Title: Development of climate resilient Sorghum-sudangrass hybrids to address the livestock feed security in extreme summer.

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Abstract:

Farmers of the developing countries in South-east Asia are facing acute deficiency of green fodder throughout the year, and situation becomes worst during summer season. Ideal quality animal feed is only achievable through interaction of potential genotypic expression with optimal environment. Among the environmental factors, water is one of the important factor and water stress steadily diminishing crops all over the world. Livestock remains undernourished due to unavailability of nutritious fodder in sufficient quantity. It leads to severe fodder crisis, which ultimately forces distress sale of valuable animals for slaughter. Pakistan has variety of summer fodder crops as corn, sorghum, millets, sudangrass and cowpeas under cultivation but existing genotypes cannot tolerate abrupt and extreme changes of climate especially raise in temperature (50^0C) during June and July. Sorghum-sudangrass hybrid have ability to provide fodder from April to October once sown in March and can tolerate extremes of high temperature and drought stress. Punjab Agricultural Research Board, Pakistan has funded a project PARB-288 to develop climate resilient multicut/multi-tillering Sorghum Sudangrass hybrid combinations. Research project presents effects of drought stress on sorghum grasses at the physiological level (water potential, turgor pressure, photosynthetic efficiency, glycine betain content and proline content) and possibility of combining genes for high fodder yield with better nutritional quality in specific hybrid combinations. 100 hybrids were developed and evaluated for multiple cuttings under drought stress for green fodder yield and fodder quality components (crude protein, crude fiber, sugar contents and TDN). It was concluded that water stress has several undesirable effects on growth of sorghum hybrids as reduced forage yields, decreasing palatability due to great extent of lignification, and reducing availability of total digestible nutrients and digestibility. A better understanding of exploiting genetic potential of intraspecific hybridization in sorghum for development of plants having ability of efficient water use utilization, and in developing

effective dry-land agriculture will be helpful to tackle issue of food security through breeding fodder crops.

Keywords

Sorghum hybrids, climate resilient, fodder yield, crude protein, TDN, drought stress.