

Research Proposal: The Development of the Peanut Sector for Guyana and Selected Caribbean Countries

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Geographical Locations

Guyana, Haiti

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Focus

Domain - Production Values - Region - Caribbean

Background

Peanut production is the primary means of income for many peoples in developing countries. However, production is often at the subsistence level, resulting in poor yields and quality. Poor economic conditions continue in these areas, and farmers cannot make meaningful strides in advancing their lives or the lives of the villagers. The goals of this project seeks to provide assistance at many levels of peanut production, resulting in better economic returns and an increase in the commonwealth of the region. We will seek to address several issues relating to peanut production in several geographic regions within the Caribbean.

The Rupununi region of Guyana is extremely remote, covering an area of 22,000 square miles with a population of 21,000 people. Amerindians make up the majority of the ethnicity, and live in approximately 50 villages throughout the region. Within the Rupununi region, two distinct types of peanut production occur. Traditional field production occurs in the north Rupununi; while slash and burn techniques on bush islands are employed in the mid and south Rupununi. Production constraints occur in both areas, with limitations of pesticide availability and fertility inputs. However, the north region is most affected due to poorer soils and land rotation limitations. In the mid and south Rupununi, the lack of obtaining inputs, particularly during the growing season, is the biggest technical restraint. The over-arching constraint throughout the entire region that is hard to overcome is the concept of budgets and accountability by the farmers. Most farmers will not pay for inputs, despite the fact that inputs will increase productivity and profitability.

Environmentally, deforestation and subsequent loss of habitat is a concern in the mid and south Rupununi, especially if peanut demand increases. The loss of soil integrity and slow forest regeneration is common following peanuts. In the north Rupununi, crop rotation is not effectively practiced and there is little known about the impact of alternative crops/cropping systems on sustainability. The Ministry of Agriculture is establishing 3 extension agents in the region to work with the National Agricultural Research Institute, and technical training will be needed in the areas of peanut production.

During the previous five year project (UFL 52), the role of women in peanut production has steadily increased. This is very evident in the case of the cottage industries, but there has been an increase in women farmers as well. As peanuts become more widely grown, the use of peanuts in the daily diet increases. Thus the need for greater understanding of aflatoxin and other problems associated with poor quality peanuts.

It is envisioned that many of the aspects realized in the Rupununi region will be transferred to peanut production in selected Caribbean countries, but final

details will be dependent upon determination of current peanut production practices.

Technical Review

This project is a multidisciplinary effort focusing on improving the peanut sector in the Caribbean region. It will encompass a collaborative effort between U.S. based universities, in-country institutions, private organizations/business, and NGO's. During the previous project (UFL 52) several aspects of peanut production were identified and addressed. These included proper row spacing, the addition of fertilizers and lime amendments, and the proper use of herbicides, insecticides and fungicides. Safety and proper pesticide application techniques were also addressed. However, additional research and training is needed for many growers, especially in the mid and south Rupununi. This will also be a focal point for growers in the Caribbean, where research trials and training has not been performed.

Harvest and storage issues continue to be of concern. A sheller has been sent to the Rupununi region, but additional machines need to be built for the cottage industries. Growers and in-country personnel have identified harvesting as a major labor constraint and feel a manually operated thresher would be a tremendous asset. Proper storage facilities also need to be constructed/amended for several areas in the Rupununi and the Caribbean. Training in proper storage techniques is also lacking.

Environmental concerns are most apparent in those areas that rely on slash and burn for peanut production. Farmers clear the forest to plant peanuts, establishing agricultural production for a period of 1-3 years. After this time, forest regrowth is very limited due to the loss of nutrients and little is known about the colonization rate and species composition of these areas. A better understanding of what species thrive can be effective in planting alternative crops to replenish the soil. This allows the expansion of alternative crops for food and cash sales, and decreases the necessity of clear-cutting forested lands for crop production. This type of rotational cropping scheme should also be explored in areas where traditional field production systems exist.

Social changes are being affected by peanut production, and more importantly, peanut processing in association with the cottage industries. As these industries are developed and expanded, the dynamics of the family will be altered. Women will become more empowered through cash earnings and this will have tremendous social implications. This has been recognized as a change that is occurring in the Rupununi region, but little has been performed to document its impact.

Scientists and extension professionals with peanut production and processing knowledge is still very limited in the Rupununi region of Guyana. This is also the case for many Caribbean countries. Although some training has occurred in conjunction with in-country professionals in Guyana, more training is needed to provide the level of continued support for the growers. The creation of a technology transfer specialist in the Rupununi has been invaluable, and this process warrants serious consideration for the Caribbean peanut production sector. The addition of expertise in the ecological and social sciences is also greatly needed.

Problem Statement

Throughout many areas of Guyana and the Caribbean, peanut is the only source of income for many households. In Guyana, most of the peanuts are produced in the Rupununi region, which is populated by Amerindians. These people farm at the subsistence level, and only recently have begun utilizing inputs to increase yield and sustainability. Introductions of technology have been useful, but limitations in logistics and infrastructure support exist. In addition, other labor saving devices, such a hand powered thresher, have not been developed. Variety testing and selection is becoming increasingly important as the industry moves toward value added products. Insect and disease control, particularly thrips and white mold, are major issues in many fields, and growers need further assistance in addressing these problems. In addition, processing and increased consumption dictates the need for increased monitoring and awareness of aflatoxin at the village level.

A production guide has been developed through research and on-farm demonstrations in the Rupununi region of Guyana. However, production issues have not been addressed in the rest of the Caribbean region. Many countries including Belize, Haiti, St. Lucia, and St. Kits grow peanuts for sale and consumption, and need assistance in basic agronomic principles. Small on-farm demonstrations and the adoption of a specific production guide for each area/country would be highly effective in addressing many of these production issues.

Vision and Approach

Goals

The goal of this project is to address the limitations in peanut production in Guyana and selected Caribbean countries. In Guyana, the goal in the Rupununi region is to advance upon the existing technologies adopted and utilized by the growers during the past 5 year Peanut CRSP project (UFL 52). Focus areas will include primary production, harvesting, storage, quality

assurance and aflatoxin. Two complementary goals will also be part of the project. One goal will be to assess the social changes occurring at the village level. These changes are a direct result of the development of the cottage industries. The second complementary goal will be to assess the environmental impact, including ecological transition after peanut production, of the slash and burn production system.

In selected Caribbean countries, the goal will be to provide on-farm demonstration research and subsequent recommendations for peanut production. Recommendations will be developed on a country by country basis, and will be provided to growers and interested persons in a variety of formats. We will follow a similar strategy as that utilized during the past 5 year Peanut CRSP project (UFL 52).

Success in the Rupununi region of Guyana will be measured by several objectives, each addressing specific areas. Success in the Caribbean countries will be measured by the adoption of specific production practices and the development of country specific production guides.

Objectives

1. Primary production enhancement in the Rupununi will be addressed through a number of mechanisms. Continued variety introduction and selection will be implemented as component of on-farm trials. Improvements in pest (weed, disease and insect) control will be performed in on-farm trials. Improvements in fertility, especially as it relates to peanut quality, will also be addressed.
2. To address increased planting and harvest efficiency, two primary items will be introduced. The first will be the introduction of a manually operated peanut sheller, which has been demonstrated in the region. This has been accomplished through cooperative work with Fully Belly project. The project has provided one fully functional sheller, along with tools and supplies to build additional units. This new project will build and supply each cottage industry with a unit, with more units built upon grower demand. A manually operated peanut thresher will be designed and built through cooperation with Fully Belly project. It is envisioned that this unit will be available for selected villages and growers for the region, based on grower demand and village need.
3. Storage facilities will be standardized for villages in the primary peanut growing areas, including those villages that currently possess a cottage industry. The primary objective will be to establish protocols for: 1) bagging at the on-farm level prior to storage (including moisture content); 2) inventory of individual farmer peanuts; 3) insect control during storage; and 4) aflatoxin and other peanut quality assessment. It

is envisioned that storage facilities will be established/upgraded through this objective.

4. Quality parameters will focus on aflatoxin content in peanut at the field, storage, and processing level. A quality assurance protocol will be developed for peanut processing that includes sanitation, proper attire, equipment cleaning, and appropriate peanut and peanut product storage. This will build upon previous assurance protocols developed for the cottage industries.
5. This objective will assess the social implications of increased peanut production and the associated processing industries in certain villages. These assessments will take place within the Rupununi region, where these changes have occurred over the past 5 years.
6. Slash and burn continues to be a common practice in the south Rupununi region. The objective is to better understand the ecological dynamics of deforestation, peanut production and subsequent forest recovery.
7. This objective is the over-arching for objectives 1 through 6. It satisfies those objectives detailed for the Rupununi region of Guyana. The purpose of this objective is to provide a cumulative cost assessment for this region.
8. This objective will address primary peanut production issues in selected Caribbean countries. This objective is multi-faceted, but seeks to 1) assess current practices; 2) initiate on- farm research demonstrations to improve existing production; and 3) transfer information on the best management practices available to growers. This will occur on a country or regional basis.

Research Approach

In the Caribbean region we will perform an initial assessment of current product practices in each country/region. From this assessment, we will integrate more modern production techniques, taking into account logistics of obtaining inputs. We will test alternative varieties and establish on-farm research trials. In these areas we will also introduce some mechanization, this being highly dependent on the availability of tractors and transportation. Storage facilities will be assessed and construction design and expertise will be provided. We will follow a similar peanut production development strategy as that utilized in the previous 5 year project (UFL 52).

In the Rupununi region, the production focus will be on variety testing and enhancing productivity and profitability through optimum use of inputs such as pesticides and fertility amendments. Storage facilities will be designed and

constructed in each of the cottage industries and in interested communities. It is expected that construction costs will be shared by the community. Shellers will be manufactured for those persons/communities interested, and will also be available on a for-sale or cost-share basis. A manually operated thresher will be designed and manufactured through cooperation with Fully Belly Project.

Ecological research will focus on the slash and burn system and will be performed through visual estimation of species composition and density as a function of peanut planting - either before clearing or subsequent years after peanut production. Assessments will also include discussions with local farmers to substantiate visual observations. We will look at slash and burn systems throughout the Rupununi region, from the north to the Deep South, as species composition, rate of re-forestation and farmer practices may change as a function of geographical region.

In addition to natural recolonization (i.e. reforestation), we will study the utility of alternative crops in these areas. This will be conducted as on-farm research trials following peanut production and will include those crops recommended or preferred by local villagers.

Social research will be performed in selected villages throughout the Rupununi region. Research will be interview based, focusing on women working in processing (cottage industries). Comparisons will be made to individuals not involved in production or processing. We will also assess impacts at the community level. It is envisioned that interviews will take place over a 2 year period in the Rupununi, but may take longer in the Caribbean countries.

Implementation of the project will be a coordinated effort between personnel from the Universities of Florida and Georgia. Guyana-based activities will be coordinated in-country through one or more NGO's. Sustainable Operational Strategies (SOS) and/or Beacon Foundation will be responsible for financial management of project funds in Guyana. We will continue to employ technology transfer specialists within the region, to facilitate daily activities and provide technical assistance to farmers.

In the Caribbean countries we will work through local offices of Inter-American Institute for Cooperation on Agriculture (IICA). IICA will provide the overall coordinating effort, but other development and government agencies will be involved on a country by country basis.

All trainings will involve personnel from host-country institutions, governmental agencies, NGO's and other interested parties. Training materials, such as production guides, technical packets, and presentations will be developed in conjunction with those personnel mentioned above whenever possible.

There will be close linkages between on-farm research and training. Therefore, in some cases, informal trainings will occur during the course of on-farm research. This is expected to be more prevalent in the Caribbean region during the initial phases of the project.

Training will be conducted every year in the Rupununi, and will focus on updates learned from the previous year's on-farm research. Training will occur on a village by village basis. Most production training workshops will take place during the spring, just prior to peanut planting. There are several villages in the region that have not received training; initial trainings will focus on these areas. In addition to production, we will provide training in harvesting (including determination of harvest maturity) and storage, including hands-on demonstrations of sorting, bagging and insect prevention. Proper storage building requirements will also be addressed in the training.

As part of an overall systems approach with peanuts as the central crop, the Peanut CRSP team will provide basic agronomic production recommendations for alternative crops, with the potential to develop a rotational scheme for a sustainable cropping system for each village. In those villages that utilize a slash and burn approach, training in conservation will be addressed to increase awareness and problems associated with deforestation. However, it is expected that training in alternative cropping systems will be coupled with this type of training.

In the Caribbean region, trainings will also occur every year in each selected country. Separate villages/growing areas will be targeted within each area. Training will be similar to that conducted in the Rupununi, but more fundamental production concepts will be addressed in initial workshops. Such concepts will include: peanut growth and development, weed, insect and disease management, pesticide safety, fertility, and variety selection. Harvesting and storage, as mentioned previously, will also be addressed.

Aflatoxin training will be addressed in both the Rupununi and the Caribbean as part of each training session. Training will focus on prevention and detection in the field, prior to storage, development during storage, and post storage. In addition, we will provide supplies and training materials to allow for in-field (at the village level) detection.

Business training is another aspect that will be addressed at the village level to farmers and processors. Individualized training will be performed whenever possible; to increase understanding and help individuals grasp the concepts of accounting and record keeping.

Implementation will occur as described in the technical approach section.

Intended Benefits & Impact Responsiveness

Development Benefits

Although this project focuses on production, many of the direct monetary benefits will be realized in conjunction with the Caribbean market development project. An attempt to separate specific benefits is found below, but market development will drive peanut production, and thus impacts. There are several impacts that will be realized through this project. The first is increased cash income from increased peanut productivity and thus profitability. Profitability will be realized through decreased costs for labor and the ability to store peanut to increase market opportunities. In slash and burn systems, the ability to rotate within cleared land areas will greatly decrease labor inputs. Additional market opportunities will be explored through the introduction of alternative crops. Consumers will benefit through improved peanut quality, most importantly through lowered aflatoxin contamination. This will occur at the village level, but also in Georgetown. This project will also have a dramatic impact on peanut farmers in the Caribbean. The adoption of new technologies will increase productivity and profitability, and provide raw product for value-added processing or other market ventures. Better quality through decreased aflatoxin will directly benefit consumers in these areas as well. In all countries, there will be a strengthening of agricultural support institutions. In Guyana this includes the National Agricultural Research Institute (NARI) and the Ministry of Fisheries, Crops and Livestock (MFCL). Regardless of institution, the development of peanut production expertise will provide long-term sustainability. This is crucial once the project has been completed. The development of the cottage industry in the Rupununi region through project UFL 52 has provided substantial income to many communities. Expansion of the snack program is being explored for the Rupununi region, raising the total of villages from 7 to 17. There is also great potential for this systems approach to be applied to other countries, and other regions within Guyana.

US Benefits

Benefits to the U.S. will include increased sales in agricultural supplies,

including potential seed sales. Variety testing and development could be a very profitable joint venture between U.S. and in-country scientists. Scientists would also gain knowledge regarding pests (insects, weeds and diseases) that could threaten the U.S. peanut industry. The proximity of the Caribbean region to the continental U.S. makes this a very real possibility. There is also a great opportunity for cross- training of scientists between the U.S. and host countries. There also exists the potential to educate students and Peace Corps volunteers in the Rupununi through web-based learning modules. Internet access is available and many young persons have a great desire to further their education in agriculture. There have been discussions with local representatives, including individuals with the Bena Hill Institute. This institute was recently developed in the Rupununi for post-secondary school education, and this provides a great opportunity for global learning. This could also be established at more traditional Universities, such as the University of Guyana in Georgetown.

Potential Impacts

Once again, impacts realized from the production project will be closely linked with impacts derived from the marketing project. The significance of this project will be an increase in the livelihood of those individuals impacted by peanut production, processing and ultimately marketing/sales. The potential impacts below are for both areas, Guyana and the Caribbean.

Increased profitability will be measured by an increase in cash income for farmers. In those areas where processing and value-added components are available, cash income for individuals and for the entire village will be measured. Attempts will be made to correlate income prior to initiation of the project.

The social component will assess the changes occurring in village dynamics, especially for women in the communities. This component will also assess changes in family structure/dynamics and how the children are being affected. Such impacts that could be realized include increased educational opportunities, increased nutrition, and increased health care.

Environmentally, there could be tremendous impacts. Limiting or decreasing slash and burn agriculture will greatly contribute to the preservation of biodiversity in the region. This could also be realized in many Caribbean countries as well. This will be of great importance in Haiti, where 98% deforestation has already occurred.

Equipment

There is limited access to vehicles in the region. A 4X4 truck will be needed for the Rupununi to perform visits to the villages, which are often extremely remote.

Project vehicle total cost - \$27,500 US.

Project Timeline

Fall 2007

1. Meet with in-country cooperators in Guyana to establish/strengthen agreements for the next 5 year project cycle
2. Visit cooperators in Haiti to establish linkages for future research and training

Spring 2008

1. Meet with in-country cooperators in the Rupununi; conduct grower meetings in key villages in the region. Establish field sites and protocols for the 2008 growing season.
2. Visit selected Caribbean countries to establish linkages for the project. This will be accomplished through a coordinated effort between IICA and other in-country NGO's. Assess current grower practices and develop protocols to provide on-farm demonstrations and training.
3. Social and environmental assessments will be initiated in the Rupununi, baseline assessments will occur in the Caribbean in summer 2008.

Spring and Summer 2008

1. Work with Full Belly Project to design and build a manually operated peanut thresher for trial implementation in the fall of 2008.

Summer and Fall 2008

1. Provide initial training for growers in those Caribbean countries that have been identified.

It is expected that 2-3 in-country visits will occur each year for the next 5 years. This will include visits to the Rupununi and those identified Caribbean countries. Scheduling, defined timelines and completion for each objective will change as the project progresses. However, it is expected that the following milestones will be completed during these timeframes:

Fall 2008

Additional shellers for the Rupununi - Spring 2008 Caribbean grower assessment.

Spring 2009

Manual operated thresher - Fall 2008 Caribbean draft production guides.

Fall 2010

Environmental impact assessment - Fall 2009 Social impact assessment.

USAID Mandate Responsiveness

MDGs

Poverty/Hunger: Improved Health: Raised Rural Incomes: Sustainable Development

Foreign Assistance Framework

Governance: Human Capacity: Economic Structure: Persistent Dire Poverty: Global Issues (HIV and Infectious Diseases, climate change, biodiversity)

IEHA

Science and Tech Applications: Increased demand for peanuts: Market Access: Increased Trade

USAID Focal Areas

Greater incomes: Greater value and market demand: Public Health: Food Security: Sustainable Value Chain: Improved Human Capacity