EVALUATION OF VEGETATIVE AND YIELD PERFORMANCE OF CHILLI (*Capsicum annuum*) IN THE LOW COUNTRY WET ZONE OF SRI LANKA

By

A.W.U.S. Siriwardhana

Department of Biosystem Technology

Faculty of Technology

Eastern University, Sri Lanka

Chenkalady

2025

ABSTRACT

Capsicum annuum is a widely cultivated crop in Sri Lanka, with significant economic and nutritional value. This study aimed to evaluate the vegetative growth performance of eight *Capsicum annuum* varieties in the Low Country Wet Zone of Sri Lanka. The eight chilli varieties; MICH 3 (T1), KA 2 (T2), MI Green (T3), Arunalu (T4), Galkiriyagama Selection (T5), Waraniya Purple (T6), Waraniya Green (T7), and MI Waraniya 1 (T8) recommended by Department of Agriculture, Sri Lanka used for the study. The varieties were arranged in a pot experiment in a CRD by using 10 replicates. Plant morphological traits and yield data were measured at two-week intervals. The results demonstrated significant variation in morphological traits among the tested varieties ($P < 0.05$). Among the tested varieties, Waraniya Purple exhibited maximum plant height (72.50±7.31 cm) and leaf length (16.01±0.16 cm), indicating vigorous vegetative growth. The variety Arunalu reported the highest leaf density (96.40±11.65 cm), reflecting enhanced photosynthetic potential. Leaf width was consistently greater in Waraniya Green (7.53±1.41 cm) and MI Waraniya 1 (7.22±3.38 cm), while KA 2 (29.10±7.46 cm) excelled in branch development, suggesting better overall plant architecture. MI Waraniya 1 produced the highest number of flowers (6.55±1.23), indicating strong reproductive potential. Biplot analysis reported that temperature and relative humidity are strongly associated with plant growth parameters in the Low Country Wet Zone. Plant Height of the tested varieties in the Low Country Wet Zone, associated with higher RH and temperature. The number of branches is strongly correlated with temperature and RH, implying that these factors enhance vegetative growth in the Low Country Wet Zone. These findings suggest that environmental factors, particularly temperature and relative humidity, play a crucial role in determining the vegetative growth performance of *Capsicum annuum* varieties. Further studies incorporating different agro-climatic conditions and extended growing periods are recommended to validate these results and optimize chilli cultivation in Sri Lanka.

Key words: *Capsicum annuum*, Environmental factors, Growth performance, Low country wet zone.

TABLE OF CONTENTS