

Cluster Analysis and Genetic Diversity Studies among Hybrid Clones of Cluster Onion (*Allium cepa* L.)

N. Logaseelan, S. Sritharan and S.J. Arasakesary*

Faculty of Agriculture, University of Jaffna, Sri Lanka

*kesary@univ.jfn.ac.lk

Onion (*Allium cepa* L.) is one of the most valuable vegetable spice crops that belongs to the family Alliaceae ($2n=16$). It is a valuable economic crop as an entomophily cross-pollinated vegetable. A hybridization experiment of onion was initiated in Sri Lanka in 1996 with a reciprocal crossing parental combination. However, the existing knowledge about onion genetic diversity and resources is to be reviewed periodically for the efficient management of germplasm and selection of parents for crossing. This study was conducted at the Home Garden, Faculty of Agriculture, University of Jaffna, Kilinochchi, located in the lowland dry zone agroecological region, characterized by red-yellow latosol soil and flat to slightly undulating topography. The objective was to identify promising third-generation hybrid clones of cluster onion. This research was laid out as non-replicated from 94 clonal families originating from a five-cross combination of selected parental lines. These materials were studied morphologically and analysed with fourteen observed agronomic parameters for evaluating the performance of hybrid clones. Five plants were selected for data observation from the twenty plants of each clonal family. Results indicated that ample variation was found in the traits of the tested entries. The population generated from crosses showed a significant difference among all parameters tested. Flowering percentage and average leaf count were removed for cluster analysis based on high correlation values shown in the matrix. The first four principal components (PC) explained about 75.86% total variability among the four components: PC1 (7 traits), PC2 (3 traits), PC3 (3 traits), and PC4 (4 traits) contributed to variability. The variable showed a moderate correlation with their respective principal components. Performed cluster analysis revealed that there are three major clusters at 100 distance level. This study will be used for further selection of the tested clonal families.

Key word: Cluster onion, Germplasm, Hybrid clone