

Some Physical and Engineering Properties of *Prosopis africana* seed

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Abstract |

Prosopis africana (Iron tree) is a popular tree in the Sub-Saharan Africa with all the parts used for food and medicinal purposes. The seed which has to be extracted from the pod is the most widely used. This study focused on the determination of some physical and engineering properties of the seed. This is with a view to obtaining data useful in machine design for handling and processing of the seeds especially decortication which is presently done manually. One thousand seed weight was obtained as 199.80 g, while the bulk and true densities were found to be 899.67 and 1397.10 kg m⁻³, respectively. The volume, angle of repose, geometric mean diameter, sphericity and porosity were 0.14 cm³, 22.3°, 6.43, 0.65 and 35.6%. The coefficient of internal friction for the seeds was 0.31, while the coefficient of friction on plywood, mild steel sheet and galvanized sheet were 0.32, 0.30 and 0.23. These data are useful in the design and development of handling and processing machines, which are not available currently in literature.