

Ünal H, Işık E, Alpsoy HC (2006) Some Physical and Mechanical Properties of Black-Eyed Pea (*Vigna Unguiculata* L.) Grains. Pakistan Journal of Biological Sciences 9(9): 1799–1806.

Abstract

The physical properties of black-eyed pea were evaluated as a function of moisture content. In the moisture range from 10.82 to 31.76% d.b., the dimensions of the major (length), medium (width) and minor (thickness) axes varied from 9.15 to 10.45 mm, 6.67 to 7.31 mm and 6.01 to 6.55 mm, respectively. In the above moisture range, the arithmetic and geometric mean diameters increased from 7.28 to 8.10 mm and from 7.16 to 7.93 mm, respectively, while the sphericity decreased from 0.783 to 0.761. thousand grain mass, surface area and projected area increased from 245.4 to 279.3 g, from 161.22 to 198.38 mm² and from 57.75 to 68.18 mm², respectively. In the moisture range from 10.82 to 31.76% d.b., the bulk density of the rewetted grain decreased from 637.80 to 602.48 kg m⁻³, true density increased from 1064.66 to 1205.99 kg m⁻³, porosity increased from 40.05 to 49.60%. The terminal velocity and angle repose increased linearly from 4.98 to 5.44 m s⁻¹ and 20.91 to 27.69°, respectively. The static coefficient of friction increased on six structural surfaces namely, rubber (0.380–0.434), galvanised iron (0.355–0.399), aluminium (0.346–0.383), stainless steel (0.333–0.375), glass (0.323–0.374) and medium density fibreboard (0.278–0.342) as the moisture content increased from 10.82 to 31.76% d.b.. The shelling resistance of black-eyed pea decreased as the moisture content increased and the highest force were obtained while loading along the Z-axis (thickness).