Internat. J. Agric. Sci. Vol.2 No.1 January 2006 : 231-234

Characterization And Evaluation Of Exotic Sorghum Germplasm Collections

M. Elangovan

Genetic Resources unit, National Research Centre for Sorghum, Hyderabad-500 030 (AP)

ABSTRACT

The preliminary characterization and evaluation of 179 accessions of sorghum germplasm collected from USA, Brazil, Sri Lanka, and Mali is presented in this paper. A total of 24 agro-morphological and one bio-chemical character were studied. The accessions studied exhibited good variability in both qualitative and quantitative traits. In qualitative traits, maximum diversity was observed in earhead shape, earhead compactness, glume colour, seed size, seed colour and races. Days to 50% flowering (69 - 116), plant height (68 - 279 cm), earhead length (17 – 40 cm), stem fresh weight (40 – 1000 g^{-1} plant), stem dry weight (20 – 317 g^{-1} plant), grain yield (9 – 104 g^{-1} plant) and brix percentage (2-27) are the highly variable based on the variance. The correlation coefficients of the quantitative traits are also analysed.

Key words: Characterization, Evaluation, Exotic germplasm, Sorghum

INTRODUCTION

Sorghum, [*Sorghum bicolor* (L.) Moench] has originated and domesticated in Africa about 5000 – 8000 years ago De Candolle (1884). Indian subcontinent is the secondary origin of this most important cereal. A total of 36,774 accessions of world collections of sorghum are conserved at International Crops Research Institute for Semi-arid Tropics (ICRISAT), Patancheru. India has rich diversity of sorghum. However, the sorghum germplasm introductions from other countries through Exotic Collections also contribute to the sorghum improvement in India. The National Research Centre for Sorghum (NRCS) has introduced 326 accessions between 2002 and 2005. The materials are from USA (203 acc.), Brazil (110 acc.), Sri Lanka (8 acc.) Mali (3 acc.) and Eritrea (2 acc.). Characterization and evaluation of germplasm are the pre-requisite for the utilization of the available diversity in the crop improvement programme. Hence, these exotic collections were characterized to assess the variability and identify the promising accessions for different traits which acclimatize the Indian conditions.

MATERIALS AND METHODS

The preliminary characterization and evaluation of 179 accessions of exotic sorghum germplasm collections were carried out at the NRCS, Rajendranagar, Hyderabad during 2002-03 and 2004-05. The accessions originated from Brazil (141 accessions), USA (21 accessions), Sri Lanka (6 accessions), and Mali (3 accessions). Sweet sorghum germplasm high grain, high fodder yield and local landrace are the types of materials.

The centre is located at $17^0$19' N latitude and $78^0$24' E longitude and at an altitude of 538 m above MSL with temperature varying from 10^0 C to a maximum of 30^0 C during the cropping season. The soil type is of red sandy. The accessions were raised in an Augmented Block Design (ABD) with check varieties (M35-1, Swati and CSV-15) in each block. The accessions were grown in 4 m rows with a row spacing of 60 cm and plant to plant spacing of 10 cm. Standard agronomic and plant protection practices were followed during the cropping season.

The data on qualitative and quantitative descriptors were recorded using minimal descriptor developed by NBPGR Mahajan et al., (2000) and list of sorghum descriptors released by IBPGR/ICRISAT (1980, 1993). Five representative plants in each accession were tagged for recording the qualitative and quantitative characters. Brix percentage of stalk juice of each accession was estimated by refractometer. The quantitative data were analysed statistically.

RESULTS AND DISCUSSION

The 179 accessions of sorghum germplasm were characterized and evaluated for 24 agro-morphological and one bio-chemical character. Wide range of variability was recorded in both qualitative and quantitative characters. Majority of the accessions showed stay green types (non-senescence), presence of awns, and non-lustrus seeds. However, variation was observed in seedling vigour, earhead shape, earhead compactness, glume colour, glume covering, seed size, seed colour, and races. Sorghum landraces are consistent for morphological characters, the importance of the midrib color, grain color, grain size, glume