

**Tomato Production Practices in  
Kirinyaga District and Assessment of  
Pest Management Options at  
KARI - Thika**

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**A thesis submitted in partial fulfillment for the award of Master of  
Science in Zoology in the Jomo Kenyatta University of  
Agriculture and Technology**

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## DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

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## **DEDICATION**

I dedicate this MSc. thesis to my late Dad, family and my friend Josephat

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## TABLE OF CONTENTS

<b>TITLE .....</b>	<b>i</b>
<b>DECLARATION .....</b>	<b>ii</b>
<b>DEDICATION.....</b>	<b>iii</b>
<b>ACKNOWLEDGEMENTS .....</b>	<b>iv</b>
<b>TABLE OF CONTENTS .....</b>	<b>vi</b>
<b>LIST OF TABLES .....</b>	<b>x</b>
<b>LIST OF FIGURES .....</b>	<b>xii</b>
<b>LIST OF PLATES .....</b>	<b>xiii</b>
<b>LIST OF APPENDICES .....</b>	<b>xiv</b>
<b>LIST OF ABBREVIATIONS .....</b>	<b>xv</b>
<b>ABSTRACT .....</b>	<b>xvi</b>
<b>CHAPTER ONE .....</b>	<b>1</b>
<b>1.0 INTRODUCTION AND LITERATURE REVIEW .....</b>	<b>1</b>
1.1 Tomato crop and the important pests .....	1
1.2 Damage caused by pests on tomato .....	3
1.3 Tomato pest management .....	8
1.3.1 Cultural control .....	8
1.3.2 Biological control .....	12
1.3.3 Botanical pesticides .....	14
1.3.4 Chemical control .....	16
1.3.5 Integrated pest management .....	18

1.4	Justification .....	19
1.5	Problem statement.....	20
1.6	Null hypothesis .....	20
1.7	Alternative hypothesis .....	20
1.8	Objectives .....	21
	1.8.1 Main objective.....	21
	1.8.2 Specific objectives .....	21
<b>CHAPTER TWO .....</b>		<b>22</b>
<b>2.0</b>	<b>MATERIALS AND METHODS .....</b>	<b>22</b>
2.1	Survey on tomato production practices .....	22
	2.1.1 Survey site description .....	22
	2.1.2 Methodology .....	22
2.2	Assessment of tomato pest management options .....	25
	2.2.1 Site description for field trial experiments.....	25
	2.2.2 Experimental design .....	25
	2.2.3 Data collection .....	27
	2.2.4 Data analysis .....	27
<b>CHAPTER THREE .....</b>		<b>33</b>
<b>3.0</b>	<b>RESULTS .....</b>	<b>33</b>
3.1	Survey on tomato production practices .....	33
	3.1.1 Basic data on the respondents .....	33
	3.1.2 Land ownership under tomato production .....	33

3.1.3	Labor incurred on tomato production .....	34
3.1.4	Inputs used in tomato production, tomato varieties grown and irrigation practices .....	35
3.1.5	Output from tomato production .....	37
3.1.6	Record keeping .....	37
3.1.7	Farmers source of information on tomato production .....	38
3.1.8	Important arthropod pests of tomato as perceived by farmers in Kirinyaga District .....	39
3.1.9	Pest control practices .....	41
	3.1.9.1 Pesticide use .....	41
	3.1.9.2 Knowledge of pesticide handling .....	42
3.1.10	Training topics received by the farmers .....	42
3.2	Field experiments to evaluate pest management options .....	44
3.2.1	Pest incidence .....	45
	3.2.1.1 Long rains (Season one) .....	45
	3.2.1.2 Short rains (Season two) .....	48
	3.2.1.3 Inter-season pest incidence .....	49
3.2.2	Beneficial insects .....	51
3.2.3	Yields obtained .....	53
	3.2.3.1 Long rains (Season one) .....	53
	3.2.3.2 Short rains (Season two) .....	55
	3.2.3.3 Inter-season yields .....	55

3.2.4	Economic benefits of the evaluated pest control treatments	56
.....		
<b>CHAPTER FOUR</b>		<b>59</b>
.....		
<b>4.0</b>	<b>DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS</b>	<b>59</b>
.....		
4.1	DISCUSSIONS	59
.....		
4.2	CONCLUSIONS	68
.....		
4.3	RECOMMENDATIONS	69
.....		
<b>5.0</b>	<b>REFERENCES</b>	<b>70</b>
.....		

## LIST OF TABLES

Table 3.1	Activities carried out in tomato production and the average cost of hired labor per season per acre .....	35
Table 3.2	Farm inputs and the percentage of farmers that used them in their tomato production .....	36
Table 3.3	Record keeping practices on production activities by tomato farmers in Kirinyaga District .....	38
Table 3.4	Farmers' source on information on tomato production in Kirinyaga District .....	39
Table 3.5	Methods used by farmers to decide when to apply pesticides .....	41
Table 3.6	Training topics tomato farmers had received and percent respondent .....	43
Table 3.7	Pest population means across the pest control treatments evaluated in the tomato trials .....	47
Table 3.8	Pest population means for the beneficial insects observed during the long rains (season one) and short rains (season two) across the treatments .....	52
Table 3.9	Mean yields (in kg/ha) obtained the long rains (season one) and short rains (season two) across the treatments.....	54

Table 3.10	Economic benefits for pest management options evaluated in the tomato field trials carried out at KARI-Thika.....	58
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## LIST OF FIGURES

Figure 2.1	Kirinyaga District, Kenya and its Administrative Divisions ...	24
Figure 3.1	Farmers perception of the arthropod pests that attacked tomato in Kirinyaga District, Kenya .....	43
Figure 3.2	Comparisons of mean pest populations observed during the long rains (season one) and the short rains (season two) of the field experiments .....	35
Figure 3.3	Comparisons of yields obtained during the long rains (season one) and the short rains (season two) of the field experiments .....	56

## LIST OF PLATES

Plate 1.1	Green peach aphids ( <i>Myzus persicae</i> ) .....	3
Plate 1.2	Damage by African boll worm ( <i>H. armigera</i> ) on green tomato fruit .....	5
Plate 1.3	Webbing caused red spider mites ( <i>Tetranychus sp.</i> ) on tomato .....	6
Plate 1.4	Adults whiteflies ( <i>Bemisia tabaci</i> ) on a tomato leaf .....	7
Plate 2.1	Tomato field experiment layout at KARI-Thika, 2007  Showing mulched and staked tomato crop .....	26
Plate 2.2	Mulched treatment .....	28
Plate 2.3	Untreated control .....	29
Plate 2.4	Farmers' practice .....	30
Plate 2.5	Staked with need-based pest control using biopesticides .....	31

## LIST OF APPENDICES

Appendix	I	Survey questionnaire .....	62
Appendix	II	Weather data .....	70

### **LIST OF ABBREVIATIONS**

AVRDC	Asian Vegetable Research and Development Centre
TSWV	Tomato Spotted Wilt Virus
TCSV	Tomato Chlorotic Spot Virus
ATTRA	Appropriate Technology Transfer for Rural Areas
TYLCV	Tomato Yellow Leaf Curl Virus
Bt	<i>Bacillus thuringiensis</i>
IPM	Integrated Pest Management

## **ABSTRACT**

A study was carried out on tomato production practices in Kirinyaga District and assessment of pest management options at KARI - Thika. The study endeavored to establish farmers' knowledge on tomato pests and their pest management practices, and to evaluate pest management options. The aim of the study was to come up with an integrated pest management strategy for tomato. The tomato production practices were studied through a survey which entailed interviewing tomato farmers in Kirinyaga District. While assessment of pest management options were done through tomato trials conducted at KARI-Thika. A structured questionnaire was used in the survey and only farmers who had been involved in tomato production for at least the past six months were each randomly administered with a questionnaire. Tomato field trial experiments were laid on randomized complete block design with five pest control treatments replicated four times. The pest control treatments were; mulch with no pest control option; untreated control; mulch with need-based pest control using biopesticides; farmers' practice with regular pest control and staking with need-based pest control using biopesticides. Disease control and other agronomic practices were conducted regularly on all the treatments. Pest incidence was recorded once in a week throughout the crop season. Harvested tomatoes were weighed and converted into yield/ha for all the treatments. The trials were conducted during the long and the short rains. One hundred and twenty farmers were interviewed during the survey. It emerged that pests and diseases were a constraint in tomato

production. Some of the pests mentioned included spider mites, African bollworm, thrips, aphids and whiteflies while the diseases included late and early blight, bacterial wilt, tomato spotted wilt virus, leaf curl virus, powdery mildew, blossom end rot and nematodes. Farmers used pesticides in pest management and they had little or no knowledge on alternative pest management and IPM. The pests observed in the field trial experiments were whiteflies, aphids, thrips, spider mites, leaf miners and African bollworms, while the beneficial insects observed were the ladybird beetles and spiders. Pest incidence varied within pest control treatments in both crop seasons at  $p < 0.0001$ . The mean marketable yield in the long and short rains differed significantly within treatments in both seasons at  $p < 0.0001$ . Farmers' practice which involved routine pesticide use had the lowest mean pest incidence and highest mean marketable yield in both seasons. The short rains had higher pest incidence and lower yields compared to the long rains. Treatments with mulch and where biopesticide application was used had low whiteflies population. Routine pesticides applications as well as poor weather conditions increased pest management costs. Farmers needed training on alternative pest management and IPM to reduce reliance on pesticides, reduce costs of pest management and to ensure correct choice and use of fertilizers and pesticides. Mulching reduced the cost of labor on weeding and provided an environment conducive for beneficial insects. Farmers incurred losses due to price fluctuations therefore there was need to put in place appropriate marketing

policies to stabilize prices. Early planting was an important factor to take advantage of good weather and evade pests.