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## Assessment of accession integrity over continued regeneration of genebank germplasm

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### Abstract

ILRI holds over 18,000 accessions of tropical and subtropical grass and legume forages in its ‘in trust’ collection. Annually hundreds of samples are requested and distributed to researchers and forage seed producers. To ensure the continuous availability of seeds, accessions are regenerated in the field to replenish exhausted inventory. Thus, a rationalized strategy is required to ensure the integrity of the germplasm over continuous generations to maintain stocks of seeds for distribution. In such effort, it is important to know the implication of continuous regeneration on the genetic integrity of accessions. Therefore, the aim of this project was to assess the effect of continued regeneration on integrity of germplasm in the genebank. Thus, we used genotyping data to assess the genetic integrity of accessions over continued regeneration in three forage species namely *Lablab purpureus*, *Vigna unguiculata* and *Stylosanthes capitata*. Accessions with the largest number of lots from the three forage species were selected and used for this study. Genomic DNA was extracted from young leaves collected from actively growing seedlings in the greenhouse and genotyped on the DArTSeq platform. The generated markers were subjected to different analyses such hierarchical clustering, principal component analysis (PCA), genetic relationship matrix (GRM), probability of identity by descent and genetic distance. The result showed that in most cases the lots from the same accession clustered together with genetic similarity close to 1. In a few cases, the lots from accessions clustered in two groups. In general, the result shows the importance of good management practices and the need to have quality insurance/control protocol during seed production and processing to ensure integrity of germplasm conserved in genebank.

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