### TABLE OF CONTENTS

		Page
Acknowledgemen		iii
Abstract in English		v
Abstract in Thai		viii
List of Tables		xiii
List of Figures		xv
Abbreviations		xvi
CHAPTER 1	INTRODUCTION	3 1
1.1 Background	d	1
1.2 Statement of	of the Problems	2
1.3 Objectives	of the Study	4
1.4 Usefulness	of the Study	4
CHAPTER 2	LITERATURE REVIEW	5
2.1 Direct Seed	ling and Row Seeding	5
	t Seeding	5
2.1.1.1	Zero-Tillage Direct Seeding	6
2.1.1.2	Water Seeding	6
2.1.1.3	Dry Seeding	7
2.1.1.4	Wet Seeding	8
	Seeding	8
	en Snail by Chiang Mai Unive	10
2.2 Policy Refo		12
	ctivized Agricultural Production System	13
	racted System	14
	Market Liberation  Privatigation of Output Market	15
2.2.3.1	Privatization of Output Market	15 16
2.2.3.2 2.2.4 Rice I	Decentralization of Input Supplies  Development Strategy	16 16
2.2.4 RICE I	プロスのいけいけい ひけなにたる	10

2.3	Cost	Benefit Analysis	17
2.4	Cobl	b-Douglas Production Function	19
CHA	APTEF	R 3 RESEARCH METHODS AND STUDY AREA	22
3.1	Cond	ceptual Framework	22
3.2	Stud	y Area	23
3	3.2.1	Location	25
3	3.2.2	Climate	25
3	3.2.2	Hydrology	26
3	3.2.3	Rainfall	27
3	3.2.4	Topography	27
3	3.2.5	Soils	27
3	3.2.6	Population	28
3	3.2.7	Administrative Units	28
3	3.2.8	Sub-Agro-Ecological Zones	28
3	3.2.9	Representative Research Area	29
3.3	Data	Gathering Procedure	31
3	3.3.1	Secondary Data	31
3	3.2.2	Primary Data	31
3.4	Meth	nod of Analysis	33
3	3.4.1	Basic Statistical Analysis	33
3	3.4.2	Costs and Returns Analysis	33
3	3.4.3	Cobb-Douglas Production Function Analysis	34
CHA	APTER	R 4 RESULTS AND DISCUSSION	37
4.1	Exis	ting Cropping Systems	37
	1.1.1	Transect Map	37
	1.1.2	Seasonal Calendar	39
4	1.1.3	The Trends of Rice Cropping System	40
4.2	Socie	o-economic Characteristic of Farm Households	42
4	1.2.1	Wealth Ranking	42
	1.2.2	The Surveyed Samples	42
4	1.2.3	Farm Size	43
	1.2.4	Household Size	43
	1.2.5	Education Attainment	44
	1.2.6	Rice Production Experience	45
	1.2.7	Row Seeding Experience	46

CU	RRICIII	JIM VITAE	84
RE	FEREN	CES	80
J . 4	10001		,,
5.2		nmendations	7 <del>4</del> 79
5.1	Concl	usion	74
CH	APTER	5 CONCLUSION AND RECOMMENDATIONS	74
CH	A DTFFF	CONCLUCION AND DECOMMEND ATIONS	714
	4.5.4	Response of Yield to Inputs Use	70
		Correlations Matrix Among Explanatory Variables	69
		Descriptive Statistics of Original Data	69
		Model Specification	67
4.5		-Douglas Production Function Analysis	67
4.5		Net Return per Total Cost and per one Output Unit	66
		Production Cost of One Kilogram of Output	65
		Benefit Cost Ratio	65
		Return over Labor (Labor Productivity)	65
		Return over Cash Cost	63
		Net Returns	63
	4.4.2	Gross Return	63
	4.4.1	Total Production Cost	62
4.4		and Returns Analysis	62
11	4.3.10	Problems of Row Seeding Practice	60
	4.3.9	Selling and Amount of Selling Rice	59 60
	4.3.8		59 50
		Yields	
	4.3.6	Control of Insect, Diseases, and Weeds Post-Harvest	59
	4.3.6		58
•	4.3.4	Fertilizer Fertilizer	56
	4.3.4	Labor Use	56
	4.3.2	Seed Rate	55
	4.3.1	Land Preparation Rice Varieties	54 54
4.3	4.3.1	Production and Row-seeding Practice	54 54
4.3		Perceptions of Row-seeding's Farmer-respondents	52 54
	4.2.10 4.2.11	Training Courses  Percentians of Power and in size Former respondents	51 52
	4.2.9	Credit Training Courses	50
	4.2.8	Gender Analysis	46
	120	Gonday Applying	16

### LIST OF TABLES

Table	ं भग्नामान	Page
2.1	Direct seeding technique in different ecosystem in Mekong Delta River.	. 9
2. 2	Rice production performance in the period from 1950 to 1987.	14
2. 3	Costs and returns in rice farming in the Mekong River Delta, 1992.	18
2. 4	Production cost of the Mekong River Delta and Red River Delta by season, 1996.	19
3. 1	Agro-ecological zones in the Mekong River Delta.	25
3.2	Sub-agro-ecological zones of Can Tho province.	29
3.3	Criteria for wealth ranking.	31
4. 1	Timeline development of direct seeding and related practices in Tan Phu Thanh village's rice cultivation.	41
4. 2	Distribution of wealth in Thanh My hamlet.	42
4. 3	Distribution of samples by seeding method and wealth.	43
4.4	Average area (ha/ household) and land use by seeding method and wealth.	. 43
4. 5	Distribution of family size toward row-seeding and broadcasting.	44
4. 6	Distribution of education of household members according to education obtainment in Tan Phu Thanh village.	45
4. 7	Distribution of respondents according to years of experience of rice production.	45
4. 8	Distribution of respondents according to number of season (times) of experience of row-seeding practice.	46
4. 9	Percentage distribution of men and women engaging in rice production activities in three farmer groups.	47
4.10	Gender analysis on edecision-making and responsibility.	49
4.11	Distribution of credit availability from formal sources.	51
4.12	Distribution of respondents according to the training courses attended in rice production.	52
4.13	Descriptive statistics of row-seeding's farmer-respondents.	53
4.14	Distribution of varieties in two seeding methods.	55

4.15	The average of seed rate, labor, yields, storing loss, and amount of selling rice per ha in two seeding methods.	56
4.16	Average fertilizer (kg/ha) used in two seeding methods by wealth in dry season.	57
4.17	The ratio of N, P2O5, and K2O using in two seeding methods in dry season, Can Tho province.	58
4.18	Problems in row-seeding practice of poor, fair, and rich group.	61
4.19	Economics of costs and returns (1000 dong/ha) of farmer groups in two seeding systems.	64
4.20	Descriptive statistics of original data.	69
4.21	Simple correlations among explanatory variables for rice production.	70
4.22	Estimates of Cobb-Douglas production functions for rice production.	71

# ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่ Copyright<sup>©</sup> by Chiang Mai University All rights reserved

#### LIST OF FIGURES

Figu	re % % % % % % % % % % % % % % % % % % %	Page
2. 1	The Structure of plastic row seeder	9
2. 2	The life cycle of golden snail	11
3. 1	Conceptual framework	23
3.2	Agro-ecological zones of Vietnam	24
3.3	Administrative map of Can Tho province	26
3.4	Map of representative research site	30
3.5	Work-flow of primary data gathering	32
4. 1	Transect map of Tan Phu Thanh village	38
4. 2	Seasonal calendar of Tan Phu Thanh village	40

# ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่ Copyright<sup>©</sup> by Chiang Mai University All rights reserved

#### **ABBREVIATIONS**

CBA Cost Benefit Analysis

HHs Households

IPM Integrated Pest Management

IRRI International Rice Research Institute

KIs Key Informants

mt Million tons

N Nitrogen

PRA Participatory Rural Appraisal

SHs Stakeholders

Std. Standard Deviation

SWOT (Strengths, Weaknesses, Opportunities, and Threats)

#### **EXCHANGE RATE (March 2003)**

1 Baht 380 VND

1 USD 15,300 VND

## ลิขสิทธิมหาวิทยาลัยเชียงใหม Copyright<sup>©</sup> by Chiang Mai University All rights reserved