

THE EFFECT OF GRASS WEED MULCH AND GRADED LEVELS  
OF NITROGEN ON THE YIELD OF WHITE CABBAGE  
(*Brassica oleracea* var capitata)  
IN  
THE EASTERN REGION OF SRI LANKA

BY

PUSHPALOSANA KUNJITHAMBY

A RESEARCH REPORT  
SUBMITTED IN PARTIAL FULFILMENT OF THE  
REQUIREMENT FOR THE ADVANCED COURSE

IN

CROP SCIENCE

FOR

THE DEGREE OF THE BACHELOR OF SCIENCE IN AGRICULTURE  
FACULTY OF AGRICULTURE  
EASTERN UNIVERSITY, SRI LANKA  
CHENKALADY

1995

APPROVED BY

  
.....  
SUPERVISOR

Mr. K. Thechanamoorthy  
Senior Lecturer & Dean  
Faculty of Agriculture  
Eastern University, Sri Lanka  
Chenkalady

Date : .....

26/6/95

.....  
T. Mahendran

HEAD/AGRONOMY  
Dr. (Mrs.) T. Mahendran  
Head/Agronomy  
Faculty of Agriculture  
Eastern University, Sri Lanka  
Chenkalady

Date : .....

27.6.95

< 3991

I



FAG78



Project Report  
Library - EUSL

PROCESSED  
Library, EUSL

## ABSTRACT

Field experiment was conducted during the rainy season (maha) of 1994/95 at the Crops farm of the Eastern University, Sri Lanka to study the effect of grass weed mulch and graded levels of nitrogen on the yield of white cabbage (*Brassica oleracea*. var. capitata).

The experiment was laid out in a Randomized Complete Block Design replicated 3 times with four levels of nitrogen (0, 80, 160, 240 kg /ha) with or without grass weed mulch.

The results indicate nitrogen individually and in combination with mulching to increase heading efficiency, heading rate, root length, root weight, plant biomass, head volume, and finally the yield of white cabbage.

The combination of mulch with all the levels of nitrogen was found effective in increasing the harvest rate.



ACKNOWLEDGEMENT

Nitrogen either at 160kg/ha or 240kg/ha with or without mulch had a definite influence on head volume, heading efficiency and mean head weight. Mulching was found more effective at 0 and 80kg N/ha on heading efficiency and mean head weight.

Nitrogen either at 160 or 240 kg/ha with the combination of mulching was found to give maximum hectare yield. Among nitrogen levels 160kg /ha could be considered most economical.

The study concludes that maximum economic yield of cabbage in the sandy regosols of the Eastern region of Sri Lanka during rainy (maha) seasons could be obtained by applying nitrogen at 160kg/ha along with grass weed mulching.

The help and assistance given by the laboratory staff is gratefully acknowledged.

Gratitude is expressed to the Head of Department, Eastern University for the opportunity to use the computer and I am greatly

indebted to Mr. A. Sirachan for his sincere support in providing the materials.

I wish to acknowledge all others who have helped me to complete my project successfully.

11ccm

## TABLE OF CONTENTS

TITLE PAGE	I
ABSTRACT	II
ACKNOWLEDGEMENT	III
TABLE OF CONTENTS	IV
LIST OF TABLES	VII
LIST OF FIGURES	VIII

Chapter	Title	Page
1	INTRODUCTION	1
2	REVIEW OF LITERATURE	4
2.1	Effect of mulch on plant growth and yield	4
2.2	Effect of mulching	5
2.2.1	Physical effects of mulching	5
2.2.2	Biological effects of mulching	9
2.2.3	Chemical effects of mulching	9
2.2.4	Effects on yield	10
2.3	Effects of nitrogen on the yield of leafy vegetables	13
2.3.1	Effects of nitrogen on the yield of cabbage	13
2.3.1	Effects of nitrogen on other leafy vegetables	14
2.3.2	Effects of mulch in combination with nitrogen on plant growth and yield of leafy vegetables	15



<b>3</b>	<b>MATERIALS AND METHODS</b>	<b>16</b>
3.1	Location and climatic condition	16
3.2	Field and soil	17
3.3	Previous crop	17
3.4	Experimental procedure	17
3.4.1	Treatments	19
3.4.2	Size of plot	19
3.5	Variety	20
3.6	Nursery	20
3.7	Field preparation and planting	20
3.8	Mulching	21
3.9	Fertilizer applications	21
3.9.1	Basal applications	21
3.9.1	First top dressing	21
3.9.2	Second top dressing	22
3.10	Agronomic practices	22
3.11.1	Irrigation	22
3.11.2	Weed control	22
3.11.3	Pest and disease control	22
3.12	Harvesting	23
3.13	Observations recorded	23
3.13.1	Soil temperature	23
3.13.2	Soil moisture content	23
3.13.3	Biometrical observations	23
<b>4</b>	<b>RESULT AND DISCUSSION</b>	<b>25</b>
4.1	Soil characteristics	25
4.1.1	Effect on soil moisture	25
4.1.2	Effect on soil temperature	27
4.2	Plant characters	27

4.2.1	The effect on root weight and root length	27
4.3	Yield attributes	32
4.3.1	Effect on plant biomass	32
4.3.2	Effect on head volume	34
4.3.3	The effect of mulch and nitrogen on harvest rate	37
4.3.4	The effect on heading efficiency	40
4.3.5	Effect on head yield of cabbage	42
4.3.5.1	Mean head weight	42
4.3.5.2	Effect on hectare yield	44
	Variations in head volume	35
5	<b>SUMMARY AND CONCLUSION</b>	49
5.1	Summary	49
5.2	Conclusion	50
	Variations in hectare yield	46
	<b>BIBLIOGRAPHY</b>	51

**APPENDICES**

- Appendix I (Rainfall during  
experimental period)
- Appendix II (Temperature range during  
experimental period)
- Appendix III (Relative humidity during  
experimental period)
- Appendix IV (Soil characteristics of  
the experimental field)