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Thin Layer Drying Process of Some Leafy Vegetables under Open Sun

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Abstract

Open sun drying experiments in thin layers of crain-crain (CC), fever (FV) and bitter (BT) leaves grown in Abeokuta, Nigeria were conducted. The drying process took place in the falling rate period and no constant rate period was observed from the drying curves. Eight thin layer mathematical drying models were compared using the multiple determination coefficients (R^2), reduced chi-square (χ^2) and root mean square error (RMSE) between the observed and predicted moisture ratios. Accordingly, Midilli et al. model satisfactorily described the drying curves of the three leaves with R^2 of 0.9980, $\chi 2$ of 2.0×10^{-4} and RMSE of 1.09×10^{-2} for CC leaves; R^2 of 0.9999, χ^2 of 2×10^{-6} and RMSE of 1.11×10^{-3} for FV leaves; and R^2 of 0.9998, χ^2 of 1.9×10^{-5} and RMSE of 3.3×10^{-3} for BT leaves. The effective diffusivity was found to be 52.91×10^{-10}, 48.72×10^{-10} and 43.42×10^{-10} m^2/s for CC, BT and FV leaves, respectively.