RESEARCH ARTICLE

MATURITY INDICES OF SWEET SORGHUM '*WANI*' VARIETY UTILIZED IN *PAUK* PROCESSING

Pandit, P.S.* and Varshney, A.K.

College of Agricultural Engineering and Technology, Navsari Agricultural University, Dediapada : 393040 (Gujarat), INDIA
Email: postharvesttechnology@nau.in

Received-06.08.2021, Revised-15.08.2021, Accepted-26.08.2021

Abstract: Sorghum is considered as versatile crop, use for; feed, food and industrial purpose. *Rabi* sweet sorghum '*wani*' variety was reported for *pauk* purpose. Green, tender, roasted and threshed clean grain of sweet sorghum is known as *pauk*. Experiment related to maturity of *wani* was carried out at MSRS-NAU, Surat with four treatments and seven replications in simple RBC design. Non-significant change was observed in plant height (2429±1mm); plant leaves (8Nos), top stalk length (678±1.5mm) and top stalk weight (112±1.21g) between 90–120DAS. Maximum length, diameter, volume, weight of head, were observed significantly high at 110DAS with value 292mm, 60.3mm, 2800ml and 106.8g, respectively. Mean diameter, sphericity, weight of thousand grains, volume of thousand grains and bulk density of grain were observed 3.33±0.7mm, 0.6954±0.023, 28±7.1g, 22.7±2.2cc and 1.217±0.212g/cc, respectively with elliptical shape. At 110DAS, all sensory parameters were recorded significantly high and then reduced, except tenderness. Proximate composition increased where as the moisture and sugars of plant as well as grain reduced with respect to maturity. Plant hormones like; GA changes with respect to maturity where as IAA and ABA was found increasing. These plant hormones could be determined using derived equations. Result related to maturity of *wani* revelled that, sorghum was at its maximum physical, biochemical and physiological maturity between 90–120DAS. Further, the sweet sorghum grain could be processed for *pauk* processing purpose between 90–110DAS otherwise it loose its quality. The collected maturity related data could be useful for further studies on *pauk* processing and its machineries development.

Keyword: Sweet Sorghum, *Wani*, Maturity Indices, *Hurda*, *Pauk*, GA

REFERENCES

Anonymous (1996). Lost Crops of Africa: Volume I: Grains. Pub.: The National Academies Press, Board on Science and Technology for International Development, Office of International Affairs, Policy and Global Affairs, National Research Council, Washington D.C., USA-2088: 127-210p. http://doi.org/10.17226/2305.ISBN: 0978-0-309-17689-7.

Anonymous (2010). Information note on sorghum structure and maturity for *hurda* purpose. ICAR-Indian Institute of Millets Research Annual Report 2010-11. ICAR-Indian Institute of Millets Research, Hyderabad.2010, p-32.

Atnavathi, C.V. R., Patil, J. V. and Chavan, U. D. (2016). Sorghum Biochemistry: An Industrial perspective. *Academic Press.* pp:7.

Berwal, J. S., Grewal, R. B., Kapoor, C. M. and Garg, M. K. (2004). Practical methods in food analysis. Pub.: Agrotech Publishing Academy, Ch.-2, pp:15-31. ISBN: 81-85680-85-X.

Chavan, U. D., Dalvi, U. S., Pawar, G. H. and Shinde, M. S. (2013). Selection of genotype and development of technology for sorghum *hurda* production. *International Food Research Journal*, Vol.-**20**(3): 1379-1382 (2013)

David, A., Miguel, A., Blázquez, J. C., Cristina, F. and Miguel, A. P. (2008). Instructive roles for hormones in plant development. *International Journal of Developmental Biology*. Vol.-**53**, ps-12. Published online: 24 November 2008. ISSN: Online 1696-3547, Print 0214-6282 doi: 10.1387/ijdb.072423da

Dharmaputra, O. S., Ambarwati, S. and Retnowati, I. (2012). Postharvest Quality Improvement of sorghum (*SorghumBicolor* (*L.*)*Moench*) Grains. *BIOTROPIA*, Vol.-**19**(2): 115 – 129p.

Gadakh, S. R., Shinde, M. S. and Gaikwad, A. R. (2013). Post rainy season sorghum varieties developed at All India Coordinated Sorghum Improvement Project, MPKV, Rahuri. An Open Access Journal published by *ICRISAT*, December 2013. Volume-**11**.SAT eJournal. ejournal.icrisat.org

Gerik, T., Bean, B. and Vanderlip, R. (2003). Sorghum Growth and Development. Agri LIFE Texas A&M system, Productive Rotation On Farm In Texas, B-6137, **7**(03); pp:1-7. https://oaktrust.library.tamu.edu /bitstream/handle/1969.1/87184/pdf_1724.pdf?sequence=1

German, R. M. (2016). Sintering Simplified: Surface Area, Density, and Grain Size Relations. *Materials Science Forum.* Vol.-**835** (2016), pp: 50-75. doi:10.4028/www.scientific.net/MSF.835.50

Madhusudhana, R., Rajendrakumar, P., Deepika, C., Raghavendra Rao, K. V. and Tonapi, V. A. (2017). ICAR-Indian Institute of Millets Research **Annual Report** 2016-17.ICAR-Indian Institute of Millets Research, Hyderabad. June, 2017, p-132.ISSN-0972-6608.

Masane, P. K., Mate, V. N., Borkar, P. A., Murumkar, R. P., Rajput, M. R. and Rathod, P.

*Corresponding Author

K. (2016). Physical Properties of Tender Sorghum (*Sorghum bicolor L.*) Grains. *Journal of Ready to Eat Food*, Vol.-**3**(4) :51-54p.

Mitchell, R. T. (2008). Food-grade sorghum varieties and production considerations: a review. *Journal of Plant Interactions*, Vol.-**3**:1, : pp 69-72, DOI:10.1080/17429140701722770

Mohsenin, N. N. (1986). Physical Properties of Plant and Animal Materials. Ed.-II and Revised. Pub.: Gordon and Breach Science Publisher, New York.Ch.-**3**. pp:79-127.ISBN:0-677-21370-0.

Li, Y. H., Wei, F., Dong, X. Y., Peng, J. H., Liu, S. Y. and Chen, H. (2011). Simultaneous analysis of multiple endogenous plant hormones in leaf tissue of oilseed rape by solid phase extraction coupled with high performance liquid chromatography–electrospray ionisation tandem mass spectrometry. *Phytochemical Analysis*, 22(5), 442-449.

Pandit, P. S. and Varshney, A. K. (2019). Sweet and Tender Green Sorghum Grain Processing in South Gujarat. *Multilogic in Science*, Vol.-**VIII**, Special Issue (B), NAHEP ICAR Sponsored, International Conference on EARES-2019, AT Dr. PDKV AKOLA;pp:58-59.

Patil, J. V., Chapke, R. R., Mishra, J. S., Umakanth, A. V. and Hariprasanna, K. (2013). Sorghum cultivation- A compendium of improved technologies, Vol-I. Directorate of Sorghum Research, Hyderabad. ISBN:89335-41-3:115p. Publication No: DSR Pub. No. 03/2012-13/Compendium of Improved Technologies (Vol.-I).

Ranganna, S. (2009). Handbook of Analysis and Quality Control for Fruit and Vegetable Products. Ed.-II. Pub.*: Tata McGraw Hill Education Private Limited, New Delhi*. Ch.-**1**. pp:3-27; Ch-**20**. pp-647-652. ISBN:973-0-07-451851-9

Rooney, L. W. and Miller, F. R. (1982). Variation in the structure and Kernel Characteristics of Sorghum. ICRISAT (International Crops Research Institute for the Semi Arid Tropics). 1982. *Proceedings of the International Symposium on Sorghum Grain Quality, 28-31 October 1981, Patancheru, A.P., India. Section-3: Grain Structure and Deterioration*. 143-170p.

Shinde M.S, Awari, V.R., Patil, V.R., Gadakh, S.R, Dalvi, U.S., Chavan, U.D. and Nirmal, S.V. (2016). *PhuleMadhur* (RSSGV-46): A Sweet Grain Rabi Sorghum Variety For Tender Grain Processing. *International Journal of Science, Environment and Technology*, Vol.- **5**(3), 1362 – 1369p.

Srivastava, L. M. (2002). Plant Growth and Development, Introduction To: Structure and Metabolism of Plant Hormones., *Academic Press*, 2002, PP:139-140, **ISBN 978-81-266-0570-9**, https://doi.org/10.1016/B978-012660570-9/50145-3.

Tonapi, V. A., Varanavasi, A. S., Navi, S. S., Reddy, C. R. and Karivatharaju, T. V. (2006). Effect of environmental factors during grain development and maturation on grain quality in *Sorghum bicolor (L.)Moench*. *Plant Pathology and Microbiology Publications*. **27**.

https://lib.dr.iastate.edu/plantpath_pubs/27

http://www.fao.org/faostat/en/?#data/QC

https://sorghumtrust.co.za/about-sorghum/

https://www.indiastate.com