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Project: Strengthening farmer organizations in the OECS



✓ PROCEEDINGS

WORKSHOP ON PRODUCTION, MARKETING AND
CERTIFICATION OF ORGANIC FOOD

October 16-21, 1989

Edited by:

Barry Borland and Jerry La Gra

Excelsior Hotel

Canefield, Commonwealth of Dominica

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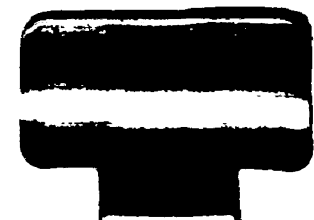


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OVERVIEW OF THE WORKSHOP

One of the principle constraints to agricultural development and diversification in the OECS is the uncertainty of markets. While banana has been the exception, in the near future even this crop will lose its protected status.

In a search for new markets for non-traditional produce from the OECS, an effort was made in early 1989 to look at the niche market for organic foods. This led to the organization of the "Round Table Meeting on Organic Farming," held in Dominica on June 8, 1989. The Proceedings of this meeting were published by the IICA Office in Dominica in February, 1990.

One of the recommendations from the Round Table was to organize a workshop for farmers and technical persons from the OECS to evaluate the feasibility of "organic farming" as an economic alternative for small farmers from the region.

A Workshop on Production, Certification and Marketing of Organically Grown Food was held at the Excelsior Hotel, Roseau, Dominica between October 16 and 22, 1989. The Dominica Ministry of Agriculture and IICA sponsored the workshop.

The organizers were extremely fortunate in obtaining four excellent resource persons: one from a microbial pesticides research center (Fernando Agudelo-Silva, EcoScience, Amherst, Massachusetts); one from a sustainable agriculture training center (Gregory Booth, Regional Center for the Study of Rural Alternatives, Rio Limpio, Dominican Republic); and two from the largest organic food distributor in the USA (Thomas B Harding, Jr. and Kristi K. Johnson, Organic Farms, Beltsville, Maryland). Thanks to their wealth of information and experiences and their dynamic teaching styles the Workshop was educational, motivating and fun.

Some 50 representatives of the agricultural sector were welcomed to the opening of the Workshop by the Chief Technical Officer, Errol Harris. Franz C. Alexander welcomed the participants on behalf of IICA. The opening address was made by Hon Charles Maynard, Minister of Agriculture, who expressed his interest and support for organic farming which, he pointed out, "Dominican farmers have been doing for many years." Jerry La Gra summarized the background and objectives of the Workshop.

In the development of the Workshop the resource persons covered a broad range of topics including natural fertilizers, building an integrated farming system, integrated pest management, certification of farmers, postharvest handling, marketing and many

more. One afternoon was spent in the field visiting natural and planned organic farms and applying some of the knowledge learned in the classroom.

On the fifth and final day of the Workshop, the 20 participants from five countries were divided into Work Groups, by country, and assigned a specific project. Each group developed their respective project to the Profile stage (page 39).

Three brainstorming sessions were organized with the resource persons. One served to prepare the section "Conclusions and Recommendations" (page 34) and the second served to generate the information for the preparation of the "Outline for a Farmers Manual on Organic Farming" (page 51). The third brainstorming session produced the short document "Requirements for the Export of Organic Grapefruit (page 56).

The Workshop was evaluated by the participants (page 58) all of whom expressed their satisfaction with the event, while making recommendations for improvements. Most agreed that they had obtained a new vision of organic farming and expressed their desire to see the Workshop repeated in 1990.

OPENING PRESENTATIONS



A WELCOME FROM THE DOMINICA MINISTRY OF AGRICULTURE

Errol Harris

The opening of the workshop was made by Mr. Errol Harris, Acting Chief Technical Officer, Dominica Ministry of Agriculture. Mr. Harris welcomed The Honourable Minister of Agriculture for Dominica, Mr. Charles Maynard, Dr. Franz Alexander, IICA Representative for the OECS countries, and Jerry La Gra, Marketing Specialist. Mr. Harris welcomed all the participants from Grenada and Carriacou, St. Vincent and the Grenadines, St. Lucia, Dominica, Antigua and Barbados. He also welcomed those persons attending the workshop as resource persons, from the United States and the Dominican Republic.

Mr. Harris stated that agriculture in the Eastern Caribbean is now coming full circle, with regard to the use of agricultural chemicals. Until fifty years ago, artificial chemicals were never used in agricultural production in this region and agricultural production was totally organic. Only within the past fifty years have synthetic chemicals been used in agriculture, and there has been considerable encouragement in this direction from agricultural experts and chemical companies, particularly from the most developed countries.

According to Mr. Harris, organic agriculture fits in well with the production systems of Dominica because farmers here do not rely totally on a monoculture. They produce a variety of crops and this is an advantage for moving into crop rotations, interplanting and companion planting and other planting systems that favor organic production. Mr. Harris again welcomed everyone to the workshop and stated that he looked forward to attending and to an active exchange of information between all those persons in attendance.

A WELCOME FROM IICA

Dr. Franz Alexander

Dr. Alexander also welcomed all the participants to this workshop, stating that IICA is proud of the work being done to promote organic agriculture. He stated that credit for this workshop must be given to Jerry La Gra, Marketing Specialist with IICA. Mr La Gra has played a key role in bringing this Institute into exploration of the potential for producing and marketing organic produce from the OECS countries.

The Eastern Caribbean was described by Dr. Alexander as an area of sun, sand and sea; all the conditions required for tourism. Tourism will continue to play a large part in the economic development of the OECS countries in the future and organic agriculture can assist the advancement of that industry. We can offer healthy, chemical-free food as well as sun, sand and sea, and take the lead in producing fruits, vegetables and meats that tourists can be sure are healthful as well as good tasting.

Answers are required for the development of a strategy to implement a system of agriculture that produces healthful food which also provides new markets for the produce grown by our farmers. Dr. Alexander stated that he looks forward to this meeting and to learning more about the production and marketing of the organic food that our farmers can produce.

THE OPENING ADDRESS

Honourable Charles Maynard

Mr. Maynard, Minister of Agriculture, related that as this is World Food Day it is only fitting that this workshop should be opened. He stated that the whole idea of World Food Day is to focus the attention of mankind on the availability of food and added that the attempts of mankind to provide food today should not prevent mankind tomorrow from providing food. Foods must be nutritionally sound, and at the same time not be produced in such a way as to cause harm to the environment.

In Dominica, farmers have been producing food organically for many years and they can increase their production of that food for the world market. We need to know the next step to take in order to create and expand markets for Dominica's fruits, vegetables and root crops. Minister Maynard stated that agricultural production using synthetic chemicals has been detrimental to the environment and organic production therefore represents an alternative for producing wholesome and nutritious food that is compatible with the preservation of our environment.

Minister Maynard remarked that in the development of manuals on organic production of food, attention should be given to assure they are usable by everyone. The common man should be able to make use of this manual and it should be used also by schools in training students to become agricultural producers in the future. In this regard, the Minister also stated that it is important for our Universities to be involved. The University of the West Indies ought to take part in this workshop and have the information necessary to train our students to adopt organic methods of production.

Learning more about the organic approach to agricultural production is particularly important today, according to Minister Maynard, because farmers need to earn a living and they may see the use of chemicals as a requirement for maximizing their production and their income. The pressure for land for agricultural production can be hazardous to our resources if synthetic chemicals are relied on for that production.

Minister Maynard stated that organic farming helps to sustain the environment and at the same time helps farmers to earn a living. The production of food organically also opens up new markets for our agricultural produce within the region as well as extra-regionally. He added that we need to secure markets for our organically produced food. This means that people in other countries must cooperate in allowing our produce to enter those

markets and not prevent them from entering by using artificial barriers.

Agricultural diversification was also identified by Minister Maynard as a benefit of organic agriculture. He went on to say that we need to develop the same infrastructure for a variety of crops that we have developed for bananas. Organic production can be one way to diversify and to produce and market a variety of crops. In this respect, further information is needed by farmers. They need to know what crops and quantities they can produce other than bananas and how much it costs to produce and market those crops. Farmers need to be able to make sound decisions about producing crops other than bananas and this will require new and relevant information.

The Minister stated that we must have guaranteed markets for the organic food that our farmers produce and this leads to a need for economic security. Who will provide the economic security necessary for our farmers to begin to produce and market organic crops? Arrangements can be made to provide all the necessary production and marketing support and we should all begin to work together cooperatively to make organic agriculture a reality for the Eastern Caribbean. We all look forward to our organic produce leaving our shores for markets all around the world.

Minister Maynard concluded his remarks by formally opening the workshop and by wishing all the participants and resource persons every success in the completion of this worthwhile effort.

INTRODUCTION TO THE WORKSHOP

Jerry La Gra

In his opening remarks, Mr. La Gra stated that agricultural diversification is an important concern for all farmers in the OECS countries. Farmers are looking to alternative crops and Ministries of Agriculture are assisting farmers to select crops that have a strong and stable market. In this connection, organic produce should be considered as a "niche" market; one for which many farmers in this region can successfully produce.

Although organic food is not entirely new, the market for organically grown produce has expanded greatly in the past two years. Mr. La Gra cited instances of a single organically grown grapefruit selling for US\$1.00 in a "yuppy" retail outlet in Miami, a few months ago. While this may be an uncommon occurrence, it nevertheless illustrates that American consumers are willing to pay more for organic produce than for conventionally grown produce.

While the market for organically grown produce is promising, organic production and marketing of this produce require special skills. Our farmers all need help in developing their production and marketing skills and this can be best achieved through farmer organizations. IICA's project to strengthen farmer organizations began in 1988 with multiple objectives, including the generation of baseline decision making information, formulation of production/marketing projects, training of farmers and leaders of farmer organisations, and exchange of information and experiences.

Mr. La Gra described this workshop as an opportunity to upgrade our knowledge about the production and marketing of organic food and to generate information to improve the ability of farmers to capitalize on this growing market. Improving the ability of farmers to respond to the demand for organically grown food strengthens their production and marketing abilities and broadens their economic base, as well as the economic base of the country in which they live.



WORKSHOP PRESENTATIONS

AN OVERVIEW OF THE ORGANIC FOODS INDUSTRY

Thomas Harding

A Description of Organic Food

Organic food consists of all foods - fruits, vegetables, root crops and livestock - produced without the use of synthetic chemicals. Chemicals are a vital ingredient of everything around us and those which occur naturally can be used in the production of organic food. In organic production the use of synthetic chemicals, which are man-made and do not occur naturally, are prohibited. Further, organic fruits, vegetables, meats and other products, must have no preservatives or colorants. They must be totally natural in their production and processing, from the farm to the market.

A Description of an Organic Producer

For a farmer to be considered to be an organic producer, he/she must not use any synthetic chemicals in the production or postharvest handling of his/her crop. In addition, synthetic chemicals can not have been used on land producing organic crops for a period of three years before that land can be certified for the production of organic food. The discontinued use of synthetic chemicals for a 36 month period serves two purposes. First, levels of synthetic chemical residues in the soil can decrease considerably during that period, improving the quality of the food it produces. Secondly, the period of 36 months signifies a real commitment on the part of the grower to produce food using organic production methods only.

A Legal Definition of Organic Farming

A legal definition of organic farming is now being developed in the United States and Canada. Such a definition can be helpful, because 43 separate organizations now have definitions of organic farming and while there are similarities in these definitions, each is different in some way. Differences in these definitions cause a great deal of confusion for farmers as well as for consumers, retailers and everyone else involved in the food business. A very important condition of this definition, however, is the inclusion of the restriction of synthetic chemicals.

Allowance of the use of any synthetic chemical, in any amount, poses a serious hazard to a definition of organic agriculture. The use of even very small amounts of these chemicals is a threat

because a little of one chemical and a little of another add up eventually to significant levels of these substances. The only way to eliminate this problem is to totally disallow the use of any synthetic chemicals throughout the production, postharvest handling, processing and marketing of agricultural produce. The integrity of food must be maintained from the farmer to the consumer if it is to be considered as organic.

Organic farming has persisted in various parts of the world through the efforts of people who used organic methods of production because of environmental stewardship principles. Today, 12 different organizations in the world have developed a uniform set of production, processing and marketing standards for organic food.

Standards and Practices

Chemical residues are not mentioned in standards of organic food because of difficulties in determining the hazards of those chemicals, and because produce can have residues as a result of previous land use practices. As a practical matter, produce that has chemical residues despite organic practices, over a minimum of 36 months, can be sold as organic, as long as it meets the tolerances of the importing country and the buyer of the produce. In the United States, 10 parts per million of chemical residue are tolerated, but in Germany, only 2 parts per million are tolerated. In Peru, soils receiving DDT more than 20 years ago were found to still have residues which exceed the German standards.

Decisions about standards and practices for organic food are sometimes difficult. In all decision making we should try to follow the guidelines for ethical decision making described by Kenneth Blanchard in his book entitled The Power of Ethical Management. Blanchard identified three conditions that should guide all ethical decisions:

1. Is the decision legal? If it is legal, how does it fit with my own personal philosophy?
2. How do the effects of this decision balance? Will everyone involved benefit from the decision?
3. How would I feel if news of my decision becomes public and all my friends and others learn of it?

Mr. Harding stated that we all live on planet earth and our problems are everyone's problems. We must all conduct our lives ethically to eliminate problems for ourselves and for everyone else. It is not a question of "we" or "they" but one of "US".

Organic production can become very complicated. Some organic growers adhere rigidly to organic standards of production, but because their farm is adjacent to land farmed by a conventional grower, their produce may become contaminated by chemical drift. In such a case, the organic producer would probably still be able to sell his produce as organically grown, as long as the chemical residues do not exceed the tolerances established by the country in which it is purchased. Still, every effort must be made to reduce the effects of chemicals used by conventional growers.

There are a number of practices that can be established in order to reduce contamination, including the use of indicator plants and establishing buffers between organic and conventional growers. These and other measures are recommended to farmers in the process of certification of organically grown food.

Markets for Organic Food

There is always a marketplace for ethically produced foods. Many consumers want to support organic production and eliminate the use of synthetic chemicals in agriculture. These people are willing to pay more for their food in order to have nutritious, synthetic chemical-free food and in order to support organic agriculture.

In most cases, the price difference between conventionally grown and organically grown food will be 25 to 35 percent in the market place. If you can hit the "windows" these differences can be even greater than 35 percent. Farmers should be cautioned against getting caught up in false expectations. Prices for organically grown food are comparatively higher, but costs of organic production may also be higher, initially. The technology of growing organically is also different.

Produce With Greatest Potential in U. S. Markets

While the development of the food system in the USA has produced the fastest destruction of natural and human resources in the history of the world, it is now on its way to becoming one of the most dynamic markets for organically grown food.

A number of crops were identified by Mr. Harding as having a strong market in the United States. The first of these was banana, which is now consumed in greater quantities than any other fruit. A potentially large market exists for exotic bananas (finger bananas, red bananas, apple bananas, plantain, etc.). Organic bananas are imported from the Dominican Republic and from Mexico in both the fresh and processed (banana puree, dried banana chips and flour) forms. In each processing operation value is added to the product. Theoretically, at least, those who obtain the greatest income from any crop are those who add the greatest value to that

crop. A number of other organic crops have a substantial demand in the United States. They are as follows:

- Guava, mango, papaya, passion fruit and pineapple;
- Citrus and citrus juices;
- Dried fruit such as bananas, mangoes, papaya;
- Vegetables (broccoli, asparagus, brussels sprout);
- Miniature vegetables;
- Tomatoes and sweet peppers;
- Eggplant, chinese vegetables and winter squash;
- Herbs for medicinal and culinary uses;
- Hot peppers in fresh, dried and ground form;
- Hot sauces;
- Cacao (variety is an important factor);
- Cinnamon, bay and other spices;
- Coffee (particularly Arabic) in green bean form; and
- Other exotics, new to the USA market (breadfruit, etc.).

Each of the commodities identified above can be marketed from several locations around the world. These commodities are marketed on the basis of where and by who they were grown, and on the basis of special qualities of the individual commodities. Labels tell the story of how these products are grown and consumers develop a loyalty to them from information they read on labels.

Protecting Organic Quality

Organic farming requires good stewardship. Farmers must not only assure that they follow the rules of organic farming but they must also do their best to avoid contamination from neighbouring farms. Buffer zones of indicator plants/trees can be established around the farm to help protect crops from neighbours who may be using synthetic chemicals and from aerial spraying. There is also a need for good communication links and close coordination with health officials where spray programs for mosquitos and other pests are concerned.

ALTERNATIVE SOURCES OF NATURAL FERTILIZERS

Gregory Booth

Nitrogen Fixing Plants

Although animal manures are often considered to be the best source of nitrogen, nitrogen fixing plants actually provide more nitrogen. Nitrogen fixing crops can also provide forage for animals which then provide an additional source of nitrogen through manure.

Several leguminous plants provide good sources of soil nitrogen and at the same time provide animal forage and serve other purposes. Descriptions of some of these plants are as follows:

Horsebean - a comparatively low growing plant which provides a source of nitrogen and organic matter when worked into the soil;

Swordbean - another low growing plant which provides animal forage and nitrogen when worked into the soil;

Velvetbean - a climbing plant which can be planted after corn. The velvetbean climbs up the cornstalk after the corn has been harvested and fixes nitrogen in the soil and serves also as a forage crop for animals;

Lablab bean - this is the best nitrogen fixing forage, and is considered to be a very good forage crop also.

Each of the leguminous plants identified by Mr. Booth has been grown in several countries of the Eastern Caribbean for many years. They are all well suited to this region and have no unusual pest or disease problems.

Tree legumes, such as Caliandra, Lucaena and Sesbanilla, can also be used as sources of nitrogen and forage. All are palatable and can be used to provide up to 30 percent of the daily forage supply for ruminants.

Caliandra can also be used as a short fence post and the lower branches of these trees can be woven together to serve as a barrier for terracing. Trimming the top from this tree keeps the plant at a desirable level while providing animal forage.

Green Manure Plants

Green manure plants like mustard are a good source of green vegetables for humans and when turned under greatly improve fertility. Buckwheat can improve soil fertility also when turned under, and provides good forage pasture as well.

Comfrey is a very versatile plant that serves as a herb and as an animal feed. Since it is high in nitrogen, it can also be applied as a fertilizer in the form of a manure tea. It is an excellent soil amendment when incorporated into the soil.

Composting

Composting is the most effective way of turning green plants and animal manures into usable organic matter to improve soil fertility and quality. There is an abundance of information on this topic in farming and gardening literature. Composting is being carried out now on a large scale on large farms, but the majority of compost producers utilize an enclosed compost heap of about 100 to 125 cubic feet.

In the composting process considerable heat is generated, which kills weed seeds and destroys pathogenic materials. This allows all green material to be utilized in improving fertility, regardless of the nature and source of that material.

Composting can also be carried out in a 3 foot by 4 foot windrow. This method does not generate as much heat as the method described above, and as a result, it does not kill weed seeds or destroy pathogens. Thus, greater care must be taken concerning the material used in this process.

Carbon and nitrogen are the most important elements in the composting process. In the ideal situation, one part of carbonaceous material will be added to twelve parts of nitrogenous materials. In composting, carbon usually comes from cured materials such as straw or hay, while nitrogen comes from green matter.

Mr. Booth presented a series of slides showing some of the crops/techniques mentioned in his presentation. He also summarized the history and described the organizational and operational structure of the Regional Center for the Study of Rural Alternatives (CREAR) where he functions as Agriculture Director.

CREAR is located in a small agrarian reform settlement in the highlands of the Cordillera Central near the Haitian border, at Rio Limpio, in Northeastern Dominican Republic. Typical of most rural villages in the third world, Rio Limpio is without electricity, safe drinking water and adequate medical facilities. Health and sanitation conditions are poor, there is no post office or telephone and education and employment opportunities are limited.

In this community of over 3,000 people, CREAR has developed a working farm and a broad program of training, demonstration and on-farm research in sustainable agriculture and integrated rural development.

The Center's 15 acres are organized into several areas: intensive horticulture, field crops, hillside terrace and soil conservation area, animal husbandry, agro-forestry, compost production, fish ponds and an appropriate technology center. There is also a small multi-purpose building which serves as office, library, dormitory, dining room, classroom and conference room with an attached kitchen.

CREAR's training programs include those oriented towards promising young farmers from Rio Limpio (3-5 year work study program); one to four week hands-on technical workshops for community leaders, health promoters, rural groups, agronomists, etc.; an informal work-study program for men and women of other countries; rural youth leadership programs designed to meet the needs of requesting organizations, and short-term consultancies to transfer the seven years of CREAR experiences in sustainable agriculture.

BIOGAS DIGESTERS

Gregory Robin

Biogas digesters have been built on several farms in the Caribbean through a programme financed by the Caribbean Development Bank (CDB) and the German Agency for Technical Cooperation and administered by the Caribbean Agricultural Research and Development Institute (CARDI). These units were developed first as an inexpensive source of gas for home cooking. They are also considered to be a safe, non-odorous means of converting animal manures into usable forms of fertilizer.

Research on Slurry

Over the past few years, CARDI has completed several studies of the benefits of slurry as a fertilizer and as a source of methane gas. In a comparison with ordinary pen manure, slurry was found to be more effective as a source of soil nutrients. Slurry was found to be most effective when applied to a crop at several stages of development.

Because it contains a high percentage of ammonia, slurry must be buried or worked into the soil in order to retain its beneficial characteristics. Biogas units producing this slurry can be very efficient, providing large volumes of soil nutrients to enhance the fertility of crop land each year.

Research into the effective use of slurry is being continued by CARDI. Further information about biogas digesters and the slurry they produce can be obtained through any national CARDI office.

THE DYNAMICS OF AN ORGANIC FARMING SYSTEM

Thomas Harding

Costs of producing organic food typically are 20 to 25 percent higher in the early stages of organic production than they are for production using conventional methods. However, as organic production becomes established and management techniques appropriate to organic production are mastered, differences in costs of production with these two systems disappear.

Organic production today is a more management intensive method of production. It rests on the use of crop diversification, companion interplanting, use of on-farm fertilizers, soil building crops and crop rotation. This method of production is necessary and must be developed further, because conventional production has failed to provide the food we require without jeopardizing the future productive ability of our soil.

Farming systems should be designed for specific farming units. This requires an indepth understanding of farmer's needs and resource availability. There is also the need to understand crop compatibility and the production and use of nutrients. Success often depends on the selection of the appropriate crop variety.

There are hundreds of insects which are not affected by chemicals. Today, the 20 most economically destructive insects are resistant to the 20 most commonly used pesticides. We will never be able to control the millions of plant and insect species. This requires a change in farming practices. Instead of working against nature we must work with nature.

On-Farm, Off-Farm Production of Fertilizer

Organic farming requires large amounts of soil nutrients such as nitrogen which can be obtained from legumes, compost, green manures and aged manures. These nitrogen sources can be developed from materials on most farms, and their production must be considered as an integral part of a cropping system. Farm resources should be analyzed in terms of an economic model.

Although a majority of soil improvements can come from on-farm materials, a wide variety of valuable materials can come from off-farm sources. These sources can include the following:

- Blended fertilizers (organic);
- Marine materials (fish, kelp, and seaweed);
- Sewage sludge;

Guano (is considered too soluble, cannot be used according to OCIA);
Fish and seaweed emulsions;
Rock phosphate;
Silt from river deposits;
Foliar liquids (combination of fish and kelp);
Trace minerals (boron, copper, zinc);
Bone meal.

Compost is the only soil amendment that can be effectively and efficiently broadcast on fields or plots. All other materials must be placed strategically beside the plant to make it accessible to plants without requiring large amounts.

Applied nutrients other than compost must be incorporated in the furrow at planting time or used as a side dressing during the growing season for maximum efficiency. Supplemental materials can be most effectively applied to the plant foliage, using a spreader sticker to promote optimal absorption by the plant.

Control of Weeds

Weed control in organic farming must be accomplished through mechanical means or through use of selected husbandry practices in most cases. There are new and rather exotic means of controlling weeds, such as with the use of electric shock or gas burners that singe the weeds, but most farmers continue to use the more traditional methods of mechanical removal.

A closed canopy, often accomplished through companion interplanting, can be a very effective method of preventing weed growth and this method can also maximize production. Control of weeds is important for conserving soil moisture and soil nutrients.

Weeds may not affect yields greatly after getting crop beyond the early critical stage. Farmers should not get over-excited about eliminating all weeds.

Pest Management

Pest management in organic farming can be accomplished effectively through the use of natural plants and materials. Neem, sabadilla, ryania, rotenone and pyrethrum are all organic products from plant materials. Each of these materials is particularly effective against specific pests.

Rotenone and pyrethrum, however, are very powerful broad spectrum insecticides and should not be used in greater than two percent solutions. They have the effect of killing a wide variety of insects, those which contribute positively to the plant

ecosystem as well as those which attack the plants being cultivated.

In an effective pest management control program, four important factors must be considered at all times. These factors are (a) the target of insect pest control, (b) the rate of application of insecticides, (c) the frequency of insecticidal application, and (d) method of application.

The target, or location of the pests on the plant determines the method of applying the insecticide, such as through the use of a spray, bait, trap or other method. Methodology can include mechanical traps, such as "sticky balls" and use of pheromones which lure insects away from the plants. The rate and frequency of application is determined by the kind of pest on the plant and the type of insecticide used. Broad spectrum insecticides will be used in lower dosages than more selective materials. The time of day or stage of maturity of the plant when it is treated is also important.

INTEGRATED SYSTEMS OF CROP DIVERSIFICATION

Gregory Booth

Integrated systems for crop diversification must be developed on the basis of social, cultural, economic and physical factors. The choice of what to plant must be made on the basis of who is going to produce them, what kinds of plants are needed for food for domestic use, the demand for excess volumes of those crops after the needs of the local population have been satisfied, and the suitability of the soil, terrain, climate and weather for the production of those crops.

Factors Involved in Integrating Crops

When determining how crops can be grown together, factors such as the compatible needs of plants for light, soil nutrients and moisture, and their ability to ward off insects, must be taken into consideration. In the rotation system at CREAR in the Dominican Republic, more than 15 different crops are included in a crop rotation. Not all crops are grown in an intercropping fashion, however, because some crops are not compatible with others.

Cowpeas and cassava are not compatible, but coffee and hot peppers make a good combination. Onions, lettuce and carrots also seem to be mutually beneficial. Tomatoes repel the cabbage worm moth. Garlic inhibits coffee rust and some insects. Certain flowers, such as marigolds, can ward off insects and at the same time improve the esthetics quality of the cropping system.

In any integrated system of crop diversification, a certain amount of experimentation is necessary to determine which combinations of crops can be most beneficial. An effort should always be made to discover how crops can be combined to produce highest yields, minimize insect and disease problems, and utilize soil nutrients most effectively. Efforts should be made to avoid conflicts such as too much shading, incompatible plant growth which may hinder production or harvesting and crowding as plants develop over time.

Integrating Crop and Livestock Production

The uses of crops in any diversification system must also take into account the need for animals in the community. Certain crops may be required solely for use by animals. These can provide a return to the cropping system through animal manures which can provide nutrients for the soil.

Lastly, the attitude of the farmer brings together the whole cropping system. The art of farming has a lot to do with the ways in which crops are combined. This affects the health of the plants, their overall yields and the appearance of the entire system. Farming units often have a disordered appearance, seeming to have been thrown together without consideration for the plants or the people who work with them. In preference, farms should have a pleasant appearance, be well ordered and an inviting place to work.

A LIST OF READINGS ON ORGANIC AGRICULTURE

Kristi Johnson

Kristi Johnson, Organic Farms Ltd., distributed handouts on diverse aspects of organic farming, including such topics as composting, marketing, organic organizations and others. She reviewed the available literature on organic farming, giving particular attention to the following publications:

Journals:

American Journal of Alternative Agriculture
Institute For Alternative Agriculture
9200 Edmonson Rd. Suite 117
Greenbelt, Md. 20770

The IPM Practitioner
Bio Integral Resource Center
P.O.Box 7414
Berkely, CA. 94707

Books:

Food First - Beyond the Myth of Scarcity
Frances Moore Lappe

Agroecology - The Scientific Basis of Alternative Agriculture

The Future is Abundant - A Guide to Sustainable Agriculture

The One Straw Revolution
Masanabu Fukuoka, published by Rodale Press

World Watch Magazine

Ms. Johnson distributed copies of Agriculture Access: Agriculture Book Source Catalog to all interested participants and offered to send books and publications to those persons making a written request to Organic Farms.

✓ BIOLOGICAL CONTROL OF INSECT PESTS

✓ Fernando Agudelo-Silva

Biological control in organic farming refers to the use of natural enemies to manage or control insect pests and pathogens. For example, wasps are natural predators of aphids. Aphids produce food for ants so the latter protect the former from the wasps. When a barrier is put up to prevent ants from reaching the aphids, the wasps can then reach the aphids easily and kill them. Farmers must be encouraged to not just treat the symptoms but to understand the systems.

We must understand the system of relationships between insects in order to interrupt the natural cycles that promote insect development. We must understand also, that all insects have an important function to perform and that there is a purpose in their destruction of certain plants. As an illustration, aphids are attracted to yellow plants, perhaps because yellow plants usually are unhealthy, thus nature's way of using aphids to destroy unhealthy plants. One way that the natural system can be used to control aphids is by placing a yellow pan of soapy water between plant rows. Aphids are attracted to the yellow pan and are killed by the soapy water.

To successfully practice sustainable agriculture you must be plugged into the ecosystem. You must understand the life cycles and characteristics of insects and attack them at their weakest point. Insects and diseases are very predictable once they are well understood.

Relations Between Physical and Biologic Environments

To be efficient producers we must practice agriculture in the concept of the ecosystem - the physical and biologic environments, including humans, and interrelations between those environments. If we ignore relationships between the physical and biologic environments we are in trouble. By knowing that insects are very sensitive to the hours of sunlight in a day we can understand more about their development and how they can be controlled.

A specific amount of daylight hours are required for some soil-borne insects to move from the pupa to the moth stage. When we know how many hours of sunlight we have had since the beginning of the pupa stage of a specific insect, we can predict when that insect will become a moth. There are parasites that can be bred and released before insects leave the soil. These parasites can then reduce the population of insect pests and reduce their ability to cause serious damage to plants.

Use of Biological Controls

While chemical controls kill only larva, biological controls can be used to attack insect pests at any stage of their development. Wasps that lay eggs in insect eggs can be used against certain pests. There are many kinds of predators that attack pests at different stages of development.

The goal of biological control is to keep the number of insect pests at a manageable level. A certain number of these insects can always be tolerated. While some insects eat plant leaves, the damage they cause may not be significant. When it becomes apparent that the damage done by the insect pests cannot be tolerated, intervention with biological controls can be justified. Farmers must determine acceptable levels of loss. For example, in economic terms, it may be better to lose 10% of a crop to pests than to spend "X" amount on pesticides. Reasonable losses to pests should not be considered losses but rather an investment in the production of the crop.

Farmers must be aware of the part played by all insects in the ecosystem. For example, aphids are attracted to the young tips of leaves and suck the sap from those leaves. They release small stick drops (honey dew) that fall on fruit and leaves that attract and feed fungi spores that cause sooty mold. Thus, the most efficient way of controlling sooty mold is through the control of aphids. Predators, such as ladybugs can be used to eat aphids.

Farmers must develop techniques of judging when to apply chemicals or treatments. If the farmer waits until he sees the plague in the field it is already too late.

One way of minimizing pest problems is by staying within the constraints of the ecosystem. Do not try to grow pineapple in a cold climate, or grow crops out of their normal season. When plants are being grown in unusual conditions, they become stressed, and then are attractive to insect pests. By understanding and working with nature you can minimize the problems of insects and diseases. An ecosystem always tends towards a balance. If parasites and predators are not doing their job, you can assist them by such things as using soap to destroy eggs.

Beneficial Insects

There are several insects that can be considered to be beneficial against aphids:

- Lacewings are predators of aphids and small larvae;
- Ladybugs eat aphids as well as scales, lepidoptera and small larvae;

- Synphid larvae are flies that eat aphids;
- Hunting wasps also eat aphids.

There are also predators of aphids in the soil, such as ground beetles and spiders. These insects climb plants and eat aphids or build webs that trap them.

Parasitoids are insects that kill a host slowly. They usually need more than one host to develop. Parasitoids can control insects by attacking them at any stage of development. Some parasitoids lay their eggs in the eggs of a pest, thereby killing the pest egg. Other parasitoids lay eggs in the pest egg which hatches and carries the parasite. The host then dies and the parasite lives. Still other parasites lay eggs in the pest egg and emerge at the pupa stage of the pest and kill it then.

It is important to know which local insects are beneficial. Conditions can be developed to promote the growth of these insects which can then remove pest insects during the growing season. Farmers can also find and grow beneficial insects to protect their crops.

The Natural Enemy Complex - Pathogens

The natural enemy complex includes predators, parasitoids and pathogens. Among the pathogens, the most prominent are bacteria, fungus, protozoa, viruses and nematodes. The most important bacteria is bacillus thuringensis also known as B t. and sold under the label of Dipel.

The Kurstaki variety of B t. is the most effective one. The bacillus is oblong in shape and produces a spore at one end and a crystal at the other. Crystals are included in B t. which digest the wall of the mid-gut of the larva which eats it. This causes osmotic shock in the larva, causing it to die quickly.

// BUILDING A CERTIFIED PRODUCTION SYSTEM

J
Thomas Harding

To be able to export organic food to USA/European markets the individual producer's farmland must be certified as free from synthetic chemicals. The certification process requires becoming a member of one of various internationally recognized certification organizations.

The Organic Crop Improvement Association

The Organic Crop Improvement Association (OCIA) was conceived in response to increased consumer demand for food products without harmful pesticides, herbicides and fungicides associated with conventional agricultural food production systems. Food grown in such conventional farm units pose a threat not only to human health but threaten the longer range sustainability of the soil system, as well as economic viability of the farm. Historically, the farmer has had little to say regarding price structures in the marketplace.

Involvement of Organic Farmers in Marketing

Farmers associated in OCIA are actively involved in promoting their products and marketing them at a price higher than is paid for conventionally grown produce. This higher price provides them with economic viability over the long term. The higher prices for organic produce are predicated upon organic quality, without harmful additives, verified by third-party independent certification and qualified by an audit trail which permit tracing the commodity from production to the consumer during product flow.

OCIA is a farmer-based, "grass roots" organization with a divergence from conventional agriculture in that decision making emanates from the bottom-up. Farmer ownership and control, meticulous land stewardship, on-going crop improvement, high standards of production, commitment to ecological alternative agriculture and the consumer guarantee in the marketplace, supported by independent third-party certification, are all principles upon which OCIA was founded.

Certification of Organic Produce

To sell food as organically grown, the fields in which organic crops are grown must be certified as free of the use of synthetic chemicals for a period of three years or more. Farmers must provide a detailed history of the cropping system used on their farm and

a description of the husbandry practices used in that cropping system.

Certification is completed by an independent person trained in the certification process at an international certification center. This process is based on a visual inspection of the land, a detailed history of the cropping system and husbandry practices used and soil tests for nutrients, micronutrients and chemical residues.

All organic producers are inspected at least once each year and more frequently if they produce honey or have a continuous cropping system. These inspections are for the purpose of assisting the farmer to improve his/her farming methods to become more productive of nutritious and chemical-free food. Soil tests are repeated in these inspections and the farm history is reviewed and updated.

Organization of Organic Growers

Growers of organic produce are organized into chapters of at least five members, three of which are organic farmers. Each chapter must have a certification review committee which consists of at least 50 percent farmers. This committee provides assurance that new members meet the criteria for organic production and that old members continue to adhere to the production standards of OCIA. OCIA chapters must have one day each year dedicated to a crop improvement seminar.

The Certification Process

To become certified as an organic grower, farmers must go through the following steps:

1. Complete a preliminary application;
2. Submit the application to the local chapter review committee which examines the application and determines whether it qualifies for inspection;
3. Prepare a farm questionnaire, maps and soil tests, a map and three to five year history of the farm, with a description of the water sources and boundaries;
4. Demonstrate good preharvest and postharvest handling techniques;
5. Complete an inspection which verifies information on the initial application and projects crop yields, evaluates cropping systems used and provides constructive comments and recommendations.

At the conclusion of the inspection process, the inspector makes an evaluation of the applicant's farm and recommends that

certification be either granted or denied. The Certification Review Committee of OCIA then decides whether to grant certification.

The Audit Trail

An audit or inventory control must be maintained which permits tracing of all raw materials from the supplier through intermediaries and on through the distribution system to the retailer, using lot numbers, serial numbers and the like.

Each country has a code, as does each county or parish, chapter and producer. Each shipment also has a lot number. These numbers are all included on a tag that accompanies each shipment. These numbers enable the produce shipped to be traced from the retailer back through the processor to the producer.

MEETING THE NEEDS OF THE ORGANIC FOOD MARKETPLACE

Kristi Johnson

The integrity of organic food must be maintained through each step of the production and marketing of organic produce. From the preparation of the seedbed to the sale of the harvested produce in the retail market, each phase of the production and marketing process must maintain standards and practices established by the OCIA or similar certifying body.

Pre and postharvest handling are important aspects of the production and marketing process because these practices have important effects on the quality of produce to be sold. In addition, these practices offer a number of opportunities for the use of chemical products which enhance the appearance and quality of fresh or processed produce. These products can be organic or non-organic and for produce to be sold as certified organic, all products used must also be organic and be accepted by OCIA or by another certifying organization.

Preharvest Handling

To assist farmers in bringing high quality produce to market, Organic Farms, as a company, provides farmers with detailed information about the most favorable stage for the harvest of produce. Other information about the harvesting process that protects the quality of the produce and enhances quality is also provided. Companies that really care about the quality and appearance of the produce they buy will help the grower by giving him or her as much information as necessary about the most appropriate harvesting practices.

No chemical treatments can be made prior to harvesting to cause the produce to ripen more quickly or evenly or to be esthetically more attractive. All produce must ripen naturally without the use of synthetic chemicals. In all harvest and postharvest activities, synthetic chemicals can not be used if the produce is to be marketed as certified organic.

Postharvest Handling

In the cleaning of produce to be sorted and packed, synthetically produced soaps are not considered acceptable for the cleaning of produce. Similarly, petroleum based waxes to give fruits a shiny appearance are disallowed. Vegetable based waxes are permitted because they do not destroy the organic integrity of the produce.

Packaging of organic produce must not utilize fungicides or other synthetic chemicals for the control of fungus or other problems. Cartons used for the shipment of banana in the Windward Islands have in the past been coated with thiabendazole, a fungicide. Using this product in a package would destroy the organic integrity of produce and would prohibit produce which was grown organically from being marketed as organic produce.

The use of synthetic chemicals to hasten ripening after produce is sorted and packed is also prohibited for organic food. Natural chemicals, such as ethylene, are acceptable to most, if not all, organic certifying organizations and facilitate ripening of fruit.

The use of synthetic chemicals to control fungus or to affect the ripening process during shipment are not permitted if produce is to be sold as organic. All practices to protect fresh fruits and vegetables or enhance their appearance must utilize totally organic products.

Maintaining Organic Integrity

Growers and packers must bear in mind at all times that for produce to be marketed as organic, the organic integrity of that produce must be maintained at each step in the movement of that produce from the farm to the retail market. No synthetic chemicals are permitted on organic produce, but chemicals which are natural and organic can be used, providing they are approved by the organization certifying the produce to be sold as organically produced.

MARKETING

Thomas Harding

Marketing is the aggregate of functions involved in moving produce from producer to consumer.

Effective marketing of organic food begins with the organisation of farmers. The effectiveness of a group of farmers depends on market opportunities. Farmers, through their respective organisations, can effectively monitor and control the production and marketing of organic food to assure that market opportunities are maintained. Farmer organisations must be formed by farmers based on their felt needs, organisations should not be forced upon them.

There is a need for some regional organisational structure to support/facilitate/monitor farmer organisations involved in organic farming and to provide legal support when required.

Marketing should not be isolated from production. On the contrary, production and marketing of organic food must be seen as a partnership, a continuum, part of a system. The principal participants in the system must be identified and their roles fully understood. Only then can all the necessary arrangements be made so that the produce will move smoothly through the system. An effective production/marketing program is one in which there is trust and honesty between the participants and where each actor carries out his role in an efficient manner.

Marketing is an essential part of an integrated farm management system. To make the system work there is a need for a clear understanding of the market. Like it or not we are in a world market. Market niches, prices and transportation are crucial aspects which must be given attention.

Effective marketing requires an active imagination. What is traditional for some (bananas, breadfruit, mangoes) is exotic for others. Use your imagination in marketing your traditional fruits and vegetables. Develop attractive slogans, packages and labels.

Successful marketing requires:

- market research to know your market and the desires of consumers;
- constant good quality to meet the demand of your intended consumer group;
- effective marketing services to satisfy customers;
- effective advertising & promotion to maintain/expand market share;
- competitive pricing based on real costs and income objectives;

- good product mix to stimulate consumer interest;
- effective merchandising to assure that your product is competitive with others on the market;

Remember, smiling faces are satisfied customers!

Many people complain about the difficulties of moving produce through USA customs. It is true that this can be a very frustrating process and products are frequently lost. By fully understanding the system and how it works, however, the proper people can be identified and, with good communication, these bureaucrats can be turned into helpers rather than a hindrance. There is a need to retrain quarantine officials at US ports as to the nature of organic foods.

Part of marketing is getting consumers to buy your product. This requires the education of consumers to the advantages of organically grown produce. Advertising and promotion must be carried out in target markets.

The OECS has an abundance and a wide variety of "real food." While most of the food sold in the USA looks very good, it tastes artificial. The Eastern Caribbean has excellent tasting foods and this is what must be promoted. Once USA consumers taste some of your fruits, it will not only open their eyes but it will also open their pocketbook.

Another approach is to zero in on some special attributes of local products, e.g., papaya might be marketed for its medicinal benefits, avocados for their low fat content, organic exotic fruit honey.

In the marketing of organic food there are 5 key points to keep in mind:

- 1) The product must be of the highest quality that can be produced, in terms of nutrition, health and safety (not necessarily from a cosmetic standpoint).
- 2) There is a need to assure a consistent and diversified supply of organic produce. Determine when you can supply, develop a plan of action and stick to it.
- 3) The product must be well packaged and attractively labeled. The label should tell a story about the product - leave a lasting impression with the consumer.
- 4) The product must have the backing of a third party certification organisation, with a clearly defined audit trail.
- 5) The product must be affordable to the intended consumers.

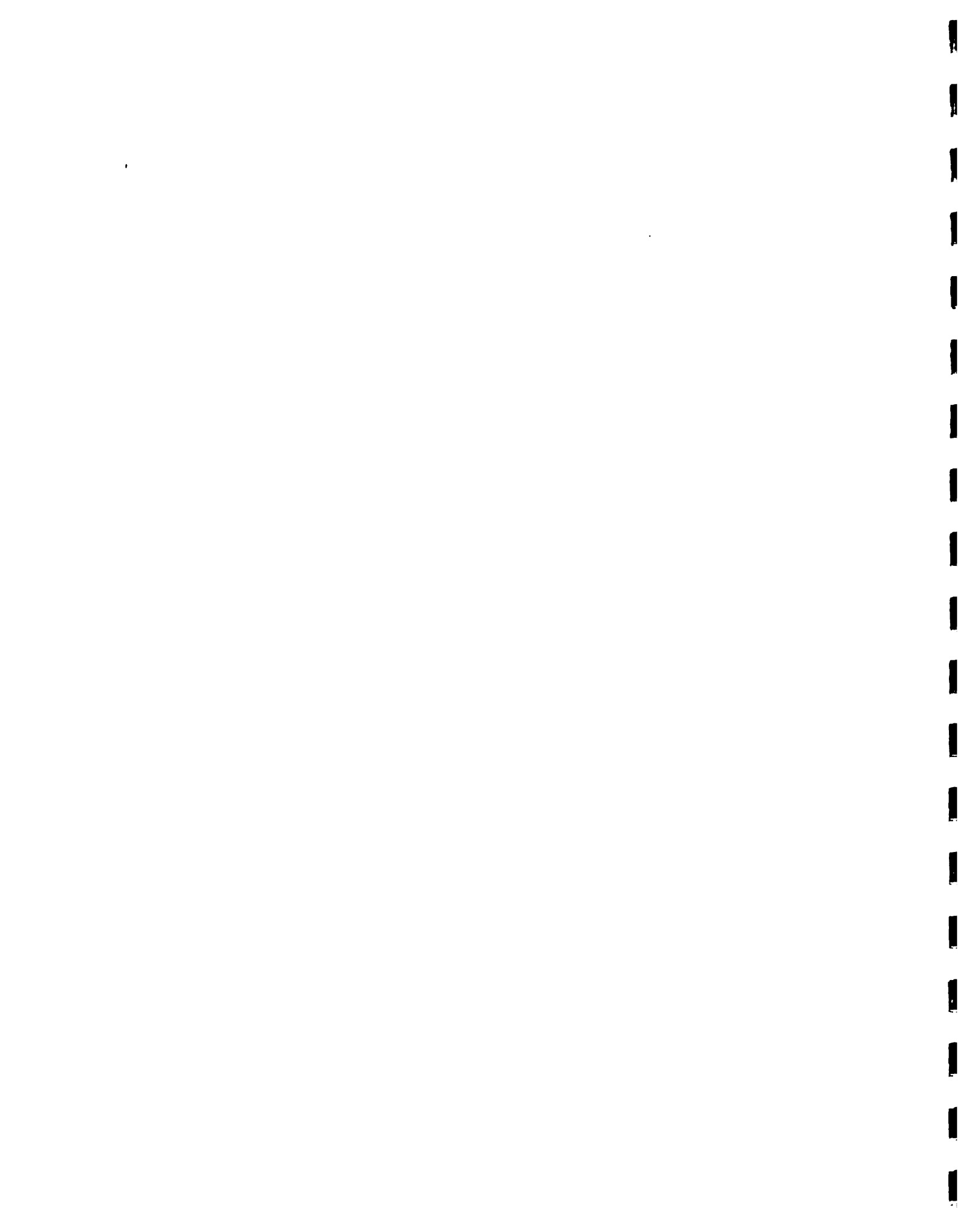
In pricing the commodity, costs should be clearly determined by adding value from farm to consumer. This requires a clear understanding of the commodity system, the identification of the diverse players, an understanding of the role of each and the determination of the value added to the product by each actor. A fair share of the final price must go to the farmer.

High quality products can be produced organically, however, it requires good planning and good stewardship and may take several years to develop, depending on the condition of the soil.

Remember, if conventional agriculture was working well the world would not be discussing sustainable agriculture so avidly. There is much concern and growing interest in organic farming. As the production of organic food increases we must strive to improve and further develop our marketing systems.



RESULTS OF THE WORKSHOP



CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- 1) Efficient and effective stewardship (management) requires that farmers have a comprehensive understanding of ecosystems and cropping systems, including the role of soil, climate, insects and animal life - including man.
- 2) For any cropping system, farmers should ask four questions:
 - Is my farming operation sustainable in the present form?
 - What is the purpose or effect of each chemical applied?
 - Can synthetic chemicals being used be replaced with natural chemicals or biological controls? and
 - What modifications/improvements can be introduced into my farming system?
- 3) Today's farmers in the OECS have developed some economically and environmentally bad habits, including an excessive application of herbicides, pesticides, fungicides and the use of highly soluble fertilisers.
- 4) There is an urgent need to re-educate our local populations, including farmers, scientists, professionals and consumers in respect to the use and misuse of chemicals.
- 5) Reasonable losses of crops to pests are not losses but investments in production, e.g. it makes economic sense to allow insects to destroy 10% of a crop if the cost of the pesticides to control such a loss is greater than the value of the crop saved.
- 6) There are no panaceas for pest control and good management. Specific systems must be developed for each cropping system.
- 7) A wide variety of existing natural and biological controls of insects makes organic farming feasible.
- 8) The maximisation of on-farm profits requires the determination of the economic threshold and the economic injury level for each cropping system.
- 9) Organic farming is a partnership with nature - developed over time.
- 10) Marketing must be visualised as a part of a production and marketing system, not simply "the identification of someone to purchase a product."

- 11) Five important conditions for effective marketing are:
 - #1 The product must be of high quality in terms of nutrition, health, and safety.
 - #2 The supply of the product must be consistent and diversified.
 - #3 The product must be well packaged and labeled, preferably telling a story (sending a message) about the product and its origin.
 - #4 An organic product must come from an organisation certified by an independent certifying group;
 - #5 The product must be affordable to the consumer and provide economic incentives to buyers and sellers.
- 12) Marketing is an essential part of an integrated farm management system.
- 13) Farmer organisations have a very important role to play in the production and marketing of organic food due to the need for an effective control mechanism to certify individual farming units as being free of synthetic chemicals and to constantly monitor and control individual farms.
- 14) Organic farming requires that the farmer is in tune with nature and his environment; this necessitates a special type of training.
- 15) Those who would like to think that organic farming is a fad should stop and ask the question: would populations and organisations around the world be giving so much attention to self-sustainable agriculture if conventional agriculture was really working well?.

Recommendations

Farmer Organisations:

- 1) Efforts should be made to strengthen farmer organisations within the region to facilitate the participation of farmers in decision making related to both production and marketing of organically grown food.
- 2) Farmer organisations should play a direct facilitating role in the reproduction of beneficial insects.

- 3) Associations or "Chapters" of organic farmers should be organised wherever sufficient farmer interest and market potential exists.
- 4) Interested farmers and groups of farmers should work together in the OECS to determine the most practical and cost effective form of organisation.

Training/Information:

- 1) An organic farming/sustainable agriculture training/research center should be established in one of the OECS countries.
- 2) Technological packages for organic farming should be prepared for selected priority crops, including costs of production and marketing.
- 3) A Farmers Guide to Organic Farming should be prepared and made available to the region's farmers, including aspects related to pre-production, production, postharvest handling, processing and marketing of organic foods.
- 4) Existing tech-packs on conventional agriculture should be collected and modified for use in organic farming.
- 5) A mechanism needs to be established within the OECS to share knowledge and information on organic food production and marketing.
- 6) Training programs must be initiated to teach farmers effective pest management, including such things as how to distinguish between pests and beneficial insects and that the elimination of 100% of insect pests on the farm can have very negative and serious effects on the ecosystem.
- 7) Efforts should be made to develop audiovisual training instruments including slide and video programs.

Research:

- 1) Systematic, but practical, research on intercropping and interplanting of companion crops, within an organic farming system, should be initiated in each of the OECS countries.
- 2) Traditional and indigenous methods of organic farming practices and insect control/management within the region should be identified, described and published.

- 3) Key farmers and experienced or knowledgeable persons in organic farming who can serve as resource persons should be identified and included in a directory, by crop and by country.
- 4) An inventory, by country, of available on-farm and off-farm fertilisers, compositing materials, natural pesticides and other available resources for organic farming should be carried out, including a description of their uses.
- 5) Key farmers, or groups of farmers, should be identified in each country to initiate and demonstrate methods of organic farming.
- 6) An inventory of small tools and equipment that may be used for organic farming in the Eastern Caribbean, and a description of their uses, should be compiled.
- 7) A review of existing information, materials and facilities related to beneficial insects within the region should be carried out.
- 8) Problems and potential negative effects of aerial spraying of bananas on organic farming should be evaluated.
- 9) There is an urgent need to determine the production and marketing costs of crops with market potential so as to be able to determine economic feasibility of production and marketing programmes.
- 10) For each priority crop with organic market potential, varieties/cultivars must be carefully selected to satisfy market demand.
- 11) The economics of weed control must be analysed for specific crops. In certain circumstances, and with certain crops, it may not be economical to practice weed control.

Pest Control:

- 1) All economic and quarantine pests affecting the production and marketing of selected crops, to be grown organically in the Eastern Caribbean, should be identified and their potential impact described.
- 2) For the key insect pests identified above, alternative methods of pest control should be identified and adapted to the needs of organic farmers, considering target, rate, frequency and methodology.

- 3) An inventory of local and regional pest control materials and beneficial organisms (pathogens, predators and parasites) should be carried out.
- 4) A farmer's field guide to beneficial insects within the region should be prepared and made available to farmers. This guide should include such things as methods of reproducing beneficial insects.
- 5) Fact sheets which provide basic decision making information for the farmer, in respect to pests and beneficial insects, should be prepared for each cropping system.
- 6) Decision making information on the life cycles of priority insects, synchronised with particular crops, should be compiled for the design of control programs.
- 7) Information on insect control mechanisms used in other countries and regions of the world should be collected and made available to farmers and scientists.
- 8) Mechanisms should be established to assure that farmers have access to beneficial insects required for the production of crops organically. The feasibility of selected farmers, or groups of farmers, producing beneficial insects as a business should be studied.
- 9) Farmers must be taught proper methods of handling "natural pest controls" as they, like synthetic chemicals, are not free of risk to farmers and their families.

Marketing:

- 1) Attention should be given to the potential impact of both import substitution and export development.
- 2) Successful penetration of extra-regional markets requires the development of partnerships between exporter and importer. Both parties should generate information systems to facilitate a smooth flow of product. Importers should provide quarantine control organisations with information on shipments of organic produce to speed up and facilitate its clearance.
- 3) Efforts need to be made to develop markets for West Indian products, stimulating consumer demand by emphasizing the product's "story," i.e. health food, good flavor, warm climate, friendly people, originated by the Carib Indians, etc.

- 4) It must be recognised by marketers that what is traditional for some is exotic for others. Marketers must use their imaginations in promoting OECS produce.

General:

- 1) Specific plant varieties suitable to organic farming in the sub-region should be selected and made available to organic farmers.
- 2) Efforts should be made by national, regional and international organisations to promote more research, training and development in sustainable agriculture considering the social, economic and ecological aspects.
- 3) At least one person from the Eastern Caribbean should be trained as a certification inspector for organic farming within the region.
- 4) Efforts should be made to integrate the countries of the Eastern Caribbean into the international movement for sustainable agriculture, so as to facilitate access to information, training and technical assistance.
- 5) An evaluation should be carried out as to the technical and economic feasibility of producing beneficial insects within the region in support of organic farming.
- 6) The cost/benefits of biogas digestors for the production of slurry for use as organic fertilisers should be determined and if viable, promoted.
- 7) Experiences from the Regional Center for the Study of Rural Alternatives (CREAR), Rio Limpio, Dominican Republic, should be transferred to the OECS. This should include the short-term training of selected farmers from the OECS at CREAR.
- 8) IICA should continue to promote and sponsor activities related to the development of organic farming in the OECS.
- 9) Efforts should be made to promote and establish an OECS network of persons interested in organic farming. Such a network should include, but not be limited to, the participants and resource persons from this Workshop.

PROJECT IDEAS AND PROFILES

On the 5th day of the Workshop some 25 participants were divided into inter-disciplinary work groups to identify and formulate project ideas. Six project profiles resulting from this experience follow.

Title: PRODUCTION OF ORGANICALLY GROWN PAPAYA IN ANTIGUA

- 1) Factors giving rise to project idea
 - a) High importation of food into the country;
 - b) Need to develop an export crop within the agricultural sector;
 - c) Need to secure an overseas market for the generation of foreign exchange, and
 - d) Need to reduce the use of harmful chemicals.

- 2) General Objectives
 - a) To meet the demand for papaya (fresh fruit) on the local market;
 - b) To provide an alternative export crop to farmers thereby generating foreign exchange revenue;
 - c) To set up a demonstration plot which will provide a base for the production of organically grown crops in Antigua and Barbuda.

- 3) Specific Objectives
 - a) To plant 10 acres of organic papaya by the end of year one;
 - b) To secure certification by the end of year two from OCIA;
 - c) To have at least two farmers' groups trained in the production of organic crops, and
 - d) To have 50 acres of land under production of organically grown papaya by year two.

- 4) Expected Outputs of Project
 - a) To produce an average yield of 20,000 pounds of papaya per acre per annum by year two;
 - b) To export (4) 20 foot trailer loads per month of organically grown papaya, and
 - c) To have 25 farmers trained in organic food production by end of year two.

- 5) Strategies for Project implementation
 - a) To seek to adjust government policies in respect to papaya and food crop importation;

Title: DOMINICA EXPORT OF ORGANIC GRAPEFRUIT FROM DOMINICA FOR FRESH FRUIT MARKET

- 1) Justification
Lack of markets for conventionally produced grapefruits (as fresh fruit or for processing) has led to abandonment of orchards and unfavourable prices to the farmers.
- 2) General Objectives
 - a) To obtain alternative markets for grapefruit.
 - b) To determine if the production and marketing of organic grapefruit is an economically viable alternative.
 - c) To increase foreign exchange earnings and the earnings of farmers.
- 3) Specific Objectives
 - a) To develop organic production systems with farmers who produce grapefruit.
 - b) In project year one (PYI):
 - trial shipments;
 - certification of 25 organic grapefruit farms;
 - group formation (Chapter of Organic Farmers);
 - c) To develop systems in post harvest handling and packaging to ascertain integrity of organic producers.
 - d) To achieve production of 200 acres at end of PY4.
 - e) To achieve exports of two (2) containers (Trial) in PY1; 25 containers (20') in PY2; 50 containers (40') PY3; 100 containers (40') PY4.
 - f) To determine the (feasibility) viability of processing organic grapefruit.
 - g) To enhance farmer share participation in all aspects of processing and marketing of organic produce.
- 4) Expected Outputs
 - a) 25 certified organic farmers producing and marketing from 200 acres of grapefruit.
 - b) Foreign Exchange earnings of EC\$1.4 million by PY4 of which farmers will receive at least 50%.
 - c) Achievement of self-sustaining organic systems on 200 acres.
- 5) Proposed Strategy
 - a) Determine the acceptability of Dominica organic grapefruit on North American market.
 - b) Certification of growers and formation of Chapter or group.
 - c) Develop training programs to enable farmers to efficiently produce organic fruit.

- d) Develop systems for movement of produce from farm to marketplace.
- e) Develop structures to ensure commitments to production and marketing of organic produce at local, regional and international levels.
- f) Develop Tech Pack for organic production of Grapefruit and related production systems.

6)	<u>Principal Components</u>	<u>Costs US\$</u>
	a) Market development	100,000
	b) Training	50,000
	c) Certification	10,000
	d) Tech-packs	50,000
	e) Marketing systems	40,000

	Total	250,000

7) Duration 4 years

8) Participants

Farmers	-	Production
MOA/IICA/CARDI	-	Extension/Research/Training
OCIA	-	Certification
CCGA	-	Post Harvest Handling
DAI	-	Processing

Title: PRODUCTION OF ORGANIC SPICES IN GRENADA

- 1) Justification
 - Spices are traditionally produced using relatively low levels of synthetic chemicals and obtaining reasonable yields;
 - There are limited market opportunities for spices being presently produced (inconsistent markets);
 - Low prices on world market;
 - Spice, production systems contribute to soil conservation and environmental balance.

- 2) General Objective

To develop the production of spices to be marketed under the organic label

- 3) Specific Objectives
 - To assist members of the minor spices coop and GCNA in obtaining membership in OCIA;
 - To sensitize the minor spices coop and GCNA on the potential of organic production of spices;
 - Identify farmers who may qualify as certified organic spice producers;
 - Assist the farmers and processors of organically produced spices to obtain necessary certification;
 - Increase production of organically produced spices;
 - Train selected farmers and extension agents in organic production methods;
 - Assist in establishing marketing linkages;
 - Develop sustainable systems for organically produced spices;

- 4) Outputs
 - Reliable market established for organically produced spices;
 - Spice producers certified as organic farmers;
 - Membership to OCIA granted to GCNA and minor spices.
 - Increased quantity of spices produced organically;
 - Sustainable systems for organically produced spices developed and adopted;

- 5) Proposed Strategy for Implementation
 - Make formal contact with GCNA and GMSCS and present proposals for their coop and support towards the marketing of organically produced spices.
 - Conduct a survey to identify and register farmers interested in producing spices organically.
 - Explore possibility of utilizing existing marketing infrastructure facilities for post-harvest handling of organically produced spices.
 - Collaborate with OCIA for necessary assistance towards solving problems which may arise.

6) Principal Components

The project will comprise 5 components:

1. Training of selected farmers and extension agents.
2. Research aimed at developing sustainable system for spice production.
3. Survey of all spice producers.
4. Certification of spice producers who meet the requirements of OCIA.
5. Establish marketing linkages to facilitate export of high quality organically produced spices.

7) Estimate of costs

The project will cost approximately US\$60,000 distributed as follows:

Training	-	\$10,000 US
Research	-	20,000
Survey	-	5,000
Certification	-	10,000
Marketing	-	15,000

8) Duration of Project

The project will have a duration of 4 years.

9) Identification of principal participants and roles

<u>Participants</u>	<u>Roles</u>
MOA	technical support, training, research survey
CARDI	technical support, research, training
GCNA	survey, funding, marketing
MSCS	funding, training, marketing survey
IICA	technical support
OCIA	certification, training
Farmers	produce

Title: RESEARCH ON THE ORGANIC PRODUCTION OF BANANAS IN ST LUCIA

1) Background

Bananas at present contribute significantly to the foreign exchange earnings of the island. It is expected, however, that as from 1992, banana producers will experience increased difficulties in the marketing of the fruit. With the demand for organically produced food increasing on the world market, it is believed that the market for organically produced bananas could serve as an alternative for many of those producers, particularly small farmers.

The banana production system in St Lucia today relies heavily on the use of synthetic chemicals (pesticides, fertilisers, weedicides). There is a lack of information on the potential of organic production of bananas for the island. Such information is necessary to determine the feasibility of such a production system and could be used in the development of a tech-pack for the farmers.

2) General Objective

To examine the major factors which would be involved in the organic production of bananas in St Lucia.

3) Specific Objectives

- a) The establishment of four trial/demonstration plots on the island.
- b) The training of extension officers and farmers on the principles of organic farming.
- c) The development and compilation of a technological package on the organic production of bananas.

4) Expected Outputs

- a) Six (6) extension officers and twenty (20) farmers will be trained on the principles of organic farming.
- b) A tech pack will be developed on the organic production of bananas.
- c) The economic and technical feasibility for the organic production of bananas will be determined.

5) Proposed Strategy for Project Implementation

Four half-acre plots of bananas will be established in areas which are not exposed to aerial spraying. The bananas will be grown organically and data collected for the development of a tech pack. Extension officers and farmers will participate in the implementation of the project.

- 6) Principle Components of Projects
 a) Establishment and maintenance of trial/demonstration plots.
 b) Preparation of tech pack.
 c) Training of extension officers and farmers.

7) Estimate of Project Cost US\$50,000.00

8) Duration of Project 5 years

9) Players/Participants Role to be Played

WINBAN	Resource personnel on banana production
IICA/CARDI/others	Resource personnel on organic farming
Crop Protection Personnel (MOA)	Development of pest and disease management systems
Extension Officers (MOA)	Collection of field data and dissemination of information to farmers
Farmers	Establishment and maintenance of trial plots; target group for the dissemination of information

Title ORGANIC PRODUCTION, PROCESSING AND MARKETING OF PASSION
FRUIT IN ST VINCENT

- 1) Justification
With the formation of a single European market in 1992, the Windward Islands stand to lose preferential treatment on the UK market for their bananas. This means a substantial reduction in export earnings for our economies. With this in mind the governments of the OECS are jointly pursuing an Agricultural Diversification Program.

Market research indicates a potential market for passion fruit, fresh and processed, in the United States, if grown organically. Additionally, farmers already have a general understanding in the production of this crop.

With the loss of earnings from bananas, farmers would require a crop or crops which could provide a regular sustainable income, in order to maintain their financial and social status.
- 2) General Objective
To achieve commercial production of organic passion fruit for export.
- 3) Specific Objective
To establish three hundred (300) acres of organic passion fruit with a projected annual yield of sixteen thousand pounds (16,000 lbs) per acre.
- 4) Expected Outputs
To process 4.8 million pounds of fruit per year giving 180,000 gallons of single strength juice weighing approximately 1.5 million pounds.
- 5) Proposed Strategy for Project Implementation
 - a) Selection of Farmers.
 - b) Verification and certification of holdings for organic production.
 - c) Selection of adequate processing infrastructure.
 - d) Drawing up of contractual arrangements with farmers.
 - e) Organize producers, processors, government and buyers into a joint venture agreement (To produce 100 acres in year 1 and an additional 200 acres in year 2).
- 6) Principal Components of Project
 - a) Establishment of propagation units
 - b) Processing equipment
 - c) Production inputs
 - d) Training for technical staff and farmers

- e) Credit sources
 - f) Marketing facilities and transport
 - g) Management and administration
- 7) Estimate of Project Cost EC\$1.5 million
- 8) Duration of Project Two years
- 9) Identification of Principal Players
- a) Farmers (producers of crop and organizations of farmers);
 - b) Ministry of Agriculture (production support services) and associated regional organizations;
 - c) HIAMP (provision of processing facilities and processing, packaging and export to organic market);
 - d) Diamond Dairy (provision of processing facilities and processing, packaging and export to organic market);
 - e) Buyers' (provision of guaranteed market and distribution to consumers in the importing countries);
- 10) Plan of Action
- a) Project formulation and approval;
 - b) Order and installation of processing equipment;
 - c) Nursery planting;
 - d) Selection of farmers and verification/certification of holdings;
 - e) Training of technicians;
 - f) Training of Farmers;
 - g) Disbursement of credit;
 - h) Land preparation and layout;
 - i) Planting and management of production;
 - j) Harvesting;
 - k) Purchase;
 - l) Processing and packaging and export;
 - m) Monitoring of all steps to ensure organic standards;
 - n) Market assessment and information sharing;
 - o) Market coordination.

Title: TRAINING CENTER FOR SUSTAINABLE AGRICULTURE

1) Justification

The governments of the Windward islands and a significant percentage of their populations are becoming more and more concerned with the damage being done to local environments as a result of excessive use of synthetic chemicals for banana farming.

As a result of increased competition in the world banana market after 1992 EEC market unity, many marginal producers of bananas may be forced into the production of alternative crops.

There is a growing demand for organic food in North America and European markets, for which consumers are willing to pay a relatively higher price. Although the Windward Islands may have comparative advantages in producing a variety of crops organically, there are very few farmers or extension officers with knowledge in this area.

A wide variety of new techniques and methods of organic farming are known in Europe, North America and the Caribbean which are not available to professionals or farmers in the OECS.

2) General Objective

to transfer state of the art technology, techniques, methods and practices of organic farming and sustainable agriculture to the rural sectors of OECS member countries.

3) Specific Objectives

- a) Establish a training center in sustainable agriculture and organic farming in Dominica.
- b) Train teachers and trainers in organic farming.
- c) Establish a documentation center on organic farming and sustainable agriculture.
- d) Undertake priority research in organic farming practices.

4) Expected Outputs

- a) Ten teachers trained under a four year program.
- b) 25 trainers trained each year in short courses (1-6 weeks).
- c) Baseline information on organic farming and sustainable agriculture, including: local and international publications, training manuals and

tech-packs on diverse crops and aspects of organic farming.

- d) Established linkages with regional and international training centers on organic and sustainable agriculture.

5) Proposed Strategy

The project will be a joint effort of the OECS countries. A consultant will be provided by CREAM/IICA to work with local experts in the formulation of a project proposal which will be presented to one or more funding agencies. Land will be donated by the Government of Dominica for the establishment of the training center. Local personnel will be recruited to operate the training center, with technical assistance from international volunteers and specialised organisations in organic farming and sustainable agriculture. Trainees will be selected from among farmers, extension personnel, and others interested in organic farming in the Eastern Caribbean. Each trainee will have a sponsoring institution or organisation to cover his/her costs during training. Work areas will include such things as:

- N-fixing legume associations, variety trials;
- Intercrop research, diversification;
- Soil conservation and improvement;
- Manure and compost handling;
- Sanitation, management, crop improvement;
- Intensive vegetable production;
- Record keeping, design, lay-out, book-keeping;

6) Principal Components

a) Infrastructure/Equipment:

- 25 acres of hillside land typical of Dominica farm land;
- Land development: roads, drainage, etc;
- Water, electricity, etc.;
- Buildings: classrooms, kitchen, dorms, staff housing, storage, library, latrines, etc.;
- Tools and equipment: shovels, forks, spades, hoes, small tools, scales, vehicles, others;

b) Personnel and Administration:

- Staff: director (management, fund raising, public relations, security, planning); teachers/trainers (classroom and hands-on); technical assistants/program managers;
- Administrative structures: responsibilities, decision making, finances, accounting, work hours, etc.;
- Course curriculum: classroom, field, goals, objectives, resources, literacy levels, formal/non-formal, continuous or blocks, hours, schedule, etc.;

- Research program: priority areas, goals, publications, duration, systems, methodologies;
- Office equipment and supplies: typewriter, computer, filing system, etc.;

c) Operational Costs:

- scholarships for students;
- food expenses;
- materials: wire, fence posts, rocks, planting material, laundry, towels, sheets, soap, etc.;
- transportation costs;

7) Estimate of Project Costs

- | | |
|-----------------------|----------------|
| a) Establishment: | US\$250,000.00 |
| b) Annual operations: | 120,000.00 |

8) Duration Permanent

9) Principal Participants

Role

- | | |
|---------------------------|--------------------------------------|
| - Ministry of Agriculture | Provide land & facilitating role |
| - farmers | definition of needs |
| - CREAR | technical assistance |
| - funding organisations | financial/technical assistance |
| - IICA | coordination/technical assistance |
| - CARDI | technical assistance |
| - others | financial/technical/material support |

OUTLINE FOR A FARMER'S MANUAL ON ORGANIC FARMING

One of the expected outputs of the Workshop on Production, Certification and Marketing of Organically Grown Food (Roseau, Dominica, October 16-22, 1989) was to produce an outline for the publication of a training manual for organic farming in the tropics. To achieve this output the resource persons participated in a series of informal brainstorming sessions during the last two days of the Workshop. The following information summarises the results of this effort.

1. Target group: trainers and farmers
2. Objective of manual: Train trainers and farmers in the development of production and marketing programs using organic farming techniques.
3. Overall guidelines:
 - the manual will be divided into two parts: the first will provide general information which will be of most use to trainers and persons interested in a comprehensive overview of organic farming; the second part will be crop specific and will generate technical information necessary to the farmer in the establishment of production/marketing programs using organic farming practices;
 - in the first part of the manual each chapter will be limited to a maximum of 10 pages;
 - while the sections on specific crops will be kept to the minimum in length, they should include all the necessary information that farmers require to establish production & marketing programmes using organic farming practices;
 - each chapter will be written by a specialist in the respective field and reviewed by a working committee consisting of a qualified inter-disciplinary team of specialists;
 - each author will carry out an extensive review of the literature so as to avoid repetition of existing publications and to maximize input from other sources;
 - a complete list of reference material will be included in annex to the manual;
 - the manual will include a list of sources for seeds, tools, information and other materials related to organic farming, therefore, each author should collect such information as opportunities arise;
 - each chapter should be didactic in nature, including diagrams, tables, outlines, examples, pictures, etc. to facilitate the training of trainers and farmers;
 - authors should attempt to clarify any jargon used outside of the mainstream, e.g. trenching (deep digging, double and triple digging);

4. Strategy for implementation:
- each author will submit a detailed outline of his/her respective chapter to the project coordinator;
 - outlines will be circulated to participating authors for review and comment;
 - proposals for modifications to outlines will be submitted to project coordinator;
 - final outlines will be sent to all authors for review;
 - authors will submit their respective draft chapters to project coordinator;
 - first draft of manual will be circulated to authors for review;
 - final comments/modification will be sent to project coordinator;
 - publication;
5. Proposed outline suggested authors:

PART I

PRINCIPLES OF ORGANIC FARMING IN THE TROPICS

<u>CHAPTERS</u>	<u>AUTHORS</u>
I. Introduction: General Principles	Mark Feedman, Tom Harding, Fernando Agudelo
II. Soil Conservation	Mark Feedman
III. Soil Fertility Management	Mark Feedman/Gregory Booth
IV. Cropping Systems	Gregory Booth
V. Biological Weed Management	G. Booth (outline), John Hammerton
VI. Biological Pest Management	Fernando Agudelo-Silva
VII. Biological Disease Management	Fernando Agudelo-Silva
VIII. Postharvest Handling & Processing	Jerry La Gra/Tom Harding
IX. Infrastructure, Marketing & Farmer Organisations	Jerry La Gra/Tom Harding
X. Certification	Tom Harding
XI. Sources of Seeds, Tools and Information	All Authors

PART II

The long term objective is to develop specific production/marketing guides for selected crops from each of the following crop groups: fruits, vegetables, grains, legumes, oils, meats, dairy, forages, fish, flowers, spices and herbs. Priority attention in the first instance will be given to grapefruit, passion fruit, bananas, cucurbits, peppers, herbs and spices. In the selection of these priority crops, criteria included ease of technical production and market opportunities.

For each of the specific crops the following outline will be followed. An example is given here for the preparation of an organic farming tech-pack for grapefruit.

<u>CHAPTER</u>	<u>AUTHOR</u>
I. Ecological considerations	Rafael Marte
II. Plant fertility requirements, soil resources & fertilisation	Rafael Marte
III. Associations: soil fertility, pest/disease management & optimum use of resources	Gregory Booth, Fernando Agudelo
IV. Weed, pest & disease management	Fernando Agudelo John Hammerton
V. Postharvest handling	Ina Harvey Jerry La Gra
VI. Marketing	Jerry La Gra, Tom Harding, Larry Leighton
VII. Review of literature	Respective authors

6. Training Tools

For each of the crop specific tech-packs a variety of training tools will be developed. These will include flash cards, fact sheets, slide presentations, videos and others. Some of the specific topics will include: terracing, barriers and drainage, *composts, N-fixing legumes, multi-cropping, inter-cropping, relay-cropping, weeds and their management, *pests and their management, harvest and postharvest handling, packaging, *certification and marketing (* indicates priority areas).

REQUIREMENTS FOR THE EXPORT OF ORGANIC GRAPEFRUIT

Organic Farms Ltd. and others have expressed interest in the purchase of organically grown grapefruit from Dominica. Field visits have proven the existence of several farms which can probably be certified as organic. The following steps and responsibilities were identified as necessary to move from the present situation to one of regular exports of organic grapefruit from Dominica.

<u>Activity</u>	<u>Date</u>	<u>Responsible Party</u>
1. Test fruit for maturity & sweetness (brix/acid)	November-December	IICA - samples AgroLab - tests
2. Confirm freedom of packing material & packing shed from pesticides	November	IICA, DEXIA, CCGA
3. Arrange sample shipment	November	DEXIA, IICA
4. Test sample to confirm organic status & marketability	November	Organic Farms Ltd. USDA
5. Negotiate with USDA, waiver of marketing order requirements for organic fruits	November	Organic Farms Ltd.
6. Negotiate with shipper to obtain most secure & cost efficient route to Baltimore	November	DEXIA, IICA Organic Farms Ltd.
7. Determine most cost efficient and reliable option for packing fruit	November	IICA in collaboration with DEXIA, CCGA & Organic Farms Ltd.
8. Establish interim certification for qualified grapefruit farmers: - fill out application; - farmer signs affidavits; - certify growers;	November-December	Farmers, IICA

- | | | |
|---|-----------------------|---|
| 9. Make projections for costs and value added at each step in system to port of Baltimore | November | IICA with support from farmers, DEXIA, CCGA and MOA |
| 10. Estimate quantities of grapefruits available 1989-1990 | December | MOA, DEXIA, IICA |
| 11. Send 20 foot container as trial shipment to test system | December | DEXIA,
Organic Farms Ltd. |
| 12. Negotiate contract for supply of grapefruit | December | Organic Farms Ltd.
DEXIA, farmers, CCGA |
| 13. Carry out activities to determine farmer interest in forming a Chapter of OCIA and if positive initiate activities to form such a chapter | November-
December | MOA, IICA, farmers |
| 14. Determine & agree upon best method for packing trailers | December | transport companies,
IICA, DEXIA |
| 15. Prepare labels for initial shipments with auditable trail to supplier | December | Organic Farms |

EVALUATION OF THE WORKSHOP



FROM THE POINT OF VIEW OF THE ORGANIZERS

The Organic Farming Workshop covered a full five days and was very intensive. Most of the time was spent in an informal classroom environment with good exchange between participants and resource persons. One day was spent in the field visiting two pre-selected farms: one farm was organic by default and the other was organic by design. Most of the participants were also able to visit Andrew G. Royers' one acre organic farm and training center.

The organizers were very satisfied with the outcome of the Workshop, based on the following criteria:

- active participation of all participants;
- favourable opinion of workshop by participants;
- good rapport between participants and resource persons;
- high quality of presentations by resource persons;
- strong support from all participating national institutions;
- written evaluation by the participants

On the negative side, there was a general feeling that too much was attempted in too short of a time period. The Workshop should have had a duration of two weeks of which half should have been utilized for on-farm visits and hands-on training in the field by the resource persons.

In respect to the Expected Outputs indicated on the Programme presented in Annex 1, the organisers subjective evaluation of level of achievement follows:

	<u>Degree of Achievement</u>
1) Transfer of experiences and modern practices of organic farming and use of microorganisms for insect pest control to the Eastern Caribbean.	Medium
2) Priority crops with potential for export to North American and European markets identified.	Medium
3) Inventory of local resources, by country, which can be utilised in the production and marketing of organically grown foods identified.	Low
4) MOA Extension Officers trained as organic farmers certification inspectors.	Low

- | | | |
|----|--|--------|
| 5) | Requirements for the formation of a Chapter of Organic Farmers clearly established. | High |
| 6) | Requirements for the export of organically grown grapefruit from Dominica clearly established. | High |
| 7) | An outline for the publication of a training manual for Organic Farming in the Tropics. | High |
| 8) | Priority areas for research in organic food production and marketing identified. | Medium |

FROM THE POINT OF VIEW OF THE PARTICIPANTS

Eighteen of the participants filled out evaluation forms in which they, in general, expressed high opinions of the Workshop. Most thought that it was "well organized" and "informative." Several found it "inspiring" or "enlightening." One stated that he was "leaving dizzy with knowledge and inspiration." Several found the Workshop very timely and many would have liked to see the Workshop continue for another week. No one expressed any negative opinions regarding the Workshop or its contents.

The participants evaluated the subject material presented during the Workshop by the resource persons. The opinions of the 18 participants responding to the questionnaire are presented below:

SUBJECT AREA	EXCELLENT	VERY GOOD	GOOD	POOR	VERY POOR	TOTAL
Overview of organic foods industry	5	10	3	-	-	18
Alternative sources of natural fertilisers	4	5	9	-	-	18
Dynamics of organic farming system	3	9	6	-	-	18
Designing systems for crop diversification	3	4	8	3	-	18
Integrated Pest Mgt.	12	3	3	-	-	18
Building a certified organic prod. system	4	9	5	-	-	18
Meeting needs of organic foods marketplace	5	11	2	-	-	18

Eight of the eighteen participants felt that insufficient information on organic farming was made available. They would have liked to see more information on such topics as:

- plants with insecticidal/herbicidal properties;
- organically manufactured chemicals;
- beneficial insects;
- integrated pest management (IPM);

- organic farming in the tropics;
- organic farming tech-packs;
- tropical companion cropping/intercropping;
- developing organic farming farm plans;
- ecological principles for ecological responsible food production;
- compositing;
- small scale tools for organic farming;
- USDA/APHIS requirements/regulations on specific commodities;

In respect to additional subject areas that participants would have liked to seen covered in the Workshop the following were mentioned (# participants making request shown inside parentheses):

- no additional subject areas (4);
- more on-farm sessions (3);
- integrated pest management (3);
- growing small livestock organically (2);
- impact of quarantine on marketing (2);
- biological control of plant diseases (2);
- alternative sources of natural fertilizers (1);
- import regulations (1);
- production of organic seedlings (1);
- market opportunities (1);
- plant pathology (1);

In response to the question as to how they intended to utilize the knowledge acquired in the Workshop, the majority of the participants identified training (11). Other responses included: dissemination of information (5), demonstration plots (4), research (3), organize farmers into organic growers association (2), marketing (2).

ANNEX 1

PROGRAM

**WORKSHOP ON PRODUCTION, CERTIFICATION AND MARKETING
OF ORGANICALLY GROWN FOOD**

- VENUE:** Excelsior Hotel, Commonwealth of Dominica
- DATES:** October 16-21, 1989
- GENERAL OBJECTIVE:** Evaluate the potential for organic farming on a commercial scale in the OECS
- SPECIFIC OBJECTIVE:** Train an inter-institutional team of professional agriculturists from national (MOA), regional (CARDI) and international (IICA) organisations located in Antigua and Barbuda, Barbados, Dominica, Grenada, St Lucia and St Vincent and the Grenadines, in the basics of organic farming, certification, postharvest handling and marketing and the use of microorganisms for insect pest control.
- EXPECTED OUTPUTS:**
- 1) Transfer of experiences and modern practices of organic farming and use of microorganisms for insect pest control to the Eastern Caribbean.
 - 2) Priority crops with potential for export to North American and European markets identified.
 - 3) Inventory of local resources, by country, which can be utilised in the production and marketing of organically grown foods identified.
 - 4) MOA Extension Officers trained as organic farmers certification inspectors.
 - 5) Requirements for the formation of a Chapter of Organic Farmers clearly established.
 - 6) Requirements for the export of organically grown grapefruit from Dominica clearly established.

- 7) An outline for the publication of a training manual for Organic Farming in the Tropics.
- 8) Priority areas for research in organic food production and marketing identified.

PARTICIPANTS:

The participants will include selected staff members from the respective Ministries of Agriculture, Caribbean Agricultural Research and Development Institute, and the Inter-American institute for Cooperation on Agriculture. Resource persons will be drawn from Organic Farms Inc., Amherst, Mass.; and The Regional Center for the Study of Rural Alternatives (CREAR), Rio Limpio, Dominican Republic. All three of these organizations are private sector companies/foundations interested in self-sustaining agriculture.

METHODOLOGY:

It is anticipated that approximately 30 professionals from eight countries will participate in the training. The methodology used for the transfer of experiences will include formal presentations, round table discussions, workshop sessions to generate information on specific topics, short training sessions on specific subjects, and field trips to selected farms. An informal atmosphere will be maintained so as to facilitate the exchange of experiences.

**HOTEL
ACCOMMODATIONS
AND EXPENSES:**

The Seminar/Conference will have a duration of six (6) days and nights and will be held at the Excelsior Hotel. The Hotel will charge a fee of US\$46.00 person/day, including meals, with double occupancy. Per diem will be paid at the rate of US\$70.00.

PROGRAM

Monday, October 16, 1989:

- 9:00 a.m. Opening Program
- 10:00 a.m. Refreshments
- 11:00 a.m. Introduction of participants
- 11:15 a.m. Overview of the Organic Foods Industry,
Tom Harding, Organic Farms
- The definition of certified organic foods;
 - History of organic farming;
- 12:30 p.m. Lunch
- 1:00 p.m. Overview of the Organic Foods Industry
(cont.), Tom Harding and Kristy Johnson,
Organic Farms
- The market situation and trends;
 - Future production/marketing opportunities
- 2:30 p.m. Alternative sources of natural
fertilisers:
- livestock manures; Organic Farms
 - green manures/legumes/others; CREAR
 - composting; CREAR
 - bio-gas digestors, Gregory Robin,
CARDI

Tuesday, October 17, 1989:

- 8:00 a.m. The Dynamics of an Organic Farming System,
Tom Harding and Kristy Johnson, Organic
Farms
- Building an integrated organic
farming system;
 - Available resources;
 - Production techniques and
requirements;
 - Techniques of organic pest
management;
 - Soil and plant fertility;
 - Varietal selection;
- 12:30 p.m. Lunch

- 1:30 p.m. **Designing Systems for Crop Diversification, Gregory Booth, CREAR**
- Food and Feed crops (grains, legumes, food crops, forages);
 - Feed and maintenance programs (pigs and cattle);
 - Soil conservation
- 3:30 p.m. **Attitude of Organic Farmer: human development, Gregory Booth, CREAR**

Wednesday, October 18, 1989:

- 8:00 a.m. **The Definition of Agroecosystem, Fernando Agudelo-Silva, EcoScience Ltd:**
- Ecosystem/agroecosystem;
 - Biological efficiency;
 - Agriculture, purposes, products and resources;
- 10:00 a.m. **The Definition of Integrated Pest Management, Fernando Agudelo-Silva, EcoScience Ltd.**
- Energy flow in agroecosystems;
 - The climatic frame in agroecosystems;
 - Predatory prey oscillations in agroecosystems;
- 12:30 p.m. **Lunch**
- 1:30 p.m. **The tools of Integrated Pest Management, Fernando Agudelo-Silva, EcoScience Ltd.:**
- Predators;
 - Pathogens;
 - Parasitoids;
 - Antagonistic organisms
- 3:30 p.m. **Integrating the Tools of IPM in Management Systems, Fernando Agudelo-Silva, EcoScience**

Thursday, October 19, 1989:

- 8:00 a.m. Building a Certified Organic Production System, Tom Harding and Kristy Johnson, Organic Farms:
- The organisational structure;
 - The certification process;
 - Documentation, inspection and review;
 - The certification inspection
- 12:00 noon Lunch
- 1:00 p.m. Visit to Belle Vue grapefruit farm for the certification inspection

Friday, October, 20, 1989:

- 8:00 a.m. Meeting the needs of the Organic Foods Marketplace, Tom Harding and Kristy Johnson, Organic Farms
- Pre and postharvest handling;
 - Packaging;
 - Understanding the marketing situation;
 - Farmers market (slide presentation);
 - Selecting the right marketing partnership;
 - Making a success of the opportunity.
- 12:00 noon Lunch
- 1:00 p.m. Formation of inter-disciplinary and inter-institutional work teams to carry out following tasks:
- Identify priority crops for organic production and marketing in North American and European markets;
 - Identify and quantify local natural resources available for the production of organic food (natural fertilisers and natural pesticides);
 - Identify priority areas for research in organic production/marketing of identified crops;
 - Prepare project profiles for the development of organic food production and marketing in the Eastern Caribbean;

- Suggest elements/chapters to be included in a training manual on organic food production, postharvest handling and marketing.

4:00 p.m. Evaluation of Workshop, Conclusions and Recommendations for followup.

5:30 p.m. Closing

Saturday, October 21, 1989:

8:00 a.m. Meeting of resource persons to discuss alternative strategies for followup actions:

- marketing grapefruit;
- training of inspectors;
- training manuals;
- research;
- training in self-sustaining agriculture;
- production/marketing projects;

ANNEX 2

LIST OF PARTICIPANTS

Organic Farming Workshop
October 16-21, 1989

Excelsior Hotel, Canefield, Dominica

<u>NAME/EXPERTISE/INSTITUTION</u>	<u>MAILING ADDRESS</u>
1. Cosmos Joseph Agronomist, IICA	P.O. Box 228 St George's GRENADA
2. Cecil Winsborrow Agronomist, MOA	c/o Ministry of Agriculture Botanical Gardens St Georges, GRENADA
3. Ronald O'Neale Agronomist/Crop Production	Ministry of Agriculture Botanical Gardens St Georges, GRENADA
4. Hubert Brumant Extension/MOA	Ministry of Agriculture Botanical Gardens Roseau, DOMINICA
5. Andrew G Royer Small Farmer	Anronat Farm Giraudel, DOMINICA
6. Winston Magloire Floriculture/Extension MOA	Ministry of Agriculture Botanical Gardens Roseau, DOMINICA
7. Lesroy C Grant Agronomist/Research Department of Agriculture	Department of Agriculture Dunbars P O Box 1282 St John's, ANTIGUA
8. Julian Laudat (Ms) Extension/Communication	Agricultural Extension Division Kentish Road St John's ANTIGUA
9. Gillian James (Ms) Agronomist/Crop Protection Ministry of Agriculture	P O Box 474 Castries ST LUCIA

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|-----|--|--|
| 10. | Floyd Alexander
Senior Crop Protection Ass.
Plant Protection Unit | Beausejour Agricultural Station
Vieux Fort
ST LUCIA |
| 11. | Lennox A Timothy
Extension/MOA | Ministry of Agriculture
Botanical Gardens
Roseau, DOMINICA |
| 12. | Sylvester Lynch
Plant Protection Officer
MOA | Ministry of Agriculture
Kingstown
ST VINCENT AND THE GRENADINES |
| 13. | Clive Bishop
Rural Development
Agronomist/Farming Systems | Camden Park
ST VINCENT AND THE GRENADINES |
| 14. | George B DeFreitas
Extension:
Topical fruits and
vegetable production
Farmer credit and
communication | Belle Vue
Colonaire, ST VINCENT

OR
c/o Rabacca Farms Ltd.
Kingstown
ST VINCENT AND THE GRENADINES |
| 15. | Allan Martinson
Horticulturist
PCV - IICA | IICA Office in Grenada
P O Box 228
St Georges, GRENADA |

Part-time Participants:

- | | | |
|-----|--|--|
| 16. | Llewellyn Rhodes
Entomologist
CARDI | CARDI
Botanic Gardens
Roseau, DOMINICA |
| 17. | Juliana Hinterberger
Bio-gas slurry
researcher | CARDI
Botanic Gardens
Roseau, DOMINICA |
| 18. | Stewart J. Jeffery
President
Hot pepper specialist | QUETZAL FOODS
P O Box 13643
New Orleans, LA 70185 |
| 19. | Oliver Grell
Chief Extension Officer | Department of Agriculture
Botanic Gardens
Roseau, DOMINICA |
| 20. | Errol Harris
Chief Technical Officer | Department of Agriculture
Botanic Gardens
Roseau, DOMINICA |

Resource Persons:

1. Thomas Harding
CEO/President
Organic Farms, Inc.
10726B Tucker St.
Beltsville, MD. 20705
USA
2. Kristi Johnson
Production Manager
Organic Farms, Inc.
10726B Tucker St.
Beltsville, MD 20705
USA
3. Gregory Booth
Agricultural Director
CREAR, Rio Limpio
Loma de Cabrera
DOMINICAN REPUBLIC
4. Fernando Agudelo-Silva
Insect Pest Management/
Ecologist
EcoScience
85 N. Whitney St.
Amherst, MA 01002, USA
5. Rafael Marte
Tropical Fruits
IICA Office in Barbados
P O Box 705
Bridgetown, BARBADOS
6. Larry Leighton
Farmer Organizations
Produce Importer
715 N.W. 186th Drive
Miami, Florida 33169
7. Gregory Robin
Agronomist/Farming System
CARDI
CARDI
Botanic Gardens
Roseau, DOMINICA

Organisers:

1. Urban Martin
Coordinator
IICA Office in Dominica
IICA Office in Dominica
IICA Office in Dominica
c/o Division of Agriculture
Botanical Gardens
Roseau, DOMINICA
2. Barry Borland
Rural Development
PCV - IICA
IICA Office in Dominica
c/o Division of Agriculture
Botanical Gardens
Roseau, DOMINICA
3. Jerry La Gra
Marketing Specialist
IICA/OECS
P O Box 1223
Castries, ST LUCIA

RESOURCE PERSONS

Fernando Agudelo-Silva

- BS Agriculture, from his home country of Colombia;
- Ph.D. Entomology/Insect Pathology, UC Berkeley;
- Work experience in tropical crop production;
- Developed integrated pest management system in Dominican Republic, IICA;
- Taught Insect Pathology and created collection of insect pathogens in Venezuela, Central University;
- Worked on policy regarding pesticide use in agriculture and health, Harvard University;
- Developed nematodes as biocontrol agents, BioSys, California;
- Presently, Director Product Development (microbial pesticides), EcoScience, and Adjunct Professor, U. of Massachusetts, Amherst.

Gregory Booth

- 10 years experience in animal husbandry, biological farming and crop management;
- For 7 years was agricultural instructor and field crop manager at Kimberton Hills, Biodynamic Farm, Kimberton, Pennsylvania;
- Since 1988 has been the Agricultural Director and overall farm coordinator at the Regional Center for the Study of Rural Alternatives, Rio Limpio, Dominican Republic.

Thomas B Harding, Jr.

- CEO/Chairman, Organic Farms, Inc., largest organic food distributor in the USA;
- Owner, AgriSystems International, International consulting service and producer of natural pest controls - ERA registered;
- Past president and founder of OCIA International, an international farmer (organic) owned program;
- Past president and founding member of OFPAMA, North American Organic Foods Trade Association;
- North American Representative to IFOAM, International Federation of Organic Agricultural Movements;
- Past president and founder, Institute for Alternative Agriculture, Washington, D.C.;
- Maintains family certified organic farms in Pennsylvania and Colorado.

Kristi K. Johnson

- BS Horticulture, Fruits and Vegetables, Kansas State U.;
- 4 years at U. of Maryland plant research farm;
- Internship at U. of California, Davis, Sustainable Agricultural Systems;
- Experience in practical organic farming;
- 2 years management experience with major retail food chain in Washington, D.C. metropolitan area;
- Presently, Production Coordinator, Organic Farms Inc.

ANNEX 3

OUTLINE FOR WORKING GROUPS

1. Title of Project:
2. Identification (description) of problems which give rise to the project idea:
3. General objective:
4. Specific objective(s):
5. Expected outputs from successful project:
6. Proposed strategy for project implementation:
7. Description of principal components of the project (these are normally associated with costs, e.g. training, infrastructure):
8. Rough estimate of project cost:
9. Duration of project (months, years):
10. Identification of the principal players (participants) in the execution of the project and a brief summary of the role to be played by each:

Players/Participants

Role to be Played

11. Prepare a plan of action for project implementation (consider the commodity system from point of planning production all the way to arrival at final destination, include such things as needs for research, credit, pest control, packaging material, training in cultural practices and postharvest handling, infrastructure, market information, market coordination, etc.).

INTER-AMERICAN INSTITUTE FOR COOPERATION ON AGRICULTURE

IICA in Dominica, Ministry of Agriculture, Roseau, Commonwealth of Dominica
Tel.: (809)448-4502, Telex: 8634 OASDOM