

Introgression of Stay-green alleles in elite sorghum varieties of Burkina Faso for post-flowering drought tolerance using a marker-assisted back-cross strategy

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RATIONALE

Sorghum is a major staple food crop for millions of people in semi-arid areas of Africa and Asia. It plays an important role for food security in these regions where post-flowering drought remains the major abiotic constraint. This study aimed at introducing Stay-green QTLs alleles for post-flowering drought tolerance into elite sorghum varieties of Burkina Faso using a marker assisted backcrossing strategy.

METHODS

Two "Stay-green" genotypes (B35, E36-1) were used to introgress flowering drought tolerance into elite varieties (Sariaso 15, BF 99-6/5-1-1) from Burkina Faso. Three BC1F1 populations corresponding to 122 individuals derived from Sariaso 15 x B35, 86 individuals derived from BF 99-6/5-1-1 x B35 and 64 individuals derived from BF 99-6/5-1-1 x E36-1 were developed. A total of 210 KASP markers including 85 foreground, to track genomic regions of interest, and 135 background markers were designed.

RESULTS

Fifty SNP-KASP polymorphic markers including 24 foreground allowing to follow 11 Meta-QTLs from chromosomes 1,2,3,4 and 10 and 26 background markers have been identified . One hundred and thirty-two heterozygous BC1F1 from the three populations were selected. Individuals bearing the highest number of donor fragment have respectively 7 areas for the cross BF 99-6/5-1-1 x E36-1 and 9 for the crosses Sariaso 15 x B35 and BF 99-6/5-1-1 x B3.

CONCLUSIONS & PERSPECTIVES

The back-cross marker-assisted strategy allowed us to track the introgression of several Stay-green alleles in three different populations. Multi-environment phenotypic evaluations based on the BC1F4:5 and BC2F2:3 populations will be done in well-watered and water deficit conditions.