

Strategies to reduce food waste - a case study in India avoiding bruises on apples by optimising orchard management

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Introduction



Bruises are a common cause of decay of apples, fungal or bacterial infections and short shelf life and hence contribute to food waste.

The objective of this contribution is to identify potential causes and suggest strategic orchard management practices in India.

Material and methods

The first author examined several apple orchards on-site during her visits to Northwest India for potential causes of bruises on the fruit and interviewed farm managers, farmers and staff.

As a result, we analysed potential causes of and suggest countermeasures to prevent and combat the development of bruises on apple fruit.

Background – rationale - facts

India

- has to feed a population of ca. 1.83 bil people
- Food waste can account for 25-40% losses
- is the 5th largest apple producer in the world
- grows ca. 2 mil tons of apples yearly
- in the Northern hillside provinces of Jammu & Kashmir, Himachal Pradesh and Uttarakhand
- imports ca 1 mil t apples from (China,) US, Europe, with a good reputation as “*bruise - free*”

Causes of bruises on fruit

- “impact forces” from dropping apple from a height
- “impact forces” from squeezing fruit to fruit or fruit against a hard surface (picking basket, crate)
- Bruises are tricky, do not become immediately visible

Results

Overall, the majority of bruises developed due to lack of knowledge, staff training and bruise un awareness.



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Careful picking without finger pressure on the fruit (left) and two picking devices (right), where padding and limited fruit stacking could easily and cheaply reduce bruises and over-tight packing in cardboard boxes

Summary and countermeasures



Countermeasures include optimum harvest date and time, staff training, padded picking devices, limited stacking height, gentle emptying panniers, and substitution of plastic panniers by soft bags, panniers and substitution of wooden boxes by cardboard boxes without overfilling.



Literature

Golombek, S. & M. Blanke, 2022: Orchard management strategies to reduce bruises on apples in India: a review. *Vegetas* (Springer Nature) 35, 1-8. open access. <https://doi.org/10.1007/s42535-021-00326-7>