PRE HARVEST AND POST HARVEST LOSS OF ORANGE IN KARMALING GEWOG, DAGANA DISTRICT, BHUTAN

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Content

- Introduction
- Research aims and methodology
- Literature review
- Reason for loss of orange
- Results and discussions
- Conclusion and recommendation

Introduction

- Orange is one of the cash crop for the Bhutanese people.
- Mostly grown in southern part of the country.
- Bhutanese people practices mixed farming
- Dagana *Dzongkhag* is located in southern part of the country that covers an area of 1389 Sq. Km, with an elevation ranging from 600 to 3800 meters above the sea level.
- Karmaling gewog people rely on agriculture farming, where orange and cardamom is main source of income.
- Pre harvest and post harvest losses of orange was the major challenge for them.

Research aims and methodology

- Aims to bring the challenges of the citrus growers into the notice of concern authority for the improvement in the future and the other alternatives that the farmers of southern Bhutan.
- Aim to estimate the pre and post harvest loss of oranges and the factors leading to loss particularly in Karmaling goeg, Dagana Dzongkhag due to transportation, storage and grading.
- It was based on literature review, field examination, observations and personal interviews with related people

Literature review

- Worldwide citrus is largest exporting fruit.
- According to FAO (2014), Brazil ranks first in citrus production followed by United States, China, India and Mexico, and in 2013 Bhutan ranked 70th in terms of oranges production.
- Pre and post-harvest losses in tropical fruits vary widely from 10 to 80 percent in both developed and developing countries.
- Citrus is one of the most important cash crops in Bhutan, home to some 670,000 people.
- The six largest orange growing *Dzongkhags* in terms of production are Tsirang, Sarpang, Pemagatshel, Samdrup Jongkhar, Dagana and Chhukha

Cont...

- India accounts 40% loss of orange (2012)
- Bangladesh has only 23.6% lower than loss of other fruits(2015)
- Nepal has 25 to 35 percent as of 2017

Reasons for loss of orange

- Pest and disease
- Poor transportation
- Poor handling
- Shortage of storage with necessary equipment
- Poor packaging
- Lack of knowledge
- No proper distribution

Results and discussion

Preharvest loss

- The preharvest loss which may be due to the pest and diseases, agroclimatic factors, edaphic factors, fruit drop or destructions incurred by wild animals and birds was evaluated during the peak harvesting season.

Postharvest loss

- In Bhutan the mode of transportation of oranges from field to terminal market are divisible to two parts. They are: 1). Transportation from orchard fields to road point: 2). Road point to depot (terminal marketing area).
- **Loss of orange in terms of Percentage**
- The average loss in terms of percentage showed that 65.50% is lost due to shape, size, and colour while 20.63 incurred by button holes and the lowest loss is incurred by mechanical injury with 13.38% from each tray that contain average orange weight of 29.95kg or 4.95pons.

Conclusion and recommendation

- Orange is the main source of income for many Bhutanese people.
- It has highest export value due to its large in size and unique taste.
- Pre harvest and post harvest loss was left unreported.
- Various factors such as greening disease, powdery mildew, insect and pest have affected the production of citrus and there was noticeably high decline of citrus production in Bhutan.
- Proper pre and postharvest practices in citrus is an important step helping farmers to reduce the losses and increase the yield.
- careful harvesting without button holes will reduce the losses.

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