

Effect of temperature, relative humidity and moisture changes on germination percentage of paddy stored in GIC silo in Konkan region of Maharashtra

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■ **Abstract :** The research paper presents the information regarding the pattern of changes in the environmental conditions *i.e.* temperature, relative humidity and moisture content on the stored paddy in Galvanized Iron Corrugated (GIC) silo. The grain moisture in the silo decreased from 13.9 per cent to 12.1 per cent during the storage period July to January. The moisture content of the grain increased from 12.3 per cent to 13.9 per cent during storage month of May to July. The temperature inside the silo was 29.3 °C to 26.4 °C than ambient temperature of 31.2 °C to 28.9 °C during storage month of April to January. The relative humidity inside the silo varied from 69.8 per cent to 71.7 per cent with storage period April to January. The germination percentage of grain inside the silo was decreased from 70.6 per cent to 52.3 per cent during storage period of April to January.

■ **Key words :** Temperature, Moisture content, Relative humidity, Germination percentage, Paddy, GIC, Silo

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Paddy (*Oryza sativa*) is the most important and extensively grown food crop in the world. It is the staple food of more than 60 per cent of the world population. Rice is mainly produced and consumed in the Asian region. India has largest area under paddy in the world and ranks second in the production after China.

The Konkan region of Maharashtra State is located at 17°45'32" N latitude and 73° 11'8" E longitude with an altitude of 250m above mean sea level (msl). The paddy is main food crop growing in this region. The region has a hilly terrain and receives an average annual rainfall ranging between 3000 to 4000 mm. Relative humidity lies between 55 per cent to 100 per cent. The temperature ranges between 25°C to 35°C. The climate of this region is hot and humid. At this condition the stored grains are damaged. Therefore it is necessary to provide solution for safe storage of paddy using modern storage techniques on commercial basis.

Primary aim of storage is simply to prevent deterioration of quality of grain. This is done indirectly through control of moisture and air movements and by preventing attack of microorganisms, insects and rodents. Farmers throughout the world, in every country at hot or cold climate store grain. They may store in traditional storages like earthen pots, in pits or in a granary, modern storages either in bulk or in

reasonably sophisticated storages. They store some large quantity of the grains.

The most important physical factor in grain storage is moisture content because it affects the growth of mould, with which all stored grains are infected. It is generally accepted that climatic conditions are lead to physical changes in stored bulk grain through the movement of moisture which leads to deterioration. This study was implemented to investigate the changes in the temperature, RH and moisture content in freshly harvested bulk paddy during a storage period of ten months (April 2009 to January 2010). The study was carried out at the Department of Agricultural Process Engineering, CAET, Dapoli. The paddy was stored in Galvanized Iron Corrugated (GIC) silo having capacity of 1.25 tonne, which is shown in Fig. A.

Singh *et al.* (1981) studied the effects of methods and duration of storage on seed germination and seedling vigour in papaya (*Carica papaya* L.). It was found that cold stored papaya seeds maintained significantly higher germination and better seedling vigour than the room stored seeds. With the increase in the duration of storage, seed germination decreased after 20 months at room temperature whereas it declined marginally during the same period when kept in the cold storage. Irrespective of the storage conditions, seeds kept in