Title Physical Properties of Fuzzy Cottonseeds

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Abstract

Various physical properties, *viz*., percent mass distribution, dimensions, sphericity, 1000 seed mass, projected area, bulk density, true density and friction coefficient were determined for the well-dried fuzzy cottonseeds of MCU 5, LRA 5166 and Rajat 5 varieties in the moisture content range of 8·2–8·94% d.b. The mass distribution of fuzzy cottonseeds followed a normal distribution. The highest percentage distribution of 35·2, 43 and 43% were observed for the varieties, MCU 5, LRA 5166 and Rajat 5, at 0·076–0·100, 0·076–0·100 and 0·051–0·075 g, mass range, respectively. Considering the germination percentage and vigour index, the seeds of MCU 5, LRA 5166 and Rajat 5 varieties of fuzzy cottonseeds, in the mass range of above 0·100, 0·075 and 0·100 g, respectively were found suitable for seed purposes. The length of the fuzzy cottonseeds varied from 7·61 to 9·74, 7·9 to 10·06 and 7·3 to 9·59 mm, width increased from 4·48 to 5·44, 4·37 to 5·47 and 4·1 to 5·52 mm and thickness increased from 3·67 to 4·73, 3·97 to 5·03 and 3·63 to 4·89 mm, for the varieties, MCU 5, LRA 5166 and Rajat 5, respectively, with respect to mass of individual seeds. The values of the sphericity were not significantly different with respect to the mass ranges and varied between 0·64 and 0·67. The values of projected area ranged from 24·3 to 38, 25·8 to 40·7 and 21·6 to 40 mm^2 and the mass of 1000 seeds increased from 36·5 to 138·3, 41·4 to 127·6 and 38·7 to 127·4 g, for the three varieties, MCU 5, LRA 5166 and Rajat 5, respectively.
The bulk density values increased from 177 to 251, 186 to 229 and 202 to 281 kg m^{-3} and the true density ranged from 1177 to 1143, 1185 to 1156 and 1245 to 1110 kg m^{-3} for the varieties, MCU 5, LRA 5166 and Rajat 5, respectively. The values of angle of repose were 38·5, 43·3 and 40·3° for the varieties, MCU 5, LRA 5166 and Rajat 5, respectively. The coefficient of static friction of fuzzy cottonseeds against the surfaces, galvanised iron, mild steel, card board, aluminium and stainless steel are 0·27, 0·34, 0·47, 0·43 and 0·41, respectively and the coefficient of internal friction for the fuzzy cottonseed is found to be 2·35. The cohesive force for the fuzzy cottonseed is found to be 1·06 N and the angle of internal friction being 26·2°. The coefficient of static friction and internal friction did not vary with variety.