

Effect of moisture content on the physical properties of three varieties of sorghum seeds

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Abstract

Three sorghum varieties (Kari-*mtama*, *Serena* and *Seredo*) were obtained from the Kenya Agricultural Research Institute and reconditioned to moisture contents ranging from 13.64% to 21.95% db. The reconditioned grain kernels were then evaluated for dimensions, 1000 grain mass, bulk density, true density, angle of repose and hardness. The major, medium and minor diameters were found to increase with increase in moisture content for all three varieties of sorghum within the experimental moisture range. At the moisture content of 13.64% db the geometric mean diameter, sphericity, 1000 grain mass, bulk density, true density, porosity, angle of repose and kernel strength were found to be 3.94 mm, 0.737, 33.91 g, 588.4 kg/m³, 1264 kg/m³, 53.44%, 30.43° and 87.89 N for *Kari-*mtama**, 3.33 mm, 0.733, 20.89 g, 686.33 kg/m³, 1087 kg/m³, 36.86%, 24.41° and 59.64 N for *Serena*, and 3.15 mm, 0.789, 19.66 g, 757.61 kg/m³, 1138 kg/m³, 33.31%, 20.11° and 48.66 N for *Seredo*, respectively. The geometric mean diameter increased linearly with moisture content for all three sorghum varieties while sphericity remained fairly unchanged. Both the 1000 grain mass and angle of repose increased linearly with moisture content within the experimental testing range (13.64–21.95% db) while bulk density and true density decreased linearly with increase in moisture content. When the moisture content was raised from 13.64% to 21.95% db, the porosity of *Kari-*mtama** decreased slightly but linearly with increase in moisture content while that of *Serena* and *Seredo* increased linearly with increase in moisture content. The hardness of *Kari-*mtama**, *Serena* and *Seredo* decreased with increase in the moisture content of the grains although a linear relationship with moisture content over the entire range of 13.64–21.95% db was not observed.

Keywords

- Sorghum varieties; *Kari-*mtama**; *Serena*; *Seredo*; Moisture content; Dimensions; Density; Hardness and angle of repose