ABSTRACTS

2nd International Conference & Exhibition on Sustainability - Innovation & Diversification in Sugar and Allied Industry

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VASANTDADA SUGAR INSTITUTE, PUNE

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Abstract Themes

- Global Sugar Scenario
- Sugarcane Improvement
- Soil Resilience and Sustainability
- Water Resource Management and Micro-Irrigation
- Advanced Agro Techniques for Sustainable Sugarbeet Production
- Integrated Management of Pest in Sugarcane: New Perspective
- Factory Processing and Engineering
- 1st And 2nd Generation Ethanol
- Diversification through Biofuels and Byproducts
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5. Total Factor Productivity (TFP) Growth of Sugarcane in India by M.J. Mohite and S.S. Wadar


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M-EXTENSION IN SUGARCANE: AN INITIATIVE TOWARDS DIGITAL INDIA

T. Rajula Shanthy\textsuperscript{1}, S. Alarmelu\textsuperscript{1}, C. Jayabose\textsuperscript{1}, P. Malathi\textsuperscript{1}, Bakshi Ram\textsuperscript{2}

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The communication support for sugarcane has been mainly conventional and this approach is inadequate to reach all the cane growers of the country. Diversity of agro-ecological situations, varied technologies recommended and needs of growers further mount to this challenge. Information and Communication Technology (ICT) and in particular mobile technologies are seen as a game changer. It is commanding therefore for the technology dissemination system to harness the potentialities of ICT bridging time and space barriers. Realizing this, we have developed an interactive android-based mobile app. Through focus group discussions conducted with cane growers/ cane staff, information was collected on mobile use pattern, content needs/services required through the app, format and preferred medium of communication; and accordingly the app was designed. The static downloadable knowledge base contains around 220 pages with 653 digital stills. Information is given as state-wise varieties, crop production technologies (plant/ratoon), identification and management of pests/diseases, history of the institute, mandate, species of sugarcane and about Sugarcane Research Stations. The modules include Login dialogue, Downloader, SchedulerApp, Fertilizer schedule and Query handler. Scheduler app is tailor-made for each individual user with the basic inputs as state, date of planting, crop (plant/ratoon) and season (autumn/spring) and correspondingly, continued advice and reminder messages on the calendar of operations are popped up on real-time mode. The app is available in google playstore as ‘Cane Adviser’ (English), ‘GannaSalahkar’ (Hindi) and ‘KarumbuAalosakar’ (Tamil) with over 124,000 hits from 59 countries.
GENETIC DIVERSITY FOR YIELD TRAITS IN PREBREEDING MATERIAL OF SACCHARUM SPP

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Principal Component Analysis (PCA) was used in evaluating genetic divergence among the sugarcane interspecific hybrids generated based on 16 traits. The variation among the F1 hybrids of improved S.officinarum x improved S. robustum was attributed by cane height. Cane height was the only trait which contributed maximum towards variability followed by NMC. In backcross generation, it was observed that diversity among the genotypes with high positive factor loads was from cane height; NMC and cane diameter, SCW, brix%, sucrose% and CCS% also had positive loads for PC1 in relation to cane height. SCW, brix%, sucrose% CCS% were positively associated with cane height and NMC but cane diameter was negatively contributed to the variation. Cane height followed by NMC (which has positive factor loads in PC1) contributed maximum towards variation among hybrids. In BC1 and BC2 hybrids, PC1 is beneficial in selecting high yielding clones in terms of cane height and PC2 is important in selecting high quality clones in terms of brix% and sucrose %. Through the present study, a representative sample of 200 clones from various introgressed groups were identified based on the evaluation of yield and quality traits from the prebred gene pool (680 clones). The frequency distribution analysis for different traits indicated that the genetic variability available in the gene pool has been observed in the representative sample also. This group due to its reduced size, will aid in proper extensive exploitation of available genetic variability for biotic and abiotic stresses to identify clones with desirable characteristics for utilization in crop improvement programmes to combat with future challenges and in genomic studies.
INVESTIGATION FOR DIVERSITY IN PARENTAL STOCKS OF SUGARCANE (SACCHARUM SPP)

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The present investigation aimed to assess the nature and magnitude of genetic divergence available in the hybridization block of ICAR-Sugarcane Breeding Institute, Coimbatore and to select suitable diverse genotypes as parents for further utilization. Seventy one sugarcane parental genotypes comprising Coimbatore canes (Co canes), Co allied canes and exotic parents were explored for their genetic diversity. Fifteen traits viz., HR Brix (330 days), Brix %, Sucrose % days, Purity %, commercial cane sugar (CCS) %, cane length, cane diameter, single cane weight, number of millable canes (NMC), number of internodes, internode length, estimated cane yield and estimated commercial cane sugar yield at 300 days and brix and sucrose % at 240 days were recorded during two crop seasons (2015 and 2017). Data was subjected to cluster analysis using Mini tab software. Based on the cluster analysis, two major groups were identified which were classified into nine clusters. The cluster wise mean values indicated substantial variation among the clusters. Maximum mean value for NMC was in cluster V. Cluster IV was found to be the largest with 21 genotypes followed by cluster I with 14 genotypes and cluster II with 12 genotypes. Cluster VI had nine genotypes and Clusters VII and VIII had three genotypes each. Clusters V and IX were the smallest with a single genotype. Cluster V was most distinct cluster among the derived clusters and it showed maximum distance with clusters I, II, III, IV and IX. Other distinct cluster in this group is cluster IX and showed the maximum inter cluster distance with clusters VI, VII and VIII. Among the distinct clusters, the cluster III expressed superior performance for most of juice quality traits at 300 days while clusters I, II and cluster III showed their superiority for sucrose content at 240 days. Clusters III, IV and VI exhibited superiority for cane yield. The most divergent clusters observed were Clusters III and VI and III and VII. Minimum inter cluster distance was found between Clusters I and II. Genotypes with high inter- cluster distance can be exploited to produce more genetic variability and desirable recombinants for further improvement.