

**EFFECT OF CHLOROMEQUAT-CHLORIDE  
APPLICATION ON GROWTH AND YIELD OF  
CAPSICUM (*Capsicum annuum* L.) GROWN IN OPEN  
FIELD**

**BY**

**D.K.U.S. DEWENIGURU**



Project Report  
Library - EUSL

436

**FACULTY OF AGRICULTURE  
EASTERN UNIVERSITY  
SRI LANKA**

**2016**

PROCESSED

## ABSTRACT

*Capsicum* (*Capsicum annuum* L.) is a tropical plant, which belongs to family solanaceae and ideally suited to hot and humid conditions. *Capsicum* has extent of 15439 ha with 72034 Mt of produced quantity in Sri Lanka during both *Yala* and *Maha* seasons in year 2014. Demand of *Capsicum* is high in Sri Lanka, because production of *Capsicum* is low due to pest and diseases, poor post harvest knowledge and post harvest facilities and unfavorable environmental conditions such as high or low rainfall, temperature, relative humidity. Flower and fruit drop also a reason for yield reduction caused by physiological and hormonal imbalance in the plants particularly under unfavorable environments, such as extremes of temperature or too low or high temperatures. Chloromequat chloride is one of growth regulator which has the ability to reduce fruit and flower drop and increase the yield.

Therefore, an experiment was carried out to determine the effect of Chloromequat chloride on growth and yield of the *Capsicum* at Horticultural Crop Research and Development Institute at Gannoruwa from 2015 October to 2016 February. *Capsicum* var CA-8 was used in this study. Chloromequat chloride as a foliar spray at different times from transplanting of *Capsicum* plants at the rate 14ml/16L.

Treatments were, T<sub>1</sub> as water spray at one, two and five weeks after transplanting, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub> were application of Chloromequat chloride at one, two, five weeks after transplanting and one, two, five week after transplanting respectively.

Treatments were arranged in Randomized Complete Block design with three replicates.

Plant height, chlorophyll content, days taken to first flowering and 50% flowering, number of days taken to fruit initiation, canopy width, number of flowers per branches, number of pods per plant, average pod width, average pod length, average thickness of pods, marketable yield, non-marketable and total yield were measured.

There was no significant difference ( $P > 0.05$ ) among tested treatments in plant height and chlorophyll content. Plant growth rate was increased in T<sub>5</sub> (application of Chloromequat chloride at one, two, five weeks after transplanting). All treatments had first flower at 34 days after transplanting. According to the chi square values, no significant difference ( $P > 0.05$ ) among tested treatments in number of days taken to 50% flowering, number of days taken to first fruit and the number of flowers per branch.

Also there was no significant differences ( $P > 0.05$ ) among tested treatments in average canopy width and number of pods per plant. Further, marketable, non marketable and total yield of capsicum were statistically same in all tested treatments. Therefore, present study concluded that application of chloromequat chloride at different time intervals in different growth stages did not show positive impact on growth and yield of capsicum grown in open field.

# TABLE OF CONTENT

ABSTRACT .....	i
ACKNOWLEDGEMENT .....	iii
TABLE OF CONTENT .....	iv
LIST OF TABLES .....	viii
LIST OF FIGURES .....	ix
LIST OF PLATES .....	x
ABRIVIATIONS.....	xi
CHAPTER 1.....	1
1.0 INTRODUCTION.....	1
1.2 Objectives .....	5
CHAPTER 2.....	6
2.0 LITRETURE REVIEW .....	6
2.1 Origin and Distribution of Capsicum .....	6
2.2 Taxonomy of Capsicum.....	7
2.2.1 Taxonomical classification of capsicum .....	8
2.3 Environmental conditions .....	8
2.3.1 Altitude .....	8
2.3.2 Temperature.....	8
2.3.3 Rainfall .....	10
2.3.4 Soil .....	10
2.4 Botanical description of capsicum plant .....	11
2.4.1 Plant.....	11
2.4.2 Leaves .....	11
2.4.3 Flowers.....	11
2.4.4 Fruit .....	12
2.4.5 Seeds .....	12
2.4.6 Root.....	12



2.5 Uses of Capsicum.....	13
2.5.1 Health Benefits of Capsicum.....	14
2.5.1.1 Anti-inflammatory properties .....	14
2.5.1.2 Mucilage.....	14
2.5.1.3 Chemopreventive properties.....	15
2.5.1.4 Cardiovascular .....	15
2.5.1.5 Antioxidant properties .....	16
2.5.1.6 Hypoglycemic .....	16
2.5.1.7 Immunology .....	16
2.5.1.8 Psoriasis.....	17
2.5.1.9 Diabetic neuropathy.....	17
2.5.1.10 Fibromyalgia .....	17
2.5.1.11 Skin and aging.....	17
2.5.1.12 Menopausal symptoms.....	17
2.6 Nutritional Composition of Capsicum .....	18
2.7.1 Vegetative growth phase .....	19
2.7.1.1 Seed germination.....	19
2.7.1.2 Seedling stage .....	20
2.7.1.3 Stem elongation and branching .....	20
2.7.2 Reproductive phase .....	20
2.8 Constraints to increase the production of capsicum.....	21
2.9 Role of plant growth regulators .....	23
2.9.1 Classification of plant growth regulators.....	24
2.10 Chloromequat chloride .....	25
2.10.1 Identity.....	25
2.10.2 Physical and chemical properties.....	26
2.10.3 Technical material (chlormequat chloride) .....	26
2.10.4 Plant metabolism .....	26
2.10.5 Role of chloromequat chloride .....	28
2.10.6 Application methods of chloromequat chloride.....	30
2.10.7 Factors affect in activity of chlormequat chloride.....	32
2.10.7.1 Environmental factors .....	32
2.10.7.2 Cultural factors .....	33
2.10.7.3 Varietal differences .....	33
2.10.8 Effect of chloromequat chloride on plants.....	34

2.10.8.1 Effect of chloromequat chloride on nodal growth.....	34
2.10.8.2 Effect of chloromequat chloride on fruit development .....	34
2.10.8.3 Effect of chloromequat chloride on shoot growth .....	34
2.10.8.4 Effect of chloromequat chloride on Chlorophyll content.....	35
2.10.8.5 Effect of chloromequat chloride on flowering.....	36
2.11 Common plant growth retardants use in agriculture.....	36
CHAPTER 3.....	40
3.0 METHODOLOGY.....	40
3.1 Experimental location .....	40
3.2 Treatments used in this experiment.....	41
3.3 Experimental design.....	42
3.4 Agronomic practices.....	42
3.4.1 Nursery management .....	42
3.4.2 Field preparation.....	43
3.4.3 Transplanting .....	43
3.4.4 Irrigation .....	44
3.4.5 Weeding .....	44
3.4.6 Fertilizer application .....	45
3.4.7 Pest and disease control.....	45
3.5 Data collection .....	46
3.6. Data Analysis.....	47
CHAPTER 4.....	48
4.0 RESULTS AND DISCUSSION .....	48
4.1 Plant height.....	48
4.2 Chlorophyll content.....	50
4.2.1 Correlation between chlorophyll content and canopy width .....	51
4.3 Number of days to 1 <sup>st</sup> flowering and 50% flowering .....	52
4.4 Number of days taken to fruit initiation after transplanting .....	53
4.5 Number of flowers per branch.....	53
4.6 Average canopy width .....	54
4.7 Number of pods per plant .....	55
4.8 Average length, width and thickness of pods.....	56
4.9 Yield per plant.....	57