Traditional and Modern Storage Practices for Food Grains

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Post-harvest management including storage and infestation account for about 10% of losses of total food grains in India. Thus, efficient storage of grains immensely contributes to socio-economic developments. Physical loss of grain in storage is the result of pest infestation (insects, birds and rodents), microbial infection, change in moisture content, poor handling and grain respiration and microorganic/microbial consumption.

The main factors affecting the spoilage/ loss of food grains during storage are as follows:

- Physical factors, e.g. temperature, relative humidity, oxygen and carbon dioxide levels
- Chemical factors, e.g. pesticides
- Biological factors, e.g. microorganisms, rodents and insects
- Engineering / mechanical factors, e.g. design of storage structure, type of packaging and transportation

Although modern methods for storage applying the chemicals (pesticides) are successful to quite some extent, but these chemicals are toxic and their residual contents in foods grains may be detrimental to health (Karthikeyan et al., 2009; Mobolade et al., 2019). On the other hand, the traditional storages used for the storage of grains were cheaper and eco-friendly and provided better shelf life and food quality. Hence there is a need to (i) understand the underlying science behind the traditional storage of grains without any chemicals (pesticides) controlling the insect infestation and imparting a longer self-life and (ii) implying these technologies to the modern storage techniques for sustainable solutions of this important challenge.

This presentation briefly outlines some modern warehouses and traditional storage structures observed in North East (NE) India (Ado & Dixit, 2013). Figure 1 shows a typical modern warehouse in Arunachal Pradesh. The storage is done on the ground floor only. This causes problems due to water seepage, rodents and insects. Although there is an arrangement for the passage of sunlight, due to prevalent cloudly weather in Arunachal Pradesh and high humidity, food grains do not get optimum temperature, resulting in the damage of grains. Farmers in Arunachal Pradesh still prefer to use traditional storage structures as shown in Figure 2. The height is divided into three-storied structure; first storey is meant for fitting supporting frames, which are approximately 1.52 m in height and the middle storey is kept blank where the device for restricting the entry of rats is fitted. These devices are made of a wooden plank that is round in shape. It appears that the traditional storages are superior to modern warehouses in certain aspects, but require some technological interventions.

Figure 1: A modern warehouse in Arunachal Pradesh. The farmer community is not comfortable in using this type of warehouse due to inherent shortcomings (Adapted from (Ado, 2012))

Figure 2: Wooden circular plank for restricting entry of rats in a traditional storage system in Arunachal Pradesh (Adapted from (Ado, 2012))

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