054-AGR

Poster Abstract

Title: Identification of Developmental Stages in Sweet Sorghum Microspores and their Fractionalization

Developmental stages of plant cells are critical factors influencing various physiological processes, including gametes especially the microspores. In sweet sorghum (Sorghum bicolor), understanding the dynamics of microspore development during their different stages is essential for improving breeding techniques towards enhancing crop productivity. In this study, six sorghum varieties, (Achi Turi, Dale, Dasht, RTx 430, Topper 76-6, and Sugar Drip), were carefully observed on their Panicle development stage. This aimed to investigate the impact of developmental stages of the harvested spikelets on microspore fractionalization per their sizes, a process vital towards genetic studies. Using a combination of histological techniques and data analysis, the microspores' development at key maturation stages were identified. The findings revealed distinct variations in microspore viability, size, and distribution across panicle length, with certain harvest times showing ideal conditions for fractionation of uninucleate and binucleate gametophytes. Thereby, plant maintenance included visiting the sorghum greenhouse periodically and cutting the dead leaves off as well as the stalks for stimulating new growth, while collaborating with peers to address pests' challenges. This research contributes to the growing body of knowledge in plant reproduction by improving microspore-based techniques in sweet sorghum. By correlating the developmental stages of spikelets with microspore fractions, this study offers to accelerate genetic advancement tools in sorghum, with potential implications for other cereal crops as well.