

Identification of Promising Advance Breeding Lines through Preliminary Yield Evaluation from Fourth-Generation Hybrid Clones of Cluster Onion (*Allium ascalonicum* L.)

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Cluster onion *Allium ascalonicum* L. is one of the most important crops grown in Sri Lanka and has a lot of economic importance and nutritional value. However, its production is limited by reduced yield, inferior bulb quality, and less ability to withstand environmental stresses. Therefore, earlier research was initiated with the hybridization of selected parents, and the F1 population has been advanced vegetatively to fourth-generation clones (F1V4). Those clonal families were used in this experiment, focusing on assessing the morphological traits and preliminary yield of these fourth-generation hybrid clones derived from five cross combinations. Sixty different entries, including 58 hybrid lines and one recommended cultivar (Vethalam) and an advanced breeding line (KCRO 15 -01), were tested using Randomized Complete Block Design (RCBD) with three replications. Each 0.3m² plot had 30 plants with a spacing of 10cm × 10cm. Observation recorded on germination, plant height, bulb size, Total Soluble Solids (TSS) at maturity, and yield per plot. The performances among the hybrid lines were compared using statistical tests of Tukey's mean separation. This study has exploited ample variations among the test entries in all parameters tested. Two entries, AHC_24_02 and AHC_24_41, had higher yield, good bulb quality, and high per day productivity than the standard checks, along with a few promising lines for desired traits. The present study points out that the application of a specific hybridization program can greatly expand the genetic pool and which will enrich the crop improvement of cluster onion using these clonal families.

Keywords: Characterization, Cluster onion, Hybridization, Hybrid clones