



Incorporation of stay-green Quantitative Trait Loci (QTL) in elite sorghum (*Sorghum bicolor* L. Moench) variety through marker-assisted selection at early generation

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ABSTRACT

Incorporation of stay-green Quantitative Trait Loci (QTL) in elite sorghum (*Sorghum bicolor* L. Moench) variety through marker-assisted selection at early generation.

Objective: The present investigation was undertaken to develop drought tolerant varieties through introgression of stay-green QTLs in order to improve sorghum yield in semi-arid areas of Burkina Faso.

Methodology and Result: Marker-assisted selection was carried out to introgress stay-green QTLs into elite sorghum variety. A stay-green donor source, BTx642 (B35), was crossed to the elite variety (Sariaso09) to obtain F₁ progenies that were backcrossed to their recurrent parents to obtain the BC₁F₁ progenies. Seventeen flanking Simple Sequence Repeat (SSRs) polymorphic markers were used for foreground selection and 18 were used for background selection. Eighteen BC₁F₁ were heterozygous at all target loci for stay-green (stg1, stg2, stg3, stg4 and stgB), 5 progenies (S9B37, S9B43, S9B46 S9B85 and S9B13) had incorporated 3 of these QTLs. 4 plants (S9B34, S9B38, S9B73 and S9B16) incorporated double QTLs (Stg3 and StgB) and three plants (S9B44, S9B48 and S9B20) were heterozygous for Stg1.

Conclusions and applications of findings: Among BC₁F₁ generation, 30 progenies had incorporated at least one stay-green QTL. Two of the introgression lines had high levels of the recurrent parents' genomes and constitute some promising lines to develop drought tolerant varieties that will ensure sorghum production in semi-arid tropics areas and therefore, contribute to ensure food security in Burkina Faso. Despite the small number of genotypes obtained, the results showed the efficiency of Marker Assisted Back Crossing (MABC) versus the conventional backcross procedure.

Key words: sorghum, stay-green, drought, post-flowering, QTL, MABC