

# THE PROMOTION OF HERBS AND SPICES PRODUCTION UNDER PROTECTED AGRICULTURE TO ENSURE FOOD SELF-SUFFICIENCY IN BARBADOS

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Figure 1. Greenhouse built with local materials in the Parish of St. John

## *Introduction*

This project was inspired by IICA-Barbados' technical cooperation project for the promotion of protected agriculture (PA) in Barbados. It was also inspired by the Development Plan for the Herbs, Spice and Condiment Industry in Barbados, which was written up by the Ministry of Agriculture in collaboration with IICA-Barbados. The plan focuses on particular herbs and spices: onions, hot peppers, thyme, marjoram, parsley, ginger, chives and basil.

Food self-sufficiency is a growing issue in Barbados, considering the country's outrageous food import bill. PA is being encouraged by both the Ministry of Agriculture and IICA-Barbados to encourage local production of crops to be sold to the local and tourist markets. In particular, herbs and spices are in high demand by locals, who would prefer locally-grown produce over current imports.

Producing herbs and spices under PA can increase yields and the local supply of fresh herbs and spices. However, the limited number of active PA growers in Barbados will most likely not have a huge impact on the import bill. There are currently approximately 35 PA producers in Barbados growing fruits and vegetables. It has

been shown that large PA systems have the potential to reduce imports of certain produce items as well as increase the farmer's gross income over time. If more farmers are encouraged to practice PA, there is potential to greatly decrease the food import bill.

## *Objectives*

The first objective of the project was to study PA systems in Barbados. This involved visiting different PA farms and learning about the local expertise of the PA growers utilizing different PA structures.

The second objective was to determine which herbs and spices will be grown under the PA system (i.e. greenhouse system) at the demonstration site. Primarily, the decision must be based on price – i.e. it must result in lower cost than the imports despite the increased costs associated with PA.

The third and final objective was to choose a demonstration site for the ideal location with an already set-up greenhouse structure for growing herbs and spices.

## *Project Activities*

Nine different PA growers were visited. These PA growers are utilizing different systems throughout Barbados. A visit to the Sustainable Barbados Recycling Centre Inc. also occurred. This agency showed interest in linking with PA growers to provide them with mulch. The growers all attended a PA workshop held by IICA-Barbados in November 2012. At the meeting, two PA specialists gave presentations as did three fellow McGill students from the BFSS program whose research project consisted of analyzing PA systems. The main goal of the visits was to pick up the discussion with PA farmers where it was left off in November 2012. Also during the workshop, the idea was put forward for a PA growers Association to be started up with the support of IICA-Barbados.



Figure 2. PA structure built by farmer to grow plant seedlings in the Parish of St. Philip

The nine farmers were provided with USB keys containing the information covered at the workshop. Conversations with farmers revealed whether any changes in their production were made after workshop attendance, their current levels of production and mode of production, their main obstacles in production, and their interest in being part of a PA growers association.

To determine which herbs and spices will be grown under the PA system (i.e. greenhouse system) at the demonstration site, online research was done. Most of the information was retrieved from research done by an organization called Appropriate Technology Transfer for Rural Areas (ATTRA) in collaboration with the National Sustainable Agriculture Information Service. It was recommended that herbs intended for fresh-cut sales be grown either in bags of growing medium or in a hydroponic system under a greenhouse structure. Basil, chives, marjoram, parsley and thyme are the most popular herbs grown under PA throughout the world. However, ginger and hot pepper can also be grown under PA.

### Results

There are many different PA systems used on the island, ranging from simple clothes baskets covering crops (as shown in Figure 3) to technologically intensive hydroponic greenhouse systems (as shown in Figure 4).



Figure 3. Plastic clothes baskets covering crops to grow okra, cabbage, parsley and spinach in the Parish of St. Michael



Figure 4. Israeli-style saw-tooth greenhouse in the Parish of St. James

The biggest cost of production varies among the different PA growers. All PA growers feel that they do not receive much technical support from the Ministry of Agriculture. Some claimed that the Ministry has no extension officers capable of assisting them.

PA growers have had much difficulty in getting funds/capital needed to expand their business. All of them expressed enthusiasm for membership in a PA growers association if it would get them better access to funds for expansion and debt relief.

Based on the research, many different herbs and spices can be grown under a greenhouse system. It is highly recommended that commercial production of herbs be grown under a hydroponic greenhouse system. From the list of the specific herbs and spices that the Ministry of Agriculture and IICA would like to focus on developing, the following have been recommended to be grown under a greenhouse setting: hot pepper, green onions in a cool greenhouse, sweet and dry onions at the beginning of their growth, thyme (Lemon, French, English, silver, creeping), sweet marjoram, parsley (both curly and flat leaf),

chives (Grolau), sweet basil (Genovese, Italian Large Leaf, Thai, Mammoth), dwarf basil (Spicy Globe) and purple basil (Dark Opal, Purple Ruffles). There has not been much research done on growing ginger under a greenhouse setting but the little research that has been done shows that it can be viable. Other herbs that were recommended to be grown under a greenhouse system include cilantro, dill, lavender, mint, oregano, rosemary, sage, scented geraniums and tarragon; however, these herbs will not be grown in the initial set-up of the demonstration site since they do not include any of the specified herbs in the development plan.

### *Recommendations*

With many different PA systems being utilized, disagreements may arise among the PA growers in a PA Growers Association, who have different end goals in mind. For instance, some PA growers are retired and only doing this as a hobby and to reduce their own personal food bill while others are looking to expand and make large profits from their enterprise. It must be made clear at the beginning what each member is expecting to get from being a part of this association. For instance, a survey asking what each member would like to receive from the Association can be completed.

Many benefits can be offered through a PA Growers Association that help all growers, no matter what PA system they utilize: life insurance, health benefits, greater access to information (market information and information on PA technology and how to increase production under a PA system), and increased access to funds.

It is chiefly recommended that to encourage farmers to raise herbs and spices in a greenhouse, each farmer should be made aware of the recommended herbs and spices to be grown under a PA system as mentioned under the 'Results'. Furthermore, the farmers will want to determine if it makes economic sense to grow the herbs and spices under a PA

system versus field agriculture. IICA-Barbados or even the Ministry of Agriculture should consider hiring someone to conduct a cost-benefit analysis. The fact is that not everything can be grown under any agricultural structure at a reasonable return to the farmer. Additionally, the food and agriculture industry changes rapidly. A cost-benefit analysis of different types of PA systems and field agriculture systems growing herbs and spices will show PA growers the economic viability of growing herbs and spices under different PA systems.

This analysis will also be useful for those producers who have shown interest in utilizing PA systems but have not as of yet. If further research is to be done on this project, more data needs to be gathered on costs of building the different PA structures, benefits that would come out of such production systems, as well as costs and benefits that come out of field agriculture, in order to do a detailed cost-benefit analysis.



Figure 5. The IICA-Barbados team (from left to right: Juliette Bowers, Damien Hinds, Jean Lowry, Marcia Husbands, Noor Denner, Rudolph Hippolyte, Marianne Roaldi, Sharon Trotman)

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