

Appendix 4: Brochure on Potato Stores/Storage

SIMPLE LOW-COST TABLE POTATO STORE

GROUND PLAN
for about 6 tonne capacity

Labels: Grass Thatched Roof, Door, Upper Window / Vent 1.5m wide & at least 0.5m high, Mud Walls (2.5m high), Table Potato (Load 1m high) in a 1.2m high wooden or bamboo shelf raised at 0.5m from the ground on poles, Lower Windows 1.5m wide & 0.5m high is possible, Corridor (0.6m wide), Corridor (1m wide), Wooden or bamboo stripes arranged 1cm apart to form a ventilated shelf base to allow aeration of the table potato.

SIMPLE LOW-COST SEED POTATO STORE (DIFFUSE LIGHT STORE)

GROUND PLAN

Labels: Walls of about 2.5m height with bamboo or wooden planks leaving 1cm gap between them for aeration, Grass Thatched Roof, Shelves (Bamboo structure) each of 0.5m height supported at 1m intervals with poles, 0.5cm gap between bamboo, Entrance, Seed potato laid on shelves (maximum of 3 layers).

Simple Low-Cost Table Potato Store (Front side)

Simple Low-Cost Table Potato Store (Back side)

LOW - COST STORES FOR SEED AND TABLE POTATO

Simple Diffuse Light Seed Potato Store (Inside)

Simple Diffuse Light Seed Potato Store (Outside)

This brochure is the proceeding of a training workshop on potato storage conducted by CIP and AT-Uganda in Kapchorwa, Uganda on 12th July, 2005

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Introduction to potato storage

Usually, potato production is seasonal while consumption is continuous throughout the year. During harvest period, supply is generally greater than the demand. This creates surplus that forces prices to drop. In order to stabilize the price or to sell at higher prices and ensure continuous supply of table potato to consumers, surpluses need to be stored.

On the other hand, seed potato tubers are dormant at harvest and should be planted when they have developed multiple vigorous sprouts. Use of diffuse light stores is recommended for seed storage.

Most farmers sell all their potato immediately at harvest at give away prices. The reason they give is that potato can't be kept for long, as it will rot or turn green or sprout. It is therefore of paramount importance to educate farmers on factors that contribute to storage losses, on how to reduce these losses, and on how to construct simple low cost stores for table potato and seed tubers.

Some farmers' traditional storage methods for table potato in Uganda

- Delay harvest by up to one month.
- Keeping of tubers in a dark corner of the house for one month. Only limited quantities (200 to 300kg) are kept using this method.
- Keeping of tubers in granaries made with mud walls and grass thatch roofs. Only healthy looking sorted potato tubers are stored. This type of storage can contain 1 to 1.5 tonnes of potatoes. In cold mountainous areas, farmers have reported that tubers can be stored for up to 6 months but weak sprouts grow after the dormancy period of tubers.

Types of losses during potato storage and methods of control**1. Rotting of tubers**

Rotting is caused by diseases such as bacterial wilt, black leg, fusarium, late blight, etc.

To control rotting, plant healthy tubers in non infested soils. Do not store tubers harvested from wilted plants even if they are healthy looking. Bruises and cuts create entry points for disease causing germs. Harvest should be done when the crop is fully mature and two weeks after killing of stems.

Sanitation is important; this includes keeping work tools clean to limit spread of disease and removing volunteer potato crop during rotation. All these help reduce the spread of bacterial wilt. When sanitation is combined with use of clean seed and crop rotation, quality potato tubers can be produced continuously, and storage losses can be minimized.

Avoid physical damage on tubers during harvest and post harvest handling.

High storage temperatures favour disease development and rotting. Keep storage temperature as low as possible.

2. Damage on tubers by insects

Potato tuber moth (PTM), cutworms (*Agrotis* sp), millipedes are some of the insects that cause damages on tubers in the field and in storage. Plant PTM free seed tubers and use recommended agronomic practices such as good hilling up of plants to control them during production. Recommended insecticides can be used to control cutworms and millipedes in the field.

3. Tuber weight loss during physiological processes in tubers

Tubers are living organisms. Physiological losses take place during respiration, transpiration and evaporation. During these processes, there is loss of tuber dry matter and water that cause tuber weight loss and shrinking. To reduce physiological losses, store mature suberised (harden) healthy tubers. The storage temperature should be kept as low as possible. Do not store wounded tubers.

4. Loss of tuber quality during storage

- Tuber greening for table potato:* greening of tubers is caused by light in storage. Green tubers are not good for consumption. Table potato should therefore be kept in dark stores. On the other hand seed tubers should be kept in diffuse light stores in order to obtain vigorous sprouts.
- Sprouting of table potato:* limit the storage duration of table potato to the dormancy period of the variety being stored. Most varieties have a dormancy period of 2 to 4 months.
- Shrinking of tubers:* This is due to water and dry matter loss.
- Wounds, bruises and rots also reduce tuber quality and market value of the produce.

Factors to consider when designing and constructing low-cost potato stores

- Storage temperature should be kept as low as possible. Choose appropriate site (cool place), provide ventilation. Tubers can be put on raised wooden floor off the ground and temperature and humidity in storage can be modified by pouring water on the ground to reduce physiological losses and tuber shrinking.
- Dark stores for table potato and diffuse light for seed potato.
- Quantity of potato to store and duration of harvest. The quantity produced will determine the size of the store. Duration of harvest can help to determine if separate harvests will be stored in separate lots.
- Number of potato varieties being produced. This permits to determine the number of separate compartments needed in the store.
- Dormancy period of each variety. This helps to determine duration of storage.
- Wind direction at the storage site. Orient building to allow in air; bottom vents should face the wind. The vents should allow in air from the bottom of the wall and out through the vents at the top of the opposite wall (*see photos*). This will enable cool air coming in to push out hot air.
- Control the height, length and width of tuber heaps in storage.
- Available construction materials in the locality. i.e. some available materials in Kapchorwa district of Uganda include iron sheets, timber, banana fibre, bamboo, mud/cow dung, poles of various sizes, nails.

In summary, some requirements for simple low-cost table potato storage include: dark store, elevated floor with small holes to let in air through ventilation vents, the height of a heap of potato should be 1 m, there should be free 0.5 to 1 m space above the potato heap and cool temperature (*see photos and designs*).

For seed potato, diffuse light is needed for thick short strong sprouts (as opposed to thin, long weak sprout in dark store) that will produce vigorous plants and high tuber yield. Ventilation and low storage temperature are also required. If seed is stored on shelves, limit the number of layers of seed tubers to a maximum of 3 to allow light reach all tubers (*see photos and designs*).

Construction of simple low-cost stores for table and seed potato
(*See photos and designs*)