

362

**Effect of compost with reduced chemical fertilizer on growth and  
yield of radish (*Raphanus sativus L.*)**

**Mohammeth Saleem Mohammeth Imthiyas**



FAG362



Project Report  
Library - EUSL

**Faculty of Agriculture**

**Eastern University**

**Sri Lanka**

**2014**

DEAN  
Faculty of Agriculture  
Eastern University, Sri Lanka

PROCESSED  
Main Library, EUSL

## ABSTARCT

Organic farming is becoming more prominent concept among local farmers because of increasing health problems and cost of production. Due to this problem to find out possible outcome on behalf of fertilizer cost of cultivation, a field experiment was carried out to evaluate the integrated use of recycled organic waste (compost) and reduced level of chemical fertilizers for improving growth and yield of radish. Compost was applied alone or in combination with half dosage of recommended chemical fertilizer as basal application. The experiment included eight treatments and three replications.

Full dosage of chemical fertilizer (T2) or 20 t/ha compost (T4) or 10 t/ha compost + half dosage of chemical fertilizer (T6) as basal application with chemical fertilizer as topdressing showed similar performance for most of the parameters such as leaf area, tuber diameter, fresh weight of tuber and marketable tuber yield. But T4 and T6 showed higher mean value in most of the parameters especially in leaf area (506.00 cm<sup>2</sup>, 587.20 cm<sup>2</sup> respectively) than T2 (430.34 cm<sup>2</sup>). Fresh weight of tuber, marketable yield and biological yield were higher in T4 and T6 than T2. But 20 t/ha compost + half dosage of chemical fertilizer as basal with full dosage of chemical fertilizer as topdressing (T8) was showed highly significant with all other treatments in all growth and yield parameters.

Results revealed that T6 and T4 gave almost same results when comparing the yield performances of T2 especially in marketable tuber yield. When concerning profitable way of cultivation, T8 causes to higher production cost and it may have over nutrition in this combination. Therefore T4 and T6 were the best choices than T2 for the better growth and yield of radish. Therefore saving half of the NPK chemical fertilizer and

# TABLE OF CONTENTS

	Page No
ABSTARCT .....	iv
ACKNOWLEDGEMENT .....	vi
TABLE OF CONTENTS .....	vii
LIST OF TABLES.....	x
LIST OF FIGURES.....	xi
CHAPTER 01.....	1
1.0 INTRODUCTION .....	1
CHAPTER 02.....	6
2.0 LITERATURE REVEIW .....	6
2.1 Concept of compost farming.....	6
2.2 Scientific classification of radish .....	6
2.3 Distribution and extent of cultivation in Sri Lanka.....	7
2.4 Main uses of radish .....	7
2.5 Compost as a fertilizer .....	8
2.6 Compost making .....	9
2.7 Materials used for composting.....	10
2.8 Factors affecting the composting process .....	10
2.9 Types of composting.....	12
2.10 Composting problems .....	13
2.11 Cow dung as a compost ingredient .....	14
2.12 Goat manure as a compost ingredient.....	14
2.13 Straw as a compost ingredient.....	14
2.14 Gliricidia as a compost ingredient.....	15
2.15 Role of farmyard manure in compost making.....	16
2.16 Effects of farm yard manure on growth and yield of crops .....	17
2.17 Benefits of using compost.....	18
2.18 Advantages of compost in soil health .....	20
2.19 Role of compost on growth and yield of crop.....	22
2.20 Detrimental effects of using inorganic fertilizer .....	27
CHAPTER 03.....	29
3.0 MATERIALS AND METHODS.....	29
3.0 Experimental design and Treatments .....	29



3.1	Experimental site.....	29
3.2	Environmental characteristics of experimental site .....	31
3.3	Compost making .....	31
3.3.1	Raw materials.....	31
3.3.2	Process of composting.....	32
3.3.3	Maturity of compost.....	33
3.4	Variety.....	33
3.5	Germination test.....	33
3.6	Agronomic practices .....	34
3.6.1	Land preparation .....	34
3.6.2	Field layout .....	34
3.6.3	Spacing.....	36
3.6.4	Sowing .....	36
3.6.5	Application of fertilizers .....	36
3.6.6	Irrigation.....	36
3.6.7	Weed management .....	37
3.6.8	Pest and disease management .....	37
3.6.9	Harvesting .....	37
3.7	Agronomic parameters.....	37
3.7.1	Growth parameters .....	37
3.7.1.1	Canopy height .....	37
3.7.1.2	Number of leaves .....	37
3.7.1.3	Leaf area.....	38
3.7.2	Yield parameters.....	38
3.7.2.1	Tuber diameter .....	38
3.7.2.2	Tuber length .....	38
3.7.2.3	Total root length.....	38
3.7.2.4	Fresh weight of leaves.....	38
3.7.2.5	Dry weight of leaves .....	38
3.7.2.6	Fresh weight of tuber .....	38
3.7.2.7	Dry weight of tuber .....	39
3.7.2.8	Total fresh weight of plants.....	39
3.7.2.9	Total dry weight of plants .....	39
3.8	Statistical analysis.....	39
<b>CHAPTER 04</b>	.....	<b>40</b>

<b>4.0</b>	<b>RESULTS AND DISCUSSION</b> .....	<b>40</b>
4.1	Canopy height .....	41
4.2	Number of leaves .....	42
4.3	Leaf area.....	42
4.4	Tuber length .....	43
4.5	Tuber diameter .....	44
4.6	Total root length.....	45
4.7	Fresh weight of leaves.....	46
4.8	Fresh weight of tuber .....	48
4.9	Fresh weight of crop .....	48
4.10	Dry weight of leaves .....	49
4.11	Dry weight of tuber .....	50
4.12	Dry weight of crop .....	50
4.13	Marketable tuber yield .....	51
4.14	Biological yield of radish.....	52
4.15	Correlation and regression analysis to fit the variable links .....	53
4.15.1	Correlation between leaf area and tuber diameter.....	53
4.15.2	Correlation between tuber diameter and fresh weight of tuber .....	53
4.15.3	Correlation between leaf area and fresh weight of tuber.....	53
4.15.4	Correlation between leaf area, total root length and tuber length .....	53
4.15.5	Regression equation between leaf area and fresh weight of tuber .....	54
4.15.6	Regression equation between leaf area and tuber diameter .....	54
4.15.7	Regression equation between tuber diameter and fresh weight of tuber.....	55
4.15.8	Regression equation between tuber length and leaf area .....	55
4.15.9	Regression equation between leaf area and dry weight of tuber.....	56
<b>5.0</b>	<b>CHAPTER 05</b> .....	<b>57</b>
<b>5.0</b>	<b>CONCLUSIONS</b> .....	<b>57</b>
	<b>RECOMMENDATIONS</b> .....	<b>59</b>
	<b>FUTURE LINE OF WORK</b> .....	<b>60</b>
	<b>REFERENCES</b> .....	<b>61</b>