Cold Chain Logistics
Resource Centre

Confederation of Indian Industry

Potato

(Table and Seed)

Care During Handling
(Table Potatoes)

Table potatoes are perishable and should be handled with care to avoid breaking and cracking. Should never be treated roughly and never loaded wet. Should not be stored over eight tiers in height as to bottom tiers are liable to damage from over-stowing. This particularly applies to potatoes in bags or frail crates or cases.

Table Potatoes should be stored in a cool, dry, well-ventilated hold at approx. 8-12°C. to minimize conversion of non-reducing sugars such as starch to reducing sugars such as glucose, which darken the product during cooking. Chipping cultivars accumulate excessive sugar if stored ‹12°C. Thus, chipping cultivars are stored at 10°C to 12°C. Potatoes are subject to damage by excess heat and moisture, which cause them to start sprouting, and excess drying conditions, which cause evaporation and shrinkage. It is, therefore, important that correct temperature and humidity are maintained by electrical ventilation, to prevent the accumulation of carbon dioxide and to ensure a constant supply of fresh air.

Sprouting can also be due to excess soil adhering to the potatoes but Phytosanitary Regulations of most importing countries put a very low limit on the amount of soil permitted in a bag and, consequently, this should not present a problem for properly dressed potatoes, which have been inspected prior to shipping.

Freshness Facts

OPTIMUM CARRYING TEMPERATURE
4° C (Seed Potatoes)
8-12°C (Table Potatoes)
10-12°C (Processing Potatoes)

HIGHEST FREEZING POINT
-0,8°C

ACCEPTABLE PRODUCT TEMP. AT LOADING INTO CONTAINERS
Max. 2°C above carrying temperature

OPTIMUM HUMIDITY
90% to 95%

Ventilation setting for containers	**10 m3/hr**
Storage life	**2-9 months** (Seed Potatoes) **2-12 months** (Table/processing Potatoes)
Climacteric / non-climacteric	**Non-climacteric**
Ethylene production	**Very low**
Ethylene sensitivity	**Medium**
Modified / controlled atmosphere	

A black, soft condition of the tubers may be evidence of poor ventilation in storage or storage while a black discoloration just below the surface of the skin is probably evidence of freezing, in which case the tubers may show surface moisture. A green discoloration of the surface is indicative of over-exposure to strong sunlight after lifting or in storage or in transit. This causes potatoes to become inedible.

Care During Handling (Seed Potatoes)

The storage of seed and table potatoes is similar. and every care should be taken in handling them. Seed tubers are commonly stored at 4°C as at temperatures ›4°C to 5°C, sprouting accelerates. Freezing or excess drying prevents the potatoes from sprouting and excess moisture causes the potatoes to grow long weak sprouts which are broken off in subsequent handling. Humid conditions encourage any bacterial and fungal diseases present to spread more rapidly through a sack, with subsequent damage to surrounding sacks. However, care must be exercised in differentiating between loss due to inherent vice and that caused by normal mishandling of sacks.

When shipping seed potatoes there are often several different varieties included in a cargo and it is important that any burst bags be refilled with care and that potatoes that have been spilt be re-bagged quite separately. In both cases the bags should be marked accordingly, as it is very important that a farmer does not receive mixed varieties as each variety has its own characteristics, e.g., earliness, shape, colour, use, etc., which makes the subsequent crop if mixed, unacceptable to the consumer.

Packaging

Potato tubers are commonly packed in leno bags made of Hussein, poly-mesh or kraft paper and in crates, barrels, and cartons. Potato seeds are packed in Jute bags. Good ventilation is needed to avoid excess CO2 build up which leads to rottage and sprouting issues. During Off-season potato, after cold storage, is packed in red nylon bags to permit proper aeration. Properly matured, cured, and dried potatoes can store for a more extended period. All kinds of soil are to be removed before storage.

Following are the important due considerations to be followed for quality maintenance

Exposure to excess heat and moisture will cause sprouting and excess drying atmospheric conditions causes evaporation and shrinkage.

Over-exposure to strong sunlight may cause potatoes to become green and inedible. Long-term storage of potato tubers of up to 12 months requires that they be cured properly.

Quality tubers can be stored for 2 to 12 months, depending on quality at harvest, quality of storage facilities, variety, and whether sprout inhibitors are used.

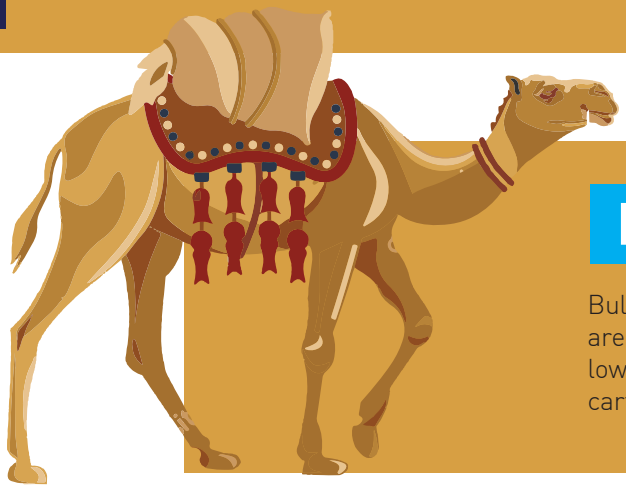
Sprout inhibitor may be applied in the field before senescence begins, on the tubers as they are graded and packaged, or in the storage after curing is completed.

Curing stimulates suberization, wound healing and reduces respiration. Optimal curing conditions are around 20°C with 80% to 100% RH and forced ventilation.

Maintaining high RH is always required to minimize shrinkage and pressure bruising in storage

Head load

The age-old method of carrying produce by a person on the head is convenient in hilly areas where the quantity of carrying produce is less and transportation is done within close vicinity.

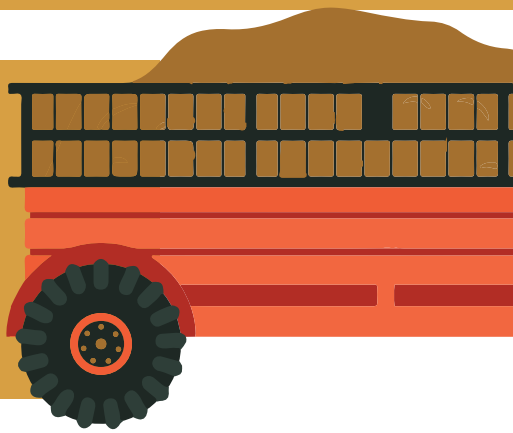


Bullock / Camel carts

Bullock / Camel carts are the primary means of transport in rural areas. The Bullocks offer cheap and easy availability with a relatively lower operational cost in rural areas. Significant advantage in bullock cart is its operation in muddy, kutcha or sandy roads.

Tractor trolley

The use of tractor attached with a trolley is commonly used for transporting potatoes in many parts in the country. It is convenient for carrying large quantity of produce in less duration of time. In surplus producing areas, where primary assembling markets are far away, tractor trolly serve as convenient means of transportation.



Trucks

Large or bulk quantity of potato tuber and seeds are carried by trucks to the distant places throughout the country. The seeds are carried in Gunny bags, while the tubers are carried in both gunny as well as Leno Bags. Padding using paddy straw must be done to ensure no pressure damage occurs in transit. The major advantages using trucks included Easy and timely availability and lower transit losses due to better handling and less shocks.

Railway Transport

During harvesting season, considerable quantities of potato are transported by railway wagons. Railways offer cheap and safe transportation wherein a large quantity of potatoes can be transported. Another significant advantage in railways as a means of transportation is it's wider reach in different parts of the country because of the wider range of the railway network.