

Value chain in Mango.....a assignment....PFDC, NAU, Navsari and SHM, Ganghinagar (Gujarat)

Cluster: Valsad, Gujarat

With a view to know the status of production to consumption practice related to mango at each stake holders level of south Gujarat, a systematic survey was conducted by Navsari Agricultural University, Navsari with the help of SHM of the state as per the guideline and prescribed format provided. In all, 100 mango growers from 20 villages were interviewed and survey was conducted.

With the scientific intervention of SAUS, Government and Semi-Government agencies, Public and Private Sector Industries, NGO and Co-operative societies; new technical ideas were executed toward production system, post harvest management and value added products development technology for mango at farmers field, processing industries and consortium laboratories. 650 stake-holder from farmers to merchants were trained for scientific production technologies, post harvest management with ripening operations and processing of value added products respectively for mango. The scientific way for utilization of valuable agrochemicals, micronutrients, fertilizers, farm input, farm tools, irrigation water, *etc* was demonstrated using efficient and correctly mechanized operations.

1. Planting material availability

a. Major varieties adopted by farmers:

There are have been around 100 farmers across the valsad district were contacted for base line survey of mango. About 80% of land holding are with small and marginal farmers with an average size of 1.30 ha. Maximum number of farmers have planted Alphonso and Kesar variety as a lead. As Valsad district is renowned for its Alphonso mangoes.

b. Certified nurseries

Majority of farmers have planted grafted plants of mango varieties. Main propagation technique is cleft grafting or modified veneer grafting. True to type plants are made using such techniques in certified nurseries and nursery of SAU. There are around 91 certified nurseries and one SAU nursery near Valsad district. Plants are acquired from such nurseries are profound to be healthy, true-to-type and free from any pest and diseases.

- c. Which type of plants are use to make orchard: grafted plants are in of maximum use for orchard plantation of mango in valsad district. As gestation period can be reduced. Before planting land is prepared by thorough ploughing. Ploughing during the month of Nov.-Dec. has been adopted by majority of farmers which facilitated reduction in infestation of pests in soil.
- d. Around 16 farmers have adopted high density planting at a distance of 3.0 m X 2.5 m, which population of 1333 plants/ha. Regular pruning and canopy management has been practiced to sustain the framework. Majority of farmers have used the method of drenching of 50 ml/lit chloropyriphos to reduce the infestation of termite in new plantation.

2. Fertilizer schedule adopted by farmer

a. Fertilizer dose

Majority of farmers have adopted the fertilizer schedule given by State Agriculture University for mango. Recommended dose of fertilizer of mango in South Gujarat zone is 750:160:750 g NPK plant per year for 10 years old tree. Organic manure in the form of FYM is adopted by all the farmers having around 100 kg per tree per year for 10 years old tree.

b. Time of application

Farmers across Valsad gives fertilizer in the month of June with half dose of nitrogen during monsoon (June-July) with full dose of phosphorus and potassium and remaining half dose of nitrogen in the month of February. In terms of micronutrients majority of farmers are applying 50 to 100 gm zinc sulphate and 100 to 200 gm ferrous sulphate per tree as only these elements are to be found scare in South Gujarat soils.

c. Types of fertilizers

Both organic and inorganic fertilizers are being used by all the farmers.

3. Insecticide/Pesticide

a. Types of IPM adopted by farmers

Generally farmers across the district have adopted the crop protection calendar of SAUs which includes application of pesticides/fungicides from the month of October to April during critical growth and development stage.

b. Any specific major issue

One of the major constraint accounted by farmers of mango cv. Alphonso is irregular bearing. However, around 58 farmer have adopted the application of

paclobutrazol @ 2 a.i/lit as recommended by SAU and State horticulture department. Spongy tissue in alphonso mango have also seems prevalent. Sod culture and mulching have been adopted by some farmers to reduce the incidence of spongy tissues.

c. Time of regular application

Regular application of copper sulphate and cholopyriphos after harvesting of mangoes and before onset of monsoon is been practiced by majority of farmers to check the diseases and pests during monsoon period. There has been issue of malformation has been accounted by some of the farmers, field sanitation and fungicide application has been practiced by these farmers. Farmers are been encouraged to buy planting materials from certified nurseries of govt. of Gujarat or from the agricultural universities.

4. Irrigation

a. Conventional methods of irrigation

Farmers across the district are mainly depend upon canal water for irrigation. Flood and furrow method with ring method is mainly adopted by farmers. However, some farmers have adopted HDPE pipe for water application at pea and marble stage in the ring of tree, which have been shown to save water by 10-12%.

b. Micro

Drip irrigation is only adopted by approximately 4% of farmers. Peak stage of irrigation adopted by farmers was pea stage and marble stage.

5. Production Traits

1. Field practices adopted by farmers

a. Land preparation

Land preparation is done before planting in the month of April-May by farmers. Farmers are incorporating farm yard manure during land preparation. Some farmers are also incorporating castor cake/bicompost during field preparations.

b. Planting season/Method/Distance

June-July with moderate monsoon is the main planting season of new mango plantation in Valsad district. Staking during planting of grafts is common practices adopted by every farmers. Common planting distance of 10X10 m has been adopted by all the farmers.

c. **Training/Pruning adopted if any**

Farmers have adopted light pruning of trees during growth stages have adopted for better framework. SAUs have recommended to apply center opening technique for increase in light penetration and better growth of tree.

2. IPM schedule

As per SAU crop protection calendar

3. Application of compost/OM if any

Generally, well rotten farm yard manure used by all the farmers across the mango orchard. However, some farmers have also started applying castor cakes, banana pseudostem sap, vermicompost as a mean of organic manure incorporated in soil. Approximately 10 t/ha of compost is incorporated by farmers.

4. Any SAUs/ICAR technologies adopted by farmers if any

- a. 29 farmers across the district have adopted the technique of pruning/center opening of tree using Lux meter which ensure better light penetration and high availability of light. Light availability in orchard have increased up to 70% after this technique.
- b. Rather than giving random irrigations, maximum farmers have adopted to give light irrigation during winter period. Irrigation using HDPE pipes and ring method at pea and marble stage have adopted by farmers which have shown to reduce the water waste and increase the fruit retention.
- c. Farmers have adopted the soil and plant analysis by the help of SAUs and give fertilizers accordingly as per the requirement. Such practices have reduced the judicious use of soil and foliar fertilizers.
- d. Farmers have adopted IPM schedule recommended by SAU as a plant protection measure which have eventually reduce other private allies.
- e. Harvesting at proper tapka stage have been adopted by farmers for better market quality. 'Dapoli' harvester developed by agricultural university have adopted by farmers which have seems to reduce the harvesting time.
- f. Farmers and merchandisers have adopted the use of CFB boxes for on field packaging of mangoes.

6. PHM

1. Harvesting/Cleaning/Sorting/Packaging

- a. Harvesting Stage

Farmers are harvesting mango at tapka stage across district. Also for long distance market harvesting at earlier stage per marketing requirement is adopted.

b. Harvesting time and peak month

Main harvesting season for the mango in Valsad district is April-May.

c. If any specific PHM practices

- i. Around 58 farmers and their marketing agents have adopted technique of de-sapping of mangoes after harvest to reduce the post-harvest losses occur due to tannins in sap.
- ii. Bagging using news papers bags were adopted by few farmers which have shown increase the average weight of volume by 16% and reduction in fruit fly and spongy tissue damage.
- iii. Sorting and grading during harvesting is a common practice among farmers to fetch good market prices per grades.
- iv. There has been increasing issue of fruit drop encountered by the farmers across the district. Farmers have adopted SAU techniques of application of 2 gm NAA + 2 kg urea in 100 lit of water spray.
- v. Farmer/Sellers also adopted using ethaphone @ 185ml/100 lit for ripening of mango instead of using Carbide which has been banned for use.

2. Processing

a. No. of processing units

There are around 3 processing sectors working in valsad on medium and large scale. Majority of industries are making pulp and pickles from ripe and unripe mangoes.

b. Processed products made by farmers

There are several processed products made from ripe and unripe mangoes. Mango pulp and its product includes mango papad, mango juice, mango nectar, mango jelly, mango jam, etc are widely made. Mango pickle is of utmost important product made from unripe mango fruits.

c. Gruh Udhyogs

Gruh udhyogs runs by women of rural areas been survey for its products and action. Women in the villages are engaged in making home made pickels, dry

powder of mango stones and mango papad at small to medium scale levels. Around 29 gruh udhyogs are running across the districts.

d. Quantity processed

Mango pulp processing and canning is by far the most processed product across the industry. Approximately 1 lac tones of pulp is being made and canned.

3. Storage facilities across district

a. Ripening room/cold room

There are around 7 ripening units and cold rooms are established owned by private sectors. Farmers selling their mangoes to processing industries are allowed to put their produce in such facilities. However, SAU also provides facility for ripening of mango and cold room for farmers on hire basis.

4. Marketing linkages

Majority of farmers are engaged in selling of mangoes to the merchandisers, directly to *sahakari mandli* or to processing industries. Small group of farmers are found to sell mangoes on their own. For marketing, farmers are getting higher price when they sell on their own. However, merchandiser and processing industries have lower price of mangoes as compared to other means. Marketing produce to the distance market is mainly practiced by merchandisers who buy mangoes directly from the farmers at decided rates.

7. Identification of Gaps

1. There has not been any involvement of FPO or FIGs found to be linked with aggregate of mangoes from the farmers across the district.
2. Status of skill development
 - Farmers have been provided on field/off field training for cultivation practices, post harvesting and marketing of mangoes through state horticulture department, Agriculture University, KVKs and SSKs extension programs.
 - Under value chain project around 400 farmers were trained for sorting, grading, packaging of fruits, use of ethaphon for ripening and visit of ripening and cold rooms.
 - Approximately 250 farmers/enterpenuers/processor/stakeholders are trained on processing and marketing of mangoes.
 - Marketing linkage has been established through public private partnership with BAIF, Patson foods Pvt ltd., Food and Inns Pvt Ltd.and Sachi Exports.

- The project on value chain in mango have done around 5 buyer sellers meet to link potential buyers with farmers.
- Farmers have participated in mango festivals organized by state and central govt. Approximately 200 t of mangoes have been sell through such promotional events and farmers have fetched higher prices as compared to local rates.
- Through value chain project 5 t mangoes have been export to UK by Valsad *Sahakari mandali*.

8. Action Points:

1. There should be a policy for an involvement of govt. sector to provide input guidance from planting to end market for better quality produce with higher net income to the farmers.
2. There should be an insurance policy on produce loss as well as unexpected low prices to the famers.
3. There should be an availability of easy hire based costly farm machineries to the farmers for their orchard management.
4. There should be a policy and platform provided by govt. for group marketing run by small farmers for their own produce.
5. There should be export oriented channel run in every district to facilitate farmers produce to send to distant market with having all document services.