

Exploring the Genetic Divergence in Barley Strains for Seed Vigour Attributes

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Abstract—Fifty diverse genotypes of barley were evaluated for different seed vigour parameters. Genetic diversity was assessed based on the observations for the different characters viz., seedling length (cm), seed density (g/cc), standard germination (%), seedling dry weight (mg), vigour index I & II, electrical conductivity ($\mu\text{S}/\text{cm}/\text{seed}$) and accelerated ageing test. All the genotypes were assembled into seven well defined clusters depending upon the similarity in the expression of their genetic divergence. Maximum number of genotypes were allocated in cluster III (13) followed by cluster II (12) and VII (6), while the cluster I was the smallest one with four genotypes only. Among the genotypes maximum distance within the same cluster was reported by cluster V (3.63) followed by cluster VII (3.37), cluster II (3.06) while the minimum intra-cluster distance was showed by the cluster IV (2.47). When diversity within clusters was studied it showed a range of 3.60 to 6.42. Cluster IV and V showed maximum inter-cluster distance of 6.42, followed by between cluster I and V (6.25). The lowest inter-cluster distance was observed between cluster II and III (3.60). Contribution of accelerated ageing (72 h) towards divergence was found maximum (37.80%) followed by seedling length (17.88%), electrical conductivity (17.63%), seedling dry weight (10.61%) whereas rest other traits contribute very little to divergence. Clusters III and V might be considered desirable for selecting genotypes which may be used as promising parents for hybridization. The genotypes which fall in these clusters could be used in the hybridization programme for generation of wider variability.

Keywords: Barley, Seed vigour, Genetic diversity, Contribution.