ASSESSMENT OF CORN DRYER PERFORMANCE USING FUEL BIOMASS

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Patterns period corn planting in Indonesia are generally divided into four periods during the year, namely: (1) the Rainy Season I (October - December) which holds 49% of the total maize, (2) Musin Rain II (January-March) to 20% of planting corn, (3) Dry Season I (April-June) to 17% of corn planting, and (4) Dry Season II (July-September) to 14% corn planting. Thus most of the corn is harvested during the rainy season. It thus raises the potential of increasing losses, due to the high water content are prone to grow fungus aflatoxin. Where quality losses due to delays the drying process reaches 10%. From these conditions, the use of a dryer is needed. Often the problems encountered in the production of seed grain is drying, especially in the rainy season and the dryer if available, the operation cost is not feasible. For the conventional dryer, with the capacity of 5-10 tons is needed about 100-150 liters of kerosene, so it is very expensive. The potential of bioenergy from waste biomass in Indonesia reached 49,810 MW. Based on available data, the use of bioenergy until now only around 1,618 MW, or approximately 3.25% of the existing potential. To Overcome these problems, then Indonesian Center for Agricultural Engineering Research and Development (ICAERD) developed a dryer by using bioenergy. In this study, the selected drying machine is a machine dryer box types, in consideration of cost and easy operation. The results show that the drying corn drying on the initial moisture content of 33% to the final moisture content of 14-15% ranging between 9-13 hours. The amount of corn drying rate ranged from 1.5 to 2.41% / hour. The fuel consumption of biomass needed is about 32.3 kg per hour of corn cobs. Diesel fuel consumption rate of about 0.95 to 1.02 liters / hour. The amount of the drying efficiency of about 70-75%, with the efficiency of the heating system by 33%, and the efficiency of drying systems by 25%. Drying results aflatoxin content of less than 2 ppb (parts per billion). While based on the standards of quality dry corn mentioned that maximum aflatoxin content in corn grain is 50 ppb. Thus it can be said that the quality of dried corn produced is very good for low aflatoxin content.

Key word : corn, dryer, biomass