

**EFFECTS OF THRESHING METHODS, MOISTURE CONTENT AND
ENDOSPERM TYPES ON THRESHABILITY AND SELECTED SORGHUM
(*Sorghum bicolor* L. Moench) SEED QUALITY PARAMETERS**

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DECLARATION

I, Fabiola Peter Langa, hereby declare that, this thesis is my original work. To the best of my knowledge, the work presented here has not been presented for a degree in any other University.

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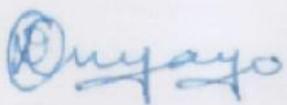
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ABSTRACT

Sorghum (*Sorghum bicolor* L. Moench) is among the most important cereal crop in the world. Sorghum is a food security crop in most African and Asian countries especially in arid and semi-arid areas where drought is persistent. However, sorghum yields are low in most parts of Africa. One of the reasons for low production is lack of quality seeds due to inappropriate technology including postharvest handling and processing of sorghum seeds. The aims of this study were to evaluate the effects of endosperm type, seed moisture content levels and threshing methods on threshability and quality parameters of the seeds. Two varieties of sorghum were grown in two diverse locations, Kiboko and Katumani. One variety Kari-mtama 1 has hard (vitreous) endosperm type while another variety Seredo has soft (non-vitreous) endosperm type. After harvesting, sorghum panicles were dried in the sun and oven. The panicles were threshed separately for each drying method at two seed moisture levels namely 18-20% and 13-14% moisture contents (M.C). The three threshing methods used included beating by wooden stick in tied sack, using wooden mortar and pestle as well as threshing machine. Mechanical damage was evaluated by using tetrazolium test while the germination percent, germination time and seedling vigour were evaluated using paper towel method in the laboratory following ISTA rules.

The results showed that vitreous endosperm variety had significantly high percentage threshability and significantly low mechanical damage than non-vitreous endosperm variety under both drying methods. Also, threshing machine had significantly lower threshability and mechanical damage compared to the other two methods. There was significant increase in threshability and decrease in mechanical damage when the seeds were threshed at 13%-14% moisture content. In both drying methods, the seeds that were threshed at low moisture content (13%-14%) had significantly high germination percentage, seedlings vigour and took

significantly short time to germinate compared to those which were threshed at high moisture content (18%-20%). Similarly, seeds from panicles that were threshed using machine had significantly higher germination percentage and seedlings vigour followed by those from panicles that were threshed by beating with wooden stick and mortar and pestle, respectively. Also, the seeds from panicles that were threshed using machine took significantly short time to germinate compared to the other two threshing methods.

The results confirmed that, vitreous endosperm sorghum varieties are better for threshability and pose breakage resistance compared to non-vitreous sorghum. However, under both endosperm types threshing machine is the best method for threshing sorghum panicles to obtain high quality seeds followed by beating with wooden stick. Similarly, the results indicate that threshing should be done at low moisture content (13%-14%) for high threshability and quality seed. There was no significant genotype by environment interaction, implying that the results are applicable for varieties planted in different environments.