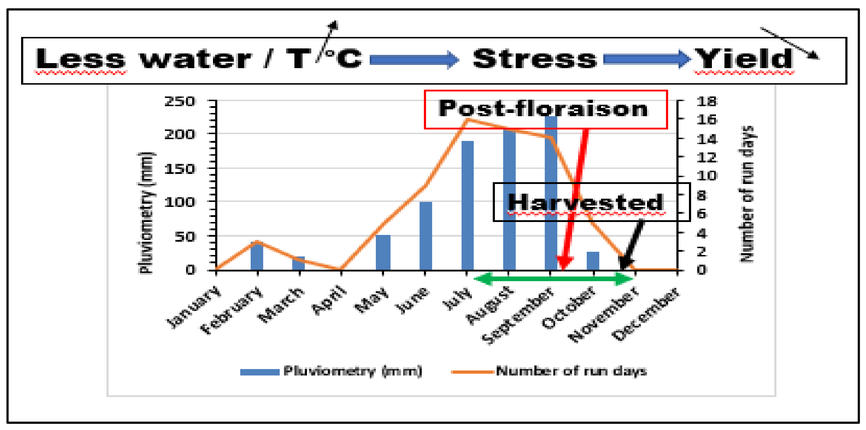
Introgression of stay-green Quantitative Trait Loci (QTL) alleles in elite sorghum varieties of Burkina Faso for post-flowering water stress tolerance using a marker-assisted back-cross strategy

Sory Amadou Jean-Baptiste,[1] Kondombo Clarisse Pulchérie,[2] Pot David[3,4], De Bellis Fabien[3,4], Calatayud Caroline.,[3,4] Sawadogo Mahamadou[1]

[1] Univeristy Joseph KI-ZERBO, Ouagadougou, Burkina Faso; [2] INERA, Koudougou, Burkina Faso, [3] CIRAD, UMR AGAP Institut, Montpellier, France, [4] AGAP Institut, Univ F-34398 Montpellier, CIRAD, INRAE, Institut Agro, Montpellier, France,

E-mail : soryjeanbaptiste@yahoo.fr

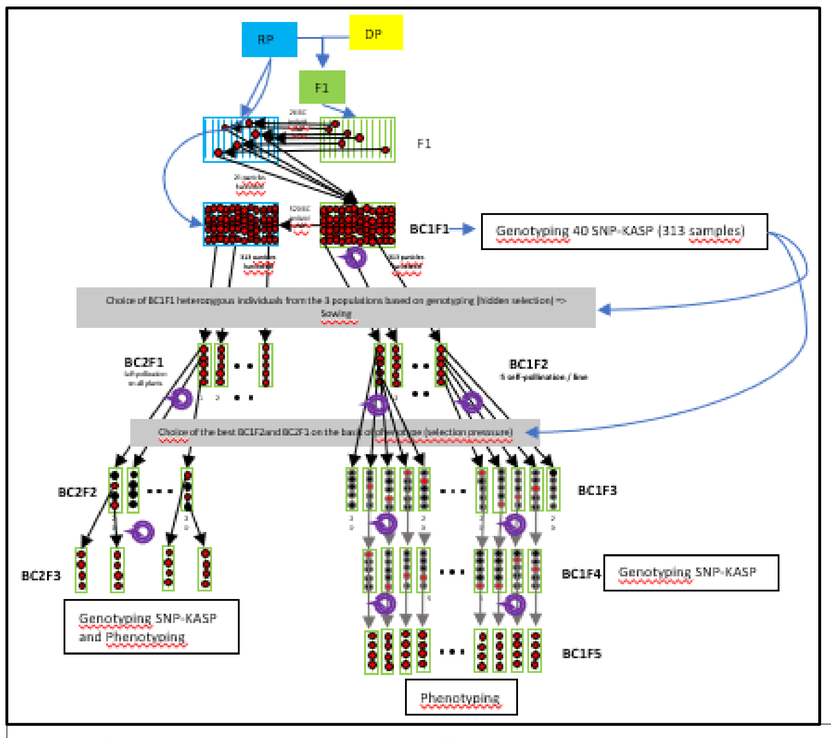


RATIONALE

Sorghum is a major staple food crop for many people in semi-arid areas of Africa and Asia.

Sorghum plays an important role in food security particularly in Soudano-sahelian zone where post-flowering drought remains the major abiotic constraint affecting its production. This study aimed to introduce stay-green QTLs alleles for post-flowering drought tolerance into elite sorghum varieties of Burkina Faso using marker assisted backcrossing strategy.

METHODS

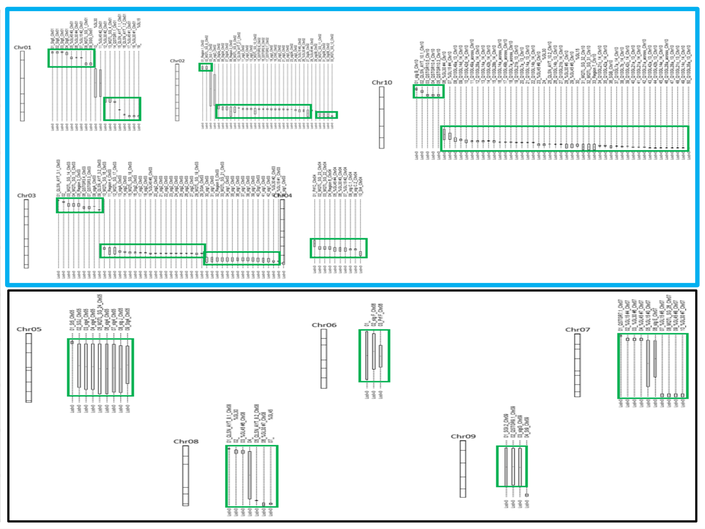


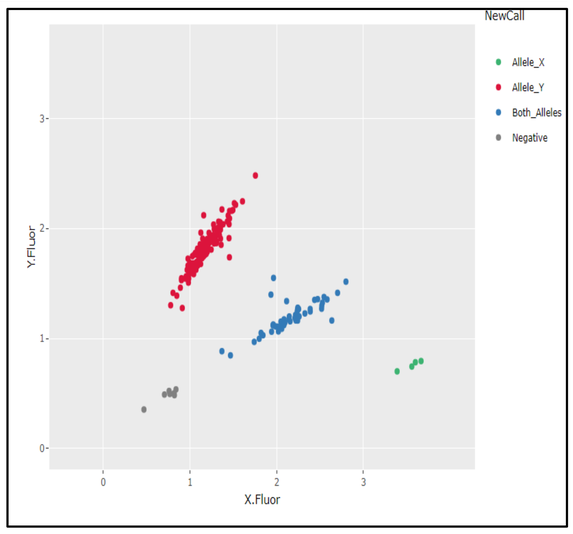
RP: **Sariaso 15, BF 99-6/5-1-1**

DP: **BTx642 (B35), E36-1**

Populations BC1F1**: 122 Sariaso 15 x B35, 86 BF 99-6/5-1-1 x B35, 64 BF 99-6/5-1-1 x E36-1**

LG	Num QTL	% QTL/LG
SBI-01	19	10,98
SBI-02	33	19,08
SBI-03	28	16,18
SBI-04	10	5,78
SBI-05	9	5,20
SBI-06	3	1,73
SBI-07	10	5,78
SBI-08	7	4,05
SBI-09	4	2,31
SBI-10	50	28,90

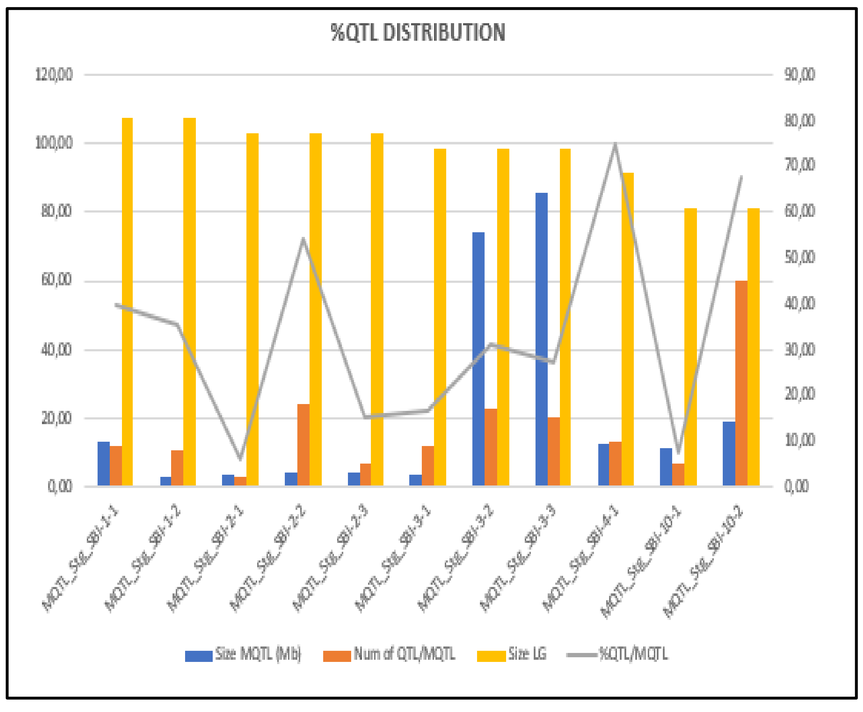




Database CIRAD_Sorghum: 40 SNP-KASP markers including 15 foregrounds and 25 backgrounds markers to track the 11 Stay-green Meta-QTL areas on chromosom 1,2,3,4 and 10.

RESULTS

Meta-QTL	Flanking Markers	Num. of marker	Size MtaQTL (Mb)
MQTL_Stg_SBI-1-1	SBI-1_413002 - SBI-1_10108256	3	9,70
MQTL_Stg_SBI-1-2	SBI-1_55303052 - SBI-2_57380674	4	2,08
MQTL_Stg_SBI-2-1	SBI-2_3632568 - SBI-2_6112987	3	2,48
MQTL_Stg_SBI-2-2	SBI-2_56692650 - SBI-2_60098712	3	3,41
MQTL_Stg_SBI-2-3	SBI-2_67990242 - SBI-2_71274952	6	3,28
MQTL_Stg_SBI-3-1	SBI-3_811547 - SBI-3_3621767	2	2,81
MQTL_Stg_SBI-3-2	SBI-3_55592399	1	55,59
MQTL_Stg_SBI-3-3	SBI-3_64433156	1	64,43
MQTL_Stg_SBI-4-1	SBI-4_48704045 - SBI-4_57973951	5	9,27
MQTL_Stg_SBI-10-1	SBI-10_2254662 - SBI-10_10692684	2	8,44
MQTL_Stg_SBI-10-2	SBI-10_45930297 - SBI-10_60231089	2	14,30



Populations	Genotypes	Num. markers/Ind.	Num. MQTL area/Indi.
Sariaso15 x B35 (SAB)	SAB-90	13	9
	SAB-101	12	8
BF 99-6/5-1-1 x B35 (BFB)	BFB-43	15	9
	BFB-205	13	8
BF 99-6/5-1-1 x E36-1 (BFE)	BFE-68	9	7
	BFE-73	10	7

CONCLUSIONS & PERSPECTIVES

The back-cross assisted marker strategy allowed us to track stay-green favourable alleles. The effects of these alleles in the elite varieties from Burkina Faso will be evaluated. Phenotypic evaluations will be done with the BC1F5 and BC2F3 populations across area of water stress constraining

Aknowledgment: This work is supported by the DeSIRA-ABEE project funded by Union European and Bill & Melinda Gates foundation. Special aknowledgment to International Maize and Wheat Improvement Center (CIMMYT) which has funded my participation to Interdrought 7th Congress