

FLUIDIZED BED DRYER PERFORMANCE FOR DRYING PADDY WITH AIR VELOCITY AND MATERIAL MASS TREATMENT

ABSTRACT

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Harvested dry grain generally has a fairly high water content, around 24 % - 26 %. The grain drying process can be done using traditional methods and modern methods using machines, generally farmers use traditional methods which take a long time. To overcome this problem, the use of a fluidized bed dryer machine as an alternative machine can be used. This research aims to determine the drying characteristics of grain using a fluidized bed dryer and the results of the material after drying by treating air speed and material mass. This research used variations in material mass, specifically 300 grams, 400 grams, and 500 grams, as well as variations in the air flow speed used, specifically 6 m/s, 8 m/s, and 10 m/s. The process of drying the grain in the drying chamber for 3 minutes, and taking changes in the water content value every 30 seconds during the drying process. Measurement of water content values can be obtained quickly and accurately using a grain moisture meter. The results of the calculations in the form of Microsoft Excel and statistical analysis using the SPSS 29 application software, obtained a drying rate value of 1.69 %/hour - 1.91 %/hour, a drying rate constant value of 0.287 - 0.373, a drying heat efficiency value of 18.26 % - 28.75 %, the efficiency value of the drying system is 14.31 % - 27.44 %, and the percentage value of the grain cleanliness level is 97.71 % - 99.25%.

Keywords: paddy, fluidized bed dryer, moisture content, air velocity, material mass, drying heat efficiency, drying system efficiency.

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