

Assessment of Physical Characteristics of Maize (Zea Mays) Stored in Metallic Silos

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Abstract : The storage losses recorded globally in maize (Zea mays) especially in the developing countries is worrisome. Certain degenerating changes in the physical characteristics (PC) of the grain occur due to the interaction between the stored maize and the immediate environment especially during long storage period. There has been tremendous reduction in the storage losses since the evolution of metallic silos. This study was carried out to assess the physical quality attributes of maize stored in 2500 MT and 1 MT metallic silos for a period of eight months. The PC evaluated includes percentage moisture content MC, insect damage ID, foreign matters FM, hectolitre weight HC, mould M and germinability VG. The evaluation of data obtained was done using statistical package for social sciences (SPSS 20) for windows evaluation version to determine significant levels and trend of deterioration ($P < 0.05$) for all the values obtained using Multiple Analysis of Variance (MANOVA) and Duncan's multivariate test. The result shows that the PC are significant with duration of storage at ($P < 0.05$) except MI and FM that are significant at ($P > 0.05$) irrespective of the size of the metallic silos. The average mean deviation for physical properties from the control in respect to duration of storage are as follows: MC $10.0 \pm 0.00\%$, HC $72.9 \pm 0.44\%$ ID $0.29 \pm 0.00\%$, BG $0.55 \pm 0.05\%$, MI $0.00 \pm 0.65\%$, FM $0.80 \pm 0.20\%$, VG $100 \pm 0.03\%$. The variables that were found to be significant ($p < 0.05$) with the position of grain in the bulk are VG, MI and ID while others are insignificant at ($p > 0.05$). Variables were all significant ($p < 0.05$) with the duration of storage with (0.00) significant levels, irrespective of the size of the metallic silos, but were insignificant with the position of the grain in the bulk ($p > 0.05$). From the results, it can be concluded that there is a slight decrease of the following variables, with time, HC, MC, and V, probably due to weather fluctuations and grain respiration, while FM, BG, ID and M were found to increase slightly probably due to insect activity in the bigger silos and loss of moisture. The size of metallic silos has no remarkable influence on the PC of stored maize (Zea mays). Germinability was found to be better with the 1 MT silos probably due to its hermetic nature. Smaller size metallic silos are preferred for storage of seeds but bigger silos largely depend on the position of the grains in the bulk.

Keywords : maize, storage, silo, physical characteristics

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