CHARACTERIZATION AND PERFORMANCE ASSESSMENT OF EXOTIC BELL PEPPER VARIETIES UNDER POLYTUNNEL CONDITIONS

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2025

ABSTRACT

Bell pepper (*Capsicum annuum*) belongs to the family Solanaceae is a popular commercial vegetable grown all over the world. This study aimed to characterize and assess the performance of exotic bell pepper varieties under polytunnel conditions. The experiment was conducted in a polytunnel at the Regional Agriculture Research and Development Center, Bandarawela during November 2024 to February 2025. The performances of eight new exotic bell pepper varieties (Tibetzi, Carnival, Lirica, Star No.01, NS280, Adonis, Karveri and Mecong) were compared with two control varieties Indra and Polaris. The experiment was laid in Completely Randomized Design (CRD) with three replicates as a pot experiment on soilless media. A total of 150 plants were in the experiment. Growth parameters, including plant height, number of leaves, days to first flowering, days to 50% flowering and morphological traits were recorded and analyzed. As a yield parameters number of fruits, fruit weight and fruit quality parameters were recorded and analyzed at first harvesting. The results indicated significant variations ($p<0.05$) among the varieties in plant height, number of leaves and flowering observations. Polaris showed the highest plant height (59.56 cm), while NS 280 recorded the lowest plant height (47.10 cm). Mecong recorded the highest number of leaves (39.10), while NS 280 had the lowest number of leaves (19.85). Mecong showed early flowering 47.93 days and NS 280 showed late flowering in 53.5 days. Morphological assessment recorded that most varieties had erect growth habits, oval shaped dark green leaves and blocky fruit shapes except Tibetzi and Carnaval, which had triangular fruit. In terms of yield, Mecong recorded the highest number of fruits per plant (7.80), whereas Indra produced the heaviest individual fruits (185.6 g) at first harvesting. Tibetzi and Carnaval showed distinct triangular fruit shapes, differing from the blocky fruit types observed in other varieties. According to the growth parameters Mecong and the control variety Indra, demonstrate a better growth potential under controlled polytunnel conditions, making them suitable candidates for commercial cultivation. However, the varietal selection primarily based on the yield performance and fruit quality characteristics. The yield data recording to be continued to make the decision on selection of the best varieties for commercial recommendation.

Keywords: Bell pepper, Exotic varieties, Growth, Polytunnel condition, Yield and Quality

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