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A Characterization Study of Orange Growers  
in the El Progreso Region of Honduras [\*]

by

Kerry J. Byrnes  
Consultant  
Academy for Educational Development  
Washington, D.C.

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## Introduction

This paper reports on a characterization study of citrus growers in Honduras. The study, conducted in Honduras between January 6 and February 15, 1986, focuses on one citrus producing region, namely, El Progreso, a zone to the east of San Pedro Sula in the Yoro Departament. The study provides data and information about the socioeconomic characteristics, production practices, and commercialization patterns of citrus growers in this region. The author cautions that the study's focus is solely on the El Progreso region; accordingly, the reader should be careful not to interpret any of the study's findings or conclusions as representative of the constraints on or potentials for citrus production in other important citrus producing zones of Honduras such as Lago de Yojoa, Choloma, or Sonaguera.

## Study Objective

The terms of reference of the consultant's contract provided for conducting a characterization study of citrus growers in two of Honduras' citrus-producing regions--Choloma and El Progreso. Within these terms of reference, the consultant defined the study's objective as that of providing the citrus and agricultural economics programs of the Fundacion Hondurena de Investigacion Agricola (FHIA) with information that could be useful in defining and evaluating FHIA's technology research and development programs for citrus. More specifically, the study's objective was defined as that of (1) developing quantitative information about the socioeconomic characteristics of a sample of Honduran citrus growers, and (2) providing analysis of how these characteristics and other relevant factors are related to the production and commercialization practices of these growers.

It should be noted that researchers within FHIA's citrus program conducted a preliminary characterization study of citrus growers in the Choloma and El Progreso regions in mid-1985. That study, however, focused primarily on agronomic factors and was not designed to shed light on the socioeconomic and market environment in which growers make decisions about citrus production and commercialization. The present study, therefore, may be seen as a complement to the earlier study conducted by FHIA.

## Key Actors

Reference is made throughout this report to a number of key actors (organizations) involved in the "citrus sector" of Honduras. These organizations include FHIA, FEPROEXAAH, ANACIHO, ACP, and the CDC. Some background information about each of these organizations is now reviewed. It should be noted that the conclusions drawn and views expressed in this report are solely those of the author and do not necessarily reflect those of any of the individual persons mentioned below in discussing key organizational actors.

Fundacion Hondurena de Investigacion Agricola (FHIA)

The Honduran Agricultural Research Foundation (FHIA) is a private-sector agricultural research center established in 1984. Occupying the former research facilities of the United Fruit Company's "La Quimica" in La Lima, Honduras, FHIA is currently developing commodity-oriented research programs in vegetables, plantain, cacao, and citrus. During 1985, as noted above, FHIA conducted a survey of citrus growers in the Choloma and El Progreso regions.

FHIA personnel who assisted in the development of the present study include the Foundation's Director General, Dr. Fernando Fernandez; Lic. Carlos Zacarias, agricultural economics; Ing. Santos Lopez, citrus program; and Ing. Roque Vaquero and Agr Napoleon Rodriguez, agronomy department.

Federacion de Asociaciones de Productores y Exportadores Agropecuarios y Agroindustriales de Honduras (FEPROEXAAH)

The Federation of Honduran Agricultural and Agroindustrial Producer and Exporter Associations (FEPROEXAAH) is a private-sector agricultural export promotion and market development organization established in 1984. While much of this organization's initial activity focused on promoting the development of commodity-specific producer organizations, FEPROEXAAH also conducted a survey of the citrus growers, with the objective of estimating the area planted to citrus, stratified by the age of the tree plantings. Information from this survey was utilized by FHIA in developing the sampling frame for the Foundation's study of citrus growers in 1985. One of the agri-support programs currently being developed by FEPROEXAAH is that of securing a line of credit (U.S.\$10 Million) that would be available to citrus and other agricultural producers to finance various types of production investments.

FEPROEXAAH personnel who assisted in the development of the present study include Dona Ilsa Diaz Zelaya, Chairperson of FEPROEXAAH's Board of Directors; Ing. Arnoldo Bueso; and Ing. Leonardo Miller.

Asociacion Nacional de Citricultores de Honduras (ANACIHO)

The National Citrus Producers Association (ANACIHO) is the apex organization for a number of regional citrus producers associations. For example, the affiliate citrus producers association in the El Progreso region is the Asociacion de Citricultores Progresenos (ACP). Growers in the El Progreso region may become a member of the ACP and thereby also a member of ANACIHO by paying an initial membership fee of 10 Lempiras and monthly dues of 10 Lempiras. Growers who wish to become direct members of ANACIHO must pay an initial membership fee plus monthly dues; one source indicated that these amounts are 100 Lempiras and 20 Lempiras, respectively. ANACIHO is currently exploring ways to strengthen its membership base (i.e., to increase the number of dues paying members), to develop a range of support services (e.g., input supply) for the organization's members, and to play a negotiator role between the citrus growers and industrial firms such as the CDC which are currently operating or which are projected to be coming on stream within the next few years.

ANACIHO was instrumental in facilitating the start-up of the Citrus Development Corporation (CDC) (see below) in Honduras and played an active role in helping to establish linkages between potential sellers (i.e., citrus growers) and the CDC processing plant as a potential buyer. During the start-up of CDC's operations in 1984, ANACIHO provided the CDC with certification of the identity of each citrus grower who signed a contract with the CDC and received an advance in cash and/or inputs. Initially, the annual dues of ANACIHO members selling oranges under contract to the CDC were deducted from the grower's proceeds and paid directly by the CDC to ANACIHO. This practice was subsequently terminated by the CDC.

ANACIHO personnel who assisted in the development of the present study include Dona Ilsa Diaz Zelaya, President of ANACIHO; and Sr. Francisco Galo, President, Asociacion de Citricultores Progresenos.

#### Citrus Development Corporation (CDC)

There are several citrus concentrate factories which are located in San Pedro Sula, La Ceiba, and Comayagua. These companies include the CDC, Mejores Alimentos, Standard Fruit Company, Compania Agricola Rio Tinto and Gurisa. Only one of these companies, CDC, was contacted during the data collection period for this study.

The CDC, located at Km. 6 on the highway to Puerto Cortes, produces orange and grapefruit juice frozen concentrate for export to the United States. The company also exports grapefruit and lemon to Europe. The firm is financed and operated as a private sector venture under the Caribbean Basin Initiative. The principal investor in and provider of technology and technical assistance to the CDC is a U.S.-based firm (Griffin and Brand, McCallen, Texas). The firm began operations in Honduras in 1984.

Several different mechanisms are currently utilized by the CDC to secure raw material (fruit) for its various processing operations. These mechanisms include:

1. Factory gate purchases of fruit at CDC's processing plant.
2. Purchases by intermediaries who are financed by the plant, work on a commission, and arrange for transport of the fruit from the grower's farm to the plant.
3. Spot market purchases arranged by CDC's own field staff who travel throughout the producing areas.
4. Purchases through outgrower contracts (with or without advances of cash and/or inputs).
5. Purchases from owners of CDC-managed farms.
6. Production of fruit on company-owned land. (This mechanism is currently not operational since any new plantings established by the CDC on company-owned land are at most only two years old.)

During its first two year's of operation, the CDC has relied heavily on the fourth-listed mechanism, namely, purchases through outgrower contracts, as a primary vehicle for obtaining raw material. However, from the outset, problems were encountered with this mechanism. These problems include nonrepayment of loans by large farmers, nondelivery of contracted product, and grower disgruntlement over CDC's nonacceptance of fruit that fails to meet

quality standards and CDC's price reductions below the price levels agreed upon in contracts which had been signed by both the CDC and the grower. The CDC has maintained that price reductions were allowable under the contract's terms and were required in 1985 due to a fall in the world market price of frozen orange concentrate, this price fall having been precipitated by a glut of orange concentrate exported to the U.S. by Brazil.

CDC personnel who assisted in the development of the present study include Mr. Derald Smart, CDC Manager; Arq. Jose Alejandro Diaz Zelaya, former assistant manager; Sr. Filiberto Diaz Zelaya; Ing. Eduardo Reynaud; and Sr. Pablo Alvarado Diaz. The latter two CDC employees assisted the study team (the consultant and a research assistant) to become familiar with the problems encountered by both the CDC and citrus growers during the plant's first two years of operation; they also assisted the team in locating citrus growers who were included in the sample of growers to be interviewed.

### Methodology

The design for this study grew out of a review of secondary information; preliminary discussions with FHIA, FEPROEXAAH, ANACIHO, and CDC representatives; and reconnaissance interviews with citrus growers in the Choloma and El Progreso regions. This preliminary phase of discussions was aimed at answering the question of how a characterization study of Honduran citrus growers could most usefully be developed. It became apparent during this exploratory phase that there are a number of key dimensions along which citrus growers could be usefully characterized. These dimensions included (1) whether or not the citrus grower is a member of ANACIHO, (2) whether or not the grower sells citrus to the CDC under contract, and (3) the number of manzanas which a farmer has planted to citrus. With these factors in mind, the idea began to crystallize of developing a stratified sampling frame based on these three factors, drawing a random sample of growers representative of the identified strata, and exploring through a survey interview questionnaire a number of variables or factors (e.g., technological practices) that could potentially be related to such characteristics as membership in ANACIHO, contract sales to CDC, and area planted to citrus.

### Questionnaire Design

Based on discussions with CDC personnel and members of FHIA's citrus and agricultural economics programs, and a review of the questionnaire used in FHIA's (1985) survey of the Choloma and El Progreso regions, a questionnaire was designed and field tested in preliminary interviews with citrus growers in both Choloma and El Progreso. Development of the questionnaire and its redrafting was facilitated by the CDC's permission to use the word processing capabilities of the firm's microcomputer.

In field testing of the questionnaire in Choloma, an attempt was made to obtain information for each grower's farm on a lot by lot basis. However, it became apparent, as we attempted to conduct interviews in the Choloma region that a significant number of the farm owners do not reside on the farm. In the absence of the owner, we attempted to interview the capataz (or "manager"). While the capataz was generally able to provide some of the desired information on a lot by lot basis, we found that there was considerable variation among capataces in their level of education and their

knowledgeability about the farm's production and commercialization practices. It quickly became apparent that obtaining much of the needed information would require additional time being allocated to locate and interview the farm's owner in the city (usually San Pedro Sula but also, in at least one case, Tegucigalpa). It also became apparent that, even if the desired data could be obtained, collecting the data on a lot by lot basis would quickly generate a tremendous amount of data that could not be readily analyzed given the limited resources available for conducting the study. Based on discussion of these reservations with CDC and FHIA personnel, a decision was made to reduce the scope of the study as follows:

1. To limit the geographical coverage of the study to the El Progreso region (rather than both the Choloma and El Progreso regions).
2. To focus on the characteristics of citrus production on the farm as a whole (rather than on a lot by lot basis).
3. To focus on a specific crop, namely, orange (rather than attempting to do a characterization study of producers of all types of citrus grown in El Progreso).

A decision was also made that the study would not seek to develop any estimates of gross or net returns, benefit/cost ratios, or returns on investment to citrus production. This decision was made in view of the limited resources available for conducting the study and recognition that FHIA's Department of Agricultural Economics, under the direction of Lic. Carlos Zacarias, is currently conducting a detailed study on production costs for citrus on a year by year basis, from the time citrus seedlings are planted until the first and subsequent years that the trees are in production. This study includes measurement of production costs, yields, and returns, with these measurements being developed through a diary or registry technique in which collaborating farmers record their costs as they are incurred. The present study, in contrast, relies solely on the grower's current knowledge of his or her citrus production and commercialization practices and recall of certain activities and events over the past two years. However, the study did attempt to collect some "point of reference" data on average labor costs incurred by growers for selected production activities. This information is presented in Appendix 8.

The final questionnaire (see Appendix 1) consisted of four sections as follows:

1. Information to identify the farm's location and the grower's residence (page 1).
2. Information to identify characteristics of the orchard and the grower's production and commercialization practices (pages 2-5).
3. Information to identify the socioeconomic characteristics of the grower and the level of institutional support received (pages 5-7).
4. Information to identify the grower's perceptions of the citrus market (pages 7-11).

Although the questionnaire was revised several times, hindsight indicates that a number of additional questions could have been usefully asked. In general, the interview respondents found the questions that were asked easy to follow and often a respondent, in answering one question, would start to answer some of the subsequent questions.

To facilitate recording of the grower's responses during the interview, a response form (see Appendix 2) was developed which contained a key word for or abbreviated version of each question as well as a blank space for recording the grower's response or the appropriate code for the response. Interviewing was initially conducted in Spanish by the consultant, while the research assistant recorded the grower's responses on the form. After a number of interviews, the research assistant began conducting the interviews, while the consultant listened and occasionally asked the grower for a clarification or additional information.

### Sample Design

The sample of citrus growers interviewed for this study was drawn from a sampling frame of 87 citrus growers listed in Annex 5 of FHIA's (1985) report on citrus growers in the region of El Progreso (see Appendix 4). This list also provided information on the number of manzanas (Mzas) of citrus cultivated by each grower and whether or not the grower was a member of ANACIHO. These data were supplemented by information drawn from the following lists: (1) a list provided by FEPROEXAAH/ANACIHO of the citrus growers in the El Progreso region who are or are not members of ANACIHO; and (2) a list provided by the Citrus Development Corporation (CDC) of the citrus growers who had sold citrus under contract to the CDC. During the course of the interviews, a third list of citrus growers was obtained from the Citrus Producers Association of El Progreso--Asociacion de Citricultores Progresenos (ACP). This list was not used in defining the sampling frame but was used in checking for consistency between the FHIA, CDC, and FEPROEXAAH/ANACIHO lists and how the interviewed growers actually responded as regards the question of whether a grower is a member of a citrus producers organization. (Copies of these lists have been provided to FHIA and are not included in this report; however, Appendix 5 does provide a list of additional citrus growers identified during the study who were not included in Appendix 4's list of growers.)

Utilizing the information in these lists, a sampling frame was defined that was stratified on three criteria: (1) whether or not the citrus grower is a member of ANACIHO; (2) whether or not the citrus grower had sold citrus under contract to the CDC in 1984 and/or 1985; and (3) whether the citrus grower cultivated less than 5 Mzas, 11-20 Mzas, 21-50 Mzas, or more than 50 Mzas. The resulting sampling frame is presented in Table 1.

Based on discussions with FEPROEXAAH, CDC, and FHIA personnel, and in view of limited resources (time, personnel, and vehicle) available for collecting data in the field, a decision was made to restrict the study's scope to growers cultivating 50 Mzas or less of orange. As may be seen in Table 2, farms cultivating 50 hectares (Has) or less of orange account for 87% of all orange-producers in Honduras. On the other hand, as may be seen in Table 1, only 6 (or approximately 7%) of the 87 growers in the sampling frame cultivated more than 50 Mzas of orange or other citrus. Note that 1 Mza. is equivalent to 7000 square meters, while 1 Ha. is equivalent to 10,000 square meters.

Table 1. Sampling Frame of 87 Citrus Growers in the El Progreso Region of Honduras, Stratified by Whether Grower is Member of ANACIHO, Whether Grower Has Sold Citrus Under Contract to CDC, and Mzas. of Citrus Cultivated by Grower.

| Mzas.                           | + ANACIHO  |  | - ANACIHO               |  |
|---------------------------------|--|--|-------------------------|--|
|                                 | + CDC<br>( <u>n</u> =16)                                       | - CDC<br>( <u>n</u> =20)   | + CDC<br>( <u>n</u> =0) | - CDC<br>( <u>n</u> =13)   |
| < 5<br>n=24                     | <u>57,63</u><br><br>(n =2)                                     | <u>05,17,18,</u><br><u>19,31,51,</u><br><u>52,71,80</u><br><br>(n=4)   | 03                      | <u>01,02,04,</u><br><u>06,07,46,</u><br><u>56,66,68,</u><br><u>69,72,83</u><br><br>(n=7) |
| 5-10<br>n=26                    | <u>09,10,22,</u><br><u>25,26,35,</u><br><u>45</u><br><br>(n=6) | <u>08,20,21,</u><br><u>23,40,53,</u><br><u>54,70,81</u><br><br>(n=6)   |                         | <u>11,24,32,</u><br><u>33,34,58,</u><br><u>67,73,74,</u><br><u>77</u><br><br>(n=4)       |
| 11-20<br>n=23                   | <u>29,36,41,</u><br><u>60,65</u><br><br>(n=5)                  | <u>13,27,28,</u><br><u>30,37,38,</u><br><u>39,42,43,</u><br><u>47,55,64,</u><br><u>75,84,85</u><br><br>(n=7) |                         | <u>12,59,86</u><br><br>(n=2)   |
| 21-50<br>n=9                    | <u>14,44,48,</u><br><u>50</u><br><br>(n=3)                     | <u>49,78,79,</u><br><u>82,87</u><br><br>(n=3)  |                         |  |
| 51-100<br>> 100<br>> 200<br>n=5 | 15<br><br>62   | 61,76  |                         | 16   |

Growers 03,04,24,30,55 excluded because grow only lemon.  
 Growers 15,16,61,62,76 excluded because > 50 Mzas.  
 Underlined number (e.g., 05) indicates interviewed grower.  
 Grower 73 was a cooperative that had cancelled its grapefruit planting and substituted African palm.  
 Grower 50 refused giving the interview.  
 Grower 25 was out of the country.

Table 2. Size in Hectares (Has.) and Number of Farms Growing Orange in Honduras (1984-85).

| <u>Farm Size a/</u> | <u>No.</u> | <u>%</u>    |
|---------------------|------------|-------------|
| < 1 Ha.             | 214        | 9.8         |
| 1 - < 2 Has.        | 286        | 13.1        |
| 2 - < 3 Has.        | 222        | 10.2        |
| 3 - < 4 Has.        | 126        | 5.8         |
| 4 - < 5 Has.        | <u>113</u> | <u>5.2</u>  |
| SUB-TOTAL           | 961        | 44.1        |
| 5 - < 10 Has.       | 351        | 16.1        |
| 10 - < 20 Has.      | <u>288</u> | <u>13.2</u> |
| SUB-TOTAL           | 639        | 29.3        |
| 20 - < 50 Has.      | 299        | 13.7        |
| 50 - < 100 Has.     | 131        | 6.0         |
| 100 - < 200 Has.    | 74         | 3.4         |
| 200 - < 500 Has.    | 54         | 2.5         |
| 500 - < 1000 Has.   | 13         | 0.6         |
| 1000 - < 2500 Has.  | 7          | 0.3         |
| > or = 2500 Has.    | <u>2</u>   | <u>0.1</u>  |
| SUB-TOTAL           | 580        | 26.6        |
| GRAND TOTAL         | 2180       | 100.0       |

a/ 1 Ha. = 10,000 square meters, while 1 Mza. = 7,000 square meters.

Source: Department of Agricultural Economics, FHIA.

With this restriction in mind, citrus growers cultivating only lemon (03, 04, 24, 30, and 55), based on the aforementioned Annex 5 and discussions with CDC field agronomists) or cultivating more than 50 Mzas. of citrus (15, 16, 61, 62, and 76, based on Annex 5) were eliminated from the sampling frame. By eliminating these 10 growers, the sampling frame was reduced to 77 growers, divided into three distinct groups as follows:

| <u>Groups</u>  | <u>n</u>  |
|--|-----------|
| <u>Group 1:</u> + ANACIHO / + CDC  | 18        |
| Member of ANACIHO (+ ANACIHO)<br>Sold under contract to CDC in 1984 and/or 1985 (+ CDC)        |           |
| <u>Group 2:</u> + ANACIHO / - CDC  | 36        |
| Member of ANACIHO (+ ANACIHO)<br>Didn't sell under contract to CDC in 1984 or 1985 (- CDC)     |           |
| <u>Group 3:</u> - ANACIHO / - CDC  | 23        |
| Not member of ANACIHO (- ANACIHO)<br>Didn't sell under contract to CDC in 1984 or 1985 (- CDC) | ---       |
| <b>TOTAL</b>   | <b>77</b> |

These three groups remained in effect even after the data were collected although certain citrus growers were found, based on the interview data, to fall in a different group than that in which they had originally been classified. Basically, the bulk of the reclassification of growers resulted because many interview respondents indicated that they were not a member of either ANACIHO or ANACIHO's regional affiliate in El Progreso--the Asociacion de Citricultores Progresenos (ACP). The difference between the number (n) of growers in the sampling frame (n1), the targetted number of growers that were randomly selected to be interviewed in each group (n2), and the actual number of growers, including replacements, interviewed in each group (n3) is summarized in Table 3.

The final distribution of sample farmers (n=49) across the three groups is presented in Table 4. Comparison of Table 4 with Table 1 provides an indication of which farmers were reclassified based on the data obtained through the interviews with the growers.

Table 3. Number of Growers in the Sampling Frame (n1), Targetted Number of Growers to be Interviewed in Each Group (n2), and Actual Number of Growers Interviewed in Each Group (n3).

---

| <u>Groups</u>                 | <u>n1</u> | <u>n2</u>           | <u>n3</u> |
|-------------------------------|-----------|---------------------|-----------|
| <u>Group 1: +ANACIHO/+CDC</u> | 18        | 18 <u>a/</u>        | 16        |
| <u>Group 2: +ANACIHO/-CDC</u> | 36        | 18 <u>b/</u>        | 9         |
| <u>Group 3: -ANACIHO/-CDC</u> | <u>23</u> | <u>12</u> <u>b/</u> | <u>24</u> |
| TOTAL                         | 77        | 48                  | 49        |

a/ Based on a decision to interview 100% of the growers in this group.  
b/ Based on a decision to interview 50% of the growers in this group.

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Table 4. Distribution of Sample Citrus Growers (n=49) Across Three Groups.

| Mzas.        | Group 1<br>+ANACIHO/+CDC<br>(n = 16)   | Group 2<br>+ANACIHO/-CDC<br>(n = 9)  | Group 3<br>-ANACIHO/-CDC<br>(n = 24)   |
|--------------|--|--------------------------------------|--|
|              | [A]  | [C]                                  | [D]  |
| < or =<br>10 | 09 <u>a/</u><br>20 <u>a/</u><br>26 <u>a/</u><br>27<br>35 <u>a/</u><br>63                         | 05<br>10<br>13 <u>d/</u><br>18<br>56 | 02 46 72<br>08 58 74<br>19 <u>c/</u> 59 81 <u>e/</u><br>21 68 83<br>22 <u>d/</u> 69<br>31 70 |
| > 10         | [B]  |                                      | [E]  |
|              | 14<br>29<br>45 <u>b/</u><br>48 <u>b/</u><br>49 <u>b/</u><br>57<br>60<br>79<br>84<br>85 <u>b/</u> | 36<br>53<br>65<br>77                 | 34<br>37<br>41<br>42<br>44<br>75<br>78<br>86 <u>e/</u>                                       |

- a/ Sold to CDC under contract only in 1984.
- b/ Sold to CDC under contract only in 1985.
- c/ Sold to CDC only in 1985 but without contract.
- d/ Sold to CDC only in 1984 but without contract.
- e/ Sold to CDC in 1984 and 1985 but without contract.

The three major groups identified in Table 4 may be defined as follows:

Group 1: Industrial Growers -- Those growers who are members of ANACIHO and who are selling some or all of their orange harvest on a contract basis to the CDC.

Group 2: Transitional Growers -- Those growers who are members of ANACIHO but who are not selling any of their orange harvest on a contract basis to the CDC.

Group 3: Traditional Growers -- Those growers who neither are members of ANACIHO nor sell any of their orange harvest on a contract basis to the CDC. This group is referred to as the traditional growers because they have basically continued to rely on sale of their harvest through traditional commercialization channels (e.g., sales to truckers).

Later in this report, these three groups will be disaggregated into five groups as follows:

Group 1:

Group A: + ANACIHO / + CDC / < or = 10 Mzas  
Group B: + ANACIHO / + CDC / > 10 Mzas

Group 2:

Group C: + ANACIHO / - CDC / > 0 Mzas

Group 3:

Group D: - ANACIHO / - CDC / < or = 10 Mzas  
Group E: - ANACIHO / - CDC / > 10 Mzas

This regrouping of Groups 1 to 3 into Groups A to E will permit making comparisons not only between "industrial" and "traditional" growers (e.g., Groups 1 and 3) but also between growers cultivating different areas of orange (e.g., Group A compared with Group B or Group B compared with Group D). As a point of reference, Appendix 6 provides a list of the growers who were interviewed, with each grower identified by the following: (1) the order in which the grower was located and interviewed (Interview No.), (2) the Grower No. (corresponding to "No. Productor" in Appendix 4's List of Citrus Growers), (3) the location of the farm (Location No. as per coding scheme for "Ubicacion de Finca" on p. 1 of the questionnaire), and (4) the group in which the consultant classified the grower (Group No.).

### Data Collection

The data for this study were collected primarily through interviews with the 49 sampled citrus growers. These interviews were conducted in Spanish by the consultant and a Honduran research assistant (Ing. Gustavo Laguna Enamorado). Assistance in locating the sampled growers was provided by field agronomists (Ing. Eduardo Reynaud and Sr. Pablo Alvarado Diaz) of the Citrus Development Corporation (CDC). At the outset of each interview, the research assistant explained to the grower that the study was being conducted to assist the Fundacion Hondurena de Investigacion Agricola (FHIA) in deciding what kinds of problems should be studied in its citrus research program. It was also explained that the study did not have any connection with the Government of Honduras, the National Citrus Producers Association (ANACIHO), or the Citrus Development Corporation (CDC), except that the field agronomist of the CDC was accompanying the survey team to assist the team in locating the growers whose names had been randomly drawn to be included in the study.

The interviews were conducted over an eleven day period from January 25 to February 5. During this period, ten days (excluding a Sunday) were actually used for interviews. An average of approximately five interviews per day were conducted, with the number of interviews per day ranging between a minimum of two and a maximum of seven. The average length of the interview was between a half hour to an hour, with the balance of each day's time being spent in trying to locate the next farmer to be interviewed. Approximately half (51%) of the interviews were conducted in or near the town of El Progreso, with the balance (49%) of the interviews taking place on or near the farms of the citrus growers. Of the total of 49 interviews, 47 were conducted with the owner or someone (other than the capataz) responsible for managing the farm. Of the two interviews not conducted with the owner, one interview was conducted with the capataz because the owner could not be located. The other interview was conducted with the owner's brother because the owner was out of the country and the farm did not have a capataz. At the end of each day's interviews, the consultant and the research assistant reviewed each questionnaire to check for any data and/or coding errors or inconsistencies.

### Data Coding, Tabulation, and Analysis

Following completion of the interviews, the preliminary coding scheme included in the survey questionnaire was revised and/or expanded for certain questions in order to accommodate unanticipated grower responses to these questions. Then each grower's questionnaire was reviewed and any responses requiring recoding were recoded. During this process, a check was also made to catch and resolve any data and/or coding errors or inconsistencies that had not previously been caught when a questionnaire had first been checked at the end of the day on which that questionnaire's interview had been conducted. A revised questionnaire including the final coding scheme is presented in Appendix 3.

The next step consisted in dividing the questionnaires into the five groups identified in Table 4. Then, within each group, the data from each questionnaire were transferred to a coding sheet. The data within each of the five groups were then tabulated to determine percentages and/or means, depending on the questionnaire item in question.

Next the tabulated data for each questionnaire item for each group were then transferred to a summary sheet according to the following format and example:

| <u>Variable</u>         | <u>Group</u> |          |           |          |          |
|-------------------------|--------------|----------|-----------|----------|----------|
|                         | <u>A</u>     | <u>B</u> | <u>C</u>  | <u>D</u> | <u>E</u> |
| No. Item                | -            | -        | % or Mean | -        | -        |
| 6. Farm Size (Manzanas) | 11.5         | 108      | 56.5      | 16.7     | 55.5     |

Once the data had been compiled in this format, the consultant grouped the variables under the following general categories:

1. Socioeconomic Characteristics
2. Orchard Characteristics
3. Technology Used
4. Institutional Support
5. Factors Influencing Planting and Harvesting Decisions

The specific variables included within each category and differences between the five grower groups across the variables within each category are discussed in detail in the section below on "Study Findings."

### Study Findings

The following discussion will review some of the statistics (percentages and means) which were calculated from the data. Basically, the discussion will focus on and compare differences between the five groups of citrus growers earlier identified. Primarily the discussion will focus on groups A, B, D, and E; however, where appropriate, relevant characteristics of group C will be noted. Near the end of the discussion of the study findings, we will focus more specifically, albeit briefly, on group C.

#### Socioeconomic Characteristics

Table 5 summarizes variables falling within the socioeconomic characteristics category. Recalling that growers in groups A and D have 10 or less Mzas. of orange, while those in groups B and E have more than 10 Mzas. of orange, we can see that there is a direct relationship between the total Mzas. owned by the grower and the number of Mzas. planted to orange. However, while growers in group E have only 3.3 times as much land as group D growers, growers in group B have 9.9 times as much land as group A growers.

Table 5. Socioeconomic Characteristics of Five Grower Groups in El Progreso.

| <u>Variable</u>         | <u>Group</u> |          |          |          |          |
|-------------------------|--------------|----------|----------|----------|----------|
|                         | <u>A</u>     | <u>B</u> | <u>C</u> | <u>D</u> | <u>E</u> |
| 06. Farm Size (Mza.)    | 11.5         | 108      | 56.5     | 16.7     | 55.5     |
| 40. Education (Years)   | 6.7          | 11.8     | 7.3      | 6.2      | 9.5      |
| 38. Off-Farm Employment | 50%          | 50%      | 50%      | 21%      | 63%      |
| --. Residence on Farm   | 50%          | 0%       | 22%      | 63%      | 38%      |
| 39. Family Size         | 4.7          | 5.9      | 6.6      | 7.3      | 7.8      |
| 44. Permanent Workers   | 1.7          | 4.0      | 3.4      | 0.5      | 2.7      |
| 46. Age                 | 58           | 58       | 57       | 51       | 44       |

This relationship between grower groups is also reflected in education, residence, family size, and permanent employees working on the farm. Looking at education, growers in groups B and E have, on average 4.2 more years of schooling than have growers in groups A and D. However, while group E growers have only 3.3 more years of education than group D growers, group B growers have 5.1 more years of education than group A growers. Generally, half of the growers benefit from some form of off-farm employment. With the exception of group D growers, approximately 50% of the growers in each group have some type of off-farm employment or business. This percentage falls to 21% in the case of group D growers, while it rises to 63% in the case of group E growers.

Depending on the group in which the grower is classified, there are some major differences in the source and composition of the labor used in operating the farm. First, there are many farms in which it is the case that the grower does not live on the farm but rather in a nearby city (e.g., El Progreso). The percentage of growers who reside on the farm is lowest in the case of growers in groups B (0%) and E (38%); as farm size decreases, the percentage of farmers residing on the farm increases--the case of groups A (50%) and D (63%). Thus, as farm size increases, and to the extent that the grower does not reside on the farm and is otherwise occupied in some form of off-farm employment, the likelihood increases that the grower will need to employ at least one person, normally called the capataz or mayordomo, to look after the farm. Thus, looking at the number of permanent employees working on the farm, we see that growers in groups B and E (> 10 Mzas.) employ an average of 4.0 and 2.7 workers, while growers in groups A and D (10 or less Mzas.) employ an average of only 1.7 and 0.5 workers, respectively.

In terms of the variable of family size, some interesting observations can be made which would appear to have implications for the type of labor employed on the farm. First, growers in groups A and B tend to have smaller family sizes (4.7 and 5.9 members, respectively), while growers in groups D and E tend to have larger family sizes (7.3 and 7.8 members, respectively).

Second, there is a strong indication that growers in groups A and B tend to rely more heavily on hired labor (1.7 and 4.0 permanent workers), while growers in group D tend to rely more heavily on family labor (only 0.5 permanent workers). Indeed, it is group D in which we find the lowest percentage of off-farm employment (21%), the highest percentage of growers residing on the farm (63%), and the lowest number of permanent workers (0.5). By contrast, while the family size of growers in group B (5.9) is somewhat smaller than that of growers in group D (7.3), none of the group B growers reside on the farm. Thus, group B growers tend to rely on hired labor and, indeed, the number of permanent workers in group B (4.0) is higher than in any other group.

Relatively little variation across groups was observed in the age of the grower, except that growers in groups D and E tended, on average, to be a little over 10 years younger than the growers in groups A and B.

Generally, the picture which emerges from an analysis of this information on the socioeconomic characteristics of the different grower groups may be summarized as follows. Growers in groups A and C, the so-called "industrial" growers, have a relatively greater amount of resources (as measured by farm size, education, access to off-farm employment, and employment of permanent workers). By contrast, the so-called "traditional" growers have a small amount of resources (as measured by the same variables). The difference between the "industrial" and "traditional" growers is most pronounced when we compare growers in groups B and D, the difference between these two groups being greatest in terms of the percentages of growers residing on the farm (0% in the case of group B and 63% in the case of group D). As compared to the "industrial" (or group B) grower, the "traditional" (or group D) grower tends to be younger, have fewer years of schooling, have little or no off-farm employment, reside on the farm, have a larger family, and employ fewer, if any, permanent workers. By contrast the "industrial" (group B) grower, tends to be older, have more years of schooling, have some form of off-farm employment, reside in a nearby town or city, have a smaller family, and employ a larger number of permanent workers.

#### Characteristics of the Orchard

Data pertaining to the characteristics of the orchards in which the grower has orange trees planted is presented in Table 6. Data on estimated productivity (number of oranges per tree) are presented in the following section on "Technology Used."

The reader may observe that at least 60% of the growers in each group also cultivate other crops on their farm. Interestingly, it is in grower groups A and D (< 10 Mzas of orange) that one finds the largest percentages of growers cultivating other crops. As the number of Mzas. of orange planted increases (the cases of groups B and E), the percentage of growers who do not cultivate crop others than orange increases, this especially being the case with many growers in Group B.

Table 6. Characteristics of the Orange Orchards of Five Grower Groups in El Progreso.

| <u>Variable</u>            | <u>Group</u> |          |          |          |          |
|----------------------------|--------------|----------|----------|----------|----------|
|                            | <u>A</u>     | <u>B</u> | <u>C</u> | <u>D</u> | <u>E</u> |
| 07. Grows Other Crops      | 83%          | 60%      | 67%      | 81%      | 75%      |
| 14. Holds Title to Land    | 100%         | 80%      | 78%      | 38%      | 87%      |
| 18. Has Intercropping      | 50%          | 20%      | 33%      | 31%      | 25%      |
| 11. Total Mzas. Planted    | 6.4          | 26.6     | 8.0      | 4.6      | 24.4     |
| 12. Mzas. In Production    | 6.4          | 19.8     | 6.8      | 3.6      | 19.1     |
| 13. Mzas. In Seedlings     | 0.0          | 6.8      | 1.2      | 1.0      | 5.4      |
| 15. Space (ft.) Btw. Trees | 20.5         | 22.0     | 22.3     | 20.5     | 21.6     |
| 17. Trees / Mza.           | 202          | 162      | 184      | 192      | 170      |
| 10. Potential Sell to CDC  | 3.5          | 2.4      | 2.6      | 2.1      | 2.9      |

Generally, land planted to orange is land for which the grower holds title (dominio pleno), "holding title" meaning that the grower can legally sell the land to a buyer. The largest percentage (62%) of land planted to orange under a form of usufruct tenure (dominio util) occurs in group D where only 38% of the growers hold title to the land they have planted in orange. Under Honduran law, land under dominio util cannot be sold or rented; also, any land held under dominio pleno and planted to citrus cannot be expropriated from its current holder. Because of the existence of this law, some students of the "citrus sector" in Honduras have expressed a concern that a significant number of Hondurans holding land under dominio util may be rushing to plant land to citrus; with their motivation being less one of ensuring the greatest economic return from the land and more one of insuring that the land cannot be expropriated from its current user.

The different grower groups vary in terms of the percentages of growers who practice some form of intercropping in their orange orchards. This practice tends to be more common in new plantings of citrus seedlings such as orange. However, as the seedlings grow, they begin to compete with standing intercrops for nutrients and sunlight; eventually, as the trees grow larger and mature, the trees' shade will make it difficult to grow most types of crops on an intercropping basis. In the present sample, intercropping was more prevalent in the smaller farms (50% and 31% in groups A and D as compared with 20% and 25% in groups B and E, respectively). Interestingly, it is in group B, the larger "industrial" growers, that one finds the lowest percentages of growers intercropping (20%) and cultivating only orange (40%).

One can see that growers in the "industrial" groups (A and B) tend to have a slightly greater number of Mzas. planted to orange--6.4 and 26.6 Mzas., respectively--than do growers in "traditional" groups D and E--4.6 and 24.4 Mzas., respectively. On average, growers across the five groups have approximately 75% of their total Mzas. in orange in production. However, in group B (the larger "industrial" growers), one finds the largest number of Mzas. (6.8) in seedlings (trees not currently in production). The percentage of land planted to seedlings (6.8 Mzas.) relative to total Mzas. planted in orange (25.6%) is larger in this group than any of the other groups.

During the interview, we estimated the density of planting of orange trees on each farm. The grower was asked about the distance between trees and the number of trees planted per manzana. This latter figure was estimated by dividing the grower's estimate of the total number of orange trees on the farm by the total number of Mzas. planted to orange. Where the grower could not give an estimate of the total number of trees, we asked the grower if he or she worked with an estimated number of trees planted per Mza. In some cases, the number of trees per Mza. was estimated by converting the space or distance (feet) between trees into meters, squaring this converted distance, and then dividing by 7,000 square meters per manzana. With the exception of a few growers, most respondents reported that trees were planted four to a square (equidistance between trees) rather than four to a rectangle (a shorter distance between trees in a row than between trees in adjacent rows).

During the interviews, numerous potential sources of error in estimating how many orange trees are planted per hectare became apparent. These sources of error include: (1) error in the grower's response as regards the number of manzanas planted to orange, (2) error in the grower's response as regards the total number of orange trees planted on the farm, (3) error in the grower's estimate of the distance between trees, (4) variation in distance between trees planted in one lot at one point in time and trees planted in another lot at another point in time, (4) variation within lots in terms of the numbers of seedlings intercropped with trees currently in production, and (5) variation within lots in terms of the number of dead orange trees, non-orange trees, and/or missing trees. In view of these potential sources of error, the reader should exercise due caution in evaluating the following data on distance between trees and trees per manzana.

The growers reported, on average, that the distance between trees is 21.4 feet. As the reader may observe in Table 6, the distance between trees in the orchards of growers in groups B and E (> 10 Mzas.) is slightly greater (by 1.3 feet) than the distance between trees planted in the orchards of growers in groups A and D. Consistent with this finding, the estimated number of trees per Mza. was found to be smaller in the orchards of growers in groups B and E (162 and 170 trees per Mza., respectively) than in the orchards of growers in groups A and D (202 and 192 trees per Mza., respectively). The consistency between these two sets of figures suggests that, consciously or unconsciously, growers having access to smaller amounts of land have planted this land with a greater density (trees per Mza.) than have growers for whom access to land was less, if any, of a constraint. If there is indeed variation across farm sizes in the number of trees per Mza., then such variation needs to be taken into account in making orchard management decisions (e.g., how much fertilizer to apply per Mza. or per tree) as well in relating agronomic and economic analyses of citrus production to actual grower conditions.

The final characteristics of the orchard on which data were collected was an indicator of the potential of the orchard to sell oranges to the CDC. During the interview, the grower was asked: "What variety of orange is principally planted on your farm?" (Question 10). This question was aimed at identifying the variety of orange having the greatest number of trees planted on the farm. Half of the respondents indicated one principal variety as being planted in their orchards, while the balance of the respondents reported that they have two or more varieties, as follows:

| <u>Number of Varieties</u> | <u>n</u> | <u>%</u> |
|----------------------------|----------|----------|
| 1                          | 25       | 51       |
| 2                          | 15       | 31       |
| 3                          | 5        | 10       |
| 4                          | 3        | 6        |
| 5                          | <u>1</u> | <u>2</u> |
| TOTAL                      | 49       | 100      |

Caution should be exercised in interpreting these data. Growers reporting only 1 principal variety may likely have additional varieties planted but were able to indicate a specific variety as the principal variety planted on the farm. Growers not indicating a principal variety may not have had precise knowledge of which of two or more varieties is the principal variety; alternatively, it could also be the case that this type of information has not been of any particular relevance to these growers' past decisionmaking as regards orchard management and product commercialization.

Based on the grower's indication of the principal variety planted on the farm, a scale weight was assigned to each grower. The assigned weight was in accordance with a scale developed by the consultant based on discussions with CDC personnel. The scale assigned a higher weight (e.g., 5) to those varieties (e.g., Valencia Roja) which are in great demand by the CDC and a lower value to those varieties having a lesser industrial demand (e.g., 2 = Criolla) or for which CDC's requirements are nil (e.g., 0 = Victoria, Nevula, and India). The scale used in measuring the grower's potential to sell to the CDC was as follows:

| <u>Weight</u> | <u>Variety of Orange</u>                           |
|---------------|--|
| 5             | Valencia Roja                                      |
| 4             | Tangelo or Mandarinina                             |
| 3             | Pina   |
| 2             | Crilloa ("jugo")                                   |
| 1             | Valencia Blanca, Valencia Palida, and Valencia (?) |

Growers who responded that they had only one principal variety planted were assigned the scale weight for that variety. Growers reporting two or more varieties were assigned the scale weight corresponding to the variety having the highest scale weight. Thus, for example, if a grower responded that he had some Valencia Palida (1), some Pina (3), and some Nevula (0), the grower was assigned the scale weight for the variety with the greatest industrial (CDC) demand of the three reported varieties; in this case, the assigned weight would be a "3", since this is the one variety that the grower has planted which has the greatest potential to be sold to the CDC. If a grower indicated that he or she had "Valencia" but could not confirm that the variety in question was indeed "Valencia Roja", a "Valencia (?)" response was coded as a "1".

Referring back to Table 6, the reader may observe that average "potential to sell to the CDC" (2.95) of the "industrial" growers in groups A and B (3.5 and 2.4, respectively) is higher than the comparable figure (2.5) for the "traditional" growers in groups D and E (2.1 and 2.9, respectively). Thus, the growers who are in the groups (A and B) that currently sell orange to the CDC under contract are precisely the growers whose orchards have orange varieties having the greatest potential to sell to the CDC.

#### Technology Used

As earlier indicated, one section of the questionnaire was oriented to asking the growers about the technology they employed in cultivating orange. The growers were asked about the utilization of irrigation systems, drainage systems, soil analyses, fertilization, weed control, insect control, disease control, pruning, and protection of wounds to the tree. The growers' responses to the questions asked about these technological practices are summarized in Table 7.

Table 7. Technological Practices of Five Grower Groups in El Progreso.

| <u>Variable</u>              | <u>Group</u> |          |          |          |          |
|------------------------------|--------------|----------|----------|----------|----------|
|                              | <u>A</u>     | <u>B</u> | <u>C</u> | <u>D</u> | <u>E</u> |
| 19. Has Irrigation System    | 67%          | 40%      | 11%      | 06%      | 0%       |
| 20. Has Drainage System      | 0%           | 70%      | 33%      | 31%      | 50%      |
| 21. Did Soil Analyses        | 0%           | 40%      | 0%       | 0%       | 38%      |
| 22. Fertilizations / Year    | 1            | 1        | 1.3      | 1.2      | 1.1      |
| 23. Controls Weeds           | 2.3          | 4.8      | 3.3      | 2.7      | 4.1      |
| 25. Controls Insects         | 67%          | 80%      | 89%      | 37%      | 75%      |
| 26. Controls Diseases        | 33%          | 50%      | 56%      | 31%      | 12%      |
| 27. Does Pruning/Trimming    | 100%         | 90%      | 78%      | 75%      | 100%     |
| 28. Protects Wounds          | 83%          | 40%      | 44%      | 18%      | 50%      |
| Level of Technology          | 6.7          | 9.9      | 7.5      | 5.4      | 8.5      |
| 30. Oranges / Tree <u>a/</u> | 817          | 844      | 806      | 615      | 640      |

a/ Measured as the farmer's estimate of the average number of oranges per tree from the principal harvest of 1985; some growers also reported an estimate of the average number of oranges / tree from a second harvest in 1985, but this amount is not included in this study's productivity measure (oranges / tree).

Additionally, based on each grower's individual responses, the consultant calculated what may be termed a "level of technology" scale which translates all of the information about an individual grower's technological practices into a single variable. The scale value for each grower was constructed by converting the grower's response concerning each technological practice into a numerical weight and then summing the weights across practices, thereby resulting in a single score for each grower. Then the average score (mean) for each of the five grower groups was calculated. The scoring scheme used in translating the grower's responses to weights was as follows:

Level of Technology

| <u>Technological Practice</u>   | <u>Response a/</u> | <u>Weight</u> |
|---------------------------------|--------------------|---------------|
| For Any Practice                | 0                  | 0             |
| 19. Has Irrigation System       | 1-4                | 1             |
| 20. Has Drainage System         | 1                  | 1             |
| 21. Did Soil Analysis           | 1                  | 1             |
| 22. Fertilizations / Year       | 1-3                | 1-3           |
| 23. Controls Weeds              | 1-7                | 1-7           |
| 25. Controls Insects <u>b/</u>  | 3-5                | 1             |
| 26. Controls Diseases <u>c/</u> | 2-3                | 1             |
| 27. Does Pruning/Trimming       | 1-5                | 1             |
| 28. Protects Wounds <u>c/</u>   | 2-6                | 1             |

a/ Response codes are summarized in the questionnaire (see Appendix 3).

b/ Responses of "1" and "2" were scored as a "0".

c/ A response of "1" was scored as a "0".

As may be seen in Table 7, there are some interesting differences between grower groups in the ability of growers to manage water. Irrigation systems of one form or another are much more prevalent on growers's farms in groups A and B as compared with groups D and E. Similarly, there is a greater presence of drainage systems on larger farmers (groups B and E) than on small farmers (groups A and D). Of course, farms vary in terms of soil type and whether the soil type present in the grower's orange orchard requires a system of drainage.

Only seven growers had obtained a soil analysis of their orange orchards during the past two years. Those growers who had obtained such an analysis were found only among the larger growers (groups B and E). Interestingly, as may be seen in Table 7, there is some evidence that the "traditional" growers (groups D and E) fertilize their orchards a little more frequently than do the "industrial" growers (groups A and B). Although data were not collected on the specific fertilizers applied and dosage levels used, one must wonder on what basis growers make fertilizer decisions as regards nutrients required, dosage levels, and frequency of application. Based on discussions with CDC personnel, there is reason to suspect current yield levels (oranges per tree) are, on average, less than one third below below potentially attainable yield levels.

Whether growers are applying optimum input levels is an issue that merits close scrutiny. Many of the growers who were interviewed expressed concern over what they perceive as "high" prices for inputs (e.g., fertilizers). However, the issue of input costs is one that must be evaluated in terms of both the potential reduction in per unit production costs that can be achieved by using productivity increasing inputs and the likely returns the grower can earn by selling a larger volume of a lower cost product at an expected market or contracted price. Currently, however, the view expressed by many growers is that they have little incentive to increase productivity if they can only earn Lempiras 125 / ton by selling to the CDC. At the same time, it may be the case that growers do not recognize that investing in productivity-increasing technology effectively reduces per unit production costs, thereby enabling the farmer to earn a greater profit on each orange sold.

Also included in Table 7 are data on the prevalence of growers applying weed, insect, and disease control measures in their orchards. For the weed control variable, a scale was devised according to the following weighting scheme:

| <u>Type of Control</u>           | <u>Weight</u> |
|----------------------------------|---------------|
| None                             | 0             |
| Only manual (machete)            | 1             |
| Only mechanical (mower)          | 2             |
| Only chemical (herbicides)       | 3             |
| Manual and mechanical            | 4             |
| Manual and chemical              | 5             |
| Mechanical and chemical          | 6             |
| Manual, mechanical, and chemical | 7             |

Then the average score on weed control for each grower group was calculated. As may be seen in Table 7, growers in groups B and E, the larger growers, practiced higher levels of weed control; by contrast, the lower levels of weed control occur among the small growers (groups A and D). The greatest difference in level of weed control is reflected in the difference between the large "industrial" growers in group B (4.8) and the small "traditional" growers in group D (2.7).

With the exception of growers in group D, nearly 70% or more of the growers in the other groups practiced some form of insect control. It is in group D, the largest sample group (n=16), that one finds the lowest percentage (37%) of growers who practice some form of insect control. Overall, of 49 growers, 11 (or 22%) indicated that their trees had experienced some insect problems during 1985, but that they had not controlled these problems in any manner. Over half (n = 6) of these 11 growers were among the smaller "traditional" growers (group D).

Percentages of growers practicing some form of disease control are lowest in groups D and E (31% and 12%, respectively). However, even among the larger "industrial" growers (group B), the percentage of growers applying disease control measures was only 50%. Overall, of 49 growers, 13 (or 26%) indicated they their trees had experienced some disease problems during 1985, but that they had not applied any control measures.

Growers generally practiced some form of pruning or trimming, although there is appeared to be a relatively low of awareness of the need to trim trees in a way that will optimize access of sunlight to the trees. Pruning is primarily done to cut off unwanted shoots and diseased or dead branches. With the exception of the small industrial growers (group A), where over 80% of the growers said that they protected wounds caused by pruning, fewer than half of the growers in the other groups follow a practice of protecting tree wounds.

As mentioned earlier, a summary "technological practices" variable was constructed. As the reader may observe in Table 7, the larger growers (groups B and E) tend to score higher on this "level of technology" measure than do the smaller growers (groups A and D). Also, the "industrial" growers (groups A and B) scored higher than comparably sized "traditional" growers (groups C and D, respectively).

Turning to a productivity measure, we see that that yields (oranges/tree) of larger growers (groups B and E) are higher than yields of smaller growers (groups A and D). Also, "industrial" grower yields (groups A and B) are higher than comparably-sized "traditional" grower yields (groups D and E). Given due recognition to the statistical limitations, and purely in the spirit of exploration, a simple correlation coefficient ( $r = .47$ ) was calculated between the "level of technology" and the yield (oranges/tree) variables reported in Table 7. The data points for groups A & B and groups D & E for these two variables were then averaged, as below, and a correlation coefficient was calculated ( $r = .87$ ):

| <u>Variable</u>     | <u>Groups A &amp; B</u> | <u>Group C</u> | <u>Groups D &amp; E</u> |
|---------------------|-------------------------|----------------|-------------------------|
| Level of Technology | 8.3                     | 7.5            | 6.95                    |
| Oranges / Tree      | 831                     | 806            | 628                     |

The difference between these two coefficients ( $r = .47$  and  $r = .87$ ) suggests not only that the level of technology applied by a grower is correlated with a tree's productivity ( $r = .47$ ) but also that this relationship is even stronger when one compares "industrial" (groups A and B) to "traditional" growers (groups D and E), without controlling for farm size (measured in terms of Mzas. planted to orange).

Why does the correlation coefficient fall from  $r = .87$  to  $r = .47$  when one controls on farm size? This question's answer lies in the consistency between this study's findings and those of many other farmer productivity studies conducted in the developing countries (Harwood, 1979:71-75; Sisler and Colman, 1979; Whyte and Boynton, 1983:146-148). As in these other studies, this study found that when one controls on farm size, the correlation between level of technology and yield is decreased because the larger farmer is not as efficient as the small farmer in converting limited resources into increased productivity. This may be readily seen by examining the data in Table 8.

Table 8. Comparison of Productivity Coefficients of Smaller and Larger Farms in Five Grower Groups in El Progreso.

| <u>Variable</u>       | <u>Group</u> |          |          |           |          |          |
|-----------------------|--------------|----------|----------|-----------|----------|----------|
|                       | <u>A</u>     | <u>B</u> | <u>C</u> | <u>a/</u> | <u>D</u> | <u>E</u> |
| Level of Technology   | 6.7          | 9.9      | 7.5      |           | 5.4      | 8.5      |
| 30. Oranges / Tree    | 817          | 844      | 806      |           | 615      | 640      |
| Output / Input        | 122          | 85       | 108      |           | 114      | 75       |
| Trees / Mza.          | 202          | 162      | 184      |           | 192      | 170      |
| Oranges / Mza. ('000) | 165          | 137      | 148      |           | 118      | 109      |

a/ Group C has 5 growers with 10 or less Mzas. & 4 growers with > 10 Mzas.

The greater productivity of smaller as compared with larger growers, both in the "industrial" and "traditional" groups, may be seen by calculating a ratio of output (yield as measured by oranges / tree) to input (as measured by the level of technology). As may be seen in Table 8, the output/input ratios for the two groups of smaller growers (122 for A and 114 for D) are higher than the output/input ratios for the two groups of larger growers (85 for B and 75 for D). This result further indicates not only that the "industrial" growers utilize scarce resources more efficiently than the "traditional" growers" but also that the productivity of the smaller "industrial" grower is higher than that of growers in any other group. Thus, for example, if we compare the total number of oranges produced per Mza. by growers in groups A and B, we can see that the production level of the smaller "industrial" grower (group A) is 20% greater than the productivity level of the larger "industrial" grower.

### Institutional Support

Table 9 summarizes the percentages of growers receiving different types of institutional support during 1985. Types of institutional support taken into consideration include credit, input supply, technical assistance, and marketing. Data were also collected on the percentages of growers who know of the Fundacion Hondurena de Investigacion Agricola as well as the percentages of growers who are members of a citrus producers organization or association.

Credit -- As may be seen in Table 9, relatively few growers in groups A, B, and C, and none in groups D and E, utilized agricultural credit to support their citrus operations. Growers were generally reluctant to take on loans given perceived high interest rates (19%) and uncertainty as regards the price they will receive for their oranges when harvested.

Input Supply -- As a measure of access to input supply, each grower was asked whether he or she had used fertilizer during 1985 and from whom the fertilizer had been purchased. Excepting the larger "traditional" growers (group E), at least 50% of the growers in the other groups applied fertilizer during 1985. However, as the reader may recall from Table 8, it was group E (the larger "traditional" growers) that had the lowest productivity measure (output/input = 75) of the five groups studied. On the other hand, group B (the larger "industrial" growers) had the largest percentage of growers (75%) who used fertilizer during 1985. But while group B had the highest percentage of growers using fertilizer, this group had the second lowest productivity measure (output/input = 85).

Some information on the grower's input supply sources is presented in Table 10. Most growers obtain their fertilizers from private stores in nearby towns (e.g., El Progreso). Some growers in groups B, C, and D obtained fertilizer from BANADESA's input store, while two growers (1 each in groups A and B) obtained fertilizer from the CDC. These latter two growers sold orange under contract to the CDC during 1985 and had received the inputs as an advance to be repaid out of the proceeds from the fruit they sold to the CDC at harvest time. Apparently, a greater number of growers had relied on the CDC as a source of input supply during 1984. However, with the problems encountered by the CDC in recovering loans made in 1984, the CDC may have reduced the number of growers to whom cash and/or input advances were made in 1985.

Table 9. Institutional Support to Five Grower Groups in El Progreso.

| <u>Variable</u>   | <u>Group</u> |          |          |          |          |
|---|--------------|----------|----------|----------|----------|
|   | <u>A</u>     | <u>B</u> | <u>C</u> | <u>D</u> | <u>E</u> |
| CREDIT  |              |          |          |          |          |
| 45. Received a Loan   | 34%          | 30%      | 11%      | 0%       | 0%       |
| INPUT SUPPLY  |              |          |          |          |          |
| 22. Bought Fertilizer in Private Sector Store                   | 67%          | 70%      | 67%      | 50%      | 38%      |
| TECHNICAL ASSISTANCE (TA)                                       |              |          |          |          |          |
| 50. Received TA   | 17%          | 50%      | 33%      | 12%      | 37%      |
| 53. Knows <u>El Agricultor</u>                                  | 50%          | 80%      | 33%      | 37%      | 75%      |
| KNOWS OF CITRUS RESEARCH CENTER                                 |              |          |          |          |          |
| 54. Knows of FHIA   | 100%         | 80%      | 89%      | 37%      | 88%      |
| AFFILIATION WITH A CITRUS PRODUCERS ORGANIZATION OR ASSOCIATION |              |          |          |          |          |
| 56. Member of ANACIHO or ACP                                    | 100%         | 100%     | 100%     | 0%       | 0%       |
| MARKETING   |              |          |          |          |          |
| 10. Potential Sell to CDC                                       | 3.5          | 2.4      | 2.6      | 2.1      | 2.9      |
| 32. Sold Only to Truckers                                       | 0%           | 0%       | 44%      | 50%      | 43%      |
| 32. Sold to CDC (1985)  | 83%          | 90%      | 0%       | 12%      | 14%      |
| 60. Sold to CDC (84 + 85)                                       | 83%          | 80%      | 0%       | 6%       | 12%      |
| 64. Sold to CDC Under Contract (84 + 85)                        | 67%          | 80%      | 0%       | 0%       | 0%       |
| 31. Avg. Price (L/1000)   | 37.80        | 38.20    | 42.40    | 35.60    | 35.00    |

Table 10. Source of Input Supply for Five Grower Groups in El Progreso:  
Fertilizer Applied in 1985

|                          | <u>Group</u> |          |          |          |          | <u>Total</u> |
|--------------------------|--------------|----------|----------|----------|----------|--------------|
|                          | <u>A</u>     | <u>B</u> | <u>C</u> | <u>D</u> | <u>E</u> |              |
| Sample (n)               | (6)          | (10)     | (9)      | (16)     | (8)      | 49           |
| Did Not Apply Fertilizer | 1            | 2        | 2        | 5        | 2        | 12           |
| <u>Source</u>            |              |          |          |          |          |              |
| Factory                  | 0            | 0        | 0        | 0        | 2        |              |
| BANADESA                 | 0            | 1        | 1        | 2        | 0        |              |
| Private Store            | 4            | 7        | 6        | 8        | 3        |              |
| % of Group n             | 67%          | 70%      | 67%      | 50%      | 38%      |              |
| Private Store in S.P.S.  | 0            | 0        | 1        | 0        | 1        |              |
| CDC                      | 1            | 1        | 0        | 0        | 1        |              |
| Cooperative              | 0            | 0        | 1        | 1        | 0        |              |
| SUB-TOTAL                |              |          |          |          |          | 40           |
| TOTAL <u>a/</u>          |              |          |          |          |          | 52           |

a/ Total is 52 is 3 > 49 because 3 growers each purchased fertilizer in 1985 from two different sources.

Technical Assistance -- Few growers received technical assistance in citrus production from any source in 1985. More than 80% of the smaller growers (groups A and D) did not receive any technical assistance. On the other hand, half or nearly half of the larger growers (50% in group B and 37% in group E) received technical assistance from some source. Sources of technical assistance reported by growers in group B included input supply stores (reported by 1 grower), agronomos employed by the public sector (2), a course (2), and FHIA (2). While none of the growers mentioned having received any technical assistance from the CDC, the CDC was likely a source of some technical information for growers in groups A and B, i.e., "industrial" growers who were in contact with the CDC during 1985. Across all groups, the most frequent sources of technical assistance were public sector agronomos (mentioned by 6 growers) and an ANACIHO-sponsored course on pruning (6).

Newspaper and magazines are potential media for disseminating information to citrus growers. However, this study found that growers do not rely on print media as sources of information about citrus production. One potential medium for reaching citrus growers is the newspaper titled El Agricultor. While 75% or more of the larger growers (groups B and E) indicated they had heard of this newspaper, 50% or less of the small growers (groups A and D) knew of the paper. Only a fourth (n = 13) of the growers indicated they had received or purchased a copy of the paper. A number of growers indicated that they received Agricultura en las Americas, a magazine published in the U.S.

Although only a few growers indicated that they had received technical assistance from FHIA in 1985, eight growers (four in group B) indicated that they would turn to FHIA for assistance in resolving technical problems that arise in citrus production. Another eight growers indicated that they would turn to ANACIHO or FEPROEXAAH for assistance in resolving citrus production problems arising in the future. The source most frequently mentioned was public sector agronomos (mentioned by 12 growers). Other sources were owners of other farms (1), input dealers (4), CDC agronomos (2), private agronomos (6), and a course (2). One grower, contemplating the source to which he would turn for help in resolving citrus production problems in the future, replied: "Pues, a Dios!" ("Well, to God!"). This grower's response perhaps reflects frustration that he had not received technical assistance from any source during 1985. Nine or nearly 20% of the growers did not or were not able to indicate a source to which they would turn for technical assistance in resolving citrus production problems in the future.

In terms of differences among groups in the sources to which a grower would turn for technical assistance to resolve citrus production problems, eight of the "traditional" growers (groups D and E) mentioned public sector agronomos, while only 1 "industrial" grower mentioned this source. On the other hand, while only 3 of the "traditional" growers (groups D and E) mentioned that they would turn to ANACIHO / FEPROEXAAH or FHIA for technical assistance, 10 of the "industrial" growers cited ANACIHO / FEPROEXAAH or FHIA as potential sources of technical assistance. Thus, the "traditional" growers in groups D and E tend to look on the public sector as a first source of technical assistance for resolving problems in citrus production, whereas the "industrial" growers in groups A and B are more likely to turn for technical assistance to private sector organizations such as ANACIHO / FEPROEXAAH and/or FHIA which are perceived as having specialized expertise in citrus production.

Knows of Citrus Research Center -- Because of FHIA's mandate to develop improved technology for various crops including orange and other citrus, growers were asked if they knew of FHIA prior to the interview. Awareness of FHIA's existence was found to be lowest among the small "traditional" growers (group D), while 80% or more of the growers in the other groups had heard of FHIA. Some of the growers know of FHIA as the La Quimica, a popular name for FHIA's research facilities when formerly operated by the United Fruit Company. Awareness of FHIA's research program on citrus has been increased by field work which FHIA's agronomy department and citrus programs have conducted over the past year or so (e.g., grower surveys and soil characterization studies). Various growers interviewed indicated that FHIA technicians had taken soil samples from their farms during 1985; these growers expressed interest in obtaining feedback on FHIA's analyses of their soils.

Affiliation with Citrus Producers Organization -- As may be observed in Table 9, none of the "traditional" growers (groups D and E) are members of ANACIHO or ACP, while 100% of the other growers (groups A, B, and C) are members of these organizations. Growers in groups D (n = 16) and E (n = 8) were asked why they are not members of a citrus growers organization. The larger (group E) growers' responses to this question clustered around a benefit/cost theme, with three growers stating that they didn't see any benefit in being a member or felt only a few benefitted by being members. Another three growers indicated their reason as being a lack of time or that it would not be worth the time involved in becoming a member and participating in such an organization. Only one respondent lacked information about becoming a member of a citrus growers organization, while another indicated that he lived too far from the city to be a member.

By contrast, smaller growers (group D) indicated a much greater diversity of reasons for not being a member of a citrus growers organization, including lack of time (1); the opportunity had not presented itself (2); previous negative experience with a cooperative or an organization (3); preference for working on one's own (1); does not perceive any benefit or that only a few benefit (1); orchard not yet in production, has only a little production, or farm is small (4); health problem (1); and unable to specify or specifies "does not like" (3). While the smaller growers in group D are among those who could potentially receive the greatest benefit by being a member of a citrus growers organization, lack of an economic incentive does not appear to be the central theme accounting for their lack of membership. These growers either believe that the current production status of their farm does not warrant that they should become members of a citrus growers organization (a view reflected by four group D growers) or they have a negative attitude toward getting involved in such an organization (a view reflected by three group D growers who reported previous negative experiences with a cooperative or some other organization). Possibly some of the negative attitude toward becoming a member of a citrus growers organization reflects negative experiences many of these growers have had with past or current cooperatives in the agrarian reform sector. Another potential explanatory factor could be the size of the initial membership fee and monthly quota which growers must pay in order to be a member of the ACP or ANACIHO. As of this report's writing, FEPROEXAAH technicians were developing an analysis to determine the ease with which different sized growers could pay membership fees and monthly dues of varying sizes.

Growers who are members of ACP or ANACIHO were asked what these organizations could do to help the growers increase their productivity and income. Some growers suggested more than one area or way in which these organizations could be of greatest assistance. The majority of grower responses to this question focused on four areas, as follows: (1) assistance in obtaining inputs at lower prices (31% of the responses), (2) technical assistance (28% of the responses), assistance in obtaining markets with better prices (22%), and credit (8%). The reader is cautioned that this priority ranking primarily reflects the views of the larger "industrial" growers (39% of the responses) and the group C growers (33% of the responses). Growers in groups D and E were not asked this question; thus, the responses of the "industrial" and group C growers do not necessarily reflect how "traditional" growers might feel they could be best served by ACP and/or ANACIHO.

Marketing -- The final institutional support area investigated was that of marketing. Table 9 summarizes relevant data for each of the five grower groups on the following variables: potential to sell to the CDC, percentages of growers who sold only to truckers in 1985, percentages of growers who sold to the CDC in 1985, percentages of growers who sold to the CDC in 1984 and 1985, percentages of growers who sold to the CDC under contract in 1984 and 1985, and the average price (Lempiras / 1,000 oranges) at which oranges were sold by growers in each group.

As previously discussed in the section on characteristics of the orchard, the varieties of orange produced by the "industrial" growers in groups A and B tend, on average, to have a higher value on the "potential to sell to the CDC" scale than do the varieties produced by growers in the other groups (C, D, and E). None of the group A or B growers sell only to truckers, while nearly half of all other growers sell only to truckers. With the exception of growers in group C, at least some growers in each group sold part of their harvest to the CDC during 1985. However, while over 80% of the growers in groups A and B sold orange to the CDC during 1985, the percentages of growers in groups D and E who sold orange to the CDC were very small (12% and 14%, respectively). The percentages of growers selling orange to the CDC in both 1984 and 1985 were even lower. Thus, between 1984 and 1985, there was a slight increase in several of the groups (B, D, and E) in the percentages of growers selling some of their harvest to the CDC. However, as may be seen in Table 9, the sale of oranges in both 1984 and 1985 to the CDC by growers under contract occurs only in the case of growers in groups A and B, consistent with one of criteria used in defining the study's sampling frame. By contrast, the percentage of growers selling orange under contract to the CDC in 1984 and 1985 in any of the other groups (C, D, or E) is nil.

Generally, the prices received (Lempiras / 1,000 oranges) by "industrial" growers in groups A and B (groups in which growers sold some of their oranges to the CDC) were, on average, higher than the prices received by "traditional" growers in groups D and E (groups in which a larger percentage of the growers sold their orange harvest only to truckers). However, the highest average price received by growers occurred in group C (Lempiras 42.40 / 1,000), this higher average price being consistent with the claims of several group C growers that they can get higher prices by selling their oranges on the open market. The price received by the larger "industrial" growers (group B) was, on average, slightly (L.40) higher than the price received by the smaller "industrial" grower, possibly indicating that the larger "industrial" growers

were more often able to negotiate a higher price with the CDC. On the other hand, the price received by the smaller "traditional" growers (group D) was, on average, slightly higher (L.60) than the price received by the larger "traditional" grower, possibly indicating that the smaller "traditional" grower does a better job in negotiating a "higher" price than does the larger "traditional" grower.

The last marketing-related question asked of growers was this: "How do you view the idea of committing yourself to a contract that fixes the price at which you will sell your harvest to a firm like the CDC?" Of the 49 growers, 37% stated that, depending on the price, they prefer a written contract. This preference was stated most frequently among the larger "industrial" growers (40% of group B) and the group C growers (44%). Another 14% (primarily five group E growers) also indicated a preference for a written contract with a fixed price but felt that the contract should also provide for technical assistance. On the other hand, 22% of the growers stated that they prefer not to make a commitment on their harvest and be free to sell it at the best price they can get. This view was most frequently expressed by the larger "traditional" growers (44% of group E). Eight growers (18%) indicated that they prefer a written contract but now fear that a firm such as the CDC will find some reason not to pay the contracted price to the grower. This apprehension was most frequently expressed by the larger "industrial" growers (50% of group E).

#### Factors Influencing Planting and Harvesting Decisions

As growers move from "traditional" to "industrial" patterns, they must face making new kinds of decisions about production practices and commercialization channels. These decisions include:

1. Whether to harvest oranges when still green, when turning from green to yellow, or when yellow.
2. Whether to sell oranges by the thousand or by the ton.
3. Whether to sell the oranges at the farm gate (e.g., to truckers) or at the factory gate (e.g., to the CDC).
4. If selling to the factory, whether to contract a trucker to haul the oranges to the factory or to pay the factory for hauling the oranges, with the cost being deducted from the amount paid by the factory for the fruit.
5. Whether to incur the risk of transporting oranges to the factory, only to find that many oranges do not meet the factory's quality standards.
6. Whether to commit to a written contract with a stated price or play the market.

In view of these and other decisions, the questionnaire obtained data providing some indication of the factors influencing the grower's planting and harvesting decisions. These data are reported in Table 11.

Table 11. Factors Influencing Planting and Harvesting Decisions of Five Grower Groups in El Progreso.

| <u>Variable</u>                             | <u>Group</u> |          |          |          |          |
|---|--------------|----------|----------|----------|----------|
|   | <u>A</u>     | <u>B</u> | <u>C</u> | <u>D</u> | <u>E</u> |
| <u>Harvest</u>                              |              |          |          |          |          |
| 59. Sees CDC as Having<br>+ Impact on Price | 83%          | 90%      | 99%      | 50%      | 49%      |
| 29. Harvests When Yellow                    | 17%          | 70%      | 11%      | 13%      | 12%      |
| 71. Knows CDC Requisites                    | 2            | 3.1      | 1.8      | 1.1      | 1.9      |
| 81. Harvests w/ Care                        | 100%         | 80%      | 89%      | 74%      | 50%      |
| <u>Planting</u>                             |              |          |          |          |          |
| 36. Replanting Potential                    | 3.0          | 3.5      | 3.0      | 3.4      | 2.3      |
| 72. Will New Plant (86)                     | 33%          | 20%      | 44%      | 50%      | 25%      |
| 74. New Plant Potential                     | 5            | 5        | 5        | 2.5      | 5        |
| 75. Mza. of New Planting                    | 4            | 19.5     | 8.5      | 4.7      | .5       |
| (n)   | (2)          | (2)      | (4)      | (8)      | (2)      |

Generally, growers in groups A, B, and C feel that the presence of the CDC as an industrial buyer has had a positive impact on the average level of prices received by the growers. Many growers reported that, prior to the startup of CDC's operations, orange prices were typically below L.10 / 1000. Now the average price is typically at least L.30 / 1000. However, among the "traditional" growers (groups D and E), no more than half perceive that the CDC has had a positive impact on prices. This may reflect that many of these growers, for one reason or another (e.g., distance from the CDC), have not seen the CDC as an alternative to simply selling their oranges to truckers.

One of the characteristics highly desired by the CDC in the oranges purchased by the factory is that the oranges be as yellow as possible at the time of harvest. To achieve this, growers must invest in and use pesticides to spray the trees to reduce the incidence of insect damage during the period before the fruit is ready for harvest. We asked growers at what stage of maturation (green, green turning yellow, or yellow) they harvest their oranges. Except for the larger "industrial" growers (group B) where 70% of the growers claimed that they harvest their oranges when yellow, fewer than 20% of the growers in the other groups made this claim. However, the percentage of smaller "industrial growers in group A (17%) who said that they harvest oranges when yellow was higher than the comparable percentages of growers in groups C, D, and E.

As a further measure of the extent to which the type of fruit required by the CDC may influence grower's decisionmaking, we developed a measure of the grower's knowledge of the range of characteristics which the CDC seeks to have in the oranges purchased for industrial consumption. Growers were asked: "If you sell or were to sell all of your orange harvest to the CDC, what requisites must the fruit meet so that the CDC will buy it?" Each grower's response to this question was assigned a score based on the simple count of the number of the following CDC requisites mentioned by the respondent:

- BRIX (not less than 10)
- Variety (Valencia Roja, Pina, Criolla, etc.)
- Maturity (yellow and not green)
- Size (not less than 2 inches)
- Healthy (not diseased, punctured, bruised, or cut)

The average score for growers in each of the five groups is presented in Table 11. Generally, the larger growers were found to have a higher level of awareness or knowledge of the requisites which oranges must meet if they are to be sold to the CDC. Also, the "industrial" growers (groups A and B) scored higher on this variable than did the growers in the other groups.

Another indicator of the impact of CDC's requirements on growers' knowledge and practices is provided by the percentage of growers who exercise precaution in harvesting oranges so they will not be damaged. All (or 100%) of smaller "industrial" growers (group A) and 80% of larger "industrial" grower reported practicing such precaution (e.g., placing a sack full of leaves or grass below the tree to provide a soft landing for oranges as they are picked). By contrast, less than 75% of "traditional" growers (groups D and E) reported following any precautionary measures when harvesting.

A final area investigated was determining some of the criteria utilized by growers in making decisions about planting. Growers replanting orange trees during 1985 were asked what variety they had planted. Table 11 provides a rough indication of the "potential to sell to CDC" of the varieties replanted by growers. Generally, the average score on this variable was found to be higher for the "industrial" growers (3.25) as compared with either group C growers (3.0) or the "traditional" growers in groups D and E (2.85). The highest score on this variable is held by the larger "industrial" growers in group B (3.5), while the lowest score is held by the larger "traditional" growers in group D (2.3).

Growers were asked if they planned to put in any new orange plantings during 1986. The percentages of growers responding positively to this question was highest in group C (44%), this relatively high percentage perhaps indicating the previously noted problem that several of these growers have varieties which have low potential salability to the CDC.

Table 11 also provides an indicator of the average size of the planned new plantings. The largest area of planned new plantings occurs among growers in groups B and C, with 19.5 and 8.5 Mzas. respectively. Interestingly, it is in group D that one finds the greatest absolute number of growers (n = 8) who are planning new plantings, yet this is the group which, as noted above, is planning to plant varieties which, compared with the planned varieties of the other groups, have the lowest potential salability to the CDC.

### Discussion

This report has reviewed the objective, methodology, and findings of a characterization study of citrus growers in the El Progreso region of Honduras. The study should not be viewed as representative of citrus production in Honduras, since the study focuses on only one citrus (orange) and one citrus producing region (El Progreso). Compared with other citrus producing areas, El Progreso has considerable diversity in terms of the range in farm sizes, the range in the sizes of the citrus plantings on these farms, and the number of different types of orange varieties planted in any given orchard. It would be of interest to know whether the variation in the different factors discussed in this report is unique to the El Progreso region or to some extent is indicative of relationships characterizing the production practices and commercialization patterns of citrus growers in other zones. To this end, the present study may serve as a basis for identifying hypotheses that merit being tested in the other citrus producing regions of Honduras.

In terms of socioeconomic characteristics, the study identified five distinct grower groups. Aside from group C (the growers who are members of ANACIHO but have not sold under contract to the CDC), the study compared the socioeconomic characteristics of, orchard characteristics of, technology used by, institutional support to, and factors influencing the planting and harvesting decisions of four distinct grower groups, as follows: Group A (smaller "industrial" growers); Group B (larger "industrial" growers); Group D (smaller "traditional" growers); and Group E (larger "traditional" growers). While the preceding section presented a detailed analysis of the differences between these groups, it would be premature to attempt here to draw hard and fast conclusions from the data and analysis. If there is any conclusion to be drawn, it is that the data reviewed herein present an interesting challenge to FHIA as the institution which is likely to become the principal source of new and improved technology for the Honduran citrus grower.

The challenge which confronts FHIA and, more specifically, FHIA's citrus program, is that of deciding at which grower groups, if not all the groups identified, FHIA will target its limited research resources. While the study provided some evidence that it is the smaller grower who is most efficient, these growers currently have limited access to the types of capital intensive resources (credit, fertilizers, etc.) essential for increasing productivity per Mza. If the adoption and use of new and improved technology is dependent on investment in capital intensive inputs and the smaller grower is not provided equitable access to these inputs, these growers will have been placed at a competitive disadvantage relative to the larger growers.

That this scenario has been played out in other developing countries is not necessarily an indicator that it will be repeated in the case of Honduran citrus growers. Indeed, based on the author's observations, there appears to be great potential for Honduras to develop a citrus industry that provides abundant opportunities for labor on farms of all sizes. Achieving this potential, however, will require the coordinated institutional support of FEPROEXAAH, industrial firms such as the CDC, ANACIHO and its affiliate citrus producers associations such as the ACP in El Progreso, agri-support institutions such as credit sources (banks) and input suppliers, and FHIA's own citrus program.

It is the author's hope that representatives of the above-mentioned organizations will find this report a useful point of departure in addressing the question of how growers can most effectively relax the factors which currently constrain the productivity and income-earning potential their orange orchards. As noted above, capital intensive technology is not likely to be of any assistance to the smaller grower unless he is provided equitable opportunity to access this technology. On the other hand, the larger grower also faces difficulties, particularly that of providing proper care and management where the grower has a large number of Mzas. planted to citrus. Such growers may be able to rely to a limited extent on some mechanization of their citrus operations but will certainly also need to rely more heavily on labor for certain practices (e.g., harvesting).

A further consideration is that which is prompted by the old adage that a chain is only as strong as its weakest link. Consequently, citrus growers cannot afford to make major investments in productivity-increasing inputs if there is any chance that the failure of some growers to comply with certain control measures (e.g., spraying for the fruit fly) could lead to disaster for all growers. As brought out in the discussion of the study's findings, fewer than 40% of the smaller "traditional" growers reported that they applied any measures for insect control during 1985. At the same time, nearly a quarter of all growers indicated that their trees had experienced some insect problems during 1985, but that they had not applied any control measure to the problematic insects.

Given the desirability of the objective of increasing the efficient production of citrus products (or derivatives) such as orange (or concentrate) which have a high export potential, and given that all of the identified grower groups can potentially contribute to the achievement of this objective, the challenge for FHIA as a center for research on citrus becomes that of identifying the types of technology which will have the greatest demand among growers in each group. Agri-support institutions such as FEPROEXAAH, ANACIHO, ACP, and the CDC must also play a role, by ensuring effective coordination and delivery of the agri-support factors (i.e., credit, inputs, technical assistance, and markets) without which growers will not be able to convert Honduras' productivity potential in citrus into a practical reality.

Fundacion Hondureña de Investigacion Agricola (F.H.I.A.)

Encuesta de Caracterizacion de Citricultores Hondureños

----- 1. Numero de Encuesta

----- 2. Numero en el Mapa

Ubicacion de Finca: -----

Nombre de Finca: -----

3. Acceso de Finca

1 - Facil (carretera pavimentada)

2 - Medio (no pavimentado pero no se necesita 4x4)

3 - Dificil (se necesita 4x4)

4. Tiene la finca un solo propietario o varios socios?

1 - Un solo propietario

-- 2 - Numero de socios (si del sector privado)

-- 3 - Numero de socios (si cooperativa de la R.A.)

Nombre del Propietario de Finca: \_\_\_\_\_

Direccion del Propietario: \_\_\_\_\_

Telefono: \_\_\_\_\_

5. Nombre del Entrevistado: \_\_\_\_\_

1 - Es el propietario (o uno de los socios)

2 - Es el capataz

----- 6. Cual es la extension total en manzanas de la finca?

7. Ademas de los citricos tiene la finca otros cultivos?

0 - No

1 - Si: Cuales?

8. Como es la topografia de la finca?

1 - Plano

2 - Pendiente Suave

3 - Pendiente Media

4 - Pendiente Pronunciada

5 - Variante (ondulada y quebrada)

9. Que clase de citrico principalmente esta sembrada en la finca?
- |             |                        |
|-------------|------------------------|
| 1 - Naranja | 4 - Mandarina          |
| 2 - Toronja | 5 - Otro (especifique) |
| 3 - Limon   |                        |
10. Cual es la variedad de naranja que principalmente esta sembrada en la finca?
- |                     |                        |
|---------------------|------------------------|
| 1 - Piña            | 5 - Valencia (?)       |
| 2 - Valencia Palida | 6 - Victoria           |
| 3 - Valencia Blanca | 7 - Nevula             |
| 4 - Valencia Roja   | 8 - India              |
|                     | 9 - Otro (especifique) |
11. Cuantas manzanas tiene sembrada en naranja? (Mzs.)
12. Cuantas manzanas de naranja estan en produccion? (Mzs.)
13. Cuantas manzanas de naranja estan en plantilla? (Mzs.)
14. Que tenencia tiene la tierra que esta sembrada en naranja?
- |                  |                              |
|------------------|------------------------------|
| 0 - No sabe      | 2 - Dominio Pleno            |
| 1 - Dominio Util | 3 - Hay lotes de los 2 tipos |
15. Cual es la distancia entre arboles en la finca? (pie x pie)
16. Cuantos arboles en total hay en la finca? (No. arboles)
17. Cual es la poblacion de arboles en la finca en terminos de manzanas? (No. Arboles/Mzs. o Estimado pie x pie)
18. Tiene ualquier cultivo intercalado en los citricos?
- |                                  |  |
|----------------------------------|--|
| 0 - No                           |  |
| 1 - En plantilla: Cual cultivo?  |  |
| 2 - En produccion: Cual cultivo? |  |
| 3 - En los dos                   |  |
19. Tiene los lotes de citricos algun sistema de riego?
- |                                       |                        |
|---------------------------------------|------------------------|
| 0 - No                                |                        |
| 1 - Si: Que tipo de sistema de riego? |                        |
| 1 - Aspercion                         | 3 - Goteo              |
| 2 - Gravedad                          | 4 - Otro (especifique) |
20. Tiene los lotes de citricos algun sistema de drenaje?
- |        |        |
|--------|--------|
| 0 - No | 1 - Si |
|--------|--------|
21. Se ha hecho un analisis de suelos en los lotes de citricos durante los ultimos dos años?
- |        |        |
|--------|--------|
| 0 - No | 1 - Si |
|--------|--------|
22. Aplico Ud. gallinazo o fertilizante a los citricos durante el año pasado (1985)? (0 - No aplico)  
No.- 1, 2, 3, etc.

23. Realizo Ud. un control de maleza en los citricos durante el año pasado (1985)?
- 0 - No
  - Si: Como realizo el control?
  - 1 - Solo manual (la chapia con machete)
  - 2 - Solo quimico (herbicida en el comal y/o en las calles)
  - 3 - Solo mecanico (chapiadora con tractor)
  - 4 - Manual y quimico
  - 5 - Manual y mecanico
  - 6 - Quimico y mecanico
  - 7 - Manual, quimico mecanico
24. Realizo Ud. un control de insectos en los citricos durante el año pasado?
- No: Esto fue porque no hubo problema con insectos o si hubo problema pero no aplico ningun control?
  - 0 - No hubo problema
  - 1 - Hubo problema pero no aplico ningun control
  - Si: Que clase de insecto le ha causado mas problemas?
  - 2 - La Chupadora
  - 3 - Mosca Mediterraneo y Mexicana
  - 4 - Sompopo
  - 5 - Gallina Ciega
  - 6 - Otro (especifique)
25. Si contesto a 24 que hubo problema pregunte:  
Que clase de control aplico Ud.?
- 0 - No hubo problema
  - 1 - Hubo problema pero no aplico control
  - 2 - Trampas
  - 3 - Manual
  - 4 - Fumigacion
  - 5 - Combinacion (especifique)
26. Realizo Ud. un control de enfermedades en los citricos durante el año pasado?
- No: Eso fue porque no hubo problema con enfermedades o si hubo problema pero no aplico ningun control?
  - 1 - No hubo problema
  - 2 - Hubo problema pero no aplico ningun control
  - 3 - Si aplico control
27. Realizo Ud. la poda en los citricos durante el año pasado?
- 0 - No
  - Si: Que clase de poda hizo en el lote?
  - 1 - Solo chupones
  - 2 - Solo sanidad
  - 3 - Chupones y sanidad
  - 4 - Formacion
  - 5 - Chupones, sanidad y formacion
28. Cuando se hizo la poda, protegio las heridas por algun tratamiento? (0 - No hizo la poda)
- 1 - Podo pero no protegio
  - 2 - Aceite agricola (Cocide)
  - 3 - Cal
  - 4 - Cal y cobre
  - 5 - Pintura de aceite
  - 6 - Otro (especifique)

29. Que criterio utiliza para saber cuando empezar hacer la cosecha?
- |                              |                             |
|------------------------------|-----------------------------|
| 0 - En plantilla             | 4 - Color amarillo          |
| 1 - Ya era tiempo cosechar   | 5 - Llega alguien a comprar |
| 2 - Color verde              | 6 - C.D.C. manda a cosechar |
| 3 - Color cambiando amarillo | 7 - Otro (especifique)      |
30. Se acostumbra hablar de dos cosechas durante el año o sea la veranera y la postrera? Cual fue el rendimiento promedio en frutas por arbol de su primera cosecha el año pasado? (0-No tiene datos)
- \_\_\_ - No. de frutas / arbol (promedio) del lote
31. A que precio vendio dicha cosecha? (0-No tiene datos)
- \_\_\_ - Lempiras / Millar
32. A quien se vendio la primera cosecha?
- |                                 |                             |
|---------------------------------|-----------------------------|
| 0 - Lote en plantilla           | 5 - Comprador en Tegus.     |
| 1 - En finca a camionero        | 6 - Comprador en E.S.       |
| 2 - Comprador en pueblo cercano | 7 - Comprador (EE.UU./Can.) |
| 3 - Comprador en San Pedro Sula | 8 - Comprador (Europa)      |
| 4 - Al CDC                      | 9 - Otro (especifique)      |
- 33-35. Repite estas ultimas tres preguntas para la segunda cosecha.
36. Durante este año pasado realizo cualquiera resiembra de naranja en la finca?
- 0 - No
- \_ - Si: Que variedad resembró? (Use codigo de pregunta 7)

#### Características Socioeconomicas

37. Cual es la edad del entrevistado?
38. Tiene el propietario algun otro negocio o empleo fuera de la finca?
- 0 - No
- - Si: Que otro negocio o empleo tiene el propietario?
- |                                      |                         |
|--------------------------------------|-------------------------|
| 1 - Con el Estado                    | 6 - Medico              |
| 2 - Con una empresa privada          | 7 - Abogado             |
| 3 - Propietario (negocio industrial) | 8 - Profesor            |
| 4 - Propietario (negocio comercial)  | 9 - Politico            |
| 5 - Ingeniero                        | 10 - Otro (especifique) |
39. Cuantos miembros son en la familia del entrevistado?
40. Que educacion realizo Ud.?
- 0 - Ninguna
- 1 - Numero actual entre 1 y 6
- 7 - Cumplio secundaria
- 8 - Cumplio superior



50. Recibio Ud. durante el ultimo año cualquiera asistencia tecnica sobre citricultura?

- 0 - No
- Si: De quien recibio la asistencia tecnica?
- 1 - El propietario (si el entrevistado es el capataz)
- 2 - Capataces
- 3 - Patrones de otras fincas
- 4 - Vendedores de insumos
- 5 - Agronomo de RR.NN
- 6 - Agronomo del C.D.C.
- 7 - Un curso
- 8 - Un folleto o boletin
- 9 - Otro (especifique)

51. Al presentarse un problema en los citricos de su finca, de quien buscaria Ud. una asistencia para resolverlo?

- 0 - No sabe o depende del problema
- Mismo codigo de la 50

52. Pregunte solo si el entrevistado es el capataz:

Con que frecuencia se reune Ud. con el patron para discutir el manejo de la finca?

- |                         |                               |
|-------------------------|-------------------------------|
| 0 - Es el propietario   | 5 - Cada mes                  |
| 1 - Una vez al año      | 6 - Dos veces al mes          |
| 2 - Dos veces al año    | 7 - Cuatro veces al mes       |
| 3 - Cuatro veces al año | 8 - Dos veces a la semana     |
| 4 - Seis veces al año   | 9 - 3 o mas veces a la semana |

53. Sabe Ud. como se llama el periodico agricola que se publica en Honduras?

- 0 - No sabe: Ud. ha oido de un periodico que se llama El Agricultor?
- 1 - No
- Si: Ha comprado o recibido alguna vez un ejemplar de este periodico?
- 2 - No
- Si: Que tan frecuente Ud. compra o recibe este periodico?
- 3 - Nunca
- 4 - Muy poco
- 5 - De vez en cuando (como 1 ejemplar al mes)
- 6 - Todos los ejemplares (2 al mes)

## Percepciones del Mercado de Citricos

54. Hace un año se establecio en Honduras un centro de investigacion que se llama la Fundacion Hondureña de Investigacion Agricola o la FHIA. Antes de esta entrevista, Ud. ha escuchado cualquiera cosa sobre esta Fundacion?
- 0 - No
  - Si: Donde esta ubicada esta Fundacion?
  - 1 - No sabe
  - 2 - Sabe que se ubica en La Lima
55. A base de su experiencia en manejar esta finca, cual es el problema que mas ha perjudicado a la productividad de los arboles?
- 0 - No ve problemas
  - 1 - Variedad
  - 2 - Riego / Drenaje
  - 3 - Fertilizacion
  - 4 - Control de malezas
  - 5 - Control de insectos
  - 6 - Control de enfermedades
  - 7 - Credito
  - 8 - Insumos
  - 9 - Comercializacion
56. Es Ud. miembro de alguna organizacion o asociacion de citricultores?
- 0 - No sabe si el propietario es miembro
  - 1 - El propietario no es miembro
  - 2 - Miembro de grupo regional (especifique)
  - 3 - Miembro del ANACIHO
  - 4 - Miembro de grupo regional y ANACIHO
57. Si contesto No a 56: Porque?
- 0 -Contesto Si a 56
58. Si contesto Si a 56: En que forma cree Ud. que esta organizacion puede mejorar la productividad y los ingresos de los citricultores? (0 - Contesto No a 56)
- 1 - Influir politica agricola
  - 2 - Mercauo (precios)
  - 3 - Mercadeo (informacion)
  - 4 - Tecnologia comercializacion
  - 5 - Insumos
  - 6 - Credito
  - 7 - Tecnologia (produccion)
  - 8 - Riego / Drenaje
  - 9 - Dominio de tierra
  - 10 - Adquisicion de tierra
  - 11 - No puede especificar
59. Piensa Ud. si el C.D.C. tuvo algun impacto en los precios de los productos citricos cuando esta fabrica empezo a comprar las cosechas en el 1984?
- 0 - No sabe
  - 1 - No
  - Si: Se bajaron o subieron los precios?
  - 2 - Se bajaron
  - 3 - Se mantuvieron
  - 4 - Se subieron

60. Esta finca ha vendido cualquiera de sus cosechas durante los últimos dos años al C.D.C.?
- 0 - No sabe
  - 1 - No vendió al C.D.C. ni en 1984 o 1985
  - 2 - Solo en 1985
  - 3 - Solo en 1984
  - 4 - En 1984 y 1985
61. Si contesto la 60 con solo en 1985, pregunte:  
Porque no vendió la cosecha al C.D.C. en el 1985?
- 1 - No vendió al C.D.C. en 1984
62. Si contesto la 60 con solo en 1984, pregunte:  
Obtuvo Ud. una ganancia vendiendo al C.D.C. en 1984?
- 0 - No vendió al C.D.C. en 1985
  - 1 - Vendió al C.D.C. pero perdió
  - 2 - Si: Porque no vendió Ud. la cosecha al C.D.C. en 1985?
63. Si contesto la 60 con 1984 y 1985, pregunte:  
Como Ud. sabe o se dio cuenta, el C.D.C. compro naranjas en el 1984 en Lempiras 150.00 por tonelada corta pero en el 1985 las compro en solo Lempiras 125.00 por tonelada corta. Con esta caída de precio, quedo la finca perdiendo o ganando vendiendo al C.D.C. en 1985?
- 0 - No vendió al C.D.C. en 1985
  - 1 - Quedo perdiendo en 1985
  - 2 - Apenas recupero los costos en 1985
  - 3 - Todavía pudo hacer una ganancia en 1985
64. Vendió su cosecha de naranja al C.D.C. a base de un de un contrato en el 1984 o 1985?
- 0 - No vendió al C.D.C.
  - 1 - Vendió al C.D.C. pero no tuvo contrato
  - 2 - Tuvo contrato en el 1984
  - 3 - Tuvo contrato en el 1985
  - 4 - Tuvo contrato en 1984 y 1985
65. Si tuvo contrato en 1984 o 1985: Fue este contrato verbal o escrito?
- |  | <u>1984</u> | <u>1985</u> |
|--|-------------|-------------|
| - <u>No vendió al CDC</u>                    | A           | E           |
| - <u>Vendió al CDC pero no tuvo contrato</u> | B           | F           |
| - <u>Contrato Verbal</u>                     | C           | G           |
| - <u>Contrato Escrito</u>                    | D           | H           |
- 
- |        |        |         |         |
|--------|--------|---------|---------|
| 1 - AE | 5 - BE | 9 - CE  | 13 - DE |
| 2 - AF | 6 - BF | 10 - CF | 14 - DF |
| 3 - AG | 7 - BG | 11 - CG | 15 - DG |
| 4 - AH | 8 - BH | 12 - CH | 16 - DH |

66. Si tuvo un contrato en 1984: En el contrato se fijo un precio de compra?
67. Si tuvo un contrato en 1985: En el contrato se fijo un precio de compra?
- 0 - No vendio al C.D.C.  
 1 - Vendio al C.D.C. pero no tuvo contrato  
 2 - Contrato verbal que no fijo precio  
 3 - Contrato verbal que se entendia que se fijo el precio  
 4 - Contrato escrito que no fijo precio  
 5 - Contrato escrito que fijo precio
- 68-69. Si fijo precio: Que precio se fijo en el contrato?
- 0 - No vendio al C.D.C.  
 1 - Vendio al C.D.C. pero no tuvo contrato  
 -- - 68. Precio que se fijo en el 1984  
 -- - 69. Precio que se fijo en el 1985
70. Como ve Ud. comprometerse a un contrato que fija un precio para vender la cosecha a una empresa como el C.D.C.?
- 0 - No opina  
 1 - Prefiere no comprometer la cosecha y venderla al que mejor convenga  
 2 - Prefiere un contrato escrito pero depende del precio que se fija
71. Si Ud. vende o fuera a vender toda su cosecha al C.D.C., que requisitos tiene que cumplir la fruta para que el C.D.C. se la compre?
- |                                  |                           |
|----------------------------------|---------------------------|
| 0 - No opina                     | 5 - Productividad y Color |
| 1 - Valencia pero no sabe porque | 6 - Productividad y BRIX  |
| 2 - Productividad                | 7 - Color y BRIX          |
| 3 - Color                        | 8 - P.dad, Color y BRIX   |
| 4 - BRIX                         | 9 - P, Color, BRIX y otro |
72. Piensa Ud. sembrar nuevas tierras en plantilla durante este año (1986)?
- 0 - No: Pase a la pregunta 77  
 1 - Si: Si contesto si, preunte 73 - 76
73. \_\_\_ Que clase piensa Ud. sembrar? (0 - No piensa sembrar)  
 Use el codigo de pregunta 9
74. \_\_\_ Que variedad piensa sembrar? (0 - No piensa sembrar)  
 Use el codigo de pregunta 10
75. Cuantas manzanas piensa sembrar?  
 \_\_\_ Manzanas? (0 -No piensa sembrar)
76. Como va a conseguir acceso a esta tierra?
- 0 - No piensa sembrar  
 1 - Tierra propia de dominio pleno  
 2 - Tierra propia de domino util  
 3 - Comprar tierra de dominio pleno  
 4 - Asociarse

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77. De que variedad son los patrones de los injertos que Ud. compra o realiza?

- |                   |                         |                        |
|-------------------|-------------------------|------------------------|
| 1 - Naranja agrio | 3 - Limon               | 5 - Otro (especifique) |
| 2 - Toronja       | 4 - Mandarina Cleopatra |                        |

78. Donde consigue Ud. los injertos para resiembra?

- |  |                    |
|--|--------------------|
| 1 - De su propio vivero                | 4 - RR.NN.         |
| 2 - Al que llega a la finca a venderle | 5 - Marylou/C.D.C. |
| 3 - En vivero de otro citricultor      | 6 - Otro (esp.)    |

79. Los injertos que Ud. compra o realiza son con yemas certificadas?    0 - No sabe    1 - No    2 - Si

80. Alguna vez compra Ud. las yemas?

- 0 - No compra  
 - Si: Son certificadas?  
 1 - No  
 - Si: Donde compra Ud?  
 Mismo codigo de la 78

81. Practican los cosechadores cualquier precaucion para no maltratar la fruta?

- 1 - Ninguna (se corta y la tira)  
 2 - Colchon lleno de hojas  
 3 - Se coloca en una bolsa en el hombro del cosechador  
 4 - Otro (especifique)

Fundacion Hondureña de Investigacion Agricola (F.H.I.A.)

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- 1 - Un solo propietario
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- 3 - Numero de socios (si cooperativa de la R.A.)

Nombre del Propietario de Finca: \_\_\_\_\_

Direccion del Propietario: \_\_\_\_\_

Telefono: \_\_\_\_\_

5. Nombre del Entrevistado: \_\_\_\_\_

- 1 - Es el propietario (o uno de los socios)
- 2 - Es el capataz

----- 6. Cual es la extension total en manzanas de la finca?

7. Ademas de los citricos tiene la finca otros cultivos?

- 0 - No
- 1 - Si: Cuales?

8. Como es la topografia de la finca?

- 1 - Plano
- 2 - Pendiente Suave
- 3 - Pendiente Media
- 4 - Pendiente Pronunciada
- 5 - Variante (ondulada y quebrada)

|                           |  |  |
|---------------------------|--|--|
| 9. Clase?                 |  |  |
| 10. Variedad?             |  |  |
| 11. Manzanas?             |  |  |
| 12. Mzs. Produccion?      |  |  |
| 13. Mzs. Plantilla?       |  |  |
| 14. Tenencia?             |  |  |
| 15. Distancia?            |  |  |
| 16. No. Arboles Total?    |  |  |
| 17. Arboles / Mza.        |  |  |
| 18. Intercalados?         |  |  |
| 19. Riego?                |  |  |
| 20. Drenaje?              |  |  |
| 21. Analisis Suelos?      |  |  |
| 22. Aplico. Abono?        |  |  |
| 23. Control Maleza?       |  |  |
| 24. Control Insectos?     |  |  |
| 25. Clase Control?        |  |  |
| 26. Control Enfermedades? |  |  |
| 27. Poda? Tipo?           |  |  |
| 28. Protegido Heridas?    |  |  |
| 29. Criterio Cosecha?     |  |  |
| 30. 1. Frutas / Arbol?    |  |  |
| 31. Precio Vendio?        |  |  |
| 32. Quien Compro?         |  |  |
| 33. 2. Frutas / Arbol?    |  |  |
| 34. Precio Vendio?        |  |  |
| 35. Quien Compro?         |  |  |
| 36. Resiembra?            |  |  |
| 37. Edad?                 |  |  |
| 38. Otro Negocio?         |  |  |
| 39. No. Mbros. Fam.?      |  |  |
| 40. Educacion?            |  |  |
| 41. Años en Finca?        |  |  |
| 42. Sueldo?               |  |  |
| 43. Incentivo?            |  |  |
| 44. Empleados Prmnts?     |  |  |
| 45. Prestamo?             |  |  |
| 46. Monto?                |  |  |
| 47. Quien Presto?         |  |  |
| 48. Donde Invirtio?       |  |  |
| 49. Fuente Abono?         |  |  |
| 50. Recibio Asis. Tecn.?  |  |  |
| 51. Donde Buscaria A.T.?  |  |  |
| 52. Frec. Reune Patron?   |  |  |
| 53. El Agricultor?        |  |  |
| 54. Saber de F.H.I.A.?    |  |  |
| 55. Que Influye Prod.?    |  |  |
| 56. Mbro. Org. Citrica?   |  |  |
| 57. Porque?               |  |  |
| 58. Forma Ayuda?          |  |  |
| 59. Impacto C.D.C.?       |  |  |
| 60. Vendio al C.D.C.?     |  |  |
| 61. Porque No Vendio?     |  |  |
| 62. Ganancia en 1984?     |  |  |
| 63. Impacto Caída Precio? |  |  |

|                                     |  |  |  |  |  |
|-------------------------------------|--|--|--|--|--|
| 64. Vendio con Contrato en 84 o 85? |  |  |  |  |  |
| 65. Verbal o Escrito?               |  |  |  |  |  |
| 66. Fijo Precio en 1984?            |  |  |  |  |  |
| 67. Fijo Precio en 1985?            |  |  |  |  |  |
| 68. Que Precio Fijo 1984?           |  |  |  |  |  |
| 69. Que Precio Fijo 1985?           |  |  |  |  |  |
| 70. Preferencia Contrato?           |  |  |  |  |  |
| 71. Requisitos de Fruta?            |  |  |  |  |  |
| 72. Sembrara Plantilla?             |  |  |  |  |  |
| 73. Clase?                          |  |  |  |  |  |
| 74. Variedad?                       |  |  |  |  |  |
| 75. Mzas. Sembrara?                 |  |  |  |  |  |
| 76. Acceso Tierra?                  |  |  |  |  |  |
| 77. Variedad Patrones?              |  |  |  |  |  |
| 78. Fuente de Injertos?             |  |  |  |  |  |
| 79. Yemas Certificadas?             |  |  |  |  |  |
| 80. Compra Yemas?                   |  |  |  |  |  |
| 81. Precaucion?                     |  |  |  |  |  |

| Actividad  | .No Temp. | Lps/Mza. | Lps/Dia. | Lps/Und. | Lps/Mqn. |
|------------|-----------|----------|----------|----------|----------|
| Comaleo    |           |          |          |          |          |
| C. Maleza  |           |          |          |          |          |
| Fumigacion |           |          |          |          |          |
| Abonar     |           |          |          |          |          |
| Poda       |           |          |          |          |          |
| Cosecha    |           |          |          |          |          |
| L. Drenaje |           |          |          |          |          |

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Fundacion Hondureña de Investigacion Agricola (F.H.I.A.)

Encuesta de Caracterizacion de Citricultores Hondureños

----- Grupo de Citricultores (Vease Anexo)

----- 1. Numero de Encuesta

----- 2. Numero del Productor en el Mapa

Ubicacion de Finca: -----

|                            |                           |
|----------------------------|---------------------------|
| 01 - Santa Marta           | 13 - La 35                |
| 02 - El Socorro            | 14 - La 29                |
| 03 - Progreso              | 15 - La 28                |
| 04 - Quebrada Seca         | 16 - Guaymitas El Castaño |
| 05 - Camalote              | 17 - Guaymon              |
| 06 - Quebrada de Yoro      | 18 - Bella Vista, Guaymon |
| 07 - Chindongo             | 19 - Las Delicias         |
| 08 - Brisas de La Libertad | 20 - Guaymas              |
| 09 - El Jute               | 21 - Toyos                |
| 10 - La 40                 | 22 - El Naranja           |
| 11 - Santa Ines            | 23 - Agua Blanca Norte    |
| 12 - La 36                 | 24 - Mezapa               |

Nombre de Finca: -----

3. Acceso de Finca

1 - Facil (carretera pavimentada)

2 - Medio (no pavimentado pero no se necesita 4x4)

3 - Dificil (se necesita 4x4)

4 - Caminando

4. Tiene la finca un solo propietario o varios socios?

1 - Un solo propietario

\_\_ 2 - Numero de socios (si del sector privado)

\_\_ 3 - Numero de socios (si cooperativa de la R.A.)

Nombre del Propietario de Finca: \_\_\_\_\_

Direccion del Propietario: \_\_\_\_\_

Telefono: \_\_\_\_\_

Residencia ( 1 - Ciudad / 2 - Finca )

5. Nombre del Entrevistado: \_\_\_\_\_

1 - Es el propietario (o uno de los socios)

2 - Es el capataz

----- 6. Cual es la extension total en manzanas de la finca?

7. Ademas de los citricos tiene la finca otros cultivos?

0 - No

1 - Si: Cuales?

8. Como es la topografia de la finca?

1 - Plano

4 - Pendiente Pronunciada

2 - Pendiente Suave

5 - Variante (ondulada y

3 - Pendiente Media

quebrada)

9. Que clase de citrico principalmente esta sembrada en la finca?
- |             |                        |
|-------------|------------------------|
| 1 - Naranja | 4 - Mandarina          |
| 2 - Toronja | 5 - Otro (especifique) |
| 3 - Limon   |                        |
10. Cual es la variedad de naranja que principalmente esta sembrada en la finca?
- 0 - Victoria, Nevula, India
  - 1 - Valencia Blanca, Valencia Palida, y Valencia (?)
  - 2 - Criolla (jugo)
  - 3 - Piña
  - 4 - Tangelo o Mandarina
  - 5 - Valencia Roja
11. Cuantas manzanas tiene sembrada en naranja? (Mzs.)
- 0 - No sabe
12. Cuantas manzanas de naranja estan en produccion? (Mzs.)
- 0 - No sabe
13. Cuantas manzanas de naranja estan en plantilla? (Mzs.)
- 0 - No sabe
14. Que tenencia tiene la tierra que esta sembrada en naranja?
- |                   |                              |
|-------------------|------------------------------|
| 0 - No sabe       | 3 - Hay lotes de los 2 tipos |
| 1 - Dominio Util  | 4 - Dominio Familiar         |
| 2 - Dominio Pleno |                              |
15. Cual es la distancia entre arboles en la finca?  
(pie x pie)
- |             |              |
|-------------|--------------|
| 0 - No sabe | 7 - 18 x 24  |
| 1 - 14 x 14 | 8 - 21 x 21  |
| 2 - 16 x 16 | 9 - 22 x 22  |
| 3 - 18 x 18 | 10 - 23 x 23 |
| 4 - 19 x 19 | 11 - 24 x 24 |
| 5 - 18 x 22 | 12 - 25 x 25 |
| 6 - 20 x 20 | 13 - 26 x 26 |
16. Cuantos arboles en total hay en la finca? (No. arboles)
- 0 - No sabe
17. Cuantos arboles hay por manzana en la finca?  
(No. Arboles/Mzs. o Estimado pie x pie)
- 0 - No sabe

18. Tiene cualquier cultivo intercalado en la naranja?

- 0 - No
- 1 - En plantilla: Cual cultivo?
- 2 - En produccion: Cual cultivo?
- 3 - En los dos

Codigo para Cultivos -

- |                          |                             |
|--------------------------|-----------------------------|
| 0 - No tiene intercalado | 5 - Granos (maiz y sorgo)   |
| 1 - Aguacate             | 6 - Otros Citricos          |
| 2 - Cacao                | 7 - Otras Frutas Tropicales |
| 3 - Caña                 | 8 - Piña                    |
| 4 - Coco                 | 9 - Platano                 |

19. Tiene el naranjal algun sistema de riego?

- 0 - No
- Si: Que tipo de sistema de riego?
- 1 - Aspercion
- 2 - Gravedad
- 3 - Goteo
- 4 - Otro (especifique)

20. Tiene el naranjal algun sistema de drenaje?

- 0 - No
- 1 - Si

21. Se ha hecho un analisis de suelos en el naranjal durante los ultimos dos años?

- 0 - No
- 1 - Si

22. Aplico Ud. gallinazo o fertilizante al naranjal durante el año pasado (1985)? (0 - No aplico)

No.- 1, 2, 3, etc

23. Realizo Ud. un control de maleza en el naranjal durante el año pasado (1985)?

- 0 - No
- Si: Como realizo el control?
- 1 - Solo manual (la chapia con machete)
- 2 - Solo mecanico (tractor con chapiadora)
- 3 - Solo quimico (herbicida en el comal y/o en las calles)
- 4 - Manual y mecanico
- 5 - Manual y quimico
- 6 - Quimico y mecanico
- 7 - Manual, quimico y mecanico

24. Realizo Ud. un control de insectos en el naranjal durante al año pasado?

- No: Esto fue porque no hubo problema con insectos o si hubo problema pero no aplico ningun control?

0 - No hubo problema

1 - Hubo problema pero no aplico ningun control

- Si: Que clase de insecto le ha causado mas problemas?

2 - La Chupadora

3 - Mosca Mediterraneo y Mexicana

4 - Sompopo

7 - Morroco

5 - Gallina Ciega

8 - Checo

6 - Hormiga

9 - Otro (especifique)

25. Si contesto a 24 que hubo problema pregunte:  
Que clase de control aplico Ud.?
- 0 - No hubo problema
  - 1 - Hubo problema pero no aplico control
  - 2 - Trampas
  - 3 - Manual
  - 4 - Fumigacion
  - 5 - Combinacion (especifique)
26. Realizo Ud. un control de enfermedades en el naranjal durante el año pasado?
- - No: Eso fue porque no hubo problema con enfermedades o si hubo problema per no aplico ningun control?
  - 0 - No hubo problema
  - 1 - Hubo problema pero no aplico ningun control
  - 2 - Si aplico control
  - 3 - Elimino el arbol
27. Realizo Ud. la poda en el naranjal durante el año pasado?
- 0 - No
  - - Si: Que clase de poda hizo?
  - 1 - Solo chupones
  - 2 - Solo sanidad
  - 3 - Chupones y sanidad
  - 4 - Formacion
  - 5 - Chupones, sanidad y formacion
28. Cuando se hizo la poda, protegio las heridas por algun tratamiento? (0 - No hizo la poda)
- 1 - Podo pero no protegio
  - 2 - Aceite agricola (Cocide)
  - 3 - Cal
  - 4 - Cal y cobre
  - 5 - Pintura de aceite
  - 6 - Otro (especifique)
29. Que criterio utiliza para saber cuando empezar hacer la cosecha?
- 0 - En plantilla
  - 1 - Ya es tiempo cosechar
  - 2 - Color verde
  - 3 - Color cambiando amarillo
  - 4 - Color amarillo
  - 5 - Llega alguien a comprar
  - 6 - C.D.C. marida a cosechar
  - 7 - 2 y 4 segun comprador
  - 8 - 3 y 4 segun comprador
  - 9 - Otro (especifique)
30. Se acostumbra hablar de dos cosechas durante el año o sea la veranera y la postrera? Cual fue el rendimiento promedio en frutas por arbol de su primer cosecha el año pasado? (0-No tiene datos)
- \_\_\_ - No. de frutas / arbol (promedio) del lote
31. A que precio vendio dicha cosecha? (0-No tiene datos)
- \_\_\_ - Lempiras / Millar
32. A quien se vendio la primera cosecha?
- 0 - Lote en plantilla
  - 1 - En finca a camionero
  - 2 - Comprador en pueblo cercano
  - 3 - Comprador en San Pedro Sula
  - 4 - Al CDC
  - 5 - Camionero y C.D.C.
  - 6 - Comprador en E.S.
  - 7 - Comprador (EE.UU./Can.)
  - 8 - Comprador (Europa)
  - 9 - Otro (especifique)

33-35. Repite estas ultimas tres preguntas para la segunda cosecha.

36. Durante este año pasado realizo cualquiera resiembra de naranja en la finca?

0 - No

- - Si: Que variedad resembro? (Use codigo de la 10)

#### Caracteristicas Socioeconomicas

37. Cuantos años tiene Ud.?

38. Tiene Ud. algun otro negocio o empleo fuera de la finca?

0 - No

- - Si: Que otro negocio o empleo tiene Ud.?

1 - Con el Estado

6 - Medico

2 - Con una empresa privada

7 - Abogado

3 - Propietario (negocio industrial)

8 - Profesor

4 - Propietario (negocio comercial)

9 - Politico

5 - Ingeniero

10 - Otro (especifique)

39. Cuantos miembros hay en su familia?

40. Que educacion realizo Ud.?

0 - Ninguna

1 - Numero actual de años de educacion que cumplio

#### Pregunte 41-43 solo si el entrevistado es el capataz:

41. Cuantos años ha trabajado Ud. como el capataz de esta finca?

0 - Es el propietario

-- - No. de años

42. Que sueldo recibe Ud. por trabajar como el capataz?

0 - Es el propietario

-- - Lempiras por mes

43. Recibe Ud. algun incentivo segun la productividad de la finca?

0 - Es el propietario

1 - No

2 - Si

44. Cuantos empleados permanentes trabajan en la finca?  
-- - No. de empleados permanentes incluyendo el capataz

45. Durante al año pasado (1985), recibio Ud. algun prestamo para el mantenimiento de los lotes de citricos?

0 - No sabe si (Pase a la pregunta 49)

1 - No (Pase a la pregunta 49)

2 - Si (Pase a la pregunta 46 - 48)

3 - Insumos (Pase a la pregunta 46 - 48)

-----  
Si contesto si a 45 pregunte 46 - 48:

46. Cuanto fue el monto del prestamo? L\_\_\_\_\_
- 0 - No tuvo prestamo
47. Quien le dio el prestamo?
- 0 - No tuvo prestamo
- 1 - Un miembro de la familia
- 2 - BANADESA - A que interes presto el dinero? \_\_\_\_\_%
- 3 - Un banco privado - A que interes? \_\_\_\_\_%
- 4 - C.D.C. 5 - Otro (especifique)
48. En que se invirtio el prestamo en la finca?
- 0 - No tuvo prestamo
- |                  |                  |               |
|------------------|------------------|---------------|
| 1 - Riego        | 5 - Insecticidas | 9 - Cerca     |
| 2 - Drenaje      | 6 - Herbicidas   | 10 - Otro     |
| 3 - Plantilla    | 7 - Fungicidas   | (especifique) |
| 4 - Fertilizante | 8 - Maquinaria   |               |
- 

49. Averigue la siguiente solo si aplico fertilizante durante el año pasado (1985): A quien compro el fertilizante?

- 0 - No aplico fertilizante
- 1 - Directamente de la fabrica (especifique) \_\_\_\_\_
- 2 - De una tienda publica de insumos (BANADESA)
- 3 - De una tienda privada de insumos en pueblo cercano
- 4 - De una tienda privada de insumos en S.P.S.
- 5 - Del C.D.C.
- 6 - De otro agricultor
- 7 - De la finca misma del citricultor (caso de gallinazo)
- 8 - Otro (especifique)

50. Recibio Ud durante el año pasado cualquiera asistencia tecnica sobre citricultura?

- 0 - No o No sabe
- Si: De quien recibio la asistencia tecnica?
- 1 - Patrones de otras fincas
- 2 - Vendedores de insumos
- 3 - Agronomo de RR.NN., INFOP, o INA
- 4 - Agronomo del C.D.C.
- 5 - Agronomo particular
- 6 - Un curso
- 7 - Un folleto o boletin
- 8 - ANACIHO / FEPROEXAAH
- 9 - FHIA

51. Al presentarse un problema en los citricos de su finca, de quien buscaria Ud. una asistencia para resolverlo?

- 0 - No sabe
- Mismo codigo de la 50

-----  
**52. Pregunte solo si el entrevistado es el capataz:**

Con que frecuencia se reúne Ud. con el patron para discutir el manejo de la finca?

- |                         |                               |
|-------------------------|-------------------------------|
| 0 - Es el propietario   | 5 - Cada mes                  |
| 1 - Una vez al año      | 6 - Dos veces al mes          |
| 2 - Dos veces al año    | 7 - Cuatro veces al mes       |
| 3 - Cuatro veces al año | 8 - Dos veces a la semana     |
| 4 - Seis veces al año   | 9 - 3 o mas veces a la semana |
- 

**53. Sabe Ud. como se llama el periodico agricola que se publica en Honduras?**

- - No sabe: Ud. ha oido de un periodico que se llama El Agricultor?
- 0 - No
- - Si: Ha comprado o recibido alguna vez un ejemplar de este periodico?
- 1 - No
- - Si: Que tan frecuente Ud. compra o recibe este periodico?
- 2 - Nunca
- 3 - Muy poco
- 4 - De vez en cuando (como 1 ejemplar al mes)
- 5 - Todos los ejemplares (2 al mes)

**Percepciones del Mercado de Citricos**

**54. Antes de nuestra visita habia oido Ud. de la Fundacion Hondureña de Investigacion Agricola o la FHIA?**

- 0 - No
- - Si: Donde esta ubicada esta Fundacion?
- 1 - No sabe
- 2 - Sabe que se ubica en La Lima

**55. A base de su experiencia en manejar esta finca, cual es el problema que mas ha perjudicado a la productividad de los arboles?**

- |                        |                             |
|------------------------|-----------------------------|
| 0 - No ve problemas    | 5 - Control de insectos     |
| 1 - Variedad           | 6 - Control de enfermedades |
| 2 - Riego / Drenaje    | 7 - Credito                 |
| 3 - Fertilizacion      | 8 - Insumos                 |
| 4 - Control de malezas | 9 - Comercializacion        |
|                        | 10 - Clima                  |

**56. Es Ud. miembro de alguna organizacion o asociacion de citricultores?**

- 0 - No sabe si el propietario es miembro
- 1 - El propietario no es miembro
- 2 - Miembro de grupo regional (especifique)
- 3 - Miembro de la Asociacion de Citricultores Progreseños
- 4 - Miembro de ANACIHO

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57. Si contesto No a 56: Porque?

- 0 - Contesto Si a 56
- 1 - No puede especificar (por ejemplo - No le gusta)
- 2 - Falta de informacion
- 3 - Vive aislado de la ciudad
- 4 - Falta de tiempo
- 5 - No llego la oportunidad
- 6 - Experiencia negativa con cooperativa u organizacion
- 7 - En plantilla, poco produccion, o finca es pequeña
- 8 - Prefiere trabajar como individual
- 9 - No ve beneficio o solo benefician unos pocos
- 10 - Problema de salud

58. Si contesto Si a 56: En que forma cree Ud. que esta organizacion puede mejorar la productividad y los ingresos de los citricultores? ( 0 - Contesto No a 56 )

- 1 - Influir politica agricola
- 2 - Mercado (precios)
- 3 - Mercadeo (informacion)
- 4 - Tecnologia comercializacion
- 5 - Insumos
- 6 - Credito
- 7 - Asistencia Tecnica en Tecnologia (produccion)
- 8 - Riego / Drenaje
- 9 - Dominio de tierra
- 10 - Adquisicion de tierra
- 11 - No puede especificar

59. Piensa Ud. si el C.D.C. tuvo algun impacto en los precios de la naranja cuando esta fabrica empezo a comprar la naranja en el 1984?

- 0 - No sabe
- 1 - No
- 2 - Si: Se bajaron o subieron los precios?
- 3 - Se bajaron
- 4 - Se mantuvieron
- 5 - Se subieron

60. Esta finca ha vendido cualquiera de sus cosechas durante los ultimos dos años al C.D.C.?

- 0 - No sabe
- 1 - No vendio al C.D.C. ni en 1984 o 1985:  
Porque no vendio al C.D.C.? (Marque la respuesta en la pregunta 61 usando el codigo de la 61)
- 2 - Solo en 1985 (Pregunte la 61)
- 3 - Solo en 1984 (Pregunte la 62)
- 4 - En 1984 y 1985 (Pregunte la 63)

61. Si contesto la 60 con solo en 1985, pregunte:  
 Porque no vendio la cosecha al C.D.C. en el 1984?
- 0 - La pregunta no aplica o no dio respuesta
  - 1 - No le gusta
  - 2 - No quiso comprometerse
  - 3 - Mejor vender al mercado libre
  - 4 - Precios fueron bajos
  - 5 - Fruta no cumplio requisitos
  - 6 - En plantilla
  - 7 - Poca produccion
  - 8 - Ya tuvo contrato con otro comprador
  - 9 - No quiso vender sin contrato
  - 10 - Se iba a firmar un contrato pero nunca lo firmo
  - 11 - No vinieron
  - 12 - No tuvo necesidad
62. Si contesto la 60 con solo en 1984, pregunte:  
 Obtuvo Ud. una ganancia vendiendo al C.D.C. en 1984?
- 0 - La pregunta no aplica
  - 1 - Vendio al C.D.C. pero perdio
  - 2 - Si: Porque no vendio Ud. la cosecha al C.D.C. en 1985?  
 (Use el codigo de la 61)
63. Si contesto la 60 con 1984 y 1985, pregunte:  
 Como Ud. sabe o se dio cuenta, el C.D.C. compro la naranja en el 1984 en Lempiras 150.00 por tonelada corta pero en el 1985 llego a estar comprando la naranja en solo Lempiras 125.00 por tonelada corta. Con esta caida de precio, quedo la finca perdiendo o ganando vendiendo al C.D.C. en 1985?
- 0 - La pregunta no aplica
  - 1 - Quedo perdiendo en 1985
  - 2 - Apenas recupere los costos en 1985
  - 3 - Todavia pudo hacer una ganancia en 1985
  - 9 - No sabe o no puede contestar
64. Vendio su cosecha de naranja al C.D.C. a base de un contrato en el 1984 o 1985?
- 0 - No vendio al C.D.C.
  - 1 - Vendio al C.D.C. pero no tuvo contrato
  - 2 - Tuvo contrato en el 1984
  - 3 - Tuvo contrato en el 1985
  - 4 - Tuvo contrato en 1984 y 1985
65. Si tuvo contrato en 1984 o 1985: Fue este contrato verbal o escrito?
- |  | <u>1984</u> | <u>1985</u> |
|--|-------------|-------------|
| - <u>No vendio al CDC</u>                    | A           | E           |
| - <u>Vendio al CDC pero no tuvo contrato</u> | B           | F           |
| - <u>Contrato Verbal</u>                     | C           | G           |
| - <u>Contrato Escrito</u>                    | D           | H           |
- 1 - AE      5 - BE      9 - CE      13 - DE  
 2 - AF      6 - BF      10 - CF      14 - DF  
 3 - AG      7 - BG      11 - CG      15 - DG  
 4 - AH      8 - BH      12 - CH      16 - DH

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66. Si tuvo un contrato en 1984: En el contrato se fijo un precio de compra?
67. Si tuvo un contrato en 1985: En el contrato se fijo un precio de compra?
- 0 - No vendio al C.D.C.
  - 1 - Vendio al C.D.C. pero no tuvo contrato
  - 2 - Contrato verbal que no fijo precio
  - 3 - Contrato verbal que se entendia que se fijo el precio
  - 4 - Contrato escrito que no fijo precio
  - 5 - Contrato escrito que fijo precio
- 68-69. Si fijo precio: Que precio se fijo en el contrato?
- 0 - No vendio al C.D.C.
  - 1 - Vendio al C.D.C. pero no tuvo contrato
  - - 68. Precio que se fijo en el 1984
  - - 69. Precio que se fijo en el 1985
70. Como ve Ud. comprometerse a un contrato que fija un precio para vender la cosecha a una empresa como el C.D.C.?
- 0 - No opina
  - 1 - Prefiere no comprometer la cosecha y venderla al que mejor convenga
  - 2 - Prefiere un contrato escrito pero depende del precio que se fija
  - 3 - Prefiere un contrato escrito pero depende del precio que se fija y que haya asistencia tecnica
  - 4 - Prefiere contrato pero tiene miedo que la fabrica no cumple
  - 5 - Prefiere tener contrato como alternative a ser solo dependiente de los intermediarios
  - 6 - Prefiere que se puede negociar el mejor contrato entre varios compradores (empresas)
  - 7 - Le gustaria un contrato que le ayude rehabilitar la finca
71. Si Ud. vende o fuera a vender toda su cosecha al C.D.C., que requisitos tiene que cumplir la fruta para que el C.D.C. se la compre?
- 0 - No sabe
- La suma de darle un punto para cada una de las siguientes que mencione el entrevistado:
- BRIX (no menos de 10)
  - Variedad (Valencia Roja, Piña, Criolla y no las otras)
  - Madura (color amarillo y no verde)
  - Tamaño no menos de 2 pulgadas
  - Sana y no golpeada ni cortada

72. Piensa Ud. sembrar nuevas tierras en plantilla durante este año (1986)?

- 0 - No: Pase a la pregunta 77  
 1 - Si: Pase a las preguntas 73 - 76

73. \_\_\_ Que clase piensa Ud. sembrar? (0 - No piensa sembrar)  
 Use el código de pregunta 9

74. \_\_\_ Que variedad piensa sembrar? (0 - No piensa sembrar)  
 Use el código de pregunta 10

75. Cuántas manzanas piensa sembrar?  
 \_\_\_ Manzanas? (0 - No piensa sembrar)

76. Como va a conseguir acceso a esta tierra?

- 0 - No piensa sembrar  
 1 - Tierra propia de dominio pleno  
 2 - Tierra propia de dominio útil  
 3 - Comprar tierra de dominio pleno  
 4 - Asociarse

77. De que variedad son los patrones de los injertos que Ud. compra o realiza? (0 - No sabe)

- 1 - Naranja agrio      3 - Limón      5 - Otro (especifique)  
 2 - Toronja          4 - Mandarina Cleopatra

78. Donde consigue Ud. los injertos para resiembra?

- 1 - Propio vivero  
 2 - Vivero particular de otro  
 3 - RR.NN.  
 4 - Marylou / C.D.C.  
 5 - Vivero de otro citricultor  
 6 - Otro (especifique)

79. Los injertos que Ud. compra o realiza son con yemas certificadas?    0 - No sabe    1 - No    2 - Si

80. Alguna vez compra Ud. las yemas?

- 0 - No compra  
 - Si: Son certificadas?  
 1 - No  
 - Si: Donde compra Ud?  
 Mismo código de la 78

81. Practican los cosechadores cualquier precaución para no maltratar la fruta? (0 - En plantilla)

- 1 - Ninguna (se corta y se deja que la fruta cae al suelo)  
 2 - Colchon lleno de hojas  
 3 - Se coloca en una bolsa en el hombro del cosechador  
 4 - Uno corta la fruta y otro la recibe ganando abajo  
 5 - Colchon y/o ganado  
 6 - Colchon y/o bolsa  
 7 - Bolsa y/o ganado

Appendix 4. Anexo 5 of FHIA's (1985) "Informe Sobre Situación Actual de las Fincas de Citricos - Zona El Progreso": List of Citrus Growers' in the El Progreso Region.

CITRICULTORES DE LA ZONA DE PROGRESO, SANTA RITA, MEZAPA  
NARANJA, LIMON PERSA, TORONJA

Group Letter (A,B,C,D, or E) of interviewed farmers to right of "No. Productor".

| Nº<br>Productor | Nombre productor  | Localidad        | Manzanas cultivadas<br>(Julio, 1985) |
|-----------------|---|------------------|--------------------------------------|
| 1               | Julio Ramírez   | El Progreso,     | 2.0                                  |
| 2 D             | Ricardo Fúnez   | Santa Rita y     | 3.0                                  |
| 3               | Emil Canales Hawit (Limón persa) (Emilia)                             | Quebrada Seca    | 3.0                                  |
| 4               | Marco Tulio Sosa (L. persa) (Marco Antonio Sosa)                      |                  | 4.0                                  |
| 5 C             | Roberto Kattan M.*  |                  | 4.0                                  |
| 6               | Julian Gonzáles   |                  | 4.0                                  |
| 7               | Andrés Alvares Meléndez   |                  | 4.25                                 |
| 8 D             | María Vda. de López*  |                  | 6.0                                  |
| 9 A             | Juana Vda. de Handal (L. persa)*                                      |                  | 6.0                                  |
| 10 C            | Céleo Moya* (Celeo A. Moya)   |                  | 10.0                                 |
| 11              | Juan Ramón Rosa   |                  | 10.0                                 |
| 12              | Luis Bogran Fortin  |                  | 11.0                                 |
| 13 C            | Jorge Handal Bendeck*   |                  | 20.0                                 |
| 14 B            | Amadeo Avila V.*  |                  | 22.0                                 |
| 15              | Miguel Machi L.* (Naranja, toronja, limón persa) (Miguel Machi Lopez) |                  | 85.0                                 |
| 16              | Compañía Bananera Hondureña (Toronja)                                 |                  | <u>116.0</u>                         |
|                 | N = 16  | = 320.75         | $\bar{x}$ = 20.05                    |
|                 |   |                  | 320.75                               |
| 17              | Cruz Perdomo*   | Camalote         | 3.0                                  |
| 18 C            | Pablo Perdomo (plantilla)* (Pablo Perdomo Guerrero)                   |                  | 3.0                                  |
| 19 D            | Guillermo Molina*   |                  | 4.0                                  |
| 20 A            | Clementina Chavarría*   |                  | 5.0                                  |
| 21 D            | Santos Quinto (plantilla)*  |                  | 5.0                                  |
| 22 D            | Julio Ortíz*  |                  | 5.0                                  |
| 23              | Alfredo Hawit*  |                  | 6.0                                  |
| 24              | Swami Machi (Limón persa)   |                  | 6.5                                  |
| 25 a/           | Vilma García*   |                  | 9.0                                  |
| 26 A            | Santos Mejía Flores*  |                  | 11.0                                 |
| 27 A            | Argentina Vda. de Chavarría   |                  | 11.0                                 |
| 28              | Michel Hawit (10 mz, plantilla)                                       |                  | 20.0                                 |
| 29 B            | Pastor Cáliz*   |                  | 20.0                                 |
| 30              | Jacobo Roth (Limón persa)*  |                  | <u>20.0</u>                          |
|                 | N = 14  | = 118.5          | $\bar{x}$ = 8.46                     |
|                 |   |                  | 118.5                                |
| 31 D            | Marcelino Medina*   | Quebrada de Yoro | 4.0                                  |
| 32              | Adan Arias Medina   |                  | 5.0                                  |
| 33 (35?)        | Eduardo Meléndez  |                  | 5.0                                  |
| 34 E            | Cooperativa Campesinos (plantilla)                                    |                  | 8.0                                  |
| 35 A            | Eduardo Contreras*  |                  | 10.0                                 |
| 36 C            | Roberto Flores*   |                  | 11.0                                 |

a/ Could not be interviewed because was out of the country.

| Nº    | Productor | Nombre productor                                   | Localidad        | Manzanas cultivadas<br>(Julio, 1985) |
|-------|-----------|--|------------------|--------------------------------------|
| 37 E  |           | Gregorio Acosta*                                   | Quebrada de Yoro | 12.0                                 |
| 38    |           | Armando Cabrera*                                   |                  | 12.0                                 |
| 39    |           | Julio C. Rodríguez (plantilla)                     |                  | <u>20.0</u>                          |
|       |           | N = 9                      = 87.0 $\bar{x}$ = 9.67 |                  |                                      |
|       |           | Lopez  |                  |                                      |
| 40    |           | Roberto Machi / (7 plantillas)*                    | La 42            | 9.0                                  |
|       |           | N = 1                      = 9 $\bar{x}$ = 9       |                  |                                      |
| 41 E  |           | Alfredo Gabrie*                                    | Chindongo        | 16.0                                 |
| 42 E  |           | Nora C. de Siwadi* Nora C. de Siwady               | (husband: Kamal) | 20.0                                 |
|       |           | N = 2                      = 36 $\bar{x}$ = 18     |                  |                                      |
| 43    |           | Elsa Vda. de Castillo*                             | La 41            | 20.0                                 |
| 44 E  |           | Jorge Machi L.*                                    |                  | 30.0                                 |
|       |           | N = 2                      = 50 $\bar{x}$ = 25     |                  |                                      |
| 45 B  |           | Andrés Hawit (Limón persa)*                        | El Jute          | 10.0                                 |
|       |           | N = 1                      = 10 $\bar{x}$ = 10     |                  |                                      |
| 46 D. |           | Angel María Velásquez                              | La 40            | 2.0                                  |
| 47    |           | Alfredo Montoya*                                   |                  | 20.0                                 |
| 48 B  |           | Emilia de Avila e hijos*                           |                  | 30.0                                 |
| 49 B  |           | Rodolfo Hall*                                      |                  | 30.0                                 |
|       |           | N = 4                      = 82 $\bar{x}$ = 20.5   |                  |                                      |
| 50 R/ |           | Luis Munguía*                                      | Santa Inés       | 24.0                                 |
|       |           | N = 1                      = 24 $\bar{x}$ = 24     |                  |                                      |
| 51    |           | Nicolás Gutiérrez*                                 | La 39            | 3.0                                  |
| 52    |           | Angel Guevara*                                     |                  | 3.0                                  |
| 53 C  |           | Oscar Hernández*                                   |                  | 5.0                                  |
| 54    |           | Andrés Velásquez*                                  |                  | 12.0                                 |
| 55    |           | Jacobo Botto (Limón persa)*                        |                  | 20.0                                 |
|       |           | N = 5                      = 43 $\bar{x}$ = 8.6    |                  |                                      |
| 56 C  |           | Teresa Espinal Majano (same as 80)                 | La 36            | 3.0                                  |
| 57 B  |           | Marco Tulio Ruiz                                   |                  | 4.0                                  |
| 58 D  |           | Hime Vda. de Handal                                |                  | 9.0                                  |
| 59 D  |           | Policarpo Bustillo                                 |                  | 15.0                                 |
| 60 B  |           | Oscar Villegas*                                    |                  | 20.0                                 |

R/ Refused

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| Nº         | Productor | Nombre productor                      | Localidad         | Manzanas cultivadas<br>(Julio, 1985) |
|------------|-----------|---------------------------------------|-------------------|--------------------------------------|
| 61         |           | Marco A. Sosa*                        | La 36             | 70.0                                 |
| 62         |           | Virgilio Guzman*                      |                   | 300.0                                |
|            |           | N = 7 = 421                           | $\bar{x} = 60.14$ |                                      |
| 63 A       |           | Juan Villatoro                        | La 35             | 4.0                                  |
| 64         |           | Daniel Reyes Gómez*                   |                   | 12.0                                 |
| 65 C       |           | José Santos Umanzor*                  |                   | 20.0                                 |
|            |           | N = 3 = 36                            | $\bar{x} = 12$    |                                      |
| 66         |           | Arturo Ferrufino                      | La 29             | 2.0                                  |
| 67         |           | Saúl Cáliz                            |                   | 5.0                                  |
|            |           | N = 2 = 7                             | $\bar{x} = 3.5$   |                                      |
| 68 D       |           | Bernardino Castillo                   | La 28             | 2.0                                  |
| 69 D       |           | Ramón Avila                           |                   | 2.0                                  |
| 70 D       |           | Santos Cabrera*                       |                   | 5.0                                  |
|            |           | N = 3 = 9                             | $\bar{x} = 3.0$   |                                      |
| 71         |           | Pablo Velásquez*                      | Guaymitas y       | 3.0                                  |
| 72 D       |           | Hernán Domínguez                      | La Colorada       | 4.5                                  |
| 73 a/      |           | Cooperativa Dimundo                   |                   | 5.0                                  |
| 74 D       |           | Evelio Ayala                          |                   | 5.0                                  |
| 75 E       |           | Celso Bobadilla*                      |                   | 20.0                                 |
| 76         |           | Donaldo Villatoro (16 plantillas)*    |                   | 88.0                                 |
|            |           | N = 6 = 125                           | $\bar{x} = 20.91$ |                                      |
| 77 C       |           | Gustavo Morales                       | Guaymon           | 5.0                                  |
| 78 E       |           | Eduardo Hall (18 plantillas)*         |                   | 26.0                                 |
| 79 B       |           | Francisco Galo*                       |                   | 35.0                                 |
|            |           | N = 3 = 66                            | $\bar{x} = 22$    |                                      |
| 80 (is 56) |           | Teresa Moreno*                        | Las Delicias      | 4.0                                  |
|            |           | N = 1 = 4                             | $\bar{x} = 4$     |                                      |
| 81 D       |           | Ramón Mayorquin*                      | Toyos             | 8.0                                  |
| 82         |           | Héctor Rivera*                        |                   | 27.0                                 |
|            |           | N = 2 = 35                            | $\bar{x} = 17.5$  |                                      |
| 83 D       |           | Fausto Fúnez                          | El Naranjo y      | 4.0                                  |
| 84 B       |           | Elizabeth Vda. de Meza (3 plantillas) | Mezapa            | 12.0                                 |

a/ Was not an orange orchard but rather a grapefruit orchard;  
has been cancelled and replanted to African palm.

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| Nº | Productor | Nombre productor                   | Localidad    | Manzanas cultivadas<br>(Julio, 1985) |
|----|-----------|------------------------------------|--------------|--------------------------------------|
| 85 | B         | Antonio Lobo Oliva (4 plantillas)* | El Naranjo y | 18.0                                 |
| 86 | E         | Horacio Figueroa                   | Mezapa       | 20.0                                 |
| 87 |           | Amilcar Figueroa*                  |              | 30.0                                 |
|    |           | N = 5                              | = 84         | $\bar{x} = 16.80$                    |

Estimaciones totales del sector de El Progreso

| Productores | Manzanas en cultivo | Promedio |
|-------------|---------------------|----------|
| 87          | 1,567.25            | 18.01    |

\*Asociados a ANACIHO = 58

| Naranja                  | Toronja          | Limón   |
|--------------------------|------------------|---------|
| Valencia, Victoria, Piña | Rubi Red, Varios | Persa   |
| 1,349.25 mz              | 129.0 mz         | 89.0 mz |

Area total en plantilla = 104 mz

Información revisada Julio 7, 1985 y confirmada con listados FEPROEXAAH.  
ANACIHO, F.H.I.A.

/myb

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Appendix 5. Additional Citrus Growers Identified During the Study Who Were Not listed in Appendix 4's List of 87 Growers.

Citrus Growers on ACP List but not on FHIA List (Appendix 4)

1. Roberto Handal, Urraco Proteccion, 16.0 Mza.
2. Nicolas Castro, Camalote, 12.0 Mza.

Additional Growers on CDC List

3. Gloria Chavarria de Recarte, Camalote
4. Aracely Chavarria de Recarte, El Progreso
5. Armando Avila Panchame, El Progreso
6. Beningno Gonzales, El Progreso
7. Edgardo Munguia, Santa Ines

Growers Identified in the Field While Interviewing Growers

8. Children of Santos Mejia Flores, Camalote
9. Amilcar Cruz, Camalote
10. Juana Vda. de Handal, Las Minas (6 Mza. of lemon)
11. Juana Vda. de Handal and children, Planes, 22 Mza. (15 Mza. of orange, 2 Mza. of lemon, and 5 Mza. of grapefruit)
12. Diana Handal de Handal, Quebrada Seca (2.5 Mza. of orange and 3 Mza. of lemon) (No. 9 on FHIA's list)
13. Frida Handal, Camalote (10 Mza. of orange seedlings and 5 Mza. of lemon)
14. Pedro Antonio Gomez, Guaymitas, 12.5 Mza. of orange in production and 20.0 Mza. in orange seedlings)

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Appendix 6. List of Citrus Growers Interviewed.

| <u>Interview No.</u> | <u>Grower No.</u> | <u>Location No.</u> | <u>Group No.</u> | <u>Grower's Name</u>                  |
|----------------------|-------------------|---------------------|------------------|---------------------------------------|
| 01                   | 79                | 20                  | B                | Francisco Galo                        |
| 02                   | 13                | 03                  | C                | Jorge Handal Bendeck                  |
| 03                   | 34                | 06                  | E                | Alfredo Acosta Santos (Coop. Morazan) |
| 04                   | 35                | 06                  | A                | Eduardo Contreras                     |
| 05                   | 37                | 06                  | E                | Gregorio Acosta                       |
| 06                   | 22                | 22                  | D                | Julio Ortiz                           |
| 07                   | 26                | 05                  | A                | Santos Mejia Flores                   |
| 08                   | 44                | 08                  | E                | Jorge Machi                           |
| 09                   | 05                | 03                  | C                | Roberto Kattan                        |
| 10                   | 41                | 23                  | E                | Alfredo Gabrie                        |
| 11                   | 58                | 12                  | E                | Hime Vda. de Handal                   |
| 12                   | 69                | 15                  | D                | Roman Avila                           |
| 13                   | 68                | 15                  | D                | Bernardino Castillo                   |
| 14                   | 70                | 14                  | C                | Santos Pablo Cabrera                  |
| 15                   | 59                | 12                  | E                | Policarpo Bustillo Maldonado          |
| 16                   | 29                | 05                  | B                | Pastor Calix Garcia                   |
| 17                   | 65                | 13                  | C                | Jose Santos Umanzor                   |
| 18                   | 42                | 07                  | E                | Nora C. de Siwady (Kamal)             |
| 19                   | 48                | 10                  | B                | Emilia de Avila                       |
| 20                   | 14                | 10                  | B                | Amadeo Avila                          |
| 21                   | 49                | 11                  | B                | Rodolfo Hall                          |
| 22                   | 78                | 17                  | E                | Eduardo Hall                          |
| 23                   | 02                | 01                  | D                | Ricardo Funez                         |
| 24                   | 19                | 06                  | D                | Guillermo Molina                      |
| 25                   | 75                | 16                  | E                | Celso Bobadilla                       |
| 26                   | 27                | 05                  | A                | Argentina Vd. de Chavarria            |
| 27                   | 20                | 05                  | A                | Clementina Chavarria                  |
| 28                   | 85                | 22                  | B                | Antonio Lobo Oliva                    |
| 29                   | 09                | 04                  | A                | Juana Vda. de Handal                  |
| 30                   | 21                | 05                  | E                | Santos Quintos                        |
| 31                   | 63                | 13                  | A                | Juan Villatoro                        |
| 32                   | 18                | 05                  | C                | Pablo Perdomo                         |
| 33                   | 36                | 06                  | C                | Roberto Flores Urrutia                |
| 34                   | 45                | 09                  | B                | Andres Hawit                          |
| 35                   | 08                | 04                  | E                | Maria Vda. de Lopez                   |
| 36                   | 10                | 02                  | C                | Celeo A. Moya                         |
| 37                   | 84                | 22                  | B                | Elizabeth Vda. de Meza                |
| 38                   | 86                | 24                  | E                | Horacio Figueroa                      |
| 39                   | 83                | 24                  | D                | Fausto Lisandro Funez                 |
| 40                   | 74                | 18                  | D                | Evelio Ayala                          |
| 41                   | 57                | 12                  | B                | Marco Tulio Ruiz                      |
| 42                   | 53                | 14                  | C                | Oscar Hernandez                       |
| 43                   | 31                | 06                  | D                | Marcelino Medina                      |
| 44                   | 81                | 21                  | E                | Ramon Mayorquin                       |
| 45                   | 46                | 10                  | E                | Angel Maria Velazquez                 |
| 46                   | 60                | 12                  | B                | Oscar Villegas                        |
| 47                   | 56                | 12                  | C                | Teresa Espinal Majano                 |
| 48                   | 72                | 12                  | D                | Hernan Dominguez                      |
| 49                   | 77                | 19                  | C                | Gustavo Morales                       |

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Appendix 6-1. List of Growers Interviewed in Groups A through E.

| <u>Interview<br/>No.</u> | <u>Grower<br/>No.</u> | <u>Location<br/>No.</u> | <u>Grower's Name</u>        |
|--------------------------|-----------------------|-------------------------|-----------------------------|
| <u>Group A</u>           |                       |                         |                             |
| 29                       | 09                    | 04                      | Juana Vda. de Handal        |
| 27                       | 20                    | 05                      | Clementina Chavarria        |
| 07                       | 26                    | 05                      | Santos Mejia Flores         |
| 26                       | 27                    | 05                      | Argentina Vda. de Chavarria |
| 04                       | 35                    | 06                      | Eduardo Contreras           |
| 31                       | 63                    | 13                      | Juan Villatoro              |
| <u>Group B</u>           |                       |                         |                             |
| 20                       | 14                    | 10                      | Amadeo Avila                |
| 16                       | 29                    | 05                      | Pastor Calix Garcia         |
| 34                       | 45                    | 09                      | Andres Hawit                |
| 19                       | 48                    | 10                      | Emilia de Avila             |
| 21                       | 49                    | 11                      | Rodolfo Hall                |
| 41                       | 57                    | 12                      | Marco Tulio Ruiz            |
| 46                       | 60                    | 12                      | Oscar Villagas              |
| 01                       | 79                    | 20                      | Francisco Galo              |
| 37                       | 84                    | 22                      | Elizabeth Vda. de Meza      |
| 28                       | 85                    | 22                      | Antonio Lobo Oliva          |
| <u>Group C</u>           |                       |                         |                             |
| 09                       | 05                    | 03                      | Roberto Kattan              |
| 36                       | 10                    | 02                      | Celeo A. Moya               |
| 02                       | 13                    | 03                      | Jorge Mandal Bendeck        |
| 32                       | 18                    | 05                      | Pablo Perdomo               |
| 47                       | 56                    | 12                      | Teresa Espinal Majano       |
| 33                       | 36                    | 06                      | Roberto Flores Urrutia      |
| 42                       | 53                    | 14                      | Oscar Hernandez             |
| 17                       | 65                    | 13                      | Jose Santos Umanzor         |
| 49                       | 77                    | 19                      | Gustavo Morales             |

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Appendix 6-1 (continued)

| <u>Interview<br/>No.</u> | <u>Grower<br/>No.</u> | <u>Location<br/>No.</u> | <u>Grower's Name</u>                  |
|--------------------------|-----------------------|-------------------------|---------------------------------------|
| <u>Group D</u>           |                       |                         |                                       |
| 23                       | 02                    | 01                      | Ricardo Funez                         |
| 35                       | 08                    | 04                      | Maria Vda. de Lopez                   |
| 24                       | 19                    | 06                      | Guillermo Molina                      |
| 30                       | 21                    | 05                      | Santos Quinto                         |
| 06                       | 22                    | 05                      | Julio Ortiz                           |
| 43                       | 31                    | 06                      | Marcelino Medina                      |
| 45                       | 46                    | 10                      | Angel Maria Velazquez                 |
| 11                       | 58                    | 12                      | Hime Vda. de Handal                   |
| 15                       | 59                    | 12                      | Policarpo Bustillo Maldonado          |
| 13                       | 68                    | 15                      | Bernardino Castillo                   |
| 12                       | 69                    | 15                      | Roman Avila                           |
| 14                       | 70                    | 14                      | Santos Pablo Cabrera                  |
| 48                       | 72                    | 12                      | Hernan Dominguez                      |
| 40                       | 74                    | 18                      | Evelio Ayala                          |
| 44                       | 81                    | 21                      | Ramon Mayorquin                       |
| 39                       | 83                    | 24                      | Fausto Lisandro Funez                 |
| <u>Group E</u>           |                       |                         |                                       |
| 03                       | 34                    | 06                      | Alfredo Acosta Santos (Coop. Morazan) |
| 05                       | 37                    | 06                      | Gregorio Acosta                       |
| 10                       | 41                    | 23                      | Alfredo Gabrie                        |
| 18                       | 42                    | 07                      | Nora C. de Siwady (Kamal)             |
| 08                       | 44                    | 08                      | Jorge Machi                           |
| 25                       | 75                    | 16                      | Celso Bobadilla                       |
| 22                       | 78                    | 17                      | Eduardo Hall                          |
| 38                       | 86                    | 24                      | Horacio Figueroa                      |

Appendix 7.

Map of Location of Growers.



Legend

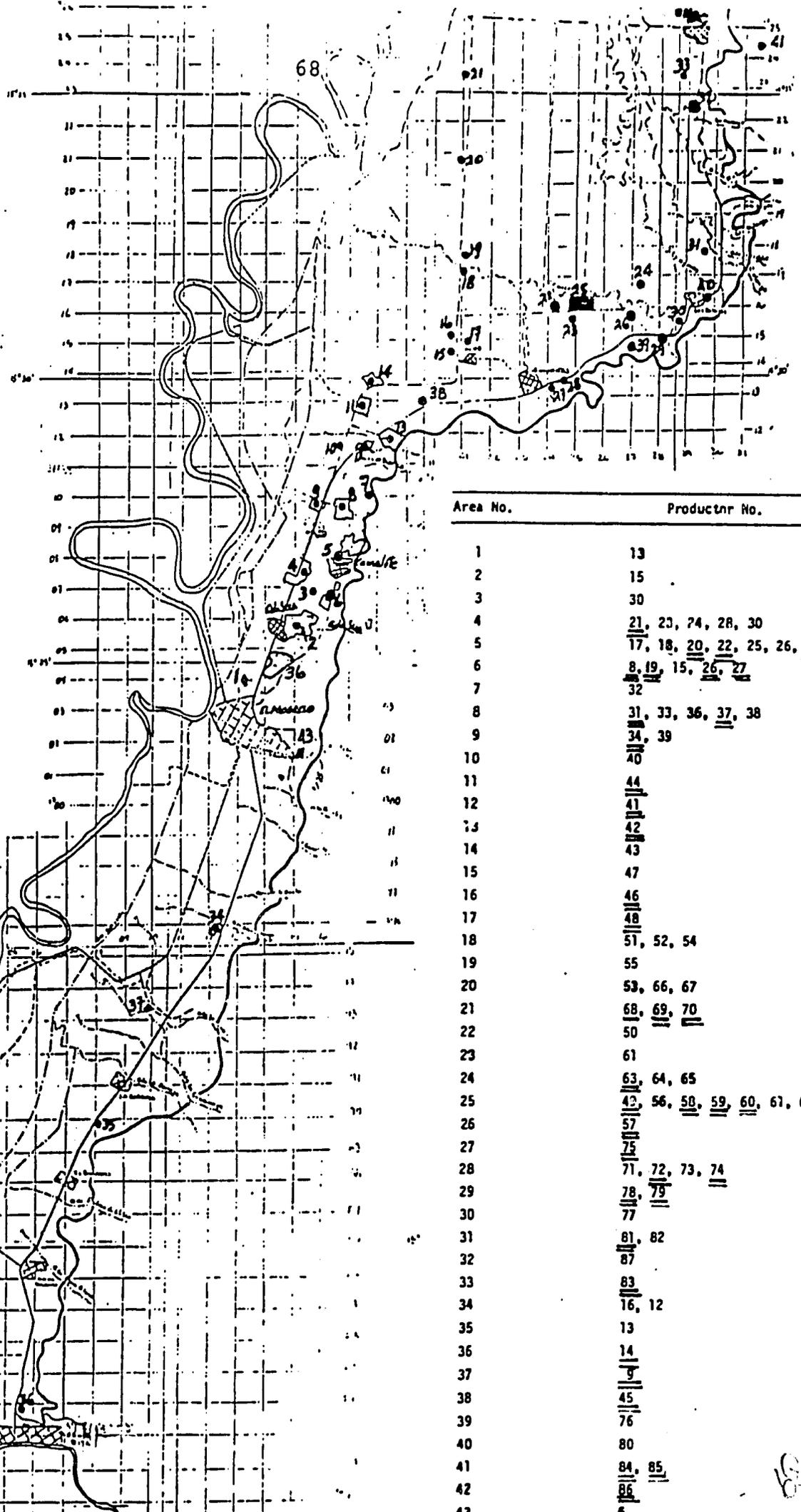
Group A = #

Group B = #

Group C = #

Group D = #

Group E = #



| Area No. | Productnr No.   |
|----------|---|
| 1        | 13  |
| 2        | 15  |
| 3        | 30  |
| 4        | <u>21</u> , <u>23</u> , <u>74</u> , <u>28</u> , <u>30</u>                                     |
| 5        | <u>17</u> , <u>18</u> , <u>20</u> , <u>22</u> , <u>25</u> , <u>26</u> , <u>23</u> , <u>35</u> |
| 6        | <u>8</u> , <u>19</u> , <u>15</u> , <u>26</u> , <u>27</u>                                      |
| 7        | <u>32</u>   |
| 8        | <u>31</u> , <u>33</u> , <u>36</u> , <u>37</u> , <u>38</u>                                     |
| 9        | <u>34</u> , <u>39</u>   |
| 10       | <u>40</u>   |
| 11       | <u>44</u>   |
| 12       | <u>41</u>   |
| 13       | <u>42</u>   |
| 14       | <u>43</u>   |
| 15       | <u>47</u>   |
| 16       | <u>46</u>   |
| 17       | <u>48</u>   |
| 18       | <u>51</u> , <u>52</u> , <u>54</u>   |
| 19       | <u>55</u>   |
| 20       | <u>53</u> , <u>66</u> , <u>67</u>   |
| 21       | <u>68</u> , <u>69</u> , <u>70</u>   |
| 22       | <u>50</u>   |
| 23       | <u>61</u>   |
| 24       | <u>63</u> , <u>64</u> , <u>65</u>   |
| 25       | <u>43</u> , <u>56</u> , <u>58</u> , <u>59</u> , <u>60</u> , <u>61</u> , <u>62</u>             |
| 26       | <u>57</u>   |
| 27       | <u>75</u>   |
| 28       | <u>71</u> , <u>72</u> , <u>73</u> , <u>74</u>   |
| 29       | <u>78</u> , <u>79</u>   |
| 30       | <u>77</u>   |
| 31       | <u>81</u> , <u>82</u>   |
| 32       | <u>87</u>   |
| 33       | <u>83</u>   |
| 34       | <u>16</u> , <u>12</u>   |
| 35       | <u>13</u>   |
| 36       | <u>14</u>   |
| 37       | <u>9</u>  |
| 38       | <u>45</u>   |
| 39       | <u>76</u>   |
| 40       | <u>80</u>   |
| 41       | <u>84</u> , <u>85</u>   |
| 42       | <u>86</u>   |
| 43       | <u>8</u>  |

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Appendix 8. Estimates of Average Labor Costs of Selected Technological Practices for Five Grower Groups in El Progreso.

| <u>Labor Practice</u> b/          | <u>Group a/</u>  |                  |                                 |                  |                             |
|-----------------------------------|------------------|------------------|---------------------------------|------------------|-----------------------------|
|                                   | <u>A</u>         | <u>B</u>         | <u>C</u>                        | <u>D</u>         | <u>E</u>                    |
| <u>Comaleo</u>                    | 0.23/A           | 0.15/A           | 0.20/A<br>0.60/D                | 0.15/A<br>6.00/D | 0.26/A<br>6.25/D<br>50.0/Mz |
| <u>Chapia</u>                     | 6.0/D            | 12.0/D<br>24.0/M | 15.0/D<br>45.0/M<br>10.0/diesel | 31.0/D           | 9.50/D                      |
| <u>Comaleo</u><br><u>+ Chapia</u> | 6.0/D<br>42.0/M  | 6.0/D<br>40.0/M  | 6.0/D<br>68.3/M                 | 30.0/M           | 51.0/M                      |
| <u>Fumigacion</u>                 | 8.0/D            | 6.0/D            | 10.0/D                          |                  | 6.67/D                      |
| <u>Abonar</u>                     | 7.0/D            | 6.3/D            | 0.1/A                           |                  | 7.12/D                      |
| <u>Podar</u>                      | 7.0/D<br>50.0/M  | 0.47/A<br>19.5/D | 0.63/A<br>6.5/D                 | 6.0/A            | 0.5/A<br>8.67/D             |
| <u>Cosecha</u>                    | 6.0/D<br>4.6/Mil | 4.3/Mil          | 9.5/D<br>4.7/Mil                | 6.0/D<br>5.0/Mil | 9.0/D<br>3.94/Mil           |
| <u>Drenaje</u>                    |                  | 0.7/Mts<br>6.0/D | 0.1/Mts                         |                  | 1.8/Mts<br>35.0/M           |

a/ L : Lempiras  
 A = arbol (tree)  
 D = dia (day)  
 M = manzana (Mza.)  
 Mil = mil (thousand)  
 Mts = metros (meters)

b/ Comaleo = clearing weeds under orange tree.  
Chapia = chopping weeds with machete.  
Fumigacion = spraying.  
Abonar = applying fertilizer.  
Podar = pruning / trimming.  
Cosecha = harvesting.  
Drenaje = draining fields.

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References

FHIA

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