ABSTRACT

Various researchers have fitted experimental drying curves for various products to existing drying models. In this study, an experimental forced convection solar grain dryer was used to select the best fitting drying model for shelled maize. 0.04 m thick grain layer of shelled maize was dried an air velocity of 0.408 m/s and a 40°C drying air temperature. Using Root Mean Square Error (RMSE), Coefficient of Determination (R^2) and Chi Square (χ^2) the selected drying model was the one by Midilli *et al.* (2002), with R^2, χ^2 and RMSE values of 0.9487, 0.4278 and 0.1723 respectively. The model coefficients were determined for drying air temperatures of 40, 45, 50 and 55°C. It was found that the predicted and experimental data agreed satisfactorily with R^2 and RMSE values of 0.9225-0.9786 and 0.0325-0.0750 respectively. A computer simulation model was developed to predict moisture ratio at a given drying time.

Keywords:
forced convection, drying model, model coefficients, shelled maize, and computer simulation model.