Thermal Conductivity of Some Vegetable Crops as affected by Bulk Density and Moisture Content

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Abstract

The thermal conductivity of tomatoes, pepper and okra were determined at room temperature by the line heat source technique. Moisture contents of tomatoes used in the tests ranged from 92 - 95% wet basis while those of pepper and okra ranged from 81 - 84% and 76 – 85% respectively. At those moisture conditions, thermal conductivities ranged from 462 x 10^{-3} to 514 x 10^{-3} W/MoK for tomatoes, from 378 x 10^{-3} to 411 x 10^{-3} W/MoK for pepper and from 456 x 10^{-3} to 479 x 10^{-3} W/MoK for okra. At constant moisture content, thermal conductivities increased linearly with bulk density. The magnitude of variability of the data about the mean values were less than 1.0%. This makes the use of line heat source technique a suitable method for thermal conductivity determination for agricultural products.