

Title Assessment of variance in the measurement of hectolitre mass of wheat, using equipment from different grain producing and exporting countries

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Abstract

Hectolitre mass (HLM), also referred to in some countries as bushel-, specific-, test- or hectolitre weight, is the weight of a standard volume of grain and is generally believed to be a measure of its bulk density. The effect of HLM devices from different grain producing and exporting countries (Australia, Canada, France, Germany, South Africa, United Kingdom and the United States of America) on the variance in HLM values of wheat has been investigated. It has been found that the South African device resulted in HLM values significantly lower ($P < 0.05$) and the device currently used in Australia with values significantly higher compared to the other devices ($P < 0.05$). Nevertheless it has been found that the HLM values obtained from the respective devices were highly correlated (inter-device correlation (IDC) consistency > 0.90). The possible use of calculated correction factors could therefore be investigated. An alternative is to consider the calculation of appropriate conversion tables for the devices used in Australia and South Africa. A significant ($P < 0.05$) increase was observed in HLM values after the removal of impurities and was shown to be device dependent. Statistical differences were found between the ten South African HLM devices, but these would be insignificant in practice (IDC agreement > 0.98). Consecutive wetting and drying cycles significantly ($P < 0.05$) influenced the HLM determinations.