



Post-harvest management

Most of the agricultural products, grown with great care, get spoiled, due to lack of appropriate post-harvest facility like transport, processing and storage. If the storage loss is significant even with well equipped and technically managed institutions like Food Corporation of India, one can imagine the quantum of grain damage at farmers' level.

Traditionally, Indian farmers and housewives have been familiar with preservation techniques of seeds and food grains. They have been doing this without using harmful chemicals, for eg., zinc phosphide for fumigation in storage. Historically, some 80 years ago, the Britishers had invited a team of scientists to educate Indian farmers on Seed Preservation Technology. The team went to North-West India. They were surprised to find an old woman plastering a huge container made of bamboo splits, with sheep dung, urine, white anthill clay and ground neem leaf paste, to store the seeds. After noticing the low cost and highly effective method of storage they cut short their visit. They concluded that farmers in India were highly knowledgeable.

Farmers have derived their own ways of assessing the moisture content while storing the seeds. They bite the seed to determine the dryness. Also, they collect the best earheads, from their fields, dry them under shade and fill them in gunny bags or make small bundles in their natural form, without threshing. These bundles are hung from the kitchen roof, above the cooking fire. They are exposed to the smoke emanating from the cooking fire. The smoke passes through the bags or bundles of grain ear heads. The exposure to smoke, enables prevention of attacks by insects and fungus. The grains are then threshed and cleaned, just 2 or 3 weeks before sowing.

Farmers have an effective way of testing seed germination also. They used to make 0.5 X 0.3 meter wooden plank smeared with fresh cowdung and filled with dry cow dung powder. Different varieties of seeds are sown on this, in lines, on *Ugadi* festival day (celebrated as regional New year's day, usually during April month). Beds are watered till *Srirama Navami* festival day (ninth day from Ugadi). If all the seeds sprouted, farmers were sure that the seeds had a minimum of 88% germination potential.

Farmers know many techniques to store grains. They mix seeds with hard smelling semi-dried *Neem*, *Adathoda*, *Vitex nigunde*, *Datura* spp., *Clerodendron* leaves etc. Sometimes, seeds are mixed with dry chillies, wood ash and clay dust. Thus, the storage pest that drills hole into pulses, is effectively controlled without incurring any expenditure. Actually, this particular insect needs the seed to be in an undisturbed position for 24 hours to make holes and damage the grain. Therefore, farmers fill the grain upto 55% of the bag capacity, seal the opening and place it at the main entrance of the house. People moving in and out of the house, walk over it several times a day, disturbing the pulses in the bag, whereby the insect is discouraged. I could not resist laughing, when few students from the School of Natural Resources, Michigan,

U.S.A., who were staying with us, told that their University was formulating a similar technology against the same insect, using a complex cost intensive process. They recommend to fill only 55% of pulses in a drum and attach a shaft with a handle. This is fixed horizontally on a stand and rotated with the help of the handle, so that the pulses move inside the drum, functioning like a mortar mixing drum. They rotate it several times a day, may be even with an electric motor, to make it easier.

Farmers have a sophisticated method of storing cereals in a pit dug like a well, known as granary. A pit, measuring about 5 metres deep and 2.5 metre in diameter, is dug with a narrow opening. The opening which is of 0.6 metre in diameter is used to store as well as collect grains when needed. A round granite lid is used to cover the pit and soil is filled over it. Farmers also prepare a 10 cm thick bed at the bottom and at the sides, to protect the grains from moisture. This was used to store up to 40 to 50 quintals of grains without any recurring expenses for 2 to 3 years. These granaries are also used to ripen bananas. In fact, it is a religious practice to ripen bananas only in this way for some special religious occasions. They also had a practice of mixing 15% of pulses, 15% of oilseeds and 70% of cereal grains, so that insects feeding on pulses and oilseeds were deterred by the odour of cereal grains. Passing methane gas once in 45 or 50 days through seeds can also avoid damage from insects. Similarly, regular smoking with neem and eucalyptus leaves could also help.

In coastal Karnataka, they hang pumpkin, cucumber and ashgourd etc., individually in the porticos for several months without damage. Rice can be stored for longer periods by mixing 1 kg of powdered salt and 500 gms of chilly powder with 100 kgs of rice. Rural women are familiar with coating 500 ml of castor oil to a quintal of wheat, jowar, green gram, cowpea, pigeon pea etc., as a preventive measure against pest damage. Such inexpensive, eco-friendly, safer practices of preserving seeds and food grains, were changed with the introduction of high technology expensive systems, which are costly, as well as, harmful to the health of consumers. While transporting the produce, farmers make soft beds in the vehicles using hay, branches and weeds, to prevent damages. While loading in the boxes or vehicles, they place fruits like watermelon, vertically, instead of placing them horizontally, to minimize the damages. Therefore, it is high time we popularize the traditional knowledge of post harvest management practices for a better future.

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