

Study of moisture based physical properties of paddy

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ABSTRACT : The objective of this study was to determine some moisture based physical properties of paddy, namely, size, sphericity, bulk density, true density, bulk porosity, angle of repose, thousand grain mass, elongation ratio and flatness ratio. The physical properties of paddy were determined at moisture content 10.01, 13.42, and 19.81 per cent. At 10.01 per cent (d.b.) moisture content the average length, width and thickness of paddy were 8.23, 2.26 and 1.77 mm, respectively. The grain sizes were found increased from 3.20 to 3.42 mm, whereas sphericity increased from 0.38 to 0.41 due to change in moisture content from 10.01 to 19.81 per cent (d.b.). The bulk density and true density increased from 562.81 to 688.68 kg/m³ and 1147.31 to 1224.68 kg/m³, respectively. While the bulk porosity decreased from 50.88 to 43.54 per cent in the specified moisture content. The angle of repose increased from 34.29 to 39.25 degrees, whereas the elongation ratio and flatness ratio decreased from 3.64 to 3.51 and 1.27 to 1.14, respectively. Thousand grain weight increased from 14.43 to 16.21 g due to change in moisture content from 10.01 to 19.81 per cent (d.b.).

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INTRODUCTION

Paddy (*Oryza sativa* L.) is the most important and extensively grown crop in the world. It is the staple food of more than 60 per cent of world population. Rice is the second most important crop after Jowar in Maharashtra state. The total area under rice in the state is 15.24 lakh ha with an annual rice production of 42.11 lakh tonnes and average productivity is 2.76 t/ha. Major rice area of Kolhapur and Ratnagiri district (Maharashtra) is covered under variety, Ratanagiri-24. The duration of the crop is about 110-115 days having yield potential of 35-59 q/ha. Now a day all developed and developing

countries are boosting the production of cereals as it is very important component of vegetarian diet. This needs better understanding of the physical properties. Shape, size, density, and appearance are the crucial physical characteristics in combination with the moisture content for handling, processing and to save energy. The handling and flow of the material requires better understanding of the frictional properties, angle of repose etc. The parameters in design of belt conveyors, screw conveyors, etc. Therefore, the study was under taken to find out the properties like size, shape, sphericity, elongation ratio, flatness ratio, 1000-grain wt., angle of repose, true density, bulk density, moisture content, for machine design purpose. In order to design equipment for handling, aeration, storing, and processing rice, its physical properties need to be known. The data on the moisture dependent physical properties of the cereal grains is scanty. In view of this the present study was undertaken to find out effect of moisture content on physical properties of paddy (Ratanagiri-24).

EXPERIMENTAL PROCEDURE

The present study on study of moisture based physical properties of paddy was undertaken at Padmashree Dr. D. Y.

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