
Hermetic Seed Storage for Seed and Food Security



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Postharvest losses in grain and seed are the major cause of reduction in quantity and quality of yield throughout the agriculture system and badly affect the farmer's food supplies and safety.

Losses of food in weight or volume are measurable but the quality losses of grain and seed are complex and difficult to assess by depending upon its consumption whether for animal or human or for seed. Seedling viability and germination of seed are two basic worries. Cereal grains losses ranging from 50 to 60% are due to improper storage techniques, lack of knowledge and inadequate storage infrastructure not only increases the risk of food hunger but also harmful for life when exposed to aflatoxins that cause cancer. The majority of research funding has gone toward raising of food crop yield while 5% of research funding over the past 30 years has been spent on lowering the post-harvest losses. Each year 1.3 billion metric tons of food which is enough to feed 2 billion people are lost globally each year. Reducing cereal grain post-harvest losses, which are mostly caused by inadequate storage conditions is a worthwhile strategy.

Loss of seed viability is caused by certain elements that are connected to the seeds themselves and the storage environment. Reduced seed life time is correlated with changes in relative humidity, composition of seed, moisture and storage temperature. Farmers in developing countries like Pakistan are harvesting for home consumption are now facing climate change, global warming

and unpredictable rainfall. Polypropylene bags in their typical storage do not perform well at this time even with or without the application of insecticides. The use of high-quality seed is essential for successful crop development since following elements depend on the effectiveness of the seed.

Seed is a living thing and poor storage puts it at danger of losing its viability. Vigor and viability of seed is high at the time of physiological maturity that begin to decline through the operations of harvesting and storage, causes seed deterioration, viability losses, loss of germination and lack of good seedling emergence. Despite the fact that packaging occurs before the ultimate storage of seeds in a seed program's sequence, the storage needs are covered first to demonstrate the kind of packaging which is useful in various circumstances. A good seed program takes place when handling the seed, regulates the temperature of store and relative humidity and practices of good sanitation that maintain, germination percentage, vigor and the high planting value of the seed in terms of purity, health of the seed during storage.

In Central America, metal silos have received a lot of attention. They are likewise hermetically sealed but are physically stronger than flexible liners. In Sub-Saharan Africa, their viability is now being investigated. The hermetic structures made it possible to use current modified atmosphere technology. Because of this, it makes sense that this kind of storage is the type of modified atmosphere technology that can be used to safeguard grain and is also known as hermetic storage.

By lowering oxygen and raising carbon dioxide, other aerobic organisms and insects are the product itself can produce modified atmosphere via this technique. The core idea behind the dry chain is to dry seeds to a low moisture content that is safe for maintaining viability of seed before packing them in hermetic containers maintain continuous drying. Super bags or hermetic bags have the ability to restrict water and oxygen entry; they may be used to execute the dry chain. Increase in carbon dioxide and reduction in oxygen have significant results against insect attacks.

The study on hermetic bags demonstrates that these bags are more efficient in humid environment and reduce the losses due to stored grain pests and fungi. Application of hermetic storage for long-lasting agricultural goods is becoming more popular, although grains have been preserved in airtight pots or containers for several thousand years. In order to preserve seed quality, minimize post-harvest losses, improve food security, and encourage sustainable farming practices, hermetic storage technology is essential. The adoption of hermetic technology in the agriculture sector not only involved policy changes but also be a good initiative in the field of seed storage and grain preservation.

Current marketing scenario of major agronomic crops in Pakistan necessitated the large-scale adoption of hermetic storage technology. Farmers are facing sever challenges in marketing wheat, maize, rice, and dry chilies. Prices of these commodities are very low during the peak of

harvesting season. Farmers must sell their produce at much lower rates due to inadequate storage facilities and lack of crop specific storage knowledge. Hermetic storage is a simple and easily accessible technology that farmers can adopt to store these crops without any losses in quality. Farmers can fetch much higher prices under better marketing conditions if they are able to store their farm produce. This will not only increase the farmers income but also contribute towards national food security by reducing the postharvest storage losses.