

ICA  
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# IICA



COST OF PRODUCTION  
OF  
FOOD CROPS



ST. MARY

FARM MANAGEMENT SECTION

MINAG-IICA

July 1991

IICA OFFICE IN JAMAICA

## WHAT IS IICA?

The Inter-American Institute for Cooperation on Agriculture (IICA) is the specialized agency for agriculture of the inter-American system. The Institute was founded on October 7, 1942 when the Council of Directors of the Pan American Union approved the creation of the Inter-American Institute of Agricultural Sciences.

IICA was founded as an institution for agricultural research and graduate training in tropical agriculture. In response to changing needs in the hemisphere, the Institute gradually evolved into an agency for technical cooperation and institutional strengthening in the field of agriculture. These changes were officially recognized through the ratification of a new Convention on December 8, 1980. The Institute's purposes under the new Convention are to encourage, facilitate and support cooperation among the 32 Member States, so as to better promote agricultural development and rural well-being.

With its broader and more flexible mandate and a new structure to facilitate direct participation by the Member States in activities of the Inter-American Board of Agriculture and the Executive Committee, the Institute now has a geographic reach that allows it to respond to needs for technical cooperation in all of its Member States.

The contributions provided by the Member States and the ties IICA maintains with its twelve Permanent Observer Countries and numerous international organizations provide the Institute with channels to direct its human and financial resources in support of agricultural development throughout the Americas.

The 1987-1991 Medium Term Plan, the policy document that sets IICA's priorities, stresses the reactivation of the agricultural sector as the key to economic growth. In support of this policy, the Institute is placing special emphasis on the support and promotion of actions to modernize agricultural technology and strengthen the processes of regional and subregional integration.

In order to attain these goals, the Institute is concentrating its actions on the following five programs: Agricultural Policy Analysis and Planning; Technology Generation and Transfer; Organization and Management for Rural Development; Marketing and Agroindustry; and Animal Health and Plant Protection.

These fields of action reflect the needs and priorities established by the Member States and delimit the areas in which IICA concentrates its efforts and technical capacity. They are the focus of IICA's human and financial resource allocations and shape its relationship with other international organizations.

The Member States of IICA are: Antigua and Barbuda, Argentina, Barbados, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Dominica, the Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, the United States of America, Uruguay and Venezuela.

The Permanent Observer Countries of IICA are: Arab Republic of Egypt, Austria, Belgium, Federal Republic of Germany, France, Israel, Italy, Japan, Netherlands, Portugal, Republic of Korea and Spain.

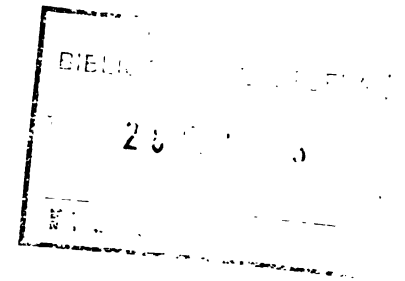


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FOOD CROPS**



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The views expressed in signed articles are those of the authors  
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## INTRODUCTION

### PURPOSE OF SURVEY

The Cost of Production survey for cash crops was the outcome of joint efforts between the Ministry of Agriculture Farm Management Section (MINAG-FMS), Ministry of Agriculture Data Bank and Evaluation Division and the Inter-American Institute for Cooperation on Agriculture (IICA). The purpose of the survey was to generate cost of production of the main crops by parish and to refine the cost of production data collection methodology.

### SURVEY METHODOLOGY

Data was collected for the ten main annual crops in each Parish. The farm sample consisted mainly of small farmers with highly labour intensive technology. The sample average farm size was less than nine acres for most of the crops and the average area planted with the crop varied between two squares for some vegetables to about one acre in some root crops and pumpkin.

### PROCESSING THE SURVEY DATA

After completing the enumeration exercise in January, 1989, the information was processed by MINAG-Data Bank. The survey technical coefficients for the different labour operations and inputs derived from the survey data were analyzed in collaboration with extension personnel from the Rural Agricultural Development Authority (RADA).

The labour operations and inputs which have been used reflect the operations and inputs used by the majority of the farmers included in the sample. Operations reported by 2 or 3 farmers only were not included. The prices used in the estimation of cost and returns have been updated using 1990 values.

Prices of labour and inputs change more rapidly than technology. Relative returns between crops are more stable. Major changes in relative prices would have to take place to affect the ranking of crops in terms of returns. The same can be said with respect to the relative requirements of labour and inputs between crops. A comparative graphical analysis between crops is included to facilitate the interpretation and use of cost and income data.

Obtaining and processing the survey data were affected by many factors and as a result an improved methodology for data collection was developed. Survey labour and inputs

estimated coefficients not always reflected farm conditions and in these cases adjustments were necessary.

### AIM OF THIS PUBLICATION

The data presented in this publication can be improved further but at the expense of delays in the release of the information to you. However, we hope that you will find the information useful bearing in mind that some coefficients may require further adjustment.

Please, write or contact us if you have a better estimate for some of the technical coefficients included in this publication. This will be an important help and stimulus to improve cost data in future publications.

### DEFINITION OF TERMS USED

**Gross Income:** is the crop yield per acre times the farmgate price.

**Cost of Production:** is the sum of fixed plus variable costs incurred in the production of the crop.  
Represents the value of all the resources that participate in the production process, including a return on the investment in land and capital and a return to farmer's labour.

**Management Returns:** income in excess of all costs.

**Cash Costs:** costs that involve a direct cash expenditure. In this publication we deal only with variable cash costs.

**Cash Variable Costs:** cost of labour and inputs used in the production and harvesting of the crop. The cash costs do not include the interest on the cash used in the production process (return on investment in operating capital).

**Fixed Costs:** costs that will occur regardless of the level of production. They generally include depreciation and interest on investment in machinery, equipment, buildings, breeding livestock, and return on investment in land plus cash expenditures in insurance, administration expenses and taxes. The total amount of fixed cost depends on each farm total assets and is dependent on farm size.

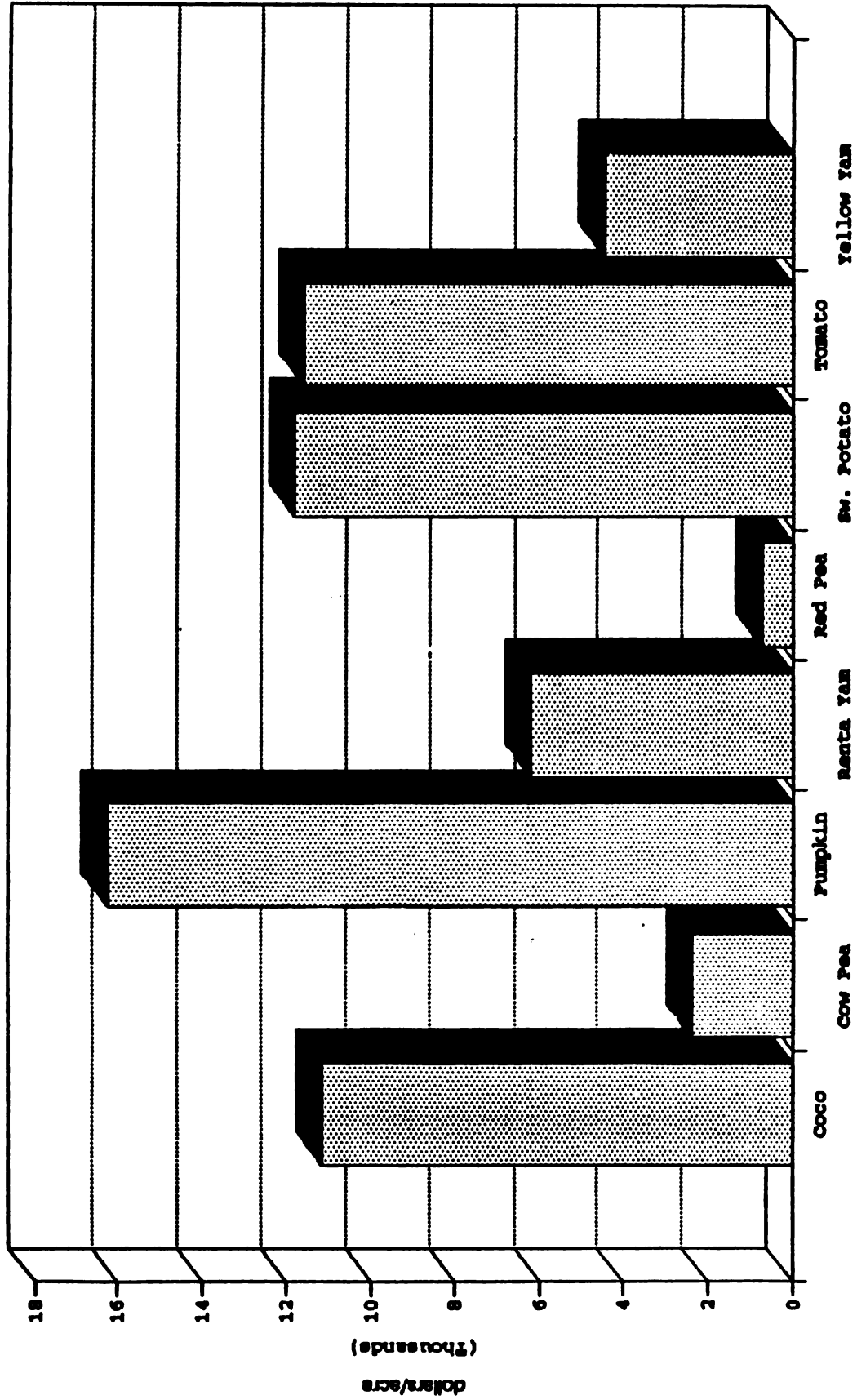
**Return to Farmer's Capital and Management:** is gross income minus cash variable costs.



# RETURN for FOOD CROPS

(Gross Inc. minus Cash Var. Cost)

## ST. MARY



# COST COMPONENTS for FOOD CROPS

(in percentage)

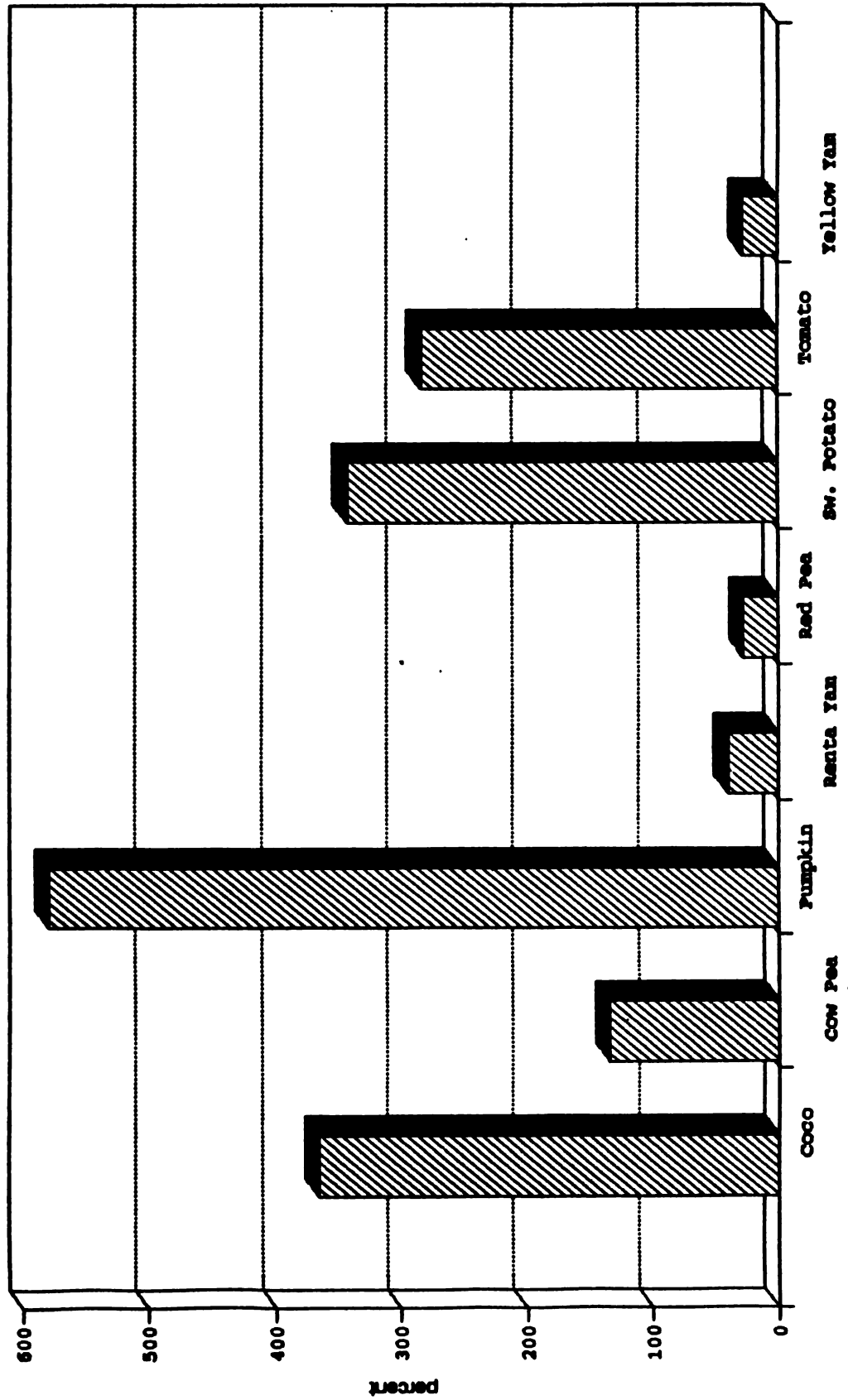
## ST. MARY



# RATE of RETURN for FOOD CROPS

(% return on investment in var. cost)

## ST. MARY



# YIELD for FOOD CROPS

(pounds per acre)

## ST. MARY



COST OF PRODUCTION

AREA: 1 Acre

PARISH:

ST. MARY

CROP:

COW PEA

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	UNIT	YIELD/ QUANTITY	PRICE	TOTAL
A. GROSS INCOME	LBS.	822	\$5.00	\$4,110.00
VARIABLE COST				
Labour cost				
Land Clearing	MAN DAYS	10	\$40.00	\$400.00
Forking				\$0.00
Refining				\$0.00
Trenching				\$0.00
Ridging				\$0.00
Lining				\$0.00
Prep.pl.material				\$0.00
Digging mounds				\$0.00
Digging holes	MAN DAYS	5	\$40.00	\$200.00
Heading plants				\$0.00
Planting(direct)	MAN DAYS	3	\$40.00	\$120.00
Nursery Charge				\$0.00
Planting(not direct)				\$0.00
Transplanting				\$0.00
Supplying				\$0.00
Herbicide Appl.				\$0.00
Weed and mould				\$0.00
Weeding	MAN DAYS	4	\$40.00	\$160.00
Fert.applic.	MAN DAYS	1	\$40.00	\$40.00
Spreading mulch				\$0.00
Staking and tying yam				\$0.00
Staking tomato				\$0.00
Pesticide Appl.	MAN DAYS	1	\$40.00	\$40.00
Irrigate field				\$0.00
Irrigate sprinkle				\$0.00
Harvesting	MAN DAYS	4	\$40.00	\$160.00
B. TOTAL LABOUR				\$1,120.00

---

PARISH: ST. MARY

CROP: RENTA YAM

Input Cost	UNIT	QUANTITY	PRICE	TOTAL
Seeds				\$0.00
Heads	LBS.	4000	\$2.50	\$10,000.00
Cutting				\$0.00
Suckers				\$0.00
Seedlings				\$0.00
Sets				\$0.00
NPK(Mixed)	CWT	8	\$70.00	\$560.00
Ammonium Sulphate				\$0.00
Organic Manure				\$0.00
Acres of Mulch				\$0.00
Trucks of Mulch				\$0.00
Herb.Emul.conc.				\$0.00
Herb.wet.powder				\$0.00
Insect.emul.conc.				\$0.00
Insect.wet.powder				\$0.00
Fungic.emul.conc.				\$0.00
Fungic.wet.powder				\$0.00
Stickers				\$0.00
Stakes	EACH	1000	\$2.00	\$2,000.00
Slug Bait				\$0.00
 C. TOTAL INPUTS				 \$12,560.00 -----
D. TOTAL VARIABLE COST (B+C)				\$15,800.00 =====
RETURN TO FARMER'S CAPITAL & MANAGEMENT				\$6,200.00
SUMMARY =====				
Gross Income				\$22,000.00
Total Labour				\$3,240.00
Total Inputs				\$12,560.00
Return (A-D)				\$6,200.00
Cost Components				
Labour %				20.51
Input %				79.49
Return on Investment in Cash Var. Cost %				39.24

## COST OF PRODUCTION

-11-

AREA: 1 Acre

PARISH:

ST. MARY

CROP:

PUMPKIN

	UNIT	YIELD/ QUANTITY	PRICE	TOTAL
A. GROSS INCOME	LBS.	6356	\$3.00	\$19,068.00
VARIABLE COST				
Labour cost				
Land Clearing	MAN DAYS	10	\$40.00	\$400.00
Forking	MAN DAYS	8	\$40.00	\$320.00
Refining	MAN DAYS	5	\$40.00	\$200.00
Trenching	MAN DAYS	5	\$40.00	\$200.00
Ridging				\$0.00
Lining	MAN DAYS	1	\$40.00	\$40.00
Prep.pl.material				\$0.00
Digging mounds				\$0.00
Digging holes	MAN DAYS	1	\$40.00	\$40.00
Heading plants				\$0.00
Planting(direct)	MAN DAYS	1	\$40.00	\$40.00
Nursery Charge				\$0.00
Planting(not direct)				\$0.00
Transplanting				\$0.00
Supplying				\$0.00
Herbicide Appl.				\$0.00
Weed and mould	MAN DAYS	4	\$40.00	\$160.00
Weeding	MAN DAYS	6	\$40.00	\$240.00
Fert.applic.	MAN DAYS	1	\$40.00	\$40.00
Spreading mulch				\$0.00
Staking and tying yam				\$0.00
Staking tomato				\$0.00
Pesticide Appl.	MAN DAYS	4	\$40.00	\$160.00
Irrigate field				\$0.00
Irrigate sprinkle				\$0.00
Harvesting	MAN DAYS	4	\$40.00	\$160.00
B. TOTAL LABOUR				<u>\$2,000.00</u>

PARISH: ST. MARY

CROP: RED PEA

Input Cost	UNIT	QUANTITY	PRICE	TOTAL
Seeds	LBS.	25	\$5.00	\$125.00
Heads				\$0.00
Cutting				\$0.00
Suckers				\$0.00
Seedlings				\$0.00
Sets				\$0.00
NPK(Mixed)	CWT	4	\$70.00	\$280.00
Ammonium Sulphate				\$0.00
Organic Manure				\$0.00
Acres of Mulch				\$0.00
Trucks of Mulch				\$0.00
Herb.Emul.conc.				\$0.00
Herb.wet.powder				\$0.00
Insect.emul.conc.	QUART	2	\$86.00	\$172.00
Insect.wet.powder				\$0.00
Fungic.emul.conc.	QUART	2	\$60.00	\$120.00
Fungic.wet.powder				\$0.00
Stickers				\$0.00
Stakes				\$0.00
Slug Bait				\$0.00
 C. TOTAL INPUTS				 \$697.00
				-----
D. TOTAL VARIABLE COST (B+C)				\$2,697.00
				=====
RETURN TO FARMER'S CAPITAL & MANAGEMENT				\$723.00
 SUMMARY				
=====				
Gross Income				\$3,420.00
Total Labour				\$2,000.00
Total Inputs				\$697.00
Return (A-D)				\$723.00
 Cost Components				
Labour %				74.16
Input %				25.84
Return on Investment in Cash Var. Cost %				26.81



COST OF PRODUCTION

AREA: 1 Acre

PARISH: ST. MARY

CROP: SWEET POTATO

---

	UNIT	YIELD/ QUANTITY	PRICE	TOTAL
A. GROSS INCOME	LBS.	7200	\$2.12	\$15,264.00
VARIABLE COST				
Labour cost				
Land Clearing	MAN DAYS	10	\$40.00	\$400.00
Forking	MAN DAYS	20	\$40.00	\$800.00
Refining				\$0.00
Trenching				\$0.00
Ridging				\$0.00
Lining				\$0.00
Prep.pl.material	MAN DAYS	1	\$40.00	\$40.00
Digging mounds	MAN DAYS	5	\$40.00	\$200.00
Digging holes				\$0.00
Heading plants				\$0.00
Planting(direct)				\$0.00
Nursery Charge				\$0.00
Planting(not direct)	MAN DAYS	3	\$40.00	\$120.00
Transplanting				\$0.00
Supplying				\$0.00
Herbicide Appl.				\$0.00
Weed and mould	MAN DAYS	5	\$40.00	\$200.00
Weeding				\$0.00
Fert.applic.	MAN DAYS	2	\$40.00	\$80.00
Spreading mulch				\$0.00
Staking and tying yam				\$0.00
Staking tomato				\$0.00
Pesticide Appl.	MAN DAYS	1	\$40.00	\$40.00
Irrigate field				\$0.00
Irrigate sprinkle				\$0.00
Harvesting	MAN DAYS	5	\$40.00	\$200.00
B. TOTAL LABOUR				\$2,080.00

---

PARISH: ST. MARY

CROP: SWEET POTATO

Input Cost	UNIT	QUANTITY	PRICE	TOTAL
Seeds				\$0.00
Heads				\$0.00
Cutting	EACH	10000	\$0.10	\$1,000.00
Suckers				\$0.00
Seedlings				\$0.00
Sets				\$0.00
NPK(Mixed)	CWT	4	\$70.00	\$280.00
Ammonium Sulphate				\$0.00
Organic Manure				\$0.00
Acres of Mulch				\$0.00
Trucks of Mulch				\$0.00
Herb.Emul.conc.				\$0.00
Herb.wet.powder				\$0.00
Insect.emul.conc.	QUART	0.5	\$160.00	\$80.00
Insect.wet.powder				\$0.00
Fungic.emul.conc.				\$0.00
Fungic.wet.powder	LBS.	1	\$20.00	\$20.00
Stickers				\$0.00
Stakes				\$0.00
Slug Bait				\$0.00
 C. TOTAL INPUTS				 \$1,380.00
 D. TOTAL VARIABLE COST (B+C)				 \$3,460.00
 RETURN TO FARMER'S CAPITAL & MANAGEMENT				 \$11,804.00
 SUMMARY =====				
Gross Income				\$15,264.00
Total Labour				\$2,080.00
Total Inputs				\$1,380.00
Return (A-D)				\$11,804.00
 Cost Components				
Labour %				60.12
Input %				39.88
 Return on Investment in Cash Var. Cost %				 341.16

COST OF PRODUCTION

AREA: 1 Acre

PARISH:

ST. MARY

CROP:

TOMATO

	UNIT	YIELD/ QUANTITY	PRICE	TOTAL
<hr/>				
A. GROSS INCOME	LBS.	6278	\$2.50	\$15,695.00
VARIABLE COST				
Labour cost				
Land Clearing	MAN DAYS	10	\$40.00	\$400.00
Forking	MAN DAYS	20	\$40.00	\$800.00
Refining	MAN DAYS	5	\$40.00	\$200.00
Trenching				\$0.00
Ridging				\$0.00
Lining	MAN DAYS	1	\$40.00	\$40.00
Prep.pl.material				\$0.00
Digging mounds				\$0.00
Digging holes	MAN DAYS	2	\$40.00	\$80.00
Heading plants				\$0.00
Planting(direct)				\$0.00
Nursery Charge	MAN DAYS	2	\$40.00	\$80.00
Planting(not direct)				\$0.00
Transplanting	MAN DAYS	5	\$40.00	\$200.00
Supplying				\$0.00
Herbicide Appl.				\$0.00
Weed and mould				\$0.00
Weeding	MAN DAYS	10	\$40.00	\$400.00
Fert.applic.	MAN DAYS	1	\$40.00	\$40.00
Spreading mulch				\$0.00
Staking and tying yam				\$0.00
Staking tomato				\$0.00
Pesticide Appl.	MAN DAYS	4	\$40.00	\$160.00
Irrigate field				\$0.00
Irrigate sprinkle				\$0.00
Harvesting	MAN DAYS	10	\$40.00	\$400.00
B. TOTAL LABOUR				\$2,800.00

PARISH: ST. MARY

CROP: TOMATO

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Input Cost	UNIT	QUANTITY	PRICE	TOTAL
Seeds	LBS.	0.25	\$800.00	\$200.00
Heads				\$0.00
Cutting				\$0.00
Suckers				\$0.00
Seedlings				\$0.00
Sets				\$0.00
NPK(Mixed)	CWT	6	\$70.00	\$420.00
Ammonium Sulphate	CWT	2	\$50.00	\$100.00
Organic Manure				\$0.00
Acres of Mulch				\$0.00
Trucks of Mulch				\$0.00
Herb.Emul.conc.				\$0.00
Herb.wet.powder				\$0.00
Insect.emul.conc.	QUARTS	4	\$60.00	\$240.00
Insect.wet.powder				\$0.00
Fungic.emul.conc.				\$0.00
Fungic.wet.powder	LBS.	20	\$17.00	\$340.00
Stickers				\$0.00
Stakes				\$0.00
Slug Bait				\$0.00

C. TOTAL INPUTS \$1,300.00

D. TOTAL VARIABLE COST (B+C) \$4,100.00  
=====

RETURN TO FARMER'S CAPITAL & MANAGEMENT \$11,595.00

SUMMARY

=====

Gross Income \$15,695.00

Total Labour \$2,800.00

Total Inputs \$1,300.00

Return (A-D) \$11,595.00

Cost Components

Labour % 68.29

Input % 31.71

Return on Investment in Cash Var. Cost % 282.80

**COST OF PRODUCTION**

AREA: 1 Acre

PARISH:

ST. MARY

CROP:

YELLOW YAM

	UNIT	YIELD/ QUANTITY	PRICE	TOTAL
A. GROSS INCOME	LBS.	10592	\$2.00	\$21,184.00
<b>VARIABLE COST</b>				
Labour cost				
Land Clearing	MAN DAYS	10	\$40.00	\$400.00
Forking				\$0.00
Refining				\$0.00
Trenching	MAN DAYS	10	\$40.00	\$400.00
Ridging				\$0.00
Lining				\$0.00
Prep.pl.material	MAN DAYS	8	\$40.00	\$320.00
Digging mounds	MAN DAYS	25	\$40.00	\$1,000.00
Digging holes				\$0.00
Heading plants	MAN DAYS	5	\$40.00	\$200.00
Planting(direct)	MAN DAYS	4	\$40.00	\$160.00
Nursery Charge				\$0.00
Planting(not direct)				\$0.00
Transplanting				\$0.00
Supplying				\$0.00
Herbicide Appl.				\$0.00
Weed and mould				\$0.00
Weeding	MAN DAYS	15	\$40.00	\$600.00
Fert.applic.	MAN DAYS	2	\$40.00	\$80.00
Spreading mulch				\$0.00
Staking and tying yam	MAN DAYS	15	\$40.00	\$600.00
Staking tomato				\$0.00
Pesticide Appl.				\$0.00
Irrigate field				\$0.00
Irrigate sprinkle				\$0.00
Harvesting	MAN DAYS	15	\$40.00	\$600.00
<b>B. TOTAL LABOUR</b>				<b>\$4,360.00</b>

PARISH: ST. MARY  
 CROP: YELLOW YAM

Input Cost	UNIT	QUANTITY	PRICE	TOTAL
Seeds				\$0.00
Heads	LBS.	4000	\$2.50	\$10,000.00
Cutting				\$0.00
Suckers				\$0.00
Seedlings				\$0.00
Sets				\$0.00
NPK(Mixed)	CWT	5	\$70.00	\$350.00
Ammonium Sulphate				\$0.00
Organic Manure				\$0.00
Acres of Mulch				\$0.00
Trucks of Mulch				\$0.00
Herb.Emul.conc.				\$0.00
Herb.wet.powder				\$0.00
Insect.emul.conc.				\$0.00
Insect.wet.powder				\$0.00
Fungic.emul.conc.				\$0.00
Fungic.wet.powder				\$0.00
Stickers				\$0.00
Stakes	EACH	1000	\$2.00	\$2,000.00
Slug Bait				\$0.00
C. TOTAL INPUTS				\$12,350.00
D. TOTAL VARIABLE COST (B+C)				\$16,710.00
RETURN TO FARMER'S CAPITAL & MANAGEMENT				\$4,474.00
SUMMARY				
=====				
Gross Income				\$21,184.00
Total Labour				\$4,360.00
Total Inputs				\$12,350.00
Return (A-D)				\$4,474.00
Cost Components				
Labour %				26.09
Input %				73.91
Return on Investment in Cash Var. Cost %				26.77









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