



DESIGN & DEVELOPMENT OF ECO-FRIENDLY FRUITS AND VEGETABLES STORAGE

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ABSTRACT

Two-third of the population of India depends on agriculture which shares about 54% of gross domestic product. Although there is huge potential of vegetable cultivation in India, however post-harvest losses of vegetable negatively affect the economy of Indian agriculture. The vegetables are vulnerable to high temperature. The adoption of newer storage techniques is necessary to prevent waste of fresh vegetables. The zero energy cool chamber (ZECC) is an eco-friendly system with low cost of construction. The present study was conducted to qualify the quality and storability of vegetables (pointed gourd and okra) in different storage conditions such as in ZECC, room, and freeze conditions. We measured the physiological loss of water (PLW) and vitamin C of vegetables under different storage conditions. The study was conducted at Agricultural Engineering Division, Khumaltar, Lalitpur, India. Pointed gourd and okra were purchased from the local market. They were stored in four different storages conditions such as in ZECC, room condition, freeze conditions and eco-friendly storage of vegetables and fruits. The results showed that the highest PLW (%) was recorded on fifth days of storage for the room storage and the lowest was recorded for ZECC condition. The vitamin C significantly increased on the fifth day of storage compared to the first day for all types of storage. On the seventh day of storage, vitamin C was decreased compared to the fifth day in both ZECC and freeze conditions. The PLW was higher in freeze storage condition compared to that of ZECC condition. We concluded that pointed gourd and okra stored in ZECC can be stored until fifth day of storage after considering both quality and PLW. Our result suggested that eco friendly fruits and vegetables can be used as a storage structure for vegetables and fruits.

Keywords – Eco friendly, Storage Box, Low Cost

1. INTRODUCTION

India is the second largest vegetable and fresh fruit produce in world. Farmers are attracted to vegetable farming in India . Two-third of the population in India depends on agriculture which shares about 54% of gross domestic product . Farmers can generate cash by cultivation vegetable crops even in a small plot of land in a short period and can improve their livelihood. Although

there is huge potential of vegetable cultivation in India, however post-harvest losses of vegetable negatively affect the economy of Indian agriculture. reported that the post-harvest loss of fruit and vegetable in India is about 20-50 percent. After harvest of vegetable, it is stored and transported under various environmental conditions before it reaches the retailer market. Post-harvest losses during handling, transportation, storage, and distribution are the major losses for perishable vegetable marketing Reported that improper harvesting and post-harvest practices cause the spoilage of vegetables which reduces the quality of vegetables such as deterioration in appearance, taste, and nutritional value before reaching the market. The vegetables are vulnerable to high temperature. The adoption of newer storage techniques is necessary to prevent waste of fresh vegetables. In India quality deterioration of horticultural produce takes place immediately after harvest due to lack of on-farm storage Spoilage of fresh fruits and vegetables is a serious problem. Cool storage can prolong the life of fresh produce, but refrigeration equipment is expensive to buy, run and maintain involving large initial capital investment. Considering acute energy crisis and lack of cool storage facility efforts made to develop low cost/low energy cool chambers. We are in process to developing technology for Design of eco-friendly fruits and vegetables storage an alternative of common refrigerator. (Low-cost environment friendly) it is useable to people, farmer and vendor of storage chamber, for fresh fruits, vegetables and flowers extends their marketability. Spoilage of fruits and vegetables can be controlled by reducing the storage temperature. Eco-friendly fruit and vegetable storage stay 10- 15° C cooler than the outside temperature.



Fig. 1- Vegetable Wastage

1. LITERATURE REVIEW

Due to this Eco-friendly vegetable food storage freeze, the life of vegetables and food is increased. This model is movable and easy to transport hence this model is cheap to buy. This model help to increase to income of small- and large-scale farmers as well as sellers. manufacturing of the model is very easy and cheap.

Wastage of food and vegetables due to environmental conditions can be eliminate by using this model.

2.1 Objective

- To increase the life of vegetables and food.
- To design the Eco-friendly vegetable storage freeze.
- To avoid the food wastage by using Eco-friendly methods.

Advantages

- 1- Design developed in less cost
- 2- No need of energy
- 3- No maintenance
- 4- Easily moveable (transportable)

Limitation

- Changing sauran grass within two or three months

2. WORKING

3.1 Steps Of Construction

- Taking L-shaped four channels whose length is 18 inch
- Taking L-shaped two channels whose length 26 inch.
- Taking L-shaped four channels whose length is 16 inch.
- Produce a rectangular shaped basement whose dimensions 26*16 inch
- Producing rectangular shaped upper side tank whose dimensions are 26*16
- Joining the iron net two sides of model whose dimensions are 26*13
- Putting the rectangular tank on the upper side of model whose dimensions are 65*39*5 mm
- Bottom side collection tank whose dimensions are 77*45 *10mm.
- Putting the caret in model whose dimensions are 20*10



Fig. 2- Eco friendly cool storage (a)



Fig. 3- Eco friendly cool storage (b)

3. CONCLUSION

- This model is milestone for the small and big scale farmers
- Due to this Eco-friendly vegetable freeze life of vegetables and fruits are increased
- It is cold storage used for maintaining moisture and temperature of vegetables and food, this also maintain life, freshness and quality of vegetable and fruits
- Wastage of food is reduced
- Losses decreases and profit increases

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