

Effect of Temperature and Packing Material on Germination Rate of Stored Paddy

M.G.G Awanthi¹, S.B. Navaratne², B.M.S Jinendra¹ and C.M. Navaratne¹

¹*Department of Agricultural Engineering, University of Ruhuna, Matara, Sri Lanka*

²*Department of Food Science and Technology, University of Jayawardhanapura, Nugegoda, Sri Lanka*

Germination rate (GR) of paddy is one of the most important quality standards to obtain a bumper harvest and it is also a key factor to conserve plant genetic resources for long time. Main objective of this study was to determine the effect of storage temperature and packing material on GR of stored paddy for 6 months. Experiment was conducted as a split-split plot design with 3 replicates. Main, sub and sub-sub plot factors were variety, packing material and temperature, respectively. About 5 kg of AT-362 and Kuruluthuda paddy varieties were packed in gunny bags, poly sacks (woven polypropylene) and polyethylene bags (300 gauge) and stored at 4 different temperatures (26, 30, 34 and 38 °C) for 6 months. The germination test was based on 100 grain samples which were drawn monthly for 6 months. Based on the result pertaining to GR after 6 months, 2 factor interaction (Temperature x Packing material) was found to be significant ($p < 0.05$). After 6 months, GR of paddy stored in polyethylene bags was significantly lower than that of gunny bags and poly-sacks at every temperatures. The high GR was recorded by AT-362 (93.3%) and Kuruluthuda (92.6%) paddy, stored at 26 °C in poly-sacks, while low GR recorded by AT-362 (8%) and Kuruluthuda (7.6%) at 38 °C when paddy was stored in polyethylene bags. Germination rate of paddy stored in gunny bags and poly-sacks were declined with rising storage temperature and it was significantly lower at 38 °C than the 26 °C. However, there was no correlation between ($p > 0.05$) GR and storage temperature when paddy was stored in gunny bags and poly sacks. Germination rate of paddy stored in poly-sacks was higher than gunny bags at all temperatures of the study, but it was not significant. Germination rate showed a negative correlation ($p < 0.05$) with storage time when they were stored in gunny bags ($r = -0.830$). It can be concluded that minimum negative effect was found on germination rate when paddy was stored at low temperatures in poly sacks.

Keywords: Germination rate, Paddy, Packing material, Storage, Temperature