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# Programs for Small Farms in Honduras: Development and Critique

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AID/ta - CA - 1

Project No. 931-1134-02

Cooperative Agreement Between  
USAID, Oklahoma State University and  
Colorado State University

International Development Series

No. 80-3

August 1980

Department of Agricultural Economics  
Oklahoma State University  
Stillwater, OK 74078

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# Preface

This report is one of a series emanating from the joint Oklahoma State University - Colorado State University cooperative agreements on Small Farmer Credit with the Agency for International Development. The overall objective of the project was to carry out small farm data collection analysis activities to improve credit use. The specific objectives of the cooperative effort between the two Universities and the agricultural development banks in Honduras and the Dominican Republic are to: (a) develop data collection and analysis approaches for use by credit institutions; (b) test these approaches in developing countries; and, (c) disseminate the results.

The approach envisioned and implemented was to evaluate alternative methodologies for farm level data collection and farm management analyses. These steps led to recommendations for improving credit allocation to small farmers in developing countries. Another major part of the project involved training of counterpart personnel and Bank loan personnel in credit policies and farm management approaches for solving small farmer credit problems.

The in-field phase of the project began in Honduras with the Banco Nacional de Fomento, now the Banco Nacional de Desarrollo Agrícola (BANADESA), on July 1, 1978, and in the Dominican Republic with the Banco Agrícola on July 1, 1979. Dr. Loren Parks, faculty member in the Department of Agricultural Economics at Oklahoma State University (OSU), was the field staff professional in Honduras for two years. Dr. Tom Dickey, faculty member in the Department of Economics at Colorado State University (CSU), is the field staff professional in the Dominican Republic.

The OSU part of this three year cooperative project was funded by AID under Cooperative Agreement AID/ta-CA-1, Project No. 931-1134-02, Basic

Memorandum of Agreement No. AID/ta-BMA-2; CSU operated under AID/ta-Ca-3 and AID/ta-BMA-6. The Credit Project began in 1977.

Dr. William Merrill, former chief of the Economics and Sector Planning Division, Bureau of Development Support, Agriculture, AID, provided early encouragement and leadership in implementing this project; Ms. Anne Grace-Ferguson, Agricultural Economist in ESP/DSB/AGR/AID helped develop the contractual agreements; and, Mr. Erhard Rupprecht and Ms. Karen Wiese, AID served as project managers and provided guidance and support during the past three years. Many in-country AID personnel provided suggestions and support for the project. Strong support of all AID personnel greatly appreciated. Special recognition is due Mr. René Cruz, President of the Banco Nacional de Fomento in Honduras, Mr. Roberto Valladares, Vice-President of BNF and BANADESA, and Mr. Alfonso Bonilla, former head of the Technical Division where the OSU project was located. Honduran counterparts on the project were Reynerio Barahona, Ricardo Arias and Rolando Medrano.

Faculty involved in the cooperative agreement, included James Osborn, Odell Walker, Harry Mapp, Michael Hardin, and Joe Williams of the OSU faculty, and Kenneth Nobe of the CSU faculty. In addition, J. D. Longwell, CSU Graduate Research Assistant was stationed in the Dominican Republic, and Kurt Rockeman, OSU Research Associate, was stationed in Honduras.

Ronald Tinnermeier  
CSU Project Coordinator, and  
Overall Project Coordinator  
Small Farmer Credit Project

Daniel D. Badger  
OSU Project Coordinator  
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## TABLE OF CONTENTS

PREFACE . . . . .	1
TABLE OF CONTENTS . . . . .	iii
INTRODUCTION . . . . .	1
METHODOLOGY . . . . .	3
The Honduras Record Book . . . . .	4
Selection of Areas and Participants . . . . .	6
Jutiapa . . . . .	6
Las Playitas . . . . .	9
Ajuterique. . . . .	10
El Matazano . . . . .	11
Training Record-Keepers . . . . .	12
WHOLE FARM RESULTS: AJUTERIQUE . . . . .	13
Net Worth Statement. . . . .	13
Assets . . . . .	13
Liabilities . . . . .	16
Cash Flow . . . . .	18
Income Statement . . . . .	21
ENTERPRISE RESULTS: AJUTERIQUE . . . . .	26
Individual Enterprise Results . . . . .	27
Risk Analysis . . . . .	29
Budget Reference . . . . .	31
Labor . . . . .	33
Family Consumption and Household Expenses . . . . .	35
Other . . . . .	37
RESULTS: EL MATAZANO . . . . .	39
Whole Farm Summaries . . . . .	39
Crop Summaries . . . . .	41
Conclusion . . . . .	41
EVALUATION AND RECOMMENDATIONS . . . . .	49
Recommendations for Organization and Management of Record Systems . . . . .	49
Completeness and Accuracy of the Data Obtained . . . . .	50
The Usefulness of Record Systems and Data . . . . .	56
The Bank . . . . .	56
Other Honduran Agencies . . . . .	57
The Farmers . . . . .	58
Other Beneficiaries . . . . .	59
Alternatives for Institutionalizing the Record System . . . . .	60

REFERENCES . . . . . 62  
APPENDIX A: THE SMALL FARM DATA . . . . .  
COLLECTION AND FARM ACCOUNT BOOK . . . . . 63

## RECORDS FOR SMALL FARMS IN HONDURAS:

## A DEVELOPMENT AND CRITIQUE

## INTRODUCTION

Farm records measure and monitor the heartbeat of a farm business. Records are the primary tool that farm managers use to gain information for decision making, to determine the profitability of the whole farm and of specific enterprises, and to measure progress over time. The physical information provided in records is useful when analyzing the efficiency of production, resources utilized, and distribution and/or consumption of products produced. By definition records are historical in nature, but the future can often be predicted by what has happened in the past. Records provide a base for planning future organization and enterprise combination, inputs required, products produced, and both quantities and timing of inputs and outputs. Based on future plans, credit needs can be determined and debt repayment ability can be analyzed.

In developed countries creditors base many lending decisions on farm records because records reflect the progress that borrowers have made in the past. Lenders typically use records to evaluate a loan application in terms of capacity and capital. Capacity signifies the ability to pay a loan when due. It is a function of receipts, cash outflow (including projected farm and nonfarm cash expenses), and previous debt commitments. A cash flow statement is usually necessary to determine repayment capacity. The cash flow statement can be developed from historical records and modified according to future plans.

The capital criterion refers to the equity or net worth of an individual. It represents the assurance that funds are available to pay a loan if the credit character or capacity should prove inadequate. Records are used to identify capital or collateral that are available to satisfy creditors'

requirements if credit character and capacity should prove inadequate. It is partially through records that lenders can evaluate the "riskiness" of a loan.

For project team members and other researchers associated with the Small Farm Credit Project, records are a source of information for verifying synthesized models such as enterprise budgets and representative farm situations. Farm records provide a realistic and reliable data source on which to develop lending procedures, rules and guidelines. Records also provide a means for Bank employees and policy makers a chance to observe, evaluate and verify the results of credit policies and procedures in the field.

Given the objectives of the Small Farm Credit Project, the needs of the Bank and farm managers, and the lack of a suitable record book or system of collecting farm management data in Honduras, the decision was made to develop a record book and implement a record program. The record program was designed to increase the awareness of lenders and borrowers about the use of information to improve farm management and loan administration.

The primary objective of the record program was to obtain information for synthesizing representative farm situations. More specifically, the information would be used to:

1. Identify and verify production coefficients, prices paid and prices received for inclusion in enterprise budgets;
2. Identify and quantify farm resources, including land, labor and capital;
3. Develop financial statements, including income and net worth, for farmer participants;
4. Determine the profitability of each crop and livestock enterprise on the farm;
5. Determine the quantity, cost and source of farm labor;

6. Identify resources used but not owned by the farmers;
7. Determine the source, amount and timing of all cash inflows and outflows;
8. Determine the quantities of farm-produced products consumed by the farm family.

The secondary objectives of the program were to:

1. Learn about the problems confronting both the farmer and the Bank;
2. Develop improved loan evaluation and administration procedures for the Bank;
3. Develop farmers awareness of the benefits of record-keeping, and improve their ability to make decisions using the information;
4. Learn how to organize and manage a records program for small farms in a less developed country.

#### METHODOLOGY

It was apparent at the outset of the program that a record book would have to be designed which would be appropriate for the situation in Honduras. The Oklahoma Looseleaf Enterprise Record Book [1] was redesigned to exclude all reference to income taxes or tax-motivated items such as depreciation schedules. The new design was based on the assumption that a local paraprofessional would visit farmers on a regular basis to make record book entries. Use of a paraprofessional was considered necessary to impose discipline on the farmers to remember their activities and enter them in the book on a regular basis. Some farmers would no doubt be illiterate, so the entries would have to be done for them. The book has a traditional accounting format so that both farmers and paraprofessionals can learn basic accounting concepts. A design compromise between simplicity and convenience in data analysis was necessary; the simpler the record

system the easier to train the paraprofessional, but the harder to organize and analyze the data.

### The Honduras Record Book

The Honduras record book is shown in Appendix A. The six basic sections include (1) receipts, (2) farm and home expenses, (3) labor records, (4) crop and livestock production summaries (5) inventory of crops, livestock, equipment, buildings and land, and (6) financial statements including net worth, cash flow, and profit and loss.

There are three forms for receipts. Forms 1.1 and 1.2 list livestock and crop receipts by category, units and quantity. These detailed forms provide per-unit return coefficients to supplement and verify enterprise budget information. Form 1.3 provides a record of miscellaneous sales, other income, and money borrowed. A complete record of farm and personal receipts is the basis for completing an annual cash flow statement, which in turn is used to develop the net income statement.

Farm and home expenses for each crop and livestock category are listed on forms 2.1 and 2.2. Form 2.3 includes overhead expenses, repairs, improvements and loan repayment. Form 2.4 is used to record household expenses. Column numbers on the income and expense forms correspond to the line numbers on the annual cash flow. The paraprofessional is not expected to complete the cash flow, but should recognize it as one of the reasons for complete accounting of farm and family income and expenses. Per unit cost and return data can also be gleaned from this data to supplement other data sources.

Labor records are extremely important due to the labor intensity of Honduran agriculture. Form 3.1 provides a description and timing of labor

activities and division of costs among operator, family and contract labor. Labor cost in currency or in kind should be allocated to the appropriate enterprise. An additional labor input form (also numbered 3.1) was designed for group loans and cooperative farms. Cash labor is also recorded in form 2.2 and 2.3, or transferred to the annual cash flow from form 3.1. Other labor costs are incorporated in the net income statement.

Form 4.1 provides an inventory of crops on hand. Purchases and production reflect an increase in the crop balance while sales, feed, seed, losses and family consumption decrease the crop balance. This record yields beginning and ending inventories, plus an accuracy check on sales and family consumption. Crop sales and family utilization could also be scheduled using inventory figures.

Livestock births, deaths and home consumption are recorded on form 4.2. Forms 4.1 and 4.2, plus beginning and ending inventories from form 5.1, provide current balance information similar to crop balance. Inventory of Perennial Crops form 5.2, is intended to measure the quantity and value of production sold or consumed at home. Perennial crop production is often consumed almost entirely at home. Inventories of machinery, equipment, buildings and land (form 5.3) sometimes include only a few items on family farms.

Sections four and five provide inventory data for net worth and the net income statement, and an accuracy check on purchases, sales and family consumption. These forms are the most difficult for the paraprofessional and can be completed by supervisory personnel if necessary. The forms in sections one through five provide all information necessary to complete the financial statements: net worth (6.1), cash flow (6.2), and profit and loss (6.3).

### Selection of Areas and Participants

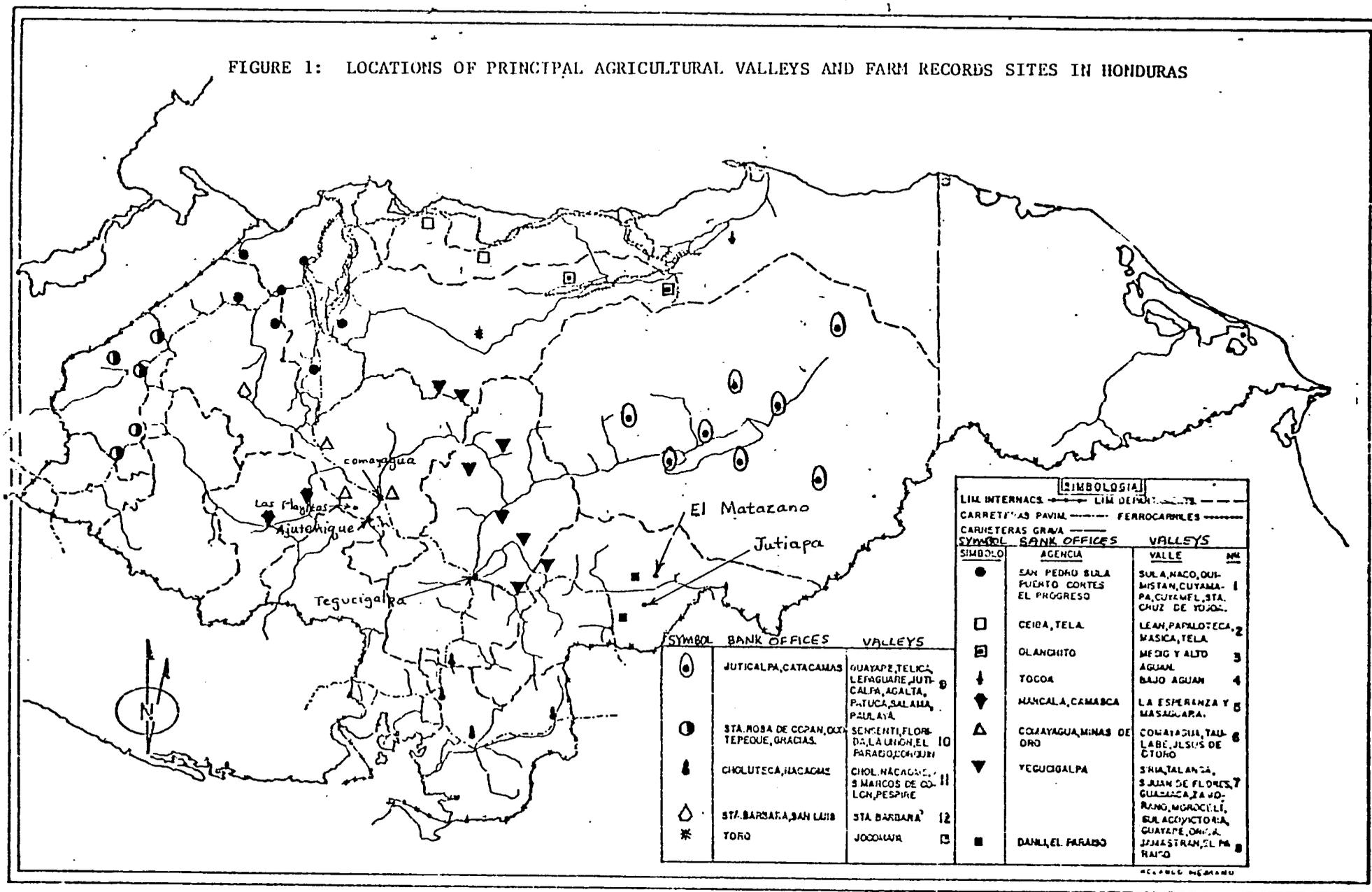
Selection of two areas in which to manage record books was planned so that data comparisons could be made. The Jamastran Valley (see Figure 1) was selected because of its importance in corn and bean production, because the Bank has serious loan repayment problems there, and because the valley could be visited from Tegucigalpa within one day.

Since some of the participating farmers would be illiterate, it was necessary to hire a literate person with easy access to the farms to help keep the books. The approach taken was to enlist participants in close proximity to each other and hire a local person to help keep the records. This "cell" model proved to be the best alternative to overcome the problems of illiteracy, transportation, and need for frequent visits.

Jutiapa. A loan officer from the Danli branch of the Bank--Roberto Sierra--recommended the community of Jutiapa to start the program. The reasons were that he was assigned to that area, there were many small farms, and the road was reasonably good. He spoke to 12 farmers (clients and non-clients of the Bank) whose initial response was favorable, then took project personnel to meet them and explain the program further. Reactions ranged from eagerness to suspicion, but ten farmers were willing to start in September, 1978.

Introduction of the farm records program was a delicate task. Care was taken to visit the farmers with Roberto Sierra at first, then return without him once they knew project personnel. The principal objection encountered among the farmers was fear that the information obtained would be used for tax assessment. It was therefore important to emphasize that the information was confidential and participation was entirely voluntary. In spite of

FIGURE 1: LOCATIONS OF PRINCIPAL AGRICULTURAL VALLEYS AND FARM RECORDS SITES IN HONDURAS



repeated assurances several participants were eternally suspicious. The severest crisis of confidence occurred when a rumor circulated that farm records had something to do with communism. The logic behind the claim was that farm records were a form of control, that the program was sponsored by a government agency, and that the ultimate objective was to usurp the farmers' freedom in the interest of the state. The participants raised questions about these issues, but the rapport with project personnel was strong enough to prevent loss of participants.

Three of the ten farmers who initially agreed to keep records never got past the first page of entries. One was rarely ever home, one was too ill to keep interest, and another decided that he didn't want to give out the information. Two more dropped out after four months for lack of interest, leaving five in the program. It was observed that the older and less affluent the farmer, the less his interest in records.

Some lessons were learned in Jutiapa, and the hardest of all was improper selection of the record-keeper. The first was the teenage son of a participating farmer, but he was neither interested nor competent enough to do the job. He also had other job alternatives which he liked better. It was then decided to hire a woman because women have fewer job alternatives in the countryside and might be more interested in the job. A town as small as Jutiapa simply does not have many literate young women available for employment, so for lack of better alternatives the 16 year-old daughter of a participant was hired. Despite frequent farm visits with her by project personnel, plus detailed instruction and practice in making entries, she never could do the job properly. It was not just a problem of intelligence or understanding; it was also a problem of personality and immaturity. Her shyness and ignorance of agriculture was an invitation

for the farmers to omit information or give imprecise information, and she would not question their response. For example, if a farmer purchased fertilizer but didn't report labor time for its application, she did not catch the omission. The program was continued until December, 1979, but after 14 months it was apparent that the records were not complete. The evidence was overwhelming when annual summaries were attempted that much information had not been recorded. In the meantime good records were obtained from two other sites, which confirmed how poorly things were going in Jutiapa.

The experiment in Jutiapa yielded some important benefits. Project personnel learned how to approach farmers about the record book, learned about the problems of farming in that area, tested initial drafts of the record book, and established a reputation in the Bank for getting out in the field and working with clients. In summary, the Jutiapa experience was valuable for what was learned about program management--not for the resulting record book data.

Las Playitas. After two months experience in Jutiapa it was decided to start another farm records cell in Las Playitas--a loose collection of houses in the Comayagua Valley that was recommended by a loan officer from the Bank branch office in Comayagua. The Comayagua Valley was selected for a second cell because it is an easy commute from Tegucigalpa, the principal agricultural experiment station in Honduras is there, and there are many irrigated small farms which contrast with the rainfed grains in the Jamastran Valley. Las Playitas was selected for the program primarily because an educated young woman was available to manage the books, and secondarily because the loan officer considered the farmers to be very cooperative.

Las Playitas proved to be a very different situation than Jutiaba. The record-keeper was intelligent, mature and conscientious, but the seven participating farmers were never serious about the program. The principal difficulty the record-keeper had was finding them; time after time their homes were visited without success. Farmers in this valley tend to be very mobile, traveling the short distance to Comayagua on the slightest pretext. They also have greater need to travel than Jutiaba farmers because vegetable crops require many inputs at specific times. This cell was abandoned after three months because the data were unreliable. Unbelievable numbers and reporting of identical information was common, and copying occurred because four of the seven participants were relatives. Others simply tired of reporting the information associated with numerous enterprises.

Ajuterique. Shortly after the ill-fated start in Las Playitas an alternative site was sought. Ajuterique is a town of approximately 8,000 persons--clearly a different setting than the other rural sites selected. Like Las Playitas, Ajuterique is characterized by many small irrigated farms within the Selguapa irrigation district.

A Bank loan officer discussed the program with prospective participants first, then project personnel visited to explain the program in detail. Thirteen farmers agreed to participate, and record book entries began the second week of January, 1979. The composition of the group underwent some changes, leaving complete records for only nine participants in calendar year 1979. One farmer lost interest, one died, and two dropped out in frustration because they could not be included in a group loan organized as part of another project program. They could not be included because they had unpaid debts to the Bank incurred when they belonged to a cooperative farm.

Three of the loan recipients suffered economic losses on onions, and one was especially hard hit because he had to take over the farm of his

deceased son (also a loan recipient). In spite of the problems the group paid off the loan, the records were maintained and the group was expanded to 17 participants. Impetus for expansion of the group was provided by a group loan for 1980. Participation in the loan required keeping complete records.

In summary, Ajuterique was the most successful record-keeping program for small, private farms. The combination of loan/records was an incentive for the farmers to keep good records because they were cognizant of the need for control of loan funds. Furthermore, the woman who kept the records did an outstanding job. A third reason for relative success was that the Ajuterique farmers were generally more educated and economically better off than participating farmers in other locations. They were more amenable to new ideas and less suspicious of the motives for keeping records.

El Matazano. "El Matazano" is the name of a cooperative farm located in the Jamastran Valley. A record book was started on this farm in January, 1979 in response to a request by Rene Cruz, the former Bank president, to include the land reform sector in the records program. Initial reaction to introduction of a record book on a cooperative farm was surprisingly good because every land reform (cooperative) farm was already required to keep a record book. But their "book" was only a simple ledger of incomes and expenses supplied by the Instituto Nacional Agrario (land reform agency). The Instituto's record-keepers visited each farm only once a month and did not prepare financial summaries. The regional association of 19 cooperative farms in the Jamastran Valley was eager to start keeping more complete records on all 19 farms immediately, but the request was deferred on grounds of inadequate project personnel and the need to gain experience with one group first.

A meeting was held at the farm with members of El Matazano and representatives from the Instituto Nacional Agrario and the Ministry of Natural Resources, during which the farm members selected one of the two literate members to keep the record book. He was an excellent choice; he was intelligent and interested enough to keep the records according to instructions, and when he didn't know how to handle a particular entry he wrote it down apart for consultation with project personnel. Results of the record book for El Matazano are presented later.

### Training Record-Keepers

During the six months prior to March, 1979 the record-keepers were trained by accompanying them on farm visits and showing them how to make entries. Each record-keeper was accompanied weekly for the first month, gradually diminishing to monthly when he or she had learned enough. At first the project team member interviewed the farmers and helped the record-keeper make entries, but the record-keeper assumed all responsibilities as soon as possible. Project personnel soon were able to spend supervisory time on particular problems like omissions and inconsistencies. The task also became easier as farmers learned which information to remember and report.

By March it was necessary to conduct a one-day course to standardize record book entry procedures and solve some problems that the three record-keepers had been having. The record-keepers from Ajuterique, Jutiapa and El Matazano participated, as did Dr. Dan Galt who set up four farm records cells for the Ministry of Natural Resources using the SFC record book. The format of the course was almost entirely sample entries prepared in advance by the project team, although some time was spent on interview techniques. Summarization and interpretation of the records were not taught at that

time because of uncertainty about the desirability of trying to teach the material when more basic concepts were not yet understood. It was expected that project personnel would handle summaries and interpretation anyway. The record-keeper in Ajuterique was subsequently taught to do enterprise summaries, however, which she did very well.

#### WHOLE FARM RESULTS: AJUTERIQUE

The following discussion centers on indicators of the financial condition of the farm firm. These indicators summarize all that occurred in the farm firm during the calendar year. No single indicator can present a complete picture of the farm firm, but by combining these indicators a complete picture of the firm can be constructed.

#### Net Worth Statement

The Net Worth Statement is a measure of the solvency and financial viability of the farm firm. It is a picture of the financial position of the firm at a given point in time. Net Worth Statements for the record book participants in Ajuterique as of December 31, 1979 are shown in Table 1. Each component of the Net Worth Statement is presented in the following discussion.

Assets. The asset section consists of three principal categories: current, intermediate and fixed assets. The Current Asset section consists of four sub-categories: Personal assets, annual crops stored and/or under cultivation, market livestock and perennial crops. Current assets are those which are highly liquid. Current assets are very important in assessing the financial condition of Honduran farmers. It is from this category that resources are made available for crop production and loan repayment. Although

TABLE 1: NET WORTH STATEMENTS FOR RECORD BOOK PARTICIPANTS IN AJUTERIQUE

DECEMBER 31, 1979

	Participants									Mean
	1	2	3	4	5	6	7	8	9	
<b>ASSETS</b>	(LEMPIRAS*)									
<b>I. CURRENT</b>										
Personal	2450.55	716.70	486.30	1501.70	85.11	1540.45	527.80	2204.20	86.00	1066.54
Annual Crops	502.00	443.98	297.00	738.00	2055.89	182.73	387.00	1352.00	218.75	686.37
Market Livestock		239.50					35.00			30.50
Perennial Crops		60.00		195.00		319.00	135.00	345.00	45.00	122.11
<b>TOTAL</b>	<b>2952.55</b>	<b>1460.18</b>	<b>783.30</b>	<b>2434.70</b>	<b>2141.00</b>	<b>2042.18</b>	<b>1084.80</b>	<b>3901.20</b>	<b>349.75</b>	<b>1905.52</b>
<b>II. INTERMEDIATE</b>										
Breeding Livestock and Draft Animals		2025.00					1320.00	675.00		446.07
Tools and Equipment	174.00	125.50	90.50	139.50	526.10	73.50	196.00	67.00	91.00	164.79
<b>TOTAL</b>	<b>174.00</b>	<b>2150.50</b>	<b>90.50</b>	<b>139.50</b>	<b>526.10</b>	<b>73.50</b>	<b>1516.00</b>	<b>742.00</b>	<b>91.00</b>	<b>611.46</b>
<b>III. FIXED</b>										
Land and Buildings	8500.00	8500.00	2000.00	11900.00	6000.00	4000.00	7750.00	14000.00	4000.00	7405.55
<b>TOTAL ASSETS</b>	<b>11626.55</b>	<b>12110.68</b>	<b>2873.80</b>	<b>14474.20</b>	<b>8667.10</b>	<b>6115.68</b>	<b>10350.80</b>	<b>18643.20</b>	<b>4440.75</b>	<b>9922.53</b>
<b>LIABILITIES</b>										
Current	1200.00				1668.05	969.75		1608.85		605.18
Intermediate										
Long Term										
<b>TOTAL LIABILITIES</b>	<b>1200.00</b>				<b>1668.05</b>	<b>969.75</b>		<b>1608.85</b>		<b>605.18</b>
<b>NET WORTH</b>	<b>10426.55</b>	<b>12110.68</b>	<b>2873.80</b>	<b>14474.20</b>	<b>6999.05</b>	<b>5145.93</b>	<b>10350.80</b>	<b>17034.35</b>	<b>4440.75</b>	<b>9317.35</b>

\* L1.00 = \$.50

on the average this category represents 19% of total assets, it is the most important category in measuring credit capacity.

Personal assets include cash on hand, bank accounts and other personal items of a liquid nature. Estimated personal assets of each of the participants on December 31, 1979 are shown in Table 1. These balances are taken directly from the ending cash balance shown on each individual's cash flow statement.

The Annual Crops category consists of the current value of stored crops plus the value of crops under cultivation. The value of crops under cultivation is estimated to be the total cash investment in the crop through December 31, 1979.

The Market Livestock category includes livestock produced for sale such as calves, weaner pigs and poultry. This is a relatively unimportant category; only two participants have an entry (2 and 7) and one is very small.

The value of perennial crops is the farmer's subjective estimate of potential net income from one year's production, plus the value of investment in crops too young to produce. In fact, perennial crops are almost exclusively used for family consumption, and rarely provide any cash income.

Intermediate assets consist of breeding livestock, draft animals and the tools and equipment owned and used in daily agricultural activities. Intermediate assets can be sold to meet the farmers cash needs and, in the case of livestock and equipment, items of higher value with a substantial useful life can be used as collateral for production loans. However, any sale of the assets materially affects the resource base and productive capacity of the firm. None of these farmers own any equipment of such value, and though the average value of breeding livestock and draft animals comprises 4.5 percent of the total asset base, only three participants actually own livestock of this type.

Breeding livestock includes mature cattle and hogs which produce such products as milk, calves, and sucking pigs. Also included are draft animals such as oxen, horses and burros which are utilized as beast of burden in production activities. Except for oxen, these livestock are not commonly owned by small farmers for production purposes, but rather as a form of savings. Only three of the nine participants own livestock, and only participant 2 sells livestock products on a regular basis.

Tools and equipment are those items which are necessary for carrying out daily agricultural activities. Note that the average investment in these items is quite small (L 164.79), amounting to only 1.7% of the firms' total assets.

Fixed assets include land and improvements, including the value of the farmer's house. These assets comprise 75 percent of average total assets, but are not very liquid. Also, according to bank policy, land cannot be used for loan collateral unless the farmer has legal title. Since land titles in Honduras are often ambiguous, land is rarely used as collateral. Houses are accepted as loan collateral but there is considerable reluctance on the part of farmers because of the risks involved.

Liabilities. The only liabilities encountered among the participants were current liabilities, namely crop production loans from the Bank. Most small farmers do not have any intermediate or long term credit other than loans for the purchase of oxen or irrigation equipment. The principal reason is that creditors will not make such loans.

There are various measures of financial solvency, or liquidity of the firm. One of the best indicators of liquidity in terms of the firm's ability to meet short term credit obligations is the Current Ratio. The Current Ratio is the ratio of the firm's current assets to current liabilities

Most lenders consider a current ratio of 2:1 to be adequate, while a current ratio of 1:1 or less is a warning of potential liquidity problems. The four participants who have current liabilities (Table 1) all have current ratios of greater than 1:1, and the average current ratio is 3.14:1. Although the portion of current assets represented by perennial crops is of limited liquidity, the ratios of participants 1, 6 and 8 are still high enough to declare them solvent in the short run. Participant 5 is still solvent, even though his current ratio is a relatively low 1.28:1. Participant 5 has his borrowed funds invested in crops currently under cultivation, and his current assets are almost entirely composed of those same crops. The financial status of small farmers is complicated by the fact that their personal assets are often the source of cash for family living expenses as well. This makes participant 5's situation particularly unfavorable.

Net worth is only a partial indicator of potential borrowing capacity in Honduras because farmers are reluctant to pledge land and buildings for collateral. The risk of losing a crop is too high to gamble the only wealth the farmer has. Furthermore, a production loan for one vegetable crop could amount to nearly half the value of the land, resulting in dangerous exposure to bankruptcy. Collateral is therefore usually limited to the value of current and intermediate assets, which compose an average of only 25% of the participants' total assets. The Bank accepts as collateral current and intermediate assets for any crop loan, but it also accepts up to 70% of the value of the crop for storable grains. Crop value is established using the government's purchase price and the loan officer's estimate of total farm production. Vegetable crops are not acceptable collateral because they are perishable.

### Cash Flow

A cash flow statement is basically a planning device used in administration of the firm. An historic cash flow shows the individual source and use of funds in the past, and serves as an aid in planning future operations. The historic cash flow statement can also be used to determine future credit needs and loan repayment conditions. Two examples of individual cash flows for Participants 5 and 7 in Ajuterique are presented in Tables 2 and 3. Participant 5 received production credit during 1979 but Participant 7 did not.

In examining these cash flows, several environmental factors affecting this group should be considered. The participants in Ajuterique cultivate mostly vegetable crops, both during the wet season and under irrigation in the dry season. Cultivation of irrigated vegetables usually begins in September or October and extends through May. During the wet season both vegetable and grains are cultivated, with this cropping cycle beginning in late April or early May and extending through October.

Participant 5 cultivated vegetables early in the year, and corn during the wet season. However, it is obvious that his production was very intensive in September when he began several vegetable crops using crop production credit. Those participants with credit tend to plant early, hoping to get a second crop in the dry season. Cropping practices were also more intensive due to the availability of credit. There is also a tendency to plant vegetable crops early in the dry season when irrigation water is more plentiful.

Participant 7, who did not have credit, was awaiting the harvest and sale of crops began in July to accumulate the resources necessary for replanting. Participant 7 shows production expenditures until May, and sale of the harvest in June. Production of the second crop began in July

TABLE 2: CASH FLOW FOR PARTICIPANT 5, 1979  
(LEMPIRAS)

Month:	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	TOTAL
<b>RECEIPTS</b>													
Crops: Cucumbers		90.50											90.50
Onions					750.00								750.00
Corn								250.00		204.00			454.00
Cattle													
Hogs													
Poultry													
Horses													
Other Livestock													
Misc. Sales													
<b>A TOTAL OPERATING RECEIPTS</b>		90.50			750.00			250.00		204.00			1294.50
Other Receipts													
Loans									623.25		535.60	509.20	1668.05
<b>B TOTAL CASH INFLOWS</b>		90.50			750.00			250.00	623.25	204.00	535.60	509.20	2962.55
<b>EXPENSES</b>													
Crops: Cucumbers			24.65						42.50		48.95	70.75	186.85
Onions	69.25	121.30	4.00	24.60					183.00	98.50	7.30	11.00	519.35
Corn					113.00		16.00						129.00
Tomatoes									123.39	19.90	235.80	435.85	814.94
Peppers									138.50		21.00		159.50
Cattle													
Hogs													
Poultry													
Horses													
Other Livestock													
Repairs													
Other Expenses	30.00	128.00	96.00	45.00	12.00	33.00	45.00	15.00	129.00	65.00	39.00	170.00	807.00
Improvements													
<b>C TOTAL OPERATING EXPENSES</b>	99.25	249.70	124.65	69.60	125.00	33.00	41.00	15.00	616.39	183.40	352.05	687.60	2616.64
Loan Repayment													
Household Expenses	129.00	159.20	120.00	113.40	100.00	163.20	152.00	100.00	100.00	216.00	100.00	108.00	1580.80
<b>D TOTAL CASH OUTFLOWS</b>	228.25	408.90	244.65	183.00	225.00	196.20	213.00	115.00	716.39	399.40	452.05	795.60	4197.44
<b>SUMMARY</b>													
E Cash Difference (B - D)	(228.25)	(318.40)	(244.65)	(183.00)	525.00	(196.20)	(213.00)	135.00	(93.14)	(195.40)	83.55	(286.40)	(1214.89)
F Beginning Cash Balance	1300.00	1071.75	753.35	508.70	325.70	850.70	654.50	441.50	576.50	483.36	287.96	371.51	
G Ending Cash Balance (E+F)	1071.75	753.35	508.70	325.70	850.70	654.50	441.50	576.50	483.36	287.96	371.51	85.11	

TABLE 3: CASH FLOW FOR PARTICIPANT 7, 1979  
(LEMPIRAS)

MONTH:	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	TOTAL
<b>RECEIPTS</b>													
Crops: Tomatoes					130.00	130.00				590.00			850.00
Onions						900.00							900.00
Cucumbers						300.00							300.00
Yucca	59.50	35.00											94.50
Cattle													
Hogs													
Poultry													
Horses													
Other Livestock													
Misc. Sales													
<b>A TOTAL OPERATING RECEIPTS</b>	<b>59.50</b>	<b>35.00</b>			<b>130.00</b>	<b>1330.00</b>				<b>590.00</b>			<b>2144.50</b>
Other Receipts													
Loans													
<b>B TOTAL CASH INFLOWS</b>	<b>59.50</b>	<b>35.00</b>			<b>130.00</b>	<b>1330.00</b>				<b>590.00</b>			<b>2144.50</b>
<b>EXPENSES</b>													
Crops: Corn	28.25	1.00											29.25
Tomatoes		9.25	117.50	81.75	8.50		40.00	9.00	50.20				316.20
Onions	54.50	200.00	15.50	61.00	16.20		100.00			35.00			480.20
Cucumbers				20.00	39.10		60.00						119.10
Yucca	46.25	1.00											47.25
Cattle													
Hogs													
Poultry													
Horses													
Other Livestock													
Repairs													
Other Expenses	37.00	92.70	195.00	246.00	296.00	39.00	45.00	118.00	43.00	91.00	90.00	80.00	1365.40
Improvements													
<b>C TOTAL OPERATING EXPENSES</b>	<b>166.00</b>	<b>303.95</b>	<b>328.00</b>	<b>408.75</b>	<b>357.80</b>	<b>39.00</b>	<b>245.00</b>	<b>127.00</b>	<b>93.20</b>	<b>119.20</b>	<b>90.00</b>	<b>80.00</b>	<b>2357.70</b>
Loan Repayment													
Household Expenses	98.60	109.60	117.80	112.40	124.00	85.20	88.20	85.20	84.00	90.00	84.00	86.00	1165.00
<b>D TOTAL CASH OUTFLOWS</b>	<b>264.60</b>	<b>413.55</b>	<b>445.80</b>	<b>521.15</b>	<b>481.80</b>	<b>124.20</b>	<b>333.20</b>	<b>212.20</b>	<b>177.20</b>	<b>209.00</b>	<b>174.00</b>	<b>166.00</b>	<b>3522.70</b>
<b>SUMMARY</b>													
Cash Difference (B - D)	(205.10)	(378.55)	(445.80)	(521.15)	(351.80)	1205.80	(333.20)	(212.20)	(177.20)	381.00	(174.00)	166.00	(1378.20)
Beginning Cash Balance	1905.00	1700.50	1322.35	876.55	355.40	3.60	1209.40	876.20	664.00	486.80	867.80	693.80	
Ending Cash Balance	1700.90	1322.35	876.55	355.40	3.60	1209.40	876.20	664.00	486.80	867.80	693.80	527.80	

using the proceeds from the sale of the first crop--a typical pattern. If proceeds from the first crop are good the farmer plants more land and uses more inputs on the second crop than if the proceeds are poor.

Labor costs by crop are not specifically shown in the cash flow statements. All costs of hired labor for each month appear on the line "Other Expenses." Due to the general lack of other entries in this category, the figures shown represent labor costs exclusively. Some crops do not appear at all on the cash flow because they are consumed at home. It should also be noted that none of the whole farm summaries account for operator and family labor utilized in crop production. This will be further discussed in the results section.

Participants tended to cultivate their crops in a manner consistent with their resource availability. Those participants with credit are not as limited as those without credit when faced with an unexpected problem such as a pest infestation. Farmers without credit often operate on a very tight margin, and are forced to limit their cash outlays to the total amount available. When these farmers are faced with an unanticipated problem they might have to accept a reduced crop yield simply because resources are not available to deal with it.

Incomes are generally received from January through June for irrigated vegetables, and from August to December for wet season crops such as vegetables and grains. Cash expenses are greatest from September through April when irrigated vegetables are grown.

#### Income Statement

The income statement, or profit and loss statement, measures the profitability of a business over a specific time period. The primary purpose of an income statement is to determine the profitability of the

business. Net farm income measures: 1) the return to unpaid operator and family labor, 2) the return to the operator's management, and 3) the return to operator capital (net worth). Net farm income is generally thought of as the amount of money available for family living, debt retirement, and increased equity of the operation.

The Income Statements of the farm records participants in Ajuterique for the calendar year 1979 are presented in Table 4. The following discussion focuses on each category in the income statement, and its significance as applied to the Honduran agricultural situation.

The first section of the income statement presents the cash flow aspect of the firm, or the simple difference between cash farm receipts and cash farm expenditures. A summary of total cash farm receipts, total cash farm expenditures and the net cash income from farming are shown for each participant. The average net cash farm income was L 1022.77. Net cash farm income was 31% of total cash farm receipts. Again it should be noted that neither the value of family labor nor family living expenses are considered in this section. It is also important to notice the absolute amount of net cash farm income, which is only slightly more than U.S. \$500.00.

The second section deals with changes in farm inventory during the year. Inventory changes are broken down into (1) changes in the value of crops stored and in the total investment in crops under cultivation, in combination with changes in the inventory of Market Livestock; (2) changes in Inventory Value of Breeding Livestock and draft animals; (3) changes in the value of equipment and machinery (including hand tools); and (4) changes in the value of land and improvements.

Changes in the beginning and ending inventories of crops under cultivation were estimated in the following manner. Beginning Inventory was estimated as a percentage of the sale value of crops sold in early 1979

TABLE 4: INCOME STATEMENTS FOR RECORD BOOK PARTICIPANTS IN AJUTERIQUE - 1979

	P A R T I C I P A N T S									Mean
	1	2	3	4	5	6	7	8	9	
Total Cash Farm Income	7,596.50	3,823.00	2,480.00	5,031.00	1,294.50	4,080.00	2,144.50	2,906.00	500.00	3,317.78
Total Cash Farm Expenses	4,009.55	1,904.70	2,559.50	1,444.50	2,616.64	1,900.95	2,349.70	3,063.85	1,801.20	2,294.51
Net Cash Income from Farming	3,586.95	1,918.30	(79.50)	3,586.50	(1,322.14)	2,179.05	(205.20)	(157.85)	(301.20)	1,022.77
CHANGES IN INVENTORY										
Crops and Market Livestock	(2,023.25)	(82.02)	126.15	(2,936.00)	1,729.64	(1,915.77)	226.50	1,179.63	206.97	(387.57)
Breeding Livestock and Draft Animals		250.00					140.00	(925.00)		( 59.44)
Equipment and Machinery	(74.50)	(48.50)	(38.50)	(56.00)	341.10	(43.00)	(116.50)	(34.00)	41.50	( 12.38)
Land and Improvements				500.00						55.56
TOTAL CHANGE IN INVENTORY	(2,097.75)	119.48	87.65	(2,492.00)	2,070.74	(1,958.77)	250.00	220.63	165.47	(403.84)
Value of Home Consumption of Crops Produced	388.75	13.02	361.95	26.20	55.20	418.05	511.00	256.00	195.58	247.30
NET FARM INCOME	1,877.95	2,050.80	370.10	1,120.70	803.80	638.33	555.80	318.78	59.85	866.23

which were under cultivation as of January 1, 1979. These percentages were derived from available budget information. To maintain consistency inventory was estimated to be 90% of the value of crops sold in January, and 80% of the value of crops sold in February. However, expenses incurred in the cultivation of those crops during January and February could not raise the total investment in the crop to more than the total sale value of the crop. Ending inventories of crops under cultivation were estimated as the total cash investment in these crops through December 31, 1979.

The inventories of stored crops and market livestock were taken at both the beginning and end of 1979, so that changes in these inventory items was the simple difference between the two inventory estimates. The inventory of stored crops consists of the estimated current market value of the crops on the date the inventory was taken. Stored crops commonly consist of grains such as corn, rice and beans for family consumption; they are not usually sold.

Breeding livestock and draft animal inventories were also obtained. For most small farmers breeding livestock are viewed as a form of savings, and are not owned in large numbers. Draft animals such as oxen and horses are more commonly owned. Note the large change in this item for Participant 8, which resulted from the sale of oxen.

In the equipment and machinery category eight of the nine participants show a negative inventory change, which is almost entirely due to depreciation. As noted in the discussion of net worth, these items are a very small part of the farmer's resource base. Investment to replace worn-out items tends to be very sporadic, with only Participant 5 adding substantially to his equipment.

The total average change in inventory was L 403.84, with the largest portion of this (96%) resulting from changes in the value of crops

stored and under cultivation, and in market livestock. In reality most of the total difference is due to changes in the value of crops under cultivation, which is highly dependent on weather conditions and resource availability. This variation is reflected by the range of total change in inventory from negative L 2,936 for Participant 4 to positive L 1,729.64 for Participant 5.

The final item included in the income statement is the value of home consumption of produced crops. Most small farmers in Honduras raise a substantial portion of the grains they consume. Though the participants in Ajuterique principally cultivate vegetables, their consumption of home grown crops substantially affects Net Farm Income. On the average this consumption constitutes 36% of Net Farm Income, and in five cases is more than 65%.

The importance of combining cash flow and inventory changes to present a complete picture of the firm's profitability is clearly illustrated. For example, Participant 5 showed a considerable cash deficit for the calendar year, but his inventory showed a considerable increase in the value of crops under cultivation and in equipment and machinery inventory. The combination of the two factors results in a Net Farm Income of L 803.80. On a pure cash basis a loss of L 1322.14 would have been incurred.

The interrelationship of the financial statements cannot be over-emphasized. Any one of the three can lead to erroneous conclusions if considered alone. For example, Participant 5's Net Worth Statement shows a current ratio of 1.3:1, which is only mediocre. If this ratio were combined with a net loss in farm income it would indicate financial problems. However, in this case a negative net cash income is more than offset by an increase in the value of crops under cultivation.

In summary, these farmers demonstrate reasonably good financial condition according to some traditional indicators, but the low absolute magnitude of money involved suggests that they are highly vulnerable to shocks such as unfavorable weather or market prices. This is particularly true considering the magnitude of family living expenses relative to total net income.

#### ENTERPRISE RESULTS: AJUTERIQUE

In the early stages of the farm records program it was discovered easier and more useful to use enterprise accounting than item accounting. Enterprise accounting in the United States presents problems because such inputs as fuel, fertilizer and insecticide are commonly purchased in bulk and spread over several crops or crop divisions in varying amounts. Overhead costs on farm equipment must also be assigned to these same enterprises, and these costs generally constitute a significant portion of total production cost. But in Honduras inputs are usually purchased for use on specific crops. Labor, fertilizer and chemicals--which constitute a large proportion of total production costs in Honduras, are typically easy to assign to specific crops. Overhead costs constitute a relatively small portion of total production costs, which makes their assignment to specific crops comparatively simple. For these reasons enterprise accounting is not complicated by U.S. standards. Additional benefits of enterprise accounting are easy summarization and interpretation of enterprise data. From a farm management standpoint enterprise records are especially useful because they permit comparison of different crop or livestock enterprises. The following discussion deals with the use and value of enterprise information.

### Individual Enterprise Analysis

Enterprise analysis provides a summary and comparison of a farmer's individual crops. The individual enterprise analysis for Participant 6 (shown in Table 5), demonstrates some types of problems encountered. The corn summary illustrates the case where corn was sold on the ear, but the conversion factor to calculate grain weight was unknown. Inventory and family consumption are in pounds. The onion crop was already under cultivation at the beginning of the year, so data are incomplete. Fortunately, bean production, consumption and inventory measurement units are uniform, and the crop data are complete.

Each crop is shown in summary form, with returns to the various groupings of farm Capital, Labor, and Management shown in detail. The product and money amounts shown in the production section were taken from the income inventory and consumption sections of the record book. Products consumed were valued at the average unit price during the consumption period. Crop production, sales and purchases were valued at the prevailing price at the time of sale or purchase. Beginning, and ending inventory values were estimated using the prevailing market price. Crops under cultivation at the time inventory was taken were valued according to the percentage basis discussed earlier.

Interest and depreciation costs were also calculated from inventory figures. Total annual interest charges on the average capital investment in equipment, land and improvements were calculated using a 12% interest rate. Depreciation was calculated as the total decrease in the value of items owned during the entire year. These costs were assigned to crops on a per manzana basis according to the amount of land cropped during the year. Although some crops were more input intensive than others, no attempt was made to include that effect on the distribution of overhead costs.

TABLE 5: ENTERPRISE ANALYSIS FOR PARTICIPANT # 6

ENTERPRISE:	Corn (6.5 Manzanas)			Onions (.5 Manzanas)			Beans (.5 Manzanas)		
	Quantity	Value	Total Value	Quantity	Value	Total Value	Quantity	Value	Total Value
<b>PRODUCTION</b>									
Ending Inventory	470 lbs.	L 94.00					169 lbs.	88.73	
Sales	**	465.00		**	L 2025.00		3000 lbs.	1575.00	
Family Consumption	3650 lbs.	511.00		**			365 lbs.	109.50	
A TOTAL	**		L 1070.00	**		L 2025.00	3534 lbs.		1773.23
Beginning Inventory				**			304 lbs.	91.20	
Purchases	890 lbs.	111.25		**	L 1822.50		304 lbs.		
B TOTAL	**		111.25	**		L 1822.50	304 lbs.		91.20
Total Production (A-B)	**		L 958.75	**		L 202.50	3230 lbs.		91.20
Value/Unit	**	**		**	**				1682.03
Yield/Manzana	**			**	**		646 lbs.	.52	
<b>COSTS AND RETURNS</b>									
Seed	113 lbs.	16.95					360 lbs.	172.00	
Fertilizer	3 cwt.	70.50					9 cwt.	216.00	
Chemicals									
Machine Hire		152.50							
Animal Hire		70.00						225.00	
Miscellaneous		14.00						80.00	
Total Direct Costs			L 323.95			L 12.00		8.00	
RETURNS TO CAPITAL, LABOR AND MANAGEMENT									L 701.00
Hired Labor	76 days	234.00	L 634.80	14 days	54.00	180.50	184 days	578.00	981.03
RETURNS TO CAPITAL, FAMILY LABOR AND MANAGEMENT									
Values of Family Labor	75 days	262.50	L 400.80	10 days	35.00	126.50	41 days	143.50	403.03
RETURNS TO CAPITAL AND MANAGEMENT			L 138.30			L 91.50			L 259.53
<b>FIXED COSTS</b>									
Interest- 12%		266.18			20.47			204.75	
Depreciation		23.29			1.79			17.92	
Total Fixed Costs			289.47			22.26			222.67
RETURNS TO MANAGEMENT			- 151.17			69.24			36.86
RETURNS TO CAPITAL, FAMILY LABOR AND MANAGEMENT PER MANZANA			61.66			253.00			80.61
RETURNS TO CAPITAL AND MANAGEMENT PER MANZANA			21.28			183.00			51.91

\*\* Undetermined

### Risk Analysis

Record books provide historical information which can be used to study risks, but one year of data is sometimes insufficient. For example, onions were generally profitable in 1979, but the low price in early 1980 caused losses for many producers. The usefulness of farm records to analyze risk therefore improves as the record history increases. Although the Ajuterique farm records covered only one year, conversations with the participants suggested that it was not an unusual year considering the previous five years. The following analysis indicates how risk could be studied if additional years of data were available.

The returns to factors of production are presented in Table 6. There are several ways of comparing the returns for these crops. In terms of average returns to Capital, Family Labor and Management, onions were the most profitable crop, followed by corn, tomatoes and cucumbers. However, when the opportunity cost of family labor was included to determine the returns to Capital and Management, tomatoes were less profitable on the average than cucumbers. In the case of small and subsistence farmers, average income is not always the best indicator of the risks involved. For example, an extremely high or low observation (onions, observation 7) can drastically affect the small sample average. A better indicator might be the probability of receiving positive returns to Capital, Family Labor, and Management, as did each of the seven participants who cultivated onions. But, six of the seven who cultivated corn received positive returns to Capital, and Management, while only four of the seven who cultivated onions received positive returns. If historical data were available that showed repetition of this pattern, it could be concluded that raising corn was less risky than onions in terms of the

TABLE 6: RETURNS TO CAPITAL, FAMILY LABOR AND MANAGEMENT, AND RETURNS TO CAPITAL AND MANAGEMENT  
PER MANZANA FOR 4 SELECTED CROPS IN AJUTERIQUE - 1979

	1	2	Observation				6	7	Mean	Range	
			3	4	5					High	Low
<b>TOMATOES</b>											
	(LEMPIRAS)										
Return to Capital, Family Labor and Management/MZ	314.65	-- 19.00	141.60	- 84.32	- 206.40			29.30	314.65	- 206.40	
Return to Capital and Management/MZ	256.15	- 271.00	- 36.70	- 291.52	- 271.73			- 122.96	256.15	- 291.52	
<b>ONIONS</b>											
Return to Capital, Family Labor and Management/MZ	399.80	55.50	61.63	155.53	253.00	96.98	1746.00	395.49	1746.00	55.50	
Return to Capital and Management/MZ	252.80	- 67.00	- 11.91	- 52.13	183.00	45.88	1641.00	284.52	1641.00	- 67.00	
<b>CUCUMBERS</b>											
Return to Capital, Family Labor and Management/MZ	- 58.00	95.50	- 25.40	- 227.00	225.90	18.10		4.85	225.90	- 222.00	
Return to Capital and Management/MZ	- 89.50	57.00	- 67.40	- 297.00	218.90	- 35.80		- 35.63	218.90	- 297.00	
<b>CORN</b>											
Return to Capital, Family Labor and Management/MZ	227.60	55.68	166.88	305.26	61.66	204.72	10.56	147.48	305.26	10.56	
Return to Capital and Management/MZ	260.10	5.86	124.25	165.26	21.28	171.47	- 2.67	106.50	260.10	2.67	

probability of incurring a loss, even though the average income received for onions was higher. Any consideration of risk must therefore take into account both average returns to a crop as well as the probability of a net gain or loss.

#### Budget Reference

Enterprise information from farm records can be used to verify enterprise budgets synthesized from questionnaires. This is achieved by comparing the ex post record of what farmers actually did with the synthesized budgets [2,3] In Table 7 the enterprise budget for cucumbers in the Comayagua Valley is compared to the actual costs incurred by participant 9 and to the average costs incurred by all six participants who cultivated cucumbers. There was a substantial difference between estimated income in the standard budget and the average income actually received by the participants. The difference was due to low prices and the common practice of selling the unharvested crop in the field. Participant 9 sold his crop in this manner. Only one of the six producers actually harvested his crop; four sold in the field at varying stages of maturity and one producer abandoned the crop because of low prices.

Differences in production costs shown for the standard budget and the participant average were partly the result of selling the crop in the field. The less mature the crop when sold the less the farmer's expenditure on labor and chemicals.

The expenses incurred by Participant 9 were quite similar to the standard budget, with the greatest difference occurring in expenditures for irrigation water. Labor expenses for Participant 9 would have been somewhat higher if he had harvested the crop. Also, some differences in expenditures were due to price changes and the differences on input amounts utilized.

TABLE 7: COMPARISON OF STANDARD BUDGET FOR CUCUMBERS  
TO FARMER'S ACTUAL COSTS

	MASTER BUDGET			PARTICIPANT 9			PARTICIPANT AVERAGE		
	Quantity	Value	Total	Quantity	Value	Total	Quantity	Value	Total
<b>CUCUMBERS</b>									
Production									
Income	250 sacks	4.00	L 1000.00						
Production Costs						L 500.00			393.60
Seed	3.5 lbs.	61.25		2.0 lbs.	41.71		2.4 lbs.	41.20	
Fertilizer	3.0 cwt.	67.50		2.85 cwt.	58.28		2.2 cwt.	47.20	
Chemicals		61.62			65.57			30.56	
Machines Hired		50.00			32.00			27.70	
Animals Hired		10.00			16.00			7.60	
Irrigation Water		42.00			10.28			7.60	
TOTAL DIRECT COSTS			292.37			223.84			161.86
Hired Labor	77 days	231.00		47 days	153.00		242 days	79.50	
Family Labor				21 days	73.50		9.6 days	33.60	
TOTAL LABOR COSTS			L 231.00			L 226.50			L 113.10
TOTAL PRODUCTION COSTS			523.37			450.34			274.96
RETURNS TO CAPITOL AND MANAGEMENT			L 476.63			L 49.66			L 118.64

32

The use of farm record books in this type of comparison cannot prove that the standard enterprise budget is accurate because of the difference in sampling. However, the records provide a reference point for comparison of the figures presented in the enterprise budgets.

The enterprise information generated greater farmer interest than the whole-farm summaries. It served as both a measure of their success or failure in certain crops, and as reinforcement of their subjective judgements on the relative profitability of crops. When enterprise summaries and comparisons were presented to the participating farmers the income statements were received with moderate interest, but greater interest was expressed in enterprise summaries. They considered enterprise analysis easier to understand and more useful in decision making.

### Labor

Honduran agriculture is very labor intensive. When unsalaried operator and family labor are used there can be large reductions in cash costs as compared to standard budget estimates. The standard budgets assume that all labor is paid the prevailing wage. Returns to family labor include the imputed wage (what they would have earned if paid) plus the imputed value of products consumed. These products-- primarily corn and beans--were valued at the average sales price during the year.

Sources and allocations of labor are summarized in Table 8. The allocation of land among crops is also shown. Due to multiple cropping the sum of cropped land appears to be greater than the total amount of land available.

The amount of operator and family labor shown does not usually include time spent overseeing hired labor; it only shows the direct time

TABLE 8: SOURCE AND USE OF LABOR AND LAND FOR THE RECORD BOOK PARTICIPANTS

IN AJUTERIQUE - 1979

PARTICIPANTS

	1	2	3	4	5	6	7	8	9	Mean
(Days)										
<b>LABOR SOURCE</b>										
Head of Family	130	90	105	35	70.5	86.5	153	142	49	95.6
Other Family		29	22		8	43.5	39	10	4	17.3
Total Family Labor	130	119	127	35	78.5	130.0	192	152	53	112.9
Hired Labor	644	233	488	172	260.0	270.0	454	564.4	77	351.4
<b>TOTAL LABOR UTILIZED</b>	774	352	615	207	338.5	400	646.0	716.5	130	464.3
<b>LABOR USE</b>										
<b>Enterprise</b>										
Onions	49	98	188	109	156.5	24	283	416	-0-	147.1
Tomatoes	655		330	62	62.4		290	223.5	-0-	180.3
Cucumbers		39	41		35.4		7	14	68	22.7
Corn		139	38		75.0	151	48	24	43	57.6
Beans	70			30		225				36.1
Yucca		12	18	6			18	39		10.3
Peppers		16			9.2				19	4.9
Cattle		48								5.3
<b>MANZANAS OF LAND WORKED</b>	3.5	5.0	3.0	4.0	5.0	9.75	2.5	7.0	2.5	4.7
<b>Land Use *(Manzanas)</b>										
Onions	.25	1.00	1.00	.50	2.50	.50	1.50	3.25		1.20
Tomatoes	7.00		1.00	.75	.50		1.25	1.00		1.30
Cucumber		1.00	1.00		.50		1.00	.25	1.75	.60
Corn		4.50	1.00		2.00	6.50	2.00	.50	1.75	2.00
Beans	2.00			1.00		5.00				.90
Yucca			1.00	.50			.75	1.00		.40
Peppers		.50			.25				.50	.10
<b>TOTAL</b>	9.25	7.00	5.00	2.75	5.75	12.00	6.50	6.00	4.00	6.50

\*Because of year-round cultivation of vegetables, more than 1 crop can be grown on much of the land.

spent in actual physical labor by the farmer and family members. On the average the operator and his family provided 24% of the total labor input, but this varied from 17% for Participant 1 to 41% for Participant 9.

The amount of operator and family labor provided varied according to the intensity of crop cultivation. For example, on the average tomatoes were grown on 20% of the land cropped, but required 39% of total labor. Corn was grown on 31% of the land cropped but utilized only 12% of total labor. Since vegetable crops are quite labor intensive the operator is not usually capable of supplying a large portion of the labor required. In these cases operator supervision of hired labor increases. The operator and his family tend to perform those jobs which would be the most expensive to contract, such as irrigation and spraying. Farmers who hired relatively less labor tended to be those who simply didn't have the money, and those who produced crops requiring relatively less labor.

#### Family Consumption and Household Expenses

The relationship between family consumption and income cannot be precisely established from record book data because nonfarm income was incomplete, and because all goods and services consumed could not be accounted for. As mentioned previously, fruit and other food products were obtained from a few trees on the property or by barter, with no record of how much was obtained.

Household expenditures are shown in Table 9. Food purchases were the largest expense category, accounting for an average of 76% of total household expenses. This category includes some non-food items, however, such as small clothing items and miscellaneous household expenses. The

TABLE 9: HOUSEHOLD EXPENSES FOR THE RECORD BOOK PARTICIPANTS IN AJUTERIQUE - 1979

	P A R T I C I P A N T									Mean	Range	
	1	2	3	4	5	6	7	8	9		High	Low
	Food	1002.00	1033.00	1004.00	1705.00	1245.00	1408.00	1057.00	970.00	688.00	1123.56	1705.00
Medical Expenses	560.00	142.00	26.00	45.00	173.00		35.20		20.00	111.24	560.00	
Transportation	64.40	26.60	226.20	4.80	121.60	20.35	46.80	146.80	4.80	73.60	226.20	4.80
Other Expenses	710.00		178.00	330.00	41.20	180.00	20.00	30.00		166.13	710.00	
<b>T O T A L</b>	<b>2336.40</b>	<b>1201.60</b>	<b>1434.20</b>	<b>2084.80</b>	<b>1580.80</b>	<b>1608.35</b>	<b>1165.00</b>	<b>1146.80</b>	<b>712.80</b>	<b>1474.53</b>	<b>712.80</b>	<b>2336.40</b>

farmer usually did not know precisely how his wife spent household money, and project personnel were not very successful in getting precise information from either him or his wife.

Medical expenses, transportation and other expenses were incurred as necessary. Medical expenses are a partial indicator of general family health, but a single catastrophic illness can drastically influence the average expenditure. "Other expenses" were usually school-related expenditures which varied according to the number of children attending school, the grade level and the type of school (public or private).

It was observed that small farmers tended to spend all the money they had. Some family expenses were highly variable, but food expenditures varied only slightly. Food expenditures tended to be higher after harvest and sale, and leveled off after several months of little or no income.

It was found impractical to obtain non-farm income available to the family. Several of the participants had other sources of income such as billiard tables and very small stores, but they did not want to reveal the proceeds. In fact, the farmers rarely knew how much they earned because most of these "businesses" were run out-of-pocket with no written record of incomes or expenses.

#### Other

A number of other information summaries could be prepared from the record books. These include detailed input and production schedules, prices, land values, consumption of grains, and other types of data comparisons. For example, the prices received by farmers for tomatoes during the year are shown in Table 10. These prices were the averages received by participants during each ten-day period. Observations were

TABLE 10: PRICES RECEIVED BY FARMERS FOR TOMATOES IN AJUTERIQUE, 1979

Period			Period			Period		
	Period	Price per box*		Period	Price per box		Period	Price per box
January	1-10	5.26	May	1-10	1.24	September	1-10	6.69
	21-20	5.06		11-20	1.25		11-20	5.00
	21-31	5.57		21-31	1.50		21-30	5.00
February	1-10	3.96	June	1-10	2.03	October	1-10	
	11-20	2.09		11-20	.98		11-20	
	21-28	1.62		21-30	1.22		21-31	8.54
March	1-10		July	1-10		November	1-10	-0-
	11-20			11-20			11-20	-0-
	21-31			21-31			21-30	5.00
April	1-10		August	1-10		December	1-10	3.00
	11-20	1.25		11-20			11-20	3.00
	21-30	1.46		21-31	14.00		21-31	3.00

\* Box contains approximately 32 lbs. of tomatoes

Prices are in Lempiras, where L 1.00 = US \$0.50.

available for 23 of the 34 ten-day periods. The prices showed tremendous variation--from a low of L 0.98 per box to a high of L 14.00--suggesting that the risk to farmers was great and that timing of production was critical.

#### RESULTS: EL MATAZANO

Record-keeping began on the cooperative farm "El Matazano" in January, 1979, and continued at least until project termination in June, 1980. Although salary payments to the member who kept records ended with the project, he intends to continue keeping records with technical assistance from Bank personnel who had worked on the project. If he continues it will be testimony to the regard that he and the other 16 members have for the records system. Results are reported below for calendar year 1979.

#### Whole Farm Summaries

The Income Statement (Table 13) and Balance Sheet (Table 11) show generally good farm financial condition. There is a tendency for cooperative farms to not invest their profits in capital improvements. There are certain equipment items they need such as sprayers, oxen, etc., but the members prefer to distribute all cash among themselves and buy needed equipment on credit. Given the poverty of the members, they prefer to have the money now instead of investing it in needed equipment. Although they understand that borrowing the money means they must pay interest charges and reduce future cash income to pay off the loan, their current income needs take precedence. It is estimated that each member received approximately \$325 in wage payments during the year, 40 cwt of corn worth approximately \$400, and small amounts of vegetables for family consumption. It seems logical that with such low incomes the immediate con-

Assets		Jan. 2, 79	Dec. 31, 79	Liabilities		Jan. 2, 79	Dec. 31, 79
II	Current	Beginning	Final	V	Current	Beginning	Final
A	Personal			24	Credit-co-op		6,387.50
1	Cash	5,083.82	3,352.10	25	LOAN (BANK)	2,400.00	1,709.00
2	Other			26			
3				27	Total Short Term	2,400.00	8,096.50
4				VI	Intermediate Liabilities		
5	Total (Line 1 - 4)	5,083.82	3,352.10	28			
B	Farm			29			
6	Crops: (Form 4.1, Page 1)		21,000.00	30			
7	(Form 4.1, Page 2)		461.26	31	Total Intermediate Liabilities		
8	(Form 4.1, Page 3)			VII	Long-Term		
9	(Form 4.1, Page 4)			32			
10	Cattle (Form 5.1, Line 4)			33			
11	Swine (Form 5.1, Line 12)			34			
12	Poultry (Form 5.1, Line 21)			35	Total Long Term		
13	Crops: (Form 5.2, Page 1)						
14	Crops (Form 5.2, Page 2)						
15	Others			VIII	TOTAL LIABILITIES (Lines 27+31+35)	2,400.00	8,096.50
16	Total (Line 6 - 15)		21,461.26				
III	Working Assets						
17	Cattle (Form 5.1, Line 9)			IX	NET WORTH (Lines IV-VIII)	53,603.82	66,006.80
18	Swine (Form 5.1, Line 15)						
19	Other (Form 5.1, Line 27)						
20							
21	Machinery and Equip (Form 5.3)	22,270.00	20,640.00				
22	Total (Lines 20 + 21)	22,270.00	20,640.00				
II	Fixed						
23	Land & Buildings (Form 5.3)	28,650.00	28,650.00				
IV	TOTAL ASSETS (Lines 5+16+22+23)	56,003.82	74,103.30				

CASH FLOW

1	Crops :	Jan.	Feb.	Mar.	April	May	June	Total
2	Corn							
3	Vegetables			486.00				
4				26.20	864.41	1626.29		
5								
6	Cattle							
7	Swine							
8	Poultry							
9	Horses							
10	Other							
11	Miscellaneous Sales							
A	TOTAL FARM SALES (Lines 1 to 11)							
12	Other Income			512.20	864.41	1626.29		
13	Money Borrowed						4467.50	
E	TOTAL RECEIPTS (Lines A + 12 + 13)			512.20	864.41	1626.29	512.50	
Expenses								
14	Crop :							
15	Corn							
16	Vegetables				60.00	1170.00	4467.50	
17		114.62	127.16	90.17	118.50		4.00	
18	Salaries							
19	Cattle	950.00		771.00		348.00		
20	Swine							
21	Poultry							
22	Horses							
23	Other							
24	Repairs							
25	Other Expenses	36.00						
26	Improvements	54.78	7.00	21.25	287.00	725.91	633.60	
C	TOTAL EXPENSES	1155.40	134.16	882.42	465.50	2243.91	5105.10	
27	Loan Payments		1000.00			1524.54		
28	Household Expenses							
D	TOTAL EXPENSES (Lines C + 27 + 28)	1155.40	1134.16	882.42	465.50	3768.45	5105.10	
E	Cash Difference (Lines B-D)	(1155.40)	(1134.16)	(370.22)	398.91	(2142.16)	(125.10)	
F	Beginning Cash Balance	5083.82	3928.42	2794.26	2424.04	2822.95	680.79	
G	Ending Cash Balance (Lines E + F)	3928.42	2794.26	2424.04	2822.95	680.79	555.69	

CASH FLOW									
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total		
1	Crops:								
2	Corn								
3	Vegetables								
4		1621.20		132.00	628.00	4301.00	5547.00		
5					92.60	806.17	5036.87		
6	Cattle								
7	Swine								
8	Poultry								
9	Horses								
10	Other								
11	Miscellaneous Sales								
A	Total Farm Sales (Lines 1 to 11)	90.00					90.00		
12	Other Income	90.00	1621.20		132.00	720.60	5107.17	10673.87	
13	Money Borrowed	672.50		524.00		970.00		6387.50	
B	TOTAL RECEIPTS (Lines A + 12 + 13)	1712.50	1621.20	524.00	132.00	1690.60	5107.17	18770.37	
Expenses									
14	Crop:								
15	Corn								
16	Vegetables								
17			74.00		22.66	254.30	110.30	5697.50	
18	Salaries		927.00						
19	Cattle				1800.00		3096.00	7892.00	
20	Swine								
21	Poultry								
22	Horses								
23	Other								
24	Repairs								
25	Other Expenses	1568.00	54.00			47.80	37.00	36.00	
26	Improvements							3436.34	
C	TOTAL EXPENSES	1568.00	981.00	74.00	1822.66	302.10	3243.30	17977.50	
27	Loan Payments							2524.54	
28	Household Expenses								
D	TOTAL EXPENSES (Lines C + 27 + 28)	1568.00	981.00	74.00	1822.66	302.10	3243.30	20502.09	
E	Cash Difference (Lines B-D)	144.50	640.20	450.00	(1690.66)	1388.50	1863.87	(1731.72)	
F	Beginning Cash Balance	555.69	700.19	1340.39	1790.39	99.73	1483.23		
G	Ending Cash Balance	700.19	1340.39	1790.39	99.73	1488.23	3352.10		

TABLE 13: INCOME STATEMENT FOR EL MATAZANO

1979 INCOME STATEMENT			
1	Total Farm Sales (Form 6.2, Line A)	L.	10,673.87
2	Total Farm Expenses (Form 6.2, Line C)		17,977.55
3	Net Cash Farm Income (Line 1 minus 2)		L. - 7,303.68
	Change in Inventory		
4	Crop and Livestock (Form 6.1, Line 16)		21,461.26
5	Working Livestock (Form 6.1, Line 20)		
6	Machinery and Equipment (Form 6.1, Line 21)		1,630.00
7	Land and Buildings (Form 6.1, Line 23)		
	Change in Inventory		L. 19,831.26
9	Value of Family Consumption (Form 4.1, 4.2, 5.2)		
10	Minus Value of Meal Fed to Laborers (Form 3.1)		
11	Net Farm Income (3 + 8 + 9 + 10)		L. 12,527.58

sumption value of \$50, which could be invested by each member for capital equipment, is worth more to them than the same amount plus interest received in the future.

There were some slight problems with the Balance Sheet due to inventory problems and credit practices as well as the values of land, equipment and improvements. The problems encountered in the entries were the result of misunderstandings about sources of credit and cash payments to members of the cooperative. El Matazano is a member of a regional cooperative made up of individual cooperative farms. The regional cooperative acts as an intermediate credit agent, administering a line of credit for each of the individual members. The regional cooperative received loans for the purchase of machinery and production inputs which were distributed among the member cooperative farms. All input amounts and costs were duly recorded in the book as expenses, but the credit received in cash and services was not recorded as income. This distorted the cooperative farms Cash Flow Summary (Table 12) because the book only shows the farm's total reimbursement to the regional cooperative. The cash flow was further distorted because the reimbursement included the farm's share of the regional cooperative's equipment loan. The components of the total payment to the regional cooperative, including cash advances, machinery loan repayment, machinery services and inputs were not clearly identifiable.

Second, wage payments were made to the cooperative farm members according to the number of days which each member worked. The Record book contains the number of days worked, but the particulars on the dates and amounts of cash payments to the individual members were not available. This also distorts the cash flow summary. In summarizing the forms, the problem was handled by using the number of days worked multiplied by the wage rate as a proxy for wage payments to obtain the cash balances. The cash balance as of April 30

was known, so the cash flow was completed by working backwards from that date. Wage payments and credit amounts were estimated and entered in such a way as to maintain a relatively low cash balance. This was done in recognition of the fact that El Matazano did not generally maintain large cash balances.

### Crop Summaries

Crop summaries include the 1979 vegetable crop (Table 14) and corn crop (Table 15). The value of labor shown on the summaries was a cash cost because each member received a daily wage from communal funds. Capital costs were not calculated.

The irrigated vegetable crop included tomatoes, bell peppers, cabbage, chili peppers, onions, and others. Total land area in vegetables was six manzanas (4.2 hectares), with approximately one-third in tomatoes. It was impractical to separate resource use by crop because of the very small area assigned to each. Transportation cost was high because of the distance to market and scarcity of contract vehicles. It is worth mentioning that in the Spring of 1980, 500 heads of cabbage and 1500 bell peppers spoiled for lack of transportation. The problem was a shortage of diesel fuel, which also prevented use of the irrigation pump and caused additional production losses.

The 1979 corn crop provided excellent income due to a good yield and unusually high corn price. After paying debts the farm members divided the unsold corn among themselves where it was consumed, sold or bartered at will.

### Conclusion

The El Matazano experience was very favorable for several reasons. It was known beforehand that the group was one of the best--homogeneous, hard,

TABLE 14: VEGETABLE SUMMARY FOR  
EL MATAZANO

INCOME (SALES) from 4.2 hectares of mixed vegetables		L. 4,138.10
EXPENSES		
Land Preparation	L.	72.00
Seed		150.00
Fertilizer		115.42
Pesticides		75.00
Fungicides		70.00
Materials		145.54
Transportation		<u>904.56</u>
TOTAL EXPENSES		L. 1,532.52
RETURNS TO LAND, LABOR, CAPITAL AND MANAGEMENT		L. 2,605.58
VALUE OF LABOR USED		
157 days @ L. 3.00/day		<u>471.00</u>
RETURNS TO LAND, CAPITAL AND MANAGEMENT		<u>L. 2,134.58</u>

TABLE 15: CORN SUMMARY FOR EL MATAZANO

INCOME: Sales from 30 hectares, or 1026 cwt. of grain	L.	18,226.00	L.
VALUE OF CORN DISTRIBUTED AMONG MEMBERS		680 cwt.	<u>13,600.00</u>
TOTAL INCOME			" 31,826.00
EXPENSES			
Land Preparation	L.	1,872.00	
Seeding		270.00	
Improved Seed		393.75	
Herbicide		1,120.00	
Fertilizer		1,962.00	
Misc. Expenses		<u>161.20</u>	
TOTAL EXPENSES			" 5,778.95
RETURNS TO LAND, LABOR, CAPITAL AND MANAGEMENT			L. 26,047.05
VALUE OF LABOR 2125 days @ L. 3.00/day			" <u>6,375.00</u>
RETURNS TO LAND, CAPITAL AND MANAGEMENT			<u>L. 19,672.05</u>

working and receptive to technical assistance. Second, the record-keeper was intelligent and conscientious, and as a working member of the farm he knew what was going on. Third and perhaps most important, the farm needed records to pay daily wages, keep track of obligations to the regional cooperative, and distribute profits among members. It was gratifying to find that they used the 1979 records to plan their 1980 vegetable crop mix, the problem being labor supply. The potential for record-keeping on cooperative farms appears to be very good, and the Bank could play a strong role in helping to train record-keepers and set up records systems. The Bank's future in farm records is discussed at the conclusion of this report.

## EVALUATION AND RECOMMENDATIONS

The Honduran experiment in farm records was a valuable learning experience for Honduran Bank employees and farmers, and for university faculty who participated in the program. The following comments are a composite of opinions expressed by project personnel about the experiment. Since organization and management of the records program has already been discussed, comments are limited to general recommendations.

### Recommendations for Organization and Management of Record Systems

1. The "cell" concept of a group of farms attended by a record-keeper who can walk the rounds is an excellent model to emulate;
2. The record-keeper should be selected before the farms, because he or she is the most critical ingredient of success;
3. The sites should be close enough to project headquarters to permit a round trip in one day;
4. Ideally, the number of participants in a cell should be kept between five and ten, although there were 17 in Ajuterique because of the loan;
5. Each cell should be visited by project personnel at least twice monthly;
6. The record-keeper must visit each farmer at least weekly, and even more often if warranted;
7. Crop enterprise summaries should be presented to the farmers as soon as the crop is harvested and sold;
8. Record-keepers should be given a course in record book entries early in the program;
9. Introduction of the records system to the participants should be done slowly and carefully with the assistance of someone who already has the confidence of the farmers;
10. Evaluation of the program at a particular site should be effected after three months, and a decision should be made about whether to continue or terminate in order to avoid further losses in time and effort;
11. It is helpful to have a reason besides records for keeping farmers' interest, such as the group loan.

### Completeness and Accuracy of the Data Obtained

The investment of time and resources necessary to maintain a set of farm records is expected to yield quality farm level data. Problems can be expected in trying to obtain a complete set of records, and some have already been mentioned in the analysis of results. However, the major problem to be resolved concerns the relationship between complete data and accurate data. The information obtained from record books might be complete, but if the information is not carefully gathered the numbers will be inaccurate. Conversely, if accurate numbers are incomplete the summary will necessarily be inaccurate. As summarization of the Honduras record books progressed, certain types of information were found incomplete. Repeated farm visits were necessary to clarify omissions and inconsistencies such as those reported below.

While organizing and summarizing the individual enterprise data, problems were encountered in reconciling the incomes and expenses for various crops. Farmers often began land preparation to cultivate a certain crop, but ended up either planting less area in the crop specified or planting a different crop. Entries for these crops were sometimes incomplete because the expenses were confused with another crop. For example, if land preparation expenses were divided among three crops but only two crops were eventually seeded, the change might not have been noted. Also, a crop might have been abandoned because of low prices, insects, drought or flood. This sometimes brought all entries concerning that crop to a mysterious end. For other crops--especially--corn, all expenses appeared but little or no income was entered. In such cases it had to be determined if the crop was harvested, and if so how much was harvested. When crops were produced primarily for family consumption it

was often difficult to determine the yield, especially if production and consumption entries were incomplete.

Problems in production and distribution records of home grown products were most often encountered in determining whether the products consumed had been bought or produced. Since consumption of home grown products affects net income estimates, the amount of product consumed by the family had to be reconciled using beginning and ending inventories and the area of the crop cultivated and harvested by the farmer.

Inventory information was also sensitive because changes in inventories had to be reconciled with incomes and expenses. For example, if the livestock inventory decreased the sale of livestock should appear, and if the number of tools increased the purchase of tools should appear. It was especially important to identify the cause of changes in the value of individual items to ensure that such changes were rational. Inventory information was obtained by interview, but since the interview to obtain ending inventories was completed before summary work began some inconsistencies had to be reconciled.

The most difficult information to obtain was cash on hand, bank accounts, and personal debts. These were so highly personal that efforts to obtain them were abandoned after several unsatisfactory experiences. Non-farm income, family household expenditures and family consumption figures were often given reluctantly, and in the case of non-farm income the farmers would not or could not give a direct answer. Even after attempts to reconcile inconsistencies in family consumption and household data, certain errors still existed which could not be clarified.

Some information necessary for the summary statements could not be obtained in interviews. Beginning cash balance and the inventory of

crops under cultivation as of January 1, 1979 were needed to complete the financial summary statements, and were estimated in the following manner. Beginning cash balance was estimated on the basis of the cash flow statement. Farmers who showed no negative cash balance during the year when zero was used as a beginning cash balance were assigned a beginning cash balance of zero. For farmers showing negative balances at any point during the year when starting with a beginning cash balance of zero, the largest negative balance occurring during the year was estimated. This number was then rounded upward to the nearest 100 lempiras and the resulting number was used for the beginning cash balance. The rationale is that it is impossible for the farmer to spend more cash than he has, so this figure represents the minimum necessary beginning balance.

As earlier explained, beginning inventories of crops under cultivation were estimated as a percentage of the total income received from the sale of the crop in the current year. This percentage was dependent upon the month on which the crop was harvested. The only limit was that the percentage estimate plus expenses incurred in 1979 before the crop was harvested could not exceed the total income received. In both of the procedures described above, the objective was to estimate the necessary information in a consistent manner. After records have been kept for a year these estimates are no longer necessary because they can be carried over from the ending summaries of the previous year.

There are several ways to improve the completeness of the records. First, knowing that certain information is difficult to estimate at year's end, a more complete interview of the farmer in the beginning could improve estimation of figures such as current investment in crops under cultivation (inventory). Second, the small inconsistencies in information

which is rarely recorded, such as miscellaneous purchases, could be reduced by developing an item checklist. Such a checklist could be covered periodically to improve the quality of such information. A basis for regularly checking such factors during the year would help minimize the problems involved in accounting for differences at the end of the year. Because the system utilized was highly dependent upon the record-keeper's training and competence, measures which improve or aid in the system of entering the information would be useful in ensuring that the information gathered is more complete.

The competence and training of the person making the entries are the most critical factors influencing the accuracy of the data collected. "Competence" is a mixture of factors. The record-keeper should be mature, thorough, educated, and knowledgeable about the situations being dealt with. It was observed, however, that the record-keeper can make very accurate entries in spite of educational deficiencies. For example, some of the farmers make their own entries, and the man in charge of the record book for the cooperative farm had less than a sixth grade education. Although the entries in those cases were not always neat, they were quite complete because of the thoroughness of the men and their intimate knowledge of all that was taking place on the farms. The young woman keeping records in Ajuterique was a school teacher with limited knowledge of agriculture, but proved to be very competent at questioning farmers. The least qualified record-keeper employed lacked maturity, and it was necessary and time-consuming to monitor her work. The Ministry of Natural Resources (includes Agriculture) had 27 record books in three areas supervised by Dr. Dan Galt. He observed that the two best record-keepers were an educated mature woman and a farmer with only a primary education.

The individual farmer cooperating in the records system is an important factor in the accuracy of the data as well, for he is the source of information. The managerial capability and the educational level of the farmer are two very important factors affecting the quality of the information given to the record-keeper. When the farmer can make his own entries with supervision, the quality of the information is further improved. However, the most important factor is the individual's willingness to cooperate. In Las Playitas the records system did not function well, even though the record-keeper was very capable, because the farmers would not give some information and were untruthful about other information. The willingness of the farmers to cooperate, as well as their individual capabilities thus have a strong influence on the quality of the data.

The farmer's capacity to give good information is influenced by his memory of details. Frequent expenditures on labor and materials are easier to remember as record book entries, but infrequent expenditures such as tools might be judged as unimportant and not mentioned, or entered in the wrong place. In this way, the infrequent use of certain pages in the record books can contribute to problems with the individual entries.

While both the record-keeper accountant and the farmer play important individual roles, the relationship between them is also a key factor. The establishment of close personal contacts between the researcher and the farmer as well as the record-keeper accountant and the farmer helps win and keep farmer confidence. In an atmosphere of respect and trust the farmer will more readily give the information required not because he understands why it is needed, but because he knows and trusts the person with whom he is cooperating. The personal relationship is also valuable because the researcher, having an intimate knowledge of the situation, is better able to judge the completeness and truthfulness of the record book entries. For

example, if a farmer spends money to buy new clothes and furniture while showing consistent losses on his crops, it would tend to cast doubt on the accuracy of his records.

Finally, the record book data should be judged on the basis of their accuracy relative to data collected by other means. The advantage of records is that they provide a reliable source of detailed historic information on production costs, input use and crop production, as well as changes in resource inventories and resources. This information permits the kind of whole-farm analysis necessary for determining the financial viability of these farms. Although certain problems with some portions of the records, as earlier discussed, have an effect on the accuracy of the data, this type of detailed information cannot be accurately obtained using surveys or questionnaires. The important factor here is the detail obtained; farmers are not usually capable of supplying such detail in questionnaire form due to memory limitations.

Other data such as family consumption of grains, household expenditures, resource base and land utilization could probably be gathered satisfactorily using questionnaires or surveys. However, the data gathered from records tends to give a more accurate picture of the interrelationships involved in the farm firm. Thus, the combination of these kinds of data with the detailed income and expense information gives a complete picture of the farm firm instead of the less detailed information obtained from surveys.

Record-keeping is definitely an expensive means of gathering data in terms of the personnel resources utilized, but is often the only way to gather accurate information. The costs of gathering such data must therefore be considered in the context of the need for and expected benefits from such data.

### The Usefulness of Record Systems and Data

Farm records have intrinsic educational value which benefits not only Bank employees and clients, but all those working with the agricultural sector. Direct use of the data shows greatest promise for the farmer and researcher, but the potential in the Bank is limited.

The Bank. The principal use of farm records envisioned for the Bank was construction of standardized tables of parameters to be used in the loan evaluation process. The plan was to establish 13 record-keeping cells of five to ten farmers in selected regions similar to the Ajuterique group. A hired record-keeper would be supervised by Bank loan officers, who would in turn be supervised by the SFC project team. The information generated would include the following general categories:

1. Standardized tables showing family grain consumption, cash expenditures on food, and other household cash expenses;
2. The source and use of funds at the farm level;
3. Verification of enterprise budget information obtained from questionnaires;
4. Resource inventory, use and cost data used in preparation of representative farm models for credit policy analysis;
5. Estimates of stored grain losses over time.

In theory the potential for use of farm records information is great, and conceptual limits are primarily a function of the imagination and desire of Bank personnel to carry out the program. Practical limitations are in fact severe, leaving little alternative but to reduce the scope of the program for the foreseeable future.

Other Honduran Agencies. The SFC project group provided record books and technical assistance to two groups working under the Ministry of Renewable Natural Resources (MRNR), which encompasses agriculture. One group working in freshwater fish production wanted to keep records for approximately 20 farms before and after their venture in fish farming. The group had myriad problems and finally ceased to ask assistance before obtaining a set of complete records.

The second "group" was essentially a one-man effort led by Dr. Dan Galt, an American agricultural economist, who kept records for 35 farms in four different areas using the "cell" concept. His interest was primarily agronomic relationships to support ongoing research at the national agricultural experiment station in the Comayagua Valley, near Ajuterique. Dr. Galt had some successes and failures, but his comments on the design and usefulness of the book were highly favorable. He left Honduras before one year of data was obtained, hence the results were limited to crop enterprise summaries with heavy emphasis in agronomic variables such as the timing of operations and quantities of inputs used. The future of farm records in the MRNR essentially came to a halt with his departure.

The greatest potential for farm records in Honduras lies with cooperative farms set up under the auspices of the national land reform agency-- Instituto Nacional Agraria (INA). A regulation already exists to the effect that these farms must keep a record of incomes and expenses, but in practice it has been of limited usefulness. The "record" is merely a ledger, the information from which is never summarized. Hired record-keepers from INA visit each farm monthly, if that often. For good reason, therefore, the cooperative farms need technical assistance in records. The SFC

project actually had to turn down requests for assistance because of lack of manpower. It appeared that demand for record systems on cooperative farms could have occupied all of the time of project personnel, but the Bank could not incur such heavy expenses to provide service to INA. Of course there would be direct benefit to the Bank from such a service role if implementation of record systems could help INA and the Bank keep tighter control over the use of loans advanced by the Bank. The land reform sector has shown a very high default rate on loans from the Bank, which is obligated to support the government's land reform program. It is impossible to predict the effect of farm record keeping or loan repayment, but the long term results certainly cannot be negative.

The Farmers. Farm records have an intrinsic educational value which benefits Bank employees and clients apart from direct use of the data. Maintenance of a record book requires a great deal of discipline on the part of the farmer, forces him to think about his costs, and encourages him to think about enterprise alternatives once he has seen the results of his labor. One of the most intriguing results presented to the record book participants was net income before and after including an imputed wage to operator and family labor. They understood the concept immediately, thus opening the door to the concept of opportunity cost. It appeared that the group of farmers in Ajuterique learned from their experience with farm records, but close contact over time with project personnel was necessary to accomplish that objective.

Members of the El Matazano cooperative farm made use of their record book without any prompting from project personnel; they used their records from 1979 to determine how much labor they would need to produce certain crops in 1980. Records are particularly useful

on cooperatives because of the intricate labor obligations of the members. Each is supposed to work a minimum number of days, sharing the tasks in an equitable way. It is also important to have an estimate of net income because part of the proceeds is divided among the members at the end of the crop year. For these reasons the record book was very useful and successful on El Matazano.

Farm records are obviously no panacea. Some farmers said they did not care to know their economic gains or losses. Others simply found the task of keeping records too demanding, and didn't report all costs and incomes. Some of the best participants in Ajuterique expressed regret that they hadn't been more careful about reporting information once they received their first summary of gains and losses on crops. That experience made "believers" out of them as to the value of the records, and more conscientious reporting resulted.

In conclusion, Honduran farmers stand to benefit from farm records-- particularly those associated with cooperative farms. Private farmers are harder to convince because there is no legal (tax) motive to maintain records, and because the small size and relative simplicity of most farms mitigate the usefulness. Along the same line, extension of the farm records to use in whole farm planning is a logical and necessary step which was not achieved during the project life.

Other Beneficiaries. Participating faculty from Oklahoma State University (OSU) and Colorado State University (CSU) benefited from this experience. They were forced to think about cultural differences, elimination of all tax-related accounting, and the farm as a production/consuming unit.

International agencies such as USAID and FAO are expected to have interest in the record book and records system tested in Honduras. The system can easily be adapted to other countries and languages.

#### Alternatives for Institutionalizing the Record System

The Practical limitations that preclude institutionalizing a comprehensive farm records system in the Bank are personnel, time, money and managerial ability. There is a chronic shortage of loan officers that precludes diverting their time to supervision of record books. Record book supervision can be a tedious, time consuming job which some loan officers would not perform willingly or conscientiously. A strong incentive would have to be devised to do the job properly, but incentives are insufficient for normal duties let alone additional ones. Even if the loan officers were willing and motivated to supervise farm record cells, there remains the problem of managerial ability to make use of the data.

The essence of the problem is that even if a flawless conceptual design for obtaining and using farm records were available, the institution currently lacks the resources, managerial ability and desire to make it work. It would be unwise to press for implementation of a full scale program which has a high probability of failure after a large expenditure of money and effort, hence limited project resources were allocated to programs with a greater probability of success.

The limited scope program recommended for the "Farm Data Analysis Unit" which was established to continue the work of the Small Farm Credit Project focuses on the educational value of farm records. The Unit will continue to directly manage at least one record-keeping cell of private farms and one cooperative farm. Experience and results obtained from this experiment

will be used to conduct training programs for Bank and non-Bank personnel who have interest and/or reason to use farm records. Specific opportunities for this include:

1. Bank loan officers. At present, two loan officers are helping several farmers keep record books simply because they are interested. Eventually, each loan officer could help one farmer maintain a book.
2. Other institutions--particularly the Instituto Nacional Agraria--need training and technical assistance in record keeping. This need was described previously.
3. Representatives from cooperative farms visited the Bank to request assistance in keeping farm records. The potential for record books on cooperative farms appears to be much better than for small private farms.

The proposed farm records program will therefore be akin to an experiment in the Bank but a valuable service to other institutions. This would be an important role for the Bank to take because no other institution in Honduras currently has the personnel or experience necessary to do it. Direct use of farm record data in loan evaluation is an ultimate objective, but as discussed previously, the benefits to be derived in the near future are general improvement in the education of employees and a possible improvement of the loan repayment record of cooperative farms.

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APPENDIX A

THE SMALL FARM DATA COLLECTION  
AND FARM ACCOUNT BOOK

## P R E F A C E

The SMALL FARM DATA COLLECTION AND FARM ACCOUNT BOOK was developed by Joseph E. Williams, Michael L. Hardin, and Loren L. Parks, assistant professors in the Agricultural Economics Department, Oklahoma State University, Stillwater, Oklahoma. The book was developed as part of a small farm credit project in Honduras, C.A. Principal financing was provided by the United States Agency for International Development. Spanish translation and field implementation in Honduras were completed by Reynerio Barahona, Banco Nacional de Fomento and Kurt A. Rockeman (OSU).

## TABLE OF CONTENTS

Form 1.1	Crop Receipts
Form 1.2	Livestock Receipts
Form 1.3	Other Income and Sales
Form 2.1	Crop Expenses
Form 2.2	Livestock Expenses
Form 2.3	Other Expenses
Form 2.4	Household Expenses
Form 3.1	Labor Record
Form 4.1	Crop Balance
Form 4.2	Livestock Production and Death Loss
Form 5.1	Livestock Inventory
Form 5.2	Record of Perennial Crops
Form 5.3	Inventory of Machinery, Equipment, Buildings and Land
Form 6.1	Net Worth Statement
Form 6.2	Cash Flow
Form 6.3	Profit and Loss Statement

















LABOR						
	Date	Description of Activity	Work Days			
			Enterprise			
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
TOTALS						









INVENTORY OF MACHINERY, EQUIPMENT, BUILDINGS, LAND

Line No	DESCRIPTION	BEGINNING			ENDING		
		NUMBER	VALUE/UNIT	TOTAL VALUE	NUMBER	VALUE/UNIT	TOTAL VALUE
1	Machinery and Equipment						
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							79
12	Total (Lines 1 - 11)						
	Building and Land						
13							
14							
15							
16							
17							
18							
19							
20	Total (Lines 13 - 19)						
	Total (Lines 12 + 20)						

NET WORTH STATEMENT

Assets				Liabilities			
		Beginning	Final			Beginning	Final
II	Current			V	Current		
A	Personal			24			
1	Cash			25			
2	Other			26			
3				27			
4				VI	Intermediate Liabilities		
5	Total (Line 1 - 4)			28			
B	Farm			29			
6	Crops: (Form 4.1, Page 1)			30			
7	(Form 4.1, Page 2)			31	Total Intermediate Liabilities		
8	(Form 4.1, Page 3)			VII	Long-Term		
9	(Form 4.1, Page 4)			32			
10	Cattle (Form 5.1, Line 4)			33			
11	Swine (Form 5.1, Line 12)			34			80
12	Poultry (Form 5.1, Line 21)			35	Total Long Term		
13	Crops: (Form 5.2, Page 1)						
14	Crops (Form 5.2, Page 2)						
15	Others			VIII	TOTAL LIABILITIES (Lines 27+31+35)		
16	Total (Line 6 - 15)						
III	Working Assets			IX	NET WORTH (Lines IV-VIII)		
17	Cattle (Form 5.1, Line 9)						
18	Swine (Form 5.1, Line 15)						
19	Other (Form 5.1, Line 27)						
20							
21	Machinery and Equip (Form 5.3)						
22	Total (Lines 20 + 21)						
III	Fixed						
23	Land & Buildings (Form 5.3)						

CASH FLOW

		Jan.	Feb.	Mar.	April	May	June	Total
1	Crops							
2								
3								
4								
5								
6	Cattle							
7	Swine							
8	Poultry							
9	Horses							
10	Other							
11	Miscellaneous Sales							
A	TOTAL FARM SALES (Lines 1 to 11)							
12	Other Income							
13	Money Borrowed							
B	TOTAL RECEIPTS (Lines A + 12 + 13)							
Expenses								
14	Crop							
15								
16								
17								
18								
19	Cattle							
20	Swine							
21	Poultry							
22	Horses							
23	Other							
24	Repairs							
25	Other Expenses							
26	Improvements							
C	TOTAL EXPENSES							
27	Loan Payments							
28	Household Expenses							
D	TOTAL EXPENSES (Lines C + 27 + 28)							
E	Cash Difference (Lines B-D)							
F	Beginning Cash Balance							
G	Ending Cash Balance (Lines E + F)							

CASH FLOW

		July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1	Crops							
2								
3								
4								
5								
6	Cattle							
7	Swine							
8	Poultry							
9	Horses							
10	Other							
11	Miscellaneous Sales							
A	TOTAL FARM SALES (Lines 1 to 11)							
12	Other Income							
13	Money Borrowed							
B	TOTAL RECEIPTS (Lines A + 12 + 13)							
Expenses								
14	Crop							82
15								
16								
17								
18								
19	Cattle							
20	Swine							
21	Poultry							
22	Horses							
23	Other							
24	Repairs							
25	Other Expenses							
26	Improvements							
C	TOTAL EXPENSES							
27	Loan Payments							
28	Household Expenses							
D	TOTAL EXPENSES (Lines C + 27 + 28)							
E	Cash Difference (Lines B-D)							
F	Beginning Cash Balance							
G	Ending Cash Balance (Lines E + F)							

1	Total Farm Sales (Form 6.2, Line A)		
2	Total Farm Expenses (Form 6.2, Line C)		
3	Net Cash Farm Income (Line 1 minus 2)		
	Change in Inventory		
4	Crop and Livestock (Form 6.1, Line 16)		
5	Working Livestock (Form 6.1, Line 20)		
6	Machinery and Equipment (Form 6.1, Line 21)		
7	Land and Buildings (Form 6.1, Line 23)		
	Change in Inventory		
9	Value of Family Consumption (Form 4.1, 4.2, 5.2)		
10	Minus Value of Meal Fed to Laborers (Form 3.1)		
11	Net Farm Income (3 + 8 + 9 + 10)		