

**RESPONSE OF TOMATO (*Lycopersicon esculentum*) GROWN IN BURNT
PADDY HUSK TREATED WITH PALM OIL MILL EFFLUENT**

by

MOHD SHAFIRUN BIN MOHD AZBA

**Final Project Paper Submitted in Partial Fulfillment for the Degree of Bachelor
of Science (Hons.) in Plantation Technology and Management
Faculty of Applied Science**

UNIVERSITI TEKNOLOGI MARA

March 2002

ACKNOWLEDGEMENT

Praise be to Allah S.W.T for giving me the strength to complete my research. I would like to take this opportunity to thank Him for helping me to understand, face the numerous challenges, intellectually and spiritually to complete this research project.

I would like to extend my sincere thanks to Prof. Dr. Wan Mohamad Wan Abdul Kadir, my supervisor, who has guided me and reviewed this project from the beginning till the end. His keen patience was essential to ensure the successful outcome of the project.

Special thanks to Puan Fatayah Husin from Malaysian Palm Oil Board (MPOB) Bangi, Selangor who has supplied me with the references about palm oil mill effluent, and to Encik Azman Abdullah from Bernas Dominal Sdn. Bhd., Kuala Selangor for supplying me with information the characteristics of burnt paddy husk and Dr. Melor Rejab, MARDI Jalan Kebun for the information on tomato plants and providing me with the seeds of tomato MT 1 and also to all the lecturers of Plantation Technology and Management programme.

Last but not least, to those whom I am unable to mention but have contributed to the project either directly or indirectly, my sincere thanks to them.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF PLATES	viii
ABSTRACT	ix
ABSTRAK	x
CHAPTER	
1 INTRODUCTION	
1.1 Fundamentals of Tomato	1
1.1.1 Objectives of Study.....	3
1.1.2 Contributions of the Research to New Knowledge.....	4
1.1.3 Benefits of the Research to Our Country.....	4
2 LITERATURE REVIEW	
2.1 Importance of Tomato.....	5
2.1.1 Soil and Climate Suitability.....	5
2.1.2 Variety of Tomato.....	5
2.1.3 Cultivation.....	6
2.1.4 Cultural Practices.....	6
2.1.5 Irrigation.....	6
2.1.6 Pest Control Method.....	7
2.1.7 Disease Control Method.....	7
2.1.8 Characteristics of MT 1 Tomato.....	8
2.2 Palm Oil Mill Effluent (POME).....	10
2.2.1 Characteristics of POME.....	10
2.2.2 Uses of POME.....	11
2.2.3 Effluent Treatments.....	12
2.2.4 Sources of POME.....	14
2.2.5 Treatments of POME.....	16
2.2.6 Types of Anaerobic System.....	17
2.2.7 Factors Influencing Anaerobic Digestion.....	18
2.2.8 Other POME Treatments.....	20
a. Tank Digestion and Mechanical Aeration.....	20
b. Tank Digestion and Facultative Ponds.....	21
c. Decanter and Facultative Ponds.....	21
d. Antara System.....	21
2.3 Burnt Paddy Husk.....	23
2.3.1 Introduction.....	23
2.3.2 Process of Paddy in Mill.....	22
a. LSU Process.....	23
b. IBD/FBD Process.....	25
2.3.3 Why Burnt Paddy Husk.....	27

ABSTRACT

RESPONSE OF TOMATO (*Lycopersicon esculentum*) GROWN IN BURNT PADDY HUSK TREATED WITH PALM OIL MILL EFFLUENT

By

MOHD SHAFIRUN B MOHD AZBA

March 2002

This experiment was conducted to determine the response of tomato variety MT 1 grown in burnt paddy husk treated with palm oil mill effluent (POME). This experiment was conducted to test the potentials of tomato variety MT 1 grown in burnt paddy husk. Another objectives are to determine the optimum growth rate of application of POME which would give the optimum level of tomato variety MT 1 grown in burnt paddy husk and to determine the optimum growth rate of the tomato variety MT 1 with the certain rates of POME application. This research was conducted by using Randomized Complete Block Design under a rain shelter structure with five treatment levels and 10 replications. The POME level per treatment was 0 g for control, 165 g for level, 330 g for level two, 495 g for level three and 660 g for level four which was equivalent to 0 kg per hectare, 50,000 kg per hectare, 100,000 kg per hectare, 150,000 kg per hectare and 200,000 kg per hectare respectively. From the observations and results in order to get an optimum yield, the application of single POME must be followed by the addition of fertilizer. Another important observation is the stage of decomposition of POME. If the POME is semi-decomposed, the phytotoxic problem caused by the phenolic acid produced by the microorganism activity affects plant growth. This problem also attracts an insect that decompose the POME. But the characteristics of the insect need further studies since it has not been identified yet. Besides, the growth rate of tomato in the agricultural wastes like burnt paddy husk compared to common soil needs further research.

CHAPTER 1

INTRODUCTION

1.1 Fundamental of Tomato

Tomato (*Lycopersicon esculentum*) is one of the important fruity vegetables, which is among the top priority crop cultivated in Malaysia. Usually it is planted in high lands like the Cameron Highlands because the temperature is more suitable than that in the low lands. With the introduction of new varieties of tomato that are resistant to high temperature and bacteria wilt, tomato can now be planted in the low land areas. The estimated production of tomato is about 12,000 tons/year planted in the areas of 700 ha.

This experiment was carried out to observe and record the response of tomato planted in the burnt paddy husk, which was treated with various levels the palm oil mill effluent (POME). The indicator crop selected was tomato from variety MT 1. The parameters of study include the height of tomato plants, number of fruits per tree and their yield. In addition, the plant biomass was also measured at the end of the experiment. This variety of tomato developed by MARDI is to fulfil the demand of fruits suitable for cooking ingredients (Melor, 1998).