Chapter -I
Review of Literature

The pattern of fruit crops cultivation differs considerably in different places owing to physical properties of land, climate, rainfall, temperature, hours of sunlight, cultural practices of the inhabitants etc. The technology and financial management along with the marketing management plays pivotal role in the production of any crop in a given context.

The farmers pay more attention and allocate available land resources for growing food crops in majority of the third world countries including India. Even the government agricultural policy is also generally related with food crops for food security of the people of the country. But gradually the importance of horticultural crops is realized by the people. It is also observed that the government of the developing countries too concentrates on horticultural products for both food security and health security. As a result the studies of fruit crops are extended in developing countries, so the farmers cannot overlook the importance of the production of the fruits crops also.

For food crops, some specialized systematic marketing systems are developed in almost all of the developing countries while in developed countries for both food crops and fruits crop marketing system is well organized and highly developed. Proper handling, storage, gradation, packaging, transportation, quality maintenance etc. are important for perishable commodities like fruits. Fruit like orange cannot be stored for longer period and if properly not handled at the time of pre harvesting, harvesting and post harvesting its quality is lost till it reaches from producers to the consumers.

The available literatures that have been studied relevant to the subject are presented briefly on the basis of two broad aspects viz.

A. Historical, Geographical and Production aspect and

B. Marketing and Post Harvest Management aspect.

A. Historical, Geographical and Production aspect:-

Bonovia (1890) in his study in “The Cultivated Orange and Lemons” analysed the historical derivation of the names of orange and other cultivated citrus crops. He also explained the geo-physical environment required for orange and other citrus crops
and uses of citrus crops. It also analyzed the orange and lemon trade of India during the period of 1880-1885.

In his analysis various references of Assam and Khasi hills are found for the availability of orange and citrus crops and its commercial production and values.

Bhattacharya and Dutta (1949) in the book “Classification of Citrus Fruits of Assam” classified the various citrus fruits of Assam and it is reported that orange and lemon are indigenous in Assam.

W.B. Hayes (1960) in the book “Fruits Growing in India” mentioned that citrus fruits are grown in tropical and subtropical regions throughout the world. It is mentioned that before the Second World War 650,000 acreage in USA, 254641 in India, 209,000 in Spain, 180,000 in Italy, 137,000 in Mexico, 103350 in Japan, 60,000 in South Africa, 55,000 in Brazil and 50,000 in Australia were used for production of citrus.

It is also estimated acreage of citrus fruits in the different part of India according to the report on the marketing of citrus fruits in India was in 1943- Madras 31,270, Madhya Pradesh 22947, the Punjab 17,150, Bombay 16,100, Assam 14,025, Coorg 10,071 and other provinces and states 18,148.

From this information it is clear that in Assam citrus fruits were cultivated widely before independence.


Gupta and George (1974) in their paper “Profitability of Nagpur Santra (Orange) Cultivation” which was published in ‘Indian Journal of Agricultural Economics’ evaluated the economic viability of an investment project where they estimated the (a) Pay-Back Period, (b) Net Present Value (NPV) (c) Internal Rate of Returns (IRR) (d) Benefit-Cost Ratio (BCR). Their findings were that the optimum size of orange groves is 1 to 2 acres since groves of this size are the most profitable ones. The pay-back period for investment in such gardens was seven years, the IRR is 45.9% the NPV at a 12 percent discount rate is Rs. 7,910 per acre and the benefit cost ratio at a
12% discount rate was 2.64. The least profitable groves are those of size up to 1 acre. These gardens had a payback period of nine years an IRR of 29.3% an NPV at 12% discount rate of Rs.4,260 per acre and a benefit cost ratio at a 12% discount rate of 1.85. Furthermore, the productive life of an orange tree is more than 24 years.


Chand (1994): in the paper “Economics of Perennial Crops :Some Methodological Issues” in the ‘Indian Journal of Agricultural Economics’ analyzed the existing approach and alternative approach for constructing ‘life time matrix’ of data to study the economics of perennial crops. These approaches provide an idea about the information for total life span of perennial crops for each production unit. Estimation of expected cost of production, return and profit can be obtained for individual grower or unit based on total life span with the help of this approach.

S.P.Ghosh (1985) in his article ‘Citrus’ the book “Fruit of India Tropical and Subtropical” edited by Bose mentioned the important citrus growing areas. Soil properties like soil reaction, soil fertility, drainage, free lime and soil concentration, etc., are some of the important factors that have determine the success of citrus. It thrives well in deep, loose, well aerated soils devoid of any hard pan layers of calcium carbonate in rooting zones. While dealing with the types of soil the article puts emphasis on those types which harm the health of citrus trees. For example over-moist soil, saline alkaline soil etc. It also mentioned the composition and uses of various citrus products and their industrial importance.

Singh (1990) in the book “Fruits of N.E. Region” discussed the climatic and soil requirement for citrus growing areas. It also mentioned about the method of citrus cultivation. One of the focal point of discussion is that in the recent past the problem of citrus decline has been a real threat to the citrus industry, especially of mandarin orange in N.E. regions. Earlier estimates showed that during 1973-74, mandarin orange covered about 22.7 thousand hectares with an annual production of 160 thousand tones of fruits in the north-eastern region. The much reduced present day figures clearly
indicate the gravity of the problem of declining mandarin orange in the region. In Meghalaya itself, from about 7 thousand hectares with about 48.5 thousand tones of fruit production during 1960-70, it has come down to about 4.8 thousand hectares with about 28 thousand tones of fruits. The important causes of decline of citrus in N .E. Region were mentioned in his work.

Singha and Sarma (1994) in the article “Horticultural Information and Crop Clinical Cell – An new Concept in Agricultural Development” published in the journal “Agricultural Extension Review” Vol.6 No.4 opined for the necessities of a proper information transfer and technical guidance system taking into consideration the needs and problems of farmers. It is high time to bring about changes in the traditional behavior of farmers and to adopt scientific cultivation methods.

Mankad (1996) in the book “Citrus in India” has explained the place of citrus in Indian economy. The characteristics of various commercial citrus fruits growing in India, their uses, cultivation practices, harvesting, yield and marketing, processed products etc. were analyzed in his book.

Roy (1998) in his unpublished thesis of “A Study on Production, Productivity and Resource Use Efficiency in Mandarin Orange Cultivation in Tinsukia District of Assam” it is mentioned that there were various factors that affect the productivity of orange. Prominent among them were lack of capital finance, lack of skill labour, managerial constraint, technical constraint of knowledge about proper use of fertilizer and pesticide , marketing problem faced by the farmers , transportation , low price, storing etc.

Gangwar and Singh (1998) in the paper “Economic Evaluation of Nagpur Mandarin Cultivation in Vidarbha Region of Maharashtra” in “Indian Journal of Agricultural Economics” evaluated the profitability of Nagpur mandarin on the basis of present value summation method and motorization method. They opine that investment in Nagpur mandarin orchards is a profitable business from the production point of view and essential for strengthening the citrus industry in domestic as well as in international markets. They also suggested that the economic productive life of Nagpur mandarin orchards is approximately 22 years and the mandarin orchards need to be replanted after it.
Baruah and Kalita (2001) in their article ‘Biluptir Pathat Asomar Sumathira Tengakheti’ (Orange Cultivation of Asom in the Verge of Decline) published in the Prantik vol.23, Nov, referred to the major privilege of orange cultivation from financial perspective. Comments were also made on its fruit value as well as medicinal value. However, the fact they observed is that in spite of being a profitable cultivation, a decline of interest has been noticed among the orange growers. Almost all the orange orchards were started long back; only a few orchards are established newly.

Another major advantage pointed out in the article is that the orange plants remain productive for 50 years or more. In the context, orange plants are compared to tea plants during the last four or five years a tendency is seen to transfer orange orchards to tea gardens. In Tinsukia district itself about six hundred hectare out of 1448 hectare of orange cultivated land is transferred to small tea gardens. The article also enumerates that profitability of orange production is higher than that of tea production per unit of land. In spite of being a convenient horticultural crop, growers lost their interest, as observed in the article, due to different diseases and the lack of a regulated market.


The book also explained the importance of fruits as a natural source of vitamins and minerals. He opined that horticulture industry has a unique role to play in the health and economy of the people of the developing countries like India.

Woodford (2005) in his book “Citrus Classification” considerable work has been done on the classification of citrus by various taxonomists in different parts of the world. In his work he analyzed the origin and name of the loose skinned mandarin orange (Citrus reticulate Blanco). The key varieties of the Khasi Mandarin are also mentioned in the work.

**B. Marketing and Post Harvest Management Aspect:**

Randhawa and Kahlon (1957) studied the price spread in marketing of citrus fruit at the Horticultural Research Station, Saharanpur and Government Garden, Abohar (Punjab) during the year 1855-56 and 1956-57 respectively. They found that the
marketing expenses of contractor formed as high as 35.5% of his gross income in case of Abohar orchard and 31.4% for Saharanpur orchard while in Attari garden it was 10.8%. The latter percentage was less due to good location of orchard which required the marketing changes. They also found the growers share of consumer price as low as 30% and 26.3 % in Saharanpur and Abhor respectively.

Patil et al (1969) studied the economics of production and marketing of mango in the Ratnagire district of Maharashtra during 1966-67 and found that the marketing expenditure on packing and transportation alone was $\frac{1}{10}$ of the consumer price. The retailer margin was higher than the wholesalers’ margin which account 24.94% and 13.11% respectively. On the other hand, 52.90% and 50.87% on the consumer rupee were taken by different agencies involved in the marketing of mango at Bombay and Poona respectively.

Abbott (1970) in the book “Marketing Fruit and Vegetables” pointed out the marketing channels and costs from growers to consumers through the various channels. He pointed out that consumer prices for apple, orange and tomatoes in the United States show that the producers do not necessarily receive a higher proportion of retail price under the advanced marketing system. It may take a larger margin to pay for the additional services it offers. From the retail price of oranges producer received 37%, while packing, grading etc. cost 14%, transportation cost 16% commission agents received 1%, wholesale traders received 8% and the retail traders received 24%.

Thakur (1973) in his paper “Pricing Efficiency of Indian Apple Market” in Indian Journal of Agricultural Economics finds out that pricing efficiency of Indian apple market in Shimla, Delhi, Bombay, Madras considering the major apple distributing market for the year 1969-70. He found that the producer received 50% of the consumer’s price in different markets was much wider than the variation in the share of producers from different market which showed that a large portion of consumer price was lost enroute and not reflected back in the producer’s share. The traders were found to make good bit of profit in the trade. The margin of the commission men was more than 40% which was the highest. The portion of over all margins for transportation and handling charges was much less than share of trader. Moreover, the spoilage cost was higher in retailer level than wholesale level.
Aulakh and Dhar (1974) mentioned in the article ‘Economic and Operational Efficiency in Marketing of Apple in Kashmir’ that the sales of apples by pre-harvest contractors were widespread. The most profitable sales of the farmers were direct sale to the customers. But due to per-harvest sale to the contractors the farmers fail to earn the gain from the production of apple. Over the period from 1962-63 to 1972-73 prices of apple increased but benefits did not reach to the cultivators.

Subrahmanyam (1998) in the summaries of group discussion on the subject “Horticulture in India, Organization of Production, Marketing and Processing” pointed out that there are two types of risks faced by the cultivators viz. i) the price risk i.e. the wide price fluctuations due to oversupply in peak season and ii) the risk created by the middlemen in the market i.e. illegal deductions, overcharging, offering low prices through collusion and under weighing.

Kumar (2000) in the article “The Border Trade in North East India, Historical Perspective” in the book ‘Border Trade in North East India and Neighbouring Countries’, edited by Gurudas Das and R.K. Purkayastha focuses on the degraded economic value of some horticultural products including orange. In fact, the foreign market enjoyed by orange faced a setback in the post independent era during the sixth decade. They comment that these items become ‘non-economic’ due to the close of different border trade transit points. Now as the privatization, liberation and globalization processes have been popularized since 1991 and as a result, different closed border areas have been opened for free trade in South Asian Countries, therefore, orange may become one important item to earn foreign currency through export.

Chitra Kalita (2001) in her book “Production and Marketing of Orange” established that profitability from orange is higher than other crops like paddy mustard, wheat, potato etc. Still, the return per hectare is lower mainly because the growers are not getting remunerative prices for their products. The farmers are exploited by the traders; a lion’s share of consumer’s rupee is enjoyed by the chain of traders and the growers are deprived of their due shares. She also pointed out that there remains a considerable potential for increasing the production of orange by rejuvenating the old orchards. By adoption of improved technology with application of appropriate doses of soil nutrients in orange area newly brought under cultivation and plantation of optimum plant population the return per hectare may be significantly higher.
She has worked out the market structure, market functionaries, marketing channels from producer to consumer and price spread of oranges.

Kader (ed) (2002) in the book “Post Harvest Technology of Horticultural Crops” mentioned the maturation and maturity indices, harvesting system i.e. hand harvesting and mechanical harvesting and their problems. The importance of attractive packaging of horticultural crops for good price in the marketing is also mentioned in the book. In the United States, most perishables are packed in corrugated fiberboard boxes. Hand packing is used mainly for field packed product and most packing houses employ mechanical packing.

One significant finding out in the work is that post harvest losses of fruits, vegetables and cut flower can reach from 20% to 30% in the United States and often are as high as 50% in developing countries. Not only that in addition, the loss of product value as quality declines during post harvest handling, storage and distribution which is an important factor of economic loss.

Dutta and Borah (2003): prepared a detailed report of a project on ‘Marketing and Preservation of Horticultural Produce of Kahibama and Adjoining Villages of Kamrup District’. In the report they mentioned that low yielding pattern of horticultural crops in the villages have been due to the combination of a few factors like lack of proper market, lack of awareness of the improved ways of maintaining orchards etc. They opined for the need of some handhold support to the growers. Therefore, the study suggested for active succor from the NGOs. Some of such organizations have already been actively working for the development of the villages under consideration.

Murthy, Gajanana and Sudha(2004) in the research notes of “Post- Harvest Loss and its Impact on Marketing Cost, Margin and Efficiency: A Study on Grapes In Karnataka” which was published in the ‘Indian Journal of Agricultural Economics Vol. 59. No.4 mentioned some important findings. They had estimated the post harvest loss of grapes at different stages of handling viz. field level, transit and wholesale marketing level and at retail level. The loss at the field level due to damages in bunches or berries, which were estimated in field at Bijapur, Karnataka, worked out to 7.31%. The water berry or mummy is the major contributing factor accounting for about 43.3% of loss at the field. Some other major causes of loss at the field level are damage to the berries
due to insects and pest and loose berries drops at the time of harvesting, sunburn injury and physical injury etc.

The loss in fresh grapes due to transit and wholesaling at local market is 4.24%, mostly due to injury to berries and detachment of berries. The loss at retail markets in Bijapur and Bangalore during 8-10 days of marketing was estimated 2.85% and 3.27% respectively.

Goel, Kumar and Mann (ed) (2007) in the book “Post Harvest Management and Value Addition” pointed out that the post harvest losses vary from 21-25 percent in case of Khasi mandarin in North –Eastern region. The post harvest losses in perishable commodities are higher in comparison to other parts of the country due to lack of mechanization, collection centers in major producing areas, suitable container, commercial storage house, poor transportation, unorganized marketing system and processing units. So under such a situation, besides increasing production, the reduction in post harvest losses will be a complementary means for increasing supply of fruits and vegetables. The approach has an added advantage because the cost of preventing post harvest losses is less than producing a similar additional amount of the same quantity. Therefore, attention has to be paid for such perishable commodities right from harvesting to processing and marketing.
Works Cited and References


