Title Determination of Dimension and Area Properties of Soybean (*Gorgan3*) by Image Analysis

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Abstract

Information about physical properties of crops and seeds are necessary in order to design suitable equipment, and to carry on tasks such as handling, transportation, processing and storage. At a moisture content of 14.4% d.b., 100 grains were selected at random from 500 g of soybean and the length, width and thickness were measured. The average length, width, thickness and mass of soybean seeds were 7.59 mm, 5.50 mm, 6.70 mm and 0.174 g, respectively. The mean geometric diameter, sphericity and surface area were found to be 6.53 mm, 0.86 mm and 120.66 mm^2, respectively. A higher value of 446.76 mm^3 for the volume was obtained using kernel dimensions, compared to that of calculated volumes of 262.3 mm^3 and 184.46 mm^3 using arithmetic and geometric diameters, respectively. The frequency distributions of soybeans by number of each size in the sample were estimated. Correlations between mass, volume, dimensions and area were found using standard regression techniques. Mass was estimated with a single variable of length with a high coefficient of correlation, as: M = -0.0169 + 0.0456L, r = 0.92.