### COMPARING GROWTH, YIELD AND NUTRIENT UPTAKE OF RICE IN ALTERNATE AERATED AND ANAERATED CONDITIONS

DANG HUU THANG

A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE (AGRICULTURE) IN AGRONOMY

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่ Copyright<sup>©</sup> by Chiang Mai University

> THE GRADUATE SCHOOL CHIANG MAI UNIVERSITY APRIL 2006 ISBN 974-9891-28-7

## COMPARING GROWTH, YIELD AND NUTRIENT UPTAKE OF RICE IN ALTERNATE AERATED AND ANAERATED CONDITIONS

### DANG HUU THANG

THIS THESIS HAS BEEN APPROVED
TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF SCIENCE (AGRICULTURE)
IN AGRONOMY

		Omco.			
*	* 1	c			
	$\cdots$		CH	ATROED	CON

Prof. Dr. Benjavan Rerkasem

**EXAMINING COMMITTEE** 

Jansance Jan/al MEMBER

Assoc. Prof. Dr. Sansanee Jamjod

Dr. Waree Chaitep MEMBER

10 April 2006 © Copyright by Chiang Mai University

#### **ACKNOWLEDGEMENTS**

Firstly, I would like to acknowledge and express my sincere gratitude to Prof. Dr. Benjavan Rerkasem, my Thesis Advisor, and Assoc. Prof. Dr. Sansanee Jamjod, Thesis Advisory Committee member for their constant guidance, timely advice, invaluable help and suggestion throughout this study. Also, I would like to express sincere gratitude for constructive criticisms by Dr. Waree Chaitep, External Examiner, in improving the thesis.

I am greatly indebted to Assoc. Prof. Dr. Dumnern Karladee, Academic Advisor for his encouragement, suggestion, supports and guidance throughout my graduate program and to finally in the completion of this research.

I also thank Mr. Sittichai Lordkaew at the Multiple Cropping Center (MCC), Faculty of Agriculture, Chiang Mai University for his genuine help on nutrient analysis and laboratory facilities, Ph. D. student Nednapa Insalud for her kindly help.

My sincere appreciation goes to the Department of Technical and Economic Cooperation (DTEC), Thailand for providing financial support to undertake this study. Especially, I extend my heartfelt thanks to the Rector and Vice-rectors of Hue University of Agriculture and Forestry as well as to the Department of Foreign Affairs for its promotion, and support extended in providing me this opportunity to attend the graduate program. I also thank the McKnight Foundation for the facilitation in some parts of my research.

Many thanks to all the staff and students of the CMUPNlab, Agronomy and Multiple Cropping Center, Faculty of Agriculture, Chaing Mai University for their genuine help during my study.

Special thanks are also extended to Assoc. Prof. Dr. Richard Bell, School of Environmental Science, Murdoch University, Western Australia for his generous guidance and timely advice me in doing my research.

Finally, a sincere, heartfelt thank to my parents, my family, my older sisters and brothers, younger brothers who have been supporting and encouraging me to complete this study.

Dang Huu Thang

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