CHEMONICS INTERNATIONAL INC.

# Training in Pruning of Mango

Dominican Republic Competitiveness and Fiscal Policy Reform
Contract No. 517-C-00-03-00110-00

Submitted to:
USAID/ Santo Domingo

Submitted by:
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Chemonics International Inc

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# SECTION I
# INTRODUCTION

## SECTION I
## INTRODUCTION

The Agricultural Private-Public Linkages ("Cluster") component of the USAID-funded Dominican Competitiveness Project (DCP) is working with the newly formed Mango Cluster, PROMANGO, to increase its competitiveness in world markets. After the public event which officially launched PROMANGO in early May 2004, the Administrative Committee identified specific activities needed to improve the competitive ability of mango growers in the Dominican Republic. Training mango producers in the use of pruning for plantation management was one of the activities identified as very important and high priority.

To implement this activity, members of the Administrative Committee, including private businessmen and women and officials for CEDAF, CONIAF, PRODEFRUD and IDIAF collaborated with the Agricultural Specialists of the DCP to conduct the Pruning for Mango Plantation Management Program, which included a presentation on the subject on August 31, 2004 at CEDAF and three, one and one-half day field demonstrations of pruning techniques offered on September 1-2, 20-21, and 22-23 on different farms in Baní and San Cristobal. Training was provided by Dr. Thomas L. Davenport. His curriculum vitae may be found in Annex I.

The presentation covered the theoretical basis for pruning, the affect that pruning has on the vegetative growth and flowering of mango and its use and benefits in mango plantation management. The field demonstrations were hands-on demonstrations of different pruning techniques and their use to manage trees of different ages and plantations with different management needs. Over 52 mango producers, farm supervisors, technical assistance providers, and nursery operators attended the presentation. The workshops were attended by 26 persons.

Figure 1. Opening remarks at Presentation by PROMANGO President Rafael Leger.

## A. Purpose

The purpose of the Pruning for Mango Plantation Management Program was to introduce to mango producers and educators from agricultural colleges and technical personnel in the DR working directly with mango producers, the concepts and importance of the mango plantation management practice of pruning.

Pruning is important tool to mango plantation management as it allows the producer to:

- restrain the exuberant vegetative growth of mangoes to manageable sizes and forms which is important to control production management and harvest costs;
- synchronize vegetative growth for more efficient management;
- synchronize flowering to extend the production cycle and sales season;
- increase productivity of plantation;
- stimulate precocious flowering of new plantings;
- extend the productive life of the plantation;
- recuperate overgrown, older plantations; and
- increase air circulation in the plantation, which lowers costs and losses associated with disease.

Figure 2. Fine example of synchronized flowering and tree shape and size management of a block of mangoes through the use of tip pruning.

## SECTION II

## Why is Pruning Important to Competitive Mango Production?

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### Why is Pruning Important to Competitive Mango Production?

The correct application of pruning in a mango plantation directly impacts competitiveness as it:

- Lowers plantation management costs
  - Decreases production loss due to disease
  - Decreases production costs to control disease
  - Lowers harvest costs
- Lowers packing house costs
  - Increased daily flow of product lowers overhead costs per unit
- Increases farm management efficiency
  - Allows for efficient planning of labor use for plantation management and harvest
  - Reduces time required to harvest
  - Synchronizes specific activities: irrigation, pruning, harvest
- Increases packing house efficiency
  - Allows for efficient planning of labor use in packing house
  - Permits better planning and use of infrastructure needs
- Increases farm productivity
  - Increases production volume
  - Puts new trees into production earlier
  - Extends the useful life of older trees
- Improves marketing capabilities of exporter
  - Improves product quality
  - Extends the harvest season of the farm
  - Allows for market timing
  - Allows producer to better predict weekly sales volume

Competitors in Guatemala, Honduras, Mexico and Brazil already use pruning and are reaping its benefits. The Dominican producers must catch up!

Figure 3. Unpruned plantation. Notice asynchronous, thin growth and large-size trees. These will bear low yields over a longer period with higher harvest

Figure 4. Pruned plantation in Honduras. Notice low growth, heavy branching of trees. These will be provide high yields within a short period of time and be

costs-Result: higher cost/unit.

easier, faster and cheaper to harvest-Result: lower cost/unit

## A. Methodology of Program

A variety of training techniques were employed during the program. The theoretical background of pruning was provided in the form of a formal lecture in a classroom setting and its practical application in the field was offered in the form of demonstrations, discussion and practical application on three different farms with plantings of different age trees in two areas with distinctly different climates, Baní and San Cristobal. A copy of the program is provided in Annex II.

Participants included two groups: (1) end users; i.e., producers and plantation supervisors and (2) educators and trainers, including agricultural university faculty and technical advisors from research and extension services: IDIAF, CEDAF and PRODEFRUD.

Particular attention was provided to the training of the second group of participants. This is the group that will provide long term, the ongoing technical assistance and training that will disseminate this information both geographically and temporally, by training producers throughout the country who were not reached by this training event, new producers in the future and new agronomists currently in training, the backbone of a sustainable training program.

Educators and trainers, extension and research technicians were provided exclusive training in the first workshop and they were required to participate in the presentation and the subsequent field workshops. The purpose of these requirements was twofold: (1) to offer them the greatest possible exposure to the use of the concepts and techniques of pruning and access to the trainer and (2) to assist the trainer in the second and third field workshops. After the program was concluded, all participants in this group received a cd rom copy of the presentation for their future use for training events.

## B. Training Program

### B. 1. Presentation

Dr. Davenport’s presentation was offered before the workshops as it provided the participant with the conceptual background necessary to understand the effect that pruning has on the physiology of mango; how that affects the mango’s vegetative and flowering behavior; and how pruning can be used to manipulate the plant’s growth to increase the number of fruit that the tree bears, to control flowering to plan harvest dates and control the overall size and shape of the trees to facilitate management of the plantation and harvest.

The presentation was held in the conference room of CEDAF on August 31, 2004. It began at 9:30 am and was opened by Rafael Leger, the president of the Cluster. The program ended, after considerable discussion, by midday and was followed by a light snack, courtesy of CEDAF.

Officially, 52 participants attended the presentation. Informal head count by the end of the program was 65. Some individuals arrived after the program had begun and did not sign in.

# SECTION III

## Workshops

# SECTION III
# Workshops

## A. Workshop I

In order to reach as many growers now producing mangos as possible over the next year and those who will get into the industry in the future, the mango cluster decided that the purpose of this workshop should be to specifically provide in-depth, hands-on training of a core group of trainers to provide technical assistance and training support to the mango cluster; i.e., a train-the-trainer workshop. The idea being that these technicians would, in turn, to disseminate the training that they received. The size of the group was limited to ten participants to increase the one-on-one interaction with Dr. Davenport. Participants committed to attend the two subsequent workshops to gain more experience under different farm conditions and to assist Dr. Davenport in the hands on training.

Consequently, the workshop was offered by invitation only to key organizations providing technical assistance and research services to mango producers and to supervisors of key farms strategically located throughout the Eastern region of the DR, where growing conditions are most favorable to mango production. Seven technical assistance providers participated: two from CEDAF, two from IDIAF, three from PRODEFRUD. Three farm owner/supervisors also participated: one from Proyecto Nazaito, a large government-supported cooperative project of small and medium farmers in Baní, one supervisor from Finca CAEI, Baní; and the owner of San Juan de La Maguana, Azua.

This workshop was held on September 1 and 2 on Finca Mangos de Matanza in Matanza, Baní courtesy of Rafael Leger, also President of PROMANGO, and Renan Anselin. Finca Mangos de Matanza is an ECOCERT-certified organic mango producer which exports its product to Europe, both by air and by sea. The farm is a mixed property of 162 hectares (ha) consisting of a small lot of older, 15-20 old Kiett, Kent, Haden, Madame Francique, and Palmer varieties and two newer and larger sections of 3-6 year old and recently planted trees. Baní is a dry region with low precipitation and relative humidity and high sunlight conditions. Trees grow more slowly and require irrigation, but experience low incidence of disease and pressure from fruit flies.

The event lasted 1 ½ days and covered the areas of:

- Types and use of tools and ladders used for mango pruning
- Regenerative pruning of older trees and the use of chainsaws
- Hedging and topping shaping of older trees
- Tip pruning
- Shape pruning for young trees

Figure 5.

Figure 6.

Figures 5 and 6 above. Finca Mangos de Matanza: onlookers of machete-wielding instructor and the use of chainsaws during hands-on practice of "topping," a pruning technique used to lower tree height.

## B. Workshop II

The second workshop was, unfortunately, delayed due to decision to return Dr. Davenport to Homestead, Florida on September 3rd which was threatened by Hurricane Ivan. It was rescheduled from September 3 and 4 to September 21 and 22.

The workshop was held on Finca CAEI, a property of Casa Vicini, located in Colonia Catalina of Paya, Baní. The Project Manager, Ricardo Perez, and Farm Manager, Miguel Diaz, hosted the event. Finca CAEI is 125 ha farm with a young plantation of trees that are less than 11-year. Varieties planted include: Kiett, Kent, Haden, Parvin, Palmer, and some Tommy Atkins. This is a certified organic plantation and mangoes are shipped to Europe.

Twenty-eight individuals attended this 1 ½ day event, of which ten were the "trainers' who had received training in Workshop I and 18 new participants, mainly producers and owners of other mango plantations in the region. The subjects covered were identical to those in the previous workshop.

Figure 7. Finca CAEI: An example of Severe pruning of older tree.

Figure 8. Dr. Davenport explains the effect of shape pruning on young trees.

## C. Workshop III

The third workshop was conducted on Quinta La Cabuya in San Cristobal. Quinta La Cabuya, a 26-ha plantation of 8-year old Kiett and Tommy Atkins mangoes, produces for the Dominican market and supplies a local exporter. The farm is located in Hato Tama, San Cristobal. This is a region with high relative humidity, high rainfall, lower sunlight conditions. Because of the climate of the region, trees grow more rapidly in San Cristobal than in Baní and there are greater challenges in controlling both fruit flies and disease of the fruit.

Twenty individuals attended this 1 ½ day event, of which 10 were the “trainers’ who had received training in Workshop I and 10 were new participants, mainly producers and owners of other mango plantations in the region as well as two faculty members of Instituto Superior de Agricultura (ISA) of Santiago, Ing. Juan Castellanos and Prof. Pedro Benoit. Ing. Castellanos is the Director and professor of the Department of Agronomy and one of the hosts of the program “A Las 18 Horas” for television channel, Tele Unión, a nationally televised channel. The subjects covered were as for the previous workshop.

Figure 8. Quinta Cabuya: Some of the participants of last day of the Quinta La Cabuya workshop.

Figure 9. Heartfelt farewell to the old ways of mango plantation management!

# SECTION IV

## Results of the Workshop Evaluation

# SECTION IV
## Results of the Workshop Evaluation

Participants in the Second and Third Workshops were asked to complete an evaluation form. A copy of the form is provided in Annex III. Forms were passed out on the last day of each of the two workshops. The total number of respondents was 26. Those participants who attended both workshops (invited technician-trainers) only responded once.

## A. Attendance of Events

### A.1. Presentation Attendance

Sixty-nine percent of the participants of the workshops reported that they also attended the presentation. Conversely, thirty-one percent of the workshop participants did not attend the presentation.

### A. 2 Workshop Attendance

**Categories of Participants**

| Category | Number | Total Participants (%) |
|---|---|---|
| Producers | 8 | 31 |
| Supervisors of farms | 3 | 11 |
| Technical assistance providers | 11 | 42 |
| Professors | 2 | 8 |
| Students | 1 | 4 |
| Researcher | 1 | 4 |
| **Total** | **26** | **100** |

### A. 3 Contents

The contents of the workshop that were rated included: content, usefulness of the material, whether the information was practical. Well organized and understandable. These attributes were rated as “Excellent”, “Good” or “Could Be Improved.”

Overall, all five attributes were rated as good to excellent by 86% or more of the respondents. In the case of content, one respondent responded that content could be improved (4% of respondents) and in the case of usefulness, three respondents (17%) reported that Usefulness of the material “Could Be Improved”.

| Attributes | Excellent (%) | Good (%) | Could be Improved (%) |
|---|---|---|---|
| **Content** | 80 | 16 | 4 |
| **Usefulness** | 68 | 18 | 14 |
| **Practical** | 76 | 24 | 0 |
| **Well organized** | 56 | 44 | 0 |
| **Understandable** | 63 | 37 | 0 |

### A. 4 Instructor

The effectiveness of the instructor was rated for four attributes: knowledge level, delivery style, providing good explanations, and how well he responded to questions. Again, these were rated as “Excellent,” “Good” or “Could Be Improved.”

Unanimously the respondents reported that the instructor, Dr. Davenport, was “Good” or “Excellent” for knowledge of the subject, his teaching style and ability to explain the material well and respond well to questions.

| Attributes | Excellent (%) | Good (%) | Could be Improved (%) |
|---|---|---|---|
| **Knowledge of subject** | 92 | 8 | 0 |
| **Style of teaching** | 54 | 46 | 0 |
| **Explains well** | 71 | 19 | 0 |
| **Responds well to questions** | 85 | 15 | 0 |

Respondents rated the workshop that they attended as “Excellent” (85%) to “Good” (15%) overall.

# SECTION V

## Impact

# SECTION V
## Impact

### A. Knowledge levels-Self-perception

To determine the impact of the workshop on participant's knowledge level, participants were asked to rate as "Nothing," "Some," "A lot" and "Advanced":

1. Their level of knowledge about the subject of pruning before taking the workshop, and
2. Their perceived level of knowledge about pruning after attending the workshop.

| Knowledge of pruning | Nothing (%) | Some (%) | A lot (%) | Advanced (%) |
|---|---|---|---|---|
| **Before workshop** | 15 | 58 | 23 | 4 |
| **After workshop** | 0 | 0 | 73 | 27 |

Self assessment of knowledge level about pruning before the workshop, 15% responded that they knew nothing about pruning and 81% responded that they knew "Something" or "A lot" about pruning. Only 4% (1 respondent) felt that his knowledge of pruning was "Advanced". After the workshop, all respondents felt that their knowledge level about pruning was "A lot" or "Advanced." These results indicate that 73% of respondents perceived their knowledge levels to have advanced from "Nothing to Some" to "A lot" or "Advanced". Twenty-seven percent of respondents felt that they had improved their level of knowledge about the pruning of mangoes to "Advanced" after attending the workshop.

### B. Willingness to Implement Training

To determine whether this training would be implemented on mango plantations, the following Yes/No questions were put to participants:

1. Have you ever used pruning on your farm prior to attending the workshop? and
2. Will you use the techniques learned in the workshop?

| Use of pruning in plantations | Yes (%) | No (%) |
|---|---|---|
| **Prior to workshop** | **73** | **27** |
| **After workshop** | **100** | **0** |

From the results of these questions it would appear that as a result of attending the workshop at least 27% of respondents are willing to implement pruning for the first time.

However, these results are slightly deceptive. One of the more important successes of the workshop was the change in attitude towards the severe pruning (cutting the tree off at chest height and allowing shoot growth to replace old growth with subsequent tip pruning to control height and form of older trees) of older mango trees to rejuvenate old plantations. Many groves and plantations of mangoes in the DR are older plantings with large, overgrown trees that are difficult to harvest and low bearing. Heretofore, no one practiced severe pruning or shape pruning of older trees as they are commonly thought to result in tree death. However, as a result of the presentation, where the discussion of this technique was strongly discussed, and the practical workshop; several producers have experienced a mindset change from a strong negative attitude against the concept of severe pruning to one of acceptance to the point of implementing the technique in large blocks on their farms. This is already being implemented on farms in Baní and San Juan de La Maguana to use as demonstration plots.

## C. Improvement of Planning for Future Events

This was the first event sponsored, planned and executed by the Mango Cluster. In order to improve the quality of future events, three additional open-ended questions were put to participants to determine what the Cluster had done that had worked well and poorly and suggestions for improvements.

## D. What Participants Liked the Most

Responses to this question can be grouped generally in the following categories:

- Organization: Combining both concept and theory with practical application (32%)
- Organization: Practical application (36%)
- Organization: Using a group experience (11%)
- Content related: exposure to synchronization of flowering (3%)
- Content related: control of growth through pruning (9%)
- Content related: the pruning of large, overgrown trees (3%)
- Everything (3%)
- No response (3%)

Results can be summarized as follows;

- Participants like a program that not only teaches them how to do something but why it works;
- Participants like to be shown how to apply a new practice and have the opportunity to practice under the supervision of a knowledgeable person;
- Participants like the opportunity to learn in small groups and to learn from one another; and
- As over 18% of the respondents responded spontaneously that they were very pleased with the exposure to the benefits of pruning, this would support comments made by participants as to the importance of learning pruning for mango.

## E. What Participants Liked Least

Responses to this question can be grouped generally in the following categories:

- No response (58%)
- Remainder at 4% each (1 response out of 26)
    - Scary! (unclear if referring to severe pruning or use of chainsaws to top trees!)
    - Late starting workshop
    - Weather (wet from Hurricane Jeanne)
    - Too repetitive (from a PRODEFRUD technician)
    - Food
    - Lack of coordination did not allow one to take advantage of the expert (technician)
    - Not enough time to practice each technique
    - Small tree pruning
    - Interruption of the program by the hurricane in Florida
    - Need to include more participants

Apparently the majority of respondents were sufficiently pleased by the workshop content and organization to have no major complaints. Those negative comments made were generally related to forces outside the control of the program (weather, personal food preferences, limitations of time) or due to personal interests (more time with expert, reluctance to fulfill commitments to attend all of the events, and fear of new ideas (pruning small trees and old trees).

One criticism made concerning the late start may be valid as on the first day of the two events, the event started later than planned to allow for those coming from long distances and unfamiliar with the location of the farms to arrive before the program started.

## F. Improvement

The request for suggestions to improve this event elicited the following comments, which are presented in three categories:

- Category I – 14%
    - Offer written material
    - Offer more pruning courses
    - No response

- Category II - 7%
    - More opportunity to practice/more time
    - Change plantations
    - Include more local experiences
    - Separate technicians from producers
    - More organization
    - Participants should bring their own tools

- Category III - 4%
    - Invite more producers
    - Provide transportation
    - Include other aspects of management of mango

Category I, 14%, had two useful comments. However, these had already been addressed during the planning process for the program, although all participants may not have known this. In the case of suggesting that more written material should be distributed, one of the additional deliverables of Dr. Davenport's consultancy is a series of three brochures, in Spanish, describing the different pruning techniques demonstrated, with photographs to demonstrate them. Copies of these will be distributed through PRODEFRUD and CEDAF. Also, more such events are planned by IDIAF and PRODEFRUD for the Linea Noroeste and San Juan La Maguana.

With respect to the second category, 7%, which focus primarily on the structure of the program; given certain restrictions, it is beyond the ability of the program to provide more time on the individual farms, more farms and more local experiences as these would become logistically difficult to manage in a single program. As the Cluster intends and is planning to host more such events through PRODEFRUD and IDIAF, we hope to address these issues in the future in an orderly fashion.

As for Category III, 4% (1-2 respondents), many more producers and nurserymen were invited than attended. Providing transportation is beyond the financial capacity of the program and logistically impossible to offer given that producers from Mao, Puerto Plata and other far flung regions of the country were invited and attended. Some minimal effort on the part of participants must be expected, arranging their own transportation to these events being one of them. With respect to the last suggestion of this category, "Include other aspects of management of mango," since the program was specifically focused on pruning and there were time constraints for the consultant's availability, delving into other commercial practices was not feasible, nor desirable.

## G. Follow up Activities

In the week following the last workshop, there have already been some further dissemination of information.

- Ing. Juan Castellanos has highlighted his experience in the workshop in two programs of "A Las 18 Horas." One half-hour exposure was televised nationally on Tele Union on September 23 and again on September 30th.

- Additionally, Ing. Castellanos will present Dr. Davenport's presentation in a course for students at ISA in mid-October. Over 80 agriculture students are expected to attend.

- The Cluster is contacting the Director of PRODEFRUD to request that two workshops be provided in Linea Noroeste and San Juan La Maguana.

- With the help of Dr. Davenport, Ing. Daisy Martich of IDIAF has set up several experiments in Baní to research the use of different techniques to stimulate flower induction in pruned trees that would be acceptable for organic production of mangoes.

- The Cluster is exploring a collaborative research and training program with Dr. Davenport through the University of Florida and CONIAF.

## ANNEX A

## ANNEX A

[redacted]

Professional Status: Associate Professor
University of Florida
Tropical Research and Education Center
18905 SW 280 St.
Homestead, FL 33031

Date of Birth: [redacted]

Born: [redacted]

Citizenship: United States of America

Education and Personal Background:

1966 Graduated McCollum High School, San Antonio, Texas, Member of National Honor Society

1967-1970 Student Assistant and Tutor, Trinity University

1970 Awarded B.A. Degree, Biology, Trinity University, San Antonio, Texas

1970-1971 Ph.D. Student in Department of Oceanography, Texas A&M University, College Station, Texas, Graduate Research Assistant

1971-1975 Ph.D. Candidate in Plant Science Department, Texas A&M University, College Station, Texas

1971-1974 Graduate Research Assistant

1974-1975 Graduate Teaching Assistant

1975 Received Ph.D. Plant Physiology,
Plant Sciences Department, Texas A&M University.
Dissertation Title: "The Movement and Endogenuos Levels of Plant Growth Regulators During Water -stress-induced Abscission in Cotton."
Supervisors: Dr. Wayne R. Jordan and
Dr. Page W. Morgan

1975-1977 Post-doctoral Fellow, University of Florida, IFAS, Tropical Research and Education Center, Homestead, FL
1977-1982 Assistant Professor, University of Florida, IFAS, Tropical Research and Education Center, Homestead, FL
1982-present Associate Professor, University of Florida, IFAS, Tropical Research and Education Center, Homestead, FL

110 Publications in Scholarly Journals and Proceedings
88 Published Abstracts of Papers Presented at National and International Conferences

**Research Activities**
I conduct independent and cooperative investigations on the mechanisms of flower and fruitlet abscission and controls of fruit set and retention. The resultant knowledge is used to develop technologies to maximize yields in commercially important tropical fruit cultivars. Similarly, the physiological and biochemical bases for floral initiation and induction in tropical fruit trees are investigated, and the resultant knowledge is used to devise technologies to control flowering in commercially important, tropical fruit crops.

**Areas of Specialization:**

-Hormonal control of floral initiation and induction mechanisms of mango, citrus, lychee, longan, and avocado
-Fruit set mechanisms of avocado, mango, and citrus
-Hormonal control of flower and fruitlet abscission
-Dynamics of vegetative growth and development of mango, citrus, lychee, longan, and avocado
-Plant hormone analysis using gas and high pressure liquid chromatography
-Development of reagent antibodies in rabbits
-Immunoassay and immunoaffinity chromatography of phytohormones
-Plant environmental growth chamber design and refrigeration technology

<u>Membership in Professional Societies:</u>

American Society of Plant Physiologists - 1971 to present.
American Society for Horticultural Science - 1980 to present.
Plant Growth Regulator Society of America - 1973 to present.
Elected Member at Large - 1986
Nominated Vice President of Society - 1987.
Elected Vice President of Society - 1988, automatically assumes office of President in 1989.
President - mid 1989 to mid 1990
Southern Section of the American Society of Plant Physiologists - 1971 to present
International Plant Growth Substances Association - 1973 to present
International Society of Citriculture - 1975 to present
International Society for Horticultural Science - 1989 to present.
Chairman of Reproductive Physiology section of the Mango Working Group
Florida State Horticultural Society - 1976 to present
Served as Vice President, Krome Section - 1980
South Florida Chromatography Discussion Group - 1977 to 1987.
Served as President – 1980

**Major Consultation Outside the University:**

Law offices of Fowler, White, Gillen, Boggs, Villareal & Banker, Tampa, FL - 1985-1986
-consultation regarding liability of a shipping company for ripening of bananas and plantains while enroute from Colombia to the United States

Law offices of Freshman, Freshman, & Michelson, Miami, FL - 1985
-for testimony regarding taxonomic identification of a tree involved in a fatal traffic accident

Law offices of Cichanowicz, Callan, Carcich, & Keene, New York, NY - 1986
-consultation regarding liability of a shipping company for ripening of bananas and plantains while enroute from Colombia to the United States (different case from above-mentioned)

Law offices of O'Neil, Ichin, & Miller, New Orleans, LA - 1989-90
-consultation regarding liability of a shipping company for ripening of bananas and plantains while enroute from Colombia to the United States (different case from above-mentioned)

J. R. Brooks & Son - 1986
consultation and providing of photographs of avocado and mango cultivars

Agro-21 of Jamaica - 1987 to 1989
-consultation on technologies to induce off-season flowering and decrease alternate bearing habit of mangoes in Jamaica

Holland Estate, Jamaica - 1993 to 1995
-consultation on technologies to induce off-season flowering of mango

Chemonics International (Miami) - 1994 to 1996
-consultation on technologies to induce off-season flowering of mango in Central America.

Landis International (Miami)– 1996 to 1998
-consultation on technologies to induce off-season flowering of mango in Central America.

Sofia Wong Mangoes (Piura, Peru) – 1997 to 1999
-periodic consultations regarding control of mango flowering

MangoSA (Nicaragua) - 1997 to Present
-periodic consultations regarding control of mango flowering

Phillips Fox Attorneys (Adelaide, Australia) – 1997 to 2000
-consultant and expert witness in litigation involving loss of cropping after application of gibberellic acid to ‘Lane Late’ navel orange trees.

Tambor Tropical (Tambor, Cost Rica) – 1998 to Present
-periodic consultations regarding control of mango flowering

Jim Bryon (Recife Brazil) – 1998 to present
-periodic consultations regarding control of mango flowering

North Bay Produce (Miami) - 1999
-consultations regarding postharvest problems with mangoes shipped from Piura, Peru.

Francisco Miranda (Ecuador) - 1999
-periodic consultations regarding control of mango flowering and post-harvest problems at DUREXPORTA.

Colorado Trading (Miami) - 1999
-consultations regarding postharvest problems with mangoes shipped from Ecuador.

J&C Enterprises (Miami) - 1999
-consultations regarding postharvest problems with mangoes shipped from Guatemala City, Guatemala.

Mark Gerard (Detroit, MI) – 1999
-consultations regarding postharvest problems with mangoes shipped from

Ecuador.

FinTrac (USAID funded) – 2000-2001
-consultation on management of mango flowering and quality production in Comayagua Valley of Honduras

City of Petrolina, Brazil - 2000
-lectured to growers, scientists, and policymakers and consulted with growers and scientists on management of mango flowering and quality production

FinTrac (USAID funded) – 2000 - 2002
-consultation on management of mango and avocado flowering and quality production in Haiti

PROMOSTA, Ministry of Agriculture, Honduras -2001-2002
-consultation on management of mango flowering and quality production in Comayagua Valley of Honduras

Colorado Trading, Miami 2002
-consultations regarding postharvest problems with mangoes shipped from Brazil.

Fruticola, Alfonso Avila, Venezuela -2003-2004

-consultation on management of flowering and quality production of mango and citrus

# ANNEX B

## ANNEX B

# TALLER DE PODA

| Fecha | Hora | Actividad |
|---|---|---|
| Aug 31 | 800 | Revisar el salón |
| | | Preparar el multimedia con |
| | | Presentación |
| | | Recibo de pago de |
| | | Inscripción |
| | | Deposito de inscripción |
| | 800 | Recoger Dr. Davenport |
| | | Del hotel |
| | 900 | Inicio presentación |
| | 1130 | Refrigerio |
| | 1200 | Llevar Dr. Davenport |
| | | A Baní |
| | 200 | Baní-registrar en hotel |
| | 400 | Recorrido del sitio y revisión del equipo |
| | | Mangos de Matanza |
| | 600 | Llegada al hotel Bani |
| Sep 1 | MANGOS DE MATANZA-TECNICOS | |
| | 700 | Desayunar |
| | 800 | Salir para finca |
| | | Equipo listo |
| | | Cobrar el entrenamiento |
| | 900 | Inicio entrenamiento |
| | 1000 | Refrigerio-refrescos |
| | 1200 | Almuerzo |
| | 100 | Re-inicio |
| | 230 | Refrigerio |
| | 400 | Salida, inventario del equipo |
| | 700 | Cena |
| Sep 2 | MANGOS DE MATANZA-TECNICOS | |
| | 700 | Desayunar |
| | 800 | Salir para finca, Equipo listo |
| | 900 | Inicio entrenamiento |
| | 1000 | Refrigerio-refrescos |
| | 1200 | Clausura y almuerzo, Salida, inventario del equipo |
| | 1230 | Llevar al hotel |

| | | |
|---|---|---|
| | 400 | Recoger del hotel |
| | | Revisar la Finca y equipo |
| | 600 | Dejar en el hotel |
| Sep 20 | FINCA CAEI-PRODUCTORES | |
| | 700 | Desayunar |
| | 800 | Salir para finca |
| | | Equipo listo |
| | | Cobrar el entrenamiento |
| | 900 | Inicio entrenamiento |
| | 1000 | Refrigerio-refrescos |
| | 1200 | Almuerzo |
| | 100 | Re-inicio |
| | 230 | Refrigerio |
| | 400 | Salida |
| | 700 | Cena |
| Sep 21 | FINCA CAEI-PRODUCTORES | |
| | 700 | Desayunar |
| | 800 | Salir para finca |
| | | Equipo listo |
| | 900 | Inicio entrenamiento |
| | 1000 | Refrigerio-refrescos |
| | 1200 | Clausura y almuerzo |
| | | Salida, inventario del equipo |
| | 1230 | Llevar al hotel |
| | | Recoger cosas |
| | 100 | Salida a Sto. Domingo |
| Sep 22 | QUINTA CABUYA-PRODUCTORES | |
| | 700 | Desayunar |
| | 800 | Salir para finca |
| | | Equipo listo |
| | | Cobrar el entrenamiento |
| | 900 | Inicio entrenamiento |
| | 1000 | Refrigerio-refrescos |
| | 1200 | Almuerzo |
| | 100 | Re-inicio |
| | 230 | Refrigerio |
| | 400 | Salida, inventario del equipo |
| | 700 | Cena |

| | | |
|---|---|---|
| Sep 23 | QUINTA CABUYA-PRODUCTORES | |
| | 700 | Desayunar |
| | 800 | Salir para finca |
| | | Equipo listo |
| | 900 | Inicio entrenamiento |
| | 1000 | Refrigerio-refrescos |
| | 1200 | Clausura y almuerzo |
| | | Salida, inventario del equipo |
| | 1230 | Llevar al hotel |
| | | Recoger cosas |
| | 100 | Salida a Sto. Domingo |

## ANNEX C

## ANEXO C

### FORMATO DE EVALUACION DEL TALLER DE PODA DE MANGO

Fecha: _____

**Para cada área, favor indicar su reacción:**

Me interesa el tema de poda de mango porque soy:

- ☐ Productor de mango
  Nombre de finca y aldea: _____
- ☐ Profesional que da asistencia técnica a productores de mango
  Nombre de institución/compañía: _____
- ☐ Supervisor de una plantación de mango
  Nombre de finca y aldea: _____
- ☐ Otro _____

El nivel de conocimiento de las técnicas de poda de mango que yo tenía antes de asistir a este taller fue:

- ☐ Nada
- ☐ Algo
- ☐ Mucho
- ☐ Avanzado

¿Ha utilizado poda en la plantación anteriormente?

- ☐ Si
- ☐ No

Asistió a la presentación brindado por Dr. Davenport el 31 de agosto en CEDAF?

- ☐ Si
- ☐ No

| **El Taller** | **Excelente** | **Bueno** | **Se podría mejorar** |
|---|---|---|---|
| Contenido del Taller | ☐ | ☐ | ☐ |
| La material brindada es útil | ☐ | ☐ | ☐ |
| Practica | ☐ | ☐ | ☐ |
| Bien organizada | ☐ | ☐ | ☐ |
| Entendible | ☐ | ☐ | ☐ |

| **Desempeño del Instructor** | Excelente | Bueno | Se podría mejorar |
|---|---|---|---|
| Su nivel de conocimiento del tema | ☐ | ☐ | ☐ |
| Su estilo | ☐ | ☐ | ☐ |
| Se explicó bien | ☐ | ☐ | ☐ |
| Respondió a las preguntas y dudas de los participantes | ☐ | ☐ | ☐ |

| Como califica este taller? | Excelente | Bueno | Se podría mejorar |
|---|---|---|---|
| | ☐ | ☐ | ☐ |

Después de participar en este taller, cuanto sabe de la poda de mango?

- ☐ Nada
- ☐ Algo
- ☐ Mucho
- ☐ Avanzado

Como resultado de participar en este taller, utilizará las técnicas aprendidas del taller en su plantación?

- ☐ Si
- ☐ No

¿Como podríamos mejorar este taller?

De este taller, que le gustó más¿

Que le gustó lo menos?