

**EVALUATION OF VEGETATIVE AND YIELD PERFORMANCE OF
Capsicum annuum IN THE LOW COUNTRY INTERMEDIATE ZONE
OF SRI LANKA**



BY

J.M.U.G.U.B. Jayasiri



FTC301

Main Library, Eastern University, Sri Lanka

Department of Biosystems Technology

Faculty of Technology

Eastern University, Sri Lanka

Chenkalady

2026

ABSTRACT

Chilli (*Capsicum annuum*) is widely cultivated in Sri Lanka. The study aimed to evaluate the vegetable growth, agronomic traits and yield performance of eight chilli varieties under Low Country Intermediate Zone condition, considering the influence of different environmental conditions and intercropping with a leguminous crop. The experiment was conducted at the Hasalaka, Kandy district (central province), Sri Lanka. The chilli (*Capsicum annuum*) varieties: *MICH01*, *KA 02*, *Galkiriyagama selection*, *MI Waraniya 01*, *MI 01*, *MI HOT*, *MICH01-Hybrid*, and *MI 02*, which were evaluated using a Complete Randomized Design (CRD) with ten replicates. The chilli variety *MI HOT* and the mungbean variety *MI 05* were selected for the intercropping study. The intercropping experiment was laid out in a Randomized Complete Block Design (RCBD) with three replicates. Plant height at vegetative stage varied from *Galkiriyagama Selection* (17.41 ± 0.728 cm) to *MI 02* (10.42 ± 0.365 cm) respectively. Number of leaves at vegetative stage varied from *MICH 03* (9.88 ± 1.17) to *MI Waraniya 01* (7.60 ± 0.476) respectively. Leaf length leaf at vegetative stage varied from *MI 01* (8.10 ± 0.120 cm) to *MI 02* (3.86 ± 0.0718 cm) respectively. Leaf width at vegetative stage varied from *MI Waraniya 01* (4.83 ± 0.111 cm) to *MI 02* (2.30 ± 0.0856 cm) respectively. The number of branches at vegetative stage varied from *KA 02* (2.10 ± 1.370) to *MI 02* (0.700 ± 0.260) respectively. The number of flowers at flowering stage varied from *MI Waraniya* to *Galkiriyagama selection* respectively. In the Low Country Intermediate Zone (LCIZ), plant height was similar between intercropping (8.20 ± 0.15 cm) and monocropping (8.12 ± 0.21 cm). Leaf number and branch number were slightly higher under intercropping (8.06 ± 0.17 , 3.86 ± 0.038) compared to monocropping (9.04 ± 0.16 and 3.60 ± 0.0589). Leaf area and leaf width showed minimal differences between the two systems, and no viable nodules were observed under either systems. During this period, the site experienced warm, dry conditions (30.42 – 35.5°C , 0 – 1.79 mm rainfall, declining humidity from 89% to 78.1% , and slightly longer day lengths of $11:46$ – $11:55$ hr), which likely constrained vegetative growth, indicating that intercropping offered only marginal benefits under LCIZ conditions.

Keywords: Agronomic traits, Chilli (*Capsicum annuum*), Intercropping, Low Country Intermediate Zone, Mungbean, Sri Lanka, Vegetative growth, Yield performance.

TABLE OF CONTENTS

DECLARATION.....	iii
DEDICATION	iv
ACKNOWLEDGEMENT	v
ABSTRACT.....	vi
TABLE OF CONTENTS	vii
LIST OF FIGURES	x
LIST OF TABLES	xi
ABBREVIATION.....	xii
CHAPTER 1	1
INTRODUCTION	1
1.1 Background	1
1.2 Justification	2
1.3 Objectives.....	3
CHAPTER 2	4
LITERATURE REVIEW.....	4
2.1 Introduction to chilli (<i>Capsicum annuum</i>)	4
2.1.1 Scientific classification of <i>Capsicum annuum</i>	4
2.2 Overview of chilli (<i>Capsicum annuum</i>) cultivation.....	5
2.2.1 Global importance and distribution of chilli.....	5
2.2.2 Nutritional, medicinal and economic value of chilli.....	6
2.2.3 Chilli cultivation in Sri Lanka and its role in local agriculture.....	7
2.3 Agro-climatic conditions of the Low Country Intermediate zone of Sri Lanka ...	9
2.3.1 Climate profile of the Low Country Intermediate zone (LCIZ)	9
2.3.2 Soil characteristics and suitability for chilli.....	10
2.4 Genetic factors (Genotypes).....	10
2.4.1 Chilli Varieties: discussion of different chilli genotypes (e.g., Local vs. hybrid varieties) and their traits.....	11
2.5 Environmental factors affecting chilli performance.....	14
2.5.1 Impact of temperature on growth, flowering and fruit development.....	14
2.5.2 Role of rainfall and soil moisture in yield performance	14

2.5.3 Effect of Relative Humidity on fruit quality and disease incidence	14
2.6 Constraints and challenges in chilli production	15
2.6.1 Biotic stresses (pest and pathogen)	15
2.6.2 Abiotic stresses (rainfall, drought, heat)	16
2.7 Chilli Intercropping with Mung Bean	16
2.7.1 Concept of intercropping	17
2.7.2 Leguminous crops in intercropping	17
2.7.3 Chilli- mung bean intercropping systems	18
CHAPTER 3	19
MATERIALS AND METHODS	19
3.1 Location.....	19
3.2 Climate and Soil	19
3.3 Experimental No.01	20
3.3.1 Planting materials.....	20
3.3.1.1 Seed treatment before planting	20
3.3.2 Experimental design.....	20
3.3.2.1 Experimental layout (CRD).....	21
3.3.2.2 Number of treatments and replication.....	21
3.3.3 Agronomic practices.....	21
3.3.3.1 Nursery management and transplanting.....	21
3.3.3.2 Pot preparation	22
3.3.3.3 Transplanting of chilli plant & the space between the pots	22
3.3.4 Crop management practices	22
3.3.4.1 Irrigation method & Weed control	22
3.3.4.2 Pest and disease management	23
3.3.5 Fertilizer application	23
3.3.6 Data collection.....	24
3.3.6.1 Vegetative growth parameters.....	24
3.3.6.2 Yield parameters	25
3.3.6.3 Environmental data	25
3.4 Experimental No. 02	26

3.4.1 Background and experimental design	26
3.4.2 Agronomic practices	28
3.4.3 Data collection	29
3.4.3.1 Vegetative growth parameters.....	29
3.4.3.2 Yield parameters	30
3.5 Data analysis	30
CHAPTER 4	31
RESULTS AND DISCUSSION.....	31
4.1 Evaluation of plant height at the vegetable stage	31
4.2 Evaluation of number of leaves at the vegetative stage	34
4.3 Evaluation of leaf length at the vegetative stage.....	36
4.4 Evaluation of leaf width at the vegetative stage.....	39
4.5 Evaluation of the number of branches at the vegetative stage	41
4.6 Evaluation of the number of flowers at the vegetative stage	42
4.7 Evaluation of the yield data at the reproduction stage	44
4.8 Analysis of the effect of the Agro Ecological Zone for the Cropping System of chilli variety <i>MI HOT</i> intercropping with mungbean.....	46
4.9 Analysis of the interaction effect between agro-ecological zone and cropping system on the morphological traits of selected chilli variety <i>MI HOT</i> intercropping with mungbean	50
4.10 Analysis of the effects of the ecological Zone for the cropping systems of the Mungbean variety <i>MI 05</i>	53
4.11 Analysis of the effect of agro-ecological zone and cropping system on the morphological traits of selected mungbean variety <i>MI 05</i>	57
4.12 The effect of Environmental factors on plant growth parameters.....	60
4.13 Principal component analysis.....	61
4.14 Relationships between environmental factors and plant traits	62
4.15 Trait Correlations and Environmental Drivers	63
CHAPTER 5	65
CONCLUSION AND RECOMMENDATIONS	65
Recommendation and suggestion.....	65
REFERENCES	66