	**Year**											
	2011			**2012**								
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Objective 1: Seed Dissemination												
Delivery of seed to SNEA								x				
Seed dissemination of existing ICTA Peten variety	x	x	x	x								
Seed dissemination of ICTA Hunapu and ICTA Ligero								x	x	x		
Objective 2: Expanded use of *Rhizobium* inoculant												
SNEA and ICTA will collaborate to carry out training on the use of Rhizobium inoculant							x	x				
Objective 3: BCSs follow up												
Identification of communities where BCS will be organized				x	x	x						
Training of extension agents and community leaders in charge of BCS following the Nicaragua model								x				
Objective 4: Monitoring and evaluation												
Data Collection										x	x	
Final report											x	x
Planning of SOW and Budget for Year 3												x

C. SNEA Cost Application (Budget and Budget Notes)

Budget Year 2

CRSP BeanTechnology Dissemination Associate Award	
Year 2 (October 1, 2011 - September 30, 2012)	
	Year 2
	10/1/11-9/30/12
Institution Name: SNEA	
A) Project Management	
Project Coordination at FUNDIT (from ICTA budget)	$0.00
Equipment support to 20 New Extension Agencies in the western highlands (a printer, a laptop computer and a GPS)	$14,000.00
Sub Total	**$14,000.00**
B) Seed Dissemination	
Transportation from ICTA to Extention Agencies	$2,160.00
Sub Total	**$2,160.00**
C) Objective two: Training and distribution of Rhizobium inoculant	
Follow up training for 50 BCS established	$7,500.00
At least one training session per community in 50 communities on the use of Rhizobium inoculum	$7,500.00
Sub Total	**$15,000.00**
D) Objective three, Monitoring & Eval.	
From ICTA budget	$0.00
Sub Total	**$0.00**
Total Direct Expenses	**$31,160.00**
Indirect Cost	**$3,116.00**
Grand Total	**$34,276.00**

Budget notes

BUDGET NOTES CRSP BeanTechnology Dissemination Associate Award Year 2 (October 1, 2011 - September 30, 2012)		
	Year 2	Budget Notes
	10/1/11-9/30/12	
Institution Name: SNEA		
A) Project Management		
Project Coordination at FUNDIT (from ICTA budget)	$0.00	
Equipment support to 20 New Extension Agencies in the western highlands (a printer, a laptop computer and a GPS)	$14,000.00	At least 20 New extension agencies will be benefitted with one notebook computer, one GPS and one printer in the areas of Western Guatemala where activities are being expanded
Sub Total	**$14,000.00**	
B) Seed Dissemination		
Transportation from ICTA to Extention Agencies	$2,800.00	This is equivalent to $80/MT for the 35 MT available for dissemination to bring the bagged seed to the extension agencies
Sub Total	**$2,800.00**	
C) Objective two: Training and distribution of Rhizobium inoculant		
Follow up training for 50 BCS established	$7,500.00	This is a lump sum cost calculated at $150/bank to be used in periodic visits with different members to their seed production fields, purchase of receipts and other support documentation to make the banks functional.
At least one training session per community in 50 communities on the use of Rhizobium inoculum	$7,500.00	This is a lump sum cost calculated at $150/bank for one of the agents to bring the inoculum, teach farmers on the practical use and document who will use inoculum for comparison purposes within each of the bank member base.
Sub Total	**$15,000.00**	
D) Objective three, Monitoring & Eval.		
From ICTA budget	$0.00	
Sub Total	**$0.00**	

BUDGET NOTES CRSP BeanTechnology Dissemination Associate Award Year 2 (October 1, 2011 - September 30, 2012)		
Total Direct Expenses	**$31,800.00**	
Indirect Cost	**$3,180.00**	
Grand Total	**$34,980.00**	

V. Outputs / Deliverables for Assessment of Technical Progress:

The following outputs and deliverables are established for FUNDIT for the activities to be carried out by ICTA and SNEA during Year 2. The deliverables outlined below mark the schedule of funding disbursements upon their progressive completion within the terms of the Fixed Price Contract established between Michigan State University and FUNDIT. The payments will be effective contingent upon completion of other minor deliverables outlined in the timeline. The schedule of disbursements will be divided in four installments. First deliverable: payment of 30% of the total budgeted amount for Year 1. Second deliverable: 40% of the total budgeted amount for Year 1. Third and fourth deliverables: 15% each of the total budgeted amount for Year.

Outputs deliverables FUNDIT

Outputs deliverables		ICTA			
Deliverables	**Output/result**	**Date**	**Contract Amount**	**%**	**Amount**
First deliverable	Approved SOW and budget	Nov 15, 2011	$116,207.10	30%	$34,862.13
Second deliverable	Harvested 27MT seed	Feb 15, 2012	$116,207.10	30%	$34,862.13
Third deliverable	Delivered seed to SNEA	May 15, 2012	$116,207.10	20%	$23,241.42
Fourth deliverable	Monitoring and evaluation data and SOW Year 3	Sep 15, 2012	$116,207.10	20%	$23,241.42
Total				**100%**	**$116,207.10**

Outputs deliverables		SNEA			
Deliverables		**Date**	**Contract Amount**	**%**	**Amount**
First deliverable	Aproved SOW and budget	Nov 15, 2011	$34,276.00	30%	$10,282.80
Second deliverable	All training for BCS completed	April 15, 2012	$34,276.00	30%	$10,282.80
Third deliverable	Seed and Rhizobium inoculum disseminated	July 15, 2012	$34,276.00	20%	$6,855.20
Fourth deliverable	Monitoring and evaluation data and SOW Year 3	Sep 15, 2012	$34,276.00	20%	$6,855.20
Total				**100%**	**$34,276.00**

FUNDIT YEAR 2 ICTA

CRSP BeanTechnology Dissemination Associate Award Three year Budget (March 1, 2010 - September 30, 2013)	
	Year Two 3/1/11-9/30/12
Institution Name: ICTA	
A) Project Management	
Project Coordination at FUNDIT	$13,000.00
Sub Total	**$13,000.00**
B) Seed Production	
Purchase of 18 MT of Icta Hunapu seed	$27,923.08
Purchase 10 MT Icta Ligero seed	$15,512.82
Transportation and conditioning of seed at ICTA	$3,426.92
Seed bags and labels (already purchased in Year 1)	$0.00
Sub Total	**$46,862.82**
C) Objective two: Training of extension agents and farmer leaders in bean production technology and use of Rhizobium	
Two training aids	$4,000.00
10 training events in different locations	$12,000.00
Materials and supplies for trainees	$5,200.00
Materials and supplies for Rhizobium inoculum	$5,100.00
Sub Total	**$26,300.00**
D) Training and monitoring activities on BCSs	
Field monitoring of at least 35 BCSs	
Transportation and per diem	$10,200.00
Sub Total	**$10,200.00**
E) Objective three, Monitoring & Eval.	
Part-time hired M&E Specialist from ICTA	$1,800.00
In country travel to visit project locations	$7,480.00
Sub Total	**$9,280.00**
Total Direct Expenses	**$105,642.82**
Indirect Cost	**$10,564.28**
Grand Total	**$116,207.10**

ICTA YEAR 2 BUDGET NOTES		
CRSP BeanTechnology Dissemination Associate Award		
(October 1, 2011 - September 30, 2012)		
A) Project Management		
Project Coordination at FUNDIT	13,000.00	Coordinator hired at f $1000/month with a 13 salary/year hiring policy. This equals $1083/month. For this year, the hiring period is 12 months.
Sub total	**13,000.00**	
B) Seed Production		
Purchase of 18 MT of Icta Hunapu seed	$27,923.08	18MT of seed at Quetzal 550 per 100lbs bag (cwt) is equivalent to Q12100. The exchange rate is 7.8 quetzal per US$1, is equivalent to $1,551.28/MT. See formula in excel.
Purchase 10 MT Icta Ligero seed	$15,512.82	10MT of seed at Quetzal 550 per 100lbs bag (cwt) is equivalent to Q12100. The exchange rate is 7.8 quetzal per US$1, is equivalent to $1,551/MT. See formula in excel.
Transportation and conditioning of seed at ICTA	$3,426.92	From Year 1's experience, there is an expense of Q45 ($5.77) per cwt to bring the seed to the ICTA facilities, clean, treat, bag and label the seed ready for dissemination. There are 22cwt per MT and a total of 27MT which equals 595 cwt. See excel formula
Seed bags and labels (already purchased in Year 1)	$0.00	This was purchased in Year 1
Sub Total	**$46,862.82**	
C) Objective two: Training of extension agents and farmer leaders in bean production technology and use of Rhizobium		
Two training aids	$4,000.00	Two training aids will be hired to support the training organization and delivery during the course of the Year 2 work plan.
10 training events in different locations	$12,000.00	This is calculated at $1200 per event for venue rental and refreshments. Extension agents already have their per diem covered by the Ministry of Ag. This events are smaller in size than previous events, but the budget considers more events in total
Materials and supplies for trainees	$5,200.00	At least 260 training kits containing field books, printed materials and training guides will be purchased at a rate of $20/kit.
Sub Total	**$26,300.00**	
D) Training and monitoring activities on BCSs		
Field monitoring of at least 35 BCSs		

ICTA YEAR 2 BUDGET NOTES		
CRSP BeanTechnology Dissemination Associate Award		
(October 1, 2011 - September 30, 2012)		
Transportation and per diem	$10,200.00	This is to cover the transportation and per diem cost of the M&E expert from ICTA's follow up on the quality of seed produced by BCSs in the different regions. The number of days reflects at least one visit to every field. While trips to Peten take no less than three full days, trips to the Western highalnds or the southeastern region can be done in the same day driving from the ICTA offices near Guatemala City.
Sub Total	**$10,200.00**	
E) Objective three, Monitoring & Eval.	**$0.00**	
Part-time hired M&E Specialist from ICTA	$1,800.00	This is to cover the partial cost of the M&E technicians at 75% during two months
In country travel to visit project locations	$7,480.00	$170 for 10 field days a month for two months of M&E activities traveling to project locations.
Sub Total	**$9,280.00**	
Total Direct Expenses	**$105,642.82**	
Indirect Cost	**$10,564.28**	
Grand Total	**$116,207.10**	

CRSP BeanTechnology Dissemination Associate Award Year 2 (October 1, 2011 - September 30, 2012)	
	Year 2
	10/1/11-9/30/12
Institution Name: SNEA	
A) Project Management	
Project Coordination at FUNDIT (from ICTA budget)	$0.00
Equipment support to 20 New Extension Agencies in the western highlands (a printer, a laptop computer and a GPS)	$14,000.00
Sub Total	**$14,000.00**
B) Seed Dissemination	
Transportation from ICTA to Extention Agencies	$2,160.00
Sub Total	**$2,160.00**
C) Objective two: Training and distribution of Rhizobium inoculant	
Follow up training for 50 BCS established	$7,500.00
At least one training session per community in 50 communities on the use of Rhizobium inoculum	$7,500.00
Sub Total	**$15,000.00**
D) Objective three, Monitoring & Eval.	
From ICTA budget	$0.00
Sub Total	**$0.00**
Total Direct Expenses	**$31,160.00**
Indirect Cost	**$3,116.00**
Grand Total	**$34,276.00**

BUDGET NOTES CRSP BeanTechnology Dissemination Associate Award Year 2 (October 1, 2011 - September 30, 2012)		
	Year 2	Budget Notes
	10/1/11-9/30/12	
Institution Name: SNEA		
A) Project Management		
Project Coordination at FUNDIT (from ICTA budget)	$0.00	
Equipment support to 20 New Extension Agencies in the western highlands (a printer, a laptop computer and a GPS)	$14,000.00	At least 20 New extension agencies will be benefitted with one notebook computer, one GPS and one printer in the areas of Western Guatemala where activities are being expanded
Sub Total	**$14,000.00**	
B) Seed Dissemination		
Transportation from ICTA to Extention Agencies	$2,800.00	This is equivalent to $80/MT for the 35 MT available for dissemination to bring the bagged seed to the extension agencies
Sub Total	**$2,800.00**	
C) Objective two: Training and distribution of Rhizobium inoculant		
Follow up training for 50 BCS established	$7,500.00	This is a lump sum cost calculated at $150/bank to be used in periodic visits with different members to their seed production fields, purchase of receipts and other support documentation to make the banks functional.
At least one training session per community in 50 communities on the use of Rhizobium inoculum	$7,500.00	This is a lump sum cost calculated at $150/bank for one of the agents to bring the inoculum, teach farmers on the practical use and document who will use inoculum for comparison purposes within each of the bank member base.
Sub Total	**$15,000.00**	
D) Objective three, Monitoring & Eval.		
From ICTA budget	$0.00	
Sub Total	**$0.00**	
Total Direct Expenses	**$31,800.00**	

BUDGET NOTES CRSP BeanTechnology Dissemination Associate Award Year 2 (October 1, 2011 - September 30, 2012)		
Indirect Cost	**$3,180.00**	
Grand Total	**$34,980.00**	

Honduras

Strategic Investment in Rapid Technology Dissemination: Commercialization of Disease Resistant Bean Varieties in Guatemala, Nicaragua, Honduras and Haiti. **(Associate Award to the Dry Grain Pulses CRSP)**

October 1, 2011 – September 30, 2012

AMENDMENT TO EAP/ZAMORANO SUBCONTRACT

SCOPE OF WORK - Year 2 (October 2011- September 30, 2012)

Organization to be Sub-Contracted: Escuela Agricola Panamericana, Zamorano, Calle Pastizales, Bloque E, Casa No. 5, Residencial La Hacienda, P.O. Box 93, Tegucigalpa, Honduras.

Project Leader: Juan Carlos Rosas, Full Professor, Escuela Agricola Panamericana, Zamorano, 011 (504)2776-6140 Ext. 2314, Cell 011(504)9982-4931, jcrosas@zamorano.edu.

Administrative/Financial Officer for Organization: Roberto Cuevas García, Rector**,** Escuela Agricola Panamericana, Zamorano, Calle Pastizales, Bloque E, Casa No. 5, Residencial La Hacienda, P.O. Box 93, Tegucigalpa, Honduras, 011(504)2287-2000, rcuevas@zamorano.edu.

Collaborating Host Country Organizations:

Dirección de Ciencia y Tecnología Agropecuaria (DICTA), Ing. Geovany Pérez, Executive Director, Secretaría de Agricultura y Ganadería, Ave. La FAO, Blvd. Miraflores, Apartado Postal 5550, 011(504)2232-7982, fperez.dicta@gmail.com.

Programa de Reconstrucción Rural (PRR), Ing. Enrique Castillo, Director, La Buena Fe, Zacapa, Santa Bárbara, Apartado Postal 140, Honduras, 011(504)2715-0923 , castillo_prr@yahoo.es.

Fundación para la Investigación Participativa con Agricultores de Honduras (FIPAH), Ing. José Jiménez, representante, Yorito, Yoro, Honduras, 011(504)2671-4091, fipahyorito@yahoo.es.

I. Amendment Justification

During the first year of the Bean Technology Dissemination Project, Escuela Agrícola Panamericana-Zamorano (EAP/Zamorano) has satisfactorily achieved the expected results of producing genetic and foundation seed to support the program goals in Guatemala, Honduras, Nicaragua and Haiti, as well as in multiplying foundation seed into quality declared seed in partnership with PRR, FIPAH and ASOCIOGUARE. According to final data, EAP/Zamorano succeeded in distributing 8.65 MT of foundation seed to all partners in the four target countries and in Honduras alone it coordinated the reproduction and dissemination of quality-declared seed for 4200 farmers in 31 municipalities. The impact of these distributions is being quantified as it has provided an opportunity for many farmers to start off their segunda planting season with a tested improved variety. The participation of three grass-roots associations in close partnership with EAP/Zamorano is a positive factor in ensuring long-term sustainability of improved seed production and the transfer of other bean production technologies supported by the BTD project. In years 2 and 3 additional work will be engaged by EAP/Zamorano and partners aiming at reaching new beneficiaries that can also take advantage of the project.

For Year 2, EAP/Zamorano will continue to produce genetic and foundation seed for the projects in Guatemala, Nicaragua, Haiti and Honduras and will continue to coordinate the multiplication of quality-declared seed in partnership with FIPAH, PRR and ASOCIOGUARE. This work is consistent with the three-year goals of the BTD which are (1) to make accessible a productivity enhancing technology package (i.e. quality seed of improved varieties, inoculants, etc.) to a total of 30,000 small-holder resource-poor bean farmers, (2) to increase the availability of nutritious bean/pulse grain in domestic markets at affordable prices so as to improve food and nutritional security of the rural and urban poor, and (3) and to implement sustainable bean seed system with local farmer/community involvement so as to ensure long-term availability of "quality seed" of superior bean varieties beyond the life of the project.

In support of the project in Honduras, the EAP/Zamorano will contribute to the attainment of the following objectives. (1) To develop sustainable national capacities for the production of quality seed of improved varieties of beans with the participation of organizations involved in local and formal systems. (2) To facilitate access of small farmers to improved varieties of beans through the dissemination of quality seed produced in target regions. (3) to develop national capacities for the production and use of *Rhizobium* inoculants, organic fertilizers and other agro-ecological management practices for the crop. And (4) to monitor and evaluate the production of seed inoculants and organic fertilizers, the spread of these technologies and their contributions to the direct beneficiaries.

This SOW builds on the results and lessons learned from Year 1 by EAP/Zamorano and its partners. This document explains in detail the activities to be carried out which are similar to Year 1, with the exception of the greater emphasis on ensuring the sustainability of the multiplication of improved varieties and the expansion of dissemination and training activities to new beneficiaries.

II. Planned Activities in this Scope of Work for Year 2 (October 1, 2011-September 30- 2012):

In Year 1 the 10,000 beneficiaries targeted to receive qualified seed were not reached due to delays in signing the institutional agreements and transfer of funds to support these activities, which caused the missing of one season for seed multiplication. In Year 2, Zamorano, DICTA and their partners will produce and distribute qualified seed to reach the target beneficiaries missing from Year 1 and the total number planned for Year 2. For the same reasons of timing during Year 1, training courses on seed production and conditioning and *Rhizobium* technology planned for Year 1 will be offered in Year 2, along with those planned for this year. The leadership of the project in Honduras is vested again this year in EAP-Zamorano as the lead institution, and more specifically on the Bean Research Program (PIF, acronymic in Spanish) led by JC Rosas, the HC-PI of the project in Honduras. Through the PIF, EAP/Zamorano is responsible for coordinating, planning and implementing the work plan and for monitoring the use of funds allocated for these purposes. To accomplish this, EAP/Zamorano will sign agreements (sub-contracts) with the NGOs PRR and FIPAH. For the purposes activities to be undertaken by DICTA through its regional offices in the West, Olancho and municipalities in other areas to be targeted, MSU will sign a subcontract directly with the Executive Director of DICTA. As such, DICTA will be responsible for the management of funds received under the project. However, the MO of Pulses CRSP specifies in the sub-contract that for purposes of planning and implementation of activities, the responsibility for coordination of the project activities in Honduras lies with EAP-Zamorano as the lead institution for the project in this country.

Also, travel funds are allocated for monitoring and technical assistance to be used by the HC-PI working with technical leaders of Honduras and other participating countries. This travel budget will also cover costs associated to the participation in some training and scheduled events in these countries.

Activity 1: Production of genetic, foundation, registered and qualified seed with national and local producers.

Seed production processes established by the Seed Law of each host country will be followed. Therefore, four categories of seed (genetic, foundation, registered and qualified) will be produced under the Honduras project. The categories of genetic and foundation seed will be produced by PIF in lots located on the

Central Campus of EAP/Zamorano, following the procedures recommended for these seed categories. In addition to its use in project activities in Honduras, the production of genetic and foundation seed will include observance to the requirements of the institutions involved in projects in Nicaragua, Guatemala and Haiti.

Genetic seed. The amount of genetic seed to be produced during the second year will be at least 20 one-hundred-pound sacks (abbreviated cwt), as EAP/Zamorano must handle high quality, sufficient stocks of all varieties to be used in the project. For the production of genetic seed, the multiplication of individual plant progenies selected in uniform lots of each variety will be used. Through frequent visits to the field, there will be strict elimination of progenies that differ even in minimum details to varietal descriptors of each material, both at field level, as in the conditioning of the seed.

Foundation seed (also known as basic seed). The amount of foundation seed to be produced in thissecond year of the project will be at least 100 cwt. Seed of five varieties of red beans (Amadeus 77, DEORHO, Cardenal, Carrizalito, Tio Canela 75) and four varieties of black beans (ICTA Ligero, ICTAZAM, Aifi Wuriti and XRAV40-4), These varieties are required for the project in the four target countries, according to producer demand. To meet the annual needs of each country and also to have an additional 20% to cover contingencies, at least 100 cwt of foundation seed production will be required. The estimated seed yield of foundation seed is 20 cwt. per hectare after selection in the field and seed conditioning, which ensures high quality seed in this category.

Registered seed. This category comes from the multiplication of foundation seed and will be completed by Zamorano and DICTA, entities authorized to produce this category of seed in Honduras. This category of seed is to be provided to selected seed producers who will be responsible for producing the qualified seed (quality declared seed) to be distributed to the direct beneficiaries. Concerning registered seed production plans, the same production estimates per area used in foundation seed production (20 cwt per hectare) are forecasted since rigorous selection criteria in the field as well as during seed conditioning are applied in both seed categories. In order to complete the production of distribution of qualified seed for the remaining 2,800 beneficiaries from Year 1 and the new 10,000 from Year 2, during the second year over 150 cwt. of registered seed will be produced for use in qualified seed production of the varieties described in the five regions of Honduras.

Qualified Seed. This category is equivalent to certified seed in the formal system, but due to the need to streamline the process and in view of the limited capacity of the national office to meet the demand for certification requests, the production of qualified seed will not follow the formal certification process strictly. Nonetheless, production lots will be supervised and the recommended visits by technicians from the participating institutions will be carried out with the assistance of the EAP/Zamorano and DICTA. Seed producers will receive inputs (seed and fertilizer) and support to install irrigation systems, seed conditioning, and training in seed production and seed conditioning, and technical assistance in the stages of crop management, harvest and post-harvest.

Qualified seed production will be conducted in five regions: (1) Yojoa Lake Region (localities of the departments of Comayagua and Santa Barbara located around the lake), under the technical supervision of the PRR and organized in collaboration with farmers in CIALs (Local Agricultural Research Committee); (2) Region Yorito-Sulaco-Victoria (municipalities of Yoro) and Vallecillo (in the department of Francisco Morazan), supervised by technicians from FIPAH and in collaboration with the Associations of CIALs of these areas; (3) Western Region (localities of the departments of Copán, Lempira and Ocotepeque) under the supervision of the Regional Office of DICTA-West and the collaboration of farmers in this region; (4) region of Olancho (localities from this department) under supervision of technicians from the Regional Office of DICTA-Olancho and in collaboration of farmers in this region, and (5) Region Yeguare River Basin (in areas of the departments of F. Morazan and El Paraiso), where the EAP/Zamorano is located, which will oversee this activity and with the cooperation of farmer CIALs from this region. These are important bean producing areas in Honduras with thousands of farmers characterized by poor access to improved seed. The concentration of bean farmers in these areas allows the project implementers to target new beneficiaries every year.

The required seed to be produced annually amounts to 2000 cwt to distribute 20lb (aprox. 10 kg)- bags of seed to 10,000 of pre-selected bean producers. EAP/Zamorano will supervise the production and distribution of 6,000 cwt of qualified seed, and DICTA will be responsible of the production and distribution of 4,000 cwt during Year 2. To accomplish this target, an average production of 400 cwt of qualified seed per region (2,000 cwt. total per year) is expected. An estimated 800 cwt (40%) of the programmed production for the regions of Lake Yojoa and Yorito-Sulaco-Victoria/Vallecillo and Yeguare is scheduled for the postrera (Oct-Dec 2011) and summer (Jan-April 2012) seasons. The remaining 60% (1,200 cwt) will be produced during the first planting season (May – Aug 2012). A rate of 20 cwt. per hectare after seed selection and preparation is being used for production estimates. Technicians from Zamorano and the collaborating institutions will provide training and technical assistance to qualified seed producers ("semilleristas") from these regions. In addition, 560 cwt will be produced during the postrera (Oct-Dec 2011) and summer (Jan-April 2012) seasons to complete Zamorano and DICTA seed distribution target for Year 1; this qualified seed will be distributed in May for the primera planting season of 2012 along to the 800 cwt produced under the Year 2 plans.

Activity 2. Distribution of seeds to 10,000 producers qualified for the dissemination of improved varieties in five regions of the country.

The seed distribution will be directed to qualified small-holder bean producers with limited resources in the five areas identified above. The selection of beneficiaries will be under the supervision of the collaborating institutions and producer organizations, local authorities, NGOs and other organizations involved in community development. This collaboration is necessary in order to facilitate the delivery of seed in a fair and impartial manner, and to the neediest beneficiaries. Information on beneficiary farmers (recipients of the technology package) will be collected and compiled including name, locality (village, town, municipality), and the name of the organization to which each beneficiary belongs using the M&E template. Additionally, contact organizations (municipality, association of producers, NGO or other) will be recorded. This information will be useful in avoiding the distribution of seed to the same individuals thereby facilitating extension of the technology package to a broader population of farmers in Honduras. Seed packages will be identified with logos of the Pulse CRSP, USAID, Zamorano, DICTA and collaborating institutions. The program brand "Semillas del Futuro" has been included in the package. The name of the variety, location and season of production and seed quality criteria (% germination and humidity) will be also included.

On Year 2, 20 lb seed-bags will be delivered to 10,000 farmers at a rate of 2,000 bags per region, and the responsibility of distribution of qualified seed by Zamorano is 6,000 and for DICTA is 4,000 beneficiaries, respectively. In order to accomplish this task, Zamorano and collaborators will be producing qualified seed during the postrera (Oct-Dec 2011) and summer (Jan-Apr 2012) seasons; and it is expected to distribute this seed during May 2012 to 40% of the beneficiaries in the areas of Lake Yojoa,Yorito-Sulaco-Victoria/ Vallecillo and Yeguare regions. Consequently, farmers will be ready to use this qualified seed for commercial production for the first planting season of 2012. In addition, qualified seed produced as part of the Year 1 remaining will be included in this distribution for the primera season planting in May 2012. The rest of the seed produced under the supervision of Zamorano (60%), will be produced during the first planting season of 2012, and distributed to the beneficiaries in early September 2012, for immediate use by farmers for their "postrera" planting season (the most important in planting area in Honduras).

Activity 3. Training of technicians and farmers in seed production, postharvest management, agronomic crop management and production and use of inoculants and organic fertilizers.

Three training courses for technicians involved in the production and distribution of seed will be conducted. These trainees will, in turn, train seed producers and the final beneficiaries. The courses will include trainees from Honduras, Nicaragua, Guatemala and Haiti. The central training topics in the second year will be seed production, crop management, seed conditioning and postharvest handling, which will be taught by staff of the PIF and Seed Unit in EAP/Zamorano. Two training courses for seed producers will be offered in every region by technicians from the collaborating institutions with the support of EAP/Zamorano.

During the year, a second training course in the target countries on *Rhizobium* technology will be imparted at the Biotechnology Laboratory of PIF/Zamorano. Also, twocourses on production and use of organic fertilizers and agro-ecological management of the bean crop will be offered to technicians and farmer leaders in the Organic Farming Unit of the EAP/Zamorano. Courses for technicians and farmer leaders from Honduras, Guatemala and Nicaragua in Zamorano will have a maximum of 15 participants and an average duration of three days. In Honduras, 10 demonstration plots for seed producers will be established where field days will be carried out to show the use and benefits of inoculants in the production of beans. Based on installed capacity and budget availability, over 300 doses of inoculant will be produced and distributed for use in the seed producer plots and 1000 doses for commercial producers in Honduras, Nicaragua and Guatemala. Follow up activities with participants at the *Rhizobium* Technology workshop to be held in Honduras in November 2011 will include visits to the laboratory and field facilities to ensure implementation of practices for *Rhizobium* maintenance and inoculant production and use in farmer fields. A regional trial to test the response to inoculation in farmer fields will be design and implemented with participants at the workshop.

Activity 4. Baseline data collection from beneficiaries, monitoring and evaluation report of the first and second years.

The data from the first year of activities will be partially completed by the end of Year 1, so the collection of information of seed production and distribution to beneficiaries, using the formats and following the recommendations of the MO developed by Dr. Mywish Maredia, will continue during the first quarter of Year 2. In the other hand, collection of information from activities planned for Year 2 will start to be recorded from the beginning of Year 2. EAP/Zamorano will help to collect and process the information in collaboration with partners in each region; which will require the part-time hiring of a qualified and experienced staff from the M&E unit of the EAP/Zamorano Agribusiness Department.

V. **Implementation Timeline:**

ACTIVITY	Year 2 (October 2011 - September 2012)											
	OCT	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**
PLANNING												
Partners meeting	x	x										
SEED PRODUCTION												
Foundation	x	x	x		x	x	x					
Registered	x	x	x		x	x	x					
Qualified	x	x	x		x	x	x		x	x	x	
Genetic	x	x	x		x	x	x					
SEED DISSEMINATION												
Lake Yojoa	Y1						x					x
Yoro and F. Morazan	Y1			x			x					x
Yeguare/El Paraíso	Y1						x					x
Others (with NGO)	Y1						x					x
Western (DICTA)	Y1						x					x
Olancho (DICTA)	Y1			x			x					x
***Rhizobium* and others**												
Inoculant production	x	x			x	x	x			x	x	x
Demonstration plots	x	x	x						x	x	x	
Commercial plots	x	x	x		x	x	x		x	x	x	
TRAINING												
Seed production	x	x					1					
Post Harvest Management			x	x				1				
Agronomic Management		x					x			x		
Inoculant production		x					x				x	
Organic fertilizer production	x					x				x		
MONITORING												
Annual Report												x
ADMIN REPORTS												
Annual												x

Y1 (complete distribution of qualified seed produced in Year 1).

VI. **Outputs/Deliverables for Assessment of Technical Progress: Outputs / Deliverables for Assessment of Technical Progress:**

See attached document.

VI. **Leveraged Resources:**

EAP Zamorano: greenhouses, experimental and field plots for genetic and foundation seed production; areas for processing, seed drying and storage on the EAP campus. Time of the HC-PI invested in project

coordination and supervision of activities of seed production and distribution to beneficiaries, training and monitoring and evaluation activities. Laboratory equipment and areas for inoculant production and *Rhizobium* technology training; use of the Organic Farming Unit including organic crop production plots and areas of production of fertilizers and organic products, for training.

DICTA: Production plots and areas for drying, packaging and storage of basic and registered seed stations. Technical personnel for monitoring and technical support for qualified seed production with farmers and monitoring of seed distribution to beneficiaries, and monitoring and evaluation activities. Transportation vehicles for technicians and trainers. Administration of funds allocated to DICTA for this project.

PRR: technical personnel for supervision, training and technical support of the qualified seed production with farmers and seed distribution to beneficiaries, and monitoring and evaluation activities. Vehicles to transport technicians and trainers. Administration of funds allocated to PRR for this project.

FIPAH: technical personnel for supervision, training and technical support from qualified seed production with farmers and seed distribution to beneficiaries, and monitoring and evaluation activities. Vehicles to transport technicians and trainers. Administration of funds allocated to FIPAH for this project.

The table below summarizes the contribution leveraged from Zamorano and partners in Honduras participating in the project.

Contributions from organizations participating in the BTD/DGPC Project- Honduras (Year 2)

Categoría	Zamorano	DICTA	PRR	FIPAH
Salaries & Benefits	16,000	15,000	5,000	5,000
Travel	2,000	2,000	1,000	1,000
Transportation	2,000	2,000	1,500	1,500
Training	10,000	5,000	5,000	5,000
Other direct costs	3,000	6,000	2,500	2,500
Total direct costs	33,000	30,000	15,000	15,000
Indirect costs	30,000	10,000	0	0
Total by organization	63,000	40,000	15,000	15,000
Total Honduras	$ 133,000			

V. **Cost Application:**

CRSP BeanTechnology Dissemination Associate Award Budget by collaborator- Year 2 (October 1, 2011 - September 30, 2012)				
	Total	**Zamorano***	**PRR**	**FIPAH**
Institution Name: EAP-Honduras				
A) Project Management				
Salaries & Fringes	$13,400.00	$13,400.00	$0.00	$0.00
Equipment & Supplies	$2,000.00	$2,000.00	$0.00	$0.00
Travel	$13,000.00	$13,000.00	$0.00	$0.00
Sub Total	**$28,400.00**	**$28,400.00**	**$0.00**	**$0.00**
B) Objective 1- Seed production				
Salaries & Fringes	$28,800.00	$19,200.00	$4,800.00	$4,800.00
Equipment & Supplies	$20,000.00	$12,000.00	$4,000.00	$4,000.00
Travel	$4,000.00	$0.00	$2,000.00	$2,000.00
Training	$10,000.00	$8,000.00	$1,000.00	$1,000.00
Contracted Services	$36,000.00	$12,000.00	$12,000.00	$12,000.00
Sub Total	**$98,800.00**	**$51,200.00**	**$23,800.00**	**$23,800.00**
C) Objective 2- Seed Handling/Dist.				
Salaries & Fringes	$8,000.00	$8,000.00	$0.00	$0.00
Equipment & Supplies	$10,800.00	$6,800.00	$2,000.00	$2,000.00
Travel	$3,000.00	$1,000.00	$1,000.00	$1,000.00
Training	$0.00	$0.00	$0.00	$0.00
Contracted Services	$12,000.00	$4,000.00	$4,000.00	$4,000.00
Sub Total	**$33,800.00**	**$19,800.00**	**$7,000.00**	**$7,000.00**
D) Objective 3- Rhizobium & others				
Salaries & Fringes	$8,000.00	$8,000.00	$0.00	$0.00
Equipment & Supplies	$12,000.00	$12,000.00	$0.00	$0.00
Training	$4,000.00	$4,000.00	$0.00	$0.00
Contracted Services	$0.00	$0.00	$0.00	$0.00
Sub Total	**$24,000.00**	**$24,000.00**	**$0.00**	**$0.00**
E) Performance Monitoring				
Salaries & Fringes	$8,000.00	$8,000.00	$0.00	$0.00
Travel	$2,000.00	$2,000.00	$0.00	$0.00
Sub Total	**$10,000.00**	**$10,000.00**	**$0.00**	**$0.00**
Total Direct Expenses	**$195,000.00**	**$133,400.00**	**$30,800.00**	**$30,800.00**
Indirect Cost 15%	**$29,250.00**	**$20,010.00**	**$4,620.00**	**$4,620.00**
Grand Total	**$224,250.00**	**$153,410.00**	**$35,420.00**	**$35,420.00**

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***Strategic Investment in Rapid Technology Dissemination: Commercialization of Disease Resistant Bean Varieties in Guatemala, Nicaragua, Honduras and Haiti.* (Associate Award to the Dry Grain Pulses CRSP)**

October 1, 2011 – September 30, 2012

AMENDMENT TO DICTA SUBCONTRACT

SCOPE OF WORK - Year 2 (October 1, 2011- September 30, 2012)

SCOPE of WORK

Organizationto be Sub-Contracted: Direcciónde Ciencia y Tecnología Agropecuaria (DICTA), Secretaría de Agricultura y Ganadería, Ave. La FAO, Blvd. Miraflores, Apartado Postal 5550, Tegucigalpa, Honduras.

Project Leaders: Narcizo Meza Linares (narcizo_meza@hotmail.com) and Ing. Misael Espinoza,DICTA, Secretaría de Agricultura y Ganadería, Ave. La FAO, Blvd. Miraflores, Apartado Postal 5550, Tegucigalpa, Honduras.

Co-Project Leader: Juan Carlos Rosas, Professor, Escuela Agricola Panamericana, Zamorano, 00 (504)2776-6140 Ext. 2314, Cell00 (504)9982-4931, jcrosas@zamorano.edu.

Administrative / FinancialOfficerforOrganization: Mrs. Ana Dunnaway, Dirección de Ciencia y Tecnología Agropecuaria (DICTA), Secretaría de Agricultura y Ganadería, Ave. La FAO, Blvd. Miraflores, Apartado Postal 5550, Tegucigalpa, Honduras, 00 (504)2232-7982, adunnaway@gmail.com.

Collaborating Host Country Organizations:
Escuela Agrícola Panamericana (EAP), Zamorano, Calle Pastizales, Bloque E, Casa No. 5, Residencial La Hacienda, Tegucigalpa, Honduras.

I. Amendment justification

This amendment to the DICTA contract details the activities to be carried in Year 2 of the BTD project in support to the three-year goals for each participant host country which include: (1) to make accessible a productivity enhancing technology package (i.e., quality seed of improved varieties, inoculants, etc.) to a total of 30,000 small-holder resource-poor bean farmers, (2) to increase the availability of nutritious bean/pulse grain in domestic markets at affordable prices so as to improve food and nutritional security of the rural and urban poor, and (3) and to implement sustainable bean seed systems with local farmer/community involvement so as to ensure long-term availability of "quality seed" of superior bean varieties beyond the life of the project.

During Year 1 DICTA was able to coordinate the multiplication of bean varieties in several departments of Honduras. While the efforts disseminate seed to reach 2665 farmers up to October 31, 2011, the results were short of reaching 3,000 farmers as planned. However, there are 67 cwt. that are being disseminated to 340 additional farmers identified. This distribution will take place in the weeks left form the year 2011 and will complete the 3,000 farmer goal. Several factors influenced the timing of this result. First, the production goals for the department of Olancho were not reached due to poor phytosanitary handling by the seed multipliers which led to poor seed. This situation has motivated DICTA to opt for different seed multiplier in that department. Second, the limited rain during the growing season and excessive rain during harvest made it a difficult for seed multipliers to reach production targets in the eastern part of the country although production goals were met satisfactorily . In the last weeks of October, the heavy rain also posed significant challenges for DICTA personnel to reach the targeted number of beneficiaries on time.

For Year 2 DICTA considers to two key changes in their approach in order to increase the number of beneficiaries through a sustainable seed reproduction and dissemination system other than contracting seed

production and distributing to farmers. First, the production of seed during Year 2 will be increased in areas where the risk of production was lower and with partners that were successful in multiplying seed under high seed quality standards. And second, half the project efforts in Year 2 will be invested the organization of community seed banks as a community-based, sustainable approach for farmers to ensure access to improved varieties season after season. This approach will begin with training of DICTA field technicians and leading collaborators in several departments, a learning mission to Nicaragua following the experience of the Guatemala Extension Service and the investment in 30 community banks during Year 2 as a first experience with this approach. The details of this strategy are explained in this amendment to the DICTA contract for Year 2 as follows.

II. Objectives of Sub-Project in Honduras for Year 2 (October 1, 2011- September 30, 2012)

Objective 1. Multiply basic seed and coordinate the multiplication of registered seed through contracts with key seed multipliers and community seed banks.

Objective 2. Facilitate access of small farmers to improved varieties of beans and the tested strains of Rhizobium inoculum in target regionsas part of the technology dissemination package of the BTD project.

Objective 3. Develop sustainable national capacities for the production and dissemination of quality seed of improved varieties of beans through the organization of 30 community seed banks in key regions of Honduras

Objective 4. Monitor and assess performance regarding the production of qualified bean seed, *Rhizobium* inoculants, and organic fertilizers, the dissemination of these technologies and their impact on beneficiaries, and on national bean production.

III. Planned Activities in this Scope of Work for Year 2 (October 1, 2011 – September 30, 2012)

Activity 1: Production of registered and qualified seed with national and local producers.

During the month of December, 2011, EAP/Zamorano will provide DICTA 2 cwt. of each of target variety for the areas covered by DICTA. The varieties are Amadeus 77, DEORHO, Cardenal, Carrizalito, TioCanela 75. This seed will be multiplied at the DICTA experimental station El CEDA, located in Comayagua and Las Acacias located in El Paraiso. DICTA's goal is to multiply a total of 150 cwt. of registered seed under irrigation in DICTA-cultivated fields at a rate of 30 cwt per variety. An estimated 80 cwt. of this registered seed varieties will be multiplied in 42ha (approximately 60manzanas[2]) through contracts with strategic partners in Occidente, the Atlantic Littoral and Olancho with a proven record of good seed production practices during Year 1.

An estimated 70 cwt. of registered seed will be invested in at least 30 community banks to be established by DICTA field technicians in cooperation with established organizations that have taken a strong leadership role in identifying farmers and disseminating improved varieties during Year 1. While this will be the first time DICTA ventures into organizing community seed banks following the model in Nicaragua, we expect to evaluate the results of this investment and modify thetarget number of banks as the project advances.

Activity 2. Distribution of the qualified seed of improved bean varieties and *Rhizobium* to 5,000 small-holder farmers in two regions of the country.

The goal for DICTA during Year 1 (October 1, 2010 – September 30, 2011) included reaching 3,000 farmers with a bags of 20lb of seed. The seed reproduction was successful despite lower yields than expected in some parts of the country, but the overall goal will be attained once the last seed is disseminated. For Year 2, it is expected that 5,000 new farmers will be reached through a combination of seed produced under contract with

[2]Manzana(s) is abbreviated Mz

key seed multipliers to target enough seed for 3,000 farmers for a total production of 600cwt.) and the launching of at least 30 community seed banks targeting 2,000 farmers for a total production of 400cwt.

Although no *Rhizobium* inoculum was available for dissemination in Year 1, this activity will be developed in Year 2 under the leadership of EAP/Zamorano which is in charge of the multiplication of Rhizobium inoculum and will be holding specific training sessions for the four target country partners. In summary, the distribution of the Bean Technology Package includes quality-declared seed of improved varieties, the use of Rhizobium inoculum and training to achieve the best performance possible from this genetic material. DICTA will work closely with Zamorano to reach the beneficiaries receiving improved seed so that they also experiment with the use of the recommended strain of Rhizobium following EAP/Zamorano's recommendation.

Activity 3. Launching the Community Seed Bank model in Honduras.

The seed multiplication and dissemination model used by DICTA in Year 1 has been effective in reaching the target amount of farmers, but it is far from building a sustainable seed system for the small Honduran bean farmer. The BTD project has made a strong case to DICTA for their participation in following the steps of Nicaragua in the organization and technical support of Community Seed Banks. Community Seed Banks or "Bancos Comunitarios Productores de Semilla" are organized and promoted by the Instituto Nacional de Tecnologias Agricolas (INTA) in Nicaragua as sustainable, community-based structures that make possible the dissemination of improved bean varieties at the lowest cost possible to the farmer. DICTA has been provided examples of how during the first year of implementation of the project in Nicaragua, bean yields of 22cwt to 26cwt per mz (1400 and 1650kg/ha) were achieved by approximately 80% of the 200 "Bancos" organized by INTA, reaching 5,000 farmers with 20lbs of improved bean seed. These yields have been obtained by small groups of farmers utilizing selected inputs (e.g., fertilizer,, plastic, etc.) for the production of quality seed ("Quality Declared Seed") of improved red bean varieties where the role of INTA has been to train and closely monitor the seed production practices to comply with the minimally-required phytosanitary standards. The gain has been for all stakeholders, but mainly for the farmer since the seed is produced in his/her community, farmers have been observing the multiplication field sites and have been captivated by the yield potentialities when inputs are judiciously used in combination with quality seed of improved varieties. After reevaluating the Community Seed Banks with DICTA, both MSU and DICTA are convinced that this model needs to be tried in Honduras with the best approach possible.

Under this activity, DICTA will engage in carrying out the following sub-activities:

a) Selecting the DICTA technicians and community individuals and/or organizations engaged in bean production that would be interested in establishing a Community Seed Bank following the experience in Nicaragua. The following steps are scheduled to take place with each interested group.
    a. Training on seed bank management practices and assessment of land characteristics to support the multiplication of high-quality seed and further dissemination of quality-declared seed and *Rhizobium* inoculum.
    b. Training of "leader farmers" on seed multiplication and handling, the use of yield enhancing technologies, ICP/IPM practices, post-harvest grain handling and storage,
    c. Seed conditioning and bagging for dissemination to their member base and seed recovery and conservation techniques for the next season.
b) Organize a learning mission to Nicaragua with at least 25 technicians and community leaders, each of them with the commitment of establishing at least 1 community seed bank in their area of work activity or community. A similar experience was carried out in July 2011 with a team of extension agents in Guatemala and the results were very motivating. Following this activity, Guatemala has engaged in organizing community seed banks with an adapted methodology to the local culture of the target regions.
c) Evaluate the Nicaraguan Community Seed Bank model and elaborate the Honduran model that best fits the target areas. For instance, in Guatemala, ICTA and SNEA have defined a start-up kit for Community Seed Banks that consists of two silos of 12cwt. each (one to store seed and the other to store grain received in payment from the bank's member base). Additionally, each bank receives 30

polypropylene sac and a cleaning tool. The package has an average cost of $250/bank but it does not include the seed and inputs provided by INTA to each of their 200 banks. For the purposes of planning DICTA will promote the package offering the start-up kit offered in Guatemala and the seed production kit for one to two mz per bank up to a total of 70 mz grown under this modality.

a. The inputs for each mz of multiplied seed under Community Seed Bank are calculated as follows:

   i. Seed: A value of $76/cwt. of seed will be provided per mz. At the very least, this should yield an average of 15 cwt. under the technology packaged for each bank.
   ii. Each bank will receive two silos of 12cwt. capacity, 30 sacks of polypropylene and a mesh for seed cleaning, a $250 cost.
   iii. A seed production package will be provided to ensure the successful production of high quality seed per bank. This package has an estimated value of $270/mz.

d) DICTA will coordinate this experience closely in order to evaluate the return on investment of banks in order to plan for Year 3 of the project. Therefore, it is MSU's conviction that modified "Community Seed Bank" model could be transferred to the Honduran context and promoted by DICTA with the ultimate goals of not only ensuring "seed security" but for also the transference of other yield enhancing technologies and practices as well as for development of business management skills of small-holder farmers so that they can be active participants in markets.

Activity 4. Baseline data collection from beneficiaries, monitoring and evaluation report of the first year.

DICTA will also receive project funds to collect information using the M & E format developed by Michigan State University to monitor performance; the production and dissemination of Qualified Seed of improved bean varieties to small-holder resource-poor farmers in the two designated regions of Honduras (Occidente and Olancho) under its responsibility. The information will be shared with EAP/Zamorano for integration into a data base that includes performance information from all five regions of Honduras that has been targeted under the project.

During Year I, data will be collected to establish the baseline at the start of the project. This will include information to be collected during seed production and distribution to beneficiaries, using the formats and following the recommendations developed by Dr. Mywish Maredia. DICTA will be solely responsible for the collection of data for the regions of theOccidente and Olancho and for presenting this in an appropriate format tothe EAP/Zamorano.

IV. Implementation Timeline for Year 2 Activities:

ACTIVITY				Year 2 (October 11 - Sep 12)										
	OCT	NOV	DIC	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV
PLANNING														
MSU Signs Agreement / DICTA														
SEED PRODUCTION														
150 cwt. registered seed						2								
Qualified Contract Service for 600cwt.											2			
Community Seed Banks 400cwt.											2,			
SEED DISSEMINATION BY CONTRACT SEED AND COMMUNITY SEED BANKS														
Western Region												3-4	1-4	
Olancho												3-4	1-4	
Atlantic Littoral														4
RHIZOBIUM AND OTHER TECH														
Demonstration plots					2									
TRAINING TO SEED BANKS														
Travel To Nicaragua (to be organized immediately)			2											
Seed production											2			
Post Harvest Management											1			
Agronomic Management								1						
Inoculants production														
Organic fertilizer production														
MONITORING														
Baseline						2		2						
Annual Report												2		
ADMINISTRATIVE REPORTS														
Annual												4		
					1, 2, 3.4 are weeks of the month; x means that the activity continues until the week / month indicated.									

Outputs/Deliverables for Assessment of Technical Progress:

(Separate page)

V. Cost Application:

VI. Budget.

Institution Name: DICTA/SAG- Honduras	
	Budget Year 2
A) Project Management	
Salaries & Fringes	$0.00
Equipment & Supplies	
Sub Total	**$0.00**
B) Objective 1- Seed production	
Salaries & Fringes	$0.00
Equipment & Supplies	
Bags (covered by Zamorano Budget	$0.00
Production registered seed	3,630.00
	0
Travel to supervise contracted seed	
Fuel	1,000.000
Per diem	1,500.000
Training	$0.00
Contracted Services	$46,056.00
Sub Total	**$52,186.00**
C) Objective 2- Seed and Rhizobium Handling/Distribution	
Salaries & Fringes	$0.00
Equipment & Supplies	
Travel	$1,000.00
Training	$1,500.00
Contracted Services	$318.00
Sub Total	**$2,818.00**
D) Objective 3- Organization of Community Seed Banks	$0.00
Learning tour to Nicaragua 30 people	$10,800.00
Community Seed Bank Package	$15,300.00
Training materials and supplies	$3,000.00
Transportation for DICTA follow up activities	$1,500.00
Sub Total	**$30,600.00**
E) Performance Monitoring	

Salaries & Fringes	
Travel	$625.00
Sub Total	**$625.00**
Total Direct Expenses	**$86,229.00**
Indirect Cost	**$0.00**
Grand Total	**$86,229.00**

Institution Name: DICTA/SAG- Honduras		**Detailed Budget Notes**
	Budget Year 2	
A) Project Management	-	
Salaries & Fringes	-	
Equipment & Supplies	-	
Sub Total	**-**	**Sub total**
B) Objective 1- Seed production	-	
Salaries & Fringes	-	
Equipment & Supplies	-	
Bags (covered by Zamorano Budget	-	
Production registered seed	3,630.00	Inputs for 3.5 has of registered seed at a rate of $1100 per hectare. This calculation includes the standard cost for one hectare as per the latest expense experience in DICTA
Travel	-	
	1,000.00	200 galons of fuel a $ 5/galon to be used in DICTA vehicles in the regional offices. On average, 4*4 vehicles yield 30 kilometers per galon. This estimate provides fuel for each region for weekly visits by technician to the production fields, coverning 150 kilometers per week during four months.
	1,500.00	Per diem for 3 trips for 2 supervisors to each of the two regions (6 trips total) at a rate of $125/day
Training	-	
	-	
Contracted Services	46,056.00	Contract production of 600 cwt. of quality seed at$76.76 per cwt.
	-	
Sub Total		

Institution Name: DICTA/SAG- Honduras		Detailed Budget Notes
	Budget Year 2	
C) Objective 2- Seed and Rhizobium Distribution	-	
Salaries & Fringes	-	
Equipment & Supplies	-	
Travel	1,000.00	200 galons of fuel a $ 5/galon to be used in DICTA vehicles in the regional offices. On average, 4*4 vehicles yield 30 kilometers per galon. This estimate provides fuel for each region for weekly visits by technician to the dissemination areas where farmer groups are located, covering 150 kilometers per week during four months.
Training	1,500.00	Funds for transportation and material reproduction for six training events ($250 each) for hands-on training (field days) of at least 30 farmers per session on seed production and conservation techniques
Contracted Services	318.00	A quoted cost of $0.53 per cwt has been obtained for the distribution of seed to the villages in the two target regions.
Sub Total	**2,818.00**	
D) Objective 3- Organization of Community Seed Banks	-	
Learning tour to Nicaragua 30 people	10,800.00	Four-day trip by bus from Tegucigalpa to Managua and three community banks along the Inter-American highway. Calculated at $90/person per day including transportation, food and lodging.
Community Seed Bank Package	15,300.00	This is the sum of the inputs for the seed and grain storage caculated at $250/bank plus the production inputs for one mz of seed at $260/bank. This equals $510/bank per 30 banks.
Training materials and supplies	3,000.00	$100 per bank is calculated to print field books, provide training expenses, pay for transportation to receive inputs and attend seed production and conditioning training events organized by EAP/Zamorano and DICTA

Institution Name: DICTA/SAG- Honduras		Detailed Budget Notes
	Budget Year 2	
Transportation for DICTA follow up activities	1,500.00	The role of DICTA technicians in following up with the activities of bancos will be key to the success of this program. Therefore, transportation expenses will be facilitated to the technicians that lead the organization of this community-based organizations. To this effect, 300 galons of fuel at $5/gallon are budgeted. On average, 4*4 vehicles yield 30 kilometers per galon. This estimate provides fuel for each region for monthly visits to the fields during the production and seed bagging activities at least twice in the season.
Sub Total	**30,600.00**	
E) Performance Monitoring		
Salaries & Fringes	-	
Travel	625.00	This funding will be used to purchase 125 gallons, at $5.0 per galon of fuel for the monitoring and evaluation team to coordinate the collection of data on project results. This will be sufficient to cover at least 3750 kilometers of in the two regions by the personnel assigned.
Sub Total	**625.00**	

Nicaragua

Strategic Investment in Rapid Technology Dissemination: Commercialization of Disease Resistant Bean Varieties in Guatemala, Nicaragua, Honduras and Haiti. **(Associate Award to the Dry Grain Pulses CRSP)**

October 1, 2011 – September 30, 2012

AMENDMENT TO INTA SUBCONTRACT

SCOPE OF WORK - Year 2 (October 1, 2011- September 30, 2012)

Organization to be Sub-Contracted: Nicaraguan Institute of Agricultural Technology (INTA). Edificio Maria Castil. Managua, Nicaragua

Project Leader: Mr. Aurelio Llano, National Bean Program, INTA Carretera Norte Kilometro 14.5 Kilometro Managua, Nicaragua Managua, Nicaragua Tel: 25 52 24 22. Email: aureliollano@gmail.com

Administrative/Financial Officer for Organization: Maria Isabel Martinez, Director General, INTA (Authorized Person) Danilo Montalvan, Director of International Relations, INTA. Email: dmontalvan@inta.gob.ni

Collaborating Host Country Organizations:

INTA Regional Office- North Pacific. Director Mr. Homero Gallo

INTA-Regional Office- South Pacific. Director Mr. Edwin Vásquez

INTA Regional Office- Centro Norte. Director Mrs. Mercedes Castillo

INTA Regional Office- South Center. Director Mr. Félix Báez

INTA Regional Office- Las Segovias. Director Mr. Juan A. Blandon

I. Amendment Justification for Year 2 Activities

During Year 1 of the BTD Project in Nicaragua the Instituto Nacional de Tecnologia Agropecuaria (INTA) programmed the establishment of 200 new community seed banks in the five regions of Nicaragua where ICTA has offices. Each region attempted to establish 40 Bancos Locales Productores de Semilla (BLPSs) and one manzana[3] of quality-declared seed was planted per bank according to the Year 1 contract. After the field information has been collected it has been established that INTA fulfilled this goal with 94% success given some difficulties for banks in the North-Central and South-Pacific regions to establish 40mz each. These zones succeeded to plant 20mz and 39mz respectively. Despite this shortage of area planted, the production of quality-declared seed was met at 88% with a total production of 2,640.5cwt of the 3,000cwt anticipated. The BTD Management Office (MO) considers these results satisfactory and looks forward to expanding the success of the leading community seed banks in Year 2.

[3] Manzana is equal to 0.7 hectares and is abbreviated mz.

The contract considerations for this amendment in Year 2 are in support of the three-year project objectives as described below:

Objective 1. To multiply registered seed utilizing farmers organized in BLPSs to produce "quality seed" of improved bean varieties to achieve an annual dissemination goal of reaching at least 2,000 farmers in each of five regions of Nicaragua (as defined by INTA-Regional Programs) per year, equivalent to 10,000 farmers per year, and a three year national goal of 30,000 farmers in Nicaragua through the project. A total of 6000 cwt[4] of improved varieties of quality bean seed will be produced to meet this goal.

Objective 2. To deliver at least 20 pounds of quality bean seed to each beneficiary farmer and to provide training opportunities to farmers who are members of the local seed banks on such topics as seed production management and handling techniques so as to ensure sustainability of the seed system in subsequent years and potential support for the creation of small seed companies.

Objective 3. To develop the technical capacity and provide the infrastructure to produce *Rhizobium* inoculants and to train farmers in their use and application potentially leading to artisanal production or the formation of small regional companies.

During Year 2 INTA will engage in a similar process as of Year 1 obtaining basic seed from EAP/Zamorano and using their own basic seed stock to produce registered seed. Based on Year 1's experience and preference by the farmers and community seed banks, only major varieties will be disseminated in Year 2. These are INTA Rojo and INTA Fuerte Sequia and INTA Matagalpa. These seed will be used to multiply 200cwt of registered seed from which each bank will receive 100 pounds to produce one manzana of quality-declared seed. The estimated yield of quality-declared seed is 15cwt which will be enough to reach

The following sections detail out the work to be carried out by INTA in Year 2.

II. Planned Activities in this Scope of Work: Year 2 (October 1, 2011 - September 30, 2012)

1. Objective 1. Production of Registered Bean Seed for Nicaragua

a. Selection of improved varieties by region for the production of certified seed

During Year 2 EAP/Zamorano will continue to supply foundation seed of INTA Fuerte Sequia and INTA Rojo as those varieties have been preferred by the community seed banks in Year 1 while other varieties will be produced by the INTA MIC Project (Manejo Integrado del Cultivo). The Unidad de Semilla of INTA (the Seed Unit) (UNISEM) in Nicaragua will assume responsibility for the production of the 'Basic' and 'Registered' seed of the improved varieties in the same fashion as in Year 1.

Following the same process as of Year 1, the registered seed of the improved bean varieties will be provided to the BLPSs for further multiplication and distribution to farmers in the various communities as 'Certified' seed (also known as "apta" or adequate seed). From this step forward, rural promoters at each community are responsible for overseeing the multiplication of the seed with the support of INTA field extension technicians assigned in each region.

b. Year 2 Project goals by region and seed requirements

As in Year 1, the project plans to distribute 20lbs per farmer to reach the goal of 10,000 new beneficiaries. The table below illustrates the distribution of new beneficiaries in Year 2 following the experience in Year

[4] Cwt. = one-hunded weight sac

Project Goals by Region.

Region	Number beneficiary farmers *	Requirements for Certified seed (cwt)	Area (mz) to be planted by region	Commercial production expected per region (cwt)
PN	2,000	400	500	6,000-10,000
PS	2,000	400	500	6,000-10,000
CN	2,000	400	500	6,000-10,000
CS	2,000	400	500	6,000-10,000
SG	2,000	400	500	6,000-10,000
Per year	10,000	2,000	2,500	30,000-50,000
Total for 3 years	30,000	6,000	7,500	90,000-150,000

- Estimated production per farmer 3-5 cwt of grain/apta seed.
- Area cultivated per farmer from 1,700 to 2,000 square meters.
- Number of participating farmers by region is 2,000 per year.
- Expected yield per manzana (0.7 Ha) 15 cwt

To produce this amount of certified seed, the project will need to purchase at least 495 cwt of "Registered Seed" in order to be able to multiply sufficient seed in all five regions to achieve the distribution requirements of the BTD project.

c. Seed production targets by region and year of the project.

Genetic seed	Basic seed		Registered seed		Certified seed
Zamorano MIC	UNISEM		BLPS Seed companies		Organized Farmers
Area in Mz	Prod. in cwt	Area Mz	Prod. in cwt	Area Mz	Production in cwt
.384	5.76	7.2	108	135	2000

f. Realistic goals to meet the project objectives per year

Goals	First growing cycle		Postrera/Apante	No. Beneficiary farmers	Project Goals
	Registered seed	BLPS Mz	Certified seed		
National	165	200	2475	12,375	10,000
Regional	33	40	600	3,000	2,000
Local (BLPS)	0.80	1	15	50	

2. Objective 2 - Delivery and Dissemination of Improved Bean Seed

The 'Certified' bean seed produced by the BLPSs will be packed in bags of 20 pounds and will be distributed with support from the MIC Project in Nicaragua. Extension agents will be responsible for this activity. At least 2,000 farmers in each of the five regions in which INTA works will be selected to meet the goal of reaching 10,000 beneficiary resource-poor farmers per year. Each BLPS will serve at least 50 farmers in their community.

The BLPS are organized with a farmers' Board of Directors. The board of each bank is responsible for the organization's capitalization and management. Each BLPS will receive initial "capital" in the form of Registered seed and production inputs. The seed production obtained is distributed among the members of the BLPS through a payment arrangement between the board and its members.

3. Objective 3- Production and Dissemination of *Rhizobium* and Training

a. Develop at INTA the technical capacity and infrastructure to produce *Rhizobium* inoculant.

Following up on Year 1, Mrs. Delfia Mercenaro will be INTA's link to EAP/Zamorano to learn the production techniques and the application of inoculant. Mrs. Mercenaro will then train INTA technicians in the handling of different strains, their propagation and commercial culture in peat moss for application in the field. INTA plans to establish the capacity for commercial inoculant production during the third year of the project. In the mean time, at least 2000 farmers are expected to be reached with a 100g of Rhizobium inoculum which is enough for 1kg of seed.

c. Technical training to farmers in the production of inoculant.

Once INTA technicians are trained on the application of the *Rhizobium* inoculum to the seed, they will organize members around BLPSs to transfer this technique and to mark the fields so that they can compare and contrast results with other farmers. INTA will identifying each receiver of 20lbs of seed with a code in order to evaluate, track and contrast the results of thi technology compared to non-inoculated seed. Farmers' organizations may consider the option of inoculant production in the area. The training will be coordinated by the Institutional Development Organization (ODI) in cooperation with the regional coordinators.

IV. Implementation Timeline:

INTA NICARAGUA TIMELINE

Objective/Activity	Year											
	2011			2012								
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Objective 1: Seed Production												
Basic seed reception from EAP/Zamorano				x								
Registered seed production				x	x	x	x					
Harvest and conditioning of registered seed								x				
Seed and production package Distribution to BLPSs								x	x			
Objective 2: Seed Dissemination												
Seed conditioning supervision								x	x	x		
Revision of lists of new beneficiaries for Year 2									x	x		
Seed dissemination support by INTA field personnel										x	x	
Objective 3: Rhizobium Dissemination												
Training of INTA field personnel								x	x			
Training of BLPS leaders										x	x	
Coordination of dissemination of bags of 100g of inoculum to at least 2000 farmers											x	
Objective 4: Monitoring and evaluation												
Field supervision of seed dissemination							x	x				
Data Collection										x	x	
Final report											x	x
Planning of SOW and Budget for Year 3												x

V. Outputs/Deliverables for Assessment of Technical Progress in Year 2:

Outputs deliverables		ICTA			
Deliverables	Output/result	Date	Contract Amount	%	Amount
First deliverable	Approved SOW and budget	by Dec 15, 2011	$175,538.00	30%	$52,661.40
Second deliverable	Harvested 27MT seed	by Feb 15, 2012	$175,538.00	30%	$52,661.40
Third deliverable	Delivered seed to SNEA	by May 15, 2012	$175,538.00	20%	$35,107.60
Fourth deliverable	Monitoring and evaluation data and SOW Year 3	by Sep 15, 2012	$175,538.00	20%	$35,107.60
Total				**100%**	**$175,538.00**

VI. Performance Monitoring Program:

During Year 1 the tasks of monitoring the project activities demonstrated to be a time-consuming activity for Regional Offices and for the Central INTA personnel. As a result, a head start on records will be initiated by compiling farmers lists as early in the process as possible. Each BLPS will receive the formats for monitoring developed by Dr. Mywish Maredia while INTA personnel will supervise that only new farmers are included in the dissemination process of improved seed varieties.

Three year Budget (October 1, 2010 - September 30, 2013)	
INTA Nicaragua	
	Year Two
	10/1/11-9/30/12
INTA Nicaragua	
A) Project Administration	
Operational expenses (A)	$3,000.00
Equipment (2 Laptop, 1 printer, 1 multimedia project, 1 mobile internet connection) (+ Acc) (A)	$7,000.00
Fuel and Per diem (A)	$5,457.00
Sub Total	**$15,457.00**
B) Objective 1. (Seed production and delivery)	
Bean seed	$17,600.00
Inputs required for the production of registered seed	$55,500.00
Seed packing and transportation	$20,000.00
Operational expenses (B)	$8,000.00
Fuel and per diem (B)	$15,914.00
Sub Total	**$117,014.00**
C) Objective 2 (Seed Dissemination)	
Operational expenses	$11,000.00
Complete fertilizer (50Lb per 1/4 Mz)	$5,000.00
Promotional material (brochures, radio, meetings)	$6,067.00
Sub Total	**$22,067.00**
D) Objective 3 (Rhizobium y Cap)	
Reactants and materials	$4,000.00
Field demonstrations for inoculants	$2,000.00
INTA personnel training	$4,000.00
Training to INTA beneficiaries	$4,000.00
Sub Total	**$14,000.00**
E) Monitoring and Evaluation	

Three year Budget (October 1, 2010 - September 30, 2013)	
Tranportation and per diem	$7,000.00
Sub Total	**$7,000.00**
Total Direct Expenses	**$175,538.00**
Indirect Cost	
Grand Total	**$175,538.00**

Budget Notes INTA

INTA Nicaragua	Amount	Budget notes
A) Project Administration		
Operational expenses (A)	$3,000.00	This operational expenses are calculated in $85 per month for each of the five regional offices of INTA ($85*7 months*5 offices) and will be necessary to purchase office stationary, cover phone and internet use.
Equipment (2 Laptop, 1 printer, 1 multimedia project, 1 mobile internet connection) (5Gps) (A)	$7,000.00	Prices consulted locally are approximately described as follows: 2 laptops Dell with increased memory to handle pictures and video for monitoring and evaluation purposes ($1500/each); 1 medium duty printer ($600), 1 medium duty multimedia projector ($1400), 1 USB-mobile internet connector ($80); $60/month for 7 months for mobile internet connection ($60*7=$420); 5 rugged gps units for monitoring and evaluation-one per INTA region- at $300/each = $1500
Fuel and Per diem (A)	$5,457.00	At least 30 field days per month are calculated in total for coordiantion purposes under this objective. This is equivalent to six field days per each INTA regional office at $25/day to cover gasoline and per diem. Hotel expenses are seldom charged since trips are within distances that permit technicians to return to their points of origin. Gas prices are currently $4.65/gallon in Nicaragua. One motorcycle can run 80km per gallon while 4*4 trucks yield 30-32Km maximum. $25/day is good for at least two gallons of fuel per day plus food and incidental expenses in the rural area. Therefore this is a conservative calculation based on recent INTA current expenses.
Sub Total	**$15,457.00**	
B) Objective 1. (Seed production and delivery)		

INTA Nicaragua	Amount	Budget notes
Bean seed	$17,600.00	Each of the 40 banks will receive 80 pounds of registered seed, enough to produce one manzana. The cost in US$ per pound of registered seed is $1. This is equal to $80/bank. Since each region will have 40 banks, the cost per region is $3200. In five regions this cost arrives to $1600.
Inputs required for the production of registered seed	$55,500.00	Plastic tarp and seed production/condition for up to $275 for each bank (200 banks total)
Seed packing (materials and labor)	$20,000.00	The sack to pack 20-pound bags is calculated in $0.40 while the two-sided label at $0.25. Labor is calcualted in $0.35. This is equivalent to $1.0/20-pound bag as every region is expected to reach 2000 beneficiaries making a total of 10,000 during year 1 of the project
Operational expenses (B)	$8,000.00	Bringing registered seed to each of the 200 banks needs the coordination of services and communication and meetings with the heads of the banks, whether they meet in Managua, secondary cities or close to the rural areas. To partially cover those expenses, the project will make $1000 available to each INTA Regional Office to bring about this activity.
Fuel and per diem (B)	$15,914.00	INTA vehicles and local services in and around the towns where the 200 banks are located will be needed to deliver the seed, packing materials, supplies and afford coordination efforts by INTA technicians. At least three days of such activities are budgeted per bank at the rate of $25/day for fuel and per diem and incidental expenses. This is equivalent to $80/bank for this objective. Expected additional expenses will be covered by INTA.
Sub Total	**$117,014.00**	
C) Objective 2 (Seed Dissemination)		
Operational expenses	$11,000.00	The project will assign $1800 per INTA regional office (total of $9000) to cover the operational expenses of coordinating the distribution of fertilizers for each of the banks. This is equivalent to $45/bank, although in some cases, several banks will be visited the same day, but in other cases, distances and the bad state of roads will make this activity more expensive. INTA considers this is a reasonable cost based on actual operational expenses in the region.
Complete fertilizer (50Lb per 1/4 Mz)	$5,000.00	One hundred sacs of 100 pounds each will be necessary for this purchase. Current prices for each hundred-weight sac (cwt) is $40.
Promotional material (brochures, radio, meetings)	$6,067.00	10,000 brochures and 10,000 mini posters informing farmers about the varieties, production practices and use of rhizobium inoculum will be printed. High-volume printed, based on previous experience, is priced at $0.13/8*11in flyers (a

INTA Nicaragua	Amount	Budget notes
		letter-sized doc.)
Sub Total		
D) Objective 3 (Rhizobium y Cap)		
Reactants and materials	$4,000.00	Laboratory materials to carry out this activity are calculated in $2000 for the full year for the production of Rhizobium inoculum.
Field demonstrations for inoculants	$2,000.00	The project will contribute this amount to the development of field trials for inoculum.
INTA personnel training	$4,000.00	The project will cover the travel and per diem of at least 2 trainees in Zamorano, Honduras for one week. This cost includes airfare, hotel and perdiem in Zamorano (2,000 per person).
Training to INTA beneficiaries	$4,000.00	At least 10 field days (two per region) will be held by INTA to train beneficiaries on different bean production technologies. It is expected that at least 25 farmers per event will attend. The funding will be used at the rate of $400/event or $16/person to cover the cost of venue, photocopy materials and provide a lunch and soft drinks. The training will include topics such as: • Use of inoculants • Agronomic handling of the crop such as planting distances, fertilization and minimum tillage. • Plant health: identification, control and management of diseases • Pests: identification, management and control • Harvest: drying, storing in metallic silos • Project-fund management • Meetings to analyze problems and solutions • Post harvest management • Production value addition and seed marketing
Sub Total	**$14,000.00**	
E) Monitoring and Evaluation		
Tranportation and per diem	$7,000.00	Two qualified technicians will be assigned to monitoring and evaluation for a total of 30 days per INTA Regional office at a rate of $26 for hotel and per diem, and $15.0/day for fuel. This is equal to 150 days at $46/day = $7000.
Sub Total	**$7,000.00**	
Total Direct Expenses	$175,538.00	
Indirect Cost	$0.00	
Grand Total	$175,538.00	

Haiti

Given the state of the sub-project in Haiti, the FY 2012 amendments for UPR, IICA and NSS are under review and discussion with partners. The expectation is that new Scopes of Work and Budgets for FY 2012 will be developed in January 2012.