Accelerating the Development of Sustainable Tropical Fruit Production in the Orinoquia of Colombia

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Introduction - There is a strong program of research in tropical fruits for the Orinoquia region in the principal station of Corpoica, now Agrosavia, La Libertad. The University Unillanos has developed expertise on the environmental and social aspects of agricultural technology introduction. Purdue University has been collaborating with these Colombian institutions in developing and training scientists to use analytical models for defining priorities, farm level profitability and constraints to further expansion at the farm level.

These models consistently identify various tropical fruits as being highly profitable. In the process of economic growth there are substantial shifts in preferences from cereals and root crops to meat, milk, cheese, fruits and vegetables. Now that the road connection to Bogotá is excellent, a truce has been reached with the FARC, and incomes are increasing in the urban areas of Colombia, some strategic public investments can accelerate this process of technology introduction and marketing improvement. These models provide some of the framework for developing an extension service and assuring a healthier and more sustainable development process.

Two economic problems need to be mentioned. First, there are many small farmers that are good entrepreneurs in the region. So when the prices are high from guava and farmers there are starting to produce guava and sell to the collectors from Corabastos in Bogotá, many others rush into this activity even though it requires substantial technical knowledge of production and the desire to become much more involved in the market economy by selling to the major market of Bogotá. The

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result is supply growing faster than demand and over a five to ten year period prices falling. So producers need to become more efficient over time or partially drop out of the market by reducing annual expenses. Farmers are observed reducing their expenditures on inputs as these are high in fruit production. To the extent that the growth of the trees is not damaged, farmers can then return to production when the more inefficient producers drop out of the market. Another farmer response is to get ready for the next crops that everyone is excited about, which presently (2017-2018) are avocado and maracuya (passion fruit). In the field established guava producers were observed planting avocado which takes 3 to 5 years to begin production. The exciting things about this is how many small farmers react to these economic incentives and master the technical skills to quickly increase production and their incomes.

The second problem is the classic one of few buyers and many sellers when selling to the main wholesale marketing outlet in Bogotá. Price fixing and worse have been observed. The way to combat price fixing is by finding alternative markets. In Bogotá low income consumers buy from the merchants pushing wagons and selling very small quantities. Middle income shoppers buy from the corner groceries which often provide credit. High income shoppers buy from the luxury supermarkets with their many imported and national goods. There are also supermarkets more oriented to middle class than high end consumers. With farmers’ associations controlling for quality and selling larger quantities, the associations should be able to sell to the neighborhood groceries and to the supermarkets if they can provide regular quantities of high quality.

Lastly, there is a problem of excessive chemical use by the Ariari fruit producers and the dangers to human health from these residuals. This problem needs to be confronted with the use of more biological controls and a consultant to analyze the dangers and to make recommendations for the chemical control alternatives.

Besides the fruits, another critical input for dairy and cattle fattening operations in the Piedemonte is the production of silage to improve the nutrition and productivity of milk production and to prevent or moderate the weight loss beef cattle can suffer during the dry season (December-March). This would especially benefit the more efficient, often middle size dairy producers. The fattening operation due to large capital requirements is definitely concentrated among the medium size producers in the Piedemonte.

1 This response to low prices has been observed elsewhere as with cacao in Ghana.
2 After a few years of very low prices rice and beef have returned to being profitable while the maize price has collapsed. Rice, corn and soybeans are principal annual crop activities in the Altillanura, the savanna plains of Meta.
3 The central farmers market in Villavicencio was destroyed and the new site is out of town making it hard for low and medium income consumers to shop there. Hence, the fruit production for the supermarkets and neighborhood stores in Villavicencio first travels to Bogotá and then returns to Villa. There is still no new building or other obvious reason for the destruction of the central farmers’ market in Villavicencio.
Objectives of the Pilot Project:

1) Develop a pilot program of extension focusing on sustainable fruit and silage production in Meta (especially but not exclusively the Ariari region of the Piedemonte). Evaluate performance and respond to limitations. Promote system to other regions of Colombia.

2) Evaluate and analyze performance with programing and field surveys (econometrically) first the potential and then the actual impacts of the extension program. Produce a bulletin on the performance of the model extension program.

3) Support the research on biological controls for fruit production in Ariari and Guaviare. Evaluate the dangers to human health from fungicides and insecticides used in fruit production. Propose alternative suggestions if appropriate.

4) Do a marketing analysis of the marketing chain for various fruit products and make recommendations for improving efficiency and increasing the returns to the fruit producers. This will probably involve facilitating the growth of farmers’ associations to increase bargaining power with the sale of larger quantities and improved quality control including reduced chemical residues.

Implementation – The pilot project is proposed as a three year effort:

First year - Identify a technical committee from various Colombian institutions and hold quarterly meeting to review and make recommendations. Introduce an extension program for sustainable production of tropical fruits especially for the small and medium producers in Ariari, the center of fruit production in the Piedemonte of Meta. The objective is to reach 500 producers in Ariari and the rest of the Piedemonte with workshops, farm visits, and extension materials. Also the program visualizes financial support for the on-going research on biological controls to reduce the use of chemical controls. Finally, an important aspect will be the marketing analysis since the perishable fruits put more pressure on the farmers to sell rapidly to the few buyers in Bogotá. Support the fieldwork of two students per year working on their thesis at Unillanos related to the objectives of the fruit proposal. Support a Colombian graduate student to work with the program coordinator on the programming analysis and another one to work on the econometric analysis using a larger sample with another professor from Purdue.

Second year - Evaluate the impact of the extension program in the Piedemonte on the determinants of yields, farm level profits, reduction of chemical controls and sustainability of the system. Estimate the profitability of fruit production. Identify the constraints and future activities with the programming model in Unillanos and at Purdue. Contract personnel to maintain the extension system in the Piedemonte of Meta. Continue the support of the biological control research with farm level testing. Develop other marketing outlets by identifying entrepreneurs interested in exporting or
domestic production of fruits, juices, other processed fruit products such as guava for “bocadillos.” Develop the software and training for marketing through the fruit network URL on the internet developed by Javier Orduz. The sustainable tropical production group of Unillanos, has formulated a project for an online market, Protos Market for Life. Support the fieldwork of two students per year working on their thesis at Unillanos and two Colombian PhD students at Purdue on research related to the objectives of the fruit/sillage proposal.

Third Year - Compare and contrast the extension performances of fruit producers in Meta with regressions and the programming. Implement a widespread diffusion of the biological control program. Make recommendations and help extend this model extension program to other regions. Present the results to various Colombian agencies and to producers’ associations. Develop a bulletin with recommendations for implementing a national program. Support the fieldwork of two students per year working on their thesis at Unillanos and two Colombian graduate students on research related to the objectives of the fruit/sillage proposal.

If sufficient funding is made available, Purdue University would consider providing overall project leadership. A project management unit would be created in Villavicencio to coordinate activities, monitor progress and lead the way in solving the problems that will inevitably arise. The project management unit would be staffed by Colombians with strategic and technical assistance from Purdue faculty and staff. At Purdue a senior faculty member, assisted by a steering committee, would oversee the project. In university terms, this senior faculty member will be the “Principal Investigator” and project lead. Purdue University, through the project management unit, will contract with Colombian organizations for specific components of the project. For example, Unillanos, Unitropico and other organizations have expressed interest in providing technical training and the higher education needed by those employed in the fruit sector. Agrosavia and other research organizations have expressed interest in providing technical support and applied research to solve production and processing problems identified in the course of the project. The management unit will work with national and international financial institutions to find credit for farmers and related businesses. The management unit will seek out educational institutions and non-governmental organizations that provide support for new and expanding businesses. The contractors and services providers will be part of a working group that meets monthly to insure good communication within the project and addresses problems early. A stakeholder advisory group would be developed to provide input on strategic decisions.

The exit strategy is that by the fifth year the project management unit will close. By that time coordination of fruit marketing and technical support can be handed over to a local organization, self-sustaining relationships will have been established between financial institutions and the fruit sector.

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4 This is a proposal developed under the Farmer to Farmer project carried out during 2016-2018.
The final internal evaluation and the external impact assessment will summarize the project experience and provide the basis for future public and private investment in the Piedemonte.

**Conclusions** - The feasibility analysis for this pilot considered a range of tree crops (i.e. oil palm, rubber, cacao, coffee) in addition to fruit, as well as dairy and cattle finishing. The linear program analysis shows fruit production is an excellent economic opportunity for small and medium scale farmers in the Piedemonte. The most profitable activities for medium sized farms are silage production and beef finishing. The three year pilot project would collaborate with Agrosavia to develop a fruit extension program to improve productivity, do research on biological controls to reduce pesticide overuse, and undertake marketing analyses.