Introgression of stay-green trait into a Kenyan farmer preferred sorghum variety

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Abstract

Backcross breeding enables breeders to transfer a desired trait from a Genetic Improvement of Kenyan sorghum variety for drought resistance donor parent, into the favoured genetic background of a recurrent parent. This study utilised back-cross breeding to transfer stay green quantitative trait locus (QTLs) from the donor parental line E36-1 into a Kenyan farmer-preferred variety, Ochuti as the recurrent parental line. The parental lines E36-1 has 3 stay green QTLs, SBI-01, SBI-07 and SBI-10 located at various chromosomes. The transfer of these QTLs was confirmed with the help of Simple Sequence Repeats (SSRs) molecular markers. Five foreground markers that were polymorphic among the two parental genotypes were used to identify individuals of F1 generation that had stay green QTLs transferred into Ochuti. A maximum of two QTLs, namely, SBI-07 and SBI-10 were identified as having been transferred into three individual genotypes. Two other F1 genotypes had only one QTL (SBI-10) transferred into Ochuti. The heterozygous F1 genotypes were used as the female parents in the generation of BC1F1. About 25% of the BC1F1 progenies that were genotyped had at least One QTL introgressed. As in the case in all marker-assisted back-cross breeding, the rate of success in introgressing QTL from donor to recurrent parental lines depends on the number of plants screened