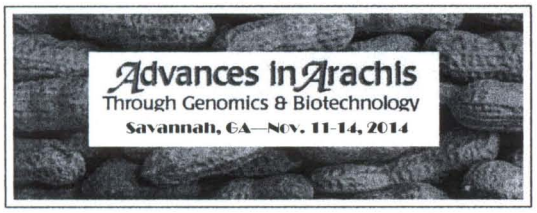

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POSTERS

Drought tolerance mechanisms for responses to pre and post flowering drought stress of groundnut in a dryland ecology

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Understanding the mechanisms of groundnut tolerance to pre and post flowering drought stress is important for improving its yield and phenological development in the drylands. The mechanisms of drought tolerance are known to be under variable genetic control. The aim of this study was to investigate the mechanism of drought tolerance of various groundnut genotypes to pre and post flowering drought stress. Screen house trials were undertaken between March and June 2014. Three moisture management treatments were imposed on 10 groundnut cultivars. Three cultivars (Ex-Dakar, Samnut 23 and Samnut 24) are known to have some drought tolerance characteristics; two cultivars (Samnut 21 and Samnut 22) do not tolerate drought, while the drought response of the remaining five cultivars (Samnut 25, Samnut 26, Sabiya, Kwankwaso and Yar Digir) is not known. The water managements were: Field Capacity throughout the period of experimentation (FCT), Imposition of Pre-Flowering Moisture Stress (PrFS) and Imposition of Post Flowering Stress (PoFS). Stomatal conductance and relative water content (RWC) were recorded at 10, 15, 20, 25, 30, 35, 40 and 45 days after emergence. Total dry matter samples (shoots and pods) were collected at 15 and 25 days after emergence, R5 and R7. From these samples, shoot and pod growth rates were calculated. Two of the drought tolerant cultivars were found to tolerate only pre-flowering drought and only Ex-Dakar tolerate both pre and post flowering drought stress. Among the two susceptible cultivars, Samnut 22 was found to tolerate post-flowering stress, but was susceptible to pre flowering stress. Samnut 26 and Kwankwaso tolerated both pre and post flowering stress, while Sabiya and Yar Digir were susceptible to both stresses. Most of the cultivars adopted the mechanism of conserving water by reducing transpiration to maintain high RWC. Only Samnut 24 showed the mechanism of improving assimilate partitioning to the pods at grain filling phase. The knowledge gathered could be used for breeding groundnut that will be suited to the drylands in order to escape periods of intermittent drought.

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