Evaluation and characterization of locally developed maize inbred lines for agro-morphological traits in Sri Lanka

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Abstract

Hybrid maize is widely grown in Sri Lanka due to its higher yield potential gained through the heterosis breeding. The evaluation and characterization of maize inbred lines is primarily essential for selecting inbred parents with desirable agro-morphological traits to develop new hybrids with higher hybrid vigor. A study was conducted to evaluate and characterize 44 locally developed maize inbred lines for 17 agro-morphological traits at Field Crops Research and Development Institute, Mahailluppallama. A higher coefficient of variation was observed in grain yield, grain weight per cob and number of tassel branches. Inbred lines were significantly different for all agro-morphological traits. Grain yield showed significant and positive correlation with ear length, number of seeds per row, plant height, height to upper most ear, leaf length and tassel length. The grain yield was negatively correlated with anthesis to silking interval and days to silking. The cluster analysis based on quantitative traits, grouped 38% inbred lines into large cluster (C-3), three similar size clusters (C-1, C-2, and C-4) and two inbred lines formed distinct cluster (C-5). The combination of lines from C-1 or C-2 with C-3 or C-4 can be used to develop single cross hybrids with higher hybrid vigor. The evaluated maize inbred lines, MI2008-35, MI2008-13 and MI2008-7 consisted of more than one desirable traits such as higher yield (4.0-4.6 t/ha), higher 100 grain weight (28 -34 g), higher seed number per row (30-32), low ASI (-2 – 2), longer ears (16 cm). The information on cluster analysis can be used to identify the male and female parents from different clusters to develop maize hybrids with higher heterosis effect.

Key words: Agro-morphological traits, Cluster analysis, Heterosis breeding, Hybrid vigor, Maize inbred lines

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