

Research Paper :

Study on physical properties of finger millet (*Eleusine coracana*)

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ABSTRACT

The present investigation was carried out to study the physical properties of two varieties of Ragi (GPU-28 and L-15). The average sizes of grain sample taken for the study were 1.7 and 1.63 mm for GPU-28 and L-15 ragi varieties, respectively. 1000 grains weight was 3.39 g for GPU-28 as compared to 3.27 g for L-15 ragi. There was not much difference in specific gravity between the two varieties. The bulk densities of 733.6 and 731.67 kg/m³ were recorded for GPU-28 ragi L-15 varieties of ragi, respectively. Angle of repose and angle of friction for GPU-28 variety ragi were 17^o-58' and 30^o-58', respectively. For L-15 ragi, the angle of repose was 17^o-31' and the angle of friction 30^o-22'. The grain samples contained a moisture content of 9.61 and 9.58 per cent for the varieties GPU-28 and L-15 ragi, respectively. The colour of GPU-28 was very attractive with red brown, while that of L-15 was brown on dark brown. The colour also plays an important role as for as consumer's acceptance is concerned. It was noted that, the GPU-28 was bold in size (1.70 mm) while the L-15 was smaller (1.63 mm). Of the factors investigated, the seed size and bulk density showed linear relationship with milling yield.

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Key words : Bulk density, Specific gravity, Angle of repose, Angle of friction

Finger millet (*Eleusine coracana*) commonly known as ragi, is one of the important small millet crops grown in red soil areas of India. It is known for its hardy nature, drought tolerance and wonderful recovering ability on restoration of favorable conditions. It can adapt to conditions of stress like heat, alkalinity, salinity and acidity. The average yield of the crop under rain fed conditions is about 16 quintals per hectare and under irrigated conditions is about 25 quintals per hectare (Anonymous, 1999). Study of physical and engineering properties of ragi is very important to know the basic information about the geometry of ragi seeds which is required to design equipment and machinery Edward *et al.* (2001). Marshal *et al.* (1984) reported the relationship between grain size, shape and milling yield. For samples that had been segregated for test weight, there was a strong correlation between test weight and milling yield. The bulk wet processed to yield edible fractions containing 10.5 per cent protein. Paulsen and hill (1985) discussed about the physical quality factors of corn, which can be measured prior to accepting or rejecting incoming truck load of corn. Information about the effect of difference in the physical quality factors on the yield of large flaking grit can aid in the selection of corn best suited for dry milling. Yield of

large flaking grit was significantly increased by selecting corn with low breakage susceptibility and high test weight. Saxena *et al.* (1981) studied and effect of grain texture on various milling and end use parameters of newly bred advanced triticle (wheat x Rye) lines. They found that increase in grain hardness, there was significant decrease in ash content of flour. Soft textured triticle contained significantly higher amount of protein in the flour. With increase in hardness, a significant decrease was observed in loaf as well as specific volume. The cookies prepared from soft and medium hard textured triticle recorded hard textured triticles. Wazari and Mittal (1983) studied the physical properties such as size, shape, weight, density, porosity, surface area, angle of repose and angle of internal friction of selected tropical agricultural products. They stated that the roundness and sphericity are important parameters that determine geometric shape of agricultural products.

METHODOLOGY

The Ragi crops of both varieties GPU-28 and L-15 were grown at the farm, Gandhi Krishi Vignana Kendra (GKVK). These were harvested at around 15-18 per cent moisture content (wet basis) and stacked. The stacks