

Stay-green QTL Stg3B is the key QTL associated with improved grain and stover yield under post-rainy sorghum growing conditions

H.S. Talwar^{1*}, S.P. Deshpande², R. Madhusudhana¹, Shiwesh Kumar¹, V. Vadez² and VA Tonapi¹

¹ICAR-Indian Institute of Millets Research (ICAR-IIMR), Rajendranagar, Hyderabad, India

²International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India

*E-mail: talwar@millets.res.in

Stay-green is the best characterized trait contributing to the adaptation of sorghum to postflowering drought conditions. Using B35 as stay-green donor, QTL introgression lines (ILs) were generated in two genetic backgrounds (S35 and R16). These lines along with local checks, recurrent parent and stay-green donor were evaluated in two years during the post-rainy season under both well-watered (WW) and water-stressed (WS) conditions at four locations. Stay-green ILs had improvement in green leaf area retention at maturity (GLAM) in both genetic backgrounds under both WW and WS, and more so under WS condition. R16 was more responsive to the QTL introgression than S35 in terms of GLAM, suggesting that effect of individual stay-green QTL introgression interacted with genetic backgrounds. Stg3B was the key stay-green QTL in en-

hancing the GLAM, particularly under WS conditions. Under WS conditions, the introgressions with Stg3B improved grain yield (GY) and total dry matter (TDM) by 16% and 9%, respectively over recurrent parent. No improvement in GY and TDM was recorded in ILs compared to recurrent parent under WW conditions in S35 background, while 8% increase in both GY and TDM was recorded under WS conditions with Stg3B introgressions in S35 background. The recipient genetic background and soil moisture conditions during postflowering growth stages played an important role in the expression of stay-green QTLs. Our results, also clearly established the superiority of Stg3B in enhancing the GY and TDM accumulation over other individual QTLs or in combination under both the genetic backgrounds, particularly under WS conditions.