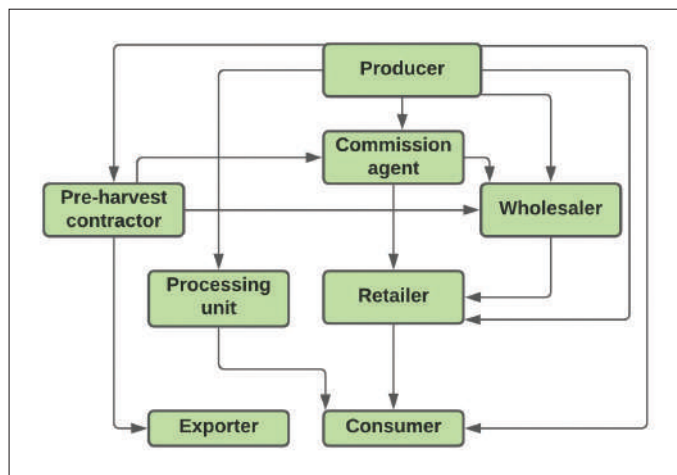


Punjab's Kinnow Value Chain: Problems and Prospects

Kinnow fruit is a rich source of ascorbic acid, bioactive constituents, vitamins and volatile compounds. Its cultivation in Punjab has raised popularity due to its profitability and high market value among the citrus fruits. The best period for harvesting of Kinnow fruit is from mid-January to mid-February. A typical value chain of kinnow runs from the farmer to the aggregator or post-harvest contractor (PHC), then via open truck transportation to the mandi or distributor, and finally to the retailer. Waxing and grading units are the major value chain identified in Punjab which increases the market value of fruit by improving the appearance and the shelf-life of the kinnow mandarin. Problems like high price of raw material, high capital and working cost and lack of well-developed trade channels to export this fruit to international markets has to be addressed to improve income of the stakeholders involved in kinnow value chain.

KINNOW cultivation in Punjab has raised popularity due to its profitability and high market value among the citrus fruits and covers around 48% of the total area under fruit crops and accounts for 58% of total fruit production. The south-western zone of Punjab comprising Fazilka, Ferozepur, Muktsar, Bathinda, Faridkot and Mansa districts are known as “kinnow belt” as this zone accounts for 75% of the entire area under kinnow cultivation in Punjab. Over time, Kinnow's demand witnessed positive growth due to its high productivity, attractive golden peel colour and high juice content with orange colour juice vesicles. Kinnow fruit is also a rich source of ascorbic acid, bioactive constituents, along with specific minerals (sodium 0.01–0.03 mg/g; potassium 1.6–2.5 mg/g; calcium 0.14–0.47 mg/g, and copper 6–8 mg/100 ml), vitamins and volatile compounds.

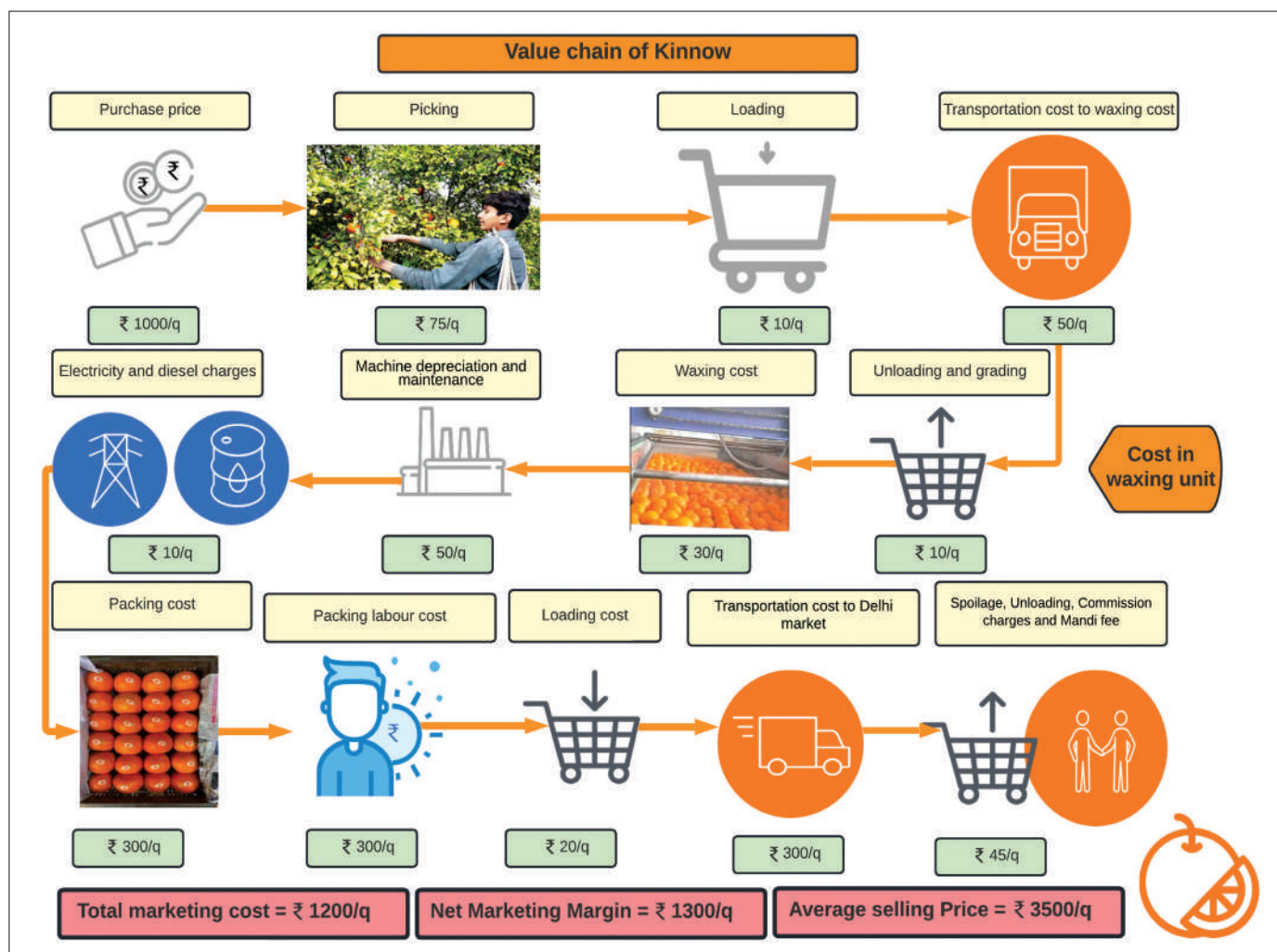
The best period for harvesting of Kinnow fruit is from mid-January to mid-February. The fruits should be cut with clippers, close to the peel of the fruits retaining shortest stalk and green button. The later is taken as sign of freshness as naturally dropped fruits don't retain the green button. All necessary precautions should be taken to prevent injuries, any contamination or cross contamination of the product after picking. Therefore, farmers mostly do post-harvest contract with aggregators and get rid of this issue. A typical supply chain of kinnow runs from the farmer to the aggregator or post-harvest contractor, then via open truck transportation to the mandi or distributor, and finally to the retailer. Different supply chains are identified in the Abohar, Fazilka as shown in figure.



Supply chain of Kinnow

Kinnow value chain – Costs and problems

The value chain is a recent concept in which various stakeholders play a significant role in increasing the value of a product through different activities like sorting, waxing, grading and marketing, etc. The marketing channels are the routes through which the agricultural commodities reach from the producer to the ultimate consumers. The price spread is the gap between price paid by the consumers and price received by the producer. The estimation of marketing margins, cost, price spread and producer's share in consumer rupee of different marketing channel is important so as to improve the market structure of kinnow. It helps in the formulation and evaluation of market policies such as market fee regulation for various market functionaries and functions. It can be used to set suitable pricing policies and ensure that producers receive a significant portion of the consumer's rupee.



Value chain mapping of Kinnow (2020-21)

Figure depicts the marketing cost and marketing margin of kinnow value-chain. The kinnow growers sell their produce at ₹ 1000 per quintal to the traders. These traders in addition to trading activity, act even as pre-harvest contractor (PHC), waxing processor and transporter to the distant market. The picking cost borne by the PHC is about ₹ 75/q. The total cost of waxing in the unit is ₹ 100/q. The cost of packaging material and labour cost of packaging is ₹ 300/q for each marketing function. The transportation cost to the Delhi market is ₹ 300/q whereas in the Bengaluru market it is around ₹ 700/q. The average price received by the trader in Delhi market is ₹ 3500/q with net marketing margin of 37.14% of selling price.

Kinnow waxing and grading units are the major value chain identified in Punjab which increases the market value of fruit by improving the appearance and the shelf-life of the kinnow mandarin. Wax coating is an important unit operation in kinnow packing house since it accomplishes following objectives:

- Applied gloss on fruit surface adds aesthetic value, improves external appearance and extends storage life,

- Provides protection from water loss as coating replaces natural wax which is removed to some extent during washing operation,
- Reduces respiration (excessive reduction results in an off-flavour); effective wax coating should reduce weight loss by 30%,
- Acts as carrier for fungicides or any bio-agent to sustain its growth.

Synthetic or natural waxes are generally used to treat the kinnow fruits. Fruit should be damp dry prior to wax application to prevent dilution. Wax should be applied at 1.5 litres per tonne of fruit. It is estimated that about 80% of the produce is sold to pre-harvest contractors and remaining to other agencies. After sorting and grading, smaller sized fruits are used in juice processing.

As per the many focussed group discussions with the kinnow growers, many production related problems like pest and insect attack, unfavourable weather conditions, high input cost and shortage of planting material are faced by the growers. While, high price fluctuations, inefficient market infrastructure, malpractices, perishability of the fruit, high transportation charges are the problems faced during the marketing of kinnow.

Acceptability of any juice in the Indian market increases due to its sweetness according to experts of Punjab Agro Juice Limited. The demand of kinnow juice in the Indian market is not that much high due to bitterness in the juice. The bitterness in the kinnow is due to its higher content of limonin and naringin biochemical compounds and this bitterness is removed by citrus processing industry by use of different raisins. Some problems found in the processing of kinnow include high price of raw material, high capital and working cost, and lack of well-developed trade channels to export this fruit to international markets.

According to traders and exporters, Pakistan is one of the major exporters of Kinnow in the world market. The government of Pakistan has invested more in developing the innovative value chains of kinnow and increase the demand of their produce at the global level, whereas, share of export in the total production of kinnow was not found to be very significant. India has only exported its produce to Bangladesh and UAE. The APEDA has to play a major role to increase kinnow export demand in line of Pakistan and to develop stable trade channel for this fruit.

Prospects

- Farmer producer organizations (FPOs) and cooperative marketing systems can be introduced to ensure assured market and better price for the products.
- Development and improvement in cold infrastructure by giving subsidies to FPOs.
- Refrigerated truck and train should be initiated by the government from Kinnow belt to South India.
- Improvement in quality of wax which increases its shelf-life which in turn leads to increase in the exports volume from India to countries like Russia and USA.
- An awareness campaign should be initiated focussing the growers to educate them about the export potential, waste management and international market requirement.
- FPOs of Abohar (Punjab), Sirsa (Haryana) and Sri Ganganagar (Rajasthan) should register for GI

(geographical indicator) tag to kinnow belt of this region.

There is lack of post-harvest and export oriented infrastructure facilities in the producing market. In the absence of such facilities, kinnow grower's going for pre-harvest contracts. Hence, ramping up such facilities by Punjab Agri Export Corporation Limited (PAGREXCO) and Agricultural and Processed Food Products Export Development Authority (APEDA), such that growers can avail them easily, will have a positive impact on domestic sales as well as exports.

Logistics including waxing units, cold chains, reefer trucks, etc for kinnow, need to be developed and made accessible to the stakeholders in the value chain. This support in terms of providing logistics will greatly improve the shelf-life and quality of the fresh produce reduces wastage, and enhances the marketability of the produce. In turn kinnow growers can get benefitted from greater demand as a result of robust value chain.

SUMMARY

Kinnow is the most popular fruit crop of Punjab and 80% of kinnow is grown in south-western region of Punjab. High price fluctuations, inefficient market infrastructure, malpractices, perishability of the fruit and high transportation charges are the major marketing problems faced by kinnow growers. Farmers' producer organizations and co-operative marketing system must be introduced for assured market and stable prices. Better logistics and export-oriented infrastructure facilities should be developed to decrease the per unit marketing cost and increase the demand of kinnow. This will ensure higher income to the kinnow growers.

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