Design and development of an indoor on farm storage structure for rural farmers

Wasala.,W.M.C.B., Rathnayake.,H.M.A.P., Fernando.,M.D., Thilakarathne., B.M.K.S., (2012), *Design and development of an indoor on farm storage structure for rural farmers, Proceedings of the Research symposium, Institute of Post Harvest Technology, pp-14, Abstracts.*

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In Sri Lanka price for paddy fluctuates severely showing a minimum price at harvest. To benefit from higher prices, farmers strive to store paddy. But poor storage management and lack of technology cause quantitative and qualitative losses by rodents, insects and microbial deterioration. To overcome these problems an airtight on farm indoor storage structure, based on a metal bin, has been developed. Objective of this study was to fabricate and evaluate the storage structure in terms of paddy quality and mass loss. Before and after storage composite samples were drawn from bin and control to analyze moisture content, thousand grain mass, insect infestation, mould, germination rate and head rice yield. Additional samples were taken from different regions in the bin.

Ephestia cautella have been found on the top layer in the bin and *Sitophilus spp*. And *Rhyzopertha Dominica* in the bottom layer. Average infestation rate was 4.8 insects/ kg. Most of the insects were dead at unloading. After six months storage, mass loss was 0.6 % in the bin and 4.6% in the control. Here rice yield was 35.8% in the bin and 27.3% in the control. A significant amount of mould was only found in the control (0.85%). Germination rate, however, decreased from 85% to 12% in the bin, whereas it still was 48% in the control. The study has shown that airtight metal bins provide a safe and convenient method for farmers in the tropics to preserve their harvest for later purchase at a higher price. Further work is necessary to develop strategies for avoiding the decrease in germination capacity.