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Accelerating Sweet Pepper Improvement: Inbred Line Development For Bangladeshi Varieties

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Abstract

An experiment was conducted during the 2023-24 winter season at the Olericulture Division, HRC, BARI to evaluate fourteen sweet pepper lines (CA0008-CA0020) against the check variety BARI Mistimorich-1, aiming to develop superior inbred lines for hybridization and quality varietal development. Significant variations were observed in all evaluated parameters, particularly in yield-related traits. The line CA0014 demonstrated exceptional earliness, requiring only 39.11 days to 50% flowering, while CA0020 produced marketable fruits earliest (57.70 days). CA0012 showed superior fruit productivity (17.44 fruits/plant), and CA0014 recorded the highest yield (11.90 kg/plot, equivalent to 42.50 t/ha). Based on comprehensive evaluation of earliness, fruit size, and yield performance, six promising lines (CA0011, CA0012, CA0014, CA0015, CA0016, and CA0018) were selected for advancement in hybridization programs and potential varietal release. This study contributes significantly to Bangladesh's sweet pepper improvement program by identifying high-performing inbred lines with desirable horticultural traits. The selected materials possess optimal characteristics for developing F_1 hybrids with enhanced productivity and quality attributes, addressing the growing demand for improved sweet pepper varieties in Bangladesh. The findings underscore the importance of systematic line evaluation in quality varietal development, which is crucial for meeting both farmer needs and consumer preferences in the domestic market. These advanced lines will form the genetic foundation for future breeding efforts aimed at developing superior sweet pepper varieties with improved yield potential, adaptability, and quality traits suitable for Bangladeshi agro-climatic conditions.