P 7.17 - Root architecture of two sorghum varieties differ than drought stress tolerance

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Root architecture of two sorghum varieties, fitted in *Durra* race and with different response in drought conditions, has been studied on hydroponic system, pot and *in situ* on field. These varieties have similar aerial agro-morphological characteristics in optimal growth conditions. In pre-flowering drought stress condition, tolerant variety (SSM1611), has a stable and higher yield than the non-tolerant one (IS16101). On hydroponics conditions and pot growth, varieties are studied at young stage. On field, observations concerned the whole plant cycle. Frequent observations of the aerial system have been made in all the trials, with counting of emerged leaves number and measuring stem height. Adventitious roots number and adventitious roots ranks number have been daily observed on hydroponic system and observations was not destructive. Spatial root disposition on stem was observed on hydroponic condition. On pot and field, these observations were destructive and realised once a week. Adventitious root and their different regions growth (basal none branched region, branched region, apical none branched region) were studied in hydroponic system and in pot. The distribution of the root length density according depth *in situ* condition was studied using passage model from root impacts to length density.
Results show that, the development and the growth of aerial system are practically similar for both of varieties whatever trials conditions. However, for the root system there are some differences in favour of the drought stress tolerant varieties (SSM1611). All the trials showed that, SSM1611 presents a higher adventitious roots number and adventitious roots ranks number than IS16101. Adventitious roots number per rank varies according to the rank and the variety. The distribution of the adventitious roots around the stem seems to be leaded by the same low. Adventitious root of the same rank are balanced distribution around the stem. Until three roots per adventitious root rank, adventitious roots of two successive ranks are distributed in a complementary way around the stem. The growth of adventitious roots and their different regions ((basal none branched region, branched region, apical none branched region)e) present similarity for both of varieties. On hydroponic system, adventitious root length increase first time and then stop their growth to maximal level. However in pot, adventitious root growth seems to bee unlimited. SSM1611 variety reveals a root length density according to depth more important than IS16101 variety one in field. Adventitious roots number, adventitious roots ranks number, and root length density could constitute pertinent and easily accessible drought stress tolerance criterions.

P 7.18 - Enhancing food security through maintenance of crop biodiversity and integrating resource pulses in rainfed areas of India –An overview

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The concept of sustainable agriculture involves the evolution of a new type of agriculture rich in technology and information with successful management of available agricultural commodities as well as crop genetic resources, to satisfy the challenging human needs. The crop biodiversity which is a key dimension of any sustainable agriculture strategy provides sustainable production of food, biological support to production and ecosystem services. Management of crop biodiversity through resource pulses, which represent a major component of rainfed agriculture with economic importance have developed and used for millennia to provide food and livelihood security for billions of people. Effective induction of pulses under rainfed agriculture is crucial for obtaining high returns from a production system and is the basis of farming which forms a large part of terrestrial biodiversity, not least in rainfed. Rainfed agro-ecosystem is characterized by limited and variable rainfall that supplies resources in