Phenotypic characterization of new sugarcane varieties using DUS descriptors

Dr M R Meena[1], M R Meena[1], Ravinder Kumar[1], N Kulshreshtha[1], M L Chhabra[1], and G Hemaprabha[1]

[1]Affiliation not available

January 25, 2023

Phenotypic characterization of new sugarcane varieties using new DUS descriptors

M.R. Meena, Ravinder Kumar, N. Kulshreshtha, M L Chhabra and G Hemaprabha

ICAR-Sugarcane Breeding Institute, Regional Centre, Karnal
ICAR-Sugarcane Breeding Institute, Coimbatore
Corresponding author: mintu_uas@yahoo.co.in

A total of one hundred and twenty seven subtropical sugarcane reference varieties were phenotypically characterized using new DUS descriptors. The trial was planted during 2020-2022 in augmented block design at ICAR-SBI-RC, Karnal under DUS experimental field. The digital Colour images of all the key traits were taken during various crop stages to identify the key traits for characterization in sugarcane varieties. These digital images were further verified via morphological colour chart i.e. Royal Horti-Society colour chart (RHS). Morphological data of 27 traits namely, growth habit, leaf sheath hairiness, ligule shape, inner auricle shape, dewlap colour, leaf blade curvature, leaf blade width, adherence of leaf sheath, internode colour not exposed to sun, internode colour exposed to sun, internode diameter, internode shape, internode zigzag alignment, internode growth crack, rind surface appearance, internode waxiness, bud shape, bud size, bud groove, bud cushion, bud tip position, prominence of growth ring, width of root band, internode cross-section, pithiness, NMC and cane height recorded during 8^{th} and 10^{th} month crop stage. Parameters on Leaf area index and green canopy were also undertaken. Digital photographs of these clones depicting major. DUS characteristics were taken during early maturity phase to late maturity phase and further characterization of all the references varieties was undertaken in order to check the consistence of traits. Cane yield and CCS yield per plot were also estimated. The overall mean for pol% in juice the top ranking test clones were Co 0237 (19.60%), Co 05011 (19.15%) followed by CoS 95255 (18.60%).

References

1. Silva, M. D. A., Jifon, J. L., Da Silva, J. A., & Sharma, V. (2007). Use of physiological parameters as fast tools to screen for drought tolerance in sugarcane. *Brazilian Journal of Plant Physiology*, *19*, 193-201.
2. Chiranjibi Poudyal, HardevSandhu, Yiannis Ampatzidis, Dennis Calvin, Odero[b]Orlando CotoArbelo, Ronald H.Cherry, Lucas FidelesCosta (2023) Prediction of morpho-physiological traits in sugarcane using aerial imagery and machine learning. Smart Agricultural Technology, Vol 3, February 2023, 100104.
3. Meena MR, Appunu C, Arun Kumar R, Manimekalai R, Vasantha S, Krishnappa G, Kumar R, Pandey SK, Hemaprabha G. Recent Advances in Sugarcane Genomics, Physiology, and Phenomics for Superior Agronomic Traits. Front Genet. 2022 Aug 3;13:854936. doi: 10.3389/fgene.2022.854936. PMID: 35991570; PMCID: PMC9382102.
4. Meena, M. R., Karuppiayan, R; Bakshi Ram, Ravinder Kumar , Neeraj Kulshreshtha (2018) Distinctness of candidate varieties of sugarcane using DUS descriptors. Bhartiya Krishi Anusandhan Patrika 2018 Vol.33 No.1/2 pp.94-98 ref.11